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UNIVERSITY OF THE WITWATERSRAND
FACULTY OF COMMERCE, LAW AND MANAGEMENT

DEVELOPING AND TESTING A FRAMEWORK FOR DIGITAL CHANNEL ADOPTION IN EMERGING MARKETS

BY

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A thesis submitted to the School of Business Sciences, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements of the degree of Doctor of Philosophy.

November 2020

DECLARATION

I, Muhommed Riyaaz Patel, declare that this thesis is my own, unaided work. It is being submitted in fulfilment of the requirements for the degree of Doctor of Philosophy to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination at this or any other university.

Name of student Muhommed Riyaaz Patel

Date submitted November 2020



Signature

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DEDICATION

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TABLE OF CONTENTS

DECLARATION ii
ACKNOWLEDGEMENTS iii
DEDICATION iv
LIST OF FIGURES x
LIST OF TABLES xii
LIST OF ACRONYMS AND ABBREVIATIONS xvii
ABSTRACT xx

CHAPTER ONE INTRODUCTION AND RESEARCH QUESTION 22
1.1 Introduction and Background 23
1.2 Rationale of the Study 24
1.3 Justification for the Research 27
1.4 Overview of the Research Problem and Questions 32
1.5 Research Aims and Objectives 34
1.6 Hypotheses of the Study 36
1.7 Thesis Layout 42
1.8 Conclusion 46

CHAPTER TWO CONTEXTUALISING DIGITAL ADOPTION IN EMERGING MARKET CONTEXTS 47
2.1 Introduction 48
2.2 Market Definitions 49
2.2.1 Developed Markets 49
2.2.2 Emerging Markets 49
2.2.3 Frontier Markets 56
2.3 M-Commerce 62
2.4 Technology Adoption in Emerging Markets 67
2.5 Conclusion 75

CHAPTER THREE LITERATURE REVIEW 76
3.1 Introduction 77
3.2 Innovation and Technology Adoption Characteristics 77
3.2.1 Existing Theory: Pitfalls 80
3.3 The Technology Acceptance Model (TAM) 81
3.3.1 The Technology Acceptance Model's (TAM) Prediction of Actual Usage and the Factors That Influence it 84
3.3.2 Review of the Technology Acceptance Model (TAM) 87
3.4 Other Adoption Models 90
3.4.1 The Theory of Planned Behaviour (TPB) 90
3.4.2 The Unified Theory of Acceptance and Use of Technology (UTAUT) 91
3.4.3 The Technology-Organization-Environment (TOE) Framework 92
3.4.4 The Diffusion of Innovation (DOI) Theory 95
3.4.5 Choice Modelling 97
3.4.6 Lazy User Model (LUM) of Solution Selection 97
3.5 Domestication Theory (DT) 98
3.5.1 Overview 98
3.5.2 Factors That Influence Domestication 102
3.5.3 Phases of Domestication 109

3.5.4 Technology Adoption in South Africa and India 111
3.5.5 Other Domestication Studies 112
3.5.6 Challenges with Domestication Theory (DT) 113
3.6 Bottom of the Pyramid (BOP) 121
3.6.1 Overview 121
3.6.2 The Landscape of the Bottom of the Pyramid (BOP) Market in South Africa 126
3.6.3 Adoption of Technology by Bottom of the Pyramid (BOP) Customers 131
3.6.4 Summary of BOP 135
3.6.5 Barriers and Challenges at the Bottom of the Pyramid (BOP) Market Segment ... 137
3.7 Summary of the Literature 139
3.8 Conclusion 140

CHAPTER FOUR RESEARCH METHODOLOGY 141
4.1 Introduction 142
4.2 Research Philosophies Adopted for the Study 142
4.2.1 Qualitative Research Paradigm 146
4.2.2 Grounded Approach 146
4.3 Ensuring Trustworthiness of the Qualitative Process 149
4.3.1 The Data-Analysis Process in Qualitative Studies 149
4.3.2 Sampling and Population 151
4.3.3 Summary of the Qualitative Research Process 152
4.4 Quantitative Research Paradigm 152
4.4.1 Research Design 152
4.4.2 Population and Sample Size 153
4.4.3 Quantitative Methodology 154
4.4.4 Pilot Test 155
4.4.5 Data Collection 156
4.4.6 Sampling Process 157
4.4.7 Measurement 158
4.5 Research Instrument Design 162
4.5.1 Data Analysis 172
4.5.2 Ethical Considerations 176
4.6 Conclusion 177

CHAPTER FIVE QUALITATIVE ANALYSIS 178
5.1 Introduction 179
5.2 The Main Research Objective of the Qualitative Analysis 179
5.2.1 Participant Profile 179
5.2.2 Contribution of Each Participant From India 180
5.2.3 Contribution of Each Participant From South Africa 181
5.3 Data-Analysis Process 182
5.3.1 Cleaning and Coding 183
5.3.2 Trustworthiness of the Data 184
5.4 A Brief Analysis of the Themes Generated 185
5.4.1 Main Themes 186
5.5 Summary of the Themes 186
5.5.1 Theme One: Cyber Security (Perceived Risk) 188
5.5.2 Theme Two: Intuitive Design (Perceived Ease of Use) 190
5.5.3 Theme Three: Convenience and Value Proposition Offered (Perceived Value) 191
5.5.4 Theme Four: Trial Periods (Trialability) 196

5.5.5 Theme Five: Protection of Personal Information (Privacy) 199
5.5.6 Theme Six: Knowledge of Mobile Apps (Awareness) 201
5.5.7 Theme Seven: Digital Enablement (Access) 204
5.5.8 Theme Eight: Cost Associated With Using the Digital Solution (Affordability)... 208
5.5.9 Theme Nine: Ecosystem Value Proposition (Lifestyle Integration)..... 210
5.5.10 Theme Ten: Feedback and Ratings (Customer Feedback)..... 212
5.5.11 Theme Eleven: Society Influence and Facilitating Conditions (User Environment) 213
5.5.12 Linking the Themes to the Propositions..... 215
5.6 Word Cloud of the Most Frequently Used Words..... 217
5.7 Comparison Analysis 218
5.8 Conclusion..... 221

CHAPTER SIX QUANTITATIVE ANALYSIS 222
6.1 Introduction 223
6.2 Demographics..... 223
6.3 Central Tendency Measure of the Constructs..... 226
6.4 Assessment of Normality 226
6.4.1 Confirmatory Factor Analysis (CFA) 227
6.5 Structural Model 232
6.5.1 Structural Model (South Africa)..... 233
6.5.2 Structural Model (South Africa) with Demographics..... 234
6.5.3 Structural Model (India)..... 235
6.5.4 Structural Model (India) with Demographics..... 236
6.5.5 R Squares - Coefficient of multiple determination for multiple regression (After Improvement) 251
6.5.6 The Results of the Structural Model 253
6.6 Mediation and Moderation Analysis..... 257
6.6.1 Mediation Analysis (India)..... 258
6.6.2 Mediation Analysis (South Africa)..... 260
6.6.3 Interpretation of the Mediation Findings 262
6.6.4 Moderation Test Results..... 262
6.6.5 Moderation Analysis (India)..... 263
6.6.6 Moderation Analysis (South Africa)..... 265
6.7 Group Difference Tests..... 266
6.7.1 Gender 267
6.7.2 Area..... 272
6.7.3 Racial Group..... 276
6.8 Comparing Means With the ANOVA..... 279
6.8.1 Level of Education..... 280
6.9 Conclusion..... 291

CHAPTER SEVEN DISCUSSION OF THE FINDINGS..... 293
7.1 Introduction 294
7.2 Research Objectives..... 294
7.3 Discussion of the Main Qualitative Findings..... 295
7.3.1 Perceived Risk (Risk and Cyber Security)..... 296
7.3.2 Privacy (Protection of Personal Information)..... 297
7.3.3 Perceived Ease of Use (Intuitive Design) 298
7.3.4 Perceived Usefulness (Convenience and Value Proposition) 299

7.3.5 Trialability ('Try Before You Buy') 300
7.3.6 Awareness (Knowledge About the Digital Offering) 302
7.3.7 Affordability (Associated Cost of Digital Offering) 302
7.3.8 Lifestyle Integration (Ecosystem Value Propositions) 303
7.3.9 User Environment (Social Influence) 304
7.3.10 Access (The User is Digitally Enabled/Facilitating Conditions) 304
7.3.11 Customer Feedback (Continuous Improvement of the App, Based on User Feedback) 305
7.4 Quantitative Research Discussion 306
7.5 Sample Characteristics 307
7.5.1 Central Tendency Measure of the Model Constructs 308
7.5.2 Reliability and Validity Tests in Confirmation Factor Analysis 308
7.5.3 The Results of the Confirmatory Factor Analysis 309
7.6 South Africa and India – Direct Relationships in the Model 311
7.7 Demographic Characteristics Influences Mobile-App Adoption 320
7.8 Mediation Results 321
7.9 Moderator Results 323
7.10 Summary of Overall Results 324
7.11 Conclusion 327

CHAPTER EIGHT RECOMMENDATIONS AND CONCLUSION 329
8.1 Introduction 330
8.2 Conclusion of the Research Questions and Objectives 331
8.3 Merit of Research and Contribution to the Field of Study 333
8.3.1 Practice Contribution 333
8.3.2 Theoretical Contributions 334
8.3.3 Methodological Contribution 338
8.4 Recommendations for the Factors That Influence Digital (Mobile App) Adoption in South Africa and India 339
8.4.1 Knowledge (Awareness) 339
8.4.2 Digital Enablement (Access) 340
8.4.3 Ecosystem Value Propositions (Lifestyle Integration) 341
8.4.4 Facilitating Conditions and Social Influence (User Environment) 343
8.4.5 Feedback (Customer Feedback) 344
8.4.6 Intuitive Design (Perceived Ease of Use) 344
8.4.7 Cyber Security (Perceived Risk) 345
8.4.8 Protection of Personal Information (Privacy) 347
8.4.9 Convenience and Digital Value Proposition (Perceived Usefulness) 347
8.4.10 Cost Associated With Digital Adoption and Usage (Affordability) 348
8.5 Practitioner Suggestions 350
8.5.1 Create awareness of your value proposition 350
8.5.2 Data and Wi-Fi 353
8.5.3 Lifestyle Integration/Ecosystems 354
8.5.4 Mobile-App Adoption in Existing Businesses 360
8.5.5 Key Steps to Ensure Digital Transformation 361
8.5.6 Merit of Research and Contribution to the Field of Study 363
8.6 Limitations and Areas for Future Research 364
8.7 Recommendations for Further Research 365
8.8 Conclusion 365
REFERENCE LIST 367

APPENDICES 434
APPENDIX A: CONSENT LETTER AND ELECTRONIC CONSENT FORM 434
APPENDIX B: INTERVIEW GUIDE 436
APPENDIX C: QUESTIONNAIRE 439
APPENDIX D: STUDY DATA 461
APPENDIX E: MODEL VARIABLE ANALYSIS 470
APPENDIX F: NORMALITY TEST RESULTS 488
APPENDIX G: ANOVA RESULTS 492

LIST OF FIGURES

Figure 1 *Theoretical Extension of the Technology Acceptance Model (TAM2)* 29
Figure 2 *Hypotheses for the Study* 37
Figure 3 *Chapter Outline* 42
Figure 4 *Emerging Market Characteristics* 53
Figure 5 *People Pursuing Higher Education in Emerging Markets* 56
Figure 6 *MSCI Market Classification* 58
Figure 7 *Mobile Internet Users in India (End 2018)* 60
Figure 8 *Mobile Internet Users in South Africa (End 2018)* 61
Figure 9 *Adapter Categorisation on the Basis of Innovativeness* 78
Figure 10 *Adoption Characteristics* 79
Figure 11 *The Technology Acceptance Model (TAM)* 84
Figure 12 *Prahalad's Economic Pyramid* 122
Figure 13 *Average Income per Pyramid Group in South Africa – Cumulative Population* 128
Figure 14 *The Shape of India's Pyramid From 2005–2025* 130
Figure 15 *Exploratory Sequential Design (Mixed-Methods Approach)* 144
Figure 16 *Probability and Non-Probability Sampling* 158
Figure 17 *Number of Quotations per Theme* 186
Figure 18 *Findings of the Study* 187
Figure 19 *Technology Barriers* 188
Figure 20 *Emerging Market Factors* 201
Figure 21 *Emerging Market Factors* 201
Figure 22 *Behaviour and Culture* 207
Figure 23 *Ecosystem Barriers* 209
Figure 24 *Most Frequently Used Words* 218
Figure 25 *Comparison Across Nationality and Ecosystem Barriers* 219
Figure 26 *Comparison Across Nationality and Emerging Market Factors* 220
Figure 27 *Structural Model (South Africa)* 233
Figure 28 *Structural Model (South Africa)* 234
Figure 29 *Structural Model (India)* 235
Figure 30 *Structural Model (India)* 236
Figure 31 *Study-Derived Model for Mobile-App Adoption* 326
Figure 32 *Factors to Create Awareness* 350
Figure 33 *Factors That Assist in Drawing Attention to Apps* 352
Figure 34 *Requested Areas of Improvement Regarding Mobile Apps* 354

Figure 35 *Mobile App Ecosystem* 355
Figure 36 *Ecosystems and Mobile Apps* 355
Figure 37 *How to Improve Customer Feedback* 356
Figure 38 *Model for Ease of Use (Participants' Point of View)* 357
Figure 39 *Five Building Blocks for Digital Transformation* 362

LIST OF TABLES

Table 1 *Emerging Market Countries* 52
Table 2 *Effect of Doubling Mobile Data Usage* 54
Table 3 *Indicator of GDP Growth* 55
Table 4 *Share of Middle-Class Consumption* 55
Table 5 *Smartphone Penetration in Emerging Markets (2017)* 59
Table 6 *Smartphone Penetration in Sub-Saharan Africa (2017)* 61
Table 7 *M-Commerce* 62
Table 8 *M-Commerce Adoption* 64
Table 9 *Mobile Cellular Subscriptions in Emerging Markets* 65
Table 10 *Online Retail as a Percentage of Total Consumption* 65
Table 11 *M-Commerce App Rankings* 66
Table 12 *Mobile Service Adoption Research* 69
Table 13 *Strengths and Weaknesses of Mobile Adoption in India* 73
Table 14 *Strengths and Weaknesses of Mobile Adoption in South Africa* 74
Table 15 *Tension Between Existing Theories* 81
Table 16 *Technology Acceptance Model (TAM) Research* 85
Table 17 *Theory of Planned Behaviour (TPB) Research* 90
Table 18 *IT Adoption Research* 93
Table 19 *Diffusion of Innovation Research* 96
Table 20 *Lazy User Model (LUM) Research* 98
Table 21 *Domestication Research Studies* 100
Table 22 *Technology Acceptance Model (TAM) Versus Social and Facilitating Conditions* 106
Table 23 *Top Three Activities of Tablet Users in the United States and Taiwan* 108
Table 24 *Journal Research Studies* 116
Table 25 *South African Bottom of the Pyramid Model* 127
Table 26 *Bottom of the Pyramid Research Studies* 132
Table 27 *Bottom of the Pyramid (BOP) Studies Conducted at GIBS* 134
Table 28 *Barriers Associated With Introducing Products and Services to the Bottom of the Pyramid (BOP) Market Segment* 138
Table 29 *Strategies for Dealing With Bottom of the Pyramid (BOP) Barriers* 139
Table 30 *The Four Levels of Measurement* 160
Table 31 *Data Instrument Derivation* 163
Table 32 *Journal Research Studies Aligned to the Methodology of This Study* 169
Table 33 *Contribution of Each Participant From India* 180
Table 34 *Contribution of Each Participant From South Africa* 181

Table 35 *Thematic Analysis* 183
Table 36 *Themes Generated From the Research* 186
Table 37 *Alignment of Main Sub-Themes to Propositions and Hypotheses* 216
Table 38 *Comparison Analysis* 219
Table 39 *Comparison Analysis* 220
Table 40 *Demographics of Participants* 223
Table 41 *Home Language of Participants* 224
Table 42 *Length of Time That Participants Have Used Mobile Apps For* 225
Table 43 *Statistical Evidence of Convergent Validity and Reliability Analysis* 229
Table 44 *Model Fit Indices* 230
Table 45 *Discriminant Validity Analysis* 231
Table 46 *Path Differences: South Africa* 237
Table 47 *Mediation Differences (South Africa)* 241
Table 48 *Control Variable Effects* 244
Table 49 *Path Differences (India)* 245
Table 50 *Mediation Path Differences (India)* 249
Table 51 *R Squares (After Improvement)* 251
Table 52 *Structural Model Results* 253
Table 53 *Mediation Analysis (India)* 258
Table 54 *Mediation Analysis (South Africa)* 260
Table 55 *Moderation Analysis (India)* 263
Table 56 *Moderation Analysis (South Africa)* 265
Table 57 *Group Statistics for 'Perceived Usefulness' According to Gender (South Africa)* 267
Table 58 *Independent Samples Test for 'Perceived Usefulness' According to Gender (South Africa)* 268
Table 59 *Group Statistics for 'Perceived Usefulness' According to Gender (India)* 268
Table 60 *Independent Samples Test for 'Perceived Usefulness' According to Gender (India)* 268
Table 61 *Group Statistics for 'Perceived Ease of Use' According to Gender (South Africa)* 269
Table 62 *Independent Samples Test for 'Perceived Ease of Use' According to Gender (South Africa)* 269
Table 63 *Group Statistics for 'Perceived Ease of Use' According to Gender (India)* 270
Table 64 *Independent Samples Test for 'Perceived Ease of Use' According to Gender (India)* 270
Table 65 *Group Statistics for 'Behavioural Intention' According to Gender (South Africa)* 271
Table 66 *Independent Samples Test for 'Behavioural Intention' According to Gender (South Africa)* 271
Table 67 *Group Statistics for 'Behavioural Intention' According to Gender (India)* 271
Table 68 *Independent Samples Test for 'Behavioural Intention' According to Gender (India)* 272

Table 69 *Group Statistics for 'Perceived Usefulness' According to Area (South Africa)* 272
Table 70 *Independent Samples Test for 'Perceived Usefulness' According to Area (South Africa)* .. 273
Table 71 *Group Statistics for 'Perceived Usefulness' According to Area (India)* 273
Table 72 *Independent Samples Test for 'Perceived Usefulness' According to Area (India)* 273
Table 73 *Group Statistics for 'Perceived Ease of Use' According to Area (South Africa)* 274
Table 74 *Independent Samples Test for 'Perceived Ease of Use' According to Area (South Africa)* 274
Table 75 *Group Statistics for 'Perceived Ease of Use' According to Area (India)* 274
Table 76 *Independent Samples Test for 'Perceived Ease of Use' According to Area (India)* 275
Table 77 *Group Statistics for 'Behavioural Intention' According to Area (South Africa)* 275
Table 78 *Independent Samples Test for 'Behavioural Intention' According to Area (South Africa)* . 275
Table 79 *Group Statistics for 'Behavioural Intention' According to Area (India)* 276
Table 80 *Independent Samples Test for 'Behavioural Intention' According to Area (India)* 276
Table 81 *Group Statistics for 'Perceived Usefulness'* 277
Table 82 *Independent Samples Test for 'Perceived Usefulness'* 277
Table 83 *Group Statistics for 'Perceived Ease of Use'* 277
Table 84 *Independent Samples Test for 'Perceived Ease of Use'* 278
Table 85 *Group Statistics for 'Behavioural Intention'* 278
Table 86 *Independent Samples Test for 'Behavioural Intention'* 279
Table 87 *Descriptive Table of 'Perceived Usefulness' According to Level of Education (South Africa)* 280
Table 88 *ANOVA Table of 'Perceived Usefulness' According to Level of Education (Africa)* 281
Table 89 *Tukey's Test of 'Perceived Usefulness' According to Level of Education (South Africa)* .. 281
Table 90 *Descriptive Table of 'Perceived Usefulness' According to Level of Education (India)*..... 285
Table 91 *ANOVA Table of 'Perceived Usefulness' According to Level of Education (India)*..... 286
Table 92 *Tukey's Test of 'Perceived Usefulness' According to Level of Education (India)*..... 286
Table 93 *Descriptive Table of 'Perceived Ease of Use' According to Level of Education (South Africa)*..... 290
Table 94 *ANOVA Table of 'Perceived Ease of Use' According to Level of Education (South Africa)* 291
Table 95 *Model Variable Contributions*..... 336
Table 96 349
Summary of the Factors That Drive Digital Adoption in South Africa and India..... 349
Table 97 *Questions Businesses Should Consider Regarding Mobile-App Adoption*..... 360
Table D1 *Gender of Participants* 461
Table D2 *Overall Age of Participants* 461
Table D3 *Area in Which Participants Resided* 461
Table D4 *Gross Income of Participants* 462

Table D5 *Devices Used by Participants* 463
Table D6 *Frequency of Mobile-App Use by Participants* 464
Table D7 *Features on Digital Devices Used Most Often By Participants* 465
Table E1 *Trialability (South Africa)* 470
Table E2 *Perceived Usefulness (South Africa)* 471
Table E3 *Perceived Ease of Use (South Africa)* 472
Table E4 *Perceived Risk (South Africa)* 473
Table E5 *Protection of Personal Information (South Africa)* 474
Table E6 *Behavioural Intention (South Africa)* 475
Table E7 *User Environment (South Africa)* 476
Table E8 *Lifestyle Integration (South Africa)* 477
Table E9 *Customer Feedback (South Africa)* 478
Table E10 *Awareness (South Africa)* 479
Table E11 *Affordability (South Africa)* 479
Table E12 *Access (South Africa)* 480
Table E13 *Trialability (India)* 481
Table E14 *Perceived Usefulness (India)* 481
Table E15 *Perceived Ease of Use (India)* 482
Table E16 *Perceived Risk (India)* 482
Table E17 *Protection of Personal Information (India)* 483
Table E18 *Behavioural Intention (India)* 483
Table E19 *User Environnent (India)* 484
Table E20 *Lifestyle Integration (India)* 485
Table E21 *Customer Feedback (India)* 485
Table E22 *Awareness (India)* 486
Table E23 *Affordability (India)* 486
Table E24 *Access (India)* 487
Table F1 *Skewness and Kurtosis Coefficients That Appear in the Final Model* 488
Table G1 *ANOVA Table of 'Perceived Ease of Use' According to Level of Education (India)* 492
Table G2 *Tukey's Test of 'Perceived Ease of Use' According to Level of Education (India)* 492
Table G3 *Descriptive Table of 'Behavioural Intention' According to Level of Education (South Africa)* 494
Table G4 *ANOVA Table of 'Behavioural Intention' According to Level of Education (South Africa)* 495
Table G5 *Tukey's Test of 'Behavioural Intention' According to Level of Education (South Africa)* 495
Table G6 *Descriptive Table of 'Behavioural Intention' According to Level of Education (India)* 498
Table G7 *ANOVA Table of 'Behavioural Intention' According to Level of Education (India)* 498

Table G8 *Tukey's Test of 'Behavioural Intention' According to Level of Education (India)* 499
Table G9 *Descriptive Table of 'Perceived Usefulness' According to Racial Group (South Africa)* . 500
Table G10 *ANOVA Table of 'Perceived Usefulness' According to Racial Group (South Africa)* 501
Table G11 *Tukey's Test of 'Perceived Usefulness' According to Racial Group (South Africa)* 501
Table G12 *Descriptive Table of 'Perceived Usefulness' According to Racial Group (India)* 502
Table G13 *ANOVA Table of 'Perceived Usefulness' According to Racial Group (India)* 502
Table G14 *Tukey's Table of 'Perceived Usefulness' According to Racial Group (India)* 503
Table G15 *Descriptive Table of 'Behavioural Intention' According to Racial Group (South Africa)* 504
Table G16 *ANOVA Table of 'Behavioural Intention' According to Racial Group (South Africa)* 504
Table G17 *Tukey's Test of 'Behavioural Intention' According to Racial Group (South Africa)* 505
Table G18 *Descriptive Table of 'Perceived Usefulness' According to Language (South Africa)* 506
Table G19 *ANOVA Table of 'Perceived Usefulness' According to Language (South Africa* 507
Table G20 *Tukey's Test of 'Perceived Usefulness' According to Language (South Africa)* 507
Table G21 *Descriptive Table of 'Perceived Usefulness' According to Language (India)* 512
Table G22 *ANOVA Table of 'Perceived Usefulness' According to Language (India)* 513
Table G23 *Tukey's Test of 'Perceived Usefulness' According to Language (India)* 513
Table G24 *Descriptive Table of 'Perceived Ease of Use' According to Language (South Africa)* ... 516
Table G25 *ANOVA Table of 'Perceived Ease of Use' According to Language (South Africa)* 517
Table G26 *Tukey's Test of 'Perceived Ease of Use' According to Language (South Africa)* 517
Table G27 *Descriptive Table of 'Perceived Ease of Use' According to Language (India)* 521
Table G28 *ANOVA Table of 'Perceived Ease of Use' According to Language (India)* 522
Table G29 *Tukey's Test of 'Perceived Ease of Use' According to Language (India)* 523
Table G30 *Descriptive Table of 'Behavioural Intention' According to Language (South Africa)* 525
Table G31 *ANOVA Table of 'Behavioural Intention' According to Language (South Africa)* 525
Table G32 *Tukey's Test of 'Behavioural Intention' According to Language (South Africa)* 526
Table G33 *Descriptive Table of 'Behavioural Intention' According to Language (India)* 530
Table G34 *ANOVA Table of 'Behavioural Intention' According to Language (India)* 531
Table G35 *Tukey's Test of 'Behavioural Intention' According to Language (India)* 532
Table G36 *VIF Analysis from SmartPLS* 534

LIST OF ACRONYMS AND ABBREVIATIONS

4IR	Fourth Industrial Revolution
ACC	Access
AFF	Affordability
ANOVA	One-way Analysis of Variance
ASO	App Store Optimisation
AT	Attitude
ATB	Attitude towards Behaviour
AU	Actual Use
AVE	Average Variance Extracted
AWS	Awareness
BI	Behaviour Intention
BOP	Bottom of the Pyramid
BRICS	Brazil, Russia, India, China, South Africa
C2C	Consumer-to-consumer
CA	Correspondence Analysis
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CBSEM	Covariance-based SEM
CF	Customer Feedback
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
DOI	Diffusion of innovation theory
DT	Domestication Theory
DV	Demographic Variable
EE	Effort Expectancy
EXP	Experience of participant
FA	Factor Analysis
FC	Facilitating Conditions
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
GSMA	Global System for Mobile Communications
HDI	Human Development Index

ICASA	Independent Communications Authority of South Africa
ICT	Information Communications and Technology
IFC	International Finance Corporation
IMF	International Monetary Fund
IS	Information Systems
IT	Information Technology
ITU	International Telecommunication Union
LI	Lifestyle Integration
LSM©	Living Standards Measure
LUM	Lazy User Model
MCA	Multiple Correspondence Analysis
MMS	Multimedia Messaging
MSCI	Morgan Stanley Capital Index
MSE	Mean Squares Error
OLS	Ordinary Least Square
PDA	Personal Digital Assistant
PEOU	Perceived Ease of Use
PLS-PM	Partial Least Squares-Path Modelling
PLS-SEM	Partial Least Squares Structural Equation Modelling
PPI	Protection of Personal Information
PPP	Purchasing Power Parity
PR	Perceived Risk
PU	Perceived Usefulness
PV	Perceived Value
RMSE	Root Mean Squares Error
S&P	Standard and Poor's
SDG	Sustainable Development Goals
SEM	Structural Equation Modelling
SEO	Search Engine Optimisation
SI	Social Influence
SmartPLS	Smart Partial Least Squared
SMS	Short Message System
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2

TB	Trialability
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TOE	Technology-Organization-Environment
TTF	Task Technology Fit
UE	User Environment
UI	User Interface
UPI	Unified Payments Interface
UNCTAD	United Nations Conference on Trade and Development
UTAUT	Unified Theory of Acceptance and Use of Technology
VAM	Value-based Adoption Model
VIF	Variance Inflation Factor
WAP	Wireless Application Protocol

ABSTRACT

The adoption rate of mobile applications in South Africa and India, both emerging markets, is lower than in developed markets. Emerging economies are unable to use developed market solutions and realise operational efficiencies in business, which can impact customer experience and satisfaction. The effect of digitalisation through mobile commerce in South Africa and India is gaining momentum; from banking to e-commerce, the acceleration of digitalisation is evident across emerging markets. New technologies and platforms are reshaping traditional business models and mobile application adoption is key to digital transformation and commercialisation. However, the context-specific aspects that drive digital adoption in emerging economies may still benefit from further research.

This study aims to enhance the literature in this field by examining mobile application adoption in South Africa and India. It develops a model that incorporates the Technology Acceptance Model, Domestication Theory, and Bottom-of-the-Pyramid emerging market characteristics through qualitative analysis. In doing so, the study investigates how digitalisation trends interface with traditional technology adoption models, emerging market characteristics, and domestication characteristics (such as lifestyle integration and community influence).

Therefore, by applying a sequential mixed-methods approach, the study seeks to determine the factors that influence mobile application adoption in emerging markets, and to investigate the influence of ecosystems and bottom-of-the-pyramid characteristics on the adoption and usage of technology. The qualitative study provides insight into factors that influence mobile application adoption in India and South Africa from a theoretical framework that was developed from a qualitative analysis and tested empirically. The analysis of 31 semi-structured interviews, 15 from South Africa and 16 from India, is conducted using Computer Assisted Data Analysis Software (CAQDAS) NVivo 12. Subsequently, the data is coded and the themes validated. The quantitative study comprises 2 061 survey questionnaire responses: 1 009 from South Africa and 1 052 from India. These are analysed using SmartPLS path modelling, whereby two structural equation models are developed.

The findings suggest that perceived ease of use, perceived risk, perceived value, privacy, user environment, lifestyle integration, customer feedback, awareness and access are all associated with digital adoption. Mediation analysis is also investigated. It shows that awareness and

customer feedback mediate the relationship between perceived risk and perceived ease of use. Tests for moderation indicate that access and affordability moderate the relationship between constructs (awareness, customer feedback, and lifestyle integration) as it pertains to intention to use. The developed theoretical framework provides a description of the drivers of digital adoption in emerging markets, specifically in South Africa and India. The findings suggest that participants in India are more knowledgeable than those in South Africa regarding the benefits and use of mobile apps. The study contributes to existing literature and discusses implications for researchers and practitioners.

CHAPTER ONE
INTRODUCTION AND RESEARCH QUESTION

1.1 Introduction and Background

Globalisation has had a defining impact on the retail and business sectors (Ristovska & Ristovska, 2014; Masharu & Nasir, 2018). For businesses to continue to operate in emerging markets, they must recognise the drivers of digital commerce, which is set to drive sales and service going forward (Akhlaq, 2015; Manoj, 2015; Suthar, 2017). Without this understanding, many businesses face certain extinction. This research investigates the factors that drive the adoption of mobile applications (hereafter referred to as 'mobile apps') in the emerging markets of South Africa and India. It considers the factors of digital adoption within the consumer ecosystem, where the definition of 'adoption' is noted as the choice to utilise or invest in a technology. Two levels of research have been conducted on information technology (IT): organisational and individual (Dasgupta et al., 2002). Mobile phone penetration in South Africa and India has increased substantially (Asongu & Nwachukwu, 2016; GSMA, 2017 & 2018; Jahani et al., 2017). The Independent Communications Authority of South Africa (ICASA, 2018) notes that South Africa's smartphone penetration was at 81% in September 2018, while India reported a smartphone penetration of 24% (GSMA, 2017 & 2019; Statista, 2018). 'Mobile penetration' refers to the number of consumers who own mobile phones, a portion of the population that has increased exponentially over the last five years in South Africa and India (Aker, 2010; Berger, 2012; Holst, 2019; Shankar & Narang, 2019; Signé, 2018).

According to the Global System for Mobile Communications, the number of Internet of Things (IoT) connections is set to triple to 25 billion by 2025. This will result in increased IoT revenue, which could reach US$1.1 trillion. Connectivity is being commoditised as mobile network operators attempt to be more involved in the value chain (GSMA, 2019). The cost of smartphones has posed a challenge for low-income individuals in emerging markets. However, this has changed in recent years, with smartphones becoming available at various price ranges, including entry-level handsets priced as low as US$4 (eServe Global, 2015; Shankar & Narang, 2019). Users in emerging markets now have access to smartphones and can benefit from the convenience and experience associated with using smartphone apps. Consumers can use mobile-app services to facilitate their day-to-day lifestyles (Barata et al., 2018; Ma et al., 2018; Shaheen et al., 2017). This presents potential commercial benefits for corporates in emerging markets (eServe Global, 2015; Stal & Paliwoda-Pękosz, 2016).

1.2 Rationale of the Study

This study investigates factors that drive the adoption of mobile apps in emerging markets. The biggest growth opportunity that exists today is annual consumption in emerging markets, which is projected to grow significantly (Banya & Biekpe, 2018; Cubeddu et al., 2014; Kongwa, 2015). Atsmon et al. (2012) suggest that by 2025 the expected revenue from digital services in emerging markets will reach US$30 trillion. The mobile-app market is continuously evolving, according to Tang (2016). Lagarde (2016) notes that the emerging market's share of global Gross Domestic Product (GDP) reached 50.4% in 2013, an increase of 19.4% since 1980. As of 2016, emerging and developing markets contributed 60% to global GDP (Lagarde, 2016). With substantial growth in GDP in emerging economies, it is imperative to understand the impact of growth and globalisation on consumers. The adoption of mobile apps enhances corporate and business profits, while reducing the cost associated with providing a service to a customer (namely, lower cost-to-income ratio). Increasing digital adoption in emerging markets assists the growth of emerging market economies (Bongomin & Munene, 2019).

However, digital adoption models can be improved to cater for the millennial population in emerging market economies, such that consumers are able to access new products and services. The Technology Acceptance Model (TAM), proposed by Davis (1989), highlights that an individual's adoption of IT is dependent on perceived ease of use and perceived usefulness of the technology (Haddon, 2017). Domestication Theory (DT) describes the integration of technologies into everyday life (Haddon, 2017). These predictive models have been investigated in isolation, but, importantly, the direct, mediated, and moderated relationships among them have not been sufficiently analysed. Hernández and Oscar (2012) suggest that Bottom-of-the-Pyramid (BOP) characteristics in emerging markets are not incorporated in traditional technology models, such as TAM and DT. As a result, traditional models may not clearly depict the factors that drive technology adoption in emerging markets.

Besides the technological aspects, several factors, including awareness, access, availability, and affordability (Prahalad, 2012), prevent individuals from adopting digital channels (Bampoe, 2015; Amer & Daim, 2011; Daştan & Gürler, 2016; Davis, 1989; Pushp et al., 2017). Cost and structural imperatives may restrict users from adopting a certain technology (Bagozzi, 2007). The current Technology Acceptance Model, used widely in industry, is not without criticism. Critics suggest that its value is questionable; that it is limited in terms of its

exploratory, descriptive, and predictive power; and that it is too trivial (Chuttur, 2009). Domestication Theory (DT) is dependent on exhaustive case studies and its descriptive methodology can make it difficult to follow. In isolation, DT is therefore not a clear predictor of digital adoption (Haddon, 2011; Hynes & Richardson, 2009).

This contrasts with quantitative approaches (such as the Technology Acceptance Model (TAM)) of North American Marketing and Information Systems (IS) research, which draws primarily on psychological models (Haddon, 2011). There have also been many research attempts to expand TAM to ensure that the factors depicted in the model are consistent with evolving changes in technology and the IT landscape. This has led to a state of chaos and confusion in theoretical discourses (Benbasat & Barki, 2007). The rationale behind these adaptations is the relevance of the TAM model (Davis, Bogozzi, & Warshaw, 1992), the Technology Acceptance Model 2 (TAM2) (Venkatesh & Davis, 2000), and the Technology Acceptance Model (TAM3) (Venkatesh & Bala, 2008), and the awareness that technology has changed significantly since then. Managers in corporate and business environments might not achieve the desired outcome from their digital solution offerings, as the premise upon which their offering is built is outdated, and thereby inappropriate for emerging markets. The result is poor digital adoption, as evidenced in emerging markets today (Sudhir et al., 2015).

Given the rapid growth and change in the technology environment, TAM is grounded in quantitative methodology, and DT is grounded in qualitative methodology in the form of exhaustive case studies, which are difficult to turn into prescriptive lessons for universal application. This is the first point of tension in the outcomes of these models. Additionally, both models are dated in terms of the research conducted and the variables they propose. This poses a challenge on account of significant advances in technology that undermine their contemporary relevance (Haddon, 2011). Therefore, both the relevance and the potential for modification of these models' constructs have come under question.

Further to this, Amer and Daim (2011), Daştan and Gürler (2016), and Haddon (2011), suggest that neither model alone provides the necessary insight into digital adoption, nor is it appropriate for analysing emerging markets. For these reasons, the current study tests a theoretical model that integrates these respective bodies of literature. Theory that predicts the patterns of the relationship between models is also analysed. The theoretical model that integrates the bodies of literature and predicts the patterns of the relationship between the

respective models is tested. It examines direct, mediated (what mediates the relationship between variables to understand the rationale behind such relationships), and moderated relationships (what influences the strength/direction of the relationship between variables) between the models as a way to provide deeper insight into the drivers of digital adoption in emerging markets. In this way, the research tests theory that predicts the patterns of these relationships.

TAM has some associated contradictions, namely response bias and the theory of reasoned action (TRA) (Chong et al., 2009; Sharma, 2019), which suggest that asking a person to complete an attitude questionnaire tends to influence that person to think about the construct being researched and form an opinion of the subject, where they may not have had an opinion prior to reading the questionnaire (Budd, 1987). By conducting a qualitative study and then testing it quantitatively, a researcher may attempt to address some concerns of bias. This can be done by understanding the nature of the consumer problem and then testing for conditions that consumers have suggested against existing models; i.e. to assess the reliability and relevance of these models. The evolution of technology provides new and increasingly inexpensive devices, such as mobile phones and tablets, within emerging markets, which enhances the digital commerce value proposition in these markets (Almazan & Sitbon, 2014). With mobile smartphone penetration increasing year on year, businesses may be able to tap into new markets, as their products or services are accessed globally (ICASA, 2018).

The penetration of these devices within emerging markets suggests that demand for data or Wi-Fi (a wireless medium for user access to the Internet), and the lowering of device costs, presents business opportunities for developing countries to easily access consumers in global markets. Prahalad (2012) formulated the so-called four A's that drive adoption, namely awareness, access, availability, and affordability, arguing that these may assist in understanding opportunities and challenges associated with products or services in an emerging market. Prahalad's four A's are mobilised here to assist in understanding how conducive environments can be created for mobile-app product or service adoption.

TAM is focused on an individual's adoption of technology, whereas DT investigates the impact of adoption on society (Haddon, 2011). This research investigates the relevance of current technology adoption models and provides an in-depth analysis of a synthesised framework that covers both the technological factors of an offering, as suggested by TAM, and the

environmental conditions covered by DT. Both models are constructed and researched in developed economies. As noted above, the unique conditions associated with an emerging market can be described according to Prahalad's four A's of marketing. This may assist a business in understanding what drives consumer adoption of their mobile apps in an emerging market. This analysis addresses a gap in knowledge pertaining to digital adoption in emerging markets. The research considers the impact of Prahalad's analysis criteria for BOP research and its influence on the application of new products and services in emerging markets (Anand & Kumaran, 2017; Prahalad, 2012).

1.3 Justification for the Research

This study aims to assist in closing the gap in the current literature by prescribing a holistic framework that can assist businesses in ensuring digital (mobile app) solutions are adopted and used. According to Credit Suisse (2015), the sum of all retail online sales across emerging markets (South Africa, India, China, Russia, Mexico, Indonesia, Turkey, and Saudi Arabia) could reach up to US$3.5 trillion over the next few years, indicating that substantial growth will be realised in emerging markets. The evolution of technology affects the way corporates and businesses operate and deliver services to their consumers. The penetration of mobile devices within emerging markets is increasing exponentially (GSMA, 2017).

This research reviews the tension between TAM and DT in terms of Prahalad's four A's for BOP, so as to better understand the factors that influence digital adoption and client behaviour, and the use and adoption of digital channel services in India and South Africa. TAM, proposed by Davis (1989), reasons that a user's adoption of technology is based on how easy or effortless it is to use the technology. This model has been used by companies and businesses, studied and extended to continuously ensure that changes in the technology environment are incorporated into the model (Dasgupta et al., 2002; Lucas & Spitler, 1999; Venkatesh & Davis, 1996). This research adopts TAM to study factors that influence adoption of mobile technology in the emerging markets of India and South Africa (Anand & Kumaran, 2017; Barata et al., 2018). DT is adopted because it gives technology a place in everyday life (Haddon, 2011). This study captures practical, temporal, and spatial factors, but, most importantly, emphasises how these factors intersect with cultural factors, as an expression of people's lifestyles and values (Haddon, 2011; Hynes & Richardson, 2009). For Silverstone et al. (1992), the degree to which

everyday technology is embedded into the life of a consumer emphasises the need for insight into the social elements that drive consumer decisions.

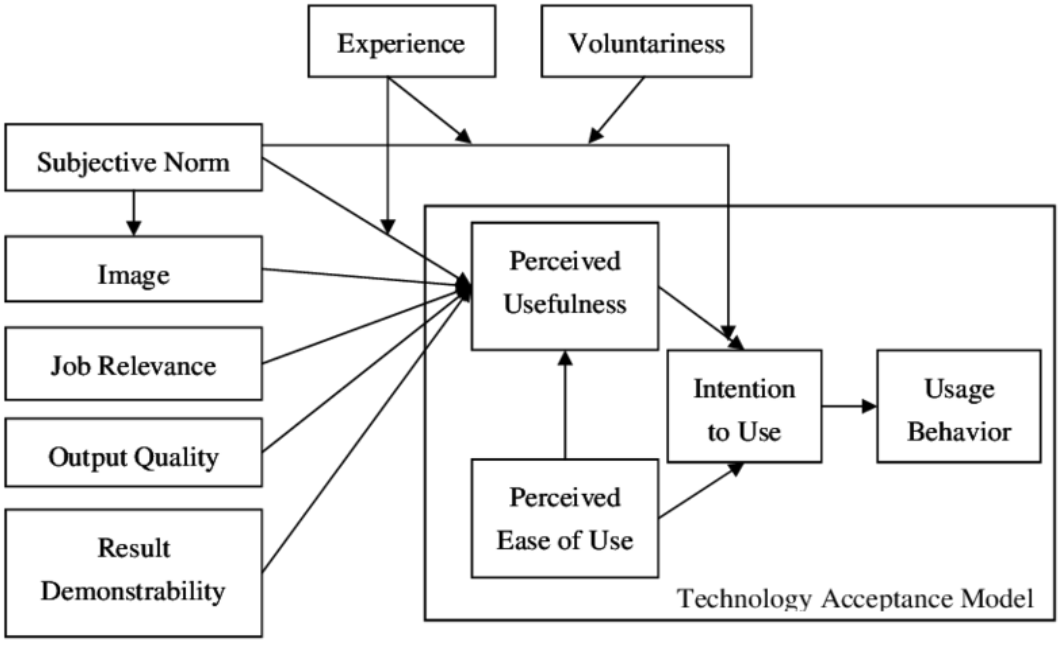
The contradictions between these models (Ajibade, 2018; Venkatesh et al., 2016) highlight the need for an integrated model that contributes to the literature by offering more contextually relevant insights into the factors that drive digital adoption in emerging markets (Birkland, 2013; Renaud & Van Biljon, 2008). Table 15 in Chapter Three provides a schematic illustration of the tension between TAM and DT. The original models integrated here were constructed in developed economies, and not in emerging markets. The study therefore contributes to the field of management by broadening people's understanding of digital adoption in emerging markets. An exploratory analysis contributes to an updated model that identifies context-specific theoretical boundary conditions and provides clarity regarding the direct, mediated, and moderated relationships between the models.

Rapid technological advancements suggest that TAM and DT frameworks need to be revised (Ajibade, 2018; Benbasat & Barki, 2007; Lai, 2017; Venkatesh et al., 2016; Matikiti et al., 2018). They ought to be combined and extended for one to truly understand the factors that drive digital adoption (Colvin, 2008; De Graaf et al., 2017). This study focuses on how to use TAM and DT to better understand the factors that influence digital adoption within emerging markets. It employs a quantitative research methodology to gain insight at an individual level, and a qualitative methodology to validate the qualitative research. Models used to interpret IT acceptance are suitable for understanding consumer behaviour, such as digital services observed by Yeong-Wha et al. (2011), to combine aspects of a technology and service from the perspective of individual behaviour. TAM evaluates technology acceptance from a user and computer perspective, while neglecting psychological, economic, and social implications (Bagozzi, 2007). Criticisms of the TAM model range from claims that its exploratory value is questionable, and that it is somewhat limited in terms of descriptive and predictive power, and triviality, to the claim that it is altogether deficient of value (Chuttur, 2009). DT evaluates technology adoption from a psychological position, without accounting for the technology involved in technology usage, and accounts for technology adoption as a process; that is, not a once-off event (Slade et al., 2015). The synthesis of the chosen models therefore provides holistic insights into technology adoption, while catering for the specific emerging market characteristics proposed by Prahalad (2009).

The literature outlines modifications to the TAM model that resulted in TAM2. These modifications are noted by Mathieson (1991) and Taylor and Todd (1995a), who suggest that TAM fails to consider imitation influences, and therefore does not illustrate the impact influential members within a community may have on other individuals (such as a relative or friend). Venkatesh and Davis (2000) build on the technology acceptance model (TAM2) to recognise user acceptance and use of technology. This extended model incorporates three interconnected social forces, namely subjective norm, voluntariness, and image (the manner in which an individual is perceived in a community). Additionally, it includes job significance, quality, and result confidence, which directly influence perceived usefulness, as depicted in Figure 1.

Figure 1

Theoretical Extension of the Technology Acceptance Model (TAM2)



Note. From *A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies* (p. 188), by V. Venkatesh and F. Davis, 2000.[1]

[1] All referencing carried out in accordance with APA 7th Edition, using the following document:
Southern Institute of Technology. 2020. *Guidelines for APA Referencing and Essay Writing* (p. 29). Retrieved on November 02, 2020 from https://www.sit.ac.nz/Portals/0/upload/APA%207th%20Edition%20Referencing%20Guide.pdf.

This study develops an adoption and usage model to determine usage characteristics and trends in digital services, and to predict consumers' usage behaviour based on patterns discerned from these characteristics and trends. Li (2010) suggests that further analysis, informed by the criticisms of and gaps within TAM in emerging markets, and the question of relevance regarding existing models in the current context, needs to be conducted to ascertain whether TAM is relevant. This research provides a relevant framework for digital adoption in an emerging market that is congruent with technologies used in communities today. It aims to help businesses realise their return on technological investment, and to avoid poor adoption within the intended market (Banya & Biekpe, 2018; Masharu & Nasir 2018; Sharma, 2019). Furthermore, the financial sector has also experienced poor adoption, where millions of rands was spent on mobile apps, without significant adoption (Doulani, Hariri, & Rashidi, 2018).

Despite the fact that mobile technology and mobile apps are popular internationally, research (for example, Bahrini & Qaffas, 2019; GSMA, 2018; Middleton et al., 2017; Roztocki & Weistroffer, 2008; Shankar & Balasubramanian, 2009; Wong et al., 2012) acknowledges that the field of study is still in its infancy, with various attributes (factors that drive adoption) still being introduced to the field.

The merging of banking services and telecommunications has created space for the emergence of mobile commerce (hereafter referred to as 'm-commerce') and mobile banking (Roshitsh, 2018; Singh & Jasmine, 2014). For Lee et al. (2007), mobile banking represents a chance for banks to increase their market share by offering mobile solutions that provide consumers with enhanced convenience, self-service capabilities, and time and cost savings (Albashrawi & Motiwalla, 2017; Cutrell, 2011; Khalek & Bakri, 2017; Ntseme & Chukwuere, 2017; Pankomera & Greunen, 2018). According to the International Telecommunication Union (ITU) (2009), there has been a substantial increase in the use of mobile phones, with almost 90% of people in South Africa using them (Berger, 2012; North et al., 2014; Noruwana et al., 2018). The literature indicates that mobile phones have become an everyday device and, through mobile banking, this creates unprecedented opportunities for banking services to reach the 'unbanked' population (Medhi et al., 2009; Twinomurinzi & Magundini, 2019). Mobile banking applications can assist in making rudimentary financial services available to low-income sectors by reducing the time it takes to bank, thereby making it easier for these consumers to use mobile banking services (Helms, 2006; Lazareska & Jakimoski, 2017; Ngumi, 2013; Vividus, 2017; Zhang et al, 2018).

An objective of the South African Financial Sector Charter is to uplift low-income individuals, and for the previously 'unbanked' to have access to banking facilities (BASA, 2003). Mobile banking provides a safe way to receive and transfer funds, as well as investment (saving) products and services (BASA, 2003; GSMA, 2009). Despite the benefits of using mobile banking, there is still uncertainty regarding whether the lower Living Standards Measure (LSM®) market will use mobile banking solutions. Scholars such as Helms (2006), Masinge (2010), Nandhi (2013), and Pankomera and Greunen (2018), have identified a crucial question: "will low-income customers view banking through their mobile phones as reliable and trustworthy, or risky?" Prahalad (2005) argues that there is money to be made at the bottom of the pyramid (BOP); that is, the low-income sector.

However, Karnani (2007) argues that the poor may not have purchasing power and remain sensitive to price. In addition, regulations also restrict mobile network operators from providing new mobile money products and services (GSMA, 2009). In South Africa, financial institutions collaborate with mobile network operators to offer mobile banking (mobile money) services (WIZZIT, 2005). Mobile banking providers have invested in mobile banking infrastructure to effectively deliver mobile banking services to the low-income market. It is therefore vital they understand all aspects that encourage the adoption of mobile banking apps in low-income markets (Helms, 2006). There is an awareness of the aspects that will permit mobile banking services to develop appropriate marketing approaches, models of business, awareness programmes, processes, and pilot projects (GSMA, 2009). This study investigates the factors that influence low-income earners in South Africa and India to adopt mobile banking.

Various research has investigated the rationale behind technology adoption, including the:

- TAM model, proposed by Davis in 1989, and an extended TAM (TAM2) proposed by Venkatesh and Davis in 2000;
- motivational model, proposed by Davis, Bagozzi, and Warshaw in 1992;
- theory of planned behaviour (TPB), proposed by Ajzen in 1991;
- model that combines TAM and TPB, proposed by Taylor and Todd in 1995[a];
- theory of reasoned action (TRA), proposed by Fishbein and Ajzen in 1975;
- model of PC utilisation, proposed by Thompson, Higgins, and Howell in 1991;
- diffusion of innovation (DOI) theory, proposed by Rogers in 1995;
- social cognitive theory, proposed by Bandura in 1986;

- unified theory of acceptance and use of technology (UTAUT) theory, proposed by Venkatesh et al. in 2003; and
- Technology Acceptance Model 3 (TAM3), proposed by Venkatesh and Bala in 2008.

Many extensions to TAM have been proposed and tested (for example, by Henderson & Divett, 2003; Lai, 2016; Lai & Zainal, 2015; Lu et al., 2003; Venkatesh & Davis, 2000; Venkatesh et al., 2002).

Prahalad (2012) suggests that the four A's (awareness, affordability, access, and availability) advance the adoption of innovation by corporates, businesses, and communities within BOP societies. Li (2010), and Legris et al. (2003), argue that additional research should be carried out to determine the rationale behind the lack of digital adoption. The literature also points to the lack of holistic knowledge regarding digital channel adoption in emerging markets. Li (2010) proposes that the construct of technology adoption was developed in first-world economies and, as a result, does not take into account social and facilitating conditions in emerging markets. Li's (2010) view is aligned with Prahalad's research into innovation application in emerging markets. Venkatesh et al. (2003, p. 453) suggest that "facilitating conditions" (that is, the degree to which an individual has confidence in the technical infrastructure of an organisation and the manner in which it supports its users) impact age and experience.

The theoretical framework ought to enable businesses in the retail sector to develop and design products and services that users in an emerging market can adopt. Managers are faced with a plethora of issues when making decisions about the best methods to effect digital product innovation and adoption (Lazareska & Jakimoski, 2017; Twinomurinzi & Magundini, 2019).

1.4 Overview of the Research Problem and Questions

Currently, the adoption rate of mobile apps in emerging markets is lower than in developed markets (Roztocki & Weistroffer, 2008; Shankar & Balasubramanian, 2009; Wong et al., 2012). Emerging economies are therefore unable to leverage developed market solutions and realise operational efficiencies in business, which may impact customer experience and satisfaction. Emerging markets may not benefit from the expected revenue from digital service projections that may reach US$30 trillion by 2025, as noted by Atsmon et al. (2012).

Smartphone penetration in emerging markets is increasing every year, and emerging markets may therefore benefit from mobile-app services – in other words, consumers from the 'bottom of the pyramid' may now have access to mobile apps and benefit from their value propositions (GSMA, 2017). However, mobile-app producers in the global domain need to understand the factors that drive adoption in an emerging market, while simultaneously catering for technological design, social influence, and BOP characteristics. To do this, they need to answer three questions:

1. What factors influence mobile-app adoption in emerging markets (TAM)?
2. To what extent do ecosystems influence adoption and usage (DT)?
3. How might Prahalad's BOP marketing characteristics influence digital (mobile app) adoption and use?

This research employs a mixed-methods sequential research approach, whereby the qualitative portion of the research is used to derive the theoretical model for testing. This study was conducted in both South Africa and India and examines the various factors that influence mobile-app adoption and usage, including aspects such as affordability, access, awareness, and the consumer environment. Prior research also suggests that cost is an aspect for further research in BOP and emerging markets (Karnani, 2009). Technology can be very expensive when it is introduced, but as the technology ages it becomes cheaper and more affordable for the lower LSM market (Wu & Wang, 2005). Various studies have considered the factors that drive technology adoption as noted by TAM, such as perceived risk (Im et al., 2008; Tan & Teo, 2000; Wu & Wang, 2005), and mobile apps, such as mobile banking (Brown et al., 2003). However, the research has predominantly noted perceived risk as one construct. Brown et al. (2003) undertook an investigative study that examines factors that influence the adoption of mobile banking apps in South Africa. This research accounts for another emerging market, India, and discusses the environmental conditions that may enhance mobile-app adoption. This can be achieved by evaluating the direct, mediated, and moderated relationships between TAM, DT, and BOP (Prahalad's four A's), providing insight into the drivers of digital adoption in emerging markets (Pal et al., 2019).

Drawing on theoretical and empirical literature, the hypotheses of this study, along with the proposed conceptual model, provide a novel explanation for consumers' adoption and usage behaviour. The research investigates how some of the usage characteristics in digital services

influence one another, based on constructs that influence technology acceptance from previous studies, and relationships that are reported to exist between them. Three dimensions are investigated in previous studies: TAM, social influence, and facilitating conditions (Henderson & Divett, 2003; Lai, 2016; Venkatesh & Bala, 2008). When comparing current technology adoption models presented in the literature, it is evident that a gap remains in terms of why these models fail on one of the three dimensions, i.e. each model in isolation may not always accurately predict a framework for digital adoption for businesses.

As discussed in the literature review (Chapter Two), the study focuses on applications of TAM (technology), DT (psychology), and emerging market theory (BOP). The first fundamental assumption made at this stage is that these models treat technology adoption as a once-off event, as opposed to a lifestyle choice. The second assumption is that digital/technology adoption differs in emerging markets, due to the environment in which the solution is offered. This research aims to understand the drivers/influencers of technology adoption by synthesising the technological constructs of TAM with the psychological constructs of DT. In addition, previous models were constructed within developed economies, while TAM has not been applied to emerging markets (Prahalad, 2012).

The study employs empirical evidence, gained from an exploratory sequential mixed-methods design analysis, to map the envisaged theoretical framework, and conducts a qualitative analysis to establish a model for further insight in this regard (Subedi, 2016). A quantitative analysis is conducted to substantiate each hypothesis derived from the envisaged theoretical framework. As discussed, this study contributes to current research by considering the traditional TAM model constructs, including those of DT and BOP (Prahalad's four A's) perspective. In isolation, each model may not accurately predict user adoption within emerging markets. The synthesis of these models may offer better analysis of adoption practices in developing countries.

1.5 Research Aims and Objectives

Research objectives are determined when defining a research aim. Research objectives provide more context than the aim and are aligned to the research question (Grove et al., 2014; Parahoo, 2014). For Creswell (2014), and Johnson and Christensen (2014), research objectives describe the precise aims of the research and should be articulated in the introduction to the research

protocol. Newell and Burnard (2011) note that these may be split into ‘primary’ (will be obtained) and ‘secondary’ (incidental) objectives, and should be aligned to the research question; cover all aspects of the problem; be precise and presented in a rational sequence; be attainable; account for resources (including time); and be mutually exclusive. This research aims to identify the factors that influence the adoption and use of mobile apps in South Africa and India.

The literature reviews the current research models (Leedy & Ormrod, 2013). Torraco (2005) suggests that research literature can take several forms, but when it involves a survey of literature for the purposes of exploring new knowledge, relevance is the key parameter for inclusion. According to Sankar (2009), researchers should understand the factors (enablers) that should be applied to ensure the factors being reviewed are applicable to the context of the research problem.

The review of existing literature for this study provides clarity on how the research objectives can be addressed, and provides propositions that are used to establish the factors that encourage enhanced digital channel adoption and use within the consumer industry. The objective of the research is to develop a theoretical framework that conceptually incorporates TAM factors as they relate to DT. The synthesis of the theory constructs, such as trialability, ease of use, perceived risk, perceived value, privacy and how this relates to lifestyle integration, and user environment and user feedback, is holistically tested, and expanded to incorporate extensions to these dated frameworks. The research analyses current models, while answering questions regarding the technological, social, and facilitative conditions required to facilitate digital adoption in an emerging market. This may lead to the realisation of e-commerce opportunities, assist business owners in maximising the return on investment within their technology structures, and enhance their customer reach in terms of digital adoption.

The objectives of the study are as follows:

- To gain insight into the rationale behind mobile-app adoption from an emerging market perspective;
- To understand the extent to which mobile-app services are consumed and used in South Africa and India;

- To suggest and validate an integrated theoretical model to help explain how various factors come together to drive mobile-app adoption and usage in an emerging market context;
- To determine the factors that encourage mobile-app adoption in South Africa and India;
- To examine the extent to which 'intention to use' is affected by the user environment (ecosystem), technology experience, and emerging market characteristics; and
- To evaluate mediating and moderating effects on the direct relationships between the models.

It is imperative that the research question, aim, and objectives are intertwined (Creswell, 2014; Doody & Bailey, 2016). The research aim may be established by deciding the complete, long-term aim and general purpose (what should be established). This allows the reader to ascertain whether the researcher has achieved that purpose (Tully, 2014). The study intends to test a theoretical model that integrates three bodies of literature (i.e. TAM, DT, and Prahalad's four A's for BOP) by using an exploratory sequential mixed-methods approach.

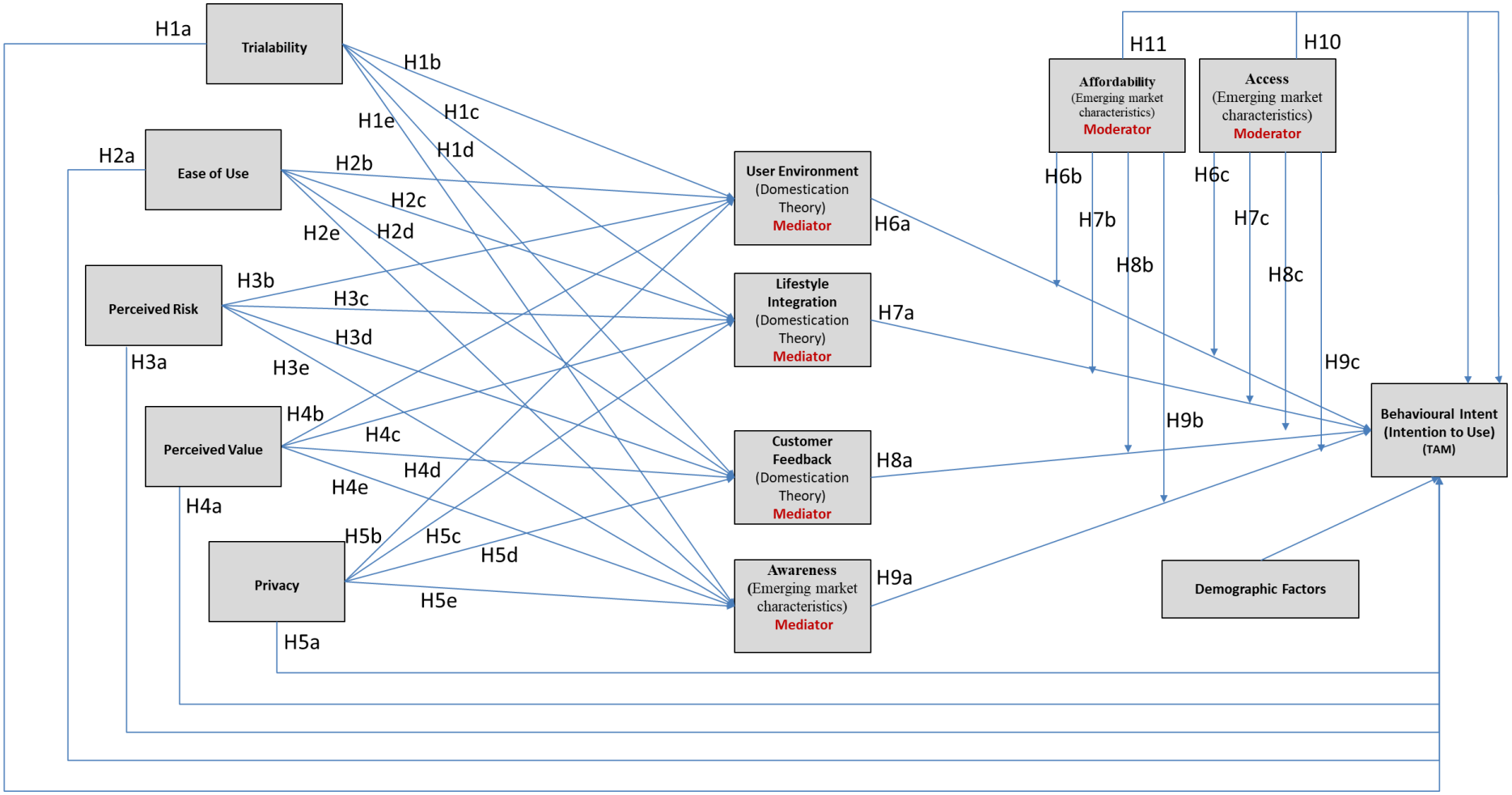
The qualitative research is conducted to inform the process of hypothesis development. The research proposes that, in combination, these will help to determine the drivers of mobile-app adoption in the respective emerging market contexts of South Africa and India. The direct, mediated, and moderated relationships between them (the variables in TAM, DT, and BOP) are investigated.

1.6 Hypotheses of the Study

The hypotheses of the study, tested in South Africa and India, are outlined in Figure 2. The illustration is based on an exploratory sequential mixed-methods design; in other words, qualitative research is conducted first, quantitative research second, and the data are then connected and analysed.

Figure 2

Hypotheses for the Study



The hypotheses in the model are as follows:

Trialability Hypotheses

- Hypothesis **H1a**: 'Trialability' is significantly and positively associated with 'intention to use'.
- Hypothesis **H1b**: 'User environment' mediates the relationship between 'trialability' and 'intention to use'.
- Hypothesis **H1c**: 'Lifestyle integration' mediates the relationship between 'trialability' and 'intention to use'.
- Hypothesis **H1d**: 'Customer feedback' significantly mediates the relationship between 'trialability' and 'intention to use'.
- Hypothesis **H1e**: 'Awareness' significantly mediates the relationship between 'trialability' and 'intention to use'.

Perceived Ease of Use Hypotheses

- Hypothesis **H2a**: 'Perceived ease of use' is significantly and positively associated with 'intention to use'.
- Hypothesis **H2b**: 'User environment' significantly mediates the relationship between 'perceived ease of use' and 'intention to use'.
- Hypothesis **H2c**: 'Lifestyle integration' significantly mediates the relationship between 'perceived ease of use' and 'intention to use'.
- Hypothesis **H2d**: 'Customer feedback' significantly mediates the relationship between 'perceived ease of use' and 'intention to use'.
- Hypothesis **H2e**: 'Awareness' significantly mediates the relationship between 'perceived ease of use' and 'intention to use'.

Perceived Risk Hypotheses

- Hypothesis **H3a**: 'Perceived risk' is significantly and negatively impacted by 'intention to use'.
- Hypothesis **H3b**: 'User environment' significantly mediates the relationship between 'perceived risk' and 'intention to use'.
- Hypothesis **H3c**: 'Lifestyle integration' significantly mediates the relationship between 'perceived risk' and 'intention to use'.
- Hypothesis **H3d**: 'Customer feedback' significantly mediates the relationship between 'perceived risk' and 'intention to use'.
- Hypothesis **H3e**: 'Awareness' significantly mediates the relationship between 'perceived risk' and 'intention to use'.

Perceived Value Hypotheses

- Hypothesis **H4a**: 'Perceived value' has a significant positive relationship with 'intention to use'.
- Hypothesis **H4b**: 'User environment' significantly mediates the relationship between 'perceived value' and 'intention to use'.
- Hypothesis **H4c**: 'Lifestyle integration' significantly mediates the relationship between 'perceived value' and 'intention to use'.
- Hypothesis **H4d**: 'Customer feedback' significantly mediates the relationship between 'perceived value' and 'intention to use'.
- Hypothesis **H4e**: 'Awareness' significantly mediates the relationship between 'perceived value' and 'intention to use'.

Privacy Hypotheses

- Hypothesis **H5a**: 'Privacy' has a significant positive relationship with 'intention to use'.
- Hypothesis **H5b**: 'User environment' significantly mediates the relationship between 'privacy' and 'intention to use'.

- Hypothesis **H5c**: ‘Lifestyle integration’ significantly mediates the relationship between ‘privacy’ and ‘intention to use’.
- Hypothesis **H5d**: ‘Customer feedback’ significantly mediates the relationship between ‘privacy’ and ‘intention to use’.
- Hypothesis **H5e**: ‘Awareness’ significantly mediates the relationship between ‘privacy’ and ‘intention to use’.

User Environment Hypotheses

- Hypothesis **H6a**: ‘User environment’ is significantly and positively associated with ‘intention to use’.
- Hypothesis **H6b**: ‘Affordability’ significantly moderates the relationship between ‘user environment’ and ‘intention to use’.
- Hypothesis **H6c**: ‘Access’ significantly moderates the relationship between ‘user environment’ and ‘intention to use’.

Lifestyle Integration Hypotheses

- Hypothesis **H7a**: ‘Lifestyle integration’ is significantly and positively associated with ‘intention to use’.
- Hypothesis **H7b**: ‘Affordability’ significantly moderates the relationship between ‘lifestyle integration’ and ‘intention to use’.
- Hypothesis **H7c**: ‘Access’ significantly moderates the relationship between ‘lifestyle integration’ and ‘intention to use’.

Customer Feedback Hypotheses

- Hypothesis **H8a**: ‘Customer feedback’ is significantly and positively associated with ‘intention to use’.
- Hypothesis **H8b**: ‘Affordability’ significantly moderates the relationship between ‘customer feedback’ and ‘intention to use’.
- Hypothesis **H8c**: ‘Access’ significantly moderates the relationship between ‘customer feedback’ and ‘intention to use’.

Awareness Hypotheses

- Hypothesis **H9a**: ‘Awareness’ is significantly and positively associated with ‘intention to use’.
- Hypothesis **H9b**: ‘Affordability’ significantly moderates the relationship between ‘awareness’ and ‘intention to use’.
- Hypothesis **H9c**: ‘Access’ significantly moderates the relationship between ‘awareness’ and ‘intention to use’.

Access Hypothesis

- Hypothesis **H10**: ‘Access’ is significantly and positively associated with ‘intention to use’.

Affordability Hypothesis

- Hypothesis **H11**: ‘Affordability’ is significantly and positively associated with ‘intention to use’.

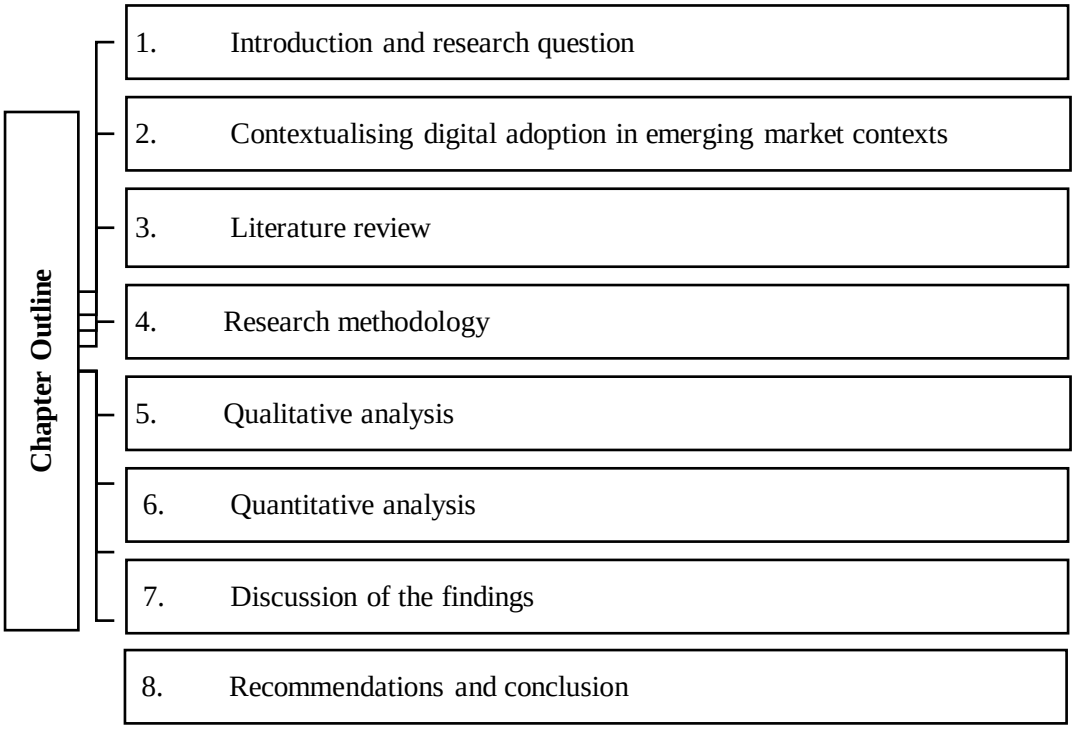
The research hypotheses provide a clear proposition that is tested in the study, based on the exploratory sequential mixed-methods design adopted. Once the hypotheses are validated by the tests and measures that were applied, each hypothesis is summarised and explained. Thereafter, a discussion regarding the acceptance and rejection of the hypothesis is provided.

1.7 Thesis Layout

This thesis is organised into eight chapters. Figure 3 provides an overview of the chapters, with the details of each chapter outlined thereafter.

Figure 3

Chapter Outline



Chapter One

This chapter introduces the factors that drive the adoption of mobile apps in emerging markets (i.e. South Africa and India), noting that attempts to address these factors within the ecosystem of a consumer, which speaks to the research problem. Gaps in the literature are identified and the objective of the current study is discussed in relation to how it contributes to knowledge available on digital adoption in emerging markets.

An exploratory sequential mixed-methods design is adopted, whereby qualitative research is conducted in South Africa and India, followed by quantitative research that validates the findings from the qualitative study. The rationale behind this research approach is to address how increasing digital adoption in emerging markets might assist in the broader growth of emerging market economies through the adoption of mobile apps.

An overview of methodological precedent applied in mobile technology research is then considered in order to place the methodology of the study in the context of existing research. A diagrammatic representation of the research model to be tested is also provided, together with an outline of the research process. The background to the study, the research objectives, and theoretical framework are also introduced in this chapter.

Chapter Two

Chapter Two introduces the concepts and definitions of emerging markets and m-commerce from the literature review conducted. The chapter provides insight into emerging market characteristics, such as gross domestic product (GDP), and outlines how a country is classified as either an emerging or developed market. Emerging market classifications are considered, as well as frontier markets, along with the characteristics of such markets in the context of mobile technology adoption. The literature also relates smartphone penetration in emerging markets in Sub-Saharan Africa to mobile Internet use in both India and South Africa; and m-commerce and m-commerce adoption, and how this relates to factors that drive technology adoption. Finally, the literature compares the strengths and weaknesses of mobile adoption in India and South Africa.

Chapter Three

This chapter draws on the literature presented in Chapter Two and discusses the theories that depict digital adoption within the literature. It presents a literature review of these theories for technology adoption. The hypotheses of the study are then derived and introduced. Literature relating to innovation and technology adoption characteristics is discussed with regard to the cumulative technology curve. Literature relating to innovation and technology adoption characteristics is discussed with regard to the cumulative technology curve (number of

consumers adopting technology over time). Literature on adoption characteristics is then reviewed and the shortcomings of the existing theories are examined.

Chapter Four

This chapter introduces the research methods employed in the study: qualitative and quantitative approaches. The first part of the chapter discusses the qualitative approach and outlines issues relating to the verification of the trustworthiness of qualitative process (Guba, 1981). Thereafter, the coding and analysis processes are outlined. The second part of the chapter discusses the quantitative process. The research design is stipulated, and the population and sample of the research are discussed. An explanation of the data-analysis process is provided, and concerns with the sampling procedure are outlined. Reliability and validity are also detailed. Thereafter, each of the hypotheses is introduced and the statistical methods used to test each hypothesis are addressed.

Chapter Five

This chapter presents and critically discusses the qualitative research findings. The data accumulated from the interviews is discussed. The qualitative analysis in this chapter is aimed at developing testable propositions, which in turn form the basis of the hypotheses tested in the quantitative portion of the research. Using a modified form of grounded research and thematic analysis, certain relationships pertinent to mobile technology adoption are analysed, and propositions derived for hypotheses. The hypotheses are derived from the qualitative analysis, the literature, and the theories identified (i.e. TAM, DT, and BOP). After the propositions are derived from the qualitative analysis, the 31 different contextual ‘cases’ are summarised in relation to the most salient relationships around factors that drive mobile technology adoption for each context. The cases show an outline of the contextual structure of the relationships around factors that drive mobile technology adoption for people within the different emerging markets in the respective contexts of India and South Africa.

Chapter Six

The results of the quantitative portion of the research are reported in this chapter. The results obtained from testing the eleven hypotheses are discussed. There is a discussion on the impact of lifestyle integration, customer feedback, and user environment from DT; and perceived ease of use, protection of personal information, perceived risk, and perceived usefulness from TAM theory as drivers of behavioural intention for mobile-app adoption.

The chapter discusses mean scores of the demographic criteria applied in the study and seeks to understand whether there is a difference in the way men and women perceive mobile-app adoption. The chapter also assesses the impact that level of education, language, and racial group have on behavioural intent to use mobile apps in both South Africa and India.

Chapter Seven

This chapter integrates the qualitative (Chapter Five) and quantitative research (Chapter Six) and presents a complete and holistic view of the data gathered from the research. As part of the integration of the qualitative and quantitative findings, an illustration of how these findings relate to the literature review is discussed. This is followed by a discussion of the results that relate to the hypotheses of the DT dimensions. The combined research analyses the key determinants of mobile-app adoption, while attempting to understand the drivers within each of the variables used in the study. The correlation between these constructs is investigated, as is whether they will contribute positively or negatively to the adoption of mobile apps in South Africa and India. This chapter attempts to understand the relevancy of the current technology adoption models in the literature. Once the results are concluded we may investigate the influencers of mobile-app adoption in emerging markets, which may be utilised by both developed and emerging countries. A holistic perspective of the findings is then offered. This analysis is in no way exhaustive, but aims to add to the literature. In doing so, the research attempts to contribute to both theory and practice.

Chapter Eight

This chapter summarises the research and provides recommendations for practice and further research, based on the research findings. With substantial growth noted in emerging markets,

the research summarises the impact that mobile apps have had on m-commerce. The evolution of technology and adoption of mobile apps in emerging markets should change the way corporates and businesses operate and deliver services to their consumers. The study also looks to illustrate that mobile apps may enhance customers' use of devices and add value to their day-to-day activities. As with any research, this research has limitations. This chapter provides a detailed overview of the five limitations associated with the research.

This study is not only important for understanding that the current technology adoption models are incomplete, but contributes to the field of mobile-app adoption from an emerging market perspective. The recommendations will assist businesses in maximising the value their respective mobile apps offer.

1.8 Conclusion

This chapter presented the background to the study, the research problem, and the research questions. The theoretical framework of the study was introduced and theory relating to the adoption and usage of technology in emerging markets was contextualised in relation to theory from the literature. An overview of the methodologies was provided, and the chapter concluded with an outline of the content covered in each chapter.

CHAPTER TWO
CONTEXTUALISING DIGITAL ADOPTION IN EMERGING MARKET CONTEXTS

2.1 Introduction

This chapter discusses emerging markets – how they are defined, their constructs, and characteristics – to ensure that the proposed digital adoption framework is understood in the relevant market context. The chapter elaborates on m-commerce and its impact on emerging markets, and discusses the operational concepts of emerging markets and m-commerce.

According to the World Bank Atlas Method (2018), emerging markets are defined as countries whose gross national income (GNI) per capita is below US$12 746. It is necessary, however, to be cautious when categorising countries in this way, as fundamental differences in countries' development behaviour ought to be considered (Pereiro, 2002). Dhanaraj and Khanna (2011) argue that we need to rethink the way we evaluate and implement technology within emerging markets. They propose a review of emerging market driving forces. Johnson et al. (2006), and Mintzberg and Gosling (2002), suggest that cultural misunderstandings and stereotypes frequently influence developed market business decisions (Adler et al., 2001; Levy et al., 2007). Care therefore needs to be taken when conducting an analysis of this type of market.

The term 'emerging markets', also referred to as 'emerging economies' or 'developing markets', refers to countries that are striving to improve their productive capacity. According to the World Bank (2017), emerging market per-capita income was less than US$4 035 in 2017. Per-capita income indicates what individuals in a market typically earn and is a measure of the standard of living in a country. Wilcox (1992) defines an emerging market as a market where GDP per capita is low. Emerging markets have developed rapidly over recent years and, according to Dhanaraj and Khanna (2011), developed market growth is dependent on involvement with emerging markets, such as those of Brazil, China, India, and South Africa.

Morgan Stanley Capital International (MSCI) (2019) has developed a market classification index that reviews a country's perspectives, policies, foreign direct investment (FDI), economic standing, and stability to ascertain how developed a country is. The index consists of the following criteria:

- Economic development: this component evaluates the stability of a country and is only used for developed markets, considering the various development levels within emerging and frontier markets.

- Size and liquidity requirements: this component analyses the securities that are required for investment, based on the MSCI Global Standard Indices.
- Market accessibility criteria: this component analyses the experience that investors have had within a market by evaluating the complexity of doing business within the country.

2.2 Market Definitions

2.2.1 Developed Markets

According to the MSCI (2019), a developed country is one with sophisticated capital markets and a developed economy. Key characteristics of a developed market include the country's human development index (HDI), income per capita, level of industrialisation, sophisticated infrastructure, ease of policy for foreign ownership, GNI, and GDP. Based on these characteristics, a country is classified as either 'developed' or 'developing' (emerging and frontier markets). Every firm that evaluates the status of a country may provide a different classification.

The International Monetary Fund (IMF) (2015) notes that developed countries hold 61% of global GDP based on nominal values; and 43% of global GDP, based on purchasing power parity (PPP).

2.2.2 Emerging Markets

When a country's trajectory of reaching a sophisticated economic and stock market comes to emulate that of a developed country, the market is considered an emerging market. Many researchers have evaluated the defining aspects of emerging markets over the decades. Examples include Adjasi and Biekpe (2006), and Bekaert and Harvey (1997), who have contributed to discourse on market amalgamation and segmentation, and financial and economic policies and pitfalls.

Emerging markets have gained much traction as a field of study, as these markets make up most of the world's population and land, which has contributed to an increase in market

progression (Bekaert & Harvey, 2002). In earlier publications, Harvey (1995), and Bekaert and Harvey (1997), note that emerging markets demonstrate greater average returns than those seen in developed economies.

Hoskisson et al. (2000, p. 249) define an emerging market as a market with the following characteristics: "low income, rapid growth economies and using economic liberalisation as their primary engine of growth". Although such countries possess some traits related to a developed market, they do not meet all the required criteria.

Various researchers and firms use the terms 'developing nations' and 'emerging markets' interchangeably, as noted by Owusu and Habiyakare (2011). MSCI (2019) defines the difference between emerging markets and frontier markets in developing markets, stating that emerging markets comprise countries that are in the process of becoming developed economies, while frontier markets are less-advanced economies in the developing world. Some scholars insist that 'emerging markets' refer to more attractive 'developing markets' (Hennart, 2012; Hoskisson et al., 2000). MSCI (2019) argues that an emerging market is more attractive than a frontier market. It is evident that different definitions exist for emerging markets. Emerging markets may also be categorised as developing markets, but the reverse is not true (Sachs, 2007).

Rapid growth in emerging markets is fuelled by increased spending on account of an expanding middle class. These markets' political policies support their nations and assist the country in transcending the traditional industrialised economy. The rapid social change in these markets also introduces high volatility, which, according to Bekaert and Harvey (1997), may result in domestic policy instability. Another aspect worth noting in emerging markets is the currency to which these countries are exposed, due to their reliance on the US dollar for trade.

Amadeo (2019) argues that emerging markets drive the global economy and make a significant contribution to global GDP. The financial systems of emerging markets have matured since the 1997 crisis, which makes business and commercial activities in these markets more attractive. Amadeo (2019) states that emerging markets are attractive for corporates and businesses and may yield many benefits for emerging market clients. However, not every emerging market is a suitable investment choice. The level of corruption, the growing labour force, and the debt to which the country is exposed also need to be considered.

India and South Africa are members of BRICS (Brazil, Russia, India, China, and South Africa). According to Katz (2016), there are over three billion individuals in BRICS countries, and they account for 43% of the world's population. Katz (2016) argues that, combined, the GDP in BRICS economies is approximately US$16 trillion, which accounts for 23% of the world's GDP. It is expected that BRICS economies will be the most dominant in the world by 2050. According to the China e-Commerce Report of 2016 (MOFCOM, 2016), China contributes the most to e-commerce, to the tune of US$376 billion. India and Russia contribute nearly US$16 billion each; Brazil contributes US$14 billion; and South Africa contributes US$2 billion. These figures demonstrate the power of emerging markets.

Khanna et al. (2005) suggest that market attractiveness and country opportunities may be evaluated by composite indices. As such, a list of indices is evaluated to determine whether or not a country can be classified as an emerging market. See Table 1.

Table 1

Emerging Market Countries

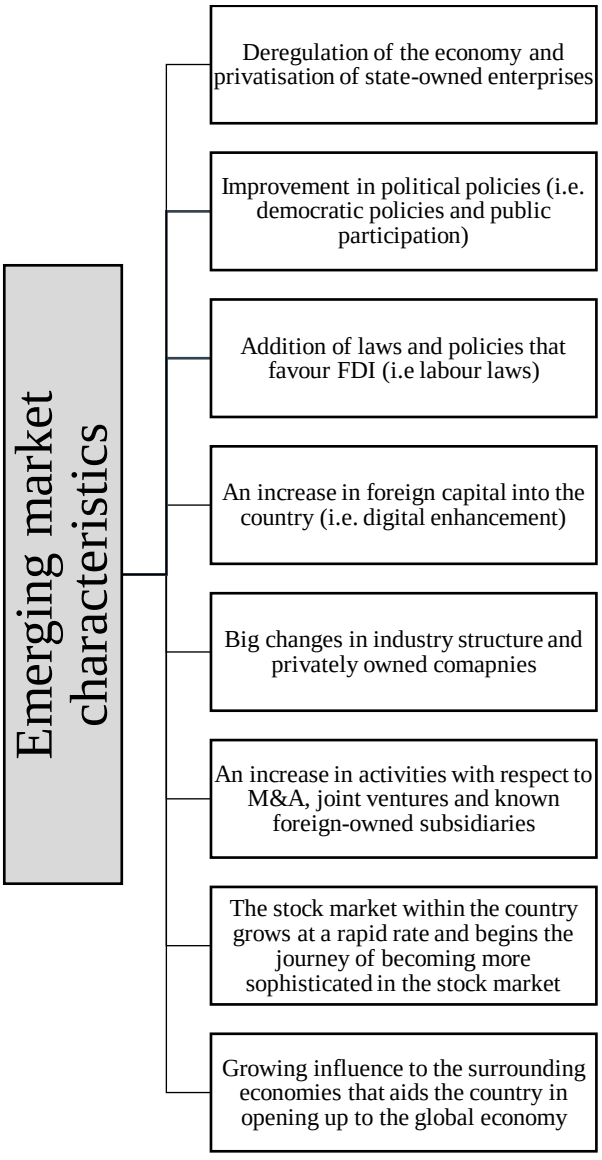
Country	IMF	BRICS+ next 11	FTSE	MSCI	S&P	EM Bond Index	Dow Jones
Argentina	Yes			Yes		Yes	
Bangladesh	Yes	Yes					
Brazil	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chile	Yes		Yes	Yes	Yes	Yes	Yes
China	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Colombia	Yes		Yes	Yes	Yes	Yes	Yes
Czech Republic			Yes	Yes	Yes	Yes	Yes
Egypt		Yes	Yes	Yes	Yes	Yes	Yes
Greece			Yes	Yes	Yes		Yes
Hungary	Yes		Yes	Yes	Yes	Yes	Yes
India	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Indonesia	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kuwait			Yes				
Malaysia	Yes		Yes	Yes	Yes	Yes	Yes
Mexico	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nigeria		Yes				Yes	
Pakistan	Yes	Yes	Yes	Yes	Yes	Yes	
Peru	Yes		Yes	Yes	Yes	Yes	Yes
Philippines	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Poland	Yes			Yes	Yes	Yes	Yes
Qatar			Yes	Yes	Yes	Yes	Yes
Russia	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South Africa	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South Korea		Yes		Yes			
Taiwan			Yes	Yes	Yes	Yes	Yes
Thailand	Yes		Yes	Yes	Yes	Yes	Yes
Turkey	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ukraine	Yes					Yes	
United Arab Emirates			Yes	Yes	Yes	Yes	Yes
Venezuela	Yes					Yes	
Vietnam		Yes				Yes	

Note. Emerging Market Countries. Data adapted from IMF (2015), FTSE Review (2014), EMGP (n.d.), MSCI (2015), Dow Jones Indices (2019), and JP Morgan (2016).

Figure 4 outlines the characteristics of emerging markets.

Figure 4

Emerging Market Characteristics



Note. Emerging Market Characteristics. From *Valuation of Companies in Emerging Markets: A Practical Approach*, by Pereiro, 2002.

Emerging markets are shifting their focus from their traditional economies (comprising agriculture and the export of raw materials) to include the production of goods and services (Amadeo, 2019). This shift in economic focus is due to governments' attempts to better the

quality of life for residents of these emerging countries. These markets are quickly mass-producing goods and services and taking on a free market or mixed economy.

2.2.2.1 Emerging Markets' Gross Domestic Product (GDP)

An economy is an organised system whereby a country's trade, industry, and money are integrated (MacMillan Dictionary, 2019). According to Stats SA (2019), GDP represents the combined value of all products and services offered in a country, and is an effective measure of a country's productivity power. A report published by Deloitte (2012) suggests that mobile telephony continues to deliver substantial benefits to developing economies. The Deloitte (2012) report notes that a 10% increase in mobile telephony penetration will result in a four-percentage basis point increase in GDP output.

GDP growth in emerging markets is much higher than that noted in developed markets. Emerging markets have outperformed developed economies in terms of GDP growth in previous market cycles. Table 2 shows the link between GDP growth and Internet usage in an emerging market context, illustrating the impact that Internet connectivity has on economic growth.

Table 2

Effect of Doubling Mobile Data Usage

Country	Approximate increase in GDP growth	Approximate average usage per 3G connection (GB/year)
South Africa	0.2%	0.4
India	0.01%	0.05
China	0.1%	0.1
Russia	1.3%	2.2
USA	0.4%	0.3
UK	0.9%	1.8
Germany	0.7%	1.4

Note. Effect of Doubling Mobile Data Usage. Adapted from *What is the Impact of Mobile Telephony on Economic Growth?* (p. 8), by Deloitte, 2012, retrieved from: content/uploads/2012/11/gsma-deloitte-impact-mobile-telephony-economic-growth.pdf.

Table 3

Indicator of GDP Growth

Market	Approximate year-on-year growth (2016)	Estimated IMF projection (2020)
Emerging market	7	5
World	3.8	3.9
Developed market	2	1.9

Note. The Evolution of Emerging Markets. Data adapted from IMF in Goldman Sachs, 2019, retrieved from: https://www.gsam.com/content/gsam/us/en/advisors/resources/investment-ideas/emerging-markets-opportunities.html#section-background_98a1_background_sectionheaderwithtab.

In the past, the rise of the middle class within a country was a good indicator of GDP growth. As more consumers reach middle-class status, their households generate more disposable income. This often results in a growing economy, as purchasing power increases for that group and they are likely to increase their spending. See Table 4.

Table 4

Share of Middle-Class Consumption

Approximate share of middle-class consumption		
Year	**Developed market**	**Emerging market**
2000	81%	19%
2010	70%	30%
2015	60%	40%
2020	50%	50%
2030	35%	65%
2040	20%	80%

Measured in constant terms

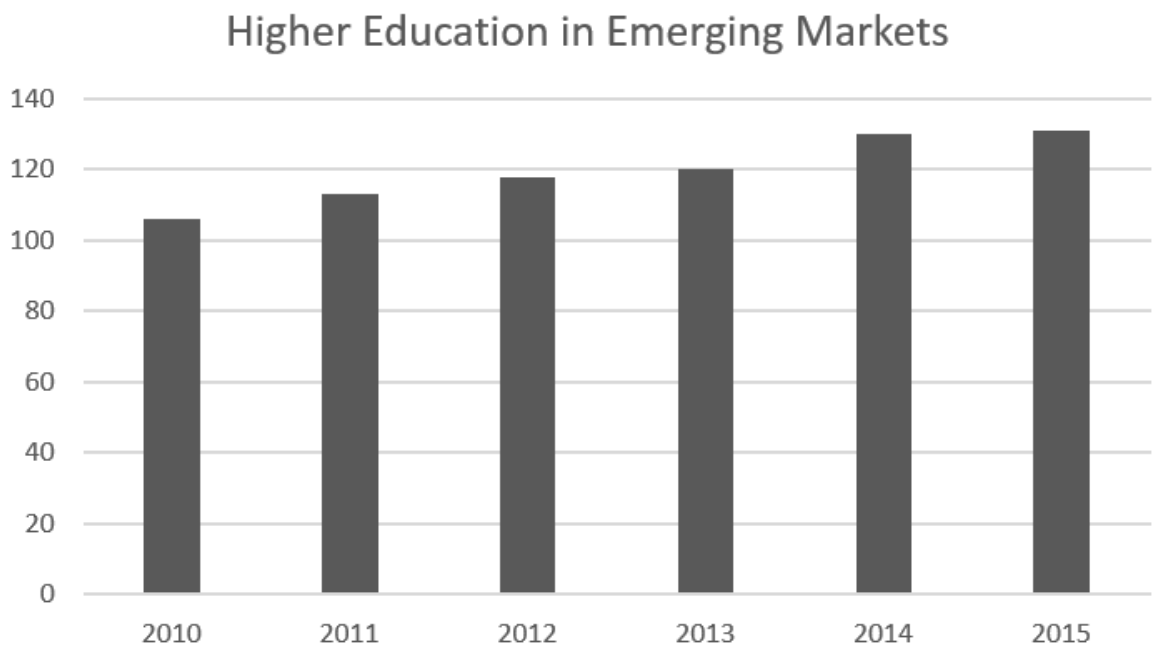
Note. The Evolution of Emerging Markets. Data adapted from Goldman Sachs, 2019, retrieved from: https://www.gsam.com/content/gsam/us/en/advisors/resources/investment-ideas/emerging-markets-opportunities.html#section-background_98a1_background_sectionheaderwithtab.

2.2.2.2 Enhanced Education Systems

As developing countries employ better educational systems and policies, they note an increase in productivity and employment, which may drive income, economic growth, and consumption. See Figure 5.

Figure 5

People Pursuing Higher Education in Emerging Markets



Note. People Pursuing Higher Education in Emerging Markets. Data adapted from Goldman Sachs, 2019, retrieved from: https://www.gsam.com/content/gsam/us/en/advisors/resources/investment-ideas/emerging-markets-opportunities.html#section-background_98a1_background_sectionheaderwithtab.

2.2.3 Frontier Markets

The International Finance Corporation (IFC) (2016) originally defined the term ‘frontier market’ in 1992. These are considered subgroups of emerging markets, as they are smaller and riskier than other developing markets.

In an IMF working paper, Abidi et al. (2016) note that the methodology by which various firms classify developed, emerging, and frontier markets differs, but is robust. According to the

working paper, frontier markets are a subcategory of emerging markets, as they are low-income development countries with poorer policies, and an underperforming economy. These countries are typically indebted and risky, and their economic development is in its infancy. They also have unstable political environments, and are not as advanced or sizeable as emerging markets.

Frontier markets are typically suited to high-risk investors; those seeking strategic or long-term returns. Another reason that investors may consider these types of markets is on account of their variation compared to other markets. In business terms, these would be the riskiest markets in which a company could invest, and companies ought to proceed with caution.

2.2.3.1 Characteristics of Frontier Markets

Berger (2012) notes that Standard and Poor's (S&P) introduced the frontier market index in 2007. As a result, the MSCI also introduced a frontier market index. Gathering data in these markets represents a real challenge, as they are small in comparison to emerging markets, underdeveloped, illiquid, and have insufficient governance and control. According to MSCI (2018), examples of frontier markets include Romania, Kenya, Kuwait, Bangladesh, and Sri Lanka.

These classifications are not fixed, and countries tend to be promoted and demoted between classifications, depending on economic performance. For example, the MSCI reclassified Jordan, Pakistan, and Argentina.

The MSCI classification of some developed, emerging, and frontier markets is provided in Figure 6.

Figure 6

MSCI Market Classification

MSCI World Index **Developed Markets**	*MSCI Emerging Market Index* **Emerging Markets**	*MSCI Frontier Market Index* **Frontier Markets**
• Canada • United States • Denmark • Finland • Belgium • France • Israel • Italy • Spain • Sweden • Switzerland • United Kingdom • Australia • Hong Kong • Japan • New Zealand • Singapore	• Brazil • Chile • Colombia • Mexico • Peru • Egypt • Greece • Hungary • Poland • **South Africa** • Turkey • United Arab Emirates • China • **India** • Pakistan • Taiwan • Thailand	• Argentina • Croatia • Estonia • Romania • Serbia • Kenya • Mauritius • Morocco • Jordan • Kuwait • Oman • Bangladesh • Sri Lanka • Vietnam

Note. MSCI ACWI and Frontier Markets Index. From *Results of the MSCI 2020 global market accessibilty review*, by MSCI, 2019, retrieved from: https://www.msci.com/market-classification.

2.2.3.2 Smartphone Penetration in Emerging Markets

Developed markets are, at this stage, reaching saturation in terms of smartphone penetration. The majority of penetration growth from 2017 to 2020 is therefore attributed to emerging markets. According to GSMA (2017), the Asia Pacific region, of which India is part, will, on average, contribute 571 million unique subscribers to additional smartphone penetration. The African continent is currently the least penetrated market, and is envisaged to grow by 6.2%. See Table 5.

Table 5

Smartphone Penetration in Emerging Markets (2017)

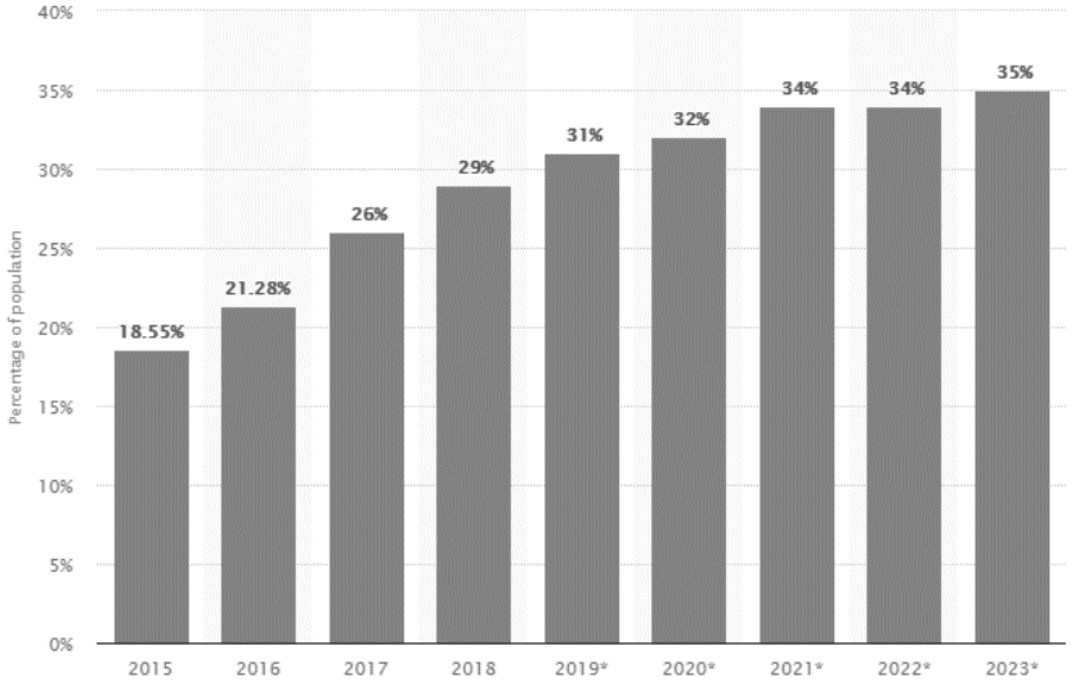
Asia Pacific	**4G network 2016**	**4G network 2020**	**Subscriber smartphone penetration 2016**	**Subscriber smartphone penetration 2020**
	27%	45%	51%	63%

Note. Asia Pacific. Adapted from *The Mobile Economy 2017* (p. 8), by GSMA, 2017, retrieved from: https://data.gsmaintelligence.com/api-web/v2/research-file-download?id=28999719&file=The%20Mobile%20Economy%202017.pdf.

According to Statista (2019a), in 2018, India recorded 390.9 million mobile Internet users (those accessing the Internet with a mobile phone). It is estimated that by 2023, the number of users accessing the Internet from a mobile device will be 500.9 million. Figure 7 provides additional insight.

Figure 7

Mobile Internet Users in India (End 2018)



Note. Mobile Phone Internet User Penetration in India From 2015 to 2018 With a Forecast Until 2023. Statista, 2019a, retrieved from: https://www.statista.com/statistics/309019/india-mobile-phone-internet-user-penetration/.

Africa has seen remarkable growth in the use of mobile phones (International Telecommunication Union, 2009). The International Telecommunication Union (ITU) suggests that one in ten Africans has access to mobile phones, which is greater than the ratios noted in leading African economies, such as South Africa and Nigeria (Djiofack-Zebaze & Keck, 2009).

According to Statista (2019b), approximately 22 million South Africans utilise smart phones. The total population of South Africa is approximately 57 million (World Bank, 2018). Feature phones – phones that have Internet connectivity but are unable to support mobile apps – are still popular in South Africa. There is therefore an opportunity for smartphone use to grow by five million by 2023 (GSMA, 2017). See Table 6.

Table 6

Smartphone Penetration in Sub-Saharan Africa (2017)

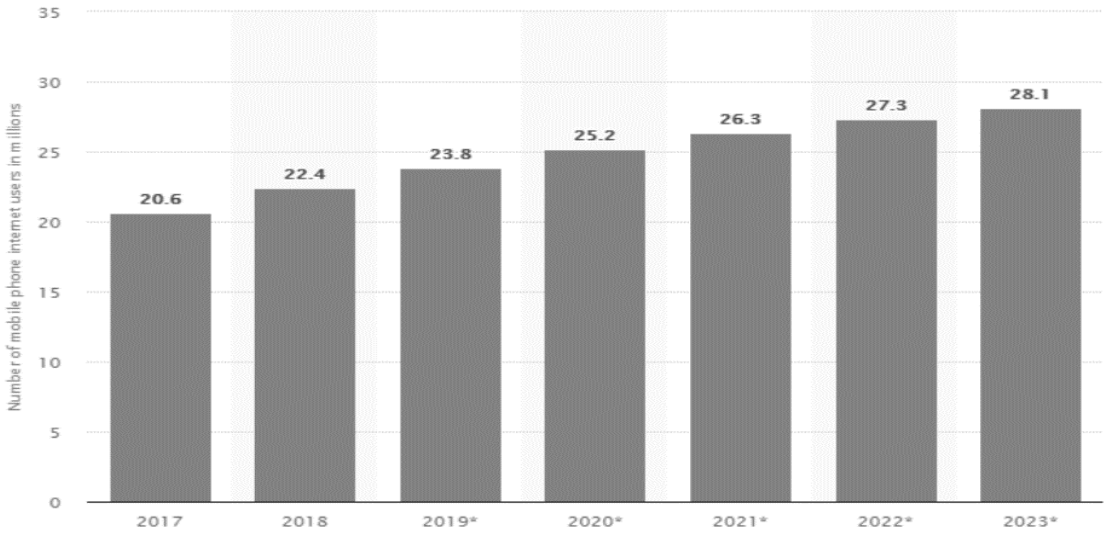
Sub-Saharan Africa	4G network (2016)	4G network (2020)	Subscriber smartphone penetration (2016)	Subscriber smartphone penetration (2020)
	2%	12%	28%	55%

Note. Sub-Saharan Africa. Adapted from *The Mobile Economy 2017* (p. 8), by GSMA, 2017, retrieved from: https://data.gsmaintelligence.com/api-web/v2/research-file-download?id=28999719&file=The%20Mobile%20Economy%202017.pdf.

There are 690 million people in Africa, which represents 88% of the world's least developed countries (Morales-Gómez & Melesse, 1998). Statista (2019b) illustrates the total number of mobile Internet users in South Africa, as at the end of 2018, to be 22.4 million. This is envisaged to increase to 28.1 million by 2023. See Figure 8.

Figure 8

Mobile Internet Users in South Africa (End 2018)



Note. Number of Smartphone Users in South Africa from 2014 to 2023 (in millions). Statista, 2019b, retrieved from: https://www.statista.com/statistics/488376/forecast-of-smartphone-users-in-south-africa/.

2.3 M-Commerce

The terms ‘e-commerce’ and ‘m-commerce’ are frequently used in the broader literature. However, the context of these definitions ought to be clearly understood. Technology is progressing at a rapid rate, and the distinction between e-commerce and m-commerce is not as clear as it once was (Okazaki, 2005). The emergence of m-commerce stemmed from initial e-commerce offerings that were accessed via desktops or computers. According to Coursaris and Hassanein (2002), m-commerce involves the purchase of an item or service using a mobile device. It is prudent that m-commerce is understood in the context of a blurring of the line between e-commerce and m-commerce. Table 7 provides m-commerce definitions from several authors.

Table 7

M-Commerce

Source	Definition
Xin (2009)	“[…] e-commerce activities carried out using a mobile device, such as a phone or PDA.” “[A]ny direct or indirect transaction with a potential monetary value conducted via wireless telecommunication networks.”
Tiwari and Buse (2007)	“[A]ny transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.”
Lian and Xiu-zhen (2010)	“[T]he ability to interact and transact with anything and anyone, anytime and anywhere.”
Ning et al. (2010)	“[…] as the conduct of information inquiries and/or business transactions using mobile devices via wireless communications.”
Chong (2013)	“[T]he buying and selling of goods and services through wireless handheld devices.”
Leung and Antypas (2001)	Leung and Antypas (2001) offer an alternative definition, defining commerce as “[…] content delivery (notification and reporting) and transactions (purchasing and data entry) on mobile devices such as Short Message Systems (SMS) devices, Wireless Application Protocol (WAP)-enabled devices, Personal Digital Assistants (PDA), etc.” They go on to explain that m-commerce is likely to be taken up for the convenience it offers to the end user.

It is important to distinguish between ‘m-business’, which constitutes a financial transaction, and ‘m-commerce’, which could be a service offering. Tiwari and Buse (2007) suggest that limiting the definition of m-commerce to financial transactions that provide monetary value is challenging, as it does not differentiate between m-commerce and m-business.

Min and Li (2009), and Long (2011), define a profitable transaction as one conducted on a mobile phone with Internet access, operating over a wireless telecommunication network. From these definitions, it can be reasoned that m-commerce may offer widespread value to potential users for accessing a product or service, or using financial or non-financial services. It facilitates a value activity that is offered to a user. According to the United Nations Conference on Trade and Development (2017), global e-commerce amounted to US$25 trillion in 2015. The future of m-commerce adoption and usage depends on people’s perceptions regarding technology, and the value associated with a business or organisation that uses it (Constantinides, 2004).

Numerous studies have discussed TAM, which only accounts for the technological aspects of adoption. A study conducted by Al Hinai et al. (2007) indicates that additional factors should be included to account for technology adoption itself. Examples of m-commerce factors that have been the subject of research are outlined in Table 8.

Table 8

M-Commerce Adoption

M-Commerce adoption factors previously researched	Previous research
Perceived usefulness	Lu et al. (2003); Yang et al. (2004); Knutsen et al. (2005); Dickinger et al. (2006)
Enjoyment	Nysveen et al. (2005); Dickinger et al. (2006)
Lifestyle benefit	Pedersen et al. (2002); Harris et al. (2005); Nysveen et al. (2005)
User satisfaction	Julius and Khasawneh (2002); Harris et al. (2005)
Perceived value	Barnes and Huff (2003)
Access	Hung et al. (2003); Pagani (2004)
Perceived ease of use	Hung et al. (2003); Pagani (2004); Ho Cheong and Park (2005); Wu and Wang (2005); Dickinger et al. (2006)
Affordability	Hung et al. (2003); Harris et al. (2005); Wu and Wang (2005)
Perceived risk	Lu et al. (2003); Barnes and Huff (2003); Wu and Wang (2005)
Trialability marketing	Barnes and Huff (2003); Pagani (2004); Harris et al. (2005); Knutsen et al. (2005)

Note. M-commerce Adoption Factors in the Existing Literature. From "A literature analysis on the adoption of mobile commerce services by individuals," by AlHinai et al., 2007.

According to the World Bank (2017), progression and access to new-generation technologies are changing the business models of businesses and corporates across emerging and developed markets, while also introducing new commercial opportunities. As noted earlier, the growth of the middle class, coupled with a millennial population with wider access to education and technology, ensures that the opportunity for corporates and businesses within emerging and developed markets is increasing exponentially. This is depicted in Table 9.

Table 9

Mobile Cellular Subscriptions in Emerging Markets

Mobile cellular subscriptions in emerging markets (millions)							
Year	2003	2005	2007	2009	2011	2013	2015
Subscribers	638	1 102	1 696	2 482	3 338	3 784	4 040

Note. Mobile Cellular Subscriptions in Emerging Markets (millions). Data adapted from World Bank (as cited in Goldman Sachs), 2019, retrieved from: https://www.gsam.com/content/gsam/us/en/advisors/resources/investment-ideas/emerging-markets-opportunities.html#section-background_98a1_background_sectionheaderwithtab.

According to Goldman Sachs (2016a), the online sales recorded in developed markets suggests an increase in online sales in emerging markets. See Table 10.

Table 10

Online Retail as a Percentage of Total Consumption

Online retail as a percentage of total consumption				
Year	**US**	**South Korea**	**China**	**Japan**
2000	1.2%	1.9%	0.0%	0.0%
2005	3.0%	6.8%	0.1%	1.4%
2010	5.5%	11.6%	0.4%	3.9%
2015 Est	9.7%	15.9%	7.6%	5.5%

Note. Emerging Markets (EM) Equity. From *Viewpoints: The Evolving Customer*, by Goldman Sachs, 2016b, retrieved from: https://www.gsam.com/content/dam/gsam/pdfs/common/en/public/articles/2017/em-viewspoints.PDF?sa=n&rd=n.

SimilarWeb (2019) provides web-analytics services for business. Mobile apps in India and South Africa are based on store and usage ranking, created using a specialised algorithm (SimilarWeb, 2019). See Table 11.

Table 11

M-Commerce App Rankings

m-Commerce	Mobile app leader	Description of services
India	1. PayTM	Mobile recharge; unified payments interface (UPI); bill payment; money transfer
	2. Flipkart	Online shopping application
	3. Amazon	Online shopping
	4. OLX	Buy and sell
	5. Nykaa	Beauty shopping application
	6. Myntra	Online shopping
	7. Scandid	Coupon, deal, and cash-back application
	8. Shopclues	Online shopping
	9. ClubFactory	Online shopping
	10. Snapdeal	Online shopping
South Africa	1. Takealot	Online shopping
	2. OLX	Buy and sell
	3. Gumtree	Local ads
	4. Wish	Online shopping
	5. Mr Price	Online shopping
	6. Superbalist	Online shopping
	7. Zando	Online shopping
	8. AliExpress	Online shopping
	9. Woolworths	Online shopping
	10. Runway Sale	Online shopping

Note. Website Analysis. From SimilarWeb, 2019, retrieved from: https://www.similarweb.com/corp/pro/.

2.4 Technology Adoption in Emerging Markets

For developing markets to remain relevant and competitive, they need to prioritise the development of digital products and services offered by government and the private sector. This is important, as businesses need to understand the way products and services are used, consumed, offered, or traded in this fourth industrial revolution (4IR), digital economies are changing, as are the various industries that offer goods and services in developing markets.

Global businesses are being transformed by innovative technologies that are defining consumer expectations and equipping businesses and corporates to cater for the anticipated needs of the future consumer. The digital economy will fundamentally change the way in which consumers and businesses conduct their day-to-day activities. In doing so, value will be created for wider societies, businesses, and governments alike (Deloitte, 2018). Bisen et al. (2013) noted in 2013 that India would have the ability to generate an additional 1.45 million jobs by 2021, if digital technology were to be adopted and used effectively and efficiently within the economy.

Consumer behaviour is changing in terms of participation with mobile platforms, specifically messaging platforms. The global subscriber base will soon reach five billion, as predicted by GSMA (2019). Interconnectivity is expedited by these mobile platforms and digital ecosystems. These digital ecosystems present an array of different value propositions that businesses and corporates may offer their respective customer base. Such changes will also require these organisations to review their business models so as to accommodate for the anticipated changes (GSMA, 2019).

According to the United Nations Economic and Social Council (2018), the focus of Goal 17 (‘strengthen the means of implementation and revitalize [sic] the Global Partnership for Sustainable Development’) of the Sustainable Development Goals (SDGs), is to integrate economic, social, and environmental problem areas across both developed and emerging economies. The benefits will be realised through these digital ecosystems, which will serve as a catalyst, and provide an opportunity to innovate and become more efficient while serving country and environmental goals.

The World Economic Forum (2016) states that the digital economy stands to present various opportunities, spanning a wide range of industries, including healthcare, the automotive

industry, the financial industry, retail, logistics, and services. The Forum stated in 2016 that 65% of children entering primary school will work at a job that does not yet exist (World Economic Forum, 2016).

Digital economies will assist developing countries by encouraging cost-efficient channels for education and promoting the development of information communications technology (ICT) skills. This will be made easier as e-learning platforms are taken up across emerging markets. Docebo (2016) states that the market for e-learning reached US$35.6 billion in 2011, and there are, on average, 13 million cross-border online students. This illustrates the impact that digital economies are likely to have and highlights the expectations the digital consumer will be able to place on future mobile app offerings.

To date, not many technological innovations have advanced consumer behaviour in the same way as the mobile phone (Greengard, 2008; Jose, 2017). A report by Shackleton (2007) states that emerging markets started outgrowing developed economies in 2006. Other studies have been carried out on mobile service adoption and the economic benefit that mobile phones provide to developing countries. Donner (2008), for example, analysed over 200 studies that were conducted within a developing market context. The author notes that, at that time, much research was focused on mobile phone and service adoption, but that there were various discrepancies among them.

Additional research has been carried out by various scholars. See Table 12.

Table 12

Mobile Service Adoption Research

Researchers	Research focus
Agarwal and Karahanna (2000)	The premise of the research was that previous literature had researched cognitive absorption, but not social cognitive theory. The results validated that cognitive absorption correlates well with usefulness and ease of use of digital worlds, thus enhancing intent to use. The author suggested that research continue in this area, as deeper insight is still required.
Walsham (2002)	Walsham (2002) provided additional theory, contributing to his previous studies. The paper serves to assist less-experienced information system users in understanding what needs to be done to ensure understanding of constructs and justifying a research contribution for technology adoption and usage.
Hung et al. (2003)	This research analysed TAM and synthesised this with perceived risk theory so as to evaluate the relationship between perceived network externalities and new product purchase intent. The outcome of the empirical study illustrated both a direct and indirect relationship. Perceived network externalities were found to have directly influenced buyer choice. The research also suggested that there is an indirect effect that influences perceived usefulness, perceived ease of use, and perceived risk.
Luo et al. (2010)	This research evaluated the impact that personal effects have on technology adoption. The proposed model incorporated two distinguishing features, namely risk and performance expectancy. The results illustrated the potential influence and relevance of adopting personal trait factors in evaluating novel IT adoption. The authors suggested that additional research would need to be conducted to comprehensively understand risk, personal contributions, and any other factors that may influence the early adoption of technology.
Zhou et al. (2010)	This research sought to understand the driving force behind technology adoption, not only from a technological perspective, but from a 'use' perspective, in terms of how the technology serves the user's required tasks. The study evaluated factors such as perceived usefulness, perceived ease of use, interactivity, and relative advantage.

	By consolidating the unified theory of acceptance and usage of technology (UTAUT) model as well as the task technology fit (TTF) model, the results indicated that TTF, social influence, and facilitating conditions are key contributors to user adoption.
Hsu et al. (2007)	The researchers used the Diffusion of innovation theory (DOI) theory to evaluate the impact of adoption and usage of multimedia messaging (MMS). The study included an empirical analysis of survey data collected from 207 users. The outcome suggested that perceived use differed over the innovation diffusion stages, and, ultimately, that there is a significant difference between them.
Kim et al. (2007)	The researchers investigated the uptake of Internet access via mobile devices (m-Internet). They stated that TAM typically explains the adoption factors of corporate technologies (such as enterprise systems). However, when it comes to the personal use of technology, adoption factors do not accommodate in a comprehensive way all factors that the ICT industry would need to consider for mobile Internet adoption. The study developed a value-based adoption model (VAM) that captures the uptake of the Internet and mobile devices. The outcome illustrated that consumers' perceptions of the value of m-Internet is a key contributor to usage intent.
Wang et al. (2006)	The researchers noted that technology has progressed with regard to wireless solutions. Many consumers use their mobile devices to access mobile-based services (m-services). The aim of the research was to understand why m-service solutions are not being adopted within the markets in which they are offered, despite massive investments made by businesses and corporations. The researchers recommended additional studies be conducted to better explore the factors that drive m-service adoption.
Wu and Wang (2005)	These researchers noted that m-commerce has performed well in markets such as Japan, but not in others. They demonstrated that many studies were conducted using the traditional TAM model, but that these studies did not have a complete understanding of the driving factors for mobile service adoption. They suggested that deeper analysis is required in terms of the three roles played by m-commerce, namely technology users, network members, and consumers. This study reviewed existing literature for the rationale behind consumer adoption and evaluated the pitfalls and contributions to the topic of m-commerce adoption. The researchers concluded that there is an incomplete understanding of m-commerce adoption and made suggestions for future research. These are included in this study.

Luarn and Lin (2005)	This study investigated consumers' mindsets in terms of factors that drive the adoption of mobile banking. The authors illustrated that numerous studies have been conducted using TAM, which predicted people's adoption of information systems. The researchers used existing theories, such as TPB, and synthesised these with TAM. An improvement to the TAM model was made by adding the additional construct TRUST. It extended the model by incorporating the following constructs: perceived credibility, perceived self-efficacy, and perceived financial cost. The sample of the study included 180 users in Taiwan. The outcome of the results strongly supported the extended TAM model with the additional constructs.
Suoranta and Mattila (2004)	This study focused on the adoption of mobile banking services. These authors suggest that much research has been conducted and identify specific aspects that would drive the adoption of mobile banking services. The study evaluated contradictory empirical findings, which were obtained from a mobile banking survey. The outcome showed potential subsequent adopters of mobile banking, and the variance between consumer segments, including demographic nuances and the preferred communication mode. The study was quantitative in nature and surveyed 1 253 participants through physical questionnaires that were distributed in the post. Their research was also referenced in the *Journal of Financial Services Marketing* (2004).

Table 12 above contextualises the need for additional studies to be conducted in developing markets, specifically South Africa and India.

According to GSMA (2015), the increase in mobile device ownership and usage in India and South Africa can be attributed to technological progression in the mobile sphere. However, both countries are behind in terms of the development of ICT infrastructure and the Internet.

Increases in mobile-app adoption and the development of local or home-made mobile apps offer additional business opportunities for emerging markets (GSMA, 2015). Some of these mobile apps include service offerings such as 2go, SIMFY Africa, Spinlet, M-Pesa, and M-Farm (GSMA, 2015; Murugesan, 2013).

South Africa's mobile telephony has been crucial in bridging the communication divide between urban and rural populations, as it offers access to areas with poor ICT infrastructure. ICT studies illustrate that in most underdeveloped countries (including South Africa), mobiles with prepaid services constitute the *only* means of communication for those from rural and underprivileged households. Although technology adoption has increased in South Africa, the opportunity for technology adoption in the country is not distributed equally, due to location (urban vs. rural), poor living standards, low levels of education, and socioeconomic factors. As with South Africa, technological advancement in India has taken place in the mobile sphere. According to Dhillon (2018), in India, there is a gender gap in terms of usage of and awareness of technology, specifically the Internet. While 80% of the male population in India has mobile phones, only 43% of women do. This is mainly due to a lack of awareness, limited education, and socioeconomic factors. Dhillon (2018) suggests that there is a higher penetration and awareness of mobile technology in urban areas (71%) than in rural areas (55%). A total of 64% of people in India said they were not familiar with the Internet. Of this group, 68% were female and 68% were from rural areas. Overall, Internet usage in the country is low (19%).

The continuous growth of mobile device and app adoption in India and South Africa is influenced by several underlying factors, including TAM, DT, and BOP, which help researchers understand the drivers behind digital adoption and consumers' attitudes towards mobile apps. Tables 13 and 14 outline the strengths and weaknesses of mobile adoption from a South African and Indian perspective.

Table 13

Strengths and Weaknesses of Mobile Adoption in India

Strengths	Weaknesses
India	
3G-enabled smartphones are available for US$40, with over 900 device types launched in 2016.	The ecosystem still requires development, with various funding being obtained. However, this presents an opportunity for growth.
According to the G20, India is considered a fast-growing economy.	Trust remains an issue from unknown merchants.
The projected contribution to GDP generated from e-commerce is expected to be 2.5% by 2030.	There is an unsophisticated regulatory framework for protecting consumers.
Huge population (1.31 billion)	Internet penetration is low.
A large percentage of India's population is under 18, which may provide an opportunity for 300 million online shoppers to adopt mobile-app products in the next 15 years.	The average spending rate per shopper is low.
Affordable smartphones are entering the market.	Consumer behaviour discourages e-commerce, due to high return rates by consumers.
Government supports m-commerce ventures.	Poor infrastructure; postal services are therefore a problem.
Many e-commerce companies are opening.	A total of 60% of online shoppers opt for cash on delivery.
It is envisaged that India will have the largest digital usage base by 2030, with one billion users.	Poor data available for assistance in policy formulation.

Note. Strengths and Weaknesses of BRICS E-Commerce. Data adapted from *Status, Opportunities and Challenges of BRICS E-Commerce* (p. 24), by The International Trade Centre, 2017, retrieved from: https://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/BRICS%20E-commerce%20_Status%20Opportunities%20and%20Challenges_22AUG2017_final.pdf.

Table 14

Strengths and Weaknesses of Mobile Adoption in South Africa

Strengths	Weaknesses
South Africa	
e-Commerce has grown steadily at 20% year-on-year since the turn of the century.	The 1% e-commerce population serves as a potential barrier for investors.
The online retail market continues to grow, despite GDP shrinkage.	GDP is reducing on a continuous basis.
It is envisaged that e-commerce sales will double by 2022.	Many retailers do not have e-commerce capability.
Retail sales reached 1% in 2016.	Business models do not support the adoption of e-commerce.
In 2016, Internet penetration reached 52%.	South African government departments, such as the Treasury, the South African Reserve Bank, and the South African Revenue Authority, do not have sufficient information on e-commerce-enabled companies.
The number of consumers who own smartphones is projected to grow from 21.73% of the population in 2015 to 37.21% in 2021.	Broadband infrastructure is not adequate in South Africa, which results in expensive data for consumers and SMEs in terms of e-commerce.
There is a population of sophisticated online users.	There is poor access to finance, a large population earning a low income, and massive skill shortages for companies looking to implement e-commerce solutions.
According to the United Nations Conference on Trade and Development (UNCTAD), B2C e-Commerce Index 2016, South Africa is a leader on the African continent in terms of e-commerce readiness.	According to UNCTAD, 6% of South African citizens above the age of 18 use e-commerce.

Note. Strengths and Weaknesses of BRICS E-Commerce. Data adapted from *Status, Opportunities and Challenges of BRICS E-Commerce* (p. 26), by The International Trade Centre, 2017, retrieved from: https://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/BRICS%20E-commerce%20_Status%20Opportunities%20and%20Challenges_22AUG2017_final.pdf.

2.5 Conclusion

This chapter outlined the operational definitions of emerging markets used in this study, and the impact that m-commerce has on developing markets. Considering the contribution that emerging markets make to global GDP, it is imperative that businesses understand the drivers of digital adoption within these markets. M-Commerce within emerging markets presents substantial revenue opportunities for businesses. The impact of digital adoption in emerging markets is enabled by mobile-device penetration and increased digital literacy. The traditional misconception that consumers in emerging markets do not have access to digital products was shown to be inaccurate, based on the actual number of mobile devices that exist within these markets. The following chapter offers a review of relevant literature.

CHAPTER THREE
LITERATURE REVIEW

3.1 Introduction

Digital channel use is expected to grow substantially in emerging markets (Anderson & Rainie, 2018). This presents an opportunity for corporates and businesses to enhance their customer value propositions.

This study aims to determine what factors influence technology adoption, specifically mobile-app adoption in India and South Africa, in an attempt to understand how to increase usage rates. This chapter analyses the current literature, which informs the study's research objectives and helps to answer the research questions.

3.2 Innovation and Technology Adoption Characteristics

Rogers (2003, p. 12) observes that "[a]n innovation is any idea, practice or object that is perceived as new by an individual or other unit of adoption". Fichman (1992, p. 2) attributes the following generalisations to Rogers' (1983) work, synthesised from more than 3 000 studies that examined adoption and diffusion:

- Innovations have specific features (such as observability, trialability, relative advantage and compatibility) that drive adoption.
- Certain adopters are more innovative than others and may therefore be identified by their personal features (for example, level of education).
- The adoption decision follows a path from awareness of the innovation to persuasion, decision implementation, and confirmation.
- The diffusion process typically begins gradually, with new adopters, until the innovation becomes familiar to the intended user base. This is often noted by an S-shaped cumulative adoption curve.

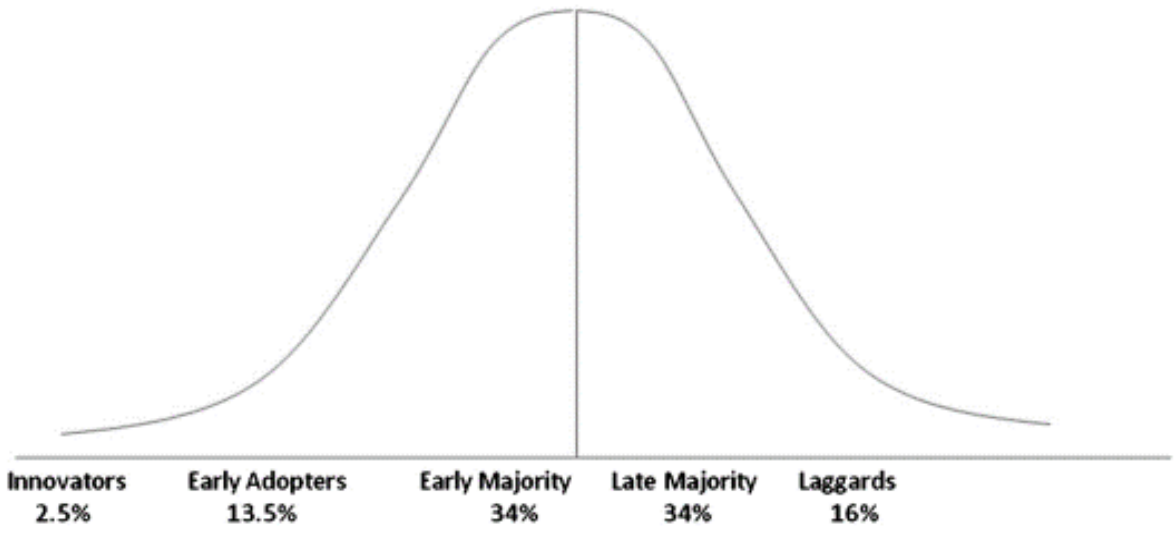
According to O'Leary (2010), there are various technology lifecycle models that measure the progression of a technology. Common amongst these is the maturity curve, which illustrates the growth in a technology's performance over time. O'Leary (2010, p. 1) assesses the cumulative adoption curve from Gartner, and the adoption curve initially postulated by Rogers (1983) in the following way: "The Gartner Group is a corporate research group which provides

information about a wide range of technologies, generally to corporate clients, to facilitate the analysis and purchase of technologies".

The cumulative adoption curve "traces the cumulative adoption of a technology over time" (O'Leary, 2010, p. 4). The variable of time allows for the classification of adopter categories (Rogers, 1983). Rogers (1983, p. 244) also notes that "[p]sychological researchers indicate that individuals learn a new skill […], through a learning process, that, when plotted over time, follows a normal curve." A normal adopter distribution is likely the result of a diffusion effect, which refers to the degree of influence, as it increases, on a person to adopt or reject an innovation due to peer or social pressure (Rogers, 1983). The determinant for adopter categorisation is innovation. This determines when, according to a time scale, a person will 'adopt' a new technology. Figure 9 depicts Rogers' (1983) adoption categories.

Figure 9

Adapter Categorisation on the Basis of Innovativeness



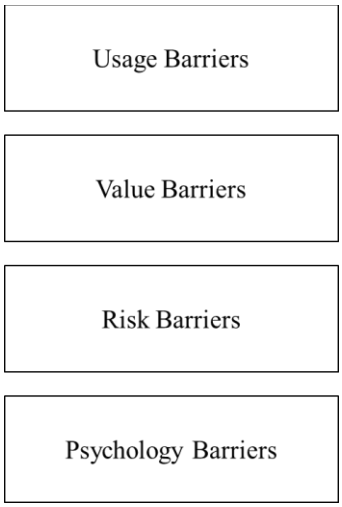
Note. Operationalization. Data adapted from Tkachenko, O., 2016, retrieved from: https://www.researchgate.net/figure/Operationalization_tbl1_309490919.

For decision-makers to determine whether or not to continue with the development of a new technology, they need to understand the factors that influence the adoption or rejection of new technologies (Taherdoost, 2018). From the adoption curve and research conducted by O'Leary

(2010), it is evident that there are common reasons for resisting a product in the introduction stage. These are outlined in Figure 10.

Figure 10

Adoption Characteristics



There are five product physiognomies that contribute to how attitudes are shaped towards new products and services, in terms of the degree to which a customer sees the quality of a novel product offering to be superior to the attributes of comparable existing product offerings (Joe's AdBlog, 2017). These five characteristics are complexity, compatibility, relative advantage, observability, and trialability. If a consumer feels that the new product attribute is superior to existing ones, this does not mean that the attribute is in fact intrinsically better, but merely that the consumer perceives it as being better.

In the field of Information Systems (IS) research, it was found that IT is underutilised in many organisations, resulting in economic losses for businesses (Li, 2010). Li (2010) and Straub (2009) demonstrate that numerous technology acceptance theories and models have been established to study IT acceptance by examining TRA (Fishbein & Ajzen, 1975); social cognitive theory (Bandura, 1986); TPB (Ajzen, 1991); DOI theory (Rogers, 1995); UTAUT (Venkatesh et al., 2003), TAM (Davis, 1989), extended TAM2 (Venkatesh & Davis, 2000), and extended TAM 3 (Venkatesh & Bala, 2008).

Other studies have investigated the impact of novel technologies on adoption and usage, and identified factors such as habits and satisfaction to be drivers of mobile-app adoption over and above traditional technology acceptance models (Arenas-Gaitani et al., 2015).

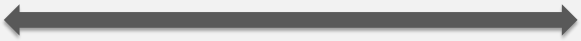
3.2.1 Existing Theory: Pitfalls

This study examines existing theories that impact the adoption of digital channels, and the pitfalls of these theories, in order to formulate a revised approach. The literature indicates that IT is consistently viewed as a mechanism to enhance the competitive position of an economy. It is widely believed that the use of IT is directly correlated with company success. It is therefore imperative to recognise the determinants of IT adoption.

Consequently, it is essential for businesses to become acquainted with the theoretical models. To date, the literature compares electronic digital channel adoption models at the individual level, and, in terms of the literature review conducted in this study, there is limited research on digital adoption that combines the individual and a business or organisation. The researcher analysed theories as they pertain to adoption models and evaluated the gaps in current literature: TAM (Davis, 1985 & 1989; Davis, 1989); TPB (Ajzen, 1985 & 1991); UTAUT (Venkatesh et al., 2003); the Technology-Organization-Environment (TOE) framework (Tornatzky et al., 1990); the DOI theory (Rogers, 1995); choice modelling, and DT (Berker et al., 2006). Various adoption models are considered in this study, as depicted in Table 15.

Table 15

Tension Between Existing Theories

Decision Base	Adoption Models							
	Adblog Innovations Possess Characteristics	**TAM Model**	**Theory of Planned Behaviour**	**Innovation Diffusion Theory**	**Choice Modelling**	**Lazy User Model**	**Domestication Theory**	**Unified Theory of Acceptance and Use of Technology**
Knowledge: What the subject knows	Relative advantage	Awareness		Innovators	Price	User Need		Performance expectancy
	Observability	Trialability			Brand			Effort expectancy
	Trialability	Credibility			Origin			Social influence
	Compatibility	Ease of Use			Performance			Facilitating conditions
	Complexity	Perceived Risk						
	Tension Line - Theory of Knowledge							
Subjective Interface: What the subject feels		Perceived Value	Attitude toward behaviour	Early adopters			Integration into everyday life	
			Subjective norms	Early Majority			User and their environment change and adapt accordingly	
			Behavioural intention	Late Majority			Adaptations feed back into innovation processes in industry	
			Perceived Behavioural Control	Laggards				
				Leapfroggers				
QUANTITATIVE							**QUALITATIVE**	

3.3 The Technology Acceptance Model (TAM)

TAM, first posited by Davis (1985), examines the acceptance and use of new information technologies in organisations. It may provide an explanation for the success or failure of the adoption of technologies. According to Gardner and Amoroso (2004), TAM is a variation of TRA, customised for modelling user acceptance of technology (Davis, 1989). The technology adoption factors are outlined below:

Trialability (T): the extent to which technology may be tried or experienced before adoption, originally noted by Rogers (1983), and referenced in the research of Moore and Benbasat (1991), and Karahanna et al. (1999). Studies conducted by Marakarkandy et al. (2017), and

Ahmed (2018), illustrate that the construct of trialability should be researched to better understand digital adoption.

Based on this information, the first hypothesis is:

- Hypothesis **H1a**: 'Trialability' is significantly and positively associated with 'intention to use'.

Perceived ease of use: Davis (1989, p. 320) defines this as "the degree to which a person believes that using a particular system would be free from effort". Yoon (2010) investigated customer satisfaction with Internet banking in China by considering ease of use and its impact on adoption and usage. The construct of ease of use was also analysed by Thong et al. (2002).

Based on this information, the second hypothesis is:

- Hypothesis **H2a**: 'Perceived ease of use' is significantly and positively associated with 'intention to use'.

Perceived risk (anxiety): the extent to which an individual is apprehensive about using technology (Venkatesh & Bala, 2008). Aghekyan-Simonian et al. (2012) investigated the impact risk has on online purchases in terms of adoption of services and continuous usage. Warkentin et al. (2002) investigated risk as a driver of digital services offered by government to increase citizen adoption and usage of e-Government capabilities.

Based on this information, the third hypothesis is:

- Hypothesis **H3a**: 'Perceived risk' is significantly and negatively impact 'intention to use'.

Perceived value (credibility and self-efficacy): the extent to which a user trusts that they can perform specific tasks or jobs using computers (Venkatesh & Bala, 2008).

Perceived usefulness: this is defined by Davis (1989, p. 320) as "the degree to which a person believes that using a particular system would enhance his or her job performance". This is also related to the perception an individual has of the benefit a person will experience from using technology (Raida & Néji, 2013). Gupta and Kim (2010) investigated the impact of value perception as a driver of online shopping to increase adoption and usage of e-commerce. Thong et al. (2002) found that in order to understand the drivers of digital adoption, perceived usefulness/value should be investigated.

Based on this information, the fourth hypothesis is:

- Hypothesis **H4a**: 'Perceived value' has a significant positive relationship with 'intention to use'.

Privacy (anxiety): the extent of a user's anxiety, or fear of loss of personal information, when using mobile apps (Venkatesh & Bala, 2008). Fortes et al. (2017), and Giovanis et al. (2012), suggest that privacy should be investigated as a construct for digital adoption.

Based on this information, the fifth hypothesis is:

- Hypothesis **H5a**: 'Privacy' has a significant negative effect on 'intention to use'.

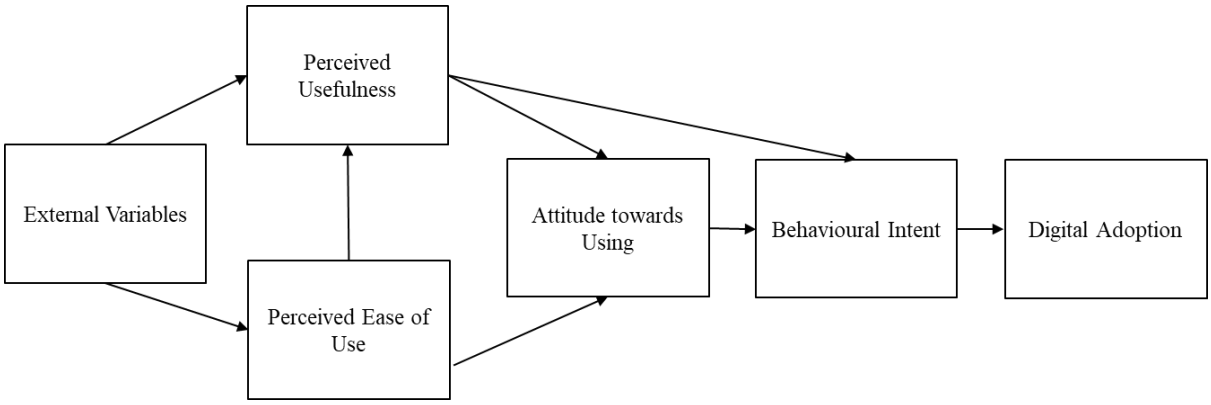
Behavioural intention: the degree to which individuals plan to utilise features or functionality of technology in the future (Venkatesh & Bala, 2008). This is the dependent variable upon which the hypotheses were tested.

Subjective norm: a person's perception that those who are important to them think that the person in question should or should not perform certain behaviours (Venkatesh & Bala, 2008). TAM was originally designed to explain the acceptance and use of information systems technologies in organisations (Raida & Néji, 2013).

In summary, TAM states that two variables, perceived usefulness and perceived ease of use, influences a user's attitude toward adopting technology and the intention to use technology. This is illustrated in Figure 11.

Figure 11

The Technology Acceptance Model (TAM)



Note. Original Technology Acceptance Model. Adapted from "The literature review of technology adoption models and theories for the novelty technology," by P. C. Lai, 2017, *Journal of Information Systems and Technology Management, 14*(1), 21-38.

This model was formulated via a study of acceptance of software programs in a work environment (Davis, 1989). The model assumes that the acceptance of the information system is determined by the intentions of using the system (Raida & Néji, 2013). The model was extended to incorporate diverse environments and technology settings that were formulated in several more recent studies (Ajzen, 1991; Sankar, 2009; Wang et al., 2003). The extended TAM model provides insight into other important variables to consider in the determination of user behaviour.

3.3.1 The Technology Acceptance Model's (TAM) Prediction of Actual Usage and the Factors That Influence it

Table 16 provides an overview of studies based on TAM.

Table 16

Technology Acceptance Model (TAM) Research

IT adoption	Analysed variables	Methods	Date and context	Authors
Employee/individual acceptance of mobile apps in Healthcare	perceived usefulness; perceived ease of use; satisfaction; usability	FA (Factor analysis) and logistic regression	Questionnaires were used and measured with a Likert scale	Abu-Dalbouh (2013)
Faculty adoption of LMS (learning management systems) in HE (higher education)	Size of the company and perceived barriers	FA and logistic regression	Electronic survey; data was collected (April 2013)	Fathema et al. (2015)
The take up of eLearning with university students	Subjective norm; system accessibility; perceived usefulness; perceived ease of use; attitude; behavioural intention	Sample and procedure	628 participants took part in the research	Park (2009)
The take up of digital technology with teachers in education	Perceived usefulness; perceived ease of use; attitudes; self-efficacy; subjective norms; behavioural intention	Meta-analysis and structural equation modelling (SEM) approach	1 826 publications subjected to initial screening, resulting in 363 eligible publications	Scherer et al. (2018)
The take up and usage of electronic banking in Tunisia	Perceived ease of use; perceived usefulness; attitude; intent	FA analysis	Questionnaire administered face-to-face (118) and via the Internet (12) to Tunisian business leaders	Raida and Néji (2013)

Technology acceptance for e-wallets	Attitude; intention to use; perceived usefulness; perceived ease of use	Structural model using Mplus 6.1 path analysis	Field study; survey (Likert scale) administered to 320 hospital patients	Lai (2012)
Contributors to mobile learning platforms in financial institutions	Acceptance and learning outputs	Qualitative study; content analysis	13 participants in a Turkish bank; semi-structured interviews	Kok (2013)

3.3.2 Review of the Technology Acceptance Model (TAM)

A meta-analysis approach refers to the statistical analysis of a set of general findings (or research) in order to combine previous findings (Doulani et al., 2018). It allows for quantitative analysis of descriptive statistics across studies; however this is done without access to the original data (Yousafzai et al., 2007). Several meta-analysis studies have been conducted on TAM. Researchers have also investigated the impact of TAM and technology adoption, with varied outcomes. These include Chan et al. (2010), Al-maghrabi and Dennis (2011), Ghalandari (2012), Pavlou (2003), Luarn and Lin (2005), Park et al. (2009), Marakarkandy et al. (2017), Ahmed (2018), and Chitungo and Munongo (2013).

The researcher used an online library and journal search (Wits e-library and EBSCO database), and various Google searches for the key words 'technology acceptance model', to locate the most recent and relevant studies. Results include a study by King and He (2006) that analyses the interdependencies between perceived ease of use, perceived usefulness, and behavioural intention to use; a study by Schepers and Wetzels (2007) that examines the influence of moderating factors and subjective norms on the relationships between TAM variables; and studies by Turner et al. (2010), and Kim and Yoon (2011) that investigate the relevance of TAM as a means of predicting technology usage.

Yousafzai et al. (2007) conducted a literature review on 145 papers on TAM; Doulani et al. (2018) conducted a meta-analysis on the main factors that lead to the acceptance of technology by investigating 164 studies; and Scherer et al. (2018) combined meta-analysis with structural equation modelling (SEM) approaches in order to understand which TAM factors can predict a teacher's technology adoption. The results of this meta-analysis confirmed that TAM successfully predicts user behaviour and is relevant for those teaching at different education levels, and in different countries (Scherer et al., 2018).

The results of the study conducted by King and He (2006, p. 740) demonstrate that TAM is a "valid and robust model that has been widely used, but potentially has wider applicability". The study was conducted using 88 published studies that provide enough data to suggest that TAM is an effective prediction model. According to King and He (2006), correlations within the model are illustrated: TAM measures of perceived usefulness and behavioural intention were dependable, and the experience level of users was noted as a moderator in a number of

studies. There was a high level of influence of perceived usefulness and perceived ease of use on behavioural intention, but it was found that the direct effect of ease of use on behavioural intention was only relevant to Internet applications.

The key construct that emerges from TAM correlates behavioural intention with usage, as opposed to actual usage. The research conducted by Turner et al. (2010) examines how effectively TAM predicts usage by considering subjective and objective measures of actual usage. The study incorporated a systematic literature analysis with six digital libraries that covered 79 relevant empirical studies. The research reflects that intention to use is associated with actual usage. Nevertheless, the TAM variables 'perceived ease of use' and 'perceived usefulness' do not significantly predict actual usage. The results of respective studies conducted by Turner et al. (2010) and Jose (2017) show that perceived usefulness and perceived ease of use are not better indicators of actual usage than behavioural intent, with perceived ease of use being less meaningful than behavioural intent.

In fact, it was shown that other than subjective usage, all TAM variables are not effective at predicting objective usage. The research noted that the upper confidence limit of the sum of significant correlations between perceived usefulness and perceived ease of use, and subjective and objective usage, is less than 95%. The research therefore implied that the outcomes of the analysis display heterogeneity, raising the question of whether the conditions under which perceived usefulness or perceived ease of use predict technology adoption. The overall outcome of the meta-analysis conducted by Turner et al. (2010) indicates that few papers consider objective measures of actual usage, and the sample sizes are small in those that have. The most recent meta-analysis on TAM was undertaken in a study conducted by Turner et al. in 2010.

The meta-analysis study conducted by Yousafzai et al. (2007) summarises 15 years of research on TAM, giving researchers an overview of additional research conducted in this area. One of the notable shortcomings of TAM is that it does not provide enough information to system designers on how users can better design new technologies (Yousafzai et al., 2007).

Šumak et al. (2011) conducted a meta-analysis on the causal effect of TAM on e-learning. The study provided a methodical literature review of 42 papers, frequently published in well-known

journals. The study combined and analysed quantitative results. The effect of common TAM-related relationships was analysed and the outcome of the analysis shows that:

- TAM is frequently utilised for e-learning adoption research; and
- the relationship between the TAM variables are impacted by the nature of the user and the type of e-learning platform.

As per the objectives of this study, the outcome of the meta-analysis conducted by Šumak et al. (2011) establishes various moderating relationships between users and technology factors that impact adoption of eLearning platforms. The research presents evidence which demonstrates that perceived ease of use and perceived usefulness generally influence the attitudes of users in employing e-learning technology. This supports the envisaged outcome of the research to test the relationships between TAM, DT, and BOP.

According to Li (2010), the evidence is not consistent with what the existing TAM models and theories predict for technology adoption within specific markets. Legris et al. (2003) performed a qualitative meta-analysis on TAM, and several scholars have discovered that TAM does not predict digital behaviour. In its original version, TAM had the following components: perceived usefulness, perceived ease of use, attitude, behavioural intention, and actual use.

A major theoretical limitation of TAM is the "exclusion of the possibility of influence from institutional, social and personal control factors" (Rao & Troshani, 2007, p. 64). The main TAM constructs fail to fully reflect the usage-context factors that may influence user acceptance (Rao & Troshani, 2007). In order to account for this limitation, various researchers have extended TAM to include additional determinants of intention and behaviour in order to predict user acceptance, such as Fortes et al. (2017), Giovanis et al. (2012), and Keith et al. (2013). However, such models have been criticised for being ineffective in non-organisational settings.

3.4 Other Adoption Models

3.4.1 The Theory of Planned Behaviour (TPB)

The theory of planned behaviour (TPB) is based on cognitive processing and level of behaviour change, according to Ajzen (1991). The gaps identified in this theory include the 'intent for use' through cognitive processing, as opposed to emotional factors, such as threats from a competitor, which may prove significant when technology is adopted (Taylor & Todd, 1995b). The emotional aspects of decision-making are excluded from TBP.

As previously highlighted in the analysis of TAM, intent is insufficient to indicate willingness to adopt a technology (Venkatesh & Davis, 2000). Commercial and industry movements are not taken into consideration (Venkatesh & Bala, 2008). These could drive technology adoption without prior intent (Davis, 2000). This draws into question the validity of this theory on technology adoption within the corporate and investment banking industry.

Table 17

Theory of Planned Behaviour (TPB) Research

IT adoption	Analysed variables	Methods	Date and context	Authors
Determine condom- use behaviour among college students	Organisational context: perceived behaviour; perceived behavioural control; and subjective norm	Stepwise multiple regression	Survey sent to 218 college students	Asare (2015)
Predict alcohol consumption	Environmental context: perceived behavioural control; and perceived self-efficacy	Search strategy and inclusion/exclusion criteria	Data were extracted from papers by the first two authors	Cooke et al. (2016)
Predict tobacco and alcohol use by South African students	Perceived behavioural control	Correlational design	Questionnaires completed. In session one, n = 107. In session two, and n = 90.	Steingold (2008)

3.4.2 The Unified Theory of Acceptance and Use of Technology (UTAUT)

This theory is limited, as shown by Straub (2009) who suggested that TAM and the unified theory of acceptance and use of technology (UTAUT) do not provide a holistic view of the factors that drive technology adoption. In addition, UTAUT presents relationships that are not always acceptable in all contexts, and may not incorporate all the relationships that are relevant or critical for technology adoption, according to Dwivedi et al. (2019). The UTAUT model was initially formulated by Venkatesh et al. (2003) in their study of four companies over a six-month period. Additional research was also carried out by Venkatesh (2012), who looked at ways to build on the UTAUT model. As such, when analysing the research topic in conjunction with UTAUT, four variables used in the model are unrelated, and many variances are therefore noted regarding the prediction of technology adoption. The following studies have investigated UTAUT:

- An investigation of teachers' acceptance of Learning Management Software (LMS) by Raman and Don (2013). The research noted a positive influence of effort expectancy on teachers' LMS acceptance and usage of learning software.
- A re-examination and revision of the UTAUT model by Dwivedi et al. (2019). The study noted a key finding: attitude was central to behavioural intentions and usage behaviours.
- An investigation of consumer acceptance, based on the UTAUT model, by Venkatesh et al. (2012). The research suggested that UTAUT2 should include three additional constructs: motivation, price value, and habit. These factors have also been noted by Arenas-Gaitani et al. (2015).
- Research on consumer information and communications acceptance and usage, by Alwahaishi and Snáše (2013). The study proposed a new theoretical framework to detect the factors that influence the adoption and use of mobile Internet, including performance expectancy, effort expectancy, facilitating conditions, social influences, perceived value, perceived playfulness, attention focus, and behavioural intention.
- Research on the drivers of mobile banking adoption from the UTAUT model by Yu (2012) show that intent to use and adopt mobile-app banking was impacted by social influence, perceived financial cost, performance expectancy, and perceived credibility.

- An investigation of social influence within work groups by Eckhardt et al. (2009), who, in their study of 152 companies, found that there were variances in responses. Further research is required to understand the drivers of digital adoption.

3.4.3 The Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework comprises the internal and external technologies integral to a business. The business context refers to the features and resources of a business: the degree of centralisation, structure of management, procurement and linkages amongst employees (Tornatzky et al., 1990).

The model presents a stable basis for the generic factors that influence a firm's adoption of technology. The model reviews adoption as generic and the assumptions upon which adoption factors are analysed may not be applicable to all industries. The focus of research enhances this model to cater for specific adoption factors for corporate and investment banking. Table 18 reflects research in IT adoption to date.

Table 18

IT Adoption Research

IT adoption	Analysed variables	Methods	Sample Size	Authors
Website	Reward/benefits; effectiveness of training; training programmes; and Internet and email norms	Multiple correspondence analysis (MCA) and profit model	637 large Portuguese firms 3 155 small Portuguese firms	Oliveira and Martins (2008)
Website e-commerce	Reward/benefits; training programmes; access and Internet and email norms	MCA and profit model	2 626 Portuguese firms	Oliveira and Martins (2010)
Internet website e-commerce	Reward/benefits; training programmes; access and Internet and email norms	MCA and logic model	3 155 small Portuguese firms	Martins and Oliveira (2009)
e-Commerce development level (0–14)	Organizational size; environment; user satisfaction and security;	FA and Ordinary Least Square (OLS)	156 firms in Shaanxi, China	Liu (2008)
e-Business usage	Organizational size; international scope; financial commitment	Confirmatory Factor Analysis (CFA), second-	624 firms in Brazil, China, México, and Taiwan	Zhu and Kraemer (2005)

		order factor modelling, and SEM		
e-Business initiation, e-Business adoption, and e-Business routinisation	Firm size; global scope; trading; globalisation; managerial obstacles	CFA and SEM	1 857 firms in Brazil, China, México, and Taiwan	Zhu et al. (2006)
e-Business	Reward/benefits; training programmes; access and Internet and email norms	T-test, FA, and Correspondence Analysis (CA)	6 964 firms in 27 countries	Oliveira and Martins (2010)

3.4.4 The Diffusion of Innovation (DOI) Theory

This theory has been adopted and applied in various ways, with little consistency. If we consider the factors upon which Rogers (1983) constructed his model – innovation, adopters, communication, time, and social systems – we find that they assume an individual perspective, even though the model claims to be inclusive of social groups and countries. The lack of application within the firm environment presents a gap in its application for the corporate and investment banking industry.

Some studies, based only on the DOI theory (Rogers, 1995), are outlined in Table 19.

Table 19

Diffusion of Innovation Research

IT adoption	Analysed variables	Methods	Date and context	Authors
The take up and usage of technology in educational environments	Perceived reward/benefits; perceived indirect reward/benefits	Qualitative and quantitative methods	20 weeks of data collection that included preparation of the survey instrument and administration of the survey	Isleem (2003)
The investigation of instructional PC use by staff in the College of Education	Demographic characteristics; expertise; access; attitude support; innovativeness	FA and logistic regression	Questionnaire sent to 157 full-time College of Education faculty members	Sahin (2006)
Technology delivery in healthcare	Demographic characteristics; attitude; experience; and employment history	Qualitative and quantitative methods	A total of 12 participants completed the questionnaires, and one was interviewed	Statnikova (2005)
Technology take up in SME's	Demographic characteristics; technology characteristics; small business characteristics; and environmental conditions	FA and logistic regression	Questionnaire survey was conducted in 166 small businesses	Thong (1999)

3.4.5 Choice Modelling

This model attempts to predict the economic benefits associated with the adoption of a certain technology or product (Thurstone, 1927). The factors introduced in this model include orthogonality, experimental design, stated preference, preferences as choice trade-offs, sampling and block allocation, and model generation. This theory, unlike the other models that have been analysed, investigates the practicality of adoption, but neglects the psychology of adoption (Vojnovic & Se-Young, 2016).

3.4.6 Lazy User Model (LUM) of Solution Selection

The lazy user model (LUM), a model in information systems created by Tétard and Collan, looks to demonstrate how an individual chooses a technology solution to cater for their individual needs from a set of potential alternatives (Tétard & Collan, 2009).

This model is flawed in the sense that it assumes the consumer will always select the least level of effort. Effort may, it stands to reason, be considered differently by different individuals. The model only evaluates monetary cost, time needed, and physical/mental effort required. This constitutes an oversimplification. At the individual level, when we consider LUM from an organisation's perspective, we realise that enhancements need to be made to include the degree of variability upon which an organisation might select a technology. The model also assumes that everyone will possess the knowledge of all options available to them, and understand the technology in its totality, which adds to its limitations.

Table 20 outlines some studies that are based only on LUM solution selection.

Table 20

Lazy User Model (LUM) Research

IT adoption	Analysed variables	Methods	Date and context	Authors
Student use of optional online learning resources	Perceived direct benefits, perceived indirect benefits	FA	55 undergraduate business school students	Guthrie (2013)
Solution selection in digital construction design	Technological context: perceived information need and perceived user-state	FA	Semi-structured interviews with 11 design professionals	Merschbrock et al. (2015)
Individual adoption and use of communication technologies	Organisational context: perceived portable teachers, 'onliners', workers, and relationships	Multiple regression	Survey of 687 individuals, using exploratory FA and multiple regression	Hayes (2012)

3.5 Domestication Theory (DT)

3.5.1 Overview

Domestication Theory (DT) is a framework for exploring social related factors and how these influence the manner in which individual's utilise and benefit from technology (Scheerder et al., 2019). The theory investigates technology, science, and media studies to outline the methods by which new technology is adopted by users (Berker et al., 2006). According to Haddon (2006), domestication as a construct was based on anthropology and consumption studies. The framework explores the constructs beyond adoption and the use of ICTs to examine what the technologies and services mean to individuals and how they experience them (Haddon, 2006). Hartmann states (2013, p. 43):

> The domestication approach stems primarily from two sources: (a) a (dominant) British media studies version, first developed in the late 1980s, which concentrated on the use and appropriation of new media entering household contexts and (b) a Norwegian science and technology studies (STS) approach, which used domestication in the wider sense of appropriation of technologies in diverse settings (by the state, within a company, etc.).

Table 21 presents an overview of domestication studies conducted in various contexts over the last few decades.

Table 21

Domestication Research Studies

IT adoption	Analysed variables	Methods	Date and context	Authors
Investigation of domestication of laptops at university	Use of laptops and experience	Exploratory sampling; K-means cluster analysis; grounded theory analysis	Questionnaires sent to all 682 students (Autumn 2004); 197 responses received; interviews with randomly selected interviewees (20 interviews conducted in 2005)	Vuojärvi et al. (2010)
The use of internet at home – a domestication perspective (digital inequality)	Educational background;digital inequalities; social contextual factors	Qualitative approach	Online questionnaires; semi-structured interviews (48 families)	Scheerder et al. (2019)
A review of the domestication of technology in schools and underprivileged communities	Factors affecting ICT integration in schools and disadvantaged communities	Interpretive approach; qualitative research approach; collection and analysis of empirical data	Data collection via semi-structured one-on-one in-depth interviews; random selection of three schools under the Khanya project (three male school principals, six females, and three male educators)	Chigona et al. (2010)
A theory of ICT user types: Evaluating a theory for technology	Factors influencing older adults' ICT usage; focus on life contexts	Comparative case study methodology	17 interpretive comparative case studies	Birkland (2013)

(ICT) types for domestication through comparative case studies				
An analysis of domestication of mobile phones by teens (rural east Texas town)	Teenagers use of mobile phones; self-expression; collective identity; factors for appropriation	Qualitative; quasi-longitudinal view	Questionnaires (2006–2012) Middle school and university students	Cooper (2016)
A review of the impact/influence social factors have on the adoption of technology in South Africa	ICT application (Facebook); socio-economic indicators	Descriptive statistics and multivariate techniques	Document reviews; structured questionnaire; focus group meetings	Tata and McNamara (2016)
The domestication of smartphones and WhatsApp with the older generation	Use of smartphones; mature generation in Spain	Mixed-methods approach	Generational samples (238 20–76 year olds) with qualitative, focus-group discussions (2014/2015)	Rosales and Fernández-Ardèvol (2016)
A review of cultural implication for the take up of tablet's in USA and Taiwan	Age; location; situational factors; adoption of technology	Ethnographic method	Participant observations (2010–2012); focus groups; semi-structured interviews	Chen (2013)
Technology domestication by families and senior immigrants in Israel	ICT domestication; family dynamics/communication	Qualitative	In-depth interviews with 26 elderly users (immigrated 20 years prior from the former Soviet Union to Israel)	Khvorostianov (2016)

3.5.2 Factors That Influence Domestication

3.5.2.1 User Environment (Social Influencers)

The literature stipulates that social influencers, such as social relationships, social expectations, and cultural norms, influence the appropriation or adoption of technology (Chen, 2013). Social influence (user environment) is regarded as the degree to which people think those around them ought to adopt and use an innovation (Rao & Troshani, 2007). Individuals adopt behaviours that they experience and learn in social settings (Rao & Troshani, 2007).

The DOI theory differentiates between two forms of social influence: external and interpersonal. External influencers are commonly the media or other non-personal influences. Interpersonal influencers are friends, peers, colleagues, family, superiors, and technology experts (Rao & Troshani, 2007). The opinions and acceptance of interpersonal influencers are likely to positively influence technology adoption by consumers. Furthermore, as these influencers have already 'tested' the technology, the risk for adoption is perceived to be less (Rao & Troshani, 2007). Further studies that support the investigation of user environment include those undertaken by Abbas et al. (2018), Kazi and Mannan (2013), and Cudjoe et al. (2015).

Based on this information, the sixth hypothesis is drawn from the literature:

- Hypothesis **$H6_A$**: 'User environment' has a significant positive relationship with 'intention to use'.

ICT technology has become more prevalent in households in recent years, including the use of e-applications to assist in making people's lives simpler by giving them easier access to products and services. Dwivedi et al. (2008) argue that the advent of technology in the home has raised many issues worth examining, including awareness, adoption, and use of emerging technologies. They also point to digital services and social segregation resulting from unsatisfactory adoption by different segments (race, gender, education, and income) of society.

Venkatesh and Davis (2000) emphasise the idea of 'subjective norm' to describe the influence on social interactions within their TAM2 model. TAM2 stipulates that social influences a user's

intention to adopt technology. This study suggests that social influences play an important and consistent role in empirical studies. This is evident in other research, including studies by Hartwick and Barki (1994); Taylor and Todd (1995b); Lu et al. (2003); Karahanna and Straub (1999); and Lucas and Spitler (1999). Lucas and Spitler (1999) report that organisational variables, such as social customs and the type, are important contributors to technology usage within a working environment.

Research by Lu et al. (2003) indicates that social influences from societal networks and the importance of image play a significant role in determining individual perceptions of usefulness and ease of use. Schepers and Wetzels (2007) conducted research on previous TAM studies (meta-analysis) and found that social customs are key in driving digital adoption.

Nevertheless, numerous studies show that the concept of subjective norms does not impact digital adoption (Davis et al., 1989; Dishaw & Strong, 1999; Mathieson, 1991 and Chau & Hu, 2002;). Dishaw and Strong (1999) report that individual standards can be discarded when one is attempting to understand the different perceptions that lead to an individual's choice to use IT. Lewis et al. (2003) found no empirical support for the expected relationship between individual standards and individual perceptions.

Venkatesh et al. (2003, p. 469) note that 'social influences' are "more likely to be salient to older workers, particularly women, and even then early stages of experience/adoption". However, being familiar with these possibilities does not help to explain the vague results reported in the literature.

Thus, it is imperative to understand whether the user environment (social influences) mediates the relationships in the TAM model, by proposing the following hypotheses:

- Hypothesis **H1b**: 'User environment' mediates the relationship between 'trialability' and 'intention to use'.
- Hypothesis **H2b**: 'User environment' (mediator) significantly mediates the relationship between 'perceived ease of use' (independent variable) and 'intention to use' (dependent variable).

- Hypothesis **H3b**: 'User environment' (mediator) significantly mediates the relationship between 'perceived risk' (independent variable) and 'intention to use' (dependent variable).
- Hypothesis **H4b**: 'User environment' (mediator) significantly mediates the relationship between 'perceived value' (independent variable) and 'intention to use' (dependent variable).
- Hypothesis **H5b**: 'User environment' (mediator) significantly mediates the relationship between 'privacy' (independent variable) and 'intention to use' (dependent variable).

Uses and gratifications research recognises individuals' motivations for adopting mobile-app services go beyond the factors of usefulness, flexibility, and availability noted by rational ICT-adoption theory (Pedersen & Ling, 2003). Studies conducted by Leung and Wei (2000) found gratifications of mobile phone use relate to social acceptability and fashion status (Pedersen & Ling, 2003). Domestication research has also identified social identity to be a motivator in technology adoption.

3.5.2.2 Facilitating Conditions

According to Rao and Troshani (2007, p. 68), "facilitating conditions refer to external controls and catalysts in the adoption environment which aim at facilitating adoption and diffusion of new technologies". Various research has proposed that facilitating conditions affect use, whether directly or through behavioural intention (Thompson et al., 1991; Taylor & Todd, 1995a). Facilitating conditions are regarded as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003, p. 453). These conditions may assist with the issues experienced with adoption and use (Rao & Troshani, 2007).

Facilitating conditions are not always found to be significant in literature, as noted by Gallivan et al. (2005), Karahanna and Straub (1999), and Mawhinney and Lederer (1990). An example of this is evident in research conducted by Gallivan et al. (2005), who discovered that there is no proof that supports the relationship between technology utilisation and facilitating conditions. In addition, Karahanna and Straub (1999) noted that facilitating conditions, such as

support and training, do not affect perceptions of ease of use when using technology. Igbaria et al. (1996) and Thompson et al. (1991) also illustrate that facilitating conditions, such as training and usage, have a non-significant relationship.

The influence of facilitating conditions on the use of technology is managed by the age and experience of the individual (Venkatesh et al., 2003). Nevertheless, having an idea of these possibilities cannot considerably assist in providing any profound guidance regarding the application practices of digital technology.

Table 22 depicts the various technology adoption models and details the research conducted, which further emphasises the need for a holistic digital adoption model.

Table 22

Technology Acceptance Model (TAM) Versus Social and Facilitating Conditions

Author	PEOU/PU/PR/ PV/TB	Ecosystem / Social influences	Environmental conditions
Agbemabiese et al. (2015)		Yes	
Abu-Dalbouh (2013)	Yes		
Govender and Sihlali (2014)		Yes	
Wells et al. (2010)	Yes		
Chipp et al. (2013)		Yes	
Nguyen (2018)		Yes	
Venkatesh et al. (2003)	Yes		
Tang (2016)	Yes		
Habib (2005)		Yes	
Chang and Wu (2012)	Yes		
Taylor and Todd (1995a)			Yes
Yadav et al. (2015)		Yes	
Davis et al. (1989)		No	
Kok (2013)	Yes		
Chau and Hu (2002)		No	
Sovacool and Hess (2017)	Yes		
Gallivan et al. (2005)			No
Effah (2016)		Yes	
Igbaria et al. (1996)			No
Mawhinney and Lederer (1990)			No
Al-maghrabi and Dennis (2011)	Yes		
Karahanna and Straub (1999)			No
Fortes et al. (2017)	Yes		
Thompson et al. (1991)			No
Kim and Yoon (2011)			Yes
Dishaw and Strong (1999)		No	
Cho et al. (2009)	Yes		
Chau and Hu (2002)	No		
Agarwal and Prasad (1998)	No		
Eckhart et al. (2009)			Yes

Subramanian (1994)	No		
Chau (1996)	No		
Chitungo and Munongo (2013)			Yes
Hu et al. (1999)	No		
Hartwick and Barki (1994)		Yes	
Fathema et al. (2015)			Yes
Lu et al. (2003)		Yes	
Lucas and Spitler (1999)		Yes	
Schepers and Wetzels (2007)		Yes	
Mathieson (1991)		No	
Abbas et al. (2018)			Yes

Note. PEOU: Perceived ease of use; PU: perceived usefulness; PR: perceived risk; PV: perceived value; TB: trialability.

Table 22 provides a review of TAM literature, making specific assumptions regarding the technology acceptance models and theories. The study recognises a significant body of literature that suggests unpredictable results with these models, as presented in Table 22. These are the discrepancies that the models and theories fail to clarify. Previous studies, such as that conducted by Li (2010), support the need for additional research to ascertain why these inconsistencies exist.

3.5.2.3 Culture and Demographics

Cultural norms relating to family, ethnicity, society, and country influence the domestication of technology. Demographic factors, such as gender and age, also have an influence. As the following studies exhibit, cultural consideration determines how technology is adopted in different environments.

The adoption of mobile phones in African countries has exceeded the number of fixed-line registrations and surpassed the rate of adoption of mobile phones in Europe (Hahn & Kibora, 2008). This resulted from the need and opportunity to participate in telecommunications, as some African countries had no infrastructure for communication prior to the introduction of mobile phones, and no alternative means of communicating long distance (Hahn & Kibora, 2008). Social structures were not undermined, as originally envisaged, by the introduction of mobile phones in Burkina Faso and other African countries. Rather, mobile phones were

adapted to support local culture, solidarity, and parental links (Hahn & Kibora, 2008). Over 40% of the population in Burkina Faso live below the poverty line and it is thus considered the poorest country in the world. As such, the country's rapid adoption of the mobile phone proved surprising. The introduction of this technology brought with it the opportunity for job creation and economic advancement, while highlighting the dire need for communication technology in the country.

Chen (2013) provides a comparison of technology adoption in countries with differing cultures; that is, the United States in the West, and Taiwan in the East. According to Chen (2013, p. 134):

> The domestication approach studied how a user appropriated a new technology into his/her everyday life. Results showed that ages, locations and situations were major factors in determining how tablet users use the device differently. Other uncategorised tablet adoption and usage patterns were Geert Hofstede's individualistic versus collective dimension.

This illustrates the degree of influence that culture has on the adoption of new technology. As a society, Taiwan has a collectivistic culture, while the United States has a more individualistic culture (Chen, 2013). The top three activities by tablet users in each country were established. These are compared in Table 23.

Table 23

Top Three Activities of Tablet Users in the United States and Taiwan

	United States	**Taiwan**
1	Social networking services (56%)	Browsing web pages (41.7%)
2	Music/video consumption (51%)	Playing games (28.1%)
3	E-books (46%)	Checking email (16.1%)

Chen's (2013) study found that DT factors help to explain the use of tablets in these countries. One of the pitfalls in the study, with regard to explaining adoption in a cross-cultural context, is the limitation of location and observations. Additional studies need to be conducted on adoption in a cross-cultural context, as studies on cross-cultural technology adoption and usage

are rare. There are many factors that might impact a user's willingness to adopt new technology, including access, affordability, connection abilities, policies, and regulations (Chen, 2013).

In China, technology has been firmly embedded into the domestic setting to help perform particular functions (Wong et al., 2012). Predicting the consumers' intention to adopt mobile shopping. People in China express their individualism through their consumption (Wong et al., 2012). The 'one-child policy' culture implemented in China has led to consumerism in the country; hence, there is a need for social and cultural acceptance. Wong et al. (2012) point out that due to the 'one-child policy', status is not defined by the size of the family, but by consumption. For Wong et al. (2012), the adoption of technology by the Chinese is linked to their lifestyle orientation. High value is placed on personal relationships in China (outside of the nuclear family), which further influences the adoption of technology, social media, and mobile communication tools. Chinese parents also regard information, communication, and technology as essential for their child's social advancement (Wong et al., 2012).

3.5.3 Phases of Domestication

There are four phases in the domestication process, which can occur in any order (Dutton & Blank, 2014):

1. Appropriation (awareness/purchase of technology)
2. Incorporation/lifestyle integration (technology is incorporated into everyday life)
3. Conversion (display of the technology)
4. Objectification (location of the technology, physically and symbolically)

The appropriation of a technology begins when the user becomes aware of the technology, either via media and advertising or social influences, and begins to wonder or visualise how the technology may fit into or enhance their life. According to Cooper (2016, p. 102), "[a]ppropriation signals a time when the potential customer becomes an actual user".

Incorporation (lifestyle integration) emphasises the way in which technology is actually used; that is, the specific ways in which a user chooses to use technology. This may differ from the external influencers of the technology and may help the user optimise their time in different

ways (Cooper, 2016). In addition, Yadav et al. (2015), and Kim and Yoon (2011), investigated lifestyle integration (people that they are surrounded by, such as family and friends) to better understand the impact of digital adoption. Incorporation of lifestyle integration is another hypothesis in the study.

The sub-hypotheses (i.e. H1c, H2c, H3c, H4c, and H5c) are derived from TAM, a model commonly used to understand digital acceptance/usage and user intent. However, key external variables affiliated with a user's internal beliefs, as depicted by DT (lifestyle integration), also needed to be investigated. Thus, through SEM, the mediation and moderation paths were assessed and analysed to understand potential relationships between these variables (Malhotra et al., 2005). The numbering of the sub-hypotheses is aligned to the original numbering of the hypotheses (see section 1.6).

Based on this information, the seventh hypothesis is:

- Hypothesis **H7a**: 'Lifestyle integration' is significantly and positively associated with 'intention to use'.
    - Hypothesis **H1c**: 'Lifestyle integration' mediates the relationship between 'trialability' and 'intention to use'.
    - Hypothesis **H2c**: 'Lifestyle integration' (mediator) significantly mediates the relationship between 'perceived ease of use' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H3c**: 'Lifestyle integration' (mediator) significantly mediates the relationship between 'perceived risk' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H4c**: 'Lifestyle integration' (mediator) significantly mediates the relationship between 'perceived value' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H5c**: 'Lifestyle integration' (mediator) significantly mediates the relationship between 'privacy' (independent variable) and 'intention to use' (dependent variable).

‘Conversion’ refers to the process by which a given technology is fully integrated into the user’s lifestyle, both inside and outside the home. It is also at this point that the user discusses the technology with ease in social and other spheres (Cooper, 2016).

‘Objectification’ is how people demonstrate the significance of ICT through the way they speak about it or provide feedback on it. It also concerns the way in which the use of the technology complements or displaces other technology in the home (Cooper, 2016).

3.5.4 Technology Adoption in South Africa and India

In South Africa, the increase in mobile usage and ownership is a result of technological advancement that has taken place in the mobile sphere. Nevertheless, South Africa is behind in terms of the development of ICT structure, ownership of computers, and access to the Internet.

According to an exploratory research paper published by UNICEF (2012), many South Africans living in urban and rural communities may examine digital information using mobile and PC Internet connections. The number of South Africans who possessed, rented, and had access to a mobile phone improved by 20% from 2005 to 2009. The literature indicates that South Africa has the third highest number of mobile subscribers in Africa, after Nigeria and Egypt. Similarly, with regard to the majority of emerging countries, South Africa’s mobile telephony has been crucial in bridging the communication divide between urban and rural populations, as it offers access to areas with poor ICT infrastructure. ICT studies illustrate that in most underdeveloped countries (South Africa was included in this study), mobiles with prepaid services constitute the *only* means of communication for those from rural and underprivileged households. Although technology adoption has increased in South Africa, the opportunity for technology adoption in the country is not distributed equally, due to location (urban vs. rural), poor living standards, low levels of education, and socioeconomic factors.

As with South Africa, technological advancement in India has taken place in the mobile sphere. According to Dhillon (2018), in India, there is a gender gap in terms of usage of and awareness of technology, specifically the Internet. While 80% of the male population in India has mobile phones, only 43% of women do. This is mainly due to lack of awareness, limited education, and socioeconomic factors. Dhillon (2018) suggests that there is a higher penetration and

awareness of mobile technology in urban areas (71%) than in rural areas (55%). A total of 64% of people in India said they did not know about the Internet. Of this group, 68% were female, and 68% were from rural areas. Overall, Internet usage in the country is low (19%).

3.5.5 Other Domestication Studies

In 2008, Dwivedi et al. (2008) published a guest editorial that summarised and reviewed the number of research studies conducted on the adoption of ICT in a household context. The following findings were provided in the review:

- A total of 80 articles were identified from the Thomson Reuters Scientific Web of Science.
- These articles appeared in 54 journals between 1998 and 2008.
- There were no articles published on these topics prior to 1998.
- Articles published increased from 1998 to 2008, with just under 50% published between 2006 and 2007.
- The largest number of articles were published in the *Information and Management Journal.*
- Other journals included *The Journal of Business Research; Industrial Management and Data Systems; MIS Quarterly; Decision Support Systems; Information Society; International Journal of Service Industry Management; New Media and Society; Personal and Ubiquitous Computing and Telecommunication Policy*, along with another 44 journals.
- The research (80 articles) was conducted across 18 countries.
- The largest number of research articles was published in the United States. The following countries also produced a moderate amount of research papers: the United Kingdom; Singapore; South Korea; Canada; Australia; Finland; Spain; and Taiwan. The following countries produced a few articles: Austria; Belgium; Egypt; Italy; South Africa; and Switzerland.
- India and Ireland, which are key IT outsourcing hubs, did not feature in the research surveyed.
- The following institutions have been the most active in this research area: the National Central University in Taiwan; the University of South California; and the University

of Wisconsin. A further 112 institutions have produced one to two published articles. USA-based institutions dominate the list.

- Positivism has been noted as the dominant research paradigm (used in 70 articles), while descriptive, conceptual, theoretical, and interpretive research paradigms were used in the remaining articles.
- The majority of the articles were empirical in nature (71 articles), while the rest were non-empirical (nine articles).
- Most of the articles used a quantitative approach, while the remainder used a qualitative approach. Only one published article used a mixed-methods approach.
- A total of six research methods were recorded from the 80 articles. The majority of studies used survey methods.
- The dominant theories explored in the articles on the study of consumer adoption and diffusion in relation to ICT were TAM, DOI theory, TPB, TRA, and TRUST.

3.5.6 Challenges with Domestication Theory (DT)

The construct of this theory is based on observation, customer feedback, or case-study analysis (Haddon, 2006). Studies by Silverstone and Haddon (1996) note that design and domestication are conflicting concepts in terms of innovation. Domestication is predicted in design and design is realised in domestication. These authors also suggest that adoption of technology may not only exist in two dimensions (i.e. design and domestication and other important factors, such as infrastructure and politics, are ignored).

By the time a technology is adopted and analysed, and customer feedback is obtained, the upgrade on the later version might possess a completely new set of criteria, which may nullify the analysis on the previous adoption. Rasiah and Ming (2010) note that customer feedback enhances digital usage through self-service effectiveness in banking. Ahmad and al-zu'bi (2016) found that customer feedback impacts Internet banking adoption. In keeping with the views expressed by Silverstone and Haddon (1996), the model could enhance the accuracy of adoption by including customer feedback, economic factors, psychological phenomena, and choice modelling to expedite the time required for customer feedback. Kardaras and Papathanassiou (2001), and Tiongson (2015), note that customer involvement in the design and

customisation of digital solutions may assist in adoption and usage. Customer feedback should be researched further.

Important external variables affiliated with a user's internal beliefs, as depicted by DT (customer feedback) also needed to be investigated. Thus, through SEM, the mediation and moderation paths were assessed and analysed to understand potential relationships between these variables (Malhotra et al., 2005).

Based on this information, the eighth hypothesis is as follows:

- Hypothesis **H8a**: 'Customer feedback' is significantly and positively associated with 'intention to use'.
    - Hypothesis **H1d** 'Customer feedback' (mediator) significantly mediates the relationship between 'trialability' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H2d**: 'Customer feedback' (mediator) significantly mediates the relationship between 'perceived ease of use' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H3d**: 'Customer feedback' (mediator) significantly mediates the relationship between 'perceived risk' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H4d**: 'Customer feedback' (mediator) significantly mediates the relationship between 'perceived value' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H5d**: 'Customer feedback' (mediator) significantly mediates the relationship between 'privacy' (independent variable) and 'intention to use' (dependent variable).

The process to elicit information (customer feedback) is time-consuming, as one approach does not provide a holistic picture. For example, when one is interviewing or obtaining customer feedback from participants or users, the answers and feedback received are only true at that point in time. After reflection, customers' answers to the questions may change. It is therefore useful to include forms of research that are quantitative in nature. As domestication studies involve understanding people's psychological, cultural, and socioeconomic preferences, and

other influencing factors, the time and resources required to conduct the study may limit the research studies undertaken in this field (Haddon, 2011). Given the nature of the information, more context can always be added to the study, which has led to limitations in various studies (Haddon, 2011). Another limitation is that focus is placed on the home and household, as observed in both earlier and later studies. However, the adoption of technology in the household is determined by various factors.

Table 24 outlines other research that aligns to the research objectives of this study.

Table 24

Journal Research Studies

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
1	***Journal of Internet Commerce***	Consumer-to-consumer (C2C) e-commerce research in information systems journals	Leonard and Jones	2010	Empirical – 22 000+ articles reviewed	This literature review suggests that the C2C e-commerce literature is not extensive.
2	***International Journal of Electronic Commerce***	Consumer acceptance of electronic commerce: Integrating trust and risk with TAM	Pavlou	2003	Quantitative – two-sample study	This journal suggests that culture plays a role in digital adoption within a target market, where the argument is made that researching the impact of culture in different markets will assist in accurate digital adoption predictions.
3	***Journal of Strategic Marketing***	Exploring consumer adoption of proximity mobile payments	Slade et al.	2015	Quantitative – online survey	The authors found personal innovativeness to be the most significant predictor of behavioural intention. Future research could explore further extensions of UTAUT2 with such constructs.
4	***Culture, Theory and Critique***	The (im)possibility of interdisciplinary: Lessons	Dini et al.	2011	Epistemological framework	The authors suggest that the inconsistencies and difficulty of numerous perspectives ought not be advanced with the hope that they will unite in a

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
		from constructing a theoretical framework for digital ecosystems				novel paradigm that exceeds received knowledge. Instead, they "should be allowed to flourish, providing a basis for different communication and exchanges, new syntheses, and new technical and social constructions and applications."
5	***International Management Review***	Understanding the effects of social media and mobile usage on e-commerce: An exploratory study in Saudi Arabia	Makki and Chang	2015	Qualitative approaches – online survey	This paper reviews the influence of social media and mobile use on the acceptance of digital technologies. It reflects that social media, particularly Instagram, could be a useful tool in enhancing awareness and conveying the product value proposition. Makki and Chang (2015) suggest that the substantial potential of social media and mobile usage on e-commerce in Saudi Arabia (emerging market) justifies further research.
6	***The Service Industries Journal***	Enjoyment and social influence: Predicting mobile payment adoption	Koenig-Lewis et al.	2015	Empirical investigation	This paper evaluates the use of unique payment systems in emerging markets, such as Mpesa in Kenya. It suggests that unique economic conditions gave rise to unique products, which are now being emulated in developed countries.

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
						It argues that within the financial service ecosystem, adoption of a novel technology by key intermediaries is critical to effective development.
7	***Information Technology for Development***	Institutional effects on e-payment entrepreneurship in a developing country: Enablers and constraints	Effah	2016	Case study based on ePay Ghana	This paper notes that to comprehend environmental influences on innovation transfer, e-business research in developing countries must go beyond adoption and diffusion studies and adopt multi-level social theories, such as institutionalism, to highlight relative impacts on local innovation initiatives.
8	***International Journal of Electronic Commerce***	Perceived e-readiness factors in e-commerce adoption: An empirical investigation in a developing country	Molla and Licker	2005	Positivist research – survey	The conclusion of this paper suggests that (a) in emerging markets, organisational elements such as humans, business, and technological resources and awareness, are more powerful than environmental elements in the initial adoption of digital commerce; and (b) as organisations in emerging markets adopt more complex digital commerce practices, the benefits from resources become less important,

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
						and the maturity level of digital commerce adoption is impacted by environmental factors.
9	***Scandinavian Journal of Educational Research***	Informed grounded theory	Thornberg	2012	Qualitative research – grounded theory	This paper notes that when a researcher conducts grounded theory methodology, they ought not to use the literature to force applications or deductions but be guided by a set of data-sensitising principles.
10	***International Journal of Electronic Commerce***	Understanding the development and diffusion of mobile commerce technologies in China: A biographical study with an actor-network theory perspective	Wang et al.	2015	Qualitative research – survey	This journal elaborates on the fact that because of the proliferation of m-commerce technologies and the growing sociotechnical complexities, it is important that researchers further their understanding regarding the factors that lead to the successful adoption of new technology.
11	***Technological and Economic Development of Economy***	Mobile service usage behaviour in Korea: An empirical study on consumer acceptance	Yeong-Wha et al.	2011	Quantitative research	This paper noted that individuals were wary of using digital services, due to fear of risk and security. Individuals also appeared to be reconsidering which features they would use, based on the feature benefit. The outcome was

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
		of innovative technologies				that behavioural tendency is influenced by marketing strategy, which should be centred on reducing perceived risk associated with using digital services. Both individuals and businesses should continue to offer value-added and convenience services to constantly meet the needs of customers.

3.6 Bottom of the Pyramid (BOP)

3.6.1 Overview

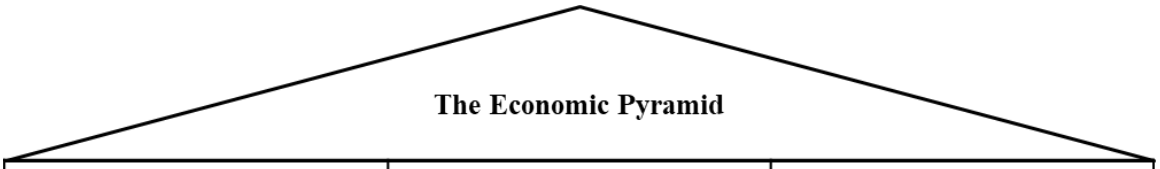
The Bottom of the Pyramid (BOP) approach established by Prahalad notes that "poor people are identified as potential customers who can be served if companies learn to fundamentally rethink their existing strategies and business models" (Seelos & Mair, 2007, p. 49). The premise of BOP is that multinational companies can serve the poor and, at the same time, generate profit (Seelos & Mair, 2007). The model suggests that there is alignment between business goals that maximise profit and the reduction of poverty (Dolan & Roll, 2013).

In his book, *The Fortune at the Bottom of the Pyramid*, Prahalad (2004) urges corporations to consider the ramifications of global poverty, hunger, and disease, and outlines a plan to perfect these realities of the global economy. The book addresses partnerships that have been formed between corporates and non-governmental organisations to help address infrastructure and social problems in the developing world at an affordable cost. Involved in these efforts is the use of technology to create jobs (Prahalad, 2004). Prahalad outlines how training individuals, supporting entrepreneurs and investors, and creating microproducts among the poor, enhances the economy. Prahalad provides practical advice on how to enhance the situation of the poor and details how corporates can assist in developing the economies of the poor by training and coaching them to be self-sustainable.

Multinational corporations view developing countries as an opportunity for growth and development. The BOP model does not seek out the wealthy in developing nations or the middle class, but rather the billions of poor people who are entering the economy for the first time (Prahalad & Hart, 2002). The term used to describe this phenomenon is 'inclusive capitalism'. According to Prahalad and Hart (2002), for companies with the resources to compete at the bottom of the pyramid, potential rewards include profit, growth, and contributions to mankind. Developing countries that do not have the necessary infrastructure to meet the demands of its people are an ideal place for the BOP model to be tested by developing affordable, sustainable products and technologies.

Figure 12

Prahalad's Economic Pyramid



Purchasing Power Parity in US$	Tier	Population in millions
>20.000	Tier 1	75 – 100
1.500 – 20.000	Tier 2 – 3	1.500 – 1.750
1.500	Tier 4	4.00
<1.500	Tier 5	

Note. The Economic Pyramid. From The Fortune at the Bottom of the Pyramid (p. 4), by Prahalad and Hart, 2002.

According to Prahalad and Hart (2002), there are a number of consumer tiers, as depicted in Figure 12. Tier 1 represents affluent consumers from around the world. This group consists of the upper- and middle-classes in developed countries, or the rich in developing countries. Tiers 2 and 3 are poor people in developed countries and the rising middle-class in developing countries. Tiers 4 and 5 represent people at the bottom of the pyramid, or poor people in developing countries. Their annual per-capita income is US$1 500 or less. This is the amount considered to be the minimum for people to live a decent life.

According to the United Nations (Shorrocks, 2006), the richest 20% in the world accounted for 85% of the total income in the year 2000, while the income accruing to the poorest 20% was 1.1%. This is an alarming portrayal of the wealth and income disparities between rich and poor. According to the World Bank (2015), approximately four billion people live on less than US$2 per day.

For organisations to realise the potential of the market at the bottom of the pyramid, the following assumptions need to be reconsidered (Prahalad & Hart, 2002):

- Products and services in developed markets have no use in developing economies, due to emerging markets' poor infrastructure.
- On account of cost structures in emerging markets, the poor are not considered a target market and, as a result, are not made aware of products and services offered in developed markets.
- In comparison to developed markets, developing markets lack infrastructure for basic services to enable technology (such as electricity and Wi-Fi).
- The poor do not appreciate products and services, and are unable to afford them.
- There is no profit to be made in emerging markets, and developing markets should be seen to by governments and non-profit organisations.

These assumptions obscure the potential for marketing in the BOP sector. To take advantage of the BOP model in developing countries, corporations need to address these assumptions. According to Prahalad (2009), these emerging markets typically lack infrastructure, good living conditions, are poor, and require a differentiated approach with regard to the adoption of a technology or service. Prahalad (2009) posits that by focusing managerial attention on the following elements (the four A's), managers can create environments for technology adoption, product consumption, and innovation.

3.6.1.1 Awareness

Creating awareness of available products and services increases the rate of adoption (Prahalad, 2009). An example of this would be making assumptions that consumers in emerging markets have access to traditional media channels. Lin (2011) investigates the impact of knowledge (awareness) on adoption, and Kim and Yoon (2011) have analysed the effect of awareness on digital adoption.

Significant external variables associated with a user's internal beliefs, as depicted by BOP (awareness), were analysed through SEM.

Based on this information, the ninth hypothesis is:

- Hypothesis **H9a**: **'**Awareness' is significantly and positively associated with 'intention to use'.
    - Hypothesis **H1e** 'Awareness' (mediator) significantly mediates the relationship between 'trialability' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H2e**: 'Awareness' (mediator) significantly mediates the relationship between 'perceived ease of use' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H3e**: 'Awareness' (mediator) significantly mediates the relationship between 'perceived risk' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H4e**: 'Awareness' (mediator) significantly mediates the relationship between 'perceived value' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H5e**: 'Awareness' (mediator) significantly mediates the relationship between 'privacy' (independent variable) and 'intention to use' (dependent variable).

3.6.1.2 Access/Availability

This refers to enablement, or the ability for all consumers to access products and services, especially consumers in rural areas; and asks, for example, whether a user has access to Wi-Fi or data (Prahalad, 2009). Another relevant question may be whether businesses have considered how a lack of infrastructure, such as telecommunication towers, may inhibit the uptake of goods and services. Uninterrupted availability of and access to infrastructure is important to build trust and a loyal base at the bottom of the pyramid to ensure that users do not experience difficulty when using products or services (Prahalad, 2009). Consumers in these markets typically consume products and services, based on the availability of the products and services in their environment. For example, according to Prahalad's (2009) study, women in rural India decide what fuel to use based on what fuel is available in the area in which they reside. Authors who have investigated access and availability as a driver of digital adoption include Park et al. (2009), Alwahaishi and Snáše (2013), and Arenas-Gaitani et al. (2015).

Tthe sub-hypotheses are derived from DT and BOP. Nevertheless, significant external variables related to a user's internal beliefs, as depicted by BOP (access), were analysed through SEM.

Based on this information, the tenth hypothesis is:

- Hypothesis **H10a**: 'Access' is significantly and positively associated with 'intention to use'.
    - Hypothesis **H6c**: 'Access' (moderator) significantly moderates the relationship between 'user environment' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H7c**: 'Access' (moderator) significantly moderates the relationship between 'lifestyle integration' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H8c**: 'Access' (moderator) significantly moderates the relationship between 'customer feedback' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H9c**: 'Access' (moderator) significantly moderates the relationship between 'awareness' (independent variable) and 'intention to use' (dependent variable).

3.6.1.3 Affordability

Affordability is made possible when similar quality products and services are made affordable at better prices. Affordability may impact the go-to-market strategy of a product or service. Many lower-income consumers fall into living standard measure (LSM) categories 1 to 4, and it is therefore unlikely that they would be able to afford new technology services or products. Studies that investigate affordability as a driver of digital adoption include those by Wang et al. (2006), Raman and Don (2013), and Ünal et al. (2011).

Additional variables associated with a user's internal beliefs, as depicted by BOP (affordability), were investigated through SEM.

Based on this information, the eleventh hypothesis is:

- Hypothesis **H11**: 'Affordability' is significantly and positively associated with 'intention to use'.
    - Hypothesis **H6b**: 'Affordability' (moderator) significantly moderates the relationship between 'user environment' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H7b**: 'Affordability' (moderator) significantly moderates the relationship between 'lifestyle integration' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H8b**: 'Affordability' (moderator) significantly moderates the relationship between 'customer feedback' (independent variable) and 'intention to use' (dependent variable).
    - Hypothesis **H9b**: 'Affordability' (moderator) significantly moderates the relationship between 'awareness' (independent variable) and 'intention to use' (dependent variable).

3.6.2 The Landscape of the Bottom of the Pyramid (BOP) Market in South Africa

DI International Business Development and FABCOS (2010) notes that South Africa has a population of approximately 53 million, and seven million households. The household consumption market of South Africa is US$135 billion. The majority of South Africans live below the economic pyramid, with approximately 30 million people at the base of the pyramid (i.e. local purchasing power of less than US$3 000 annually).

According to information published about bottom of the pyramid and stokvels on Quicket (n.d.):

> [i]n South Africa (SA), it is estimated that approximately 30 million, or two out of three people, live at the BOP. […] When the total buying power of the low-income consumer groups are calculated, the BOP in SA represents a US$40 billion market – or one third of the entire South African market.

BOP characteristics are imperative for South Africa, as the country has a large poor and underserved market, which has been excluded from mainstream economic activity. See Table 25.

Table 25

South African Bottom of the Pyramid Model

	Pyramid group			
Income measure	**Foundation**	**Core**	**Buttress**	**Apex**
Average personal income per month	R1 312.00	R2 642.70	R6 071.52	R11 159.02
Average personal income per day	R43.73	R88.09	R202.38	R371.97
Average household income per month	R2 069.60	R4 664.16	R12 125.90	R23 562.60
Average household income per day	R68.99	R155.47	R404.20	R785.42

Note. The SAARF AMPS Living Standards Measure (LSM) by the South African Advertising Research Foundation, 2009, retrieved from: http://www.saarf.co.za/AMPS/technicalreport-2009A/data%20files/Technical/21 +22.pdf.

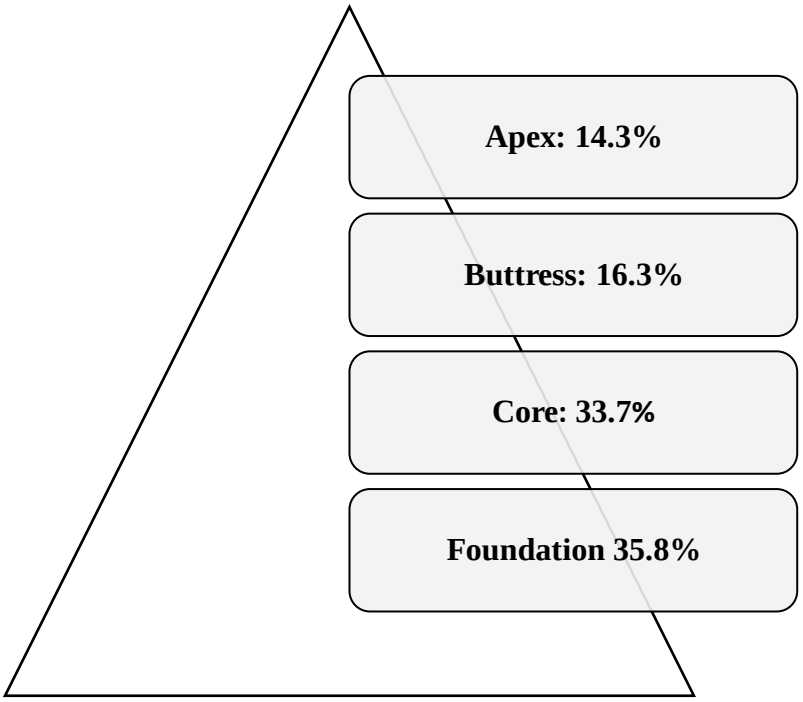
Chipp et al. (2012) conducted a study in order to identify the BOP context in South Africa. The following four clusters were derived:

1. The foundation forms the base, and is South Africa's BOP. There are 11 194 000 adults at this level;
2. The core, representing 33.7% of South African adults (10 534 000);
3. The buttress, representing 16.3% of South African adults (5 105 000); and
4. The apex, representing 14.3% of South African adults (4 463 000).

Figure 13 provides a visual representation of the South African BOP.

Figure 13

Average Income per Pyramid Group in South Africa – Cumulative Population



Note. The South African BOP. From "Price versus brand: assessing the role of price and brand in low-income consumer decision-making," by M. Allan, 2014, Semantic Scholar.

According to the data analysed in the study, ownership rates for durable goods are very low. The price-performance trade-off is the single most important consideration for consumers in this segment. Furthermore, the analysis shows that companies in South Africa (local and international) have achieved penetration in the 'foundation' or BOP segment.

Chipp et al. (2012, p. 18) raised another important factor regarding the study. They stated:

> The extant literature has tended to view these consumers as individuals acting in a social vacuum. By contrast, this study departs from an atomised view of consumers and adopts a collectivist perspective to describe the South African bottom of the pyramid.

Considering this result, the authors conducted an additional study "to demonstrate empirically that collectivism as a construct, and several proxy indicators for collectivism, accurately and parsimoniously predict whether or not a South African can be described as being part of the BOP" (Chipp et al., 2013, p. 2). In prior studies, the BOP viewed consumers in that segment as individual consumers, whereas the results of this study confirm that South Africans should be viewed as a collective household (unit). This is a better predictor for BOP classification than personal income in South Africa.

In India, 70% of the BOP market live in rural areas (Prahalad, 2012). According to World Bank (2015) estimates, 41.6% of India's population lives on below US$1.25 per day and 75.6% live on below US$2 per day. The BOP segment in India lacks access to basic needs, such as education, food, healthcare, water, sanitation, information, communications, banking, and insurance (Kapoor & Goyal, 2013).

The BOP in India comprises 1.05 billion people; that is five out of six Indians, who live on an annual household income of less than INR200 000 as of 2005 (Unitus Ventures, 2019). This is equivalent to a monthly household income of less than INR16 667.

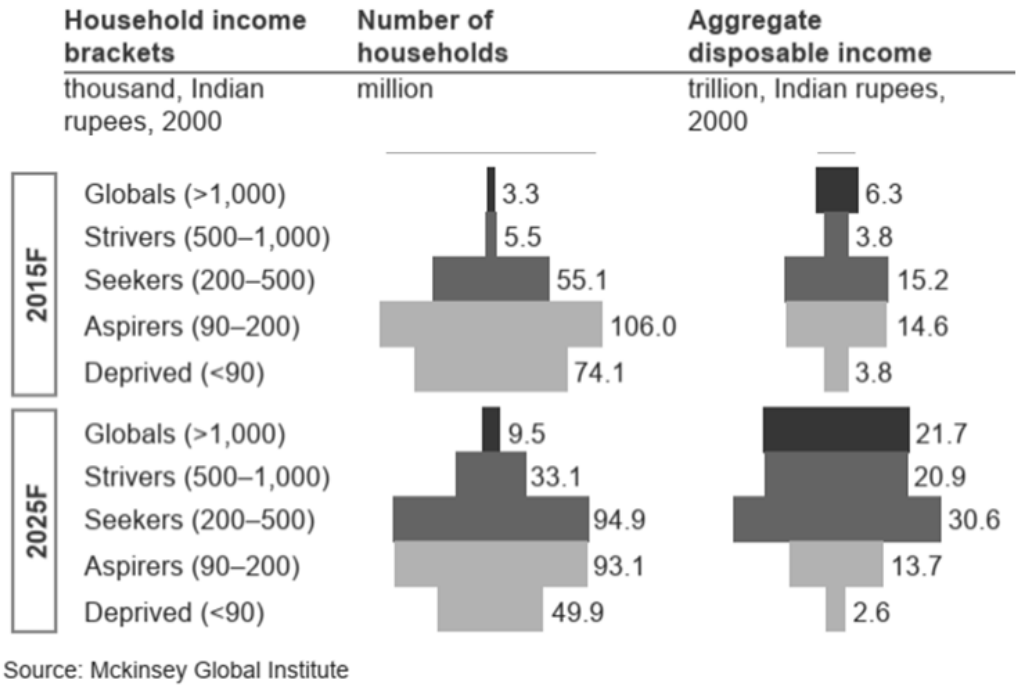
Figure 14 represents the pyramid for India, with a projection for the Indian landscape in 2025. The Indian consumer market has been categorised according to the following classifications (Ablett et al., 2007):

- Global (Indians earning more than INR1 000 000, or more than US$21 882): this group of people have a high standard of living. They usually occupy positions at executive level; own large businesses or have agricultural farms; or are politicians or top-tier professionals. They earn premium salaries.
- Strivers (Indians earning INR500 000 – 1 000 000, or US$10 941 – 21 882): this group is regarded as successful in society. They are traders, established professionals, senior government officials, industrialists, and farmers.
- Seekers (INR200 000 – 500 000, or US$4 376 – 10 941): the people in this bracket occupy various types of jobs as mid-level traders and business people.

- Aspirers (INR90 000 – 200 000, or US$1 969 – 4 376): these are small-time shopkeepers or low-skilled workers. They struggle to live comfortably, as half of their income is required for necessities.
- Deprived (less than INR90 000, or US$1 969): this is the poorest group of people in India. People in this bracket earn their income through unskilled or low-skilled activities.

Figure 14

The Shape of India's Pyramid From 2005–2025



Note. The Shape of India's Income Pyramid Will Change Dramatically as Income Grows. From 'The Bird of Gold': The rise of India's consumer market (p. 13), by McKinsey Global Institute, 2007, retrieved from: https://www.mckinsey.com/~/media/mckinsey/featured%20insights/Asia%20Pacific/The%20bird%20of%20gold/MGI_Rise_of_Indian_Consumer_Market_full_report.ashx.

The 'deprived' segment above, as well as part of the 'aspirers' segment, represents the BOP in the Indian consumer market. According to the analysis and projection above (Ablett et al., 2007), by the year 2025 the BOP segment will shrink to half its current market size in India, due to GDP growth and an increase in household income.

3.6.3 Adoption of Technology by Bottom of the Pyramid (BOP) Customers

Table 26 provides a summary of literature available on the adoption of technology in the BOP segment in different third-world countries.

Table 26

Bottom of the Pyramid Research Studies

BOP technology adoption	Analysed variables	Methods	Date and context	Authors
Innovation and social entrepreneurship at the BOP – a conceptual framework	Key success criteria for innovation at the BOP	Inductive research methodology	Data collection via secondary sources, using case-study strategy	Pervez et al. (2013)
The enablers of Internet take up and usage – a BOP perspective in Vietnam	Influences on the BOP; Internet; TAM	Qualitative	Eight individual in-depth, semi-structured interviews (annual income lower than US$3 000)	Nguyen (2018)
The drivers of mobile banking apps – a BOP perspective in Kenya	Adoption factors; BOP characteristics	Descriptive study; purposeful and convenience sampling	Self-administered questionnaires	Kariuki (2012)
The take up of electricity payment systems – a BOP perspective in rural Uganda	Payment system; diffusion of renewable energy; diffusion of innovation	Qualitative research method; collection of data	Literature study (secondary data); qualitative methods; expert interviews; focused interviews; survey; participant observation	Eder and Mutsaerts (2013)
The take up of mobile solutions and utilisation – a BOP perspective in South Africa	Demand for mobile communication and applications, BOP in South Africa	Quantitative and qualitative (mixed-methods approach)	Household and informal business survey; focus group discussions	World Bank (2012)

The impact of BOP for marketing in South Africa	Consumers; South African BOP; collectivism	Ward's method of cluster analysis	All media and product survey (household data) 21 083 urban and rural consumers over 16 years of age	Chipp et al. (2012)
The impact of social influence on mobile take up and utilisation – a BOP perspective in Asia	Influences on mobile phone adoption; bottom of the pyramid customers (across six BOP countries)	Quantitative and qualitative research methods	A total of 9 540 face-to-face interviews over three consecutive months; survey administered to selected participants; 60 protocols in six countries (not equally distributed) of home visits, together with media-mapping exercises and focused group discussions	De Silva et al. (2009)
A review of BOP in South Africa and the role it plays in collectivism	Collectivism; income; lifestyle; community size; racial classification	Descriptive statistics	Archival data from the AMPS	Chipp et al. (2013)
The factors that drive decision-making in underprivileged households – a BOP perspective	Decision-making in poor households (BOP); Western households	Qualitative research study	Interview-based approach	Gupta and Sesa (2015)

Table 27 outlines further research conducted in South Africa on BOP, investigating the impact that BOP has on digital adoption.

Table 27

Bottom of the Pyramid (BOP) Studies Conducted at GIBS

BOP technology adoption	Analysed variables	Methods	Data and context	Authors
Financial products for BOP	Products and services; BOP segment in South Africa	Qualitative research methodology; secondary data analysis	Ethnographic interviews, published articles, books, and periodicals	Geldenhuys (2008)
What drives BOP usage of mobile banking	Mobile banking; low-income individuals (BOP)	Quantitative research methodology	Survey questionnaire	Masinge (2010)
BOP and the impact of hubs in South Africa	Network hubs; adoption of products; the BOP segment	Quantitative research method; judgemental sampling; secondary data collection	Consumer and merchant databases	Matsau (2010)
BOP and thrift	Discretionary thrift; low-income earners	Quantitative research design	154 surveyed individuals	Nkosi (2011)
BOP and the impact on intrapreneurship	Internal organisation factors; Intrapreneurship; BOP business units	Qualitative research method	Expert interviews	Ramsundhar (2009)
BOP buying behaviour	Consumer behaviour, product packaging, BOP	Descriptive research method, quantitative research design	Questionnaire	Variawa (2011)

3.6.4 Summary of BOP

A study by Nguyen (2018) assesses what factors influence Internet adoption, and how the BOP segment in Vietnam have integrated the Internet into their daily lives. The model was based on UTAUT, using previous BOP studies to create a framework. The framework/model incorporated four independent variables, namely function expectancy, ease of use, social influence, and facilitating conditions; where the dependent variable was intention to use.

'Performance expectancy' comprises all the advances attained from the adoption and use of the Internet. The BOP has much to consider in terms of Internet usage (cost, access, and awareness). Recommendations from relatives and reference groups constitute the 'social influence' for BOP. Lastly, 'facilitating conditions' is hypothesised to encourage adoption because the BOP customer is risk-averse. The study found that 'performance expectancy' influences adoption; 'ease expectancy' correlates with usage behaviour; the Internet is a social norm, in that it is embedded in society and adds value to the day-to-day lives of a family; and social influence may also be enhanced based on BOP usage of the Internet. 'Facilitating conditions', such as the level at which the BOP believes the required infrastructure will be available to facilitate Internet usage, and the fact that they have control over how and when they use the Internet, influences their use of the Internet.

Kariuki (2012) conducted research on the factors that influence the take up of mobile-app banking by BOP banking customers in Kenya to determine the effect of risk, trust, and cost of usage. The study found that 75% of participants preferred to use the mobile phone banking app, while 94% used online banking. The independent variables in the study included perceived risk, trust, and cost. The dependent variable was the adoption of a mobile phone banking app. The results show that adoption was determined by whether the app was forced or optional, and that a cost reduction in banking fees influenced the adoption of mobile banking. Regarding perceived risk, the study concluded that banking on a mobile device enhances convenience, on account of quick access. However, issues experienced with the mobile network operator's infrastructure pose a challenge to accessibility. Banks were also noted to be trustworthy; and mobile apps as being easy to learn and use. Trust contributed the most to the uptake of mobile-app banking, preceded by cost and perceived risk.

An article produced by De Silva et al. (2010) quantitatively measured several influences on mobile-app adoption at the BOP in, India, the Philippines, Sri Lanka, and Thailand. The study found proof of two types of social influence that affect mobile adoption: one that applies pressure on individuals to take up and use mobile apps, and another that assists, via social networks, to generate a network that connects societies to economic and business networks.

Various research has been conducted in the South African BOP context. Louw (2008) studied prospective applications at the BOP; Naidoo (2009) evaluated the impact of customer loyalty in corporate social investment; and Chipp et al. (2012) studied BOP for South African marketers.

Chipp et al. (2012) conducted a study that highlights the importance of a collectivist, rather than an individualist perspective. They reviewed the Living Standards Measure (LSM®); segmented the South African market using LSM® household variables and Ward's method of cluster analysis; identified and described the South African BOP that emerged from this segmentation exercise in terms of size, income, and household variables; and demonstrated that South African BOP consumers, despite their relatively low incomes, are indeed consumers of major national and international brands. By using only household variables, it was possible to segment the South African market and empirically derive the BOP. This market in South Africa is considerable, at more than one-third of the total population (35.8%). The income from households is typically low. However, the market is big enough as it pertains to the population size and the customers within that market, which results in significant spending power overall. Ownership rates for durable goods are low. Price/Quality is an important factor for this segment. The study also showed that organisations in South Africa have penetrated the local BOP market.

Pervez et al. (2013) conducted a case-study analysis of organisations with disruptive innovations at the BOP level, which include a combination of successful and failed ventures. The analysis revealed that attempts at innovation or social enterprise models produced different results in terms of social and economic impact: "[t]he major difference between the success and failure of innovation and social entrepreneurship models at the BOP has been found to be the perceived value by the BOP market" (Pervez et al., 2013, p. 63). When operating at the base level of the pyramid, it is important to focus on value creation for consumers. To be

successful, the chosen product or service ought to be designed to give the market access to an ordinarily inaccessible product or service.

3.6.5 Barriers and Challenges at the Bottom of the Pyramid (BOP) Market Segment

Karnani (2007) argues that the BOP theory posited by Prahalad is unrealistic. He does not believe that there is 'fortune' for companies in this market segment, nor that the market potential is as high as projected in previous studies. Garrette and Karnani (2009) conducted an analysis of three global companies that attempted but failed to market 'useful' products and services to the intended BOP segment, concluding that there are not many examples of businesses that succeeded in offering useful goods in markets with a low LSM (Garrette & Karnani, 2009). The lessons drawn from this analysis for multinationals are that the development of BOP strategies require organisations to return to basic principles of economics and business, prioritise objectives, gain customer insights, and acknowledge the role of the economy. The authors note that "the biggest difference between BOP and affluent markets is the obvious but under-emphasised fact that the poor have very low purchasing power" (Garrette & Karnani, 2009, p. 32).

A study conducted by Debelak (2011) on five BOP ventures in Ghana considered certain distribution challenges. Debelak (2011) categorised these challenges according to Prahalad's four A's, providing recommendations to overcome these challenges. The top challenges noted included the lack of transportation infrastructure; geographical complexities; inadequate distribution networks; increased purchasing power; barriers for small enterprises; awareness; and managing adoption.

Kamp et al. (2015) discuss the barriers encountered by introducing products and services to the BOP market segment. Challenges include lack of natural resources and insufficient knowledge application. Kamp et al. (2015) identify context-specific obstacles, such as lack of after-sales service, advanced high technology products, lack of knowledge of technology, and inhibiting macro-economic aspects. See Table 28.

Table 28

Barriers Associated With Introducing Products and Services to the Bottom of the Pyramid (BOP) Market Segment

No.	Barrier Name	Definition
Important barriers		
1	Ability to raise funding (capital)	How easy it is to obtain access to working capital finance
2	Affordability issues	How comfortable consumers are with product and service costs
3	Awareness/insufficient knowledge of application	The knowledge a consumer has about products and services and the benefits they provide
4	Restrictive regulation	The regulation of the environment
5	Market readiness for uptake	Will consumers buy a product or service?
6	Infrastructure challenges	The value chain required to service customers
7	Resource constraints	The resources required across the value chain
Context-specific barriers		
8	Ability to service post-sales	The capability to service post purchase (i.e. after-sales support)
9	Counterfeit goods	Fake or cheaper product options are available in the market
10	Culture and education	Societal beliefs and practices that influence consumers

Note. Important and Context-Specific Barriers. Data adapted from "Barriers and strategies entering BOP markets," (p. 1600), by Kamp et al., 2015.

Kamp et al. (2015) identify the following strategies (see Table 29) to assist in mitigating the barriers identified above.

Table 29

Strategies for Dealing With Bottom of the Pyramid (BOP) Barriers

No.	Strategy Name	Definition
Important strategies at the bottom of the pyramid		
1	Building strategic alliances	Availability of partnerships within the market for strategic alliances
2	Funding partners	Access to products is easier, due to ease of funding
3	Awareness and education	Training needs to be provided to customers to build awareness
4	Multi-country approach	A regional approach is selected for the sale of products and services to identify the best market for growth
5	Use of complementary technologies	Consumers use similar technology to cater to their needs
Context-specific strategies		
6	LSM segmentation	The products are sold to the higher LSM first and then expected to be taken up by lower LSM markets (aspiration)
7	Prototyping within the market	Ensuring that products introduced in a market are aligned to the market expectations

Note. Important and Context-Specific Strategies. Data adapted from "Barriers and strategies entering BOP markets," (p. 1602), by Kamp et al., 2015.

3.7 Summary of the Literature

TAM proposes that behavioural intention is correlated with usage, as opposed to actual usage. In addition, TAM investigates technological factors (e.g. ease of use), while DT investigates social contextual factors (i.e. lifestyle integration, customer feedback, and user environment), and how they influence the way people use and benefit from digital acceptance and usage (Scheerder et al., 2019). BOP investigates facilitating conditions (including awareness, access, affordability, and availability).

The research reviews the tension between TAM, DT, and BOP to better understand the factors that influence digital adoption and client behaviour, and the use and adoption of digital channel services in India and South Africa. The variables from these theories and the literature were used in conjunction with the qualitative analysis to derive the hypotheses in this study. The

contradictions between the models suggest that individually they may not provide enough insight into the factors that drive digital adoption in emerging markets. The study therefore contributes to the field of management and an understanding of digital adoption in emerging markets. Rapid technological advancements suggest that the TAM, DT, and BOP frameworks need to be revised (Benbasat & Barki, 2007). They should be combined and extended. These models were constructed in developed economies and therefore need to be tested in an emerging market context (Prahalad, 2012).

Further to this, digital/technology adoption differs in emerging markets, due to the environment in which the solution is offered. This research attempts to develop a holistic understanding of the aspects of technology adoption by synthesising the technological components of TAM with the psychological components of DT and BOP (emerging market characteristics), based on the technological, facilitating (the infrastructure that an individual has access to i.e. WIFI, Electricity etc.), and social impact (influence of people an individual is surrounded by on a daily basis) that the combined model may offer.

The gap in the literature suggests that technological factors, social factors, and facilitating conditions all need to be investigated in order to present a holistic adoption model that will assist in improving the accuracy of digital adoption in an emerging market context.

3.8 Conclusion

There is a great deal of scrutiny (analysis of consumer behaviour) and business effort to drive digital adoption in emerging markets. The adoption of digital services, such as mobile apps, has provided significant benefits to sales and operations, and can therefore significantly impact businesses within emerging markets and assist in rapidly growing these economies as they overcome traditional e-commerce barriers. It is imperative that businesses understand emerging market dynamics and how best to navigate them, on account of globalisation.

This chapter provided a literature review of relevant technology adoption theories. Gaps in the existing literature were identified, and an argument was made for the amalgamation of extant theories that may lead to further insight regarding digital adoption in an emerging market context. The research methodology is outlined in the following chapter.

CHAPTER FOUR
RESEARCH METHODOLOGY

4.1 Introduction

The previous chapters provided a detailed account of the study's background (Chapter One), the framework in which the research was carried out (Chapter Two), an intensive literature review of the theoretical concepts underpinning the study (Chapter Three), and the conceptual framework.

This chapter builds on the previous chapter, where the research methods were justified. It presents the methods of exploratory sequential mixed-methods design (qualitative and quantitative) applied to answer the research questions. As previously indicated, the purpose of the qualitative study is to provide insight into the factors that drive mobile technology adoption in India and South Africa, and to provide a localised theoretical framework that can be empirically tested. In this way, the study attempts to provide a holistic analysis of technology adoption and its relationship with TAM, DT, and emerging market characteristics.

4.2 Research Philosophies Adopted for the Study

Research shows that different scholars have a different understanding of the word 'paradigm'. For instance, Mac Naughton et al. (2001) argue that the word consists of three elements: (i) a belief of the nature of knowledge; (ii) validity criteria; and (iii) methodology. Saunders et al. (2017), and Mackenzie and Knipe (2006), note that a paradigm may be positivist (post-positivist), constructivist, interpretivist, transformative, pragmatist, critical realist, and deconstructivist. This research defines 'paradigm' as the manner in which one looks at the world and the context to understand human experience (Kuhn, 1962). It is necessary to consider that it may be difficult for individuals to always understand the idea of definitive expectations, as people are invested in their personal viewpoints and perspectives. For this reason, the paradigm definitions provided by Mac Naughton et al. (2001) and Saunders et al. (2017) are considered in the qualitative and quantitative research.

In this study, the qualitative component is grounded on the assumption that reality is socially constructed – in keeping with interpretivism (Willis, 2007); where what we know is understood to always be embedded within cultures, social settings, and relationships with other people (Saunders et al., 2012 & 2017). From this viewpoint, validity or truth cannot be said to be grounded in an objective reality. Willis (2007) contends that in finding answers for research, those who follow an interpretive paradigm use experience to construct and interpret an

understanding from gathered data. The interpretive paradigm often looks for solutions from the research by investigating the reasons why individuals have different viewpoints. Inclusion and acceptance of different viewpoints in the interpretive paradigm lead to the complete understanding of a given circumstance (Myers & Klein, 2001; Morehouse, 2012).

Interpretivism is the study of interpretation, offering a simple and subjective way to interpret data. As such, interpretivism in this research is associated with constructivist epistemology. The rationale is that participants in the study have unique perspectives and their reasoning may contribute to the study from an emerging market perspective. Thus, the researcher was able to analyse and understand how participants perceived the world.

The use of interviews encouraged participants to express their views free from the study's influence. The belief was that participants would not just react to social influence, as noted by a positivist belief, but a combination of factors was evaluated.

Some assumptions made from an ontological position were that multiple realities could be explored, and constructs could be formed through human interactions (i.e. interviewing candidates within their home environment so the researcher could clarify and validate some of the responses). An example would be access to Wi-Fi and electricity, whereby the researcher may validate this or the ability for participants to walk the researcher through their day-to-day mobile-app activities within their home or work environment. From an epistemological perspective, it was assumed that occurrences are interpreted through the mental processes of interpretation, which is influenced by interaction within social contexts.

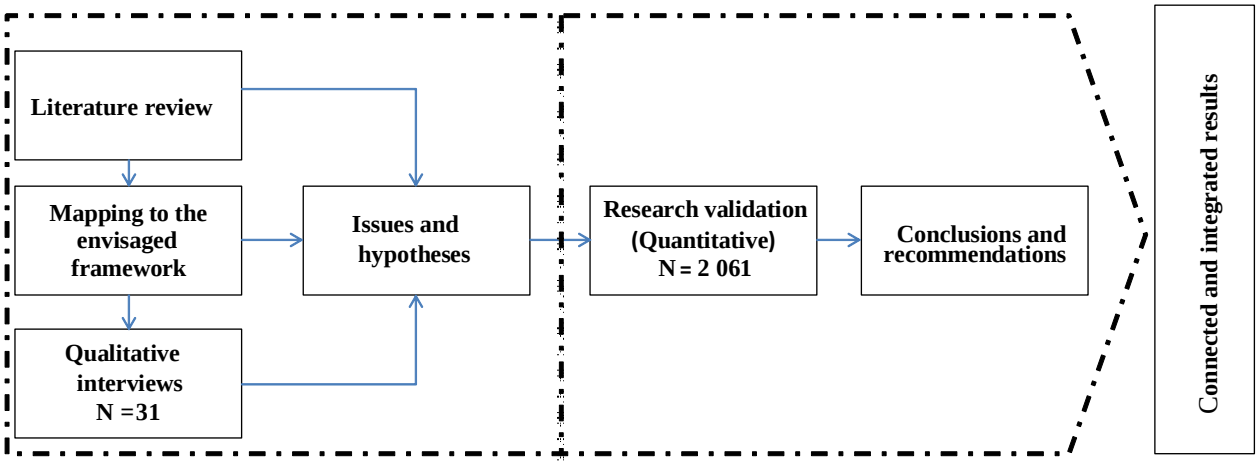
For Miles and Huberman (1994), interpretivists and transcendental realists share the point of view that social phenomena are real; that is, existing in the mind and in an objective world beyond the individual. Both perspectives attempt to explain events and to find causal descriptions of forces at work (Miles & Huberman, 1994; Saunders et al., 2017).

The quantitative aspect of the research adopts a post-positivist paradigm (Bak, 2004; Kaboub, 2008; Žukauskas, 2018). The role of the positivist paradigm is to analyse, describe, predict, and allow for control of and improvement to phenomena and processes. Deductive quantitative inquiry is adopted to ascertain the drivers of technology adoption (Creswell, 2003).

Despite using two different paradigms, both qualitative and quantitative approaches support Creswell's view (2003) that the problem being investigated drives the paradigmatic approach, where researchers may choose to adopt a combination of research methods (mixed methodology), as appropriate. Hence, different methods and levels of analysis are employed to provide a complete analysis of the drivers of mobile-app adoption in South Africa and India. Figure 15 provides a schematic of the research method used for this study.

Figure 15

Exploratory Sequential Design (Mixed-Methods Approach)



An exploratory sequential mixed-methods approach was adopted for this research. The researcher aimed to gain insight into what drives mobile-app adoption. A post-positivist paradigm allowed the researcher to potentially overcome some of the underlying pitfalls in the research paradigm and assisted in maximising the research output (Trochim et al., 2015). Using sequential mixed-methods design, the issues typically noted within a single research model can be understood in a more realistic way. This research applied an exploratory sequential mixed-methods design, as suggested by Creswell and Plano Clark (2011), whereby qualitative research is followed by a quantitative validation. The researcher followed a grounded approach for the qualitative study, within the first phase of the exploratory sequential mixed-methods design, which is deemed beneficial.

Each of the three models (TAM, DT, and BOP) provide a view of the factors that drive digital adoption, which guided the researcher regarding the constructs being formed and analysed. Once the theory emerged from the qualitative study, an instrument was developed based on the

"emergent" framework. This framework was informed by the initial qualitative phase of the grounded approach, which categorised variables and hypotheses to test them using statistical methods.

An exploratory sequential mixed-methods design (qualitative and quantitative) also assists with the pitfalls of a selecting a single method, which is reduced significantly when a mixed-methods approach is chosen (Schulenberg, 2007). A mixed-methods approach provides deep insights and perspectives through triangulation, as the consolidation of data follows inductive (qualitative) and deductive (quantitative) approaches (Riazi & Candlin, 2014). As a result, the research is better positioned to deliberate on the questions posed, while enhancing both objectivity and subjectivity and providing a holistic presentation of the research output (Schulenberg, 2007).

The study is made up of two phases, in line with its objectives: the first phase is an inductive analysis, using qualitative methods to understand the factors that drive the adoption of digital apps in emerging markets; and the second is a deductive analysis, using quantitative methods to categorise the factors that drive digital app use in emerging markets. Leedy and Ormrod (2010), Creswell (2007), Delport and De Vos (2011), and Mouton and Marais (1990), are of the view that a quantitative approach is exceedingly formalised and controlled in comparison to a qualitative approach. Thus, the objective of the qualitative research was to develop theory that relates to factors that drive the adoption of mobile apps within emerging markets, based on their predicted relationships with user intention, such as perceived ease of use, affordability, availability, perceived risk, access, perceived value, awareness, trialability, user environment, life integration, customer feedback, and privacy and credibility for the quantitative data instrument. On the other hand, quantitative analysis tests certain relationships predicted by the derived theory. Researchers ought to familiarise themselves with the variances among these methods and then select a mixed-method approach by combining qualitative and quantitative analysis, if suitable (Bergman, 2008; Bryman, 2008). Quantitative and qualitative approaches have merits and pitfalls.

The qualitative and quantitative process provide a holistic analysis of factors that drive mobile adoption within the two emerging markets (India and South Africa). The study adopted both personal (one-on-one) interviews, which were conducted in India and South Africa for the

qualitative study, and online surveys, which were conducted with the help of research assistants and self-administered survey responses for the quantitative study. This resulted in recommendations that relate to technology adoption and its benefits. In this research chapter, the qualitative research methodology is discussed and, thereafter, the quantitative methodology is considered.

4.2.1 Qualitative Research Paradigm

This research is broadly based on Glaser's (1992) grounded approach methodology, which was initially developed by Glaser and Strauss (1967), to devise a theory that predicts and explains behaviour. Glaser's (1992) grounded approach is based on the principle that no theoretical framework is 'forced' on data, but, rather, that relationships emerge from the analysis. The grounded analysis conducted in this research employed thematic analysis as a way of generating theory from the data. According to Crooks (2001), the grounded approach results in theory that is useful for exploring social relationships and behaviour of individual groups, and creating theory that is likely to predict and explain relevant fields of research. The following paragraphs provide a brief overview of the grounded approach and its application in this research.

4.2.2 Grounded Approach

As previously discussed, a grounded approach (grounded theory-lite) was used. Grounded theory lite may be defined as a method of grounded theory that creates themes or concepts and investigates how these relate to various categories (Pidgeon & Henwood, 1997). This approach provided the researcher with an understanding of participants' perspectives. It is also multidimensional, which allows for a better understanding of complex matters (Williams, 2011). Qualitative research assisted in conceptualising how individuals within emerging markets adopt digital products and services through digital apps; and illustrated technological, domestic, and emerging market characteristics that drive digital app adoption. Qualitative research is generally conducted by personal interpretation of phenomena. Participants are analysed within specific contexts; i.e. participant observation (Creswell, 2014; Punch, 2005). The qualitative approach encourages a holistic view, where interpretations are made from the language a participant speaks, as well as the context of the answers provided. In addition, allowances are made for certain limitations, an example of which is observer bias

(Bhattacherjee, 2012). Observer bias is the researcher's inclination to see what is expected or what the researcher wants based on their prior knowledge and the research outcomes.

Unlike traditional grounded theory, this study adopted a *grounded approach* or *grounded theory lite* application. The grounded theory lite approach was also noted by Servant-Miklos and Noordzij (2021), Boeije (2010), and Braun and Clarke (2013) in their research. The *grounded approach* or *grounded theory lite approach* is a recent development in research commonly used for smaller projects, whereby the researcher can use emergent data, line-by-line coding, and perform a constant comparison between the data and between the emergent coded categories and the data. However, with a grounded approach, the researcher does not need to conduct iterative rounds of interviews with participants. In addition, the theoretical sampling mandated by a traditional grounded theory application does not need to be conducted (Carlin & Kim, 2019). As with most grounded theory studies, like those by Williams (2011) and Glaser (1992), this study also commenced with purposive sampling, followed by the collection and analysis of data. However, iterative rounds of interviews were not conducted.

The grounded approach is a research process that focuses on the inductive development of theory embedded in qualitative data that has been methodically collected and interpreted (Bryant & Charmaz, 2007; Locke, 2002; McCallin, 2009; Sbaraini et al., 2011). The adequacy of a theory is dependent on the process used to generate it (Glaser & Strauss, 1967).

According to Bryant and Charmaz (2010), Bryman and Bell (2015), Glaser and Strauss (1967), and Strang (2015), both qualitative and quantitative data can be used to generate and validate theory, and the process of generating theory is independent of the kind of data used. Components of theory are, however, best found using qualitative methods "from data on structural conditions, consequences, deviances, norms, processes, patterns, and systems" (Glaser & Strauss, 1967, p. 18). This view is supported by Locke (2002). Comparative analysis lies at the heart of the grounded approach methodology. The goal of such research is therefore to make plausible claims based on theoretical constructs that are formed from empirical observations, which are generalised to form a conceptual framework (Locke, 2002).

The exploratory grounded approach entails an approach to research and theory building fundamentally related to direct contact "with the social world, coupled with a rejection of a prior theoretical categories and propositions" (Locke, 2002, p. 19). However, Locke (2002, p. 19–20) cautions that this "does not mean that grounded theorists should embark on research

without the guidance of some disciplinary school of thought that provides an orienting theoretical perspective" to inform the researcher's "understanding of complex social realities". In this way, the researcher may form an orienting framework that is underpinned by the subjective experience of everyday interactions and behaviour (Service, 2009; Glaser & Strauss, 2017; Locke, 2002; Morse et al., 2009).

According to Chamberlain-Salaun et al. (2013), Glaser and Strauss (1967), and Milliken and Schreiber (2012), the grounded approach reflects the assumptions of symbolic interactionism; namely that the social environment must be analysed in a way that is faithful to it. Key practices of grounded approach analysis are in-depth face-to-face interviews and first-hand observation. Guest et al. (2013) and Malhotra et al. (2013) argue that qualitative data are a source of well-grounded, rich explanations, and descriptions of procedures in distinguishable local contexts, which can offer the perception of sequential flow; and an understanding of the consequences of events, which produces comprehensive explanations. They also argue that good qualitative data helps researchers go beyond original ideas and generate and revise conceptual frameworks (Guest et al., 2013; Miles & Huberman, 1994).

The grounded approach is therefore aimed at supporting theory development, as the first phase of grounded approach research is empirical observation (Allen, 2010; Glaser & Strauss, 2017; Locke, 2002; Tan, 2010). This is followed by a definition of concepts, formulation of theoretical categories from the qualitative data, and recognising the ways in which they relate to one another (Charmaz & Belgrave, 2012; Lawrence and Tar, 2013; Locke, 2001; Tie et al., 2019; Vollstedt & Rezat, 2019).

According to Glaser and Strauss (1967), many hypotheses can be developed concurrently, where their interrelationships are based on the development of themes/categories. However, their properties will form a central theoretical framework, which constitutes the "core" of the emerging theory. The suggestions derived from the qualitative analysis are testable. At the larger theoretical framework level, a 'story' emerges from the data through analysis, where analytic activity becomes oriented towards ensuring that the core conceptual categories, their constituent subcategories, and their associations are sufficiently stated and developed in terms of the selective coding phase of the process (Glaser & Strauss, 1967; Holton, 2008; Locke, 2001).

4.3 Ensuring Trustworthiness of the Qualitative Process

Guba (1981), Forero et al. (2018), Korstjens and Moser (2017), Nowell et al. (2017), and Shenton (2004), argue that qualitative research studies must meet certain criteria for the outcomes of the qualitative study to be trustworthy. Myburgh and Poggenpoel (2007) provide perspective regarding these outcomes, as follows:

- Truth value: this suggests that data for a study is holistic and reflects the participants' knowledge. In this study, knowledge was established through participants' engagement during the data-collection phase. Tight linkages between the qualitative data and the analysis were observed.
- Applicability of the research: this refers to the extent to which the outcomes of research may be appropriate in other study frameworks. The study catered for this by employing a qualitative sampling process: participants came from two different emerging countries and had different educational and dialectical backgrounds. A clear description of participants' demographic information is included.
- Reliability/consistency: this refers to the ability to follow the research methodology. This was achieved through a detailed description and a step-by-step application of the methodology and the data provided. Additionally, data records were maintained and all processes recorded.
- Neutrality dimension: this refers to the research being free of bias. In order to support neutrality, a grounded qualitative approach was incorporated to ensure important relationships among phenomena emerged from the data without the imposition of any prior theoretical framework (Glaser & Strauss, 1967).

4.3.1 The Data-Analysis Process in Qualitative Studies

For this study, interview transcripts were compiled to deduce event outcomes, activities, and emotions, in line with the work of Taylor and Bogdan (1998), who argue that analysing feedback from interviews is not mechanical or technical, but a process of inductive reasoning, thinking, and theorising. Due to the innate and inductive nature of qualitative data analysis, this study used Computer Assisted Data Analysis Software (CAQDAS) NVivo 12 to analyse and code the data (Saldaña, 2016). Taylor and Bogdan (1998) identify three specific activities

related to data analysis: examining the data for themes, concepts, and propositions; coding the data and refining one's understanding of the subject matter; and comprehending the data in the environment in which it will be collected.

Qualitative data analysis can be described as the understanding of research participants' "views and opinions of situations, corresponding patterns, themes, categories and regular similarities" (Cohen et al., 2007, p. 461). Nieuwenhuis (2007) and Fielding (2002, p. 163) provide perspective on the essence of data analysis as follows: "qualitative data analysis tends to be an ongoing and iterative process, implying that data collection, processing, analysis and reporting are intertwined, and not necessarily a successive process." For Marshall and Rossman (1999), qualitative data is defined as the search for overarching statements about relationships within groups of data. Creswell (2013) mentions that data analysis may be considered inductive, where collected data is converted into discoveries or results.

In this study, Saldaña's (2009) first cycle of coding was employed, using descriptive and in-vivo coding. Coding is the process of analysing qualitative text data by "taking them apart to see what they yield before putting the data back together in a meaningful way" (Creswell, 2015, p. 156). After the codes were created, they were ordered in an inductive manner, based on their relationships or categories (Elliott, 2018; Gibbs, 2007; Miles & Huberman, 1994; Theron, 2015). Codes are initially assigned as part of the open-coding process and are referred to as tags or descriptors for allocating units of meaning to the inferential data (Fereday & Muir-Cochrane, 2006).

The codes that emerged were then refined by collapsing, deleting, or merging those that were irrelevant. The final number of parent and child codes were developed into themes. The data was coded using descriptive codes and in-vivo codes at different levels of analysis, in a process that resulted in the re-coding of descriptive items during the analysis (Saldaña, 2016). The final set of codes represented descriptive codes in the form of themes. Descriptive coding was used to attribute a class of phenomena to a segment of text (Miles & Huberman, 1994).

The descriptive coding process formed the basis of the final analysis, as relationships were discussed in terms of the descriptions (in the form of themes) in the write-up phase. The relationships between the data were premised to be at the level of 'consequences' (Miles & Huberman, 1994; Saldaña, 2013 & 2016), where the qualitative questions were formulated in

such a way as to collect data about the factors that drive the adoption of mobile technology. For the purposes of this study, only the relationships relevant to the respective limits and enablers of mobile technology adoption were reported on and analysed. Interview questions were employed in an attempt to probe participants.

4.3.2 Sampling and Population

According to Strang (2015), sampling involves two fundamental views: (i) that elements must possess similar characteristics or attributes; and (ii) that they must be adequately representative of the population (Bryman & Bell, 2015; Leech & Onwuegbuzie, 2007; Creswell & Plano-Clark, 2011; Saunders et al., 2016). The sampling process was based on purposive sampling, which allows the researcher to select appropriate participants and certain characteristics, such as age, gender, and educational background (Tansey, 2007). A total of 31 participants were sampled from South Africa and India. Unlike probability sampling techniques, non-probability sampling aids in purposely selecting a target population.

Statistical generalisability is not the goal of the qualitative process, and a sample size of 31 was judged to be adequate for the purposes of obtaining 'thick descriptions' of factors that influence mobile-app adoption (Miles & Huberman, 1994). Morse (1994) agrees with Miles and Huberman (1994) and contends that 30 to 50 interviews are enough for an exploratory grounded approach. Creswell (1998), however, suggests that only 20 to 30 interviews are necessary; to ensure the researcher does not reach a point of theoretical saturation, or the point where no new data or subjects are observed (Boddy, 2016). Participants' responses were recorded, and the interview responses were transcribed verbatim, to capture their full meaning. Written Word documents were also created for each interview. After transcribing the data, the interviews were reviewed and typographical errors were removed. The transcriptions were coded and analysed. The analysis is reported in Chapters Four and Seven. The identity of each participant was removed from the transcript, and pseudonyms were assigned to protect participants' identities.

The population for this study comprised 15 participants from South Africa and 16 from India. The participants were drawn from one commercial hub within each country: Johannesburg in South Africa, and Delhi in India. The population consisted of individuals who resided in these commercial hubs. The sample frame consisted of males and females (i) between the ages of 18

and 65; (ii) who had various levels of education; (iii) were from various income brackets; and (iv) were living in rural or urban areas (those living in rural areas had to have lived in the city for the previous 12 months, at least).

The objective of the qualitative portion of the research was to map the theory of the exploratory grounded approach, which arose from the responses to the interviews. This informed the adoption model tested in this study. The qualitative analysis process is summarised below.

4.3.3 Summary of the Qualitative Research Process

The objective of the qualitative research was to: (i) develop theory that was grounded in the context, and therefore not necessarily available in the literature; (ii) to provide validation, or justification, for the choice of variables tested quantitatively; and to (iii) provide a triangulated perspective of the results of the entire study (in relation to the empirical results) to support the recommendations. As explained, the qualitative methodology is an inductive process, whereby testable propositions are derived and hypotheses developed from these for testing in the quantitative instrument used for the study. In the discussion chapter, a holistic analysis of the relationships around research mobile-app adoption is undertaken and recommendations are derived from the analysis. The quantitative research process is discussed below.

4.4 Quantitative Research Paradigm

The quantitative component of this study was conducted using the findings from the qualitative research processes. Data from the qualitative phase was used to develop a survey instrument for the quantitative phase. The survey measured digital adoption criteria as they pertained to TAM, DT, and BOP characteristics. Questions from the survey were developed from the salient themes that emerged from the qualitative data analysis.

4.4.1 Research Design

Research design is described by Welman et al. (2005) as the full, detailed plan of the research, which refers to systematic methodological and accurate execution of that design. In addition, Babbie and Mouton (2010) describe the research design as a blueprint for directing the research; one which also involves detail about how to complete the research. The main aim of

a research design, according to Kothari (2009), Mouton (1996), Saunders et al. (2017), and Zikmund et al. (2013), is for the researcher to predict suitable research choices and what these are, as well as increase the validity of the concluding results.

In this study, a qualitative exploratory grounded process was adopted based on the inductive principle of using qualitative data, developed by Glaser (1992) and modified by Ralph and Smilek (2015) in order to validate and justify variables used to test the model in the quantitative process. Propositions were derived from the qualitative study, the literature, and theories noted in the literature review. The propositions that were derived became the hypotheses for testing in the quantitative component of the research (Malhotra, 2015).

According to Kivunja and Kuyini (2016), the origins of positivism can be attributed to the French philosopher Auguste Comte (1789–1857) (Rehman & Alharthi, 2016). Crotty (1998) posits that the positivist paradigm is a well-established theory-driven philosophy grounded in evidence.

Positivists suggest that patterns in phenomena may be obtained by investigating and predicting behaviour in social environments. According to Kivunja and Kuyini (2016), positivists may develop hypotheses and test them, as knowledge is a cumulative process. In this research, the hypotheses were derived from the propositions found in the qualitative data.

4.4.2 Population and Sample Size

The study sample for the qualitative research was sourced from two emerging markets: South Africa and India. The sample was drawn from one commercial hub within each country: Johannesburg in South Africa, and Delhi in India.

The population consisted of individuals who resided within these commercial hubs. The sample frame consisted of males and females (i) between the ages of 18 and 65; (ii) who had various levels of education; (iii) were from various income brackets; and (iv) were living in rural or urban areas (those living in rural areas had to have lived in the city for the previous 12 months, at least).

The main objective of the qualitative study was to develop theory regarding the factors that drive mobile-app adoption in India and South Africa, which was validated through the quantitative study. The objective of the quantitative study was therefore to test the relationships developed through the qualitative findings, which resulted in the hypotheses being analysed, including moderating and mediation effects of some of the variables. The mediation and moderation hypotheses were formed from the literature and not derived from the qualitative study. The qualitative analysis was used to derive hypotheses for the quantitative, study as discussed in the literature review. Thereafter, the proposed hypotheses were tested.

The total sample for the qualitative study included 31 participants (15 in South Africa and 16 in India), and 2 061 for the quantitative study (1 009 in South Africa and 1 052 in India). Purposeful sampling was used for both the qualitative and quantitative studies. The sequential mixed-methods design in this study combined qualitative and quantitative components to produce a holistic view of the themes and their validation. A precedent of using 15 in a sample has been established in qualitative analysis, and therefore a sample size of 16 is adequate for obtaining meaningful insights into the relationships around research productivity (Miles & Huberman, 1994). The quantitative analysis was conducted using SEM. Hair et al. (2010) recommend a sample size of 500. This criterion was met in both South Africa and India.

4.4.3 Quantitative Methodology

Drasgow and Schmitt (2002, p. 4) argue that "more complex and advanced tools should never be used when a simple mean, standard deviation, frequency table, correlation, regression analysis, or plot of the data is sufficient to answer a research objective". As discussed, a sequential mixed-methods research design was employed in this study; a qualitative analysis was used to derive a theoretical model, and this was then quantitatively tested. The quantitative, numerical data-collection method was developed to empirically test the stated hypotheses in a manner that would result in standardised, dependable, valid, and generalisable data.

Quantitative methodology analyses data collected through questionnaires. The approach allows one to collect and analyse large amounts of data from a significant sample of participants, depending on the requirements of the statistical test (Malhotra, 2015; Malhotra & Peterson, 2001). Malhotra and Peterson (2001) emphasise that quantitative research is characterised by structure (flow and logic), and larger participant samples (statistically significant). Aligned to

the thinking of Malhotra and Peterson (2001), in this study, questionnaires were distributed to respondents drawn from the population of South Africa and India. A total of N = 2 061 completed questionnaires were obtained from data analysis. According to Kent (2007), quantitative data is formed from numerical records, and quantitative research is explicit in what it measures, which supports the methodology and sample used here (Burns & Bush, 2010; Kent, 2007).

4.4.4 Pilot Test

A pilot test was conducted to test the appropriateness of the measures employed in this study. The purpose of the pilot study was to assess the reliability and validity of the data-collection instruments by checking whether respondents were able to answer the questions, and whether the questions measured what they were supposed to measure. According to Browne (1995), a researcher may use a sample size of N = 30 as a rule to estimate a parameter, whereas Julious (2005) recommends using at least N = 12 participants. The pilot test was conducted with N = 30 to ensure that the constructs of the questionnaire were reliable, using the appropriate Cronbach's alpha of greater than 0.7 (Malhotra, 2015). The test assessed the reliability and validity of the instrument used to collect data in the survey. Data was collected using questionnaires developed in Microsoft Forms. The questionnaire was distributed in two ways: (i) a sharable link on social media platforms (including WhatsApp, Facebook, and LinkedIn) and email; and (ii) field researchers were hired to conduct the pilot test in two cities (Johannesburg in South Africa and Kolkata in India). This approach ensured that the problematic questions and items measuring the constructs could be amended prior to the final data analysis (Kent, 2007; Malhotra, 2015). In addition, the questions were reordered, which improved the flow and logic of the questionnaire.

For the pilot sample, participants were selected through a purposeful sampling technique (Etikan et al., 2016; Fuhrmann et al., 2015). Purposeful sampling is commonly used in marketing research. It allows the researcher to apply judgement in selecting appropriate participants (Saunders et al., 2012). The participants were selected based on the following demographic characteristics: gender, race, language, income, and education level. As a result of the demographic criteria that needed to be met, purposeful sampling provided a better coverage of the population, since researchers have control over the selected participants, to ensure all of them are represented in the sample population.

4.4.5 Data Collection

Berndt and Petzer (2011) and Ngulube (2015) note that data collection is a methodical process, whereby the researcher obtains information from a target sample. For the information to be obtained from the respondents, certain requirements of relevance and informed consent (Anastasi, 1993) were used to guide the design of the instrument. Consent forms were provided to participants electronically, and confidentiality and anonymity were assured. The quantitative interview protocol and questionnaire are provided in Appendices B and C. Following suggestions by Glaser (1992), Saunders et al. (2012) and Malhotra (2015), an interview guide was also used to guide the questions posed to participants in the survey. A sampling protocol was established that specified the requirements for cases to enter the sample.

Dwivedi et al. (2007, p. 299) suggest that "a defining property of [a] social survey is that answers to questions are used as a measure which is a critical dimension of the quality of survey estimates". This is key to the reliability (giving dependable measures in comparable situations) and validity (responses adhere to what they expect to measure) of questions. Thus, it was imperative that reliability and validity of the research survey were maintained as key aspects of this research (Fowler, 2002; Straub et al., 2004). This research adopted the use of a survey agency (field workers), as depicted by Malhotra (2010). To ensure that the field research was conducted at an acceptable standard, the researcher:

- provided training to the research assistants on the interview protocol (in other words, introduction to the research, probing for clarity, and termination of the interview, among others).
- arranged for mock surveys to be conducted with the research assistants.
- ensured random interviews were supervised through WhatsApp video (the researcher was present in WhatsApp video calls for interviews that research assistants completed). In South Africa, 17 supervised interviews took place, while in India 32 took place.
- where possible, sought permission from individuals who were willing for a geotag photograph of them to be taken, to add to the validity of the research. The research administrators used an Android application to take these geotag photographs.

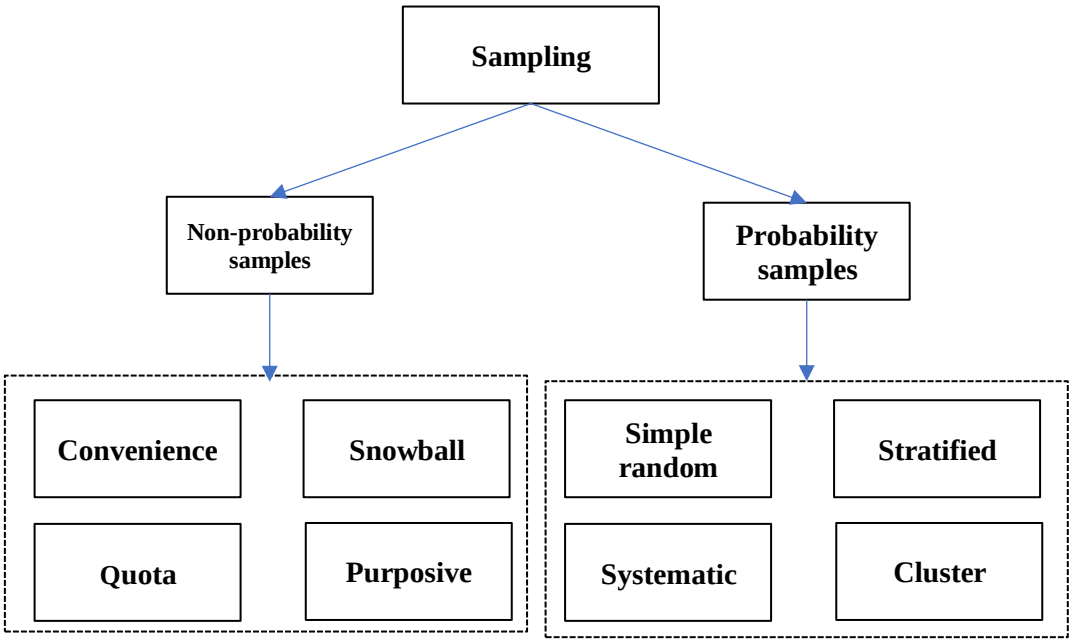
- conducted face-to-face interviews in India and South Africa, capturing responses on a tablet and mobile phone through the survey link provided to the research administrators.
- where required, had the survey translated into different languages. Local research administrators were provided with the surveys and they then translated these into local languages. The hardcopy forms were completed and captured by the head research administrator. This took place in India, as 873 respondents found it difficult to understand the language used in the questionnaire (English).
- ensured the questionnaire was clearly written and contained clear instructions.
- conducted random visits of sites (in South Africa only).

4.4.6 Sampling Process

Kumar (2000) describes a sample as a selected subset of elements from the populace. The sample was obtained from cities in South Africa and India, based on participants' characteristics, which were informed by the study. Zikmund and Babin (2010) refer to this as a study sample. Iacobucci and Churchill (2010) note that, in designing a sample, researchers must specify the sample population. In addition, the type and size of the sample requirement must be specified. Two sample plans, formulated by Iacobucci and Churchill (2010), are provided in Figure 16. A purposive sample was used to assist with representivity in the study. The study attempted to improve the representivity of the population by stratifying the sample.

Figure 16

Probability and Non-Probability Sampling



4.4.7 Measurement

This section discusses the measurement scales employed to elicit responses from participants. Measurement is obtained through the collection of data from designed surveys (Burns & Bush, 2010). Survey research is defined as "the collection of information from a sample of individuals through their responses to questions" (Check & Schutt, 2012, p. 160). The survey instrument used in this study allowed for the collection of data from selected participants. This data was then gathered using the relevant measurement scales (i.e. Likert scale).

Stevens (1946) outlines the statistical procedures that can be used for these measurement scales. Explaining Stevens' reasoning, Bork and Mohler (1994, p. 163) state that "[a] scale that preserves meaning under some class of transformations" must, according to Stevens, be limited to statistics whose meaning would not change any of those transformations applied to the data.

Burns and Bush (2010) differentiate between categorical and metric scales. The choice of scale is based on its ability to generate the data required to solve the research problem. Categorical data was used to determine smaller number of distinct values, such as differences between

gender. Metric scales use numbers/labels as a primary measurement. Metric scales use numbers/labels as a primary measurement, which includes ratio scales (Burns & Bush, 2010).

Aaker et al. (2013) divided the measurement scales into four classes:

1. Nominal: dichotomous, ‘yes/no’ type scale, measured with percentages, model/chi squared.
2. Ordinal: comparative or ranked order measured by percentile, median, rank order, correlation, Friedman’s ANOVA.
3. Interval: Likert, Thurstone, Staple scales are measured by mean, standard deviation, correlation tests, ANOVA, regression, and factor analysis.
4. Ratio: scales with special instructions are measured by geometric and harmonic mean, and coefficient of variation.

Table 30

The Four Levels of Measurement

Measurement Level	Properties	Examples	Statistics
Nominal	Discrete Arbitrary (no order)	Yes/No Gender	Frequencies Percentage Mode
Ordinal	Ordered categories Ranks	Ranking of favourites Academic grades	Frequencies Mode Median Percentiles
Interval	Equal distance between values Discrete	Discrete thoughts	Frequencies (if discrete) Mode (if discrete) Median Mean SD Skewness Kurtosis
Ratio	Continuous/ metric/meaningful/allows ratio statements	Age Weight	Mean SD Skewness Kurtosis

Note. Summary of the Four Levels of Measurement: Appropriate Descriptive Statistics and Graphs, by Niell, 2009.

This study employed a combination of nominal and interval scales, including a six-point scale (Likert-type scale) that was tested for reliability and validity. The attitudes, behaviours, and attributes of the research were measured as a result of interval scales. The researcher attempted to ensure quality, while at the same time reducing bias, by considering the following:

- Coverage error: this occurs when there are too many or two few participants in the population, according to Lavrakas (2008). This first aspect to be noted is a limitation introduced in Chapters One and Eight; that, due to time and resource constraints, it

was not possible to include the full population in South Africa and India. Rather, the researcher sought representivity within the sample population. Also, many participants in rural areas in South Africa and India may not have had the resources required to complete the survey electronically. To cater for this error, there were two ways in which the surveys were distributed: using email and social media to share the survey link, and conducting face-to-face interviews to ensure everyone who participated was not excluded because they did not have access to digital devices.

- Sampling error: this occurs when participants are not representative of the population. It is essential in describing how research results vary and the statistical level of confidence that can be placed in them, according to Salkind (2010). The research used clear strategies to select participants, based on the demographics of each country, and the languages spoken there. For example, in India, the majority of participants were Hindi-speaking, the most commonly spoken language in India.
- National demographics: other considerations included education, income, gender, age, and nationality. The researcher also ensured a minimum of 1 000 valid responses were received per country to assist with the error.
- Measurement error: this is the process whereby participants are assigned a number on the response received to measure variability between responses, i.e. the participant is the 'object' and level of income is the 'attribute' for which a value is assigned to each object. Measurement involves both creating a rule and making assignments (Lavrakas, 2008). To overcome this error, the researcher ensured that variability in responses from participants could be measured by designing questions so that a number could be assigned to each response.
- Non-response error: according to Loosveldt (2008), the response rate can be described as the percentage of qualified sample units from a survey. To assist with this error, the researcher continuously verified responses until 1 000 valid responses were received from both countries. The researcher also increased the timeframe for data collection to ensure the target response rate was reached.

Measurement scales were employed to ensure the required data could be generated. The instrument design is discussed in the following section.

4.5 Research Instrument Design

According to Krosnick and Presser (2009), a questionnaire is the heart of a survey: its design is critical for answering the research questions. With regard to the design of a questionnaire, Brace (2018) notes that a questionnaire is a remote medium between researchers and participants, and emphasises that the questionnaire and the questions contained therein must be designed in such a manner that participants perceive the purpose of the questionnaire and understand the questions contained therein exactly as desired by the researcher. Mathers et al. (2007) highlight the need for questions to be clear and precise so that meaningful and valid results can be obtained. As such, the effectiveness of the questionnaire depends on the researcher's writing skills (Brace, 2018).

There is a considerable amount of literature on designing effective questionnaires and questions, but, as Alwin et al. (2016) observe, there is no consensus on the specifics of question design, leading the exercise to be viewed as an art, rather than as a science. However, despite the lack of consensus, efforts have been made to identify characteristics of 'good questionnaires' and 'good questions' (Alwin et al., 2016). Alwin et al. (2016) refer to the widely applied tenet 'KISS' ('keep it short and simple'). Nevertheless, the authors acknowledge the school of thought that motivates for longer questions to help in eliciting more accurate responses.

Alwin et al. (2016) and Payne (1951), and Taherdoost (2018), draw attention to the wording of questions. This is supported by Lewin and Somekh (2011), who stress, among other things, and in addition to clarity, that questions in a questionnaire must be unambiguous and should desist from using technical or inappropriate language. Krosnick and Presser (2009), and Taherdoost (2018), caution against using leading or double-barrelled questions. Kachroo and Kachen (2018) indicate that all questionnaire design principles are aimed at attaining instrument validity and reliability.

The questionnaire used a six-point rating scale (Likert-type scale or Likert scale) with a range of labels ('Strongly Disagree', 'Disagree', 'Slightly Disagree', 'Slightly Agree', 'Agree', and 'Strongly Agree', as noted in section C, D and E of the questionnaire in Appendix C). A Likert scale is frequently used in market research (Wilson et al., 2012). Respondents should select a response that closely aligns with their position on the question, according to Aaker et al. (2013).

Aaker et al. (2013) provide the following guiding principles for questionnaire design: use simple language; remove ambiguity from statements or questions; do not include lead or loaded questions; provide clear instructions; ensure questions are succinct; and steer clear of sensitive/difficult questions.

A Likert-type scale or Likert scale was used to obtain an overall measurement of the responses to each statement (see Table 31, which highlights the instrument questions). Likert-type scales are questions with several responses (for example, participants could select a score from 1 to 6). Once the pilot questionnaire was designed, a sample test was completed with 30 participants to ensure they understood the instrument questions and to gauge the validity of responses.

Table 31 outlines the instrument questions and links them to the literature, but does not include the demographics. The instrument statements were either derived or adapted from the literature.

Table 31

Data Instrument Derivation

Model	Construct and Literature	Instrument Questions Derived/Adapted from Qualitative Study	Measurement
Technology acceptance model (TAM)	**Trialability** Moore and Benbasat (1991) Karahanna et al. (1999) Marakarkandy et al. (2017) Ahmed (2018)	I understand how to use mobile apps, but a demonstration of the app would still be useful.	Six-point Likert scale
		I have opportunities to try various mobile apps.	Six-point Likert scale
		I know where I can go to review mobile apps.	Six-point Likert scale
		I like to try a mobile app before I purchase it (try-before-you-buy).	Six-point Likert scale
		Learning to navigate mobile apps would be easy for me.	Six-point Likert scale

Technology acceptance model (TAM)	**Perceived value** Venkatesh and Bala (2008) Fortes et al. (2017) Arenas-Giovanis et al. (2015)	Mobile apps are useful to me.	Six-point Likert scale
		Mobile apps would make my life easier/more convenient.	Six-point Likert scale
		Mobile apps improve the quality of tasks I perform.	Six-point Likert scale
		Mobile apps allow me to make better decisions in my life because of the information they provide.	Six-point Likert scale
		Mobile apps allow for better control of tasks/activities I perform.	Six-point Likert scale
		Mobile-app incentives are important to me (i.e. rewards for using the mobile app).	Six-point Likert scale
Technology acceptance model (TAM)	**Perceived ease of use** Venkatesh and Bala (2008) Aghekyan-Simonian et al. (2012) Warkentin et al. (2002)	It is easy for me to learn how to use mobile apps.	Six-point Likert scale
		I find it easy to complete a task on a mobile app.	Six-point Likert scale
		My interaction with mobile apps is clear and understandable.	Six-point Likert scale
		Learning to operate mobile apps is easy for me.	Six-point Likert scale
		I would find it easy to get mobile apps to do what I want them to do.	Six-point Likert scale
		It is easy to search for and download a mobile app.	Six-point Likert scale
		I understand how to use all my mobile app features.	Six-point Likert scale
		I understand how to navigate the mobile apps I download (i.e. I know where to find the features or information I'm looking for).	Six-point Likert scale
		I know what to do if something on my mobile app does not work.	Six-point Likert scale
		Interacting with mobile apps would not require a lot of my mental effort (i.e. thinking).	Six-point Likert scale

Technology acceptance model (TAM)	**Perceived risk** Venkatesh and Bala (2008) Raida & Néji (2013) Gupta and Kim (2010)	I will not download a mobile app that is not worth the cost.	Six-point Likert scale
		It is possible that I might download a mobile app and not enjoy the mobile app, due to poor performance.	Six-point Likert scale
		Using mobile apps may expose me to financial loss (i.e. my phone could be compromised and I could lose money).	Six-point Likert scale
		It is uncertain whether mobile apps would be as effective as I think.	Six-point Likert scale
		Compared to other technologies, mobile apps do not have more uncertainties.	Six-point Likert scale
Technology acceptance model (TAM)	**Privacy and credibility** Venkatesh and Bala (2008) Raida & Néji (2013)	Mobile apps may result in me losing my personal information.	Six-point Likert scale
		Mobile apps do not always protect my privacy.	Six-point Likert scale
		I am comfortable with the security on mobile apps (i.e. banking apps, Facebook, etc.).	Six-point Likert scale
		Authorisation mechanisms (e.g. passwords on mobile apps) make me feel comfortable.	Six-point Likert scale
		I am comfortable accepting recommendations that my mobile app may offer me.	Six-point Likert scale
		I am comfortable with my information being backed up to the Cloud (i.e. my mobile-app provider stores my information for me).	Six-point Likert scale
Technology acceptance model (TAM)	**Intention to use** Davis (1989) Venkatesh and Bala (2008)	I intend to continue using mobile apps in the future.	Six-point Likert scale
		I will always try to use mobile apps in my daily life.	Six-point Likert scale
		I plan to continue using mobile apps frequently.	Six-point Likert scale
		I plan to use mobile apps often in the future.	Six-point Likert scale
		I would recommend mobile apps to others.	Six-point Likert scale

		I feel I am part of the community of people using mobile apps.	Six-point Likert scale
Domestication theory (DT)	**User environment** Abbas et al. (2018) Kazi and Mannan (2013) Cudjoe et al. (2015)	Mobile apps are used frequently in my city or community.	Six-point Likert scale
		I use mobile apps based on advice given to me by the people in my city or community.	Six-point Likert scale
		I gain social status (prestige) when I use some mobile apps in my city/community.	Six-point Likert scale
		People whose opinions I value prefer that I use mobile apps.	Six-point Likert scale
		People who influence my behaviour think that I should use mobile apps.	Six-point Likert scale
		Using mobile apps is entirely within my control.	Six-point Likert scale
Domestication theory (DT)	**Lifestyle integration** Cooper (2016) Yadav et al. (2015) Kim and Yoon (2011)	The mobile apps that remember my frequent usage make my life easier (e.g. previous purchases and transactions).	Six-point Likert scale
		The mobile apps that connect me to my family and friends add value to my everyday life (e.g. Uber rides being ordered for a family member).	Six-point Likert scale
		It is beneficial for my social media platforms to recommend mobile apps that are based on my lifestyle needs.	Six-point Likert scale
		My tradition/culture/religion has influenced my decision to download a mobile app.	Six-point Likert scale
		Mobile apps fit into my daily routine.	Six-point Likert scale
		Mobile apps are compatible with other technologies I use.	Six-point Likert scale
Domestication theory (DT)	**Customer feedback**	I use mobile apps more when I am able to provide feedback on what does not work.	Six-point Likert scale
		For me to continue using a mobile app, frequent improvements are necessary.	Six-point Likert scale

	Rasiah and Ming (2010) Ahmad and al-zu'bi (2016) Silverstone and Haddon (1996)	I normally look at mobile app ratings before I download the app (i.e. other people's feedback is important to me).	Six-point Likert scale
		I would use my mobile apps more if I could provide feedback in the mobile app itself (i.e. in-app feedback).	Six-point Likert scale
Emerging market characteristics (BOP)	**Awareness** Lin (2011) Kim and Yoon (2011)	I have used channels such as YouTube, wikiHow, or similar, to make myself aware of the different features provided on my mobile apps, but these would be useful to me.	Six-point Likert scale
		I am aware of the features and benefits my mobile apps offer me.	Six-point Likert scale
		I am aware of the options I have to seek assistance on the mobile apps I use (i.e. mobile app support number.)	Six-point Likert scale
		I have downloaded certain mobile apps because I knew about them, or was told about them by a friend or family member.	Six-point Likert scale
		I am aware of what I need to do to download a mobile app.	Six-point Likert scale
Emerging market characteristics (BOP)	**Access** Park et al. (2009) Alwahaishi and Snáše (2013)	I always have access to the Internet, either on Wi-Fi or through mobile phone data (i.e. 3G/4G).	Six-point Likert scale
		I have access to electricity to charge my mobile phone or tablet so that I can use my mobile apps.	Six-point Likert scale
		I have repaired my mobile phone or tablet previously, in the area I live, so that I can continue using my mobile apps.	Six-point Likert scale
		I have everything I need in order to use mobile apps.	Six-point Likert scale

	Arenas-Gaitani et al. (2015)	I can access my mobile apps because the community in which I live has access to electricity or charging stations.	Six-point Likert scale
		I have purchased airtime or data in the area that I live so that I can use my mobile apps.	Six-point Likert scale
Emerging market characteristics (BOP)	**Affordability** Wang et al. (2006) Raman and Don (2013) Ünal et al. (2011)	Mobile apps are always good value for money.	Six-point Likert scale
		I always use my data to download mobile apps that I need and find valuable.	Six-point Likert scale
		I would pay for a mobile app that I need and find valuable.	Six-point Likert scale
		Mobile apps are expensive to use, as they consume a lot of mobile data or airtime.	Six-point Likert scale
		Data is expensive at the current price.	Six-point Likert scale

In designing the questionnaire for this study, the views discussed above were cautiously applied to obtain optimal responses. The guiding principle is to avoid unnecessary redundancy and complexity so that participants understand the questions (Alwin et al., 2016). In an effort to minimise effort on the part of the participant, close-ended questions were used. Having structured questions in place assisted in preventing responder bias. The questionnaire was lengthy, based on the number of variables that emerged from the qualitative research, but the validity checks ensured that only completed and valid surveys were used.

Previous studies guided the qualitative and quantitative studies/methodology used in this study. See Table 32.

Table 32

Journal Research Studies Aligned to the Methodology of This Study

No.	Journal	Title	Author/s	Year	Research methodology	Journal synopsis
1	***Journal of Strategic Marketing***	Exploring consumer adoption of proximity mobile payments	Slade et al.	2015	Quantitative – online survey	The authors found the more willing a person is to try new technologies, the more significant the relationship with behavioural intention.
2	***International Management Review***	Understanding the effects of social media and mobile usage on e-commerce: An exploratory study in Saudi Arabia	Makki and Chang	2015	Qualitative approach – online survey	This paper reviewed the impact of social media and mobile use on the acceptance of digital technologies. It reflected that social media, particularly Instagram, could be a useful tool in enhancing awareness and conveying the product value proposition.
3	***Qualitative Research in Psychology***	Grounded theory-based research within exercise psychology: A critical review	Hutchison et al.	2011	Qualitative research – grounded theory	The paper presents a key finding as it pertains to the use of grounded theory; namely, that it should be a process of focused active involvement by the researcher, which centres on the data collected and its relationship to the studied phenomenon. The paper also notes that in an effort to continue

						theoretical development, researchers are requested to use a variety of techniques to seek suitable questions of the data in order to help identify dimensions and relationships associated with the emergent themes and categories.
4	***Scandinavian Journal of Educational Research***	Informed grounded theory	Thornberg	2012	Qualitative research – grounded theory	This paper notes that when a researcher conducts grounded theory methodology the literature ought not to be used to force applications or deductions, but should be guided by a set of data-sensitising principles.
5	***International Journal of Electronic Commerce***	Understanding the development and diffusion of mobile commerce technologies in China: A biographical study with an actor-network theory perspective	Wang et al.	2015	Qualitative research – survey	This article elaborates on the fact that because of the proliferation of m-commerce technologies and the growing sociotechnical complexities, it is important that researchers further their understanding of the factors that lead to successful technology adoption.
6	***Technological and Economic***	Mobile service usage behaviour in Korea: An	Yeong-Wha et al.	2011	Quantitative research	This paper notes that individuals were wary of using digital services, due to

	Development of Economy	empirical study on consumer acceptance of innovative technologies				fear of risk and security. Individuals also appeared to be selective regarding which features they would use, based on the feature benefit. The outcome was that behavioural tendency is influenced by marketing strategy, which ought to be centred on reducing perceived risk associated with using digital services. Both individuals and businesses ought to continue to offer value-added and convenience services to constantly meet the needs of customers.

4.5.1 Data Analysis

Statistical analysis was used to analyse the study data in different ways (Wiid & Diggines, 2010). Descriptive statistics illustrates how the data is distributed, grouped, and characterised, and whether there are any variations in the survey data set from the research (Wilson et al., 2012). The research used a variety of statistical techniques, such as frequency distribution, percentage, and measures of central tendency.

A quantitative methodology allows the researcher to analyse characteristics through a structured data-collection process. This study attempted to be as representative as possible by keeping demographic ratios consistent with those of the city population. The researcher extrapolated the results within each country (Davis, 2000).

SEM allows for a multivariate statistical analysis of the study data by examining structural relationships between measured variables and latent constructs. It involves both multiple regression analysis (MRA) and factor analysis (FA). This research used SEM to represent the theory that emerged from the qualitative study to depict pattern variation and correlation amongst the variables (Hoyle, 2011). SEM provided a sequence of structured equations that could be exhibited graphically to depict an abstract framework for digital adoption in South Africa and India.

Mediation and moderation were analysed using SmartPLS, to ensure that the impacts variables had on each other were clearly understood over and above the direct relationship that was tested. An SEM was used to illustrate direct relationships, and for mediation and moderation purposes.

An alpha of 0.05 was used for this study, based on Cohen's research (2013), and the suggestion that 0.05 is the normal alpha level. Field (2000, p. 88) proposes that 0.05 is sufficient, stating that "[u]sually, social scientists accept any probability value below 0.05 as being statistically meaningful and so any probability value below 0.05 is regarded as indicative of genuine effect […]". The research therefore used an alpha level of 0.05.

The statistical analysis and different techniques used in this study are detailed below.

4.5.1.1 Frequency Distribution

The survey data set was analysed to determine how often a number (raw response) was noted (Shiu et al., 2009). Once frequency is determined, the percentages that demonstrate the differences between the variables must be clearly represented (Tustin et al., 2005). The authors explain that a frequency distribution indicates how popular the different values of the variable are among the units of analysis. A frequency distribution was converted into a percentage distribution by dividing each frequency count by the total number of observations (Shiu et al., 2009).

4.5.1.2 Measures of Central Tendency

Central tendency was determined by the mean, median, and mode, as outlined by Tustin et al. (2005). The average or 'mean' was calculated by adding the set of values and dividing it by the total (Tustin et al., 2005). According to Aaker et al. (2013), the mean is obtained by dividing the total responses to a question by the number of respondents. The median is the middle number of all the data collected once the data has been ranked (Tustin et al., 2005). The median can be calculated by totalling two middle values and dividing them by two, as noted by Wiid and Diggines (2009). The mode illustrates the value that occurs most frequently (Tustin et al., 2005).

4.5.1.3 Measures of Dispersion

According to Shiu et al. (2009), the spread of data is referred to as the 'range' (in other words, the distance between the values within the frequency distribution). Standard deviation is commonly used and well established as a means of measuring variance (Tustin et al., 2005). It measures the average distribution of the values in a set of responses about their mean. The variance is calculated by deducting the mean from each individual value and then squaring the deviations. Thereafter, these numbers are added together, and an average is calculated. Zikmund and Babin (2010, p. 332) suggest that "a standard deviation is an index of a distribution's variability; it provides a formula used to determine the standard deviation".

4.5.1.4 Confidence Level for Statistics

It is important to ascertain whether a relationship of difference exists between a set of data. Wiid and Diggines (2009) note that this is measured by understanding the 'significance', which measures the relationship between data. Efron (2010) suggests that different statistical tests can be used to establish significance. Examples of these include the Chi-square analysis, Z- and t-test, and variance analysis.

This study made use of online surveys and surveys that were completed with the help of research field assistants. According to Lavrakas (2008), the significance level (p-value) refers to the possibility of rejecting a null hypothesis that may be noted as true. The p-value ranges from zero (0.0) to one (1.0) and may be recognised by the Greek letter alpha (a). The data was consolidated, and the p-values were reported, which allowed each hypothesis defined in the study to be accepted or rejected.

The 'confidence interval' (typically referred to as the margin of error) is the deviation that is accepted – be it positive or negative – in the survey results, where the opinion of the sample is representative of the entire population. As an example, if a confidence interval of 3 is selected, and half (50%) of the sample picks an answer, we may assume that if the entire population was surveyed then between 47% (50 – 3) and 53% (47 + 3) of the population would have selected that answer.

The 'confidence level' illustrates how often the percentage of the population lies within the boundaries of the margin of error. It is noted as a percentage and denotes how frequently the actual percentage of the population would select an answer that is within the range of the confidence interval. A 95% or 99% confidence level means the researcher can be reasonably assured of the result obtained. Most research aims to satisfy a minimum 95% confidence level (Edwards, 1984).

4.5.1.5 Measurement Model Analysis

Confirmatory factor analysis (CFA) is a form of SEM that examines measurement models, such as the relationships between indicators and latent variables. The intent behind latent variable measurement models is to determine how many factors 'speak' to the variation and covariation between a set of indicators within the theoretical construct. The use of CFA in this

study allowed the researcher to thoroughly understand the covariation between a range of indicators within the theoretical construct, as noted in Chapter One (Hoyle, 2011).

4.5.1.6 Assessment of Normality

The key assumption in multivariate analysis is normality (Hair et al., 2014). It analyses the form of the data dispersment for a variable and its alignment to the normal distribution (Shiau et al., 2019). An absolute value of the score is significant if it is greater than 1.96 or less than -1.96 at $p<0.05$, when it is noted to be higher than 2.58 or less than -2.58 is significant at $p < 0.01$, and more than 3.29 or less than -3.29 is significant at $p < 0.001$. In small samples, values greater or less than $p < 0.001$ may be deemed significant (Field, 2014; Gardener, 1995; Shiau et al., 2019).

4.5.1.7 Convergent Validity

Convergent validity can be assessed by using both the Average Variance Extracted (AVE) and factor loadings (both values are expected to be above 0.5), as noted by Hair et al. (2010) and Shiau (2019). The results statistically supported convergent validity of the items that appeared in the measurement model. This means that all the items selected in the study are effective measures of their respective constructs.

4.5.1.8 Interpreting and Reporting

There are two ways to measure/interpret whether a relationship exists between a set of dependent and independent variables within the emerged framework depicted in Chapter One: correlation analysis and regression analysis (Wiid & Diggines, 2009). Correlation methods analyse with the same occurrence between variables (Wiid & Diggines, 2009). Aaker et al. (2013) state that the Pearson correlation coefficient analyses whether there is a linear association between two variables. This study used regression analysis to investigate the cause-and-effect relationships between the variables within the devised framework (Wiid & Diggines, 2009).

The study attempted to conduct thorough analyses of the survey data to ensure information was obtained about the factors that drive digital adoption in emerging markets (Hair et al., 2010).

These authors state that interpretation of data involves more than a description of the results to assist in answering the research questions noted above (Hair et al., 2010).

4.5.2 Ethical Considerations

Ethics is a field of philosophy believed to have been established by Aristotle, which focuses on human action (Seale et al., 2004). A key consideration in ethics is the relationship between the individual and the social world.

This research contemplates how the burden of the research on individuals can be managed. Ethical considerations for participants include the right to privacy, management of deception, and the right to use data (Zikmund et al., 2013). The following ethical recommendations were adopted (Sekaran & Bougie, 2013):

- The researcher ensured sensitive or intrusive data was not solicited from participants.
- Privacy and anonymity were maintained in terms of participants' personal information and the responses provided.
- All participants were treated with respect.
- It was not mandatory for a participant to partake in the research.
- Participants could withdraw from the survey at any time.
- Participants were always provided the contact details of the supervisor and the researcher.
- The ethics committee at the University of the Witwatersrand approved the research protocol and questionnaire.

Participants were required to provide consent for an interview to take place, and for the information to be used for research purposes. Once consent was provided, participants were taken through the research topic and invited to provide information on a voluntary basis. The questionnaire clearly stipulated that participation was voluntary, that the research was being conducted for academic purposes, and that the confidentiality of participants would be assured (as noted in Appendices A and C).

4.6 Conclusion

This chapter introduced and discussed the quantitative and qualitative research components. The considerations and limitations relating to the verification of qualitative and quantitative research were discussed. The qualitative analysis process was explained in relation to coding, analysis, and the sampling process that was used. The chapter explained the research design, scope of the study, the study population. The sampling process, sample-size calculation, sampling protocol, and interview process were then discussed, together with reliability and validity. The hypotheses were introduced, in relation to the statistical methods and measures used to test them. The process used to formulate the scales of measurement was also explained.

Data-collection methods were presented and discussed. The qualitative approach of the study incorporated in-depth face-to-face interviews in South Africa (Johannesburg) and India (Delhi). For the quantitative approach, an online and hard-copy questionnaire was administered by researchers in South Africa and India.

This chapter also discussed ethical considerations as they pertain to voluntariness, anonymity, confidentiality, privacy, and how data was analysed and handled. This chapter provided the foundation for data presentation and analysis, as depicted in Chapter Five and Chapter Six. The interpretations of the analysis (survey data) and conclusions of this study are presented in Chapter Seven.

CHAPTER FIVE
QUALITATIVE ANALYSIS

5.1 Introduction

This chapter reports on the qualitative analysis. The qualitative analysis derives a model that is tested quantitatively to establish what influences intention to use. It aims to explore the relationships between the theory and the derived model and how these impact the adoption of mobile technology and intention to use.

5.2 The Main Research Objective of the Qualitative Analysis

A thematic analysis method was adopted to examine the qualitative information provided by participants, and thereby address the study's objectives, as suggested by Braun and Clarke (2006). In accordance with the grounded inductive thematic analysis technique, after transcribing the audio interviews, data was organised, coded, and grouped, and themes were constructed, refined, and finalised. The qualitative interviews provide the foundation for the quantitative instrument that was used in the study.

5.2.1 Participant Profile

A total of 31 participants took part in the study: 16 from India and 15 from South Africa. In terms of educational qualifications, some of the participants held PhDs (three participants), MBAs (two participants), undergraduate degrees (nine participants), certificates (four participants), diplomas (four participants), and matric certificates (five participants), with four participants in both countries having completed Grade 7 or higher.

Regarding the participants' home languages, from India 12 participants spoke Hindi, two spoke both Punjabi and English, and two spoke Hindi and English. From South Africa, two participants spoke Tswana, three spoke Setswana, three spoke Zulu, two spoke Tshivenda, one spoke Chichewa, one spoke Xitsonga, one spoke Sesotho, one spoke English, and one spoke Ndebele. The rationale behind providing a language demographic was to ensure representivity amongst the sample population.

5.2.2 Contribution of Each Participant From India

Table 33

Contribution of Each Participant From India

Name	Number of codes	Number of references
Participant 1	33	171
Participant 2	28	117
Participant 3	23	67
Participant 4	24	106
Participant 5	21	61
Participant 6	34	228
Participant 7	19	49
Participant 8	22	53
Participant 9	25	87
Participant 10	28	102
Participant 11	20	41
Participant 12	28	144
Participant 13	37	214
Participant 14	29	112
Participant 15	27	129
Participant 16	24	76

Table 33 outlines the number of contributions that each participant made to the codes that were developed and the number of quotations extracted from participants' feedback to support the codes.

5.2.3 Contribution of Each Participant From South Africa

Table 34

Contribution of Each Participant From South Africa

Name	Number of codes	Number of references
Participant 17	25	79
Participant 18	19	77
Participant 19	22	70
Participant 20	26	84
Participant 21	23	80
Participant 22	18	63
Participant 23	13	34
Participant 24	23	63
Participant 25	25	100
Participant 26	25	85
Participant 27	27	98
Participant 28	21	79
Participant 29	21	58
Participant 30	19	73
Participant 31	19	44

Table 34 outlines the number of references that each participant contributed to the codes that were developed. The thematic analysis was conducted coding using NVivo Software (inductive approach). Information provided by the participants who took part in the research study is presented in terms of the codes they contributed and the number of references extracted from the information they provided to support the codes created. For instance, 79 references from Participant 17 are broken down into 25 different codes.

According to NVivo's website, 'code' is defined as a collection of references about a specific theme, case, or relationship (QSR International, 2014). Codes are important when working with NVivo, because they allow the researcher to deposit similar data in one place so that they can look for emerging patterns and ideas. This is done through open coding in order to develop a

coding template. Open coding is a process that allows the textual data to be analysed, including the labelling of concepts to generate theory from data (Given, 2008). Open coding is typically used for inductive research and allows the researcher to generate codes while reviewing the document (Elo & Kyngas, 2008). Researchers must thoroughly examine data to ensure that new insights emerge (Hsieh & Shannon, 2005).

5.3 Data-Analysis Process

This section discusses the data-analysis process that was followed to extract themes from the transcribed interviews.

An interpretive paradigm that employed a qualitative research design was used. The interviews were conducted with 16 participants from India and 15 participants from South Africa. The interviews were recorded on a digital voice recorder. Audio was also recorded on a mobile device as a backup to ensure all data was captured and all voices were heard. In addition, the researcher made notes, which provided additional context to the interviews. The interviews were transcribed to ensure that everything participants said was captured. The original audio recordings were replayed to ensure that the researcher could become conversant with the data for the purposes of analysis and interpretation. Transcription codes and interview notes were used, as suggested by Henning et al. (2004), to capture text that could not be transcribed, in order to gain a holistic view of participants' perspectives. Written Word documents were also created for each interview, i.e. each interview was transcribed into text that could be referenced and analysed.

The researcher went through the interviews after they were transcribed, and systematically removed all typographical errors. Participants' identifying information was removed from each transcript, and pseudonyms were allocated to ensure their identities were protected.

An analysis of the 31 interviews was performed using thematic analysis, as postulated by Clarke and Braun (2017). See Table 35. The use of thematic analysis facilitated the recognition of themes from the data, while ensuring the process was credible and transparent (Guest et al., 2011). The thematic analysis was used to interpret the data and create suitable themes.

Thematic analysis is a process of simplifying interview data into meaningful sections and then recombining them into themes that fit together. This involves open, axial, and selective coding.

Table 35

Thematic Analysis

Phase	Description of the process
Ensure you are familiar with the data	Review and re-read the transcribed data.
Create codes	Data from each code is collected from the data in a systematic manner.
Analyse for themes	Themes are created by analysing the data.
Complete thematic review	Validate that themes are correct, based on the code taken from the entire data set.
Define and naming themes	Ensure that definitions and themes are generated by ongoing analysis.
Report generation	At the end of the analysis selection, compelling data is extracted which relates back to the analysis of the study, its aims, and the literature. A scholarly report of the analysis is created.

Note. Adapted from "Mis(conceptualising) themes, thematic analysis, and other problems with Fugard and Potts' (2015) sample-size tool for thematic analysis," by V. Braun and V. Clarke, 2016, *International Journal of Social Research Methodology*, *19*(6), 739-743.

5.3.1 Cleaning and Coding

Ensuring that clean data is obtained from a qualitative study is often a challenging, tedious, and difficult task (Basit, 2003). Even though this process is considered a mechanical exercise, the researcher has to be dynamic, instinctive, and innovative; and needs to be able to code, think, reason, and theorise the information provided by participants (Basit, 2003). The objective of qualitative analysis is to analyse sets of data through coding and categorise them so that assumptions can be made about the phenomenon being studied. In this study, the methodology used to 'clean and prepare' the interviews comprised a systematic review of the transcripts, which were transcribed verbatim and translated into working Word documents. The researcher removed typographical errors and missing words.

During the preliminary reading, relevant paragraphs were emphasized to facilitate the data-analysis process (Creswell, 2013; Kruger et al., 2005). Coding of data underpins the key research outcomes and can be used to shape the data to test, enhance, or validate traditional literature, to create a novel model or add to existing literature (Creswell, 2013; Punch, 2011). To augment the coding, NVivo 12 Pro was used and lexical queries were examined, such as word frequency and text-search queries. This coding procedure ensures that data is ordered, structured, and provides meaningful insights (De Vos et al., 2005; Patton, 2002). The coding process was guided by Saldaña's (2015) coding manual.

5.3.2 Trustworthiness of the Data

Data was validated by ensuring the transcripts matched the interview recordings. According to Bazeley and Jackson (2013), these validation steps add to the validity of the assumptions noted from the codes and categories generated. Coding helps to lessen the subjectivity bias in qualitative data analysis, as different viewpoints are considered when analysing the data (Guest et al., 2011; Saldaña, 2009). To ensure a thorough and in-depth analysis was carried out, Computer Assisted Qualitative Data Analysis Software (CAQDAS) NVivo version 12 Pro was used.

The researcher focused on themes related to digital adoption to better understand the factors that influence intent to use and consumer behaviour, and the use and adoption of digital channel services in India and South Africa as units of analysis. The transcripts were coded in three steps, described by Thiétart (2007) and Neuman (2011) as open coding, axial coding, and selective coding.

Open coding was conducted by assigning initial codes or labels. This process entails reading and re-reading the data to generate an idea of how patterns might be clustered and coded. Open coding comprises identification of patterns or categories of expression, streamlining the data into separate parts, thoroughly analysing them, grouping them for likenesses and differences, and investigating the phenomena that are reflected in the data (De Vos, 2005; Saldaña, 2015). Open coding automatically codes sources depending on the words or phrases they comprise of. This can be achieved using word frequency searches or text search queries (Saldaña, 2016). Open coding is an inductive process that creates codes while a researcher is reading through a document (Elo & Kyngas, 2008). The clustered patterns or codes are then categorised into

themes or sub-themes, relying on the subject matter and using text provided by the participants as supporting evidence. This identification procedure is referred to as ‘conceptualising the data’ (De Vos et al., 2005; Strauss & Corbin, 1990).

Axial coding was conducted by examining and analysing the initial codes that were noted above. Coherence, causality, and context were established by investigating and identifying patterns and groupings from the data.

Selective coding is the concluding stage of the coding process, which entails reviewing all codes that were noted for linkage, variance, and comparison as it pertains to the study objective. A central theme or themes may emerge.

According to NVivo’s user guide, this can be a helpful starting point when reviewing data (QSR International, 2014). Codes may be referred to as labels or tags that assign units of meaning to the descriptive data gathered during research (Fereday & Muir-Cochrane, 2006; Neuman, 2011).

A coding methodology that includes descriptive coding, in-vivo coding, and process coding is the first phase of coding, as outlined by Saldaña (2009). Once codes are generated, they are methodically arranged into a codebook, based on their categories, types, and relationships. Initially, 41 codes were created. Thereafter, they were refined, and, where appropriate, merged. Unrelated codes were deleted. The total number of parent and child codes generated was 32. The themes were labelled and refined, with reference to the study aims and objectives. From the deductive data-analysis process, three main codes emerged. These are outlined in the following section.

5.4 A Brief Analysis of the Themes Generated

The main themes that emerged from the study are presented in Table 36. The table also indicates the number of quotations retrieved for each theme. The primary objective of the study was supported by the themes that emerged through manageable codes, categories, patterns, and relationships in accordance with the research aims (Mouton, 2010; Neuman, 2011; Saldaña, 2015).

5.4.1 Main Themes

Table 36

Themes Generated From the Research

Main themes	Number of sources	Number of quotations
Ecosystem barriers	31	386
Environmental barriers	31	268
Technological barriers	31	423

Figure 17

Number of Quotations per Theme

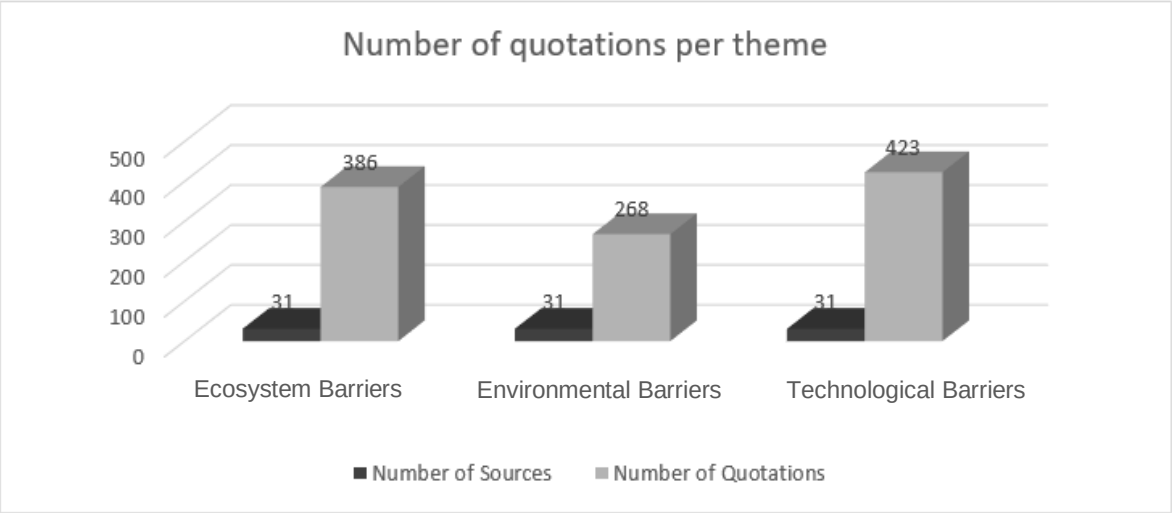


Table 36 and Figure 17 indicate that the most discussed theme in the data was 'technology barriers', covered by all participants, with 423 quotations. 'Ecosystem barriers' was second, with 386 quotations. 'Environmental barriers' was third, with 268 references.

5.5 Summary of the Themes

This section discusses the results of the study according to the three main themes and sub-themes that emerged from the coding process and data analysis. The process of coding followed Saldaña's (2009) cycle of coding, using methods such as descriptive coding and in- vivo

coding. This coding technique aligns with the process of analysing qualitative text data by reorganising the data in a meaningful way, as employed by Creswell (2015). After the codes were created, they were systematically sorted in an inductive manner into a codebook according to category, type, and relationship (Elliott, 2018; Gibbs, 2007; Miles & Huberman, 1994; Theron, 2015). Thereafter, initial codes or labels were assigned. These codes were then refined. Some were combined whilst unrelated codes were removed. Thereafter the concluding number of parent codes and child codes were developed into themes. The results generated from the exploratory grounded approach of data analysis serve to add to the information used to validate the quantitative research study.

Figure 18

Findings of the Study

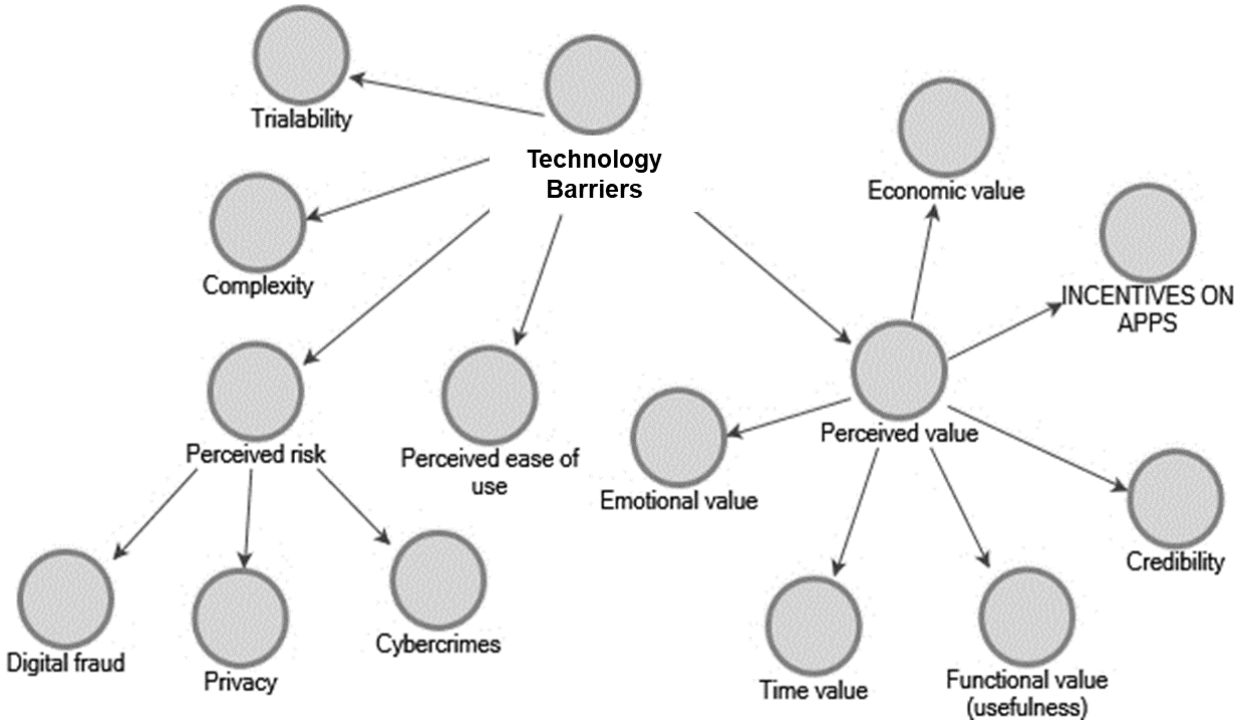
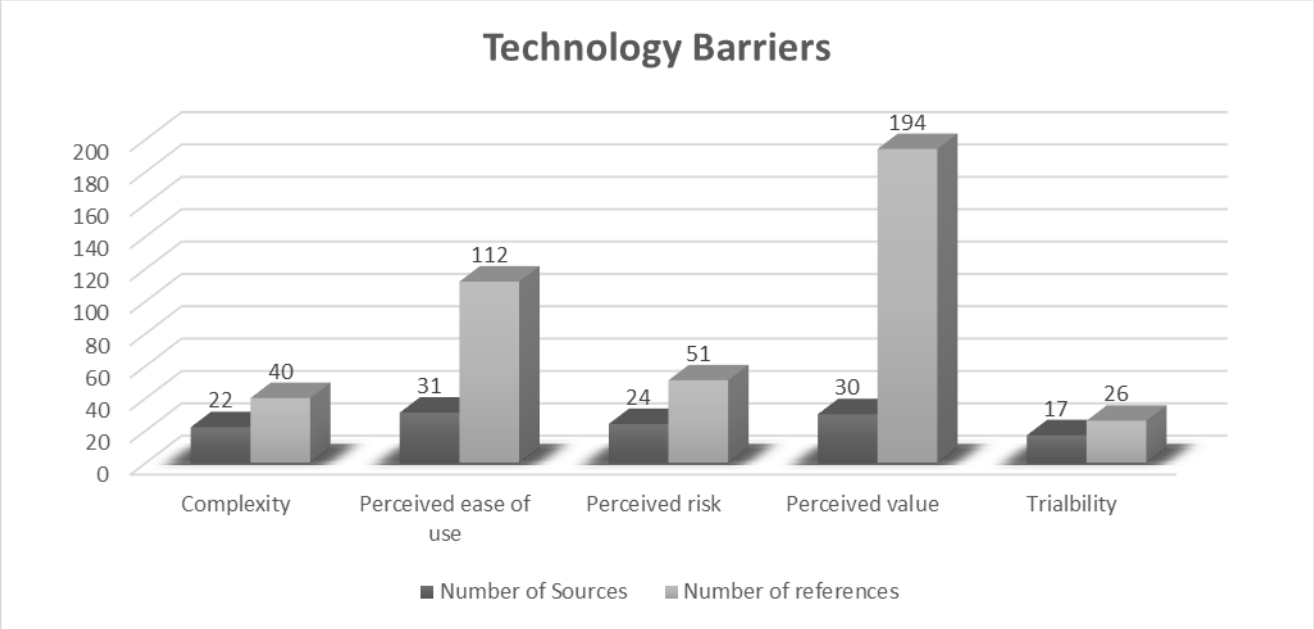


Figure 19

Technology Barriers



Through the data-analysis process, participants highlighted perceived risk, trialability, perceived ease of use, awareness, availability, and perceived value, among others, as some of the factors that influence digital adoption and consumer behaviour in South Africa and India. It is important to note that the participant terms noted above were named according to the terminology in the literature.

The propositions below were used to derive a digital adoption model that can be tested quantitatively, according to a sequential mixed-methods design.

5.5.1 Theme One: Cyber Security (Perceived Risk)

From the data-coding process, participants indicated that cyber security and the threat of risk would likely prevent them from adopting digital solutions. ‘Perceived risk’ (cyber security) therefore impacted their behavioural intent as it pertains to digital adoption, which may be a key issue with mobile-app adoption in emerging countries. Holton (2004) defines risk as a condition of individuals who are self-aware. Importantly, risk has been raised as a concern by users whenever new technology is presented to them, and the notion of perceived risk has

drawn interest from academics in various fields, on account of its important consequences for the adoption of new technology. From the findings, participants highlighted that a complicated relationship exists between technology adoption for Internet banking and mobile apps, as most participants thought that it was not secure for them to use mobile apps. Additionally, participants emphasised factors such as fear of digital fraud, cybercrime, and meddling with people's privacy as factors that might affect adoption and intention to use digital technology.

As a technological barrier, participants also noted that cybercrime is a concern (crime related to technology). Most of the participants in the research study mentioned fear of cybercrime as being one of the risks associated with digital adoption. For instance, **Participant 15** from India stated, "[s]o, cybercrime could be a concern for companies and for us individuals, for us cybercrime is a concern". **Participant 20** from South Africa argued, "[a]nd cybercrime worries me, in the sense when you are using the bank, because today, we hear a lot of things like people getting into other people's accounts and they don't know how it happened". **Participant 6** from India indicated, "[c]ybercrimes is my worst nightmare, for example, Google Play, it directly has access to my bank account so that is something that is worrying, if someone hacks it". **Participant 23** from South Africa stated, "[t]here is cybercrimes and it is real. So, if somebody tries to clone you through [the] Internet, it is very difficult getting the money back."

Based on this information, the first proposition from the qualitative analysis is:

First proposition: 'Perceived risk' is related to 'intention to use'.

Participants argued that cyberspace has provided a platform for prompt communication, commerce, and interaction between individuals and organisations across the globe. It has an undeniable impact on society. However, as it has grown in prominence, so too has the number and variety of cyber-attacks (Widup et al., 2018). Research has shown that digital technology enables near-perfect reproduction of important documents, such as identification cards, licences, birth certificates, banks cards, and any other documents that may be used to construct a false identity and other fraudulent instruments. Hence, when people think about these risks, they seem to have a hard time deciding whether or not to adopt new technologies.

5.5.2 Theme Two: Intuitive Design (Perceived Ease of Use)

Even though some of the participants contributed more insight regarding factors that affect their intention to use technology on account of risk perceptions they have about mobile technology, they did highlight factors that make people want to adopt technologies. Throughout the data analysis, participants emphasised intuitive design (mobile apps that are easy to use) or perceived ease of use (intuitive design) as factors that encourage people to adopt new technologies and download new apps.

The findings here illustrate that perceived ease of use is a key factor in the literature of information technology usage. Perceived ease of use results show that perceived ease of use is related to usage of and intention to use a technology, as well as the perceived usefulness of that technology, as indicated by Davis (1989). Participants mentioned that perceived ease of use determines certain attitudes towards innovation, and at times relates to non-utilitarian motives, such as enjoyment and expressiveness for using mobile apps.

For instance, **Participant 1** from India stated, "[e]verything is getting digitalised in India these days, so it is making work much easier. These days you have so many technologies and these technologies are making the work easy, but they can't make the decisions on our behalf."

Participant 3 from India reinforced this view by indicating the following:

> [y]es. It diminishes the time and time is very essential for now. Technology has made the work very easy, there are so many technologies being used today. We have artificial intelligence coming into the picture. We have analytics, machine learning, robotics, now the crypto currency, where we earlier banking came and for example, earlier we used to go with a cheque book, but now it's very digital, where we're sitting in one place and having different access.

It should be noted here that perceived ease of use works in conjunction with perceived usefulness, because if an individual believes that using a particular mobile technology or system would enhance his or her job performance, then they would use the technology – even if it may not be intuitive. In other words, they would learn how to use the technology. However, perceived ease of use findings show that participants attach different meanings to ease of use.

Like Zeithaml et al. (2002), some participants viewed perceived ease of use as the extent to which a new technology is easy to understand, is intuitive, or is better than its substitutes. This is reflected in the participant responses that follow.

Echoing these sentiments, **Participant 18** from South Africa argued, "[y]es, if you look at some people it looks easy to use and it can help me but all I want now if the WhatsApp, because it is easy for me". **Participant 19** from South Africa agreed what with Participant 18 said, "[i]t is convenient to use cellphones [mobile phones] and it is easy to use them as well". **Participant 2** from India asserted that technological apps are easier for him to use because "[i]t is really easy to use the things, I can easily manage my accounts, the banks started their own apps, but I don't have to go to the bank. I easily manage my accounts by staying at home."

Most participants indicated that online apps offer convenience. For example, they can easily transfer money from one bank to another and make payments without drawing cash from ATMs. **Participant 4** stated, "I have to pay extra tax. By doing it online transaction, I don't need to pay extra tax."

Based on this information, the second proposition from the qualitative analysis is:

Second proposition: 'Perceived ease of use' is related to 'intention to use'.

In line with these findings, extensive research over recent years has provided evidence that perceived ease of use is related to usage intention. Further to this, the factors that enhance Internet and mobile banking are established by perceived ease of use, which is a combination of convenience, secure platforms, and user-required services, as reinforced in this study's findings.

5.5.3 Theme Three: Convenience and Value Proposition Offered (Perceived Value)

Perceived value (convenience/value proposition offered) is usually regarded as the value proposition that is delivered to the consumer. It describes the perception the customer has of the benefits or disadvantages associated with purchasing a product or service. The extent of the insights gained from the qualitative analysis are noted in Chapter Eight. From the research findings it can be noted that the perceived value of mobile apps varies from being low (where

consumers have a low perceived value of adopting the mobile apps) to high (where the product is perceived as having more benefits). Data shows that the perceived value of a product, such as mobile-app technology, is usually informed by whether there are significant benefits associated with the product, and whether there is enough information available for people to make accurate purchasing decisions about it.

Therefore, information provided by the participants indicates that perceived value is an indicator for digital adoption. For example, participants outlined different types of perceived value associated with digital adoption. Participants argued that there is a functional value associated with digital adoption and emphasised the usefulness of adopting new technologies.

Participant 5 from India argued:

> [f]or me to download a new app there must be a digital functional role/value to it. There are a lot of things you can do at any given time. It is a versatile thing. Amalgamation of different things in one go. For example, you have a grocery app and you can go purchase a lot of things in one go rather than going out and this will force me to go for it.

Reinforcing this view, **Participant 30** from South Africa argued, "[s]o my subscriptions in getting an app should be good in terms of service and usability. And if the service is not good, I won't even think of getting it, not even trying it." For **Participant 12**, these apps are just "amazing'' because "[i]t offers me ease of shopping, ease of transportation, knowledge, ease of working. So, when I say transportation, I use Uber, or shopping I use Amazon, Flipkart I use, my daily needs, my everyday needs."

'Sacrifice' refers not only to a monetary cost, but also includes non-monetary opportunity costs, (referred to as behavioural price) as the time and effort spent buying and using products and services. Customers are willing to pay a higher price in exchange for convenience, meaning that services which create more convenience will increase the perceived value, as indicated in the quotations provided above.

Some of the participants mentioned that there ought to be an economic value linked to new technologies.

For instance, **Participant 12** from India contended:

> [s]o, this phone was bought by my son, for me, so I don't decide which phone I buy, my son decides. And he bought one for me and one for my daughter. And then, one for his grandmother, the same Honour, because he says that the application… cost wise, it's less. You know, as per the application that this phone has, it is really nicely priced.

Participant 24 from South Africa argued:

> I've been in love with Samsung from the beginning, so even though I see other brands, if there is a new Samsung product on the market, I buy it without testing it. I'm a bit sceptical of other brands though, and the prices they charge. There is no value for money in my thinking.

Supporting the notion of economic value, **Participant 4** from India claimed, "[t]he price is important […], not the features. It depends on price."

Some of the participants pointed to the credibility associated with certain apps they might want to use. For example, **Participant 10** from India indicated, "[i]f the bank gives the guarantee I will use that app, because there is credibility already established there, and I will not have any doubts". **Participant 12** from India stated, "[t]he trusted website, Amazon, Flipkart, and you know basics are fine, then it is ok and always remembering that if it is 'https', it is secure. If it is 'http', it is not."

Participant 18 from South Africa stated:

> [t]here are certain websites which you should not use, especially the unsecure ones. Like we all know that the 'https' is a secure website, it won't harm my compute, unlike the http; and I trust WhatsApp, I think it is safe.

Participant 26 supported this view by stating:

> I usually trust digital devices when there is some element of trustworthiness. I will go and check the reviews and you know the consumer review it, and you know they issue ratings. So, I believe in the comments given by the customers.

Some participants commented on how the emotional value associated with digital devices encourages them to use or download some of the apps linked to these devices.

Participant 17 from South Africa emphasised that when it comes to new technologies, he is very cautious and does not impulsively buy or download any new software. He said:

> [i]n terms of new technology, I am very excited but cautious, given that we're a tech business. It'd be very hard for me not to be. I am cautious around the promises that all new technologies, such as AI, AR, VR, because I don't think people are necessarily executing but there's no doubt that the vision of new technology is very exciting.

Supporting the idea that when testing or trying new technology, people either attach emotions to the process or they accept the technology, **Participant 19** from South Africa noted:

> [i]t is very entertaining because you can call anyone, anytime, anywhere. You can even WhatsApp people far from home. So, for me it is very entertaining it is very good, and this makes me adopt easily when it comes to digital devices. I can connect easily.

Participant 12 from India said, "[s]o, I like to use new things. I'm not an early adopter, yet I would want to see something that would simplify my life and something that speaks to my heart."

Participants also mentioned that time value is a contributor to digital adoption. In this age, it is true that anything that makes life easier is considered an asset. **Participant 10** from India argued, "I use apps because they save time and made the work easier and it is convenient to buy, and it saves money".

Participant 12 from India stated:

> [t]hen it saves time. So, had it saved time and was not cost effective, probably I would not have gone for it. It is cost effective also, and of course, it saves time, it is convenient, the ease, it is safe, secure… you name it.

These days, people do not have time to go shopping and, as **Participant 19** from South Africa argued, "[a]pps are good they save time and money good. Especially time, today I do not have time to go the market and buy something; that is not possible. Through the app it is convenient to get everything."

Various participants mentioned that there are some apps that offer incentives, and, at times, it is these incentives that inspire people to adopt mobile apps. For instance, **Participant 7** from India stated, "[y]es, I enjoy the discounts and coupons that are given by the various apps. I love it and enjoyed the discounts."

Participant 13 from India provided the following information:

> [t]he second thing is that I get a lot of discounts also, on e-commerce sites specially. I am a prime member for Amazon, so I end up saving 20–30% on the product and when you do your bookings in hospitals, or if you are fixing an appointment, you also get some credit points, so you can purchase medicine with those points. So, again it's more of a discount or a service exchange you get. And then, you also get certain preference over the other members, she is the one who has been using her apps for points, so they would send you goodies, or if they come up with a new offer you would be the first one who would be communicated about all that.

People feel that they can get cash-back discounts from using mobile apps, and ultimately buy less-expensive products. **Participant 17** from South Africa argued, "I think people are fatigued enormously around offers and so I think there may be some really great offers that are being made but we don't explore them, because there's just so much".

Participant 27 echoed this sentiment by stating:

> I only found out about that recently. I downloaded the McDonald's app and then I got some free meals, and then I wanted to download Debonair App and they told me I'd only get incentives on my birthday. But that's so far! So, I think it could be a good factor for adoption because it did excite me.

Participant 3 argued that it is a delight to be offered incentives: "[y]es, it is good. I bought new Bluetooth speakers with that incentive, so I think it is good for me."

Based on this information, the third proposition from the qualitative analysis is:

Third proposition: 'Perceived value' is related to 'intention to use'.

Despite the fact that perceived values are personal and subjective, consumers perceive them differently, depending on their situation. The findings here show that perceived value is an important precursor to satisfaction and behavioural intention to use new technology or software, and this therefore indicates that perceived value is related to purchase intention and usage.

5.5.4 Theme Four: Trial Periods (Trialability)

Most of the participants indicated that they need to experience the innovation associated with a product or service before they commit to using it. Trialability ('try before you buy') of products and services tends creates less perceived uncertainty for individuals who consider adopting the new technology. Participants argued that they tended to learn through this experience; in other words, having the ability to try new technology before buying it. These participants vowed that they would not buy any digital device without trying it first. However, some participants indicated that they do not feel the need to try new products or gadgets before buying them.

Participant 13 from India claimed that she does not try out new devices before buying them. She stated:

> I will be very honest with you, I do not believe in doing that, because I am not very comfortable checking out gadgets in stores. I do read the reviews, but when it comes to my husband or my brother in law, I mean, the men in this family, they are very keen and experimenting with gadgets, that's as far as I would say before purchasing one.

Reinforcing this view, **Participant 11** stated, "I do not like trying new technologies, but my son does".

Participant 17 from South Africa prefers to read reviews on devices rather than actually testing them. He argued:

> [n]o, I don't. I don't remember the last time I went to a retail store. For me, it's about waiting and looking at reviews, trying to establish where the value comes up from other people who have tested it and then I would make my decision around that. That's just from an infrastructure point of view.

Since the trial period is usually regarded as the decisive moment where a product or technology is either adopted or rejected, **Participant 24** from South Africa felt that it is important to try out new devices before purchasing them or downloading any new software. He stated, "I would try things and I like to explore on a device for 15–20 minutes, and if I don't understand it, then will uninstall it. You don't keep it, whatever the app is."

Participant 15 from India asserted:

> I usually try to see what is new, what is different, because the technology is changing. So, we usually check what is different in the new product, whether it is beneficial for us or not. For me or not, specifically.

Information obtained from some of the participants indicated that trialability is critical in facilitating adoption. Participants argued that they want to see what new technology can do for them, and they often give it a test run. For example, when **Participant 29** encounters a new

device or software, he will "[d]ownload that app and try that by experience; if I like that app, I will use that, not delete it".

Most of the participants felt trialability presents an opportunity for early adopters to experiment with new technology before committing to it. This helps to curb any unknown fears they may have beforehand.

Participants also indicated that trialability is important, as, at times, when new technology is perceived as being difficult to use and understand, it is unlikely to be adopted. Some participants emphasised that new technologies that are simpler to understand are adopted more rapidly than those that require an individual to first develop new skills.

Participants cited a lack of knowledge with regards to mobile-app benefits and the ability for mobile apps to be intuitive and complex (relating back to the theme of perceived ease of use). Most of the participants who took part in the research study indicated that, at times, they may require assistance to operate the apps or the software they have downloaded, because it can be complicated to learn. For many, the issue of complexity does not hinder them from using digital devices; they just want assistance regarding their operation. **Participant 10** from India mentioned, "[s]ometimes I need assistance to use phones and computers such as short command and some words and all". Echoing this sentiment, **Participant 18** from South Africa argued that he had no idea how to download software he wanted to use. He said, "[n]o, I asked someone to download for me. I do not know how to download."

From the information provided by most of the participants, it is evident that using digital devices can be complex at times. However, most participants stressed that they always want help to understand the devices better so that they are more user-friendly. **Participant 28** from South Africa said, "[b]ecause some of the cellphones [mobile phones] are very difficult to use, like going to the Internet sometimes, you don't know how to do it, you have to ask someone to help you, and everything like that".

For **Participant 25** from South Africa, the notion of complexity varies according to age group. He stated, "[f]or us youngsters they are easy to understand, but for the older people who are between the ages of 40 and 80, it's very difficult". **Participant 27** from South Africa indicated,

"[b]ecause certain things are very technical, for instance I'm not an Apple fan. I wouldn't get any of their products, even if I could; because it's quite complicated and different to Android."

Based on this information, the fourth proposition from the qualitative analysis is:

Fourth proposition: 'Trialability' is related to 'intention to use'.

To a certain extent, complexity was shown to have a direct effect on users' intention to use or buy a product. This is corroborated in studies undertaken by Tanakinjal et al. (2010) and Shih (2008).

5.5.5 Theme Five: Protection of Personal Information (Privacy)

Some of the participants highlighted privacy (protection of personal information and information fraud) as a factor that hinders them from adopting new software or apps on the market. For example, **Participant 1** from India asserted, "I like the food application and the coupons but there are a lot of scams coming into the picture. Digital fraud is rife in this technology age…"

Participant 17 from South Africa stated the following:

> [y]ou are obliterated by constant digital coupons and vouchers you know, and how are you supposed to know what's real? That's another problem. You don't know what's fraudulent and you're going to spend all this time chasing something that ends up being completely rubbish and at the end of the day you lose everything.

Participant 2 from India agreed that privacy is perceived as a risk for digital adoption:

> [t]here is too much digital fraud out there with these new technologies. For instance, yes, I did not easily trust because especially from bank because from these messages people took your account number and all by doing fraud transactions – so I did not easily trust from the bank.

Participant 29 asserted, “I am afraid of Internet crimes because I could lose my money, but this comes to mind that the scam can happen, so it is here and there but I am happy to use it”.

Some participants claimed that their private information was not safe, and this is the main fear they have regarding the adoption of new technologies.

For example, **Participant 3** from India claimed:

> [t]here are sometimes applications that are taking a lot of personal data, like your number, or your email address, and so on. Because at the end of the day, they are selling my data to someone else. Like recently with Facebook as well and this does not sit well with me […]

Participant 1 from India echoed this sentiment by stating:

> [f]ear is basically losing the data, personal information, making that lead generation format that happens in India. For example, if you want to know your credit score, you must fill out that form. That form can be used by other insurance companies selling you an insurance policy. So that is what people fear.

Participant 17 from South Africa contended, “[s]o I would say privacy is a concern, but I’ve kind of absolved of worrying about it because at the end of the day nothing that we do is private anymore and digital technology has led to that”. **Participant 20** from South Africa argued, “[s]o I don't want to download an app because it passes on your information to other people”.

Based on this information, the fifth proposition from the qualitative analysis is:

Fifth proposition: ‘Privacy’ is related to ‘intention to use’.

In keeping with this theme, participants were extremely conscious about online intrusion, which involves the use of the Internet and apps to invade, harm, or otherwise ‘infect’ another user’s online space, computer programmes, network, or computer systems through dangerous malicious software, such as malware. Participants are afraid of online piracy, whereby their ‘intellectual property’ could be stolen through peer-to-peer file sharing programmes. However,

there is a relationship between perceived risk and technology adoption, as indicated by participants who took part in the research study.

Figure 20

Emerging Market Factors

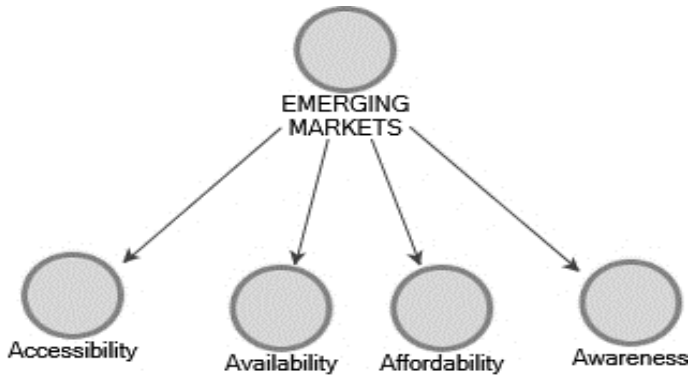
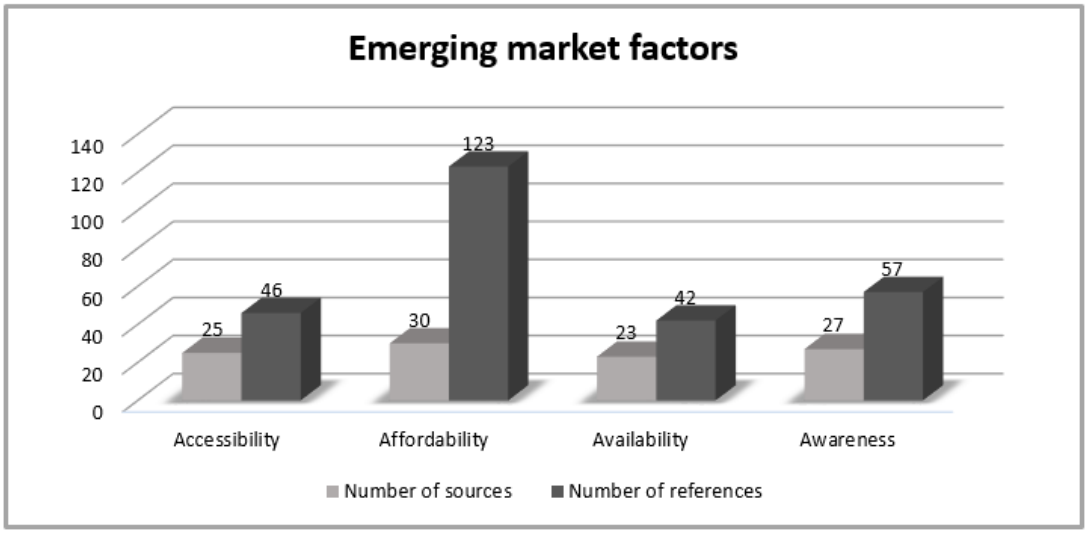


Figure 21

Emerging Market Factors



5.5.6 Theme Six: Knowledge of Mobile Apps (Awareness)

Participants highlighted that different enablers influence the adoption of digital channel offerings in emerging markets. From the information they provided, it was evident that emerging markets cannot be infiltrated in the same manner as developed markets. Interestingly,

participants who took part in the research study emphasised that they require knowledge of the offering, or awareness; in other words, they must be able to find the service. In addition, participants noted that price and availability of a product or service are important.

For Kotler and Armstrong (2004), 'awareness' is the exploration of the mechanisms used by individuals to gain knowledge of a product or service, and the degree to which there is a lack of information about a product or service. From the findings, it is evident that the most important factor individuals consider before adopting mobile apps is the amount of information they have about an app. In this context, when people have some knowledge about new technology, the awareness of technology might not affect intention to use. This is because, in most cases, exposure to technology is not random.

From the information provided, some participants were knowledgeable regarding knowledge/awareness; they understand what is being offered to them and the benefits of novel technologies. **Participant 10** indicated, "[y]eah I know about some retailers that offer digital solutions. Not every retailer offers digital solutions and I understand some benefits associated with these digital solutions."

Participant 13 argued:

> [a]t times when you're exploring sites like Yahoo, or now that I've started taking lessons in digital marketing, they keep telling us about new apps, the new technology that is coming, we have those discussions also. I have a group on digital marketing, so we have friends who talk about it.

Some of the participants knew about certain technologies from exploring different sites, and because they received notifications from their banks regarding various upgrades that the banks had made.

For instance, **Participant 15** from India reported:

> I only know that I have my online bank access as well. So, from there I find out what are the modes of payment, online modes of payment. But I do not get any info,

> specifically related to the information that these are the payments which you can do from us. So, there is no such service given by the bank.

Participant 2 from India stated, "[…] by Amazon they give the new features advertisement on the app and Internet that we can use". This view was echoed by **Participant 21** from South Africa, who emphasised, "[i]f I go to open an account they explain everything to me, come of it, they write it down for me, so if I use the app on my phone, it would be easy".

In this study, 'awareness' is regarded as a major factor that affects intention to use. Most participants argued that they do have some level of awareness about what is being offered to them, and the benefits of novel technology, while others showed no awareness.

For instance, **Participant 19** from South Africa indicated, "I am not aware of digital solutions offered to me by retailers, whether in the form or coupons or discounts". Reinforcing this sentiment, **Participant 18** indicated, "[n]ormally hear people say so but I do not know about it". **Participant 15** from India also argued, "[n]o, not fully aware". Some participants indicated that there is a lack of awareness regarding digital devices and the features being offered; at times they are not aware of what digital devices and features are on offer. This was confirmed by **Participant 2** from India, who reported, "[n]o, they did not reach to me to tell me these are new features, and up to now have no idea and cannot download any new feature". Some of the participants stated that because of a lack of awareness, they end up getting 'lost' and deleting the apps.

Participant 27 from South Africa said:

> [n]o, and nobody trains me on it. You're so reluctant to download the new app because you know the old one so well, and now you need to navigate the new one. So, you would call in to say you want to make a withdrawal and they would say you can do it on the app, but then something freezes. So generally, my trust has gone down.

From the information presented, it is evident that awareness is one of the key determinants of adoption and use related to a new technology and it is decided dependent on how familiar people are with technology.

Based on this information, the sixth proposition from the qualitative analysis is:

Sixth proposition: 'Awareness' is related to 'intention to use'.

Awareness is also regarded as contributing to the adoption of new and innovative products. Islam and Gronlund (2011) state that awareness refers to a user's degree of attention and their ability to illustrate beliefs within their environment, as well as how the product or service is used. In this study, some of the participants indicated that they might not utilise innovative mobile technology, because they do not have the knowledge of the mobile phone's design, interface, features, functionality, and applications, which would be required for usage. Hence, the absence of awareness is one of the challenges associated with lack of adoption.

5.5.7 Theme Seven: Digital Enablement (Access)

Participants made reference to the importance of having 'access' to the Internet and digital devices within the environment that they live. It was clear that most participants have access to digital devices and the Internet, with only a handful indicating otherwise.

Participant 1 from India argued:

> [w]e have analytics; machine learning; robotics; now the crypto currency, where we earlier banking came and for example, earlier we used to go with a cheque book, but now it's very digital, where we're sitting in one place and having different access.

Some of the participants spoke to the stability of digital offerings in emerging economies, and that infrastructure issues (such as electricity supply) may interrupt access to digital services. Many of the participants indicated that having several social media platforms available to them makes life easier.

For instance, **Participant 1** from India stated:

> [e]verything is getting digitalised in India these days, so it is making work much easier. These days you have so many technologies. I still remember when we had the social media platforms, we had Yahoo and then it came into Facebook now there's

> each and everything we are surrounded by technologies. These technologies are making the work easy, but they can't make the decisions on our behalf, but they are readily available for use.

Participant 10 also argued, "[w]e have an app called UrbanClap everyone is available there, as in electrician, repairers, plumbers and all. It is available on one single app. It is easier to use, and it is easy to connect them."

Participant 21 from South Africa asserted:

> [a]bsolutely. There is a new app for phones that is very nice. It's called Company Portal. Are you aware of it? You can access your work email on your phone if you have Company Portal. So, it's not only for your personal life, it's also good for your work environment and it is available for many South Africans.

Participant 13 from India indicated that he can access the Internet using a data card:

> [y]es. I have my own data card, I use that, I don't use the office Internet. As an only phone, my official work I use the office Internet, otherwise I have my own data card in my mobile, which I use for me to access the Internet and the new services I might want to download.

Interestingly, most of the Indian participants indicated that they access the Internet daily, and they have unlimited access to download new apps and features they might want to use for their own businesses. Most of the South African participants stated that they access the Internet using their mobile data. **Participant 18** stated, "I have access to the Internet if I am inside the building, but outside, I use my data". **Participant 21** said, "Wi-Fi I use it, because there are many places that have free Wi-Fi. If you go shopping, there are places that you can have the Wi-Fi for free."

Based on this information, the seventh proposition from the qualitative analysis is:

Seventh proposition: 'Access' is related to 'intention to use'.

Some of the participants indicated that having mobile apps on their smartphones makes life more convenient for them. **Participant 3** from South Africa stated, "I only use the app – I never go to the bank. Transfer money, buying with it, and updating my personal things, home address, changing of numbers; all these things I am doing over the Internet or my cellphone [mobile phone]."

However, some participants have no access to the Internet, as highlighted by **Participant 11** from India, who commented:

> [t]here is a big challenge, but in the tier two cities, tier three cities, electricity would be a challenge, as Internet penetration could be an issue because in the rural areas. Internet connectivity is not like what we have here, 20–30mbps speed, you won't get in rural areas, only the metro cities have such speeds.

This is also a concern for some South African participants, who still use feature phones. They do not have access to the Internet, or to Wi-Fi.

From the information provided by most of the participants from India, it is evident that technological apps are readily available and can be used for business and personal purposes. Some of the participants argued that Wi-Fi is readily available/accessible for almost everyone, to the extent that most people do live streaming in taxis. Data is cheap and can be accessed by a multitude of people.

For instance, **Participant 2** emphasised:

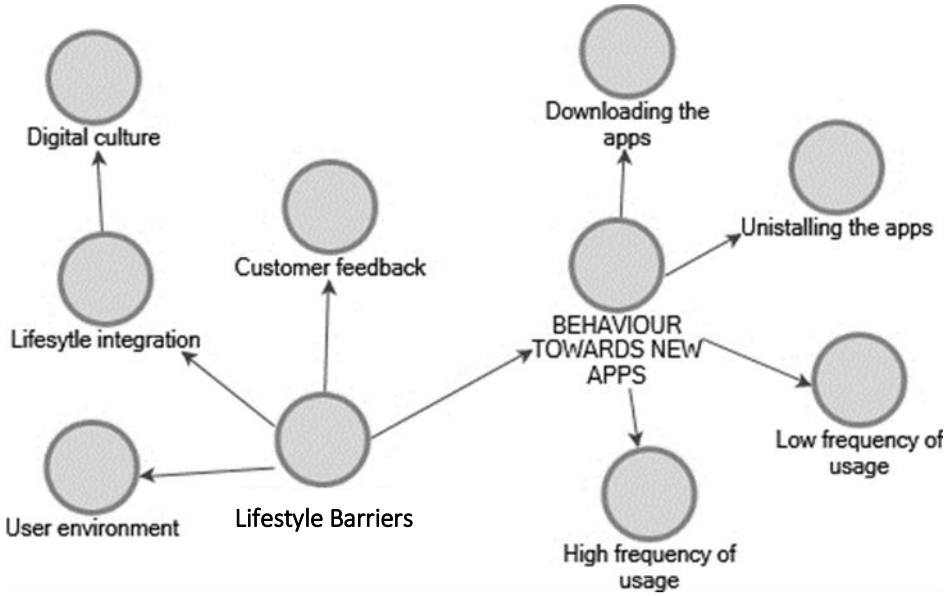
> [i]n India it is like the market, we always trending, but Samsung and Apple are best phones, because we are always trending because Samsung and Apple's futures, most of the futures are easily available or at low cost in that trend. Samsung and Apple phones are sometimes expensive.

In South Africa, however, the case is different. Some of the participants argued that the Internet is not readily available, which makes it difficult for them to connect. For example, **Participant 18** contended, "[w]e do not have fast Internet connectivity in our area". **Participant 31** from South Africa confidently said, "[s]o, it's a challenge sometimes. Sometimes there is no Internet connection. I mean, I had this Internet connection – a local Internet connection – so after every ten days, the speed used to go down."

In terms of Internet connectivity, most of the participants from South Africa argued that they do not have fast Wi-Fi connections, except for those who use public Wi-Fi, such as **Participant 26**, who declared, "I use the Municipal Wi-Fi and it is fast, and it is free." It is also very difficult for those who live in the locations and townships to get connected, as evidenced by **Participant 29**: "[n]o am staying in Vereeniging and yes where I am staying there is no availability of Wi-Fi connections and I find it very difficult to connect".

Figure 22

Behaviour and Culture



5.5.8 Theme Eight: Cost Associated With Using the Digital Solution (Affordability)

The issue of 'affordability' (cost associated with using the digital solution) is central to the notion of digital adoption in emerging markets. Some participants highlighted the importance of being able to fund the devices, and the connectivity cost required for the device to remain active on digital platforms.

For participants from India, such as **Participant 1**, using apps such as Amazon is affordable. He indicated:

> [t]he thing which prompted me nowadays in digital application such as Amazon, like if I have something saved in my cart and I'm not buying it, it will prompt me with certain offers or discount, and if the discount is appropriate and in my range and what I am looking at, then I will go for it.

For **Participant 10**, digital apps are vital "[b]ecause I use both apps easily and they save time and money because I use mostly free apps from cellphones [mobile phones]".

Reinforcing this notion, **Participant 12** argued that he is getting genuine service through digital adoption:

> [s]econd is cost effective. It is more cost effective to sort of compare the prices, and they give good deals. Then it saves time. So, had it saved time and was not cost effective, probably I would not have gone for it. It must be cost effective also, right? And of course, it saves time, it is convenient, the ease, it is safe, secure.

Online purchasing was referred to as the best platform one can use to purchase items such as clothes, as indicated by **Participant 14** from India who claimed, "[o]nline shopping is easy to buy clothes and any product from there. It saves his time and on OLX one gets second-hand phone at a lesser price. It saves his time and cost." **Participant 19** from South Africa mentioned, "[a]pps are good; they save time and money good; especially time. today's time he did not have time to go the market and buy something, that is not possible. By app it is convenient to get everything." People feel that they can get cash-back discounts by using mobile apps and end up buying less expensive products through apps.

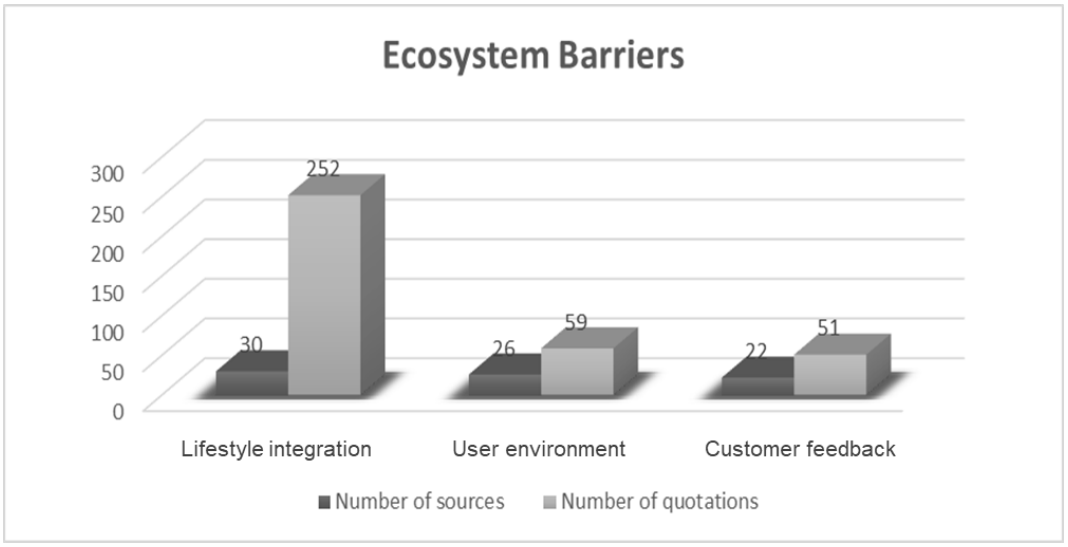
Based on this information, the eighth proposition from the qualitative analysis is:

Eighth proposition: 'Affordability' is related to 'intention to use'.

This supports the 'affordability' aspect of apps. **Participant 19** noted that the whole process of buying online is expensive for her and she would prefer WhatsApp, which she feels is very affordable, over purchasing on mobile apps. **Participant 20** said, "[t]echnology it makes things easier. Nowadays we use WhatsApp, it's easier and cheaper." For some, such as **Participant 27**, technology adoption is important and affordable in the sense that "it enables us to communicate with people who are far away from us, especially family. We use WhatsApp, Facebook, and Facebook Messenger, because they don't cost much to use."

Figure 23

Ecosystem Barriers



Participants emphasised the different enablers that influence the adoption of digital channel offerings in emerging markets and highlighted the integration of technologies in their everyday lives. Although a handful of the participants indicated that there is no correlation between lifestyle and digital adoption, most highlighted that technology has an impact on everyday life.

5.5.9 Theme Nine: Ecosystem Value Proposition (Lifestyle Integration)

Participants mentioned 'lifestyle integration' (ecosystem value proposition based on everything that a consumer does, buys, likes, and needs) of technology in daily life; that they will use technology if it relates to their everyday activities. **Participant 1** from India said, "I am not bothered by the marketing strategy of the app as I told you that I take it for the need. For example, if it is related to my day-to-day activities, they will definitely use it." **Participant 10** argued, "I sometimes download some apps according to my needs, and yes, apps that are suggested by friends or family members, apps which give me benefits, or apps l need will only download those apps and use them […]". Some of the participants pointed out that technological apps have had a positive impact on their lives. They are able to travel, shop, and work easily. **Participant 12** said, "[s]o, it offers me ease of shopping, ease of transportation, knowledge, ease of working. So, when I say transportation, I use Uber, or shopping I use Amazon, Flipkart I use, my daily needs, my everyday needs."

It is therefore clear that the integration of technologies in people's everyday lives has made life easier for them.

Participant 13 stated:

> Absolutely! Specially for oldies, who cannot go and submit the bills or if they want to do some research, or do a booking for a hospital also for that part, you just need an app like a Practo, you know? Login to wait, make a call, and your appointment is fixed. You don't have to physically go and get those things done.

Participant 13 argued, "[a]bsolutely, same goes for like in-laws, or like cousins. Their kids are using Kindles these days to study. So, digitisation is the way."

Participant 17 from South Africa asserted:

> [i]t's the environment that makes your life easier, that would be hardware and software or a kind of much more undefined greater digital code that is making my life more efficient. That's what I've tried to create of my own digital ecosystem. So, my family

> is completely digitally illiterate, so it won't come from them, but friends do it all the time. We're always swapping, have you seen this software? I would say very often.

Participant 19 from South Africa argued that lifestyle integration is key, and he uses mobile apps to perform many of his everyday chores.

For **Participant 24**, integrating technology makes life easier for her. She confessed:

> I love it. It's very convenient. I like selling things. I sell Avon and such. Instead of going to my clients to give them hard copies of promotional material, I email it to them. Technology makes things very easy and it links us.

Participant 26 commented, "I think it's very convenient. It simplifies life in general. In today's times you can process things in minutes that would normally have taken hours or days."

Some participants highlighted that they have an affinity for new apps that integrate into their lifestyle. Most participants confirmed that they like to download new apps if these appeal to them and if they contribute positively to their day-to-day activities.

This was supported by **Participant 3** from India, who argued:

> I like the food application and the coupons, but there are a lot of scams coming into the picture. I do download, but I'm not that updated; when it comes to apps I do a lot of research work. But if I have a need, and if I find I have a need, I download, then yes, but not that frequently.

Participant 10 stated, "[y]eah I used to download retail apps, Amazon, Clipcard… Flipkart to buy different items and all after the recommendation of family and friends". Similarly, **Participant 19** also mentioned, "[…] love downloading apps and I use some apps like Taxify/Uber online for hiring a cab and some online shopping apps for purchasing things". **Participant 24** indicated that he downloads the apps that are recommended to him by people in his social circle. He emphasised, "[y]es. I download apps that are suggested by friends or family members, apps which give me benefits when I need to use them."

Some participants have developed a digital culture. **Participant 17** from South Africa argued, "[s]o my family is completely digitally literate, so it sometimes come from them, but friends do it all the time. We're always swapping, 'have you seen this software?' I would say very often it is an online culture we are developing."

Participant 2 from India declared:

> [y]es, obviously they can be used every day. But you know, more of digital things are getting modified every day. When the application originally launched, now it is something new. Nowadays by the needs if you have something you're getting another. This is literary a culture that we have all developed. It's one in the same thing which is getting and trying to be the best thing.

Some participants supported the idea that certain digital principles have been adopted by people, albeit in India or South Africa, to make communication easier. Thus, the ninth proposition from the qualitative analysis is:

Ninth proposition: 'Lifestyle integration' is related to 'intention to use'.

For instance, **Participant 11** confessed, "I use WhatsApp more than calling on a daily basis and it is something that is now part of me".

5.5.10 Theme Ten: Feedback and Ratings (Customer Feedback)

Some participants specified the importance of 'customer feedback' for easy adoption of technology on the different apps they use daily. They argued that they would continue to use mobile apps and frequently provide relevant feedback to ensure necessary improvements to the services and digital devices are made. Certain participants argued that they do not provide customer feedback on the apps they are using, because it is a tiring process. For example, **Participant 12** stated, "[g]iving feedback […] it's tiresome, so mostly I don't. If they ask me, I don't". **Participant 14** also indicated, "I never give feedback to technology providers and retailers, around what I believe will make my life easier". **Participant 19** asserted, "I have never had a problem and I don't give feedback to WhatsApp or Facebook or bank to say this is working or not […]".

Although some participants argued that they do not like the idea of giving feedback on the technologies or apps they are using, others stated that they always provide feedback as a way of creating room for improvement.

For instance, **Participant 13** declared that whenever he uses Uber, he always rates the drivers at the end of each journey. He stated:

> Uber I do use and provides feedback at the end of each journey. That's easy. And then you know, you want to rate the person who was giving you good service, and safe. Or if someone has not given you a good service, then you would want to rate them. So, and it's just like, one click.

Supporting this, **Participant 21** indicated:

> [o]ne-click solution. And then, you know, that feedback will be used very quickly. Uber feedback is, like, very quickly, they get back and it's used. And I've complained also to them at times when things have not happened in a way that they should.

Based on this information, the tenth proposition from the qualitative analysis is:

Tenth proposition: 'Customer feedback' is related to 'intention to use'.

Similarly, **Participant 16** commented, "[y]es, I do give feedback. Yeah, I give them long paragraphs." Some participants, such as **Participant 25** from South Africa, argued that they provides customer feedback in the form of surveys. The participant said, "I provide feedback if they send me a survey or they ask me to rate the app".

5.5.11 Theme Eleven: Society Influence and Facilitating Conditions (User Environment)

Participants cited 'user environment' (influence based on the society the user lives in) as a factor that influences the adoption of digital technology in emerging markets. The participants emphasised the extent to which the user and his or her environment changes and adapts, based on their use of mobile apps.

For example, **Participant 1** highlighted:

> [e]verything is getting digitalised in India these days, so it is making work much easier. These days you have so many technologies. I still remember when we had the social media platforms, we had Yahoo and then it came into Facebook now there's each and everything we are surrounded by technologies. These technologies are making the work easy, but they can't make the decisions on our behalf.

Similarly, **Participant 10** declared, "[s]ome apps are used on a daily basis, some apps like Amazon and Flipkart, which are used for buying products for our home and [inaudible] for connecting friends and family members on a daily basis". **Participant 13** from India asserted:

> [i]n my case, I use the shuttle app or the Ula app almost daily, even on weekends when I have to travel, because there's no dedicated shuttle service to the office on a weekend. So, I do the bookings through the shuttle, or it has an account. Then at the same time, if you talk about the daily apps, many a times you have to deliver, get the groceries delivered. If not daily, at least after two to three days you can use it. There are certain apps which would be used every day. In my case it would be a travel app, for others it would be something else.

Some participants demonstrated that they use mobile apps based on the advice they are given by friends and family. **Participant 15** said, "[y]es. But this is my point of view, people usually download it if their friends tell them that they should […]."

Reinforcing this notion, **Participant 12** posited:

> Indians, we move by faith. So, if somebody tells us, you know, do this, it will work out for you, definitely people will do it. At least 30 out of 50 people will do it. Perhaps not the young generation, but people of, you know, in their forties or fifties, if they are using apps, if they are comfortable with technology, they will definitely do it. Younger generations might not do it.

Thus, the eleventh proposition from the qualitative analysis is:

Eleventh proposition: 'User environment' is related to 'intention to use'.

From the information provided, **Participant 21** also argued:

> [t]he best sources, I'll talk to somebody in the bank itself. I'll get their point of view, I'll check internally with my contacts, my network, my friends, if they have used it. I'll check on google how effective this is, if there is any loophole which might affect me later on. So, based on that I'll make a call whether I should go ahead with it or not.

The research highlights that participants' social circles certainly have an influence on their adoption of digital devices.

5.5.12 Linking the Themes to the Propositions

Table 37 clearly articulates the main themes found in the qualitative analysis and how these link back to the sub-themes and the eleven propositions that were formed as a result. The various sub-themes were explicitly noted in terms of which support the propositions, and which negate or have no implications for a proposition.

The propositions below were used to derive a digital adoption model that can be tested quantitatively, according to a sequential mixed-methods design. The supporting statements (as mentioned in sections 5.5.1 to 5.5.11) for Table 37 were highlighted in each proposition, and the direct quotes from participants were used to support or negate the propositions.

The eleven themes are as follows:

- Theme One: Cyber security (perceived risk)
- Theme Two: Intuitive design (perceived ease of use)
- Theme Three: Convenience and value proposition offered (perceived value)
- Theme Four: Trial periods (trialability)
- Theme Five: Protection of personal information (privacy)

- Theme Six: Knowledge of mobile apps (awareness)
- Theme Seven: Digital Enablement (access)
- Theme Eight: Cost associated with using the digital solution (affordability)
- Theme Nine: Ecosystem value proposition (lifestyle integration)
- Theme Ten: Feedback and ratings (customer feedback)
- Theme Eleven: Society influence and facilitating conditions (user environment)

The derivation of some of the propositions listed in Table 37 are noted, as well as which propositions had no implications and were excluded. A grounded approach was used to obtain useful insights from the literature, which informed some of the models from the qualitative analysis. Thus, the table below also illustrates how the themes led to the derived hypotheses.

Table 37

Alignment of Main Sub-Themes to Propositions and Hypotheses

Main theme	Sub-theme	Supports proposition	Negates OR No impact on proposition
Ecosystem barriers	Digital culture	1, 3, 4, 5, 6, 7, 9, 10, 11	2
	Lifestyle integration	3, 4, 6, 7, 9, 11	0
	Hypothesis **H7a**: 'Lifestyle integration' is significantly and positively associated with 'intention to use'.		
	User environment	1, 3, 7, 9, 11	0
	Hypothesis **H6a**: 'User environment' is significantly and positively associated with 'intention to use'.		
	Customer feedback	1, 2, 4, 6, 10	0
	Hypothesis **H8a**: 'Customer feedback' is significantly and positively associated with 'intention to use'.		
	Downloading of apps	1, 2, 3, 6, 10, 11	7, 8
	Uninstalling apps	5, 10, 11	3, 4
	Frequency of usage	1, 3, 6, 7, 8, 9, 10, 11	2,4
Environmental barriers	Accessibility /Availability	4, 6, 7	0
	Hypothesis **H10**: 'Access' is significantly and positively associated with 'intention to use'.		
	Affordability	3, 4, 6, 8, 11	0

	Hypothesis **H11**: 'Affordability' is significantly and positively associated with 'intention to use'.		
	Awareness	1, 2, 3, 4, 6, 9, 11	0
	Hypothesis **H9a**: 'Awareness' is significantly and positively associated with 'intention to use'.		
Technological barriers	Trialability	1, 2, 4, 6	0
	Hypothesis **H1a**: 'Trialability' is significantly and positively associated with 'intention to use'		
	Complexity	2, 4, 6	1, 3, 9, 10
	Perceived risk	1, 4, 11	0
	Hypothesis **H3a**: 'Perceived risk' is significantly and negatively impacted by 'intention to use'.		
	Digital fraud	1, 4, 11	2, 3, 10
	Privacy	1, 5	0
	Hypothesis **H5a**: 'Privacy' has a significant positive relationship with 'intention to use'.		
	Cybercrimes	1, 5	2, 4, 8, 9
	Perceived ease of use	2, 4, 9, 11	0
	Hypothesis **H2a**: 'Perceived ease of use' is significantly and positively associated with 'intention to use'.		
	Perceived value	2, 3, 4, 6, 8, 9, 10, 11	0
	Hypothesis **H4a**: 'Perceived value' has a significant positive relationship with 'intention to use'.		
	Emotional value	3, 4, 6, 9, 11	1
	Time value	2, 3, 4, 9	1,5, 10
	Functional value	2, 3, 4, 6, 8, 9, 11	1
	Credibility	3, 4, 5, 6, 9, 11	1, 10
	Economic value	3, 4, 6, 8, 9	1, 11
	Incentives	3, 4, 6, 8, 9, 11	1, 2

5.6 Word Cloud of the Most Frequently Used Words

Word cloud is a method for visually presenting text with the most common words utilised in transcribed scripts to highlight the key words used in the research (QSR International, 2014). In this study, the most frequently used keywords appear in the Word cloud format; presenting

these trends and patterns in tabular format would have been less effective (QSR International, 2014; Saldaña, 2015). Most of the keywords were used as codes or sub-codes that were later merged into a theme (Bletzer, 2015; Saldaña, 2015). Figure 24 illustrates the key words assembled from this study.

Figure 24

Most Frequently Used Words



5.7 Comparison Analysis

This section explores the opinions of participants and compares them across relevant demographic clusters.

Table 38

Comparison Analysis

Nationality	Customer feedback	Lifestyle integration	User environment
India	32	30	34
South Africa	19	16	25

Figure 25

Comparison Across Nationality and Ecosystem Barriers

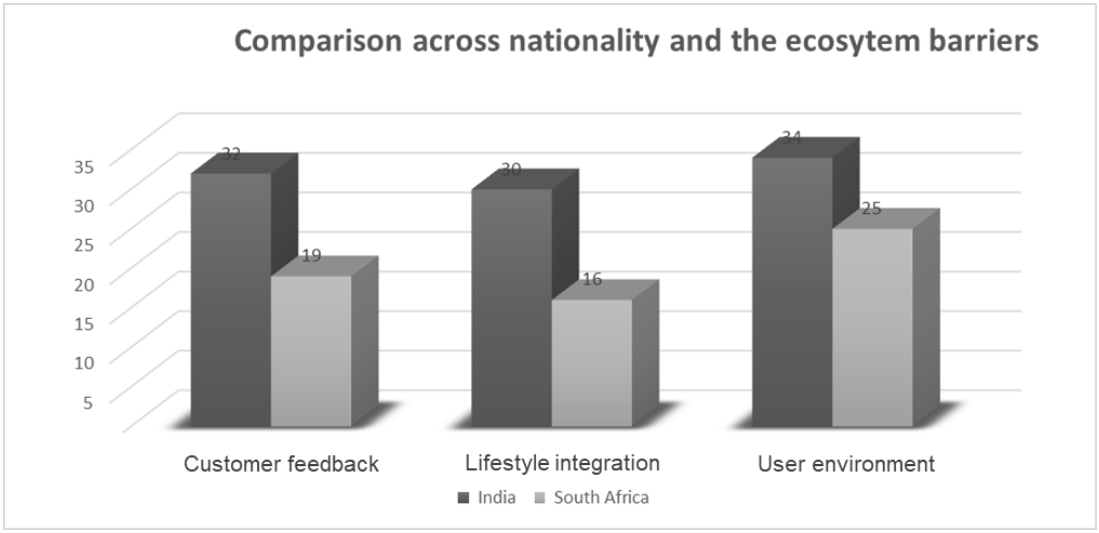


Figure 25 and Table 38 provide a comparison across nationalities and underpinning ecosystem factors that drive digital (mobile app) adoption. It is interesting to note that participants from India provided more insight on customer feedback (32 references), whereas participants from South Africa contributed 19 references. This is evident in the other two factors of lifestyle integration, where participants from India provided 30 references and those from South Africa provided 16.

The figures in Table 38 indicate the number of references (in other words, the number of times) information relating to code was coded from India or South Africa, respectively. A total of 32 references on customer feedback were retrieved from Indian participants, while only 19 references were retrieved from South African participants.

Table 39

Comparison Analysis

Nationality	Accessibility	Availability	Affordability	Awareness
India	17	15	60	36
South Africa	29	27	63	21

Figure 26

Comparison Across Nationality and Emerging Market Factors

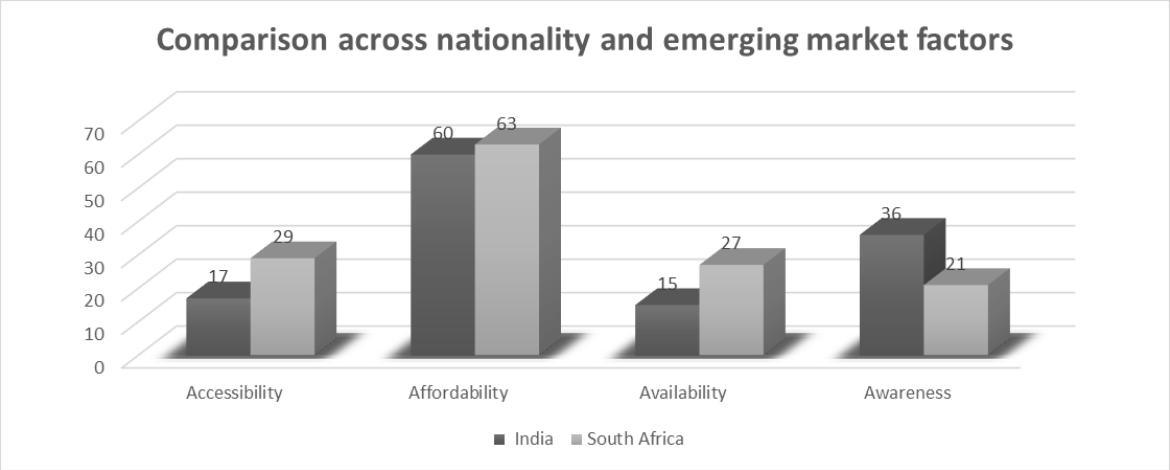


Table 39 and Figure 26 illustrate how participants from different nationalities discussed factors that support emerging market theory. Table 39 and Figure 26 represent the number of quotations on digital adoption in emerging markets. South African participants contributed more insight in relation to the notion of accessibility. They contributed 29 references/quotations, as compared to Indian participants, who contributed 17. However, with regard to awareness, participants in India contributed more information than South African participants. Indian participants contributed 36 references, while South African participants contributed 21 references.

Participants from India contributed more information on the perceived value of using digital devices. They contributed 118 references, while South African participants contributed 59 references. The same was true with 'trialability', where participants from India contributed 17

references and South African participants contributed nine. People from India are therefore less likely to purchase technological devices without trying them first. Participants from South Africa contributed more information on ‘complexity’. More South African participants stated that they sometimes do not have the required knowledge to either download or use technological features, such as apps.

5.8 Conclusion

This chapter reported on and interpreted the results of the grounded qualitative analysis. A grounded analysis allows for an understanding of relationships that are independent of the constraints of pre-existing theories; relationships grounded in a specific context. Using thematic analysis, data was analysed, themes were created, and propositions were derived.

A rationale was provided for the testing of these propositions as hypotheses in the quantitative portion of the research. For instance, the first proposition related perceived risk to intention to use.

The next chapter reports on the quantitative results of the study. These results form part of the holistic analysis undertaken in Chapter Seven, from which recommendations are derived and presented in Chapter Eight.

CHAPTER SIX
QUANTITATIVE ANALYSIS

6.1 Introduction

This chapter extends the work of previous chapters to report on the results of the empirical testing of the hypotheses. In the previous chapter, qualitative findings were used to derive propositions which together with a review of theory and literature were developed into hypotheses. The qualitative research provided insight into the factors that drive mobile-app adoption in emerging markets. The derived model was based on the qualitative analysis. Thereafter, the derived model provided theoretical associations in the form of propositions that were tested as hypotheses to provide quantitative insight. This insight offered a holistic perspective of factors that drive digital (mobile app) adoption in emerging markets. The derived themes from the qualitative study are tested and reported on in this chapter.

6.2 Demographics

Descriptive results were analysed on SPSS® Statistics version 25 to screen the data and identify typographical errors. For this analysis, no missing values were found from the responses on the constructs. This was as a result of validation criteria being in place before respondents could submit (i.e. fields were made mandatory for digital surveys submitted). For the face-to-face surveys, the researcher ensured that respondents completed all the questions.

Table 40

Demographics of Participants

Country	Frequency	Valid percent (%)
India	1 052	51.0
South Africa	1 009	48.9
Total	**2 061**	**100.0**

The sample population was carefully selected to ensure both South Africa and India were equally represented. This resulted in 51.0% respondents from India and 49% from South Africa. In terms of gender, males constituted a majority 69.5%, while females constituted a minority 30.3%. In South Africa, women constituted 50.6% of the participants, while men constituted 49.3% (see Table D1 in Appendix D). The overall age of respondents from both South Africa and India shows that they were in their 30s (India, mean = 30 years; South Africa,

mean = 33 years) (see Table D2 in Appendix D). From the results, it was evident that most of the participants from both India (76.4%) and South Africa (88.8%) resided in urban areas (see Table D3 in Appendix D). According to the results, most of the Indian participants had a gross income of R4 001 – R5 000/INR20 001 – R25 000 (18.6%). In South Africa, the highest percentage (13.7%) had a gross income of more than R30 000/INR150 000 per month (see Table D4 in Appendix D). Respondents were asked to indicate which type of devices they owned. The results show that most of the participants from India owned mobile phones (55.5%). In South Africa, most of the participants own more than one device, such as a mobile phone, tablet, computer, smart device, smart TV, and so forth (28.9%) (see Table D5 in Appendix D). Participants were asked to indicate the frequency with which they use mobile apps. According to the results, the majority of respondents in India use mobile apps several times a day (76.3%), which was more than those in South Africa (42.5%) (see Table D6 in Appendix D).

The data reported above illustrates the representivity that the study aims to achieve by ensuring the participants in the study were from both urban and rural areas, had varying income levels, owned mobile devices and had experience with technology, and were from different age groups.

Table 41

Home Language of Participants

Home language			
Country	**Language**	**Frequency**	**Valid percent**
India	Bengali	205	19.5
	English	5	0.5
	Gujarati	108	10.3
	Hindi	486	46.2
	Marathi	140	13.3
	Odia	1	0.1
	Tamil	1	0.1
	Telugu	106	10.1
	Total	**1 052**	**100.0**
South Africa	Afrikaans	115	11.4

	Bengali	3	0.3
	English	137	13.6
	French	1	0.1
	Hindi	7	0.7
	Marathi	1	0.1
	Ndebele	28	2.8
	Portuguese	1	0.1
	Sepedi	118	11.7
	Setswana	28	2.8
	Shona	1	0.1
	Southern Sesotho	108	10.7
	SiSwati	9	0.9
	Xitsonga	12	1.2
	Tshivenda	34	3.4
	Xhosa	163	16.2
	Zulu	243	24.1
	Total	**1 009**	**100.0**

Table 41 shows that the majority of Indian people who contributed to the study spoke Hindi (46.2%); in South Africa, the majority were Zulu speakers (24.1%). This aligns to the language demographics of the respective countries, indicating that the same population adequately represented both countries.

Table 42

Length of Time That Participants Have Used Mobile Apps For

How long have you used mobile apps for?	
India	**South Africa**
Mean	**Mean**
5	10

The results in Table 42 show the overall number of years that most of the respondents had been using mobile apps for, with most in India (mean = 5) having used mobile apps for five years, and most in South Africa (mean = 10) having used them for ten years. This suggests that participants in the surveys have adequate experience with using mobile apps.

With regard to features on digital devices used most often by participants, the results in Table D7 (see Appendix D) indicate that the highest number of participants from both India (39.8%) and South Africa (48.0%) used common features more often, such as WhatsApp; social media (such as Facebook and Twitter); search engines (such as Google and Yahoo); entertainment (such as YouTube and music); mobile banking; gaming (such as Angry Birds and Candy Crush); online shopping (such as Amazon, Takealot, Flipkart, and Uber Eats); and features related to lifestyle needs (such as Uber, or logging a complaint).

6.3 Central Tendency Measure of the Constructs

All the constructs investigated were measured on the six-point Likert scale; the values vary from 1 (‘strongly disagree’) to 6 (‘strongly agree’). The mid-point of the six-point Likert scale was therefore 3. Mean values below 3 suggest that most participants tend to disagree with the statements that measured a certain construct. Values between 3 and 3.5 indicate that participants tended to slightly disagree or slightly agree (neutral). Mean values above 3.5 reflect that the majority of participants tended to either agree or strongly agree with the statements measuring the construct in question.

From the results, all the constructs for South Africa and India (trialability, perceived usefulness, perceived ease of use, perceived risk, protection of information, behavioural intention, user environment, lifestyle integration, customer feedback, awareness, affordability, availability/access) have a mean of above 3.5, meaning that the majority of the respondents tended to agree with items measuring each construct in the questionnaire (all output tables are presented in Appendix E).

6.4 Assessment of Normality

Normality is an essential requirement for applying multivariate analysis (Hair et al., 2014). It takes into consideration the form of the data dispersal for a variable and its alignment to the normal distribution (Shiau et al., 2019). Larger sample sizes generally minimise the effects of non-normality, whereas the effects of non-normality receive more focus in smaller sample sizes (Shiau et al., 2019).

Table F1 (see Appendix F) indicates skewness and kurtosis coefficients of all the items that appear in the final model. Generally, the value for skewness and kurtosis is between -2 and +2, and this is considered acceptable to suggest normal univariate distribution (George & Mallery, 2010). With regard to the issue of normality, Field (2014:172) points out that for a sample size above 167, such as the one in this study, the central limit theorem stipulates that the assumption of normality on the data-analysis results will approximate a normal distribution. This means that all items with skewness and kurtosis of above -2 and +2 will not affect the overall results of the data analysis (Field, 2009; Pallant, 2007).

6.4.1 Confirmatory Factor Analysis (CFA)

In this study, SEM was used to analyse structural relationships (Cohen, 2013; Shiau et al., 2019). SEM offers a convenient framework for statistical analysis that encompasses several multivariate methods; these include factor analysis (FA), regression analysis, discriminant analysis, and canonical correlation (Capmourteres & Anand, 2016; Chen & Lin, 2010). SEM incorporates the measurement model and the structural model (Hair et al. 2010). According to Hoyle (2011), Kline (2010), and Fan and Sivo (2016), a measurement model evaluates the latent variables or composite variables, although the structural model assesses all the hypothetical dependencies, which is dependent on path analysis.

6.4.1.1 Reliability of the Scales

In this study, the measurement model was used to confirm the structure of the construct through CFA. Cronbach's alpha was used to measure the internal consistency of the constructs. Cronbach’s alpha is a measure based on correlations between items in a construct. It is obtained by dividing the sum of the variances of the items constituting a scale by the general variance, taking a value between 0 and 1. Values beyond the 0.7 threshold indicate that the scale is reliable. Values below 0.6 reveal the reliability of the scale to be low (Field, 2014; Karagöz, 2016). Although there is a rule of thumb of 0.7, in extreme cases, a Cronbach’s alpha of 0.6 is sometimes permissible when the reliability of the construct was already established in previous studies (Abraham & Barker, 2014; Shiau et al., 2019; Wild, 2015). The overall results in Table 43 indicate a good reliability of all the scales involved in the study, for both South Africa and India.

Construct reliability (CR) is another measure of internal consistency in scale items, much like Cronbach's alpha (Netemeyer et al., 2003). The threshold of CR is 0.7, although a low CR of 0.6 can be accepted. The acceptance of a 0.6 CR depends upon whether previous studies also reported a coefficient of 0.6. (Brunner & Süß, 2005; Ketchen & Bergh, 2006; Shiau et al., 2019; Field, 2014; Pallant, 2007).

6.4.1.2 Convergent Validity

As recommended by Hair et al. (2010) and Shiau et al. (2019), convergent validity can be examined with both the Average Variance Extracted (AVE) and factor loadings (both values are expected to be above 0.5). Table 43 shows that the factor loadings of the majority of the constructs are all above the recommended threshold of 0.5 (Field, 2014). Similarly, the AVEs of all the constructs are above the required cut-off of 0.5 (Chin et al., 1997).

All the results statistically support a convergent validity of the items that appear in the measurement model. This means that all the items selected are acceptable measures of their respective constructs. The statistical evidence of discriminant validity is assessed and discussed by analysing the matrix of correlations and AVE square-root coefficients (see Table 43).

6.4.1.3 Model Fit Indices

Table 43

Statistical Evidence of Convergent Validity and Reliability Analysis

	Cronbach's alpha (should be above 0.7)	**Composite reliability (should be above 0.7)**	**AVE (should be above 0.5)**
South Africa			
Access	0.730	0.847	0.650
Affordability	0.691	0.824	0.617
Awareness	0.804	0.870	0.626
Behavioural intention	0.894	0.919	0.655
Customer feedback	0.829	0.887	0.662
Lifestyle integration	0.819	0.874	0.581
Perceived ease of use	0.915	0.934	0.702
Privacy	0.852	0.899	0.690
Perceived risk	0.732	0.832	0.553
Perceived usefulness	0.902	0.928	0.719
Trialability	0.843	0.889	0.617
User environment	0.813	0.860	0.507
India			
Access	0.885	0.916	0.686
Affordability	0.783	0.860	0.608
Awareness	0.865	0.903	0.650
Behavioural intention	0.874	0.905	0.613
Customer feedback	0.821	0.882	0.651
Lifestyle integration	0.857	0.894	0.584
Perceived ease of use	0.892	0.917	0.648
Privacy	0.878	0.908	0.621
Perceived risk	0.827	0.878	0.591
Perceived usefulness	0.880	0.909	0.626
Trialability	0.843	0.888	0.615
User environment	0.856	0.893	0.581

Table 44

Model Fit Indices

With D India	Saturated Model	Estimated Model
SRMR	**0.040**	**0.040**
d_ULS	**3.707**	**3.831**
d_G	**1.495**	**1.542**
Chi-Square	**11994.071**	**12203.360**
NFI	**0.861**	**0.858**
No D India	**Saturated Model**	**Estimated Model**
SRMR	**0.050**	**0.051**
d_ULS	**5.212**	**5.338**
d_G	**1.597**	**1.648**
Chi-Square	**9491.995**	**9653.839**
NFI	**0.819**	**0.816**
With D SA	**Saturated Model**	**Estimated Model**
SRMR	**0.061**	**0.065**
d_ULS	**8.663**	**9.990**
d_G	**1.919**	**2.069**
Chi-Square	**18258.660**	**19086.514**
NFI	**0.811**	**0.802**
No D SA	**Saturated Model**	**Estimated Model**
SRMR	**0.082**	**0.086**
d_ULS	**13.851**	**15.373**
d_G	**2.053**	**2.168**
Chi-Square	**12058.525**	**12445.401**
NFI	**0.715**	**0.706**

Table 45

Discriminant Validity Analysis

The bold values noted below are the square roots of the AVE used for discriminant validity.

	ACC	AFF	AWS	BI	CF	LI	PEU	PPI	PR	PU	TB	UE
South Africa												
ACC	**0.806**											
AFF	0.420	**0.786**										
AWS	0.391	0.588	**0.791**									
BI	0.399	0.659	0.728	**0.809**								
CF	0.388	0.603	0.666	0.700	**0.814**							
LI	0.437	0.653	0.672	0.774	0.726	**0.762**						
PEU	0.359	0.653	0.670	0.810	0.649	0.755	**0.838**					
PPI	0.213	0.585	0.472	0.635	0.516	0.633	0.651	**0.831**				
PR	0.318	0.580	0.643	0.728	0.644	0.646	0.713	0.563	**0.743**			
PU	0.324	0.644	0.642	0.784	0.653	0.741	0.862	0.657	0.680	**0.848**		
TB	0.301	0.639	0.613	0.728	0.631	0.733	0.818	0.721	0.662	0.828	**0.786**	
UE	0.344	0.532	0.544	0.689	0.598	0.613	0.576	0.514	0.620	0.545	0.548	**0.712**
India												
ACC	**0.828**											
AFF	0.771	**0.780**										
AWS	0.865	0.805	**0.806**									
BI	0.874	0.826	0.850	**0.783**								
CF	0.827	0.825	0.840	0.846	**0.807**							
LI	0.833	0.810	0.859	0.844	0.813	**0.764**						
PEU	0.865	0.826	0.860	0.886	0.840	0.842	**0.805**					
PPI	0.863	0.842	0.841	0.855	0.827	0.850	0.871	**0.788**				
PR	0.822	0.817	0.830	0.831	0.802	0.821	0.830	0.837	**0.769**			
PU	0.861	0.842	0.859	0.878	0.842	0.855	0.864	0.869	0.823	**0.791**		
TB	0.790	0.793	0.811	0.804	0.802	0.799	0.805	0.806	0.813	0.807	**0.784**	
UE	0.755	0.785	0.771	0.762	0.773	0.825	0.776	0.809	0.805	0.792	0.753	**0.762**

Note. ACC: access; AFF: affordability; AWS: awareness; BI: behavioural intention; CF: customer feedback; LI: lifestyle integration; PEU: perceived ease of use; PPI: protection of personal information; PR: perceived risk; PU: perceived usefulness; TB: trialability; UE: user environment.

Discriminant validity is used to assess the similarities that exist between constructs. The statistical evidence of discriminant validity is assessed through a comparison between the square root of the AVE estimates and the highest inter-construct correlation of the specific construct (Malhotra et al., 2017). The square root of the AVE is expected to be above all the

inter-construct correlation values; however, according to Rahim and Magner (1995), small variances between the reported figures may be considered. Table 45 presents the correlation matrix between the 12 constructs and the square root of the AVE of each construct (as noted by the values in bold that run across the table). In terms of discriminant validity, the results reflect that the correlation between each pair of scales did not exceed 0.9 (Hair et al., 1995), or 0.8 as suggested by Flavián et al. (2004), thus the constructs within the model were not highly correlated with each other. In addition, variance inflation factors (VIF) were also analysed, as noted in Table G36, with all individual factors scoring below 4.

6.5 Structural Model

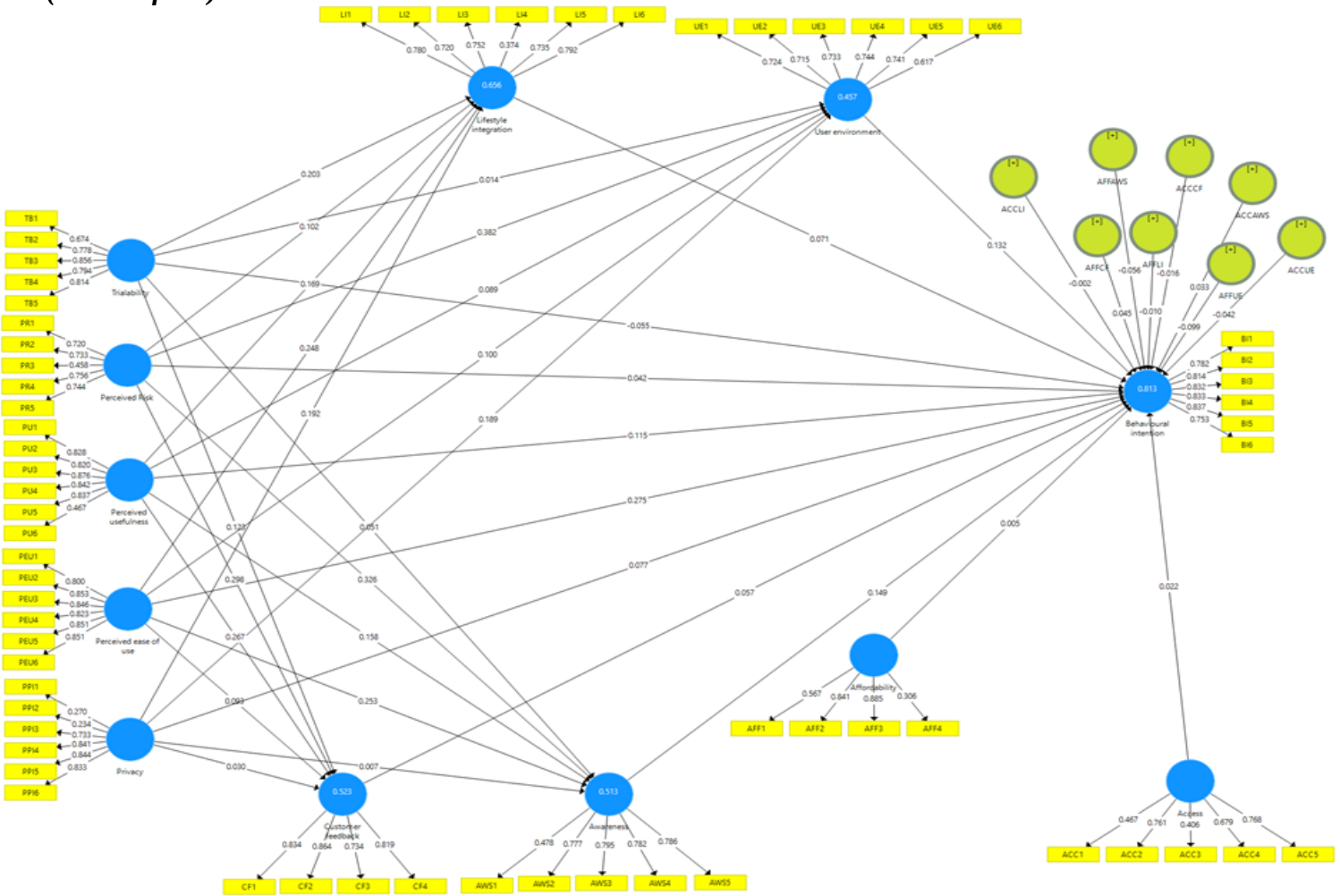
SmartPLS is commonly used in Partial Least Squares Structural Equation Modeling (PLS-SEM), as depicted by Ringle et al. (2005). SmartPLS is popular because it is easily available to academics and researchers, and it is easy to use and offers advanced reporting capabilities (Shiau et al., 2019; Wong, 2013). SEM is a second-generation multivariate data-analysis process that is frequently used in management research (digital adoption), due to the theoretical test it enables, which incorporates linear and additive causal models (Chin & Marcoulides, 1998; Haenlein & Kaplan, 2004; Statsoft, 2006). It allows researchers to estimate complex models with various constructs (Sarstedt & Cheah, 2019). This technique is recommended when the research objective is to test a conceptual model empirically (Hair et al., 2010; Shiau, 2019; Wong, 2013). It was adopted in this study because the study intended to develop and test a conceptual framework that consists of factors that are perceived to influence individual behavioural intention to adopt mobile apps.

The purpose of the structural model is to test the hypotheses in the study. Since the SmartPLS package was used in this study, the SEM analysis made use of a component-based approach. Figures 27 and 28 depict the structural model of this study. The initial structural model for both countries needed to be improved, as some of the items in the model were loading below 0.5 in their respective constructs. For instance, the construct ‘lifestyle integration’ for South Africa had six items, but item LI4 was deleted due to the low factor loading below 0.5. For India, the construct ‘affordability’ had five items, but item AFF5 was deleted to improve the model. It is important to note that the abbreviations used in the SEM schematic are the interaction variables (e.g. ACCAWS). They are automatically generated by SmartPLS when running moderation analyses. The structural models are presented below (Figures 27–30).

6.5.1 Structural Model (South Africa)

Figure 27

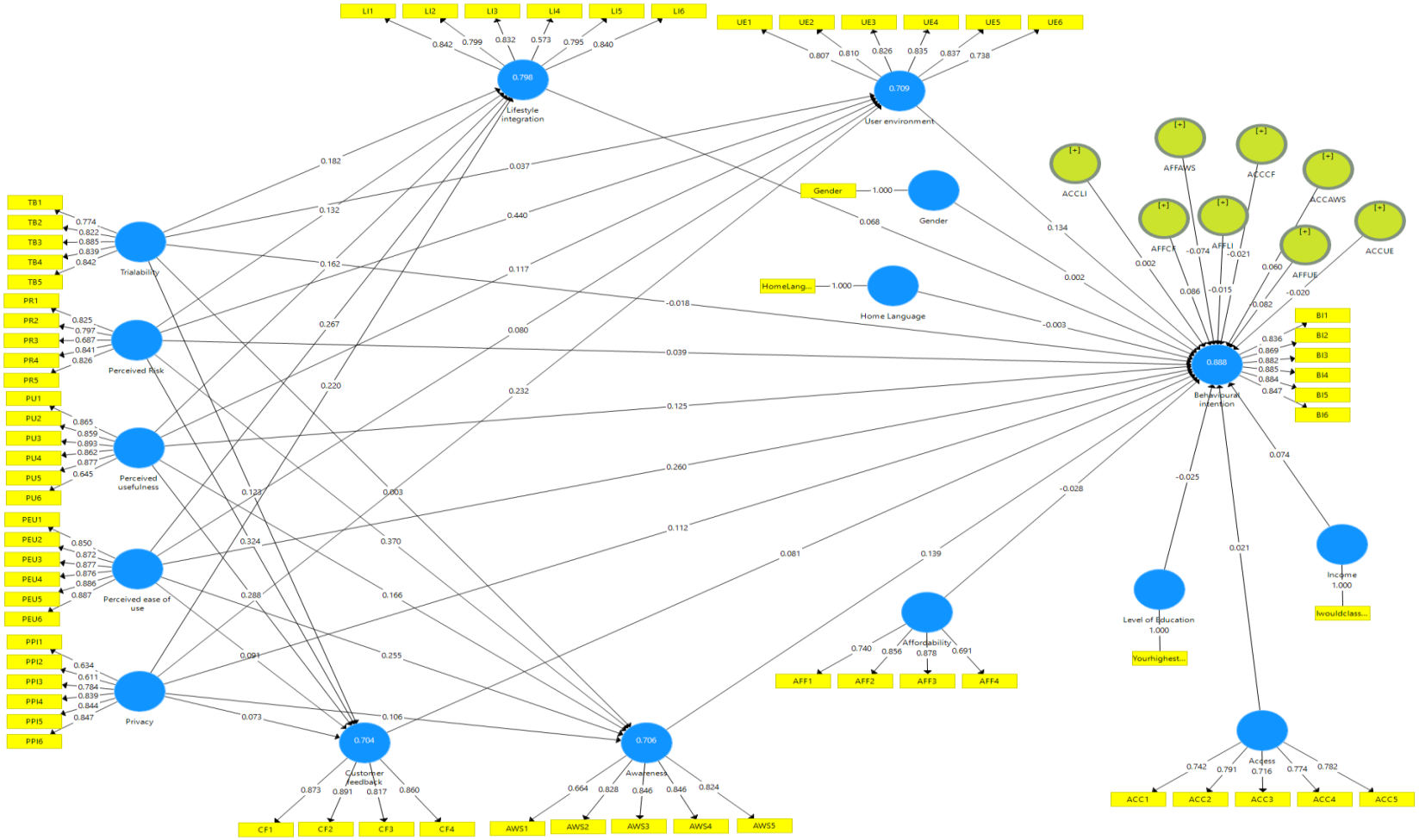
Structural Model (South Africa)



6.5.2 Structural Model (South Africa) with Demographics

Figure 28

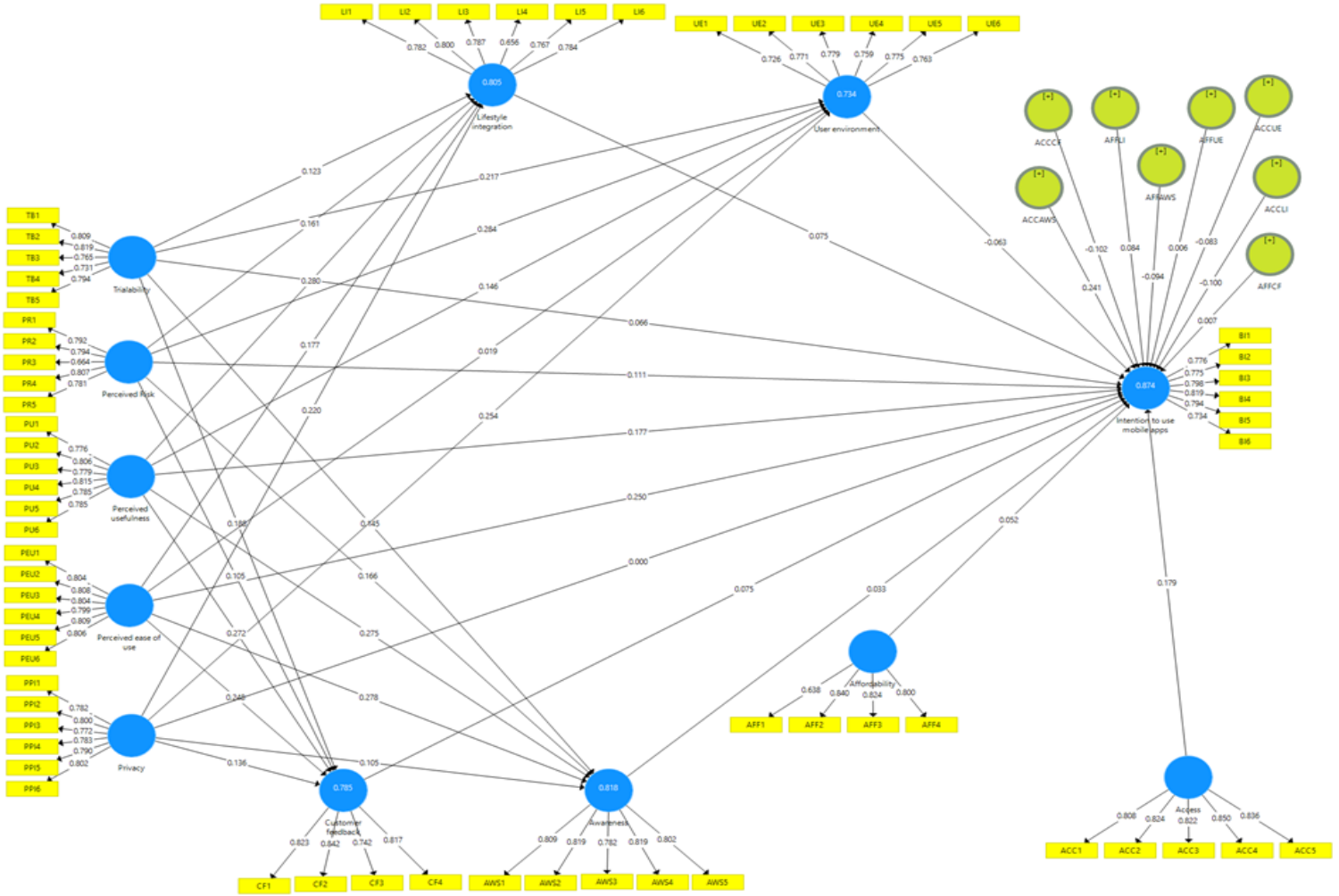
Structural Model (South Africa)



6.5.3 Structural Model (India)

Figure 29

Structural Model (India)



6.5.4 Structural Model (India) with Demographics

Figure 30

Structural Model (India)

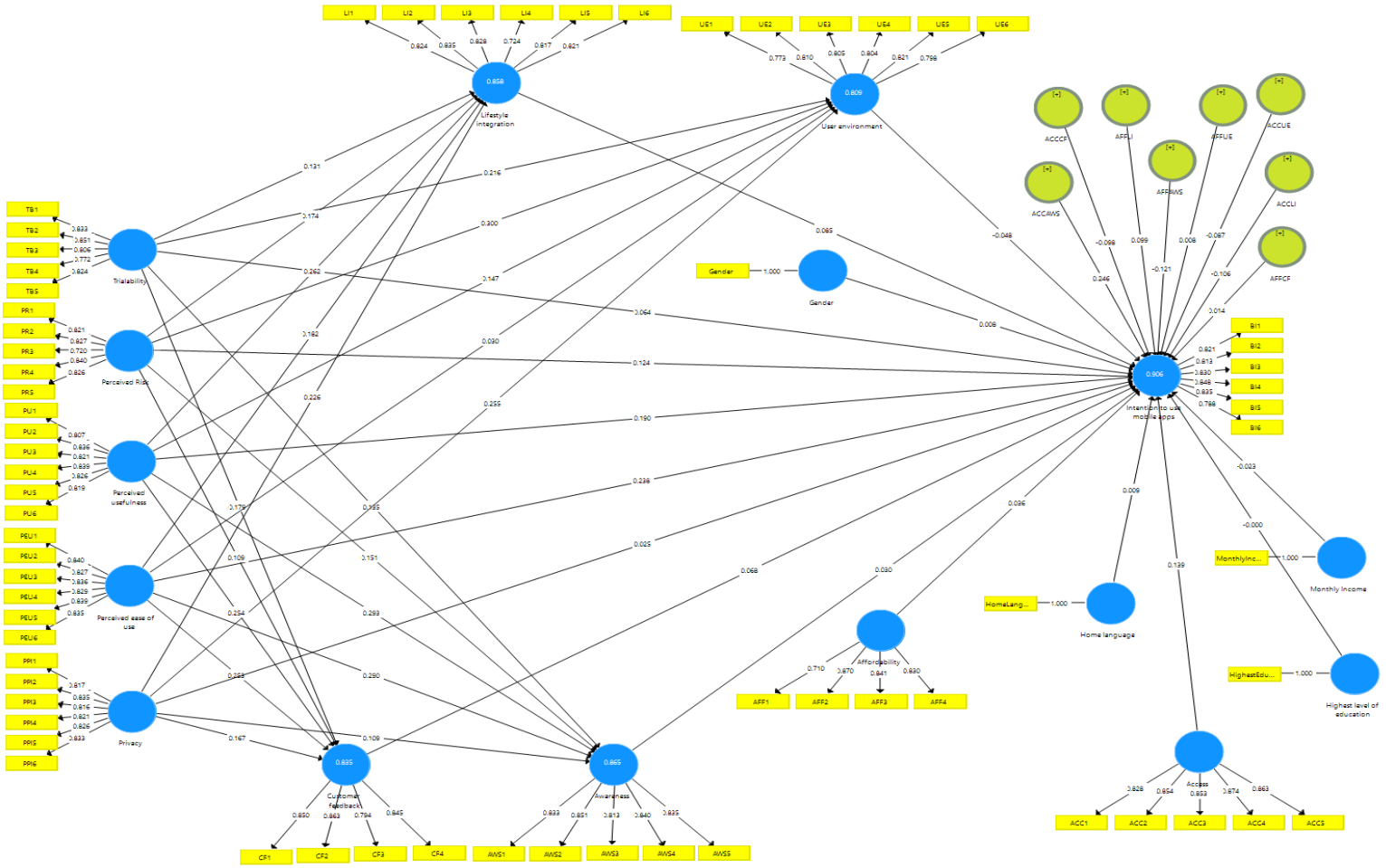


Table 46

Path Differences: South Africa

	Original Sample (No D)	P Values (No D)	Original Sample (With D)	P Values (With D)	Conclusion
ACCAWS -> behavioural intention	0.033	0.292	0.060	0.076	There is no significant change in this relationship.
ACCCF -> behavioural intention	–0.016	0.641	–0.021	0.562	There is no significant change in this relationship.
ACCLI -> behavioural intention	-0.002	0.940	0.002	0.963	There is no significant change in this relationship.
ACCUE -> behavioural intention	–0.042	0.190	–0.020	0.580	There is no significant change in this relationship.
AFFAWS -> behavioural intention	–0.056	0.032	–0.074	0.009	There is no significant change in this relationship.
AFFCF -> behavioural intention	0.045	0.155	0.086	0.006	There is a significant change in this relationship, as it is non-significant for No D and significant for D.
AFFLI -> behavioural intention	–0.010	0.770	–0.015	0.669	There is no significant change in this relationship.
AFFUE -> behavioural intention	–0.099	0.000	–0.082	0.010	There is no significant change in this relationship.
Access -> behavioural intention	0.022	0.247	0.021	0.238	There is no significant change in this relationship.

Affordability -> behavioural intention	0.005	0.839	–0.028	0.218	There is no significant change in this relationship.
Awareness -> behavioural intention	0.149	0.000	0.139	0.000	There is no significant change in this relationship.
Customer feedback -> behavioural intention	0.057	0.064	0.081	0.009	There is a significant change in this relationship, as it is non-significant for No D and significant for D.
Lifestyle integration -> behavioural intention	0.071	0.043	0.068	0.019	There is no significant change in this relationship.
Perceived risk -> awareness	0.326	0.000	0.370	0.000	There is no significant change in this relationship.
Perceived risk -> behavioural intention	0.042	0.153	0.039	0.146	There is no significant change in this relationship.
Perceived risk -> customer feedback	0.298	0.000	0.324	0.000	There is no significant change in this relationship.
Perceived risk -> lifestyle integration	0.102	0.002	0.132	0.000	There is no significant change in this relationship.
Perceived risk -> user environment	0.382	0.000	0.440	0.000	There is no significant change in this relationship.
Perceived ease of use -> awareness	0.253	0.000	0.255	0.000	There is no significant change in this relationship.
Perceived ease of use -> behavioural intention	0.275	0.000	0.260	0.000	There is no significant change in this relationship.

Perceived ease of use -> customer feedback	0.093	0.114	0.091	0.112	There is no significant change in this relationship.
Perceived ease of use -> lifestyle integration	0.248	0.000	0.267	0.000	There is no significant change in this relationship.
Perceived ease of use -> user environment	0.100	0.152	0.080	0.125	There is no significant change in this relationship.
Perceived usefulness -> awareness	0.158	0.006	0.166	0.002	There is no significant change in this relationship.
Perceived usefulness -> behavioural intention	0.115	0.009	0.125	0.001	There is no significant change in this relationship.
Perceived usefulness -> customer feedback	0.267	0.000	0.288	0.000	There is no significant change in this relationship.
Perceived usefulness -> lifestyle integration	0.169	0.001	0.162	0.000	There is no significant change in this relationship.
Perceived usefulness -> user environment	0.089	0.231	0.117	0.039	There is a significant change in this relationship, as it is non-significant for No D and significant for D.
Privacy -> awareness	0.007	0.818	0.106	0.000	There is a significant change in this relationship, as it is non-significant for No D and significant for D.

Privacy -> behavioural intention	0.077	0.001	0.112	0.000	There is no significant change in this relationship.
Privacy -> customer feedback	0.030	0.376	0.073	0.015	There is a significant change in this relationship, as it is non-significant for No D and significant for D.
Privacy -> lifestyle integration	0.192	0.000	0.220	0.000	There is no significant change in this relationship.
Privacy -> user environment	0.189	0.000	0.232	0.000	There is no significant change in this relationship.
Trialability -> awareness	0.051	0.317	0.003	0.946	There is no significant change in this relationship.
Trialability -> behavioural intention	-0.055	0.104	–0.018	0.519	There is no significant change in this relationship.
Trialability -> customer feedback	0.123	0.046	0.123	0.025	There is no significant change in this relationship.
Trialability -> lifestyle integration	0.203	0.000	0.182	0.000	There is no significant change in this relationship.
Trialability -> user environment	0.014	0.844	0.037	0.413	There is no significant change in this relationship.
User environment -> behavioural intention	0.132	0.000	0.134	0.000	There is no significant change in this relationship.

Table 47

Mediation Differences (South Africa)

	Original Sample (No D)	P Values (No D)	Original Sample (With D)	P Values (With D)	Conclusion
Perceived ease of use -> user environment -> behavioural intention	0.013	0.179	0.011	0.127	There is no significant change in this mediation analysis.
Trialability -> user environment -> behavioural intention	0.002	0.848	0.005	0.434	There is no significant change in this mediation analysis.
Perceived ease of use -> awareness -> behavioural intention	0.038	0.000	0.035	0.000	There is no significant change in this mediation analysis.
Trialability -> awareness -> behavioural intention	0.008	0.329	0.000	0.947	There is no significant change in this mediation analysis.
Perceived risk -> awareness -> behavioural intention	0.048	0.000	0.051	0.000	There is no significant change in this mediation analysis.
Trialability -> customer feedback -> behavioural intention	0.007	0.186	0.010	0.098	There is no significant change in this mediation analysis.
Perceived risk -> user environment	0.050	0.000	0.059	0.000	There is no significant change in this mediation analysis.

-> behavioural intention					
Privacy -> customer feedback -> behavioural intention	0.002	0.474	0.006	0.129	There is no significant change in this mediation analysis.
Perceived ease of use -> customer feedback -> behavioural intention	0.005	0.260	0.007	0.204	There is no significant change in this mediation analysis.
Privacy -> user environment -> behavioural intention	0.025	0.000	0.031	0.000	There is no significant change in this mediation analysis.
Privacy -> lifestyle integration -> behavioural intention	0.014	0.056	0.015	0.022	There is a significant change in this mediation, as it is non-significant for No D and significant for D.
Perceived ease of use -> lifestyle integration -> behavioural intention	0.018	0.066	0.018	0.037	There is a significant change in this mediation, as it is non-significant for No D and significant for D.
Perceived risk -> lifestyle integration -> behavioural intention	0.007	0.126	0.009	0.056	There is no significant change in this mediation analysis.
Perceived usefulness -> customer feedback ->	0.015	0.094	0.023	0.021	There is a significant change in this mediation, as it is non-significant for No D and significant for D.

behavioural intention					
Trialability -> lifestyle integration -> behavioural intention	0.014	0.067	0.012	0.035	There is a significant change in this mediation, as it is non-significant for No D and significant for D.
Perceived usefulness -> awareness -> behavioural intention	0.023	0.010	0.023	0.008	There is no significant change in this mediation analysis.
Privacy -> awareness -> behavioural intention	0.001	0.816	0.015	0.001	There is a significant change in this mediation, as it is non-significant for No D and significant for D.
Perceived risk -> customer feedback -> behavioural intention	0.017	0.073	0.026	0.011	There is a significant change in this mediation, as it is non-significant for No D and significant for D.
Perceived usefulness -> user environment -> behavioural intention	0.012	0.238	0.016	0.055	There is no significant change in this mediation analysis.
Perceived usefulness -> lifestyle integration -> behavioural intention	0.012	0.079	0.011	0.039	There is a significant change in this mediation, as it is non-significant for No D and significant for D.

Table 48

Control Variable Effects

Effect of the control variables in SA	Beta value	P value	Conclusion
Gender -> behavioural intention	0.002	0.844	These two variables had no effect on the demographic variable (DV), so it was not necessary to control them.
Home language -> behavioural intention	–0.003	0.720	
Income -> behavioural intention	0.074	0.000	These two variables are responsible for the changes observed.
Level of education -> behavioural intention	-0.025	0.028	
Effect of the control variables in India	**Original Sample (O)**	**P Values**	
Gender -> intention to use mobile apps	0.008	0.294	These three variables had no effect on the DV, so it was not necessary to control them.
Highest level of education -> intention to use mobile apps	–0.000	0.984	
Home language -> intention to use mobile apps	0.009	0.226	This variable is responsible for the changes observed.
Monthly income -> intention to use mobile apps	–0.023	0.040	

Table 49

Path Differences (India)

Relationships	Original Sample (No D)	P Values (No D)	Original Sample (With D)	P value (with D)	Conclusions
ACCAWS -> intention to use mobile apps	0.241	0.000	0.246	0.000	There is no significant change in this relationship.
ACCCF -> intention to use mobile apps	–0.102	0.050	–0.098	0.058	There is no significant change in this relationship.
ACCLI -> intention to use mobile apps	–0.100	0.069	–0.106	0.058	There is no significant change in this relationship.
ACCUE -> intention to use mobile apps	–0.083	0.128	–0.087	0.088	There is no significant change in this relationship.
AFFAWS -> intention to use mobile apps	–0.094	0.045	–0.121	0.011	There is no significant change in this relationship.
AFFCF -> intention to use mobile apps	0.007	0.858	0.014	0.714	There is no significant change in this relationship.
AFFLI -> intention to use mobile apps	0.084	0.045	0.099	0.022	There is no significant change in this relationship.
AFFUE -> intention to use mobile apps	0.006	0.893	0.008	0.837	There is no significant change in this relationship.
Access -> intention to use mobile apps	0.179	0.003	0.139	0.006	There is no significant change in this relationship.

Affordability -> intention to use mobile apps	0.052	0.304	0.036	0.388	There is no significant change in this relationship.
Awareness -> intention to use mobile apps	0.033	0.469	0.030	0.464	There is no significant change in this relationship.
Customer feedback -> intention to use mobile apps	0.075	0.120	0.068	0.093	There is no significant change in this relationship.
Lifestyle integration -> intention to use mobile apps	0.075	0.130	0.085	0.059	There is no significant change in this relationship.
Perceived risk -> awareness	0.166	0.001	0.151	0.001	There is no significant change in this relationship.
Perceived risk -> customer feedback	0.105	0.069	0.109	0.032	This relationship is non-significant without the demographics; it becomes significant when controlling for the demographics. So, there is a significant change of relationship.
Perceived risk -> intention to use mobile apps	0.111	0.018	0.124	0.004	There is no significant change in this relationship.
Perceived risk -> lifestyle integration	0.161	0.003	0.174	0.000	There is no significant change in this relationship.
Perceived risk -> user environment	0.284	0.000	0.300	0.000	There is no significant change in this relationship.

Perceived ease of use -> awareness	0.278	0.000	0.290	0.000	There is no significant change in this relationship.
Perceived ease of use -> customer feedback	0.248	0.001	0.253	0.000	There is no significant change in this relationship.
Perceived ease of use -> intention to use mobile apps	0.250	0.000	0.238	0.000	There is no significant change in this relationship.
Perceived ease of use -> lifestyle integration	0.177	0.017	0.182	0.006	There is no significant change in this relationship.
Perceived ease of use -> user environment	0.019	0.780	0.030	0.614	There is no significant change in this relationship.
Perceived usefulness -> awareness	0.275	0.000	0.293	0.000	There is no significant change in this relationship.
Perceived usefulness -> customer feedback	0.272	0.000	0.254	0.000	There is no significant change in this relationship.
Perceived usefulness -> intention to use mobile apps	0.177	0.002	0.190	0.000	There is no significant change in this relationship.
Perceived usefulness -> lifestyle integration	0.280	0.000	0.262	0.000	There is no significant change in this relationship.

Perceived usefulness -> user environment	0.146	0.021	0.147	0.010	There is no significant change in this relationship.
Privacy -> awareness	0.105	0.097	0.109	0.040	This relationship is non-significant without the demographics; it becomes significant when controlling for the demographics. So, there is a significant change of relationship.
Privacy -> customer feedback	0.136	0.037	0.167	0.004	There is no significant change in this relationship.
Privacy -> intention to use mobile apps	0.000	1.000	0.025	0.596	There is no significant change in this relationship.
Privacy -> lifestyle integration	0.220	0.001	0.226	0.000	There is no significant change in this relationship.
Privacy -> user environment	0.254	0.000	0.255	0.000	There is no significant change in this relationship.
Trialability -> awareness	0.145	0.001	0.135	0.001	There is no significant change in this relationship.
Trialability -> customer feedback	0.188	0.000	0.179	0.000	There is no significant change in this relationship.
Trialability -> intention to use mobile apps	0.066	0.136	0.064	0.100	There is no significant change in this relationship.

Trialability -> lifestyle integration	0.123	0.014	0.131	0.005	There is no significant change in this relationship.
Trialability -> user environment	0.217	0.000	0.216	0.000	There is no significant change in this relationship.
User environment -> intention to use mobile apps	-0.063	0.072	–0.048	0.131	There is no significant change in this relationship.

Table 50

Mediation Path Differences (India)

	Original Sample (No D)	**P Values (No D)**	**Original Sample (with D)**	**P Values (with D)**	**Conclusion**
Perceived ease of use -> awareness -> intention to use mobile apps	0.009	0.485	0.009	0.480	There is no significant change in this mediation analysis.
Perceived ease of use -> lifestyle integration -> intention to use mobile apps	0.013	0.221	0.016	0.122	There is no significant change in this mediation analysis.
Perceived usefulness -> awareness -> intention to use mobile apps	0.009	0.473	0.009	0.462	There is no significant change in this mediation analysis.
Perceived ease of use -> customer feedback -> intention to use mobile apps	0.019	0.147	0.017	0.116	There is no significant change in this mediation analysis.
Privacy -> customer feedback -> intention to use mobile apps	0.010	0.216	0.011	0.153	There is no significant change in this mediation analysis.

Perceived usefulness -> customer feedback -> intention to use mobile apps	0.021	0.152	0.017	0.144	There is no significant change in this mediation analysis.
Privacy -> lifestyle integration -> intention to use mobile apps	0.016	0.168	0.019	0.100	There is no significant change in this mediation analysis.
Trialability -> awareness -> intention to use mobile apps	0.005	0.495	0.004	0.494	There is no significant change in this mediation analysis.
Perceived risk -> customer feedback -> intention to use mobile apps	0.008	0.232	0.007	0.206	There is no significant change in this mediation analysis.
Perceived usefulness -> user environment -> intention to use mobile apps	-0.009	0.157	–0.007	0.194	There is no significant change in this mediation analysis.
Trialability -> user environment -> intention to use mobile apps	-0.014	0.103	–0.010	0.131	There is no significant change in this mediation analysis.
Privacy -> user environment -> intention to use mobile apps	–0.016	0.121	–0.012	0.163	There is no significant change in this mediation analysis.
Privacy -> awareness -> intention to use mobile apps	0.003	0.553	0.003	0.562	There is no significant change in this mediation analysis.
Perceived risk -> user environment -> intention to use mobile apps	–0.018	0.120	–0.014	0.169	There is no significant change in this mediation analysis.
Perceived usefulness -> lifestyle integration ->	0.021	0.160	0.022	0.098	There is no significant change in this mediation analysis.

intention to use mobile apps					
Perceived risk -> awareness -> intention to use mobile apps	0.005	0.482	0.005	0.488	There is no significant change in this mediation analysis.
Perceived ease of use -> user environment -> intention to use mobile apps	–0.001	0.813	–0.001	0.675	There is no significant change in this mediation analysis.
Perceived risk -> lifestyle integration -> intention to use mobile apps	0.012	0.184	0.015	0.108	There is no significant change in this mediation analysis.
Trialability -> customer feedback -> intention to use mobile apps	0.014	0.159	0.012	0.141	There is no significant change in this mediation analysis.
Trialability ->lifestyle integration -> intention to use mobile apps	0.009	0.254	0.011	0.143	There is no significant change in this mediation analysis.

6.5.5 R Squares - Coefficient of multiple determination for multiple regression (After Improvement)

Table 51

R Squares (After Improvement)

	R Square	R Square adjusted
South Africa		
BI	0.795	0.793
India		
BI	0.865	0.863

Table 51 represents the R squared statistics of dependent variables in both models. The R squared (R^2) represents the variance of the dependent variable. This alludes to the proportion of the variance explained in the dependent variable. The results show that trialability, perceived

risk, access, awareness, lifestyle integration, protection of personal information, customer feedback, perceived usefulness, perceived ease of use, and affordability explained up to 79.3% of behavioural intention in South Africa, and 86.3% of behavioural intention in India. This indicates that the model incorporates an important set of drivers of behavioural intention. These drivers explain a large proportion of behavioural intention; where it is important to identify the contribution of each driver on behavioural intention.

Conclusions of the hypotheses (below) are primarily based on the p-value. Any p-value below 0.05 means that there is a significant relationship; and any p-value above 0.05 means there is a non-significant relationship. However, the p-value is somewhat arbitrary. The p-value was chosen, as is common in the literature. However, an increase in sample size can change the significance of a relationship and this was taken into consideration (Shiau et al., 2019). The results are presented in Table 52.

6.5.6 The Results of the Structural Model

Table 52

Structural Model Results

Relationships	Original sample (Standardised beta coefficient)	P-values	Conclusion
South Africa			
Access -> behavioural intention	0.019	0.185	**Access** does not have a significant association on **behavioural intention.** This means improving **access** may not translate into an improvement of **behavioural intention**.
Affordability -> behavioural intention	0.026	0.291	**Affordability** does not have a significant association on **behavioural intention.** This means improving **affordability may** not translate into an improvement of **behavioural intention**.
Awareness-> behavioural intention	0.170	0.000	**Awareness** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **access** may result in a 17% increase of the standard deviation of **behavioural intention**.
Customer feedback-> behavioural intention	0.038	0.242	**Customer feedback** does not have a significant association on **behavioural intention.** This means improving **customer feedback** may not translate into an improvement **of behavioural intention**.
Lifestyle integration -> behavioural intention	0.139	0.000	**Lifestyle integration** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **lifestyle**

			integration may result in a 13.9% increase of the standard deviation of **behavioural intention**. In other words, it means lifestyle integration has a positive and significant association. This means that it may translate into an improvement in **behavioural intention**.
Perceived ease of use-> behavioural intention	0.263	0.000	**Perceived ease of use** has a positive and significant association on **behavioural intention**. This means that an increase of one (1) standard deviation of **perceived ease of use** may result in a 26.3% increase of the standard deviation of **behavioural intention**.
Privacy -> behavioural intention	0.078	0.003	**Privacy (protection of personal information)** has a positive and significant association on **behavioural intention**. This means that an increase of one (1) standard deviation of **protection of personal information** may result in a 7.8% increase of the standard deviation of **behavioural intention**.
Perceived risk -> behavioural intention	0.097	0.002	**Perceived risk** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **perceived risk** may result in a 9.7% increase of the standard deviation of **behavioural intention**.
Perceived usefulness -> behavioural intention	0.172	0.000	**Perceived usefulness** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **perceived usefulness** may result in a 17.2% increase of the standard deviation of **behavioural intention**.
Trialability -> behavioural intention	-0.062	0.087	**Trialability** does not have a significant association on **behavioural intention.** This means improving trialability may not translate into an improvement in **behavioural intention**.

User environment -> behavioural intention	0.187	0.000	**User environment** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **user environment** may result in an 18.7% increase of the standard deviation of **behavioural intention**.
India			
Access-> behavioural intention	0.203	0.000	**Access** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **access** may result in a 20.3% increase in the standard deviation of **behavioural intention**.
Affordability -> behavioural intention	0.069	0.149	**Affordability** does not have a significant association on **behavioural intention.** This means improving **affordability** may not translate into an improvement of **behavioural intention**.
Awareness -> behavioural intention	-0.011	0.819	**Awareness** does not have a significant association on **behavioural intention.** This means improving **awareness** may not translate into an improvement in **behavioural intention.**
Customer feedback -> behavioural intention	0.099	0.046	**Customer feedback** has a positive and significant association on **behavioural intention**. This means that an increase of one (1) standard deviation of **customer feedback** may result in a 9.9% increase in the standard deviation of **behavioural intention**.
Lifestyle integration -> behavioural intention	0.083	0.122	**Lifestyle integration** does not have a significant association on **behavioural intention.** This means improving **lifestyle integration** may not translate into an improvement in **behavioural intention.**
Perceive ease of use -> behavioural intention	0.234	0.000	**Perceived ease of use** has a positive and significant association on **behavioural intention**. This means that an increase of one (1) standard deviation of **perceived**

			ease of use may result in a 23.4% increase in the standard deviation of **behavioural intention**.
Privacy -> behavioural intention	0.001	0.977	**Privacy (protection of personal information)** does not have a significant association on **behavioural intention.** This means improving **privacy** may not translate into an improvement in **behavioural intention**.
Perceived risk-> behavioural intention	0.083	0.084	**Perceived risk** does not have a significant association on **behavioural intention.** This means improving **perceived risk** may not translate into an improvement of **behavioural intention**.
Perceived usefulness-> behavioural intention	0.175	0.005	**Perceived usefulness** has a positive and significant association on **behavioural intention.** This means that an increase of one (1) standard deviation of **perceived ease of use** may result in a 23.4% increase in the standard deviation of **behavioural intention**.
Trialability -> behavioural intention	0.035	0.408	**Trialability** does not have a significant association on **behavioural intention.** This means improving **trialability** may not translate into an improvement in **behavioural intention**.
User environment -> behavioural intention	-0.063	0.075	**User environment** does not have a significant association on **behavioural intention.** This means improving **user environment** may not translate into an improvement in **behavioural intention**.

6.6 Mediation and Moderation Analysis

The mediation and moderation analyses were also carried out on SmartPLS. Moderation allows the researcher to analyse the influence that a variable will have on the relationship between an independent and dependent variable (Hayes, 2013). Mediation is either full (where the association between two other variables becomes non-significant when the mediator is added to the regression, or partial (the association becomes less significant). This has been noted in Tables 49, 50, and 53. The extent to which the variables mediate or moderate relationships in the model were clearly noted. The majority of variables did not mediate or moderate the variables in the model. A mediator mediates the relationship between the independent and dependent variables, which describes the rationale for a relationship to exist (Hayes, 2013). The mediation analysis was conducted to investigate whether awareness mediates the relationship between the variables from the derived model. The number of bootstrap samples extracted was 2 000 and the bias-corrected confidence intervals were set at 95%. The confidence intervals implied that there is a 95% chance that the proposed mediations will occur.

6.6.1 Mediation Analysis (India)

Table 53

Mediation Analysis (India)

	Beta value	T Statistics (|O/STDEV|)	P-values	Conclusion
Perceived risk -> awareness -> behavioural intention	0.001	0.122	0.903	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Perceived ease of use -> awareness -> behavioural intention	0.001	0.121	0.904	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Perceived usefulness -> awareness -> behavioural intention	0.001	0.122	0.903	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Privacy -> awareness -> behavioural intention	0.000	0.076	0.940	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Trialability -> awareness -> behavioural intention	0.001	0.122	0.903	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Perceived risk -> customer feedback -> behavioural intention	0.006	1.021	0.308	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback
Perceived ease of use -> customer feedback -> behavioural intention	0.011	1.237	0.217	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback
Perceived usefulness -> customer feedback -> behavioural intention	0.012	1.171	0.242	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback
Privacy-> customer feedback -> behavioural intention	0.005	0.825	0.410	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback

Trialability -> customer feedback -> behavioural intention	0.011	1.200	0.231	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback
Perceived risk -> lifestyle integration -> behavioural intention	0.011	1.149	0.251	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived ease of use -> lifestyle integration -> behavioural intention	0.008	0.947	0.344	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived usefulness -> lifestyle integration -> behavioural intention	0.015	1.115	0.265	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with lifestyle integration
Privacy -> lifestyle integration -> behavioural intention	0.011	1.187	0.236	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with lifestyle integration
Trialability -> lifestyle integration -> behavioural intention	0.008	0.949	0.343	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived risk -> user environment -> behavioural intention	-0.017	1.556	0.120	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with user environment
Perceived ease of use -> user environment -> behavioural intention	-0.001	0.247	0.805	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with user environment
Perceived usefulness -> user environment -> behavioural intention	-0.009	1.265	0.207	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with user environment
Privacy -> user environment -> behavioural intention	-0.015	1.562	0.119	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with user environment
Trialability -> user environment -> behavioural intention	-0.013	1.528	0.127	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with user environment

6.6.2 Mediation Analysis (South Africa)

Table 54

Mediation Analysis (South Africa)

	Beta value	T Statistics (|O/STDEV|)	P-values	Conclusion
Perceived Risk -> awareness -> behavioural intention	0.044	4.678	0.000	Awareness mediates the relationship between perceived risk and behavioural intention (p< 0.05)
Perceived ease of use -> awareness -> behavioural intention	0.033	3.145	0.002	Awareness mediates the relationship between perceived ease of use and behavioural intention (p< 0.05)
Perceived usefulness -> awareness -> behavioural intention	0.022	2.250	0.025	Awareness mediates the relationship between perceived usefulness and behavioural intention (p< 0.05)
Privacy -> awareness -> behavioural intention	0.000	0.021	0.983	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Trialability -> awareness -> behavioural intention	0.006	0.856	0.393	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with awareness
Perceived risk -> customer feedback -> behavioural intention	0.019	2.043	0.042	Customer feedback mediates the relationship between perceived risk and behavioural intention (p< 0.05)
Perceived ease of use -> customer feedback -> behavioural intention	0.003	0.519	0.604	No mediation, as p> 0.05. Thus, there is no relationship/influence between the variables with customer feedback
Perceived usefulness -> customer feedback -> behavioural intention	0.017	1.909	0.057	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with customer feedback

Privacy -> customer feedback -> behavioural intention	0.000	0.020	0.984	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with customer feedback
Trialability -> customer feedback -> behavioural intention	0.007	1.331	0.184	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with customer feedback
Perceived risk -> lifestyle integration -> behavioural intention	0.007	1.437	0.151	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived ease of use -> lifestyle integration -> behavioural intention	0.014	1.577	0.115	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived usefulness -> lifestyle integration -> behavioural intention	0.012	1.617	0.106	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with lifestyle integration
Privacy -> lifestyle integration -> behavioural intention	0.011	1.798	0.073	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with lifestyle integration
Trialability -> lifestyle integration -> behavioural intention	0.012	1.630	0.104	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with lifestyle integration
Perceived risk -> user environment -> behavioural intention	0.049	4.526	0.000	User environment mediates the relationship between perceived risk and behavioural intention (p< 0.05)
Perceived ease of use -> user environment -> behavioural intention	0.011	1.098	0.273	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with user environment
Perceived usefulness -> user environment -> behavioural intention	0.011	1.118	0.264	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with user environment
Privacy -> user environment -> behavioural intention	0.023	3.555	0.000	User environment mediates the relationship between privacy (protection of personal information) and behavioural intention (p< 0.05)
Trialability -> user environment -> behavioural intention	0.001	0.123	0.902	No mediation, as p> 0.05 Thus, there is no relationship/influence between the variables with user environment

6.6.3 Interpretation of the Mediation Findings

The results presented above show that there was no mediation found in all the relationships tested for India. However, the samples are fundamentally different in terms of their demographic characteristics, and in South Africa six mediations were found. For instance, the relationship between protection of personal information and behavioural intention was mediated by user environment.

Looking at the relationship between privacy and behavioural intention presented above, it appears that privacy has a strong and statistically significant association with behavioural intention. Therefore, there is a partial mediation of user environment in the relationship between protection of personal information and behavioural intention. In other words, it means that for the relationship between privacy and behavioural intention to occur, it does have partial association with the third variable (user environment). Protection of personal information retains influence over behavioural intention, and has partial association with user environment.

6.6.4 Moderation Test Results

The moderation effect was also tested on SmartPLS and an interaction term (moderator X predictor) was created. The effect of this interaction term on the behavioural intention (outcome variable) illustrates a significant interaction between the moderating variables. This was tested for the three moderations. The results of the moderation effects are shown in Tables 55 and 56.

6.6.5 Moderation Analysis (India)

Table 55 indicates that only 'access' has a moderating effect on the influence of awareness and lifestyle integration on behavioural intention, respectively.

Table 55

Moderation Analysis (India)

	Beta value	t-value	P-values	Conclusion
Access -> awareness-> behavioural intention	0.287	3.817	0.000	Access is a significant moderator of the relationship between awareness and behavioural intention ($p<0.05$). Access therefore improves this relationship.
Access –> customer feedback -> behavioural intention	-0.106	1.851	0.065	Access is close to being significant as a moderator of the relationship between awareness and behavioural intention ($p<0.05$). Access therefore improves this relationship.
Access – > lifestyle Integration -> behavioural intention	-0.133	1.904	0.050	Access is a significant moderator of the relationship between lifestyle integration and behavioural intention ($p<0.05$). Access therefore strengthens this relationship.
Access – > user environment -> behavioural intention	-0.110	1.557	0.120	No moderation
Affordability-> awareness -> behavioural intention	-0.093	1.850	0.065	Affordability is close to being significant as a moderator of the relationship between awareness

				and behavioural intention ($p<0.05$). Access therefore improves this relationship.
Affordability-> customer feedback -> behavioural intention	0.006	0.135	0.893	No moderation
Affordability-> lifestyle integration -> behavioural intention	0.068	1.453	0.147	No moderation
Affordability-> user environment -> behavioural intention	0.014	0.278	0.781	No moderation
Availability -> awareness -> behavioural intention	-0.088	1.348	0.178	No moderation
Availability -> customer feedback -> behavioural intention	0.003	0.051	0.959	No moderation
Availability -> user environment -> behavioural intention	0.036	0.578	0.564	No moderation
Availability -> lifestyle integration -> behavioural intention	0.077	1.164	0.245	No moderation

6.6.6 Moderation Analysis (South Africa)

Table 56 indicates that access and affordability weaken the relationship between awareness and user environment on behavioural intention.

Table 56

Moderation Analysis (South Africa)

	Beta value	T statistics (|O/STDEV|)	P-values	Conclusion
Access -> awareness -> behavioural intention	-0.029	0.642	0.050	Access is a significant moderator of the relationship between awareness and behavioural intention ($p<0.05$).
Access -> customer feedback -> behavioural intention	-0.002	0.058	0.954	No moderation
Access -> lifestyle integration -> behavioural intention	-0.015	0.335	0.738	No moderation
Access -> user environment -> behavioural intention	0.020	0.498	0.619	No moderation
Affordability -> awareness -> behavioural intention	-0.062	2.519	0.012	Affordability is a significant moderator of the relationship between awareness and behavioural intention ($p<0.05$).
Affordability -> customer	0.040	1.280	0.201	No moderation

feedback -> behavioural intention				
Affordability -> lifestyle integration -> behavioural intention	-0.014	0.430	0.668	No moderation
Affordability -> user environment -> behavioural intention	-0.091	3.471	0.001	Affordability is a significant moderator of the relationship between user environment and behavioural intention ($p<0.05$).

6.7 Group Difference Tests

An independent t-test was conducted to compare the mean score of certain model constructs between women and men, and then between non-urban and urban residents, to determine whether there is a significant difference between the means in this study. For a significant difference in the t-test the p-value should be below 0.05. Should the p-value be above 0.05, this would indicate no significant difference between the two groups. Pallant (2010) states that the sample t-test is recommended when a researcher wants to compare and test the hypotheses through the score mean of continuous variables, such as perceived usefulness, ease of use, and perceived risk across different demographic characteristics (such as gender).

Interestingly, the results in Appendix G (Tables G16, G17, and G18) illustrate that there is a significant difference in mean scores across racial groups for mobile-app usage in South Africa. The behavioural intention average score of black people who use mobile apps is significantly higher than the average score of white, coloured and Indian people.

The study also found that there is a significant difference in mean scores across Indian languages (Appendix, Table G34) for mobile-app usage. The behavioural intention average score of Hindi-speaking people who use mobile apps is significantly higher than the average score of Bengali-, Gujarati- and Telugu-speaking people who use mobile apps. In South Africa, there is a significant difference in mean scores across South African languages for mobile-app usage. The behavioural intention average score of English-speaking people who use mobile

apps is significantly higher than the average score of Zulu- and Southern Sesotho-speaking people who use mobile apps (see Table G32 in Appendix G).

6.7.1 Gender

6.7.1.1 Perceived Usefulness (Ease of Use)

Table 57 shows the score mean and standard deviation of the construct 'perceived usefulness'. The results show that the score mean for 'perceived usefulness' in South Africa and India was more or less the same for both men (South Africa: mean = 4.57; India: mean = 4.42) and women (South Africa: mean = 4.69; India: mean = 4.41).

Table 57

Group Statistics for 'Perceived Usefulness' According to Gender (South Africa)

Group statistics			
Perceived usefulness	**Gender**	**Mean**	**Std. deviation**
	Male	4.57	1.01
	Female	4.69	0.93

Table 58 shows a p-value of above 0.05 (0.059) for South Africa. This suggests that there was no statistically significant difference in the way men and women scored 'perceived usefulness'. In other words, the score of 'perceived usefulness' does not change according to gender.

The results for India indicated a p-value of above 0.05 (0.828), which means that there was no significant difference in the manner in which men and women scored 'perceived usefulness'. In other words, the score of 'perceived usefulness' does not significantly change according to gender, as noted in Table 60.

Table 58

Independent Samples Test for 'Perceived Usefulness' According to Gender (South Africa)

Independent samples test							
	t-test for equality of means						
	t	**df**	**p-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived usefulness	-1.89	1 006	**0.059**	-0.1151	0.06091	-0.23463	0.00443

Table 59

Group Statistics for 'Perceived Usefulness' According to Gender (India)

Group statistics			
Perceived usefulness	**Gender**	**Mean**	**Std. deviation**
	Male	4.42	1.02
	Female	4.41	1.13

Table 60

Independent Samples Test for 'Perceived Usefulness' According to Gender (India)

Independent samples test							
	t-test for equality of means						
	t	**df**	**p-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived usefulness	0.218	1 049	0.828	0.015	0.071	-0.124	0.154

6.7.1.2 Perceived Ease of Use

The results show that the mean score for perceived ease of use in South Africa was 4.53 for males, and 4.60 for females. This indicates little numerical difference. The same applied in India, where the mean score for males was 4.43, and for females it was 4.40.

The results from the independent samples test indicated a p-value of above 0.05 for both countries (South Africa: 0.205; and India: 0.693). This suggests that there was no significant difference in perceived ease of use according to gender.

See Tables 61–64 below.

Table 61

Group Statistics for 'Perceived Ease of Use' According to Gender (South Africa)

Group statistics			
Gender		**Mean**	**Std. deviation**
Perceived ease of use	Male	4.53	0.96
	Female	4.60	0.86

Table 62

Independent Samples Test for 'Perceived Ease of Use' According to Gender (South Africa)

Independent samples test							
	t-test for equality of means						
	T	**df**	**P-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived ease of use	-1.268	1 006	0.205	-0.073	0.058	-0.186	0.040

Table 63

Group Statistics for 'Perceived Ease of Use' According to Gender (India)

Group statistics			
Gender		**Mean**	**Std. deviation**
Perceived ease of use	Male	4.43	1.058
	Female	4.40	1.104

Table 64

Independent Samples Test for 'Perceived Ease of Use' According to Gender (India)

Independent samples test							
	t-test for equality of means						
	T	**df**	**p-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived ease of use	0.395	1 049	0.693	0.028	0.072	-0.113	0.169

6.7.1.3 Behavioural Intention

The tables below show the mean results for both South Africa and India according to gender. In South Africa, the mean score for males was 4.63, and for females it was 4.68. This demonstrates little numerical difference regarding how behavioural intention was scored. For India, there was also a slight numerical difference. The mean score for males was 4.63, and for females it was 4.68. See Tables 65–68 below.

Table 65

Group Statistics for 'Behavioural Intention' According to Gender (South Africa)

Group statistics			
Behavioural intention	**Gender**	**Mean**	**Std. deviation**
	Male	4.6 3	0.88
	Female	4.68	0.74

Table 66

Independent Samples Test for 'Behavioural Intention' According to Gender (South Africa)

Independent samples test							
	t-test for equality of means						
	t	**df**	**P-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Behavioural intention	-1.007	1 006	0.314	-0.052	0.051	-0.152	0.049

Table 67

Group Statistics for 'Behavioural Intention' According to Gender (India)

Group statistics			
Gender		**Mean**	**Std. deviation**
Behavioural intention	Male	4.40	1.03
	Female	4.43	1.04

Table 68

Independent Samples Test for 'Behavioural Intention' According to Gender (India)

Independent samples test							
	t-test for equality of means						
	t	df	p-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Behavioural intention	-0.385	1 049	0.700	-0.027	0.069	-0.163	0.109

6.7.2 Area

6.7.2.1 Perceived Usefulness

Tables 69–72 indicate that there was a significant difference in how participants from urban and non-urban areas perceived the usefulness of digital technology. Participants from urban areas perceived digital technology to be more useful than those from non-urban areas.

The same results were observed in India.

Table 69

Group Statistics for 'Perceived Usefulness' According to Area (South Africa)

Group statistics			
	Area	Mean	Std. deviation
Perceived usefulness	Non-urban (farm area)	4.02	1.54
	Urban (city)	4.71	0.84

Table 70

Independent Samples Test for 'Perceived Usefulness' According to Area (South Africa)

Independent samples test							
	t-test for equality of means						
	t	df	P-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Perceived usefulness	-7.222	1 007	0.000	-0.68080	0.09427	-0.86578	-0.49582

Table 71

Group Statistics for 'Perceived Usefulness' According to Area (India)

Group statistics			
	Area	Mean	Std. deviation
Perceived usefulness	Non-urban (farm area)	3.99	1.337
	Urban (city)	4.55	0.913

Table 72

Independent Samples Test for 'Perceived Usefulness' According to Area (India)

Independent samples test							
	t-test for equality of means						
	t	df	p-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Perceived usefulness	-7.544	1 051	0.000	-0.564	0.075	-0.710	-0.417

6.7.2.2 Perceived Ease of Use

Tables 73–76 show that for both South Africa and India, people from urban areas perceived using digital technology to be easy compared to those living in non-urban areas.

Table 73

Group Statistics for 'Perceived Ease of Use' According to Area (South Africa)

Group statistics			
	Area	**Mean**	**Std. deviation**
Perceived ease of use	Non-urban (farm area)	3.98	1.45
	Urban (city)	4.64	0.79

Table 74

Independent Samples Test for 'Perceived Ease of Use' According to Area (South Africa)

Independent samples test							
	t-test for equality of means						
	t	**df**	**P-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived ease of use	-7.482	1 007	0.000	-0.664	0.089	-0.838	-0.490

Table 75

Group Statistics for 'Perceived Ease of Use' According to Area (India)

Group statistics			
	Area	**Mean**	**Std. deviation**
Perceived ease of use	Non-urban (farm area)	3.97	1.36
	Urban (city)	4.56	0.92

Table 76

Independent Samples Test for 'Perceived Ease of Use' According to Area (India)

Independent samples test							
	t-test for equality of means						
	t	df	p-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Perceived ease of use	-7.797	1 051	0.000	-0.590	0.076	-0.738	-0.441

6.7.2.3 Behavioural Intention

Table 77

Group Statistics for 'Behavioural Intention' According to Area (South Africa)

Group statistics			
	Area	Mean	Std. deviation
Behavioural intention	Non-urban (farm area)	4.00	1.32
	Urban (city)	4.74	0.68

Table 78

Independent Samples Test for 'Behavioural Intention' According to Area (South Africa)

Independent samples test							
	t-test for equality of means						
	t	df	P-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Behavioural intention	-9.603	1 007	0.000	-0.745	0.078	-0.898	-0.593

Table 79

Group Statistics for 'Behavioural Intention' According to Area (India)

Group statistics			
	Area	**Mean**	**Std. deviation**
Behavioural intention	Non-urban (farm area)	4.00	1.30
	Urban (city)	4.54	0.90

Table 80

Independent Samples Test for 'Behavioural Intention' According to Area (India)

Independent samples test							
	t-test for equality of means						
	t	**df**	**p-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Behavioural intention	-7.351	1 051	0.000	-0.538	0.073	-0.682	-0.395

6.7.3 Racial Group

6.7.3.1 Perceived Usefulness

Tables 81 and 82 show that there was a difference in how Indians based in India and Indians based in South Africa perceived the usefulness of digital technology.

Table 81

Group Statistics for 'Perceived Usefulness'

Group statistics			
Perceived usefulness	**Racial group**	**Mean**	**Std. deviation**
	Indian based in India	4.83	0.224
	Indian based in South Africa	4.38	1.094

Table 82

Independent Samples Test for 'Perceived Usefulness'

Independent samples test							
	t-test for equality of means						
	t	**df**	**P-value**	**Mean difference**	**Std. error difference**	**95% confidence interval of the difference**	
						Lower	**Upper**
Perceived usefulness	3.86	1 049	0.000	0.449	0.116	0.22	0.677

6.7.3.2 Perceived Ease of Use

According to the results below, Indians from India perceived ease of use of mobile-app usage differently from South African Indians. See Tables 83 and 84.

Table 83

Group Statistics for 'Perceived Ease of Use'

Group statistics			
Racial group		**Mean**	**Std. deviation**
Perceived ease of use	Indian based in India	4.78	0.253
	Indian based in South Africa	4.38	1.111

Table 84

Independent Samples Test for 'Perceived Ease of Use'

Independent samples test							
	t-test for equality of means						
	t	df	P-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Perceived ease of use	3.379	1 049	0.001	0.399	0.118	0.167	0.631

6.7.3.3 Behavioural Intention

Tables 85 and 86 indicate that Indians based in India and in South Africa do not behave in the same way with regard to mobile-app adoption.

Table 85

Group Statistics for 'Behavioural Intention'

Group statistics			
Racial group		Mean	Std. deviation
Behavioural intention	Indian based in India	4.88	0.333
	Indian based in South Africa	4.37	1.066

Table 86

Independent Samples Test for 'Behavioural Intention'

Independent samples test							
	t-test for equality of means						
	t	df	P-value	Mean difference	Std. error difference	95% confidence interval of the difference	
						Lower	Upper
Behavioural intention	4.483	1 049	0.000	0.509	0.114	0.286	0.732

6.8 Comparing Means With the ANOVA

The one-way analysis of variance (ANOVA) was used to associate the mean score of more than two groups as a way of analysing variances between South Africa and India across various demographic factors (Pallant, 2010). A one-way ANOVA between groups was conducted to compare the mean across levels of education and mobile-app usage according to perceived usefulness, perceived ease of use, and behavioural intention. There are three tables of interest: the descriptive table, which provides the mean and standard deviation of dependent variables for each separate group; the ANOVA table, which indicates whether there is a statistical significance between the groups (the significant association is determined by the p-value that is expected to be below 0.05, which indicates that there is a mean difference); and the post-hoc table (multiple comparison table), which should be analysed when the ANOVA shows a significant result. The post-hoc assesses the mean difference within the groups. The Tukey test was used in this ANOVA. The results of the ANOVA are noted in Tables 87–92.

6.8.1 Level of Education

6.8.1.1 Perceived Usefulness

Table 87

Descriptive Table of 'Perceived Usefulness' According to Level of Education (South Africa)

Descriptive							Conclusion
Perceived usefulness							
	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	The average score of perceived usefulness seems to differ according to level of education
			Lower bound	Upper bound			
Pre-Matric	3.4538	1.43445	3.1749	3.7328	1.00	6.00	
Matric	4.5464	0.90591	4.4513	4.6415	1.80	6.00	
Diploma	4.8230	0.83885	4.7172	4.9287	1.00	6.00	
Degree	4.8755	0.49322	4.7940	4.9571	2.00	6.00	
Honours	5.1688	0.41590	5.0649	5.2726	4.20	6.00	
Master's degree	4.9851	0.49275	4.8649	5.1053	3.60	6.00	
PhD	4.8833	0.47065	4.5843	5.1824	4.40	6.00	
Higher certificate	4.9333	0.97732	4.3124	5.5543	2.00	6.00	
LLB	5.0000	0.00000	5.0000	5.0000	5.00	5.00	
Chartered Accountant	4.6800	1.08259	3.3358	6.0242	2.80	5.60	
Postgrad	5.2500	0.30000	4.7726	5.7274	5.00	5.60	
Total	**4.6293**	**0.96794**	**4.5695**	**4.6891**	**1.00**	**6.00**	

Table 88

ANOVA Table of 'Perceived Usefulness' According to Level of Education (Africa)

ANOVA						Conclusion
Perceived usefulness						
	Sum of squares	**Df**	**Mean square**	**F**	**P-value**	There is a significant difference in mean scores across level of education (p-value =.000 <.05).
Between groups	194.880	10	19.488	25.948	.000	
Within groups	749.531	998	.751			
Total	**944.412**	**1 008**				

Table 89

Tukey's Test of 'Perceived Usefulness' According to Level of Education (South Africa)

Multiple comparisons							Conclusion
Dependent variable: Perceived usefulness							
Tukey HSD							
(I) Highest education	**(J) Highest Education**	**Mean difference (I-J)**	**Std. error**	**p-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
Pre-Matric	Matric	-1.09259*	.09675	.000	-1.4047	-.7804	The p-values indicate that there is a significant difference in the perceived usefulness across level of education. For instance, there is a significant difference between pre-matric and
	Diploma	-1.36910*	.10149	.000	-1.6965	-1.0417	
	Degree	-1.42168*	.11168	.000	-1.7820	-1.0614	
	Honours	-1.71490*	.13768	.000	-2.1591	-1.2707	
	Master's degree	-1.53123*	.13576	.000	-1.9692	-1.0932	
	PhD	-1.42949*	.26421	.000	-2.2819	-.5771	
	Higher certificate	-1.47949*	.26421	.000	-2.3319	-.6271	
	LLB	-1.54615	.50751	.084	-3.1835	.0912	
	Chartered Accountant	-1.22615	.39677	.074	-2.5062	.0539	

	Postgraduate	-1.79615*	.44157	.003	-3.2207	-.3716	matric on the average score of perceived usefulness (p-value below 0.05).
Matric	Pre-Matric	1.09259*	.09675	.000	.7804	1.4047	The perceived usefulness average score of groups of people who have obtained Matric is significantly higher than the average score of groups of people who have obtained Pre-matric, diplomas, degrees, Honours and Master's degrees (p = <.05).
	Diploma	-.27651*	.07223	.006	-.5096	-.0435	
	Degree	-.32909*	.08597	.006	-.6065	-.0517	
	Honours	-.62231*	.11779	.000	-1.0023	-.2423	
	Master's degree	-.43864*	.11554	.007	-.8114	-.0659	
	PhD	-.33689	.25441	.965	-1.1577	.4839	
	Higher certificate	-.38689	.25441	.913	-1.2077	.4339	
	LLB	-.45356	.50248	.998	-2.0747	1.1675	
	Chartered Accountant	-.13356	.39032	1.000	-1.3928	1.1257	
	Postgraduate	-.70356	.43577	.876	-2.1094	.7023	
Diploma	Pre-Matric	1.36910*	.10149	.000	1.0417	1.6965	The perceived usefulness average score of people who have obtained a diploma is significantly higher than the average score of people who have obtained Matric (p = < .05).
	Matric	.27651*	.07223	.006	.0435	.5096	
	Degree	-.05257	.09127	1.000	-.3470	.2419	
	Honours	-.34580	.12171	.144	-.7385	.0469	
	Master's degree	-.16212	.11953	.958	-.5478	.2235	
	PhD	-.06038	.25625	1.000	-.8871	.7663	
	Higher certificate	-.11038	.25625	1.000	-.9371	.7163	
	LLB	-.17705	.50341	1.000	-1.8011	1.4470	
	Chartered Accountant	.14295	.39152	1.000	-1.1202	1.4061	
	Postgraduate	-.42705	.43685	.996	-1.8364	.9823	
Degree	Pre-Matric	1.42168*	.11168	.000	1.0614	1.7820	The perceived usefulness average score of people who have obtained a degree is significantly higher than the average score of people who
	Matric	.32909*	.08597	.006	.0517	.6065	
	Diploma	.05257	.09127	1.000	-.2419	.3470	
	Honours	-.29323	.13033	.470	-.7137	.1273	
	Master's degree	-.10955	.12830	.999	-.5235	.3044	
	PhD	-.00781	.26046	1.000	-.8481	.8325	
	Higher certificate	-.05781	.26046	1.000	-.8981	.7825	

	LLB	-.12448	.50557	1.000	-1.7555	1.5066	have Pre-matric and
	Chartered Accountant	.19552	.39428	1.000	-1.0765	1.4676	those who have obtained Matric
	Postgraduate	-.37448	.43933	.999	-1.7918	1.0429	(p = < .05).
Honours	Pre-Matric	1.71490*	.13768	.000	1.2707	2.1591	The perceived
	Matric	.62231*	.11779	.000	.2423	1.0023	usefulness average
	Diploma	.34580	.12171	.144	-.0469	.7385	score of people who
	Degree	.29323	.13033	.470	-.1273	.7137	have obtained
	Master's degree	.18368	.15147	.981	-.3050	.6724	Honours is
	PhD	.28542	.27262	.994	-.5941	1.1649	significantly higher
	Higher certificate	.23542	.27262	.999	-.6441	1.1149	than the average score of people who
	LLB	.16875	.51194	1.000	-1.4829	1.8204	have obtained Pre-
	Chartered Accountant	.48875	.40242	.981	-.8095	1.7870	matric and Matric (p = < .05).
	Postgraduate	-.08125	.44665	1.000	-1.5222	1.3597	
Master's degree	Pre-Matric	1.53123*	.13576	.000	1.0932	1.9692	The perceived
	Matric	.43864*	.11554	.007	.0659	.8114	usefulness average
	Diploma	.16212	.11953	.958	-.2235	.5478	score of people who
	Degree	.10955	.12830	.999	-.3044	.5235	have obtained a
	Honours	-.18368	.15147	.981	-.6724	.3050	Master's degree is
	PhD	.10174	.27165	1.000	-.7747	.9781	significantly higher
	Higher certificate	.05174	.27165	1.000	-.8247	.9281	than the average score of people who
	LLB	-.01493	.51142	1.000	-1.6649	1.6350	have obtained Pre-
	Chartered Accountant	.30507	.40177	1.000	-.9911	1.6012	matric and Matric (p = < .05).
	Postgraduate	-.26493	.44606	1.000	-1.7040	1.1741	
PhD	Pre-Matric	1.42949*	.26421	.000	.5771	2.2819	The perceived
	Matric	.33689	.25441	.965	-.4839	1.1577	usefulness average
	Diploma	.06038	.25625	1.000	-.7663	.8871	score of people who
	Degree	.00781	.26046	1.000	-.8325	.8481	have obtained PhDs
	Honours	-.28542	.27262	.994	-1.1649	.5941	is significantly
	Master's degree	-.10174	.27165	1.000	-.9781	.7747	higher than the
	Higher certificate	-.05000	.35380	1.000	-1.1914	1.0914	average score of groups of people
	LLB	-.11667	.55940	1.000	-1.9214	1.6881	who have obtained
	Chartered Accountant	.20333	.46129	1.000	-1.2849	1.6916	Pre-matric and Matric

	Postgraduate	-.36667	.50034	1.000	-1.9809	1.2475	(p = < .05).
Higher certificate	Pre-Matric	1.47949*	.26421	.000	.6271	2.3319	The perceived usefulness average score of people who have obtained Higher certificates is significantly higher than the average score of groups of people who have obtained Pre-matric (p = < .05).
	Matric	.38689	.25441	.913	-.4339	1.2077	
	Diploma	.11038	.25625	1.000	-.7163	.9371	
	Degree	.05781	.26046	1.000	-.7825	.8981	
	Honours	-.23542	.27262	.999	-1.1149	.6441	
	Master's degree	-.05174	.27165	1.000	-.9281	.8247	
	PhD	.05000	.35380	1.000	-1.0914	1.1914	
	LLB	-.06667	.55940	1.000	-1.8714	1.7381	
	Chartered Accountant	.25333	.46129	1.000	-1.2349	1.7416	
	Postgraduate	-.31667	.50034	1.000	-1.9309	1.2975	
LLB	Pre-Matric	1.54615	.50751	.084	-.0912	3.1835	There is no significant difference in the score of perceived usefulness for people who have obtained LLBs across other levels of education (p > 0.05).
	Matric	.45356	.50248	.998	-1.1675	2.0747	
	Diploma	.17705	.50341	1.000	-1.4470	1.8011	
	Degree	.12448	.50557	1.000	-1.5066	1.7555	
	Honours	-.16875	.51194	1.000	-1.8204	1.4829	
	Master's degree	.01493	.51142	1.000	-1.6350	1.6649	
	PhD	.11667	.55940	1.000	-1.6881	1.9214	
	Higher certificate	.06667	.55940	1.000	-1.7381	1.8714	
	Chartered Accountant	.32000	.63289	1.000	-1.7218	2.3618	
	Postgraduate	-.25000	.66189	1.000	-2.3854	1.8854	
Chartered Accountant	Pre-Matric	1.22615	.39677	.074	-.0539	2.5062	There is no significant difference in the score of perceived usefulness for people who have obtained Chartered Accountant qualifications across other levels of education (p > 0.05).
	Matric	.13356	.39032	1.000	-1.1257	1.3928	
	Diploma	-.14295	.39152	1.000	-1.4061	1.1202	
	Degree	-.19552	.39428	1.000	-1.4676	1.0765	
	Honours	-.48875	.40242	.981	-1.7870	.8095	
	Master's degree	-.30507	.40177	1.000	-1.6012	.9911	
	PhD	-.20333	.46129	1.000	-1.6916	1.2849	
	Higher certificate	-.25333	.46129	1.000	-1.7416	1.2349	
	LLB	-.32000	.63289	1.000	-2.3618	1.7218	
	Postgraduate	-.57000	.58135	.996	-2.4455	1.3055	
Postgraduate	Pre-Matric	1.79615*	.44157	.003	.3716	3.2207	The perceived usefulness average score of Postgraduates is
	Matric	.70356	.43577	.876	-.7023	2.1094	
	Diploma	.42705	.43685	.996	-.9823	1.8364	
	Degree	.37448	.43933	.999	-1.0429	1.7918	

	Honours	.08125	.44665	1.000	-1.3597	1.5222	significantly higher than the average score of groups of people who have obtained Pre-matric (p = < .05).
	Master's degree	.26493	.44606	1.000	-1.1741	1.7040	
	PhD	.36667	.50034	1.000	-1.2475	1.9809	
	Higher certificate	.31667	.50034	1.000	-1.2975	1.9309	
	LLB	.25000	.66189	1.000	-1.8854	2.3854	
	Chartered Accountant	.57000	.58135	.996	-1.3055	2.4455	
*. The mean difference is significant at the 0.05 level.							

Table 90

Descriptive Table of 'Perceived Usefulness' According to Level of Education (India)

Descriptive							
Perceived usefulness							
	Mean	**Std. deviation**	**95% confidence interval for mean**		**Min.**	**Max.**	**Conclusion**
			Lower bound	**Upper bound**			
Pre-Matric	2.56	0.976	2.20	2.92	1	5	The average score of perceived usefulness seems to differ according to level of education
Matric	3.13	1.341	2.88	3.39	1	6	
Diploma	4.54	0.935	4.43	4.66	2	6	
Degree	4.66	0.811	4.56	4.76	2	6	
Honours	4.76	0.595	4.67	4.84	2	6	
Master's degree	4.83	0.564	4.72	4.94	2	6	
PhD	4.93	0.321	4.73	5.13	4	5	
Graduate	4.37	1.042	4.16	4.58	2	5	
Total	**4.42**	**1.056**	**4.35**	**4.48**	**1**	**6**	

Table 91

ANOVA Table of 'Perceived Usefulness' According to Level of Education (India)

ANOVA						Conclusion
Perceived usefulness						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	348.463	7	49.780	63.097	.000	There is a significant difference in mean scores according to level of education (p-value = .000 < 0.05).
Within groups	824.458	1 045	.789			
Total	**1172.921**	**1 052**				

Table 92

Tukey's Test of 'Perceived Usefulness' According to Level of Education (India)

Multiple comparisons							Conclusion
Dependent variable: Perceived usefulness							
Tukey HSD							
(I) Highest education	**(J) Highest education**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower Bound	**Upper bound**	
Pre-Matric	Matric	-.576*	.181	.032	-1.12	-.03	The perceived usefulness average score of people who have obtained Pre-matric is significantly higher than the average
	Diploma	-1.983*	.169	.000	-2.50	-1.47	
	Degree	-2.101*	.169	.000	-2.61	-1.59	
	Honours	-2.198*	.173	.000	-2.72	-1.67	
	Master's degree	-2.271*	.183	.000	-2.83	-1.72	
	PhD	-2.371*	.302	.000	-3.29	-1.45	

	Graduate	-1.811*	.183	.000	-2.37	-1.26	score of people who have obtained Matric, diplomas, degrees, Honours, a Master's degrees, PhDs, and Graduate degrees (p =. < 0.05).
Matric	Pre-Matric	.576*	.181	.032	.03	1.12	The perceived usefulness average score of people who have obtained Matric is significantly higher than the average score of people who have obtained Pre-Matric, diplomas, degrees, Honours, a Master's degree, PhDs, and Graduate degrees (p = < 0.05).
	Diploma	-1.408*	.101	.000	-1.71	-1.10	
	Degree	-1.525*	.101	.000	-1.83	-1.22	
	Honours	-1.622*	.107	.000	-1.95	-1.30	
	Master's degree	-1.695*	.123	.000	-2.07	-1.32	
	PhD	-1.796*	.270	.000	-2.62	-.98	
	Graduate	-1.236*	.123	.000	-1.61	-.86	
Diploma	Pre-Matric	1.983*	.169	.000	1.47	2.50	The perceived usefulness average score of people who have obtained diplomas is significantly higher than the average score of people who have obtained Pre-Matric, and Matric (p = < 0.05).
	Matric	1.408*	.101	.000	1.10	1.71	
	Degree	-.118	.078	.802	-.35	.12	
	Honours	-.214	.086	.198	-.48	.05	
	Master's degree	-.287	.105	.111	-.61	.03	
	PhD	-.388	.262	.818	-1.18	.41	
	Graduate	.172	.105	.723	-.15	.49	
Degree	Pre-Matric	2.101*	.169	.000	1.59	2.61	The perceived usefulness average
	Matric	1.525*	.101	.000	1.22	1.83	

	Diploma	.118	.078	.802	-.12	.35	score of people who have obtained degrees is significantly higher than the average score of people who have obtained Pre-Matric and Matric (p = < 0.05).
	Honours	-.097	.086	.952	-.36	.16	
	Master's degree	-.170	.105	.740	-.49	.15	
	PhD	-.270	.262	.970	-1.07	.53	
	Graduate	.290	.105	.106	-.03	.61	
Honours	Pre-Matric	2.198*	.173	.000	1.67	2.72	The perceived usefulness average score of people who have obtained Honours is significantly higher than the average score of people who have obtained Pre-Matric, Matric, and Graduate degrees (p = < 0.05).
	Matric	1.622*	.107	.000	1.30	1.95	
	Diploma	.214	.086	.198	-.05	.48	
	Degree	.097	.086	.952	-.16	.36	
	Master's degree	-.073	.111	.998	-.41	.26	
	PhD	-.174	.265	.998	-.98	.63	
	Graduate	.387*	.111	.012	.05	.72	
Master's degree	Pre-Matric	2.271*	.183	.000	1.72	2.83	The perceived usefulness average score of people who have obtained Master's degrees is significantly higher than the average score of people who have obtained Pre-Matric, Matric, and Graduate degrees (p = < 0.05).
	Matric	1.695*	.123	.000	1.32	2.07	
	Diploma	.287	.105	.111	-.03	.61	
	Degree	.170	.105	.740	-.15	.49	
	Honours	.073	.111	.998	-.26	.41	
	PhD	-.101	.272	1.000	-.93	.72	
	Graduate	.460*	.126	.007	.08	.84	
PhD	Pre-Matric	2.371*	.302	.000	1.45	3.29	The perceived usefulness average score of people who
	Matric	1.796*	.270	.000	.98	2.62	
	Diploma	.388	.262	.818	-.41	1.18	

	Degree	.270	.262	.970	-.53	1.07	have obtained PhDs is significantly higher than the average score of people who have obtained Pre-Matric and Matric (p = < 0.05).
	Honours	.174	.265	.998	-.63	.98	
	Master's degree	.101	.272	1.000	-.72	.93	
	Graduate	.560	.272	.440	-.26	1.38	
Graduate	Pre-Matric	1.811*	.183	.000	1.26	2.37	The perceived usefulness average score of people who are graduates is significantly higher than the average score of people who have obtained Pre-Matric, Matric, Honours, and Master's degrees (p = < 0.05).
	Matric	1.236*	.123	.000	.86	1.61	
	Diploma	-.172	.105	.723	-.49	.15	
	Degree	-.290	.105	.106	-.61	.03	
	Honours	-.387*	.111	.012	-.72	-.05	
	Master's degree	-.460*	.126	.007	-.84	-.08	
	PhD	-.560	.272	.440	-1.38	.26	
*. The mean difference is significant at the 0.05 level.							

6.8.1.2 Perceived Ease of Use

Table 93

Descriptive Table of 'Perceived Ease of Use' According to Level of Education (South Africa)

Descriptive							
Perceived ease of use							
	Mean	**Std. deviation**	**95% confidence interval for mean**		**Min.**	**Max.**	**Conclusion**
			Lower bound	**Upper bound**			
Pre-Matric	3.47	1.379	3.20	3.73	1	6	The average score of perceived ease of use seems to differ according to level of education.
Matric	4.45	0.867	4.36	4.54	2	6	
Diploma	4.74	0.767	4.65	4.84	2	6	
Degree	4.86	0.442	4.79	4.93	3	6	
Honours	5.13	0.351	5.04	5.22	4	6	
Master's degree	4.87	0.488	4.75	4.99	3	6	
PhD	4.99	0.261	4.82	5.15	5	6	
Higher certificate	4.81	0.536	4.47	5.15	3	5	
LLB	5.06	0.096	4.82	5.29	5	5	
Chartered Accountant	4.73	0.596	3.99	5.47	4	5	
Postgraduate	5.04	0.083	4.91	5.17	5	5	
Total	**4.57**	**0.913**	**4.51**	**4.62**	**1**	**6**	

Table 94

ANOVA Table of 'Perceived Ease of Use' According to Level of Education (South Africa)

ANOVA						
Perceived ease of use						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	**Conclusion**
Between groups	181.674	10	18.167	27.533	.000	There is significant difference of mean scores across the level of education (p-value = .000 < 0.05).
Within groups	658.532	998	.660			
Total	**840.206**	**1 008**				

The rationale for a using both a t-test and ANOVA is the t-test analysed the means between two samples, but ANOVA is required for cases where there were more than two samples. ANOVA is an important test because it allows us to see how effective two different types of treatment are. Emerson (2017) notes in his study of 328 articles that 127 of them used both t-test and ANOVA to ensure appropriate tests were used for the data being analysed. Emerson (2017) suggests that it is acceptable to use both ANOVA and t-tests when analysing data, even though this may not be a common approach.

6.9 Conclusion

This chapter reported on the results of the quantitative research. The study found that seven of the eleven hypotheses tested significant in South Africa and four of the eleven tested significant in India as it pertains to driving digital (mobile app) adoption. The derived digital adoption model reflected the eleven hypotheses that were tested for significance. These included access from the emerging theory (qualitative analysis); lifestyle integration and user environment; and perceived ease of use, protection of personal information, perceived risk, and perceived usefulness as these were linked back to the literature. All these factors are therefore drivers of behavioural intention to adopt mobile apps in South Africa.

Group difference tests were conducted to determine the mean score difference of gender, area, level of education, language, racial group and mobile apps (frequency) to ascertain how people

perceived usefulness of mobile apps, ease of use of mobile apps, and their behavioural intention to adopt mobile apps.

T-tests were conducted to examine the difference between two groups. The results showed that there is no significant difference in the manner in which men and women from both South Africa and India scored the following constructs in relation to mobile apps: perceived usefulness, perceived ease of use, and behavioural intention. However, it can be concluded that mobile-app adoption differs among those from different racial and language groups.

The results indicated that people's perceived usefulness of mobile apps, perceived ease of use of mobile apps, and behavioural intention to adopt mobile apps vary significantly, according to level of education, language and racial group, among others.

CHAPTER SEVEN
DISCUSSION OF THE FINDINGS

7.1 Introduction

This chapter reports on the results of the qualitative and quantitative analyses. It interprets the results from the qualitative study reported on in Chapter Five and evaluates the factors that drive the adoption of mobile apps in two emerging markets (South Africa and India).

The quantitative analysis is based on the derived model presented in Chapter Six, where the methodology and the statistical tests applied to the data were defined and explained. A sequential mixed-methods approach was adopted as a way of first understanding the factors that drive consumers to adopt digital (mobile app) technology in South Africa and India, and then testing the hypotheses to either refute or confirm the reliability and relevance of the derived model for digital (mobile app) adoption. Regression and SEM results were reported and the findings are discussed in this chapter.

Each hypothesis is used as a heading and the discussion is structured according to the eleven main hypotheses of the study, including the moderating and mediating effects identified. This chapter discusses the main findings of the study by highlighting the similarities, differences, relationships, and themes that emerged. The themes are discussed with reference to the literature and the theories used in this study (Hsieh & Shannon, 2005). The chapter concludes with a summary of the discussed results.

7.2 Research Objectives

This study answered the following three questions, which are discussed in this chapter:

1. What factors influence mobile-app adoption in emerging markets (technology barriers)?
2. Do ecosystems influence adoption and usage (ecosystem barriers)?
3. How do the BOP characteristics influence digital (mobile app) adoption and usage (environmental barriers)?

The objectives of the study were met by providing supporting data on the following aspects:

- The analysis provided insight regarding the rationale behind mobile-app adoption from an emerging market perspective. (The structural equation model for South Africa and India is depicted in Chapter Six.)
- The data illustrated the extent to which mobile-app services are consumed and used in South Africa and India.
- A derived model, which was validated statistically, was developed to explain how various factors combine to drive mobile-app adoption and usage in an emerging market context (see Figure 31). This provides evidence of the findings in this study.
- The output of the qualitative and quantitative results provided insight into the factors that encourage mobile-app adoption in South Africa and India.
- The results of the research show that 'intention to use' is affected by ecosystems, technology experience, and emerging market characteristics.
- The SEM analysis found that mediating and moderating factors affect direct relationships between model constructs.

The study also examined extant theories that impact the adoption of converged digital channels, and the pitfalls of these theories, and then derived a model for digital adoption within emerging markets. As such, it was essential for the researcher to become acquainted with the theoretical models that exist in the literature and broaden the area of research to contribute to the literature.

The hypotheses from the derived model provided a clear proposition that was tested using an exploratory sequential mixed-methods design. The hypotheses were validated by way of statistical tests and measures (see Chapter Six) and the findings are presented in this chapter.

7.3 Discussion of the Main Qualitative Findings

The study aimed to ascertain the factors that drive technological adoption in emerging markets, such as South Africa and India. Aspects of the study that are covered include technological design, social influence, and emerging market characteristics in South Africa and India.

This section aims to answer the research questions by drawing on the findings from both the qualitative and quantitative analyses. The following sections outline the findings from the semi-structured interviews that were conducted with participants in South Africa and India.

To determine the factors that influence mobile-app adoption in the selected emerging markets, the derived model adopted codes and categories for the qualitative data-analysis process. The derived model was adopted because research indicates that existing literature, as it pertains to TAM and DT, does not provide insight into digital adoption in isolation, or within an emerging market, unless the models are used in combination (Haddon, 2011).

7.3.1 Perceived Risk (Risk and Cyber Security)

Perceived risk refers to an individual's anxiety, or even fear, when faced with the possibility of using mobile apps (Venkatesh & Bala, 2008). Wells et al. (2010) believe that risk influences individual decision-making, more so when the decision may have opposing results over which one has no control. The meaning of the construct tends to apply differently to different individuals. According to the results, people in South Africa believe that perceived risk influences their behavioural intention towards mobile apps. They are cautious of the potential risk associated with using mobile apps. People in India, on the other hand, are not driven by the perceived risk, as they expect businesses to ensure that the correct risk-mitigation factors are in place. Interestingly, the qualitative study noted that participants from India and South Africa expressed their fear regarding the adoption of mobile apps, but their expectations regarding the sound risk/security protocols of businesses differed. People in South Africa do not have confidence in the risk-mitigation protocols offered by businesses. The majority of the participants indicated that there is too much risk connected to new mobile apps. Participants noted that there is a high chance of digital fraud, cybercrime, and loss of personal information associated with adopting some of these new mobile apps.

This is also specified by Wells et al. (2010), who state that perceived risk influences the adoption of new technology in consumer behaviour studies. Perceived risk is regarded as one of the core factors for adoption of a service or technology, as consumer selections are frequently made based on situation-specific goals (Cunningham, 1967). According to Aldás-Manzano et al. (2009), the perception of risk associated with banking applications or technology may adversely affect people's adoption rate because, to consumers, the risk may be physical or

psychological. Similarly, in this study, participants indicated that there is risk associated with the adoption of new mobile apps, further supporting the current literature. From the research findings, the data shows that digital fraud has an influence on the adoption of new mobile apps. A study conducted by Hirunyawipada and Paswan (2006) indicates that perceived risk has a significant impact on innovation adoption, which aligns with participants' feedback from the qualitative study. When investigating digital adoption and usage, researchers should therefore consider that there is no direct relationship with risk, as users expect that mobile apps will be secure. However, should the user be exposed to any form of risk (i.e. data theft or financial loss), the user would be unlikely to continue to use the mobile app.

7.3.2 Privacy (Protection of Personal Information)

In addition to perceived risk, privacy was also identified as a barrier to adoption. This is supported by a 2019 report titled Unmasked Digital Fraud, where Kirchner and Schüßler (2019) indicate that there are approximately 143 million US citizens, and roughly half of them lost their security authentication data, including name, address, date of birth, and social security number, in a breach at US-based credit bureau Equifax. The consequences of this incident will be felt over the years to come (Kirchner & Schüßler, 2019). Raj and Rahman (2015) notes that common cyber-based criminal activities, such as online fraud and phishing attacks, are perpetrated through the use of false identity and fraudulent documents, which result from increased online transactions. According to researchers, as long ago as the early 2000s, fraud on the Internet was 20 times more complex than offline fraud, which is a point of concern for intended users and businesses (Snyder, 2000; Bajari & Hortaçsu, 2004).

According to Raj and Rahman (2015), e-commerce is growing rapidly and generating new prospects for traders, but also creating opportunities for fraudulent practices in terms of loss of personal data and identity theft. Criminals have tried to take advantage of the new opportunities to carry out online fraud against both sellers and buyers by gaining access to customer data. Studies conducted by Han et al. (2008), Tan and Teo (2000), and Wu and Wang (2005), indicate that mobile apps, such as mobile banking, are perceived by consumers to be risky; they fear that their personal data, in the form of login credentials and financial information, may be compromised. Kariuki (2012) conducted a research study on the factors that influence the adoption of mobile phone banking by BOP customers of commercial banks in Kenya. The study found that risk and trust impacted the adoption of mobile banking. The results of the

study highlighted that 75% of participants felt that risk/trust was the main barrier associated with adoption. A study conducted by Yeong-Wha et al. (2011) notes that the perceived benefits of mobile adoption are actually obstructed by privacy, such as identity theft, which aligns with the feedback received in the qualitative study. Some participants felt their data was being sold for financial gain.

From the literature, it is evident that mobile apps offer high feature functionality that provides users with an easy and convenient way of performing tasks in any aspect of their lives, despite the risks associated with their adoption. Mobile apps allow smartphones to operate as powerhouses for various roles that may be required by the user, and their perceived risks should therefore be reduced by marketing strategies (Yeong-Wha et al., 2011). Several studies have suggested that perceived risk may negatively influence the adoption decisions that people make regarding new products or apps (Ramezani Ghotbabadi et al., 2016). This view was echoed by some participants in the study, who argued that the issue of privacy is a concern, as there is a high possibility of losing data or personal information. When investigating digital adoption and usage, researchers should therefore view this construct (privacy) as a direct contributor to predicting digital adoption.

7.3.3 Perceived Ease of Use (Intuitive Design)

From an information system perspective, the literature on technology adoption indicates that research relating to consumers' intentions to use mobile solutions have been directed based on Davis's (1989) technology acceptance model (Hung et al., 2003). These scholars argue that the model is convenient for clarifying behavioural intent, where numerous extensions of the model may be relevant for explaining the intention to use mobile services.

Perceived ease of use is the belief that using any system will be free from effort (Davis, 1989). Lee et al. (2010) state that behavioural intention is affected by perceived ease of use. The relationship between perceived ease of use and behavioural intention was also assessed. The results show that there is a positive and significant effect of perceived ease of use on behavioural intention towards mobile-app usage for South Africa and India. The results demonstrate that perceived ease of use is an important factor in influencing people's behaviour towards adoption. The information above substantially reinforced the findings from the qualitative study, whereby participants highlighted that mobile apps are more convenient and

user-friendly, and people can easily transfer their money from one bank to another. This notion is supported by Tang (2016), who notes that if consumers find mobile apps simple to use, they will utilise mobile solutions frequently. Additionally, they can easily tend to daily activities, such as ordering taxis and food, for example, without leaving their home or office. The participants noted that ease of use is important, as not all mobile apps are intuitive, and some felt that they had to learn how to use apps from friends and family, thus emphasising the findings of this study for intuitive design that makes usage effortless.

Davis (1989) notes that perceived ease of use is the effort associated with using technology. However, it also influences intention to use mobile services (Hung et al., 2003). Research conducted by Šumak et al. (2011) demonstrates that the direct effect of perceived ease of use on behavioural intent to adopt a technological skill was important with regard to mobile and Internet applications. In support of this, Hoştut (2010), and Leung and Wei (2000), observe a strong association between perceived ease of use and intention to use. When investigating digital adoption and usage, researchers should therefore view this construct (perceived ease of use) as a direct contributor to predicting digital adoption.

7.3.4 Perceived Usefulness (Convenience and Value Proposition)

According to Davis (1989), perceived usefulness is regarded as the degree to which a person believes that using a particular system will make their lives easier. Participants noted that perceived usefulness is a key determinant in mobile-app adoption and influences intention to use. According to Fishbein and Ajzen's (1975, p. 288) definition of behavioural intention, "adoption is associated with the benefit associated with using a particular technology".

Hsiao et al. (2016) and Ofori et al. (2016) conducted studies that highlight the importance of perceived usefulness on technology adoption. This aligns with the qualitative analysis in this study, whereby participants noted that digital solutions must add value/convenience to their daily lives for them to adopt these solutions.

The findings of this study are supported by Adams et al. (1992), and Davis, (1989), who suggest that perceived usefulness is a fundamental factor for predicting user acceptance when adopting a new technology. Davis (1989 & 1993) argues that perceived usefulness informs someone's perception that using a new technology will enhance or improve his or her performance. Prior

studies also found that mobile users view proficiency and accessibility as the main advantages associated with adopting mobile apps, and these advantages stem from the ergonomics of a mobile device (Chen et al., 2009; Hill & Roldan, 2005; Ai-Ting, 2005).

'Perceived usefulness' is a variable that explains users' extrinsic motivations. It is regarded as an individual's ability to perceive that adopting a certain type of technology will assist with activities such as time and value for money. This is echoed in this study's findings, where most of the participants revealed that there is value for money in adopting a new technology. When investigating digital adoption and usage, researchers should therefore view this construct (perceived value) as a direct contributor to predicting digital adoption.

7.3.5 Trialability ('Try Before You Buy')

The study indicated that trialability is an important factor for adoption of mobile apps, as noted by participants. A demonstration of the digital solution does not suffice; participants stated that they would like a trial period before making a purchase decision, during which they can ascertain whether the mobile app provides value. Previous studies have been conducted to determine the degree to which new mobile apps undergo pilot testing to obtain user feedback before the app is made available to the wider public, as noted by Rogers (1983) and referenced in articles by Moore and Benbasat (1991), and Karahanna et al. (1999). The findings in this study align with prior studies, which indicate that people's desire to experiment with new technology before adoption is important (Agarwal & Prasad, 1998; Rogers, 2003), as it makes them more comfortable with the technology and increases the rate of adoption. Tan and Teo (2000) support this argument by stating that if customers are allowed to experiment with the new technology, it reduces certain unknown fears, such as the risk of losing personal information, and fraud, which would lead to an increase in adoption.

Scholars such as Carayannis and Turner (2006) point out that trialability provides a platform whereby potential users may experiment with the offering. Should a new innovation or idea be 'trialable' by potential end users, its ambiguity would be dispelled (Rogers, 2003). According to Gerrard and Cunningham (2003), users are capable of figuring out how to use new technology and are therefore not afraid to explore and 'play around' with the technology until they understand all its functions.

Trialability influences mobile-app adoption to a great extent, as new technology reveals novelties, and most people want to view and experiment with new technology before adopting it. However, some scholars have argued that the users' assessment of a new technology after trial can be erroneous or biased, based on prior knowledge, feedback from other users and experience. This was described in the research findings by participants from India and South Africa. This highlights that users from both India and South Africa would not necessarily want to trial a mobile app. To a certain extent, the participants would trust the ratings of other users. However, they may want a trial period during which to test the value proposition.

Overall, some participants were comfortable with relying on reviews and ratings provided by other people. However, they noted that prior to referring to reviews they would want to test new mobile apps or devices. Today, the consensus is that customer feedback ratings are the dominant reason that people download mobile apps. Thus, trialability is not a key influencer of mobile-app adoption.

According to various studies carried out on mobile technology adoption, the perceived ease of use (complexity) of an innovation is seen as a major barrier to mobile-app adoption (Au & Kauffman, 2008; Mallat, 2007; Ondrus & Pigneur, 2006). Ease of use (complexity) is viewed as the degree to which an idea or innovation is difficult to understand or use (Rogers, 2003). At times, innovation may be simple to understand and use. However, at other times it may be complex, and additional interaction with the innovation may be required for the technology to be adopted. Much experiential research suggests that technical complexity is a significant barrier to mobile-app adoption.

Various individual barriers are reported in a number of studies, such as difficulty with utilisation, infrastructure, and design of mobile-apps (Al-Jabri et al., 2012). The ease of use (complexity) of using novel technology may fail to influence intention to use. In this study, the participants' reluctance to use a complex system was also an important factor that hampers the adoption of mobile apps in South Africa and India. Participants did not expect any mobile app to be complicated to use. They stated that the complexity of a device may play a role in influencing adoption, based on their experience with devices they had used before. For example, Android users noted that they would not be comfortable using Apple products, and vice versa. When investigating digital adoption and usage, researchers should therefore view this construct (trialability) as an indirect contributor to predicting digital adoption.

7.3.6 Awareness (Knowledge About the Digital Offering)

Awareness refers to the degree to which emerging market consumers are aware of mobile-app products and services. This creates an issue, as consumers in emerging markets do not have access to conventional advertising media. For example, in India, only 41% of poor rural families own a TV (Anderson & Billou, 2007; Prahalad & Hart, 2002). This study noted that awareness is an important factor for digital (mobile app) adoption, in contrast to the findings of Clarke et al. (2002), who discovered that awareness of mobile apps does not necessarily imply that they will be used. To further support this finding by Clarke et al. (2002), a survey was conducted whereby 89% of participants were aware of a PIN facility on a mobile app, but only 56% used it. This supports the view that awareness does not result in adoption of mobile apps.

However, it is evident from the research that awareness enhances intention to use. In this context, Sathye (1999) identified awareness as a major factor that affects intention to use. This study is consistent with the view proposed by Sathye (1999), in that the use of Internet banking services is a relatively new experience for many people. However, low awareness of digital channels inhibits adoption. Awareness is therefore a key contributor to the adoption of mobile apps in an emerging market construct. If the consumer is not aware of the mobile app and its benefits, they will not be in a position to adopt it. When investigating digital adoption and usage, researchers should therefore view this construct (awareness) as a direct contributor to predicting digital adoption.

7.3.7 Affordability (Associated Cost of Digital Offering)

According to Kotler and Armstrong (2004), affordability is usually determined by the price associated with adopting a mobile app. Their study suggested that price is perceived as the total value obtained for the benefit the user receives from the product or service. The findings in this study were consistent with this argument. Most of the participants in South Africa and India were of the view that they would adopt mobile apps on the basis that they could afford the service and were in a position to fund the technological devices. Most consumers use price as a determining factor when deciding on whether or not to adopt a product. These findings align with the findings of Tiongson (2015) and Ünal et al. (2011), who illustrate that incentives, such as promotional offers or discount coupons, or any benefit in financial terms, encourages

adoption of mobile apps. This highlights the importance of price and value in the adoption process, and implies that affordability is dependent on price. The literature shows that if a mobile app is expensive, people ought to examine the perceived value obtained from the device in order for them to adopt it. In support of the findings in this study, Lin (2011) proposed that affordability drives the adoption of digital (mobile app) solutions.

Most participants noted that the adoption of a mobile app was based on the value proposition of the app, and not the price itself. This study shows that affordability is a key contributor to the adoption of mobile apps, in conjunction with perceived usefulness (value proposition). When investigating digital adoption and usage, researchers should therefore view this construct (affordability) as an indirect contributor to predicting digital adoption.

7.3.8 Lifestyle Integration (Ecosystem Value Propositions)

Various studies have explored the intention to use mobile services in the context of everyday life. The technological perspective ought to be aided by theories that incorporate both non-utilitarian motives and utilitarian motives for use (Katz et al., 1974). The findings in this study indicate that lifestyle/ecosystem integration is a key factor in the adoption of mobile apps, as participants use them for their everyday chores, interaction with their communities, and daily business. This finding is supported by Eckhardt et al. (2009), who note that perceptions of the community/people are important for the acceptance of any concept introduced within that society, thus influencing consumer decisions regarding adoption of the mobile apps.

Some participants who were experienced users of mobile-app technology spoke of technology being integrated into their daily life by referencing the Internet of things (IoT); i.e. an environment whereby all their technology (e.g. fridge, TV, washing machine, and other appliances) is seamlessly connected and available/accessible through a mobile app. Participants also noted that they value the experience (the way they interact with an app) and insight they gain from using mobile apps, and the ability of these apps to integrate into their daily activities, and their life goals and aspirations. These mobile apps ought to have the ability to integrate data from different offerings that consumers consume and provide personal insights into what they should be purchasing, using, and even doing daily. The concept of a ‘digital assistant’ would add value to their life if they were able to use voice commands to trigger instructions to the ecosystem within which they live and operate.

The notion of digitisation and universal platforms that Apple and Android provide increases expectations of universal services that integrate into the lives of a consumer. An example of this, noted in the study, is the use of Spotify on Bose audio products, where the former's mobile music playlist seamlessly integrates with the latter's standalone audio system. Such examples show lifestyle integration to be a key contributor to mobile-app adoption. When investigating digital adoption and usage, researchers should therefore view this construct (lifestyle integration) as a direct contributor to predicting digital adoption.

7.3.9 User Environment (Social Influence)

Participants also noted the influence their environment has on their adoption and use of mobile apps. One participant stated that they started using WhatsApp to get community updates on their village. This notion is supported by Venkatesh (2003), who notes that a user takes into consideration others' beliefs before opting to use certain technology themselves. A study conducted by Riquelme and Rios (2010) illustrates that social norms are a key contributor in the adoption of mobile apps. This finding aligns with studies conducted by Yu (2012) Amin and Muhammad (2007), who illustrate that social influence/community is a significant predictor of mobile-app adoption and use. When investigating digital adoption and usage, researchers should therefore view this construct (user environment) as a direct contributor to predicting digital adoption.

7.3.10 Access (The User is Digitally Enabled/Facilitating Conditions)

Venkatesh (2003) defines 'facilitating conditions' as the technical infrastructure that an individual would need to have in place to support mobile-app use. The results from the qualitative study indicate that user environment information influences the adoption of mobile apps. This finding aligns with previous studies by Abbas et al. (2018), and Kazi and Mannan (2013). What emerged from the analysis is that the majority of participants interviewed have access to digital devices and the Internet.

Participants illustrated that individual environments may not impact a user, but the environment in which they work, commute or visit may, on account of the infrastructure available (e.g. Wi-Fi, electricity, and data coverage). The variation of how user environment or facilitating conditions are defined aligns with previous studies, whereby Ajzen (2002) notes that perceived

facilitating conditions entails the user's perception of infrastructure, user skills or resource availability, and access to technology. It is not surprising that definitions differ, given some of the variations in how the construct is defined in the literature (Ajzen, 2002).

Interestingly, most of the participants in India indicated that they access the Internet daily, and they have unlimited access to download new apps and features they might want to use for their own businesses. Two participants, who voiced their opinion on India's mobile-app adoption maturity, suggested that, as a result of Mukesh Ambani (an Indian billionaire, who launched a mobile network operator called *Jio*), who in 2016 launched extremely cheap data services with mobile devices that were "basically free", people in India use mobile apps without any concern for data costs. The key findings here were that cheap data facilitates mobile-app adoption and usage in India, and that user environment (access to cheap data) significantly contributes to the adoption of technology. The notion that user environment is a factor that drives mobile-app adoption has been supported by Cudjoe et al. (2015), Chitungo and Munongo (2013), and Govender and Sihlali (2014). TAM and DT provides a limited view on how emerging market characteristics and user ecosystems play a role in technology adoption. When investigating digital adoption and usage, researchers should therefore view this construct (access) as an indirect contributor to predicting digital adoption.

7.3.11 Customer Feedback (Continuous Improvement of the App, Based on User Feedback)

Participants in both South Africa and India outlined that customer feedback is an important factor for digital (mobile app) adoption. Participants noted that mobile apps provide them with self-service convenience (i.e. use mobile banking or Uber Eats). Thus, they suggested that businesses find ways to obtain their feedback by designing digital solutions that effortlessly solicit feedback from users. This notion is supported by Rasiah and Ming (2010), who note that a business must consider a customer's viewpoints while rendering digital solutions to them (i.e. mobile banking). The authors suggest a failure to consider customer feedback may lead to a significant gap, which typically results in non-improvement of digital solutions that may lead to customer dissatisfaction. The finding of this study is also supported by Ibbotson and Moran (2003) and Monsuwé et al. (2004), who found that customer feedback is a key contributor to products and services customisation, which enhances customer adoption, usage, and satisfaction.

Participants argued that they would continue to use mobile apps and frequently provide relevant feedback to ensure necessary improvements to the services and digital devices are made. Certain participants argued that they do not provide customer feedback regarding the apps they are using, because it is a tiring process and businesses must ensure the feedback process is seamless and efficient (i.e. quick feedback mechanisms and the ability to provide comprehensive feedback when required). This view aligns with that of Kardaras and Papathanassiou (2001), and Yoon (2010), who, in their study on improving e-commerce and Internet banking, note that customer feedback is an important component in meeting customer demand and expectations. Interestingly, in a study on Jordan (an emerging market), conducted by Ahmad and al-zu'bi (2016), customer feedback was not found to be a factor that drives digital channel adoption. When investigating digital adoption and usage, researchers should therefore view this construct (customer feedback) as an indirect contributor to predicting digital adoption.

7.4 Quantitative Research Discussion

This section outlines the impact that the demographics had on the study; the frequency of mobile-app usage; the constructs used for the study; the reliability and validity of the data; SEM; results and interpretation of SEM; and demographic results based on frequency (ANOVA).

Mobile-app adoption is imperative for business success, due to consumer expectations as they pertain to quick access, convenience, content, and engagement (Kimberley, 2014). The research suggests that different factors drive mobile-app adoption, but that technology models, such as TAM, are not sufficient to drive such adoption. Social and emerging market characteristics must also be considered in order to holistically drive mobile-app adoption. The study proved that the derived model, which was based on TAM, DT, and emerging market theory (BOP), all holistically assist in providing an understanding of mobile-app adoption.
This study tested a derived model that describes the factors that drive mobile-app adoption in emerging markets. The model comprised eleven factors, of which nine were found to be influencers of digital (mobile app) adoption.

7.5 Sample Characteristics

The results of the study incorporated data from 1009 participants in South Africa and 1052 in India. In India, the majority of participants who contributed to the study were men (69.5%); in South Africa, the majority were women (50.6%). According to the results, the majority of participants in both South Africa and India were in their 30s (India, 30 years; South Africa, 33 years); and 76.4% of the participants in India were from urban areas, while 88.8% were from urban areas in South Africa. In South Africa, racial demographic representation was also achieved: 74.6% of participants were African, 11.1% white, 10.9% coloured, and 3.4% Indian/Asian. This aligns with current racial statistics in South Africa: African, 80.9%; coloured, 8.8%; white, 7.8%, and Indian/Asian, 2.5% (Index Mundi, 2018).

Participants were selected based on the language they spoke, in order to align with the language demographic of each country. In South Africa, the majority of the population speak Zulu, followed by Xhosa, and then Afrikaans (Stats SA, 2018). The study reflected that 24% of participants spoke Zulu, 16.2% Xhosa, and 11.4% Afrikaans, which aligns with the language demographic of South Africa. In India, the majority of people speak Hindi, followed by Bengali and then Marathi (Census India, 2011). The results from the survey reflected 46.2% of the participants spoke Hindi, 19.5% Bengali, and 13.3% Marathi, which aligns with the language demographic of India.

The greatest number of participants in India hold a diploma (24.9%), and in South Africa a Matric (34.8%). Regarding the frequency use of mobile apps, the majority of people using mobile apps several times a day are based in India (76.3%), as compared to South Africa (42.4%). This is important, as the adoption criteria noted in the study are based on individuals and their beliefs around what the barriers to digital adoption are. Thus, participants from South Africa provided detailed insights into the criteria that prevent digital (mobile app) adoption. The suggestions made by participants were based on their experience of and exposure to mobile phones within their respective countries. A total of 99.7% of participants in India own a mobile phone and a total of 99.5% in South Africa. In India, 39.8% of participants indicated that they use their mobile phones for the following: WhatsApp; social media; to search for information; for entertainment; mobile banking; gaming; online shopping; and for lifestyle needs. In South Africa, 48% of the participants said they use their mobile phones for the following: WhatsApp;

social media; to search for information; for entertainment; mobile banking; gaming; online shopping; and for lifestyle needs.

7.5.1 Central Tendency Measure of the Model Constructs

All the constructs investigated in this study were measured on a six-point Likert scale. The values range from '1' ('strongly disagree') to '6' ('strongly agree'). The mid-point of the six-point Likert scale is therefore '3'. All the mean values below '3' suggest that most participants tend to disagree with the information measuring the construct. The values between '3' and '3.5' indicate that participants tend to slightly disagree or slightly agree (neutral). All the means above '3.5' reflect that the majority of participants tend to either agree or strongly agree with the statements measuring the construct. Based on the results from the central tendency analysis, the mean score of all the constructs in both South and India was above '4', meaning that people tended to agree with statements measuring each construct, despite the noticeable difference in the educational background of the two groups. The purpose of descriptive results is to provide a summary and an indication of the overall results.

7.5.2 Reliability and Validity Tests in Confirmation Factor Analysis

Byrne (1994) and Hair et al. (2016) suggest that reliability and validity must be assessed after an appropriate overall fit is established. An advanced level of Cronbach's coefficient alpha shows more dependability of the measurement scale, according to Chinomona and Pretorius (2011). Validity is noted, as the results obtained illustrate that the Cronbach's alpha value for each research construct ranged from 0.837 to 0.931 and these are above 0.6, as recommended by Nunnally and Bernstein (1994). Additionally, total values ranged from 0.503 to 0.722 and were therefore above the cut-off point of 0.5, as advised by Dunn et al. (1994).

A composite reliability test was also carried out to analyse the internal reliability of all constructs in the study, as suggested by Nunnally (1978). For the composite reliability to be accepted, the index should be greater than 0.7 (Hair et al., 2009). In this regard, the results of composite reliability were acceptable for all constructs in this study.

Path modelling of the data was conducted after the composite reliability was determined through the use of SEM, as suggested by Beran and Violato (2010). Path modelling explains

the relationships between observed/measured variables and theoretical constructs (Roche et al., 2011), and tests the structural paths of the hypothesised research model. In this study, a structural model was assessed by analysing the p-values, together with the standardised regression coefficients. Wu (2010) suggests that a researcher has the responsibility to explain standardised regression coefficients and predictive ability with path modelling. Thus, this study conducted mediation and moderation analysis.

7.5.3 The Results of the Confirmatory Factor Analysis

7.5.3.1 The Constructs of 'Reliability' and 'Validity'

SEM was analysed using SmartPLS path modelling. SEM is commonly used as a general statistical modelling method and has gained popularity in research, as it blends both factor analysis and path analysis (Bowen & Guo, 2011). According to Bowen and Guo (2011), SEM software can be used for numerous statistical algorithms, such as path analysis, factor analysis, analysis of covariance, and analysis of variance. SEM is divided into two different approaches: the covariance-based SEM (CBSEM) method, and the variance-based method (Vinzi et al., 2010). Thus, SmartPLS is recommended when a researcher wants to develop and test a model. As suggested by Hair et al. (2010), SEM is carried out in two phases. The first phase is the measurement model, which uses confirmatory factor analysis (CFA). It aims to ascertain the validity (convergent and discriminant) and the reliability (Cronbach's alpha and composite reliability [CR]) of the scales used to measure each construct in the study. The reliability of the constructs refers to the internal consistency of the measurement (Cho & Kim, 2015).

The second phase is the structural model, aimed at testing the structural relationships specified in the conceptual model. The reliability and validity of the model are pivotal, and a new model needs to be tested (Mulaik & Millsap, 2000). Once the confirmation factors analysis was concluded and acceptable, the derived model was suitable to test the hypotheses stipulated in this study. The reliability and validity of Cronbach's alpha (results above 0.7), the composite reliability (results above 0.7), and AVE (results above 0.5) criteria were all met, based on the results presented in Chapter Six.

7.5.3.2 The Results of SEM Using SmartPLS

SmartPLS software is commonly used for Partial Least Squares Structural Equation Modelling (PLS-SEM), developed by Ringle et al. (2005). The SmartPLS used the bootstrapping algorithm procedure, which tested whether the relationships among variables were significant (Sarstedt et al., 2017). SmartPLS was used to test eleven hypotheses formulated in the study, as a way of assessing factors from the derived adoption model that may influence mobile-app adoption.

To express the significance of the relationship, the p-value was examined. Any p-value less than 0.05 means that there was a significant relationship between tested variables; any p-value above 0.05 means that there was no significant relationship between the same variables (Hair et al., 2010). The path coefficient was used to assess whether the relationship was positive or negative. The R-squared of dependent variable in both models represents the variance that the dependent variables have on the independent variable. This refers to the proportion of the dependent variance explained by the model (independent variables). The model in South Africa explained up to 79.3% of behavioural intention towards digital adoption. In India, the model explained up to 86.3% of behavioural intention towards digital adoption. It should be noted that the tested hypothesis was deemed acceptable if accepted in either South Africa or India.

The SEM analysis of the derived model analysed eleven hypotheses, of which eight were found to be significant. Therefore, the integration of ecosystems/lifestyle integration and emerging market characteristics with the TAM factors is positively associated with digital (mobile app) adoption.

7.6 South Africa and India – Direct Relationships in the Model

7.6.1 Trialability Will Have a Significant Effect on Behavioural Intention Towards Digital Adoption

Rogers (1983) defines 'trialability' as the degree to which mobile apps can be experienced before take up and utilisation. This supports the assumption that individuals who have had the opportunity to try an innovation are more likely to adopt it than those who have not, because those who have tested the innovation are more confident about its output (Agarwal & Prasad, 1998; Rogers, 2003; Tan & Teo, 2000). The relationship between trialability and behavioural intention towards mobile-app usage was evaluated using SEM. The results indicated that there is no significant effect of trialability on behavioural intention to use mobile apps in both South Africa and India. This means trialability does not drive intention to use. The hypothesis was therefore rejected.

This contrasts with studies that were previously conducted, which show a significant relationship between trialability and digital (mobile app) adoption (Ahmed, 2018; Marakarkandy et al., 2017; Tobbin, 2010). From the statistical results mentioned above, it can be concluded that people have behavioural intention to actual usage, not to pre-usage. This result is the same in the qualitative findings, where participants from India and South Africa did not necessarily want to trial a mobile app for experience. The participants stated that they are likely to trust the ratings of other users. However, they might use a trial period to test the value proposition of the service provided. This study contributes to existing literature by noting that trialability may no longer be a factor that influences digital (mobile app) adoption within emerging markets.

7.6.2 Perceived Ease of Use has a Significant Effect on Behavioural Intention to Adopt Mobile Apps

Venkatesh (2012, p. 157–178) defines ease of use as "the degree of ease associated with the use of the system". In addition, Davis (1989) notes that perceived ease of use is the belief that using any system will be free from effort. Mobile apps and digital technology are considered useful if a user finds the experience effortless (Al-Maghrabi & Dennis, 2011). This research heeded the call of Agarwal and Karahanna (2000), who suggest further studies be conducted

on the social influence of technology adoption. The relationship between perceived ease of use and behavioural intention was also assessed. The results showed that there is a positive and significant effect of perceived ease of use on behavioural intention towards mobile-app usage in South Africa and India. This aligns with previous research conducted by Lee et al. (2010), Abu-Dalbouh (2013), Park (2009), Lai (2012), Scherer et al. (2018), and Raida and Néji (2013), who stated that behavioural intention is affected by perceived ease of use.

According to Cho et al. (2009), a user-friendly system interface design influences an individual to use a certain product. As a result, their study notes that perceived ease of use motivates students to adopt and use e-learning platforms. This study's results align with current literature, in that perceived ease of use is an important factor in influencing people's behaviour towards mobile-app adoption. The information above substantially reinforces the findings from the qualitative study, whereby participants highlighted that mobile apps are more convenient and user-friendly, and people can easily transfer their money from one bank to another. Additionally, they can easily make payments without drawing cash from ATMs. Most of them indicated that they enjoy using mobile apps because there are often no transaction fees on payments, for example. If they were to use physical channels (visiting the bank), they would be charged a transaction fee.

The findings of this study are supported by Tang (2016) and Abu-Dalbouh (2013), who note that if consumers find mobile apps easy to use, they tend to use them more often. This study contributes to existing literature by noting that the concept of perceived ease of use (intuitive design) is a strong influencer of mobile-app adoption.

7.6.3 Perceived Risk has a Negative Influence on Behavioural Intention to Adopt Mobile Apps

'Risk' is consumers' personal belief that they will incur losses if they use technology, according to Warkentin et al. (2002). Perceived risk refers to anxiety, or even fear, associated with using mobile apps (Venkatesh & Bala, 2008). Wells et al. (2010) believe that risk influences individual decision-making, more so when the decision may have opposing results over which there is no control. The meaning of the construct tends to apply differently to different individuals in this study. According to the results, participants in South Africa believed that perceived risk influences their behavioural intention towards mobile apps. They are cautious

of the potential risk associated with using mobile apps. This aligns with current literature, which illustrates that a user's perceived risk negatively affects their decision to conduct a transaction online (Aghekyan-Simonian et al., 2012). This has also been noted by Chang and Wu (2012), and Yeong-Wha et al. (2011).

People from India, on the other hand, are not driven by perceived risk. This is in contrast to what was echoed in the qualitative study, where participants from India and South Africa expressed their fear pertaining to the adoption of mobile apps. The majority of participants indicated that there is too much risk connected to using new mobile apps. Data shows that there is a high chance of digital fraud, cybercrime, and loss of personal information associated with the adoption of some new mobile apps. This study contributes to existing literature by noting that the concept of perceived risk may be associated with user experience, as the study noted conflicting responses from participants in South Africa and India. Future researchers would need to test for this construct to ensure it is appropriate for the emerging market that they are studying.

7.6.4 Perceived Value (Usefulness) Influences Behavioural Intention to Adopt Mobile Apps

'Perceived usefulness' is regarded as the extent to which an individual believes that using a certain system will make their lives easier (Davis, 1989). According to the results, perceived usefulness is one of the factors that influences people's behavioural intention to adopt mobile apps, both in South Africa and India. This finding aligns with studies that reflect customer satisfaction (value derived) as a determinant of mobile-app adoption, according to Hsiao et al. (2016), Kok (2013), Abu-Dalbouh (2013), Park (2009), Lai (2012), Scherer et al. (2018), Raida and Néji (2013), and Ofori et al. (2016).

Current literature on mobile learning acceptance and usage suggests that motivation and perceived enjoyment contribute to the rate of digital adoption. This is supported by many studies, which report on the influence of perceived satisfaction when compared to mobile-app acceptance and use (Raman & Don, 2013). This also adds to the notion of customer satisfaction, which supports the findings in this study. Therefore, the experience mobile apps provide will increase a user's 'enjoyment', which will enhance the adoption and use of mobile apps in emerging markets.

Data from the qualitative findings also supports this claim, as the majority of participants indicated that adoption of a new technology is based on the value for money, enjoyment, social norms, or experience satisfaction associated with it. Participants reiterated that benefits linked to mobile apps are important, as they encourage people to adopt mobile apps. These findings were also noted by Tang (2016), and Kim and Yoon (2011), who found that 'information-seeking' apps (such as banking and m-payments) and 'social/entertainment' apps (such as Snapchat, Instagram, Facebook, and WhatsApp) are influenced by user interface or perceived ease of use, perceived usefulness, and visual appeal. Cho et al. (2009) support the construct of system functionality (usefulness) by noting in their study of e-learning tools that functional features (usefulness) encourage scholars to learn successfully. In contrast, Ghalandari (2012), and Al-maghrabi and Dennis (2011), found that perceived usefulness had little to no effect on behavioural intention. This study contributes to existing literature by noting that the concept of perceived value influences digital (mobile app) adoption within the derived model for emerging markets.

7.6.5 Privacy (Protection of Personal Information) Influences Behavioural Intention to Adopt Mobile Apps

'Protection of personal information' refers to an individual's fear of loss of personal information when use they mobile apps (Venkatesh & Bala, 2008). Protection of personal information has a positive and significant effect on behavioural intention towards mobile-app use for people in South Africa who participated in the study; and a non-significant effect on people from India. Protection of personal information is therefore one of the factors that influences people's behavioural intention towards the use of mobile apps in South Africa, but not in India. The qualitative data showed that people are more worried about their personal information, and they want it to be protected. The findings show that people are more likely to adopt a certain technology when there is a guarantee that it will not affect their personal information. This aligns with research conducted by Pavlou (2003). Additional studies conducted by Giovanis et al. (2012) investigated the impact that privacy has on electronic banking adoption in an emerging market (Greece). Their findings show that 'privacy risk' significantly influences a user's intention to adopt and use Internet banking. 'Privacy risk' was also found, by Keith et al. (2013), to adversely affect a user's intention to use mobile apps and, by Fortes et al. (2017), to affect their intention to use e-commerce.

Thus, this study contributes to existing literature by highlighting ‘privacy’ as a construct in the derived model, which demonstrates conflicting results from participants in South Africa and India. ‘Privacy’ was shown to be significantly associated with ‘intention to use’ in South Africa, but not in India. People in India expect privacy to be in place and no longer see it as a barrier to adoption and usage. South Africa still experiences privacy as a barrier. Going forward, researchers will need to test for this construct to ensure it is appropriate for the emerging market that they are studying.

7.6.6 User Environment Influences Behavioural Intention to Adopt Mobile Apps

‘User environment’ refers to the extent to which the user and his or her environment changes and adapts, based on the use of mobile apps. This comprises objectification; that is, how mobile apps are recognised and how the community feels about mobile apps and mobile phones (Sovacool & Hess, 2017). User environment also influences people’s behavioural intention to adopt. The results indicated that user environment has a positive and significant effect on behavioural intention towards mobile-app use in South Africa. These findings align with previous studies by Abbas et al. (2018), Kazi and Mannan (2013), Cudjoe et al. (2015), Fathema et al. (2015), Chitungo and Munongo (2013), Lucas and Spitler (1999), Schepers and Wetzels (2007), Hartwick and Barki (1994), and Govender and Sihlali (2014) in terms of environmental/social influence and how they affect adoption based on environmental influence. The results in India showed a non-significant effect on use. People in India are therefore not driven by user environment to adopt mobile apps. User environment therefore influences behavioural intention towards mobile-app usage in South Africa. This study contributes to existing literature by noting that ‘user environment’ may be associated with ‘user experience’, as there were conflicting responses from participants in South Africa and India.

Chipp et al. (2013) and Nguyen (2018) assess the influences on Internet adoption, and how the BOP segment in Vietnam integrated the Internet into their daily lives, based on the UTAUT model. The finding aligns with the outputs of this research, in that performance expectancy, ease expectancy, social influence, and facilitating conditions were all found to be relevant factors that drive digital adoption. TAM 2 noted that social norms are a factor of perceived use, which explains a user’s intent to use. Venkatesh et al. (2003) found that perceived use is not a barrier when the use of a specific technology is mandatory. This contrasts with this study’s

findings, by suggesting that users in emerging markets will follow their own belief systems when adopting mobile apps.

This perspective is also supported by Venkatesh and Davis (2000) and Zhou et al. (2010), who found that the impact of social influence decreases with time. Additional studies note that social influence was a result of limited experience with a technology and that if a user had enough experience, then the impact of social influence is diminished (Taylor & Todd, 1995a). This was not the case in this study, as users who had adequate experience (average mobile-app usage of ten and five years in South Africa and India, respectively) are still influenced by the society/community in which they work and live. The results illustrated that in India, social influence is not a predictor of mobile-app adoption, but social influence drives mobile-app adoption in South Africa. Thus, future researchers will need to test for this construct to ensure it is appropriate for the emerging market that they are studying.

7.6.7 Ecosystem/Lifestyle Integration Influences Behavioural Intention to Adopt Mobile Apps

Ecosystem or lifestyle integration refers to the degree to which mobile apps are integrated into everyday life. This is the way mobile apps are 'appropriated' into a consumer's life. Lifestyle integration also includes how the use of mobile apps is influenced by contextual factors, such as status, and how these reinforce the use of mobile apps (Sovacool & Hess, 2017). According to the results, lifestyle integration has a positive and significant effect on behavioural intention towards mobile-app use in South Africa, but not in India.

For South Africa, the finding aligns with studies which reflect that consumer decisions are highly influenced and formed by the feedback of peers, relatives, friends, and other users (Yadav et al., 2015; Effah, 2016). Kim and Yoon (2011) also support this finding by noting that customers who form part of a social network are more inclined to use mobile apps within that network. Findings from the qualitative data analysis indicated that lifestyle integration is a key factor in the adoption of mobile apps in both India and South Africa. Participants highlighted that they use technology, such as mobile apps, for their everyday chores and daily businesses. Some also stated that they value the experience and insights provided by mobile apps, and their ability to integrate into the daily activities they perform and their life goals and aspirations. Eckhardt et al. (2009) note that perceptions of the community/people are important

for the acceptance of any concept introduced within that society, thereby influencing consumer decisions regarding adoption of mobile apps. This study contributes to existing literature by introducing the concept of 'lifestyle integration' within the derived model as an influencer of digital (mobile app) adoption and usage within emerging markets.

7.6.8 Customer Feedback Influences Behavioural Intention to Adopt Mobile Apps

This refers to the degree to which feedback is used to shape products and services being offered, according to Sovacool and Hess (2017). Customer feedback is perceived to influence individual behavioural intention to adopt mobile apps. However, the results show that customer feedback has a non-significant effect on behavioural intention towards mobile-app usage on the surveyed population in South Africa. In India, customer feedback influences people's behavioural intention towards the adoption of mobile apps. From the qualitative analysis, the rationale behind this could be that users in India are more experienced with mobile-app usage and often noted the need to provide feedback to improve experience and design of certain apps. Tang (2016) supports this perspective by noting that aesthetics (i.e. the 'look and feel' of a mobile app) is related to feedback on design, animation and visual elements, and encourages the use of mobile apps. Well-designed interfaces and graphics gain the attention of users, which enhances adoption and frequent usage (Tiongson, 2015). This study contributes to existing literature by introducing the concept of 'customer feedback' within the derived model as an influencer of digital (mobile app) adoption and usage within emerging markets.

7.6.9 Access Will Influence Behavioural Intention to Adopt Mobile Apps

Access refers to the degree to which Bottom of the Pyramid (BOP) consumers (emerging market consumers) access mobile-app products and services. Infrastructure in these markets may pose a challenge to BOP consumers. Factors, such as electricity, may not be as easy to access as in developed markets (Prahalad, 2012). Access influences people's behavioural intention towards the adoption of mobile apps. The statistical results confirm the above-mentioned statement, indicating that access has a positive and significant effect on behavioural intention towards mobile-app usage in India. This means that, in India, the more people have access to mobile apps, the more they develop behavioural usage. However, in South Africa, people are not driven by the accessibility of mobile apps.

Current research supports this, as noted by Arenas-Gaitani et al. (2015), and Birkland (2013), who consider ‘access’ (facilitating conditions) a crucial driver of mobile-app adoption. ‘Facilitating conditions’ is defined as the resources and information that enable users to use technology (Alwahaishi & Snáše, 2013). The qualitative research found that mobile apps and access to the Internet go hand in hand and that data-enabled devices, data bundles, and Internet speed are important to consider when investigating the adoption of mobile apps. This study contributes to existing literature by noting that the concept of ‘access’ may be associated to the environment in which a user lives or works. The study also noted conflicting responses from participants in South Africa (not significant) and India (significant).

In their study of digital library systems in developing markets, Park et al. (2009) illustrate that access is significantly associated with intention to use and further note that it has a direct relationship with various TAM constructs. In addition, access positively influences perceived ease of use as a result of design features that enable information, as depicted by Thong et al. (2002).

The current literature indicates that resource availability has a significant positive effect on intention to use mobile apps (Concannon et al., 2005; De Silva et al., 2009). Participants in this study had access to mobile devices but argued that cost, data, and Wi-Fi still impact their ability to adopt and use certain mobile apps. This finding is supported by Van Biljon (2006), who suggests that users require infrastructure within their environment in order to adopt and use technology. Future researchers would need to test for this construct to ensure it is appropriate for the emerging market that they are studying.

7.6.10 Awareness Will Have a Significant Positive Effect on Behavioural Intention to Adopt Mobile Apps

The study of the construct of ‘awareness’ is supported by Petter et al. (2008), who suggest that literature is limited as to the impact information (awareness) has on intention to use. ‘Awareness’ refers to the degree to which consumers are aware of mobile-app products and services. This presents an issue, as users in emerging markets do not have access to normal advertising media. In India, for example, only 41% of poor rural households have access to TV (Anderson & Billou, 2007; Prahalad & Hammond, 2002). If a person is not aware of how to use mobile apps, they might not develop the behavioural intention to use them.

Participants mentioned that they already possess knowledge of how to use mobile apps. The results show that people in South Africa feel that awareness has a positive and significant effect on their behavioural intention towards mobile-app usage. In India, however, people's behavioural intention to adopt mobile apps is not influenced by awareness. The qualitative findings highlight that awareness is a key contributor in the adoption of mobile apps within emerging market constructs. Interestingly, participants indicated that if the consumer is not aware of the mobile app and its associated benefits, they would not be in a position to adopt it.

These findings align with those of Kim and Yoon (2011), who note that a consumer is more likely to use a mobile app when they have better knowledge regarding the content and benefits of the app. This notion is supported by Oliveira and Martins (2008, 2009, & 2010), who found that training programmes assist in user knowledge creation on technology, which influences adoption and usage. This study contributes to existing literature by noting that the concept of 'awareness' within the derived model is an influencer of digital (mobile app) adoption and usage within emerging markets.

7.6.11 Affordability Will Have a Significant Positive Effect on Behavioural Intention to Adopt Mobile Apps

The more people can afford to use a system, the more they develop usage behaviour. Previous research models, such as UTAUT2, show affordability (price) as a significant factor that drives adoption and use of technology (Venkatesh et al., 2012). This suggests that affordability has a direct relationship with intention to use technology. These authors also found that affordability strongly affects intention to use mobile phones and digital solutions. The results in this study indicate that affordability is not an important factor in influencing people's behavioural intention to adopt mobile apps. This was the case in both South Africa and India. This finding was partially aligned to what was identified in the qualitative data. The qualitative and quantitative findings were aligned to current literature (Luarn & Lin, 2005; Wang et al., 2006; Masinge, 2010), where it was also found that affordability is not significantly associated with intention to use.

Raman and Don's (2013) findings are consistent with participants' responses in this study, whereby participants indicated that affordability may still be an issue if the user is required to carry the cost. They stated, for example, that there should be no data costs associated with

mobile-app usage. Participants from both South Africa and India were of the view that the adoption of mobile apps is based on whether they would like to pay for a mobile-app offering. Affordability was not a barrier as such but participants would adopt the mobile-app offering depending on whether the spend was warranted. These participants also indicated that promotions and discounts would encourage them to adopt mobile apps.

Tiongson (2015) and Ünal et al. (2011) illustrate that incentives, such as promotional offers or discount coupons, or any benefit in financial terms, encourage adoption of mobile apps. This study contributes to existing literature by noting that the concept of 'affordability' in the derived model is not a direct influencer on digital (mobile app) adoption and use within emerging markets.

7.7 Demographic Characteristics Influences Mobile-App Adoption

The study noted that gender, area, racial group, level of education, home language, and frequency of use are strong predictors of mobile-app adoption. The results indicate that there is no difference in the way men and women perceived the usefulness of mobile apps, both in South Africa and India. Men and women in South Africa and in India perceived the ease of use of mobile apps in the same way. They also had the same behavioural intention to adopt mobile apps.

Area tends to be a strong predictor of mobile-app adoption. The results show that participants who lived in urban areas and non-urban areas tend to have different perceptions of perceived usefulness of mobile apps, both in South Africa and India. They perceived the ease of use of mobile apps differently in both countries. The results also indicated that people who stay in urban areas and non-urban areas have a different behavioural intention for adopting mobile apps, in both South Africa and India.

There was a difference in how Indians based in South Africa and Indians based in India viewed the usefulness of mobile apps, how they viewed the ease of use of mobile apps, and their behavioural intention to adopt mobile apps. There was also a significant difference in how racial groups in South Africa perceived the usefulness and ease of use, and their behavioural intention to adopt mobile apps. Level of education was also a predictor of mobile-app adoption in South Africa and India. People with different levels of education had different perceptions

regarding perceived usefulness and ease of use and different behavioural intentions to adopt mobile apps.

Moreover, people from different language groups had different perceptions regarding usefulness and ease of use, and had different behavioural intentions. This was the case in both South Africa and India. The results also indicated that there is no difference regarding the frequency of use of mobile apps among men and women, both in South Africa and India. Both men and women use mobile apps in the same manner. People who live in urban areas use mobile apps differently to those who live in non-urban areas.

7.8 Mediation Results

According to Fairchild and MacKinnon (2009), in statistics, a mediating variable suggests the effect of an independent variable on a dependent variable. The variances between mediators and moderators are investigated to understand the effects different variables have on each other. These authors suggest that mediating variables could be psychological, behavioural, or made up of social constructs, which may explain the effects of the variables on each other. Thus, mediation is a good means by which research can define the process by which variables affect one another. The literature to date has investigated many drivers of technology adoption. However, the literature suggests that there is limited studies on mediation variables, and the findings from this study propose that environmental and ecosystem barriers are important to consider. The derived model also tested specific pathways of model variables, and the relationship effects (i.e. hypotheses) that were accepted are as follows:

- ‘User environment’ (mediator) significantly mediates the relationship between ‘perceived risk’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that ‘user environment’ mediates the relationship between ‘perceived risk’ and ‘behavioural intention’.

- ‘Awareness’ (mediator) significantly mediates the relationship between ‘perceived ease of use’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that awareness mediates the relationship between ‘perceived ease of use’ and ‘behavioural intention’.

- ‘Customer feedback’ (mediator) significantly mediates the relationship between ‘perceived risk’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that ‘customer feedback’ mediates the relationship between ‘perceived risk’ and ‘behavioural intention’.

- ‘Awareness’ (mediator) significantly mediates the relationship between ‘perceived risk’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that awareness mediates the relationship between ‘perceived risk’ and ‘behavioural intention’.

- ‘Awareness’ (mediator) significantly mediates the relationship between ‘perceived usefulness’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that ‘awareness’ mediates the relationship between ‘perceived usefulness’ and ‘behavioural intention’.

- ‘User environment’ (mediator) significantly mediates the relationship between ‘privacy’ (independent variable) and ‘intention to use’ (dependent variable). It was noted that ‘user environment’ mediates the relationship between ‘protection of personal information’ and ‘behavioural intention’.

The study found that the mediation and moderation results were not consistent for South Africa and India. The extent of the direct effects from variables in the model varied between adoption measures and external variables. This confirms and extends the finding of Burton-Jones and Hubona (2005), who suggest that a full mediation assumption is not always required.

7.9 Moderator Results

According to Fairchild and MacKinnon (2009), the relations between variables are often more complex than direct relationships, as noted in the envisaged model. Thus, it is important to understand which variables influence or moderate the relationship between the dependent and independent variable. Moderation allowed the study to establish whether a third variable influenced the strength or direction of the relationship between independent and dependent variables within the envisaged model. As discussed earlier, the moderation effect was tested on SmartPLS. An interaction term (moderator X predictor) was created. The effect of this interaction term on the behavioural intention (outcome variable) is akin to the moderation effect. To date, the literature has investigated many drivers of technology adoption. However, the researcher did not find studies that had been carried out on moderation variables from environmental barriers and ecosystem barriers that emerged in this study. This perspective is also supported by Gupta and Kim (2010). The derived model tested specific pathways of model variables, and the relationship effects (i.e. hypotheses) that were accepted are as follows:

- 'Affordability' (moderator) significantly moderates the relationship between 'user environment' (mediator) and 'intention to use'. It was noted that affordability is a significant moderator of the relationship between user environment and 'intention to use'. Affordability thus worsens the effect of user environment on 'intention to use'.

- 'Access' (moderator) significantly moderates the relationship between 'lifestyle integration' (mediator) and 'intention to use'. It was noted that access is a significant moderator of the relationship between 'lifestyle integration' and 'intention to use'. Access therefore exacerbates this relationship.

- 'Affordability' (moderator) significantly moderates the relationship between 'awareness' (mediator) and 'intention to use'. It was noted that affordability is a significant moderator of the relationship between 'awareness' and 'intention to use'. 'Affordability' thus exacerbates the effect of awareness on 'intention to use'.

- 'Access' (moderator) significantly moderates the relationship between 'awareness' (mediator) and 'intention to use'. It was noted that access is a significant moderator

of the relationship between ‘awareness’ and ‘intention to use’. Access therefore improves this relationship.

7.10 Summary of Overall Results

This chapter assists in achieving the study objectives by analysing data presented in Chapters Five and Six. The discussion began with key takeaways from the qualitative study and then the sample characteristics of participants. Thereafter, the outputs of the descriptive statistics were presented and discussed. The findings of the study were then compared to other studies for rigour and insight for both adopters and non-adopters of mobile apps. The overall results indicate that the following factors are found to have an impact on people’s behavioural intention to adopt mobile apps. People in South Africa are driven by lifestyle integration, perceived ease of use, protection of personal information, perceived risk, perceived usefulness, and user environment to use mobile apps. People in India, on the other hand, are driven by access, customer feedback, perceived ease of use, and perceived usefulness.

All these factors were found to be statistically significant. The factors that drive digital adoption in India are no longer seen as barriers to adoption. The Indian population has an expectation that these factors exist; without them the result would therefore be non-adoption. In South Africa, the factors in the model are still seen as barriers to adoption. Businesses should therefore not only focus on ensuring they meet these expectations, but that the South African population is aware of how the factors in the derived model have been catered for. Both SEM models also showed significantly higher explained variance for digital (mobile app) adoption within an emerging market, thereby confirming the study’s objectives.

SPSS was used to conduct group difference tests, such as the independent samples test and ANOVA, to evaluate whether there was a significant difference in perceived usefulness, perceived ease of use, and behavioural intention to adopt mobile apps across categories such as gender, area, racial group, level of education, home language, and frequency of use. Rogers (2003) emphasises that people who are more likely to adopt new technology are young people who earn a decent salary, and have an appropriate level of education. However, this study refutes Rogers’ finding, as participants from South Africa and India whose adoption rate was above 75% were not young, and many possessed secondary education qualifications. Demographic characteristics play a fundamental role in predicting adoption (Rogers, 2003). In

his DOI theory, Rogers (2003) states that people who have access to resources tend to adopt new technology more frequently than those who do not have access to resources.

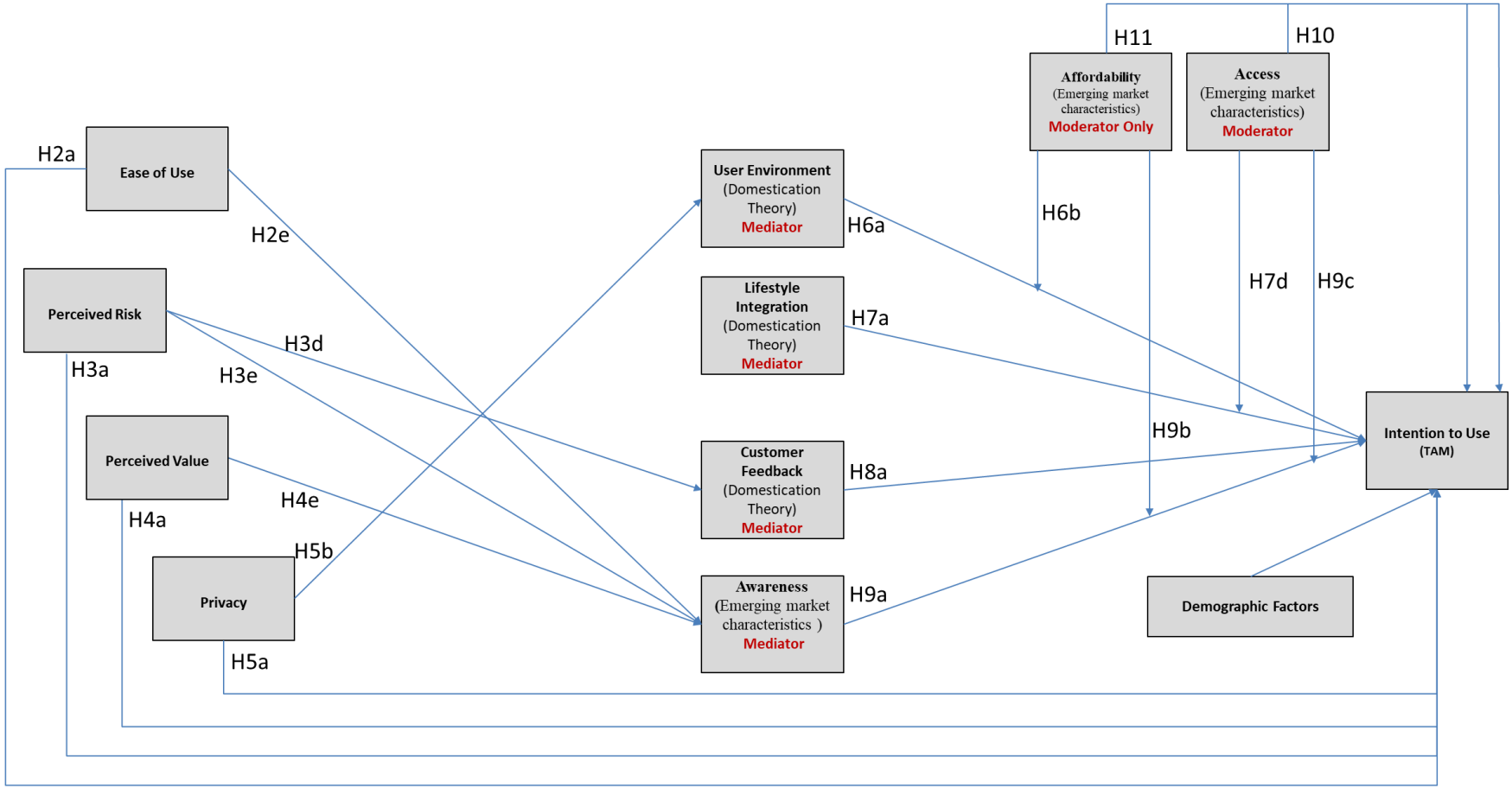
Traditional technology adoption/usage model extensions from this study include the following:

- This study investigated not only the technological components that drive technology adoption, but extends current theory by incorporating ecosystem thinking, which embeds technology into the lives of the consumer.
- Another extension is the contribution that emerging market characteristics, such as awareness and access, make regarding the adoption of technology in South Africa and India. This model could also be tested in other emerging markets.
- The study of variables that mediate and moderate the relationship between factors in the model, such as affordability and access, add to the literature.

Figure 31 illustrates the factors found to be relevant for digital (mobile app) adoption.

Figure 31

Study-Derived Model for Mobile-App Adoption



7.11 Conclusion

While these findings are in no way exhaustive, they add to the growing body of digital technology adoption literature in general, and to m-commerce adoption research in particular. The study therefore significantly contributes to both theory and practice.

The study proposed and verified that the derived model can be employed to explain and predict the drivers of mobile-app adoption in South Africa and India, and may also be used for other emerging markets. The findings have several implications for mobile-app providers and researchers interested in digital technology. First, the study found that all constructs from the models adopted to frame the research study are key determinants of mobile-app adoption. However, perceived usefulness/value affects individuals' attitudes more than perceived ease of use. Although people require a simple way to adopt new technologies, such as mobile apps, perceived usefulness is critical. The combination of awareness, trialability, credibility, ease of use, perceived risk, perceived value, and how this relates to lifestyle integration, user environment and user feedback, was tested holistically. The study reflected nine out of the eleven hypotheses to be significant in driving mobile-app adoption. In South Africa, of all eleven factors that were tested, seven were found to be significant.

In line with the study aims and objectives, the research intends to enhance current technology adoption models, and consider the characteristics of emerging market consumers and how these may affect mobile-add adoption (as depicted in the derived model). The findings suggest that there is a high correlation between these constructs, and they therefore all contribute positively to mobile-app adoption in South Africa and India. The interpretation of the qualitative and quantitative data shows that TAM alone is no longer sufficient to predict technology adoption of consumers in emerging markets. Consumers' needs have changed, and they have developed higher expectations around how they would like to interact with technology. Adoption has commonly been considered from a technological perspective, but as consumers become more sophisticated in their use of technology, adoption models must incorporate the consumer environment and emerging market characteristics. These results provide an understanding of what influences mobile-app adoption in emerging markets, which can be leveraged by developed and developing countries.

This chapter concluded with an interpretation of the results. The researcher linked the qualitative and quantitative findings and illustrated how they relate to the literature. The synthesis of theories in the derived model found that the current technology acceptance model may be inadequate to predict user adoption of digital (mobile app) solutions.

The final chapter outlines the implications for businesses, concludes the findings of this study, and discusses the contribution from a practice, theoretical and methodological perspective.

CHAPTER EIGHT
RECOMMENDATIONS AND CONCLUSION

8.1 Introduction

This study aimed to identify the digital-adoption drivers in emerging markets and provide conclusions that extend beyond descriptive analysis. Using a qualitative study, a comprehensive review of the literature was conducted and a digital adoption model was derived. Thereafter, the derived model was empirically tested. The qualitative and quantitative findings are concluded in this chapter, along with a summary of the research and its objectives.

The overall objective of this study was achieved by structuring the research into eight chapters. Chapter One outlined the background, objectives, and theoretical framework of the study. Gaps in the literature were identified through a review of existing theories, and a brief overview of the tension between existing theories and how this research adds to the literature was provided. An exploratory sequential mixed-methods design was adopted, whereby qualitative research was conducted in South Africa and India, followed by quantitative research that validated the findings.

Chapter Two introduced the concepts of emerging markets and m-commerce and provided insight into emerging market characteristics to help understand emerging market classifications. The literature investigated the impact of smartphone penetration in emerging markets in Sub-Saharan Africa on mobile Internet use in India and South Africa. In addition, m-commerce adoption was discussed in relation to digital adoption in emerging markets. The chapter concluded by analysing the strengths and weaknesses of mobile adoption in India and South Africa.

Chapter Three provided an overview of technology adoption models in relation to domestication theory and emerging market characteristics. The hypotheses of the study were derived from the literature, which influenced the sequential mixed methodology that was adopted. Guided by the theories in Chapters Three and Four, the research methodology followed a sequential mixed-methods design: qualitative research and quantitative testing of the findings.

Chapter Five detailed the qualitative research findings. It examined the data gathered from 31 interviews conducted with participants from both South Africa and India and provided an

analysis thereof. Using a modified form of grounded research and thematic analysis, certain relationships pertinent to mobile technology adoption were analysed.

Chapter Six analysed the quantitative data. The hypotheses of the derived model were tested and the characteristics of the sample and constructs were presented.

Chapter Seven interpreted the results of the qualitative and quantitative studies.

This chapter provides insight into the criteria for digital (mobile app) adoption in emerging markets by discussing the implications of the research for theory and practice. The key findings, as well as limitations and recommendations for further research, are discussed.

8.2 Conclusion of the Research Questions and Objectives

The research questions and objectives were as follows:

- What factors influence mobile-app adoption in emerging markets?
  The research suggested that TAM alone is not sufficient for understanding the factors that drive mobile-app adoption. Businesses need to consider the holistic model developed in this study to enhance digital adoption within an emerging market context, specifically South Africa and India. This also provided insight into the rationale/usage behind mobile-app adoption in South Africa and India, as per the objectives of this study.

- Do ecosystems influence adoption and usage?
  The study noted that DT significantly influences adoption and usage. The user ecosystem plays an important role in influencing the adoption of digital solutions within emerging markets. The study provided insight into the rationale behind mobile-app adoption from an emerging market perspective, with specific reference to South Africa and India, and how consumers within these markets are influenced by the ecosystem within which they live and operate.

- How do the emerging market characteristics influence adoption and usage?
  The research noted that emerging market characteristics influence adoption and usage of mobile apps in South Africa and India. Businesses must not assume accessibility or affordability are barriers to entry within emerging markets. The model derived in this study dispels the assumptions that people in emerging markets are not fit to consume digital solutions. The derived model helps to explain how various factors come together to drive digital (mobile app) adoption and usage in emerging markets, as per the objectives of the study.

This study proposed a conceptual model that was grounded in a literature review, which analysed existing theories and models that aim to enhance technology adoption. The derived model used the data collected from this study to explore the key drivers affiliated with users' adoption of mobile apps in emerging markets, specifically South Africa and India.

Wang et al. (2006) note that model synthesis was required in their study of m-commerce in emerging markets. To achieve the objectives of this study, the research reviewed the relationship between existing theories to better understand the factors that influence digital adoption, usage, and client behaviour in India and South Africa. The study formulated eleven hypotheses, based on a qualitative analysis. Using the derived model, the research noted that, individually, existing theories/models (TAM, DT, and BOP [Prahalad's four A's]) may not provide insight into the factors that drive digital adoption in emerging markets. A research model was therefore developed for this research, based on the literature on TAM, DT, and BOP, and the qualitative analysis derived a conceptual model that was tested quantitatively. The research then compared the findings to existing literature by reviewing studies that both agreed and disagreed with the findings in this study.

These hypotheses were developed to describe and test the relationships of digital adoption factors in the derived model. A survey instrument was developed and deployed in the qualitative and quantitative analyses. The research data was screened, ordered, and statistically analysed using SmartPLS software to develop two structured equation models (SEM). The results indicated that nine out of the eleven hypotheses were significantly associated with digital adoption, which validated the synergised derived model and illustrated the need for a holistic model for digital (mobile app) adoption. Businesses should combine these models to maximise consumer adoption of mobile apps.

8.3 Merit of Research and Contribution to the Field of Study

The study conducted research with participants in South Africa and India, both qualitatively and quantitatively, and presented an integrated derived model that provided deeper insights for businesses on how they may enhance digital (mobile app) adoption. The study contributed to theory, methodology, and practice. These areas are discussed in more detail below.

8.3.1 Practice Contribution

As noted in Chapter One, there is substantial GDP growth in emerging economies. It is therefore imperative to understand the impact of growth and globalisation on consumers. These consumers may be encouraged to adopt digital channels so as to enhance corporate and business profits, while reducing the cost associated with providing a product or service. In addition, annual consumption in emerging markets will reach US$30 trillion by 2025; the biggest growth opportunity for businesses looking to expand their market share (Atsmon et al., 2012).

It is therefore essential that digital adoption is enhanced in emerging markets. This will assist in the growth of emerging market economies as consumers gain access to new products and services. To date, digital adoption models have not catered for the ‘millennial mindset’ of potential digital consumers, as the predictive models are dated and incomplete.

Businesses have invested substantially in IT infrastructure to cater for the needs of mobile-app consumers, but the real benefit of digital adoption (customer satisfaction and revenue generation) has not yet been realised in South Africa or India. Effective digital adoption models have not offered a holistic model for digital adoption in emerging markets.

Simply put, adoption has commonly been considered from a technological perspective, but as consumers become more sophisticated in their use of technology, adoption models need to incorporate the consumer environment, ecosystem expectation, and cater to value demand. The characteristics of emerging markets differ substantially from those of developed economies and, as such, require their own adoption framework. This research outlined the factors that influence mobile-app adoption in emerging markets, which can be leveraged in both developed and developing countries. In so doing, the annual consumption projection within emerging

markets of US$30 trillion by 2025 may be reached sooner. Thus, this research provides a guide for businesses that wish to enhance or offer digital solutions in emerging markets.

8.3.2 Theoretical Contributions

The study makes a significant contribution to the current literature as it pertains to digital adoption in emerging markets. Attempts to create a holistic view that combines more than one theoretical perspective have been noted in recent years to better understand the adoption of digital solutions, as suggested by Oliveira and Martins (2011), and Fichman (2004). However, a holistic model that considers technology barriers, social influences, and emerging markets still required research. This study followed the suggested approach and combined theory from TAM, DT, and BOP (Prahalad's four A's), and themes that emerged from the qualitative study, and formulated a conceptual model to drive digital adoption in emerging markets, specifically South Africa and India. The integrated model will assist future researchers in understanding the factors that drive digital adoption in emerging markets.

Research conducted to date also highlights the relevance of investing in BOP markets (Prahalad & Hart, 2008). Businesses often lack the ability to change their business models to facilitate the digital adoption process, based on the technology they deploy, even though they invest in these digital transformation programmes. Chesbrough and Rosenbloom (2002), and Teece (2010), note that businesses struggle to link their digital innovation to their business models. The critical link between digital innovation and BOP is severely lacking (Prahalad & Hart, 2008). To the researcher's knowledge, current literature mostly fails to link technology adoption to the BOP, while catering for ecosystem integration. This study attempted to do this.

The study conducted the research in two emerging markets, providing an in-depth explanation on behavioural intent for digital adoption in emerging markets. This highlights that the derived model is adaptable and may be used in future studies that focus on digital adoption in emerging markets. Studies have typically focused on technology adoption in developed markets or one market, as detailed in Chapter Three. This study investigated digital adoption by integrating existing theory and deriving a conceptual model. In addition, technology adoption models were originally designed to explain the acceptance and use of information systems technologies in organisations (Raida & Néji, 2013), whereas this study incorporated the country characteristics and the ecosystem of the user.

The following list, which is discussed in more detail in this chapter, illustrates the significant contributions that this research makes:

- Contributions in two countries (i.e. South Africa and India) and how these countries may drive digital mobile-app adoption. The study noted that the findings were not consistent, and therefore bespoke mobile-app adoption strategies need to be included for each country.
- A mixed method study that has contributed to a synthesised framework, which will assist mobile app providers to enhance adoption and usage.
- Both theory and empirical findings contribute to an understanding of the interplay between digital adoption factors from a mobile-app perspective. This study also contributes to our understanding of what drives mobile-app adoption.
- Significant digital (mobile app) adoption criteria were identified.
- A better predictability of digital adoption in emerging markets was established.
- The significance of the emerging market context in TAM and DT was validated by the newly derived model.
- New mediating and moderating path analysis for technology acceptance (mediating and moderating factors), such as awareness, user environment, access, and customer feedback, were noted, as depicted in Chapter Six.
- Significant constructs, such as privacy, customer feedback, lifestyle integration, and user environment, which infuse digital (mobile app) adoption and use, were identified in the derived model.

In addition, Table 95 clearly articulates the model variables and the contribution to the existing literature. It also illustrates that an extension and synthesis of existing theoretical models such as TAM, BOP, and DT are important when predicting mobile app adoption.

Table 95

Model Variable Contributions

No.	Model Variable	Previous Studies	Contribution to literature
1.	Trialability	Ahmed (2018) Marakarkandy et al. (2017) Tobbin, (2010)	This study contributes by illustrating that previous literature may be dated and that trialability is no longer a factor that drives digital adoption for mobile apps.
2.	Perceived ease of use	Lee et al. (2010) Abu-Dalbouh (2013) Park (2009) Lai (2012) Scherer et al. (2018) Raida and Néji (2013)	This study contributes by demonstrating that perceived ease of use is still relevant in driving mobile-app adoption. It also illustrates that this is a key driver in the derived model, in both South Africa and India.
3.	Perceived risk	Aghekyan-Simonian et al. (2012) Wu (2012) Yeong-Wha et al. (2011)	Further studies may benefit from this finding by conducting further research in emerging markets that are looking to introduce mobile apps. The study reflected and contributes to the literature by noting that not all emerging markets have risk as a barrier.
4.	Perceived value (usefulness)	Hsiao et al. (2016) Kok (2013) Abu-Dalbouh (2013) Park (2009) Lai (2012) Scherer et al. (2018) Raida and Néji (2013) Ofori et al. (2016)	Current literature on mobile-app acceptance and usage suggests that motivation and perceived enjoyment contribute to the rate of digital adoption. This is supported by many studies, which report on the influence of perceived satisfaction when compared to mobile-app acceptance and use. This specifically highlights that this is still relevant in South Africa and India as emerging markets.
5.	Privacy (Protection of personal information)	Pavlou (2003) Giovanis et al. (2012) Keith et al. (2013) Fortes et al. (2017)	This study contributes to the literature by highlighting 'privacy' as a construct in the derived model, which demonstrates conflicting results from participants in South Africa and India. 'Privacy' was shown to be significantly

			associated with 'intention to use' in South Africa, but not in India.
6.	User environment	Abbas et al. (2018) Kazi and Mannan (2013) Cudjoe et al. (2015) Fathema et al. (2015) Chitungo and Munongo (2013) Lucas and Spitler (1999) Schepers and Wetzels (2007) Hartwick and Barki (1994) Govender and Sihlali (2014)	The study contributes to the literature by introducing a new variable to the traditional TAM model. This variable also contributes to the literature by supporting some studies, but it is changing in terms of relevance for mobile-app adoption. The results illustrated that in India, social influence is not a predictor of mobile-app adoption, but social influence drives mobile-app adoption in South Africa. Thus, future researchers will need to test for this construct to ensure it is appropriate for the emerging market that they are studying.
7.	Ecosystem/ lifestyle	Yadav et al. (2015) Effah (2016) Kim and Yoon (2011) Eckhardt et al. (2009)	The study contributes to the literature by introducing new variables to the traditional TAM model. In addition, it also contributes to existing literature by introducing the concept of 'lifestyle integration' within the derived model as an influencer of digital (mobile app) adoption and usage within South Africa and India, and may be tested further in other emerging markets.
8.	Customer feedback	Tang (2016) Tiongson (2015)	The study contributes to the literature by introducing new variables to the traditional TAM model. This variable also contributes to the literature by illustrating that customer feedback has a non-significant effect on behavioural intention towards mobile-app usage on the surveyed population in South Africa. However, in India, customer feedback influences people's behavioural intention towards the adoption of mobile apps. From the qualitative analysis, the rationale behind this could be that users in India are more experienced with mobile-app usage and

			often noted the need to provide feedback to improve experience and design of certain apps.
9.	Access	Prahalad (2012) Arenas-Gaitani et al. (2015) Birkland (2013) Alwahaishi and Snáše, (2013) Park et al. (2009) Thong et al. (2002) Van Biljon (2006)	The study contributes to the literature by introducing new variables to the traditional TAM model. This means that, in India, the more people have access to mobile apps, the more they may develop behavioural usage. However, in South Africa, people do not seem to be driven by the accessibility of mobile apps.
10.	Awareness	Anderson & Billou (2007) Prahalad and Hammond (2002) Petter et al. (2008) Kim and Yoon (2011)	The study contributes to the literature by introducing new variables to the traditional TAM model. In addition, the study also contributes to existing literature by noting that the concept of 'awareness' within the derived model is an influencer of digital (mobile app) adoption and usage within South Africa, but not in India.
11.	Affordability	Venkatesh et al. (2012) Luarn and Lin (2005) Wang et al. (2006) Masinge (2010) Raman and Don (2013)	This study contributes to existing literature by noting that the concept of 'affordability' in the derived model is not a direct influencer on digital (mobile app) adoption and use within emerging markets, in particular South Africa and India. Further studies could test this variable in other emerging markets.

8.3.3 Methodological Contribution

The methodological approach conducted in this study contributes to current literature. A sequential mixed-methods design was employed and i) explored the literature in terms of technology adoption models; ii) determined the drivers of digital adoption through a qualitative analysis and content analysis; and iii) tested and validated the conceptual framework quantitatively, which led to a new digital adoption model that can be used in South Africa and India, but may also be considered for other emerging markets.

Another methodological contribution of this study has been the synthesis and enhancement of traditional theoretical models (TAM, DT, and BOP), which formed the basis of the qualitative study. In addition, the methodological contribution lies in the process followed in this study. This involved a qualitative and quantitative analysis, which included data-collection procedures. The methodical process adopted in this study may be useful for other studies on the drivers of digital adoption in an emerging market.

The study also incorporated inductive and deductive approaches throughout the phases of research, which adds to its uniqueness. The mixture of qualitative and quantitative analyses provided insight into the research problem, which is a methodology not used frequently in technology adoption studies.

Lastly, the study contributes by providing suitable theoretical concepts that may be applied in future studies. The suitability of current adoption models has been questioned in terms of their validity within an emerging market context, as there are many cultural, environmental, and social aspects that could impact the suitability of a prescribed model that was developed in a developed market. The effective use of the prescribed framework in this study contributes helps to interpret digital adoption in countries such as South Africa and India.

8.4 Recommendations for the Factors That Influence Digital (Mobile App) Adoption in South Africa and India

8.4.1 Knowledge (Awareness)

Interviewed participants, from both India and South Africa, felt that mobile-app providers ought to ensure that the value proposition of mobile apps is clearly communicated to their respective target markets. It is no longer only the responsibility of marketing departments to encourage mobile-app adoption. There exists a strong collaboration between marketing and other business functions, with accountability residing in each business unit. For businesses to offer meaningful value, they must create awareness with potential customers.

Key insights from the research also noted that businesses ought to ensure that awareness of their mobile apps is communicated to the targeted customer on platforms that appeal to the different segments in the target market. These days, many companies communicate the value

proposition of their respective mobile apps using their company websites. It is important for these companies to provide clear instructions and links regarding how the customer can set up their mobile app and how the mobile app will be supported. Infographics and pictures of the mobile app are an effective way of attracting the website user's attention, as noted by participants in the study. The use of online communities is also a useful way to create a viral campaign on why the mobile app is beneficial, and to have mobile-app ambassadors who can assist fellow customers with queries or questions.

The study noted that most users access the Internet from their mobile devices. Using download links of the company's mobile app on social media could therefore enhance the adoption of that company's mobile app. Companies should also be cognisant of the social media platforms they use and how they link back to the intended audience. The feedback received from the surveys suggested that social media platforms are commonly used by customers in emerging markets, but companies should look to understand which social media platforms are relevant for their respective target market. The use of in-app advertising also drives quicker adoption of mobile apps. When conducting in-app advertising, companies should be creative in their use of communication channel. Participants found that short videos and updates were key for them to continue using a mobile app.

8.4.2 Digital Enablement (Access)

Participants noted that some mobile apps use a lot of data, or that they consume significant amounts of data when a user downloads them. From an access perspective, the participants requested compensation from businesses to download apps (i.e. there should be no data cost associated with using and downloading mobile apps).

Participants noted that it is important that the places they visit have Wi-Fi access. In addition, they stated that they often visit particular places knowing that they will be able to enjoy free Wi-Fi access there. Participants elaborated by saying that if they had access to guest Wi-Fi networks, they felt more comfortable making purchase decisions when they were able to compare product/service prices, gain community insights via blogs, and even face-call friends and family for advice. They noted that they preferred to use guest networks, as they were conservative with their mobile data use.

Should Wi-Fi not be offered on the premises, customers would potentially inspect merchandise and make their purchases online or at another store. Participants noted that Wi-Fi access tended to keep them in certain stores for longer. They felt that offering access to the Internet was insufficient; stores should consider offering charging stations as well.

The use of 'instore guest Wi-Fi' and 'instore devices' also presents marketing benefits, as the business is able to set its website as a default landing page. This will ensure customers are always aware of items that are on promotion, and companies will be able to target customers based on their spending patterns, provided they have an account that can be linked at sign-up (in other words, the business will have access to customers' spending and use data analytics to promote relevant products to them).

Participants also felt that larger companies, such as banks, insurance companies, and Uber, ought to offer zero-rated (no data cost for the consumer) mobile apps, as it would encourage use and ease of access.

As a precaution, businesses must ensure that their networks are encrypted. They ought not to provide open access to their servers by offering guests the business Wi-Fi passwords. Specific guest accounts should rather be set up (this was recommended by one participant).

8.4.3 Ecosystem Value Propositions (Lifestyle Integration)

Participants noted that mobile apps are no longer a novelty. Everyone is aware of them and has high expectations of mobile-app providers. Businesses need to find new ways to attract and retain customers on mobile-app platforms, and mobile apps need to 'draw in' the consumer. Lifestyle integration has emerged as a key contributor in this regard, positioning the mobile app to take advantage of the integration capability of lifestyle, offering to meet the customer's needs and provide them with an ideal platform. Mobile apps need to offer seamless and effortless integration that provides an unmatched experience to the consumer. Participants noted that businesses should take the time to understand their needs, and how they would like to transact/interact with mobile apps on a daily basis.

Lifestyle integration could assist in the adoption of mobile apps for businesses. This can be accomplished if various businesses and technology providers 'partner up', to ensure that mobile

apps delivered in the market are appealing, feature-rich, and exclusive. This will encourage rapid adoption, and ensure market position on app stores.

Participants also noted that many companies have focused their efforts on product-led development and design by offering more products through common channels. Examples include Amazon, Airbnb, and Uber. Something that participants felt certain organisations have done very well is their ability to offer various goods and services on *one* platform. However, there is still much work to be done for various organisations that exist today to catch up to such companies. While these companies are playing catch up, the industry continues to move forward.

Participants mentioned that they would like their product providers to create 'true convenience' in their mobile-app offerings. They alluded to the fact that mobile apps are too segmented and that businesses ought to amalgamate offerings into industry-specific value propositions. In other words, the financial industry should amalgamate banking, insurance, medical aid, and forex, for instance, into *one* open platform to which all companies can connect. This is how ecosystems in their true form will be built. An example of this is a bank that allows customers to integrate Google Analytics for spend analysis, or integrate Google Drive for statement storage. The key message is that businesses should allow external parties to connect to their platforms to further enhance their value proposition. In this way, everything is interconnected and free from corporate influence, which provides true value for corporates and businesses alike. Simply put, lifestyle integration/ecosystems integrate external product providers with product offerings to create enhanced value for customers by continuously searching for better ways to meet customers' needs and future expectations.

The business landscape is changing at a rapid pace, and it is difficult for large companies to keep up with the rate of change. They do not have the flexibility or the resources to keep up with industry trends and start-up organisations. Ecosystems and lifestyle integration are becoming an expectation businesses face, rather than a choice. Companies that do not develop mobile apps that integrate into the lives of consumers will face significant challenges in the future.

Mobile-app ecosystems and lifestyle integration can significantly contribute to the innovative capability of a business and allow the business to entrench itself in an ever-evolving matrix of

interconnectedness that continuously delights customers, while protecting the business's core offering. Further research on ecosystem/lifestyle integration will assist in providing deeper insights into digital adoption. These recommendations noted from participants are by no means exhaustive and present an opportunity for further research as it pertains to creating awareness in emerging markets.

8.4.4 Facilitating Conditions and Social Influence (User Environment)

Mobile-app users are influenced by their environment. In the qualitative and quantitative studies, many participants indicated that they are influenced by their communities, families, friends, and culture. Social factors also play a role in people's intentions to use mobile apps. Some participants felt that language barriers could become an issue for mobile apps that attempt to offer social interaction. Many participants noted that their mobile apps ought to make it easier for them to use self-help services, such as YouTube, or leverage Wi-Fi networks in the environment in which they live and work.

Businesses ought to be aware of the influence that social organisations have on the use of mobile apps. An example provided from the study in India was that of Baba Ramdev, an Indian yoga guru, who has had a substantial influence in politics, Ayurveda, business, and agriculture. He has many 'followers', and participants in the study noted that they would adopt the suggestions made by Baba Ramdev (such as mobile apps to use, goods to purchase, and services to consume), and adopt his political views. By way of analogy, in South Africa, the Zionist Christian Church holds as much significance to participants as Baba Ramdev does in India. It therefore behoves mobile-app providers to be aware of the significant impact that larger social organisations have on the role of consumer behaviour.

Social norms and family characteristics must not be overlooked, as they can present additional opportunities for businesses. An example provided in the study was that of an elderly, illiterate woman, without a bank account, who purchased from Amazon on a regular basis. Her son provided her with a mobile phone, and she browsed the Amazon app and took screenshots of the items she needed. She would then send the screenshots to her son via WhatsApp, and he would purchase the items. The goods were then delivered to her home. This is a powerful example of how businesses may fail to truly understand their consumer market and how family characteristics play a significant role in purchasing decisions in a social ecosystem.

8.4.5 Feedback (Customer Feedback)

Participants indicated that it is vital for mobile-app providers to continuously improve their apps. They do not have loyalty to certain apps and will easily swap one for another should they see better value elsewhere. Mobile-app providers need to ensure that users are engaged, and that the app is easy to use. For businesses to encourage mobile-app use, they must ensure that there is a strong value proposition in the offering, and a great user experience. This is challenging for most organisations, as businesses and developers alone cannot understand the ever-changing needs of the consumer.

Participants noted that testing (prototyping) and in-app feedback may offer insights into intended users' engagement preferences. There is no catch-all solution for mobile-app developers. Instead, businesses must invest time and effort in considering user feedback, and must continuously effect changes to cater to shifts in user expectation and demand.

Businesses must also recognise the competitive environment in which their respective mobile apps operate. Every mobile app attempts to outperform the next. Service expectations from these mobile apps are unparalleled. They are expected to be robust, agile, efficient, and highly functional. It is therefore imperative that businesses offering mobile apps actively drive the value-adds of their mobile apps, while at the same time ensuring that the functionality and performance of the apps remain optimal.

Attention must be given to features that create value, based on customer expectations. Mobile apps can obtain feedback within the app itself, which enhances user engagement. As suggested above, prototyping will give mobile-app providers the ability to quickly obtain feedback for the intended users and adjust the value proposition and interface accordingly. This forms part of an agile development philosophy, which allows businesses to obtain quick insight without incurring considerable research costs.

8.4.6 Intuitive Design (Perceived Ease of Use)

As noted from many participants' feedback, mobile apps are not a new phenomenon. People are accustomed to the various options available and have ever-changing needs in terms of the user experience. 'Ease of use' is a factor that drives customers' continued use of downloaded

mobile apps. Participants provided insight into what they believe businesses should consider when offering mobile apps to emerging markets. Participants expect digital solutions to be effortless, intuitive, informative, to track progress, and they should be personalised.

Participants in this study noted that their needs differ depending on the experiences being offered in the market. One participant observed: "[a] mobile app may be great today, but when I see something better being offered from other mobile app providers, I expect the same from the mobile app I use." These expectations make it difficult for businesses to continuously meet the ever-changing expectations of their customer base. Thus, businesses must have a quick turnaround time for mobile-app changes that speaks to their mobile-app development philosophies. This is important, as mobile apps may become obsolete before the company has the opportunity to adapt. This will impact mobile-app usage rates. Businesses may benefit from considering the views of the participants from this study.

8.4.7 Cyber Security (Perceived Risk)

Participants noted that security of mobile apps drives mobile-app adoption. The fear of risk did not only pertain to mobile apps that use financial information, such as credit-card details or banking information, but included any information that the customer would deem confidential. Many participants were not completely comfortable with using all mobile apps. The general consensus in the study was that risk perception and comfort were not as severe as anticipated. Even though risk is a factor that drives usage and adoption, many users expect that security protocols will be adhered to. However, if a business fails once, it could compromise the success of the mobile app going forward; consumers are unlikely to be loyal to specific apps and would switch to an alternative app. Participants felt that they could control risk to an extent, but that it remains an important consideration.

Participants stated that they did not feel the same way about all mobile apps. Should the mobile app brand be one that they trust, such as a banking app, they reported that they would choose to use it. They used websites for banking services and were comfortable using mobile apps as a new platform for banking. Thus, from a customer perspective, not all assumptions around the risk of using mobile apps are equal for all mobile apps – even though the risk factors are the same.

Some key aspects noted from participants' feedback may help to drive mobile-app adoption. Businesses ought to consider the following:

- Financial services should allow people to set transaction limits on their mobile apps for the transfer of funds.
- Businesses should provide risk insurance for any financial or personal information that is lost through the use of mobile apps (in other words, they should believe in the security of their platforms).
- There should be continuous enhancements of security protocol, and two-factor authentications (in other words, something the customer knows [password] and something the customer owns [device biometric function]).
- The stability of mobile apps is important, as customers want to be able to trust the mobile-app provider. Should the stability of the mobile app be compromised, the customer is likely to lose faith in the degree of security offered. Three participants (two from South Africa and one from India) also noted that aspects such as encryption are assumed to be in place.
- Participants noted that businesses ought to offer complimentary malware/antivirus software packages as part of their mobile-app offering.
- Businesses should also be aware of the use of public Wi-Fi, and mobile-app providers should step up authentication when public networks are being used – perhaps not allowing public Wi-Fi access to critical apps, such as banking apps, may assist in protecting customers.
- Businesses ought to ensure that the entire chain of security protocols is secured and that the use of one-time passwords is not intercepted by fraudsters.
- People should have the ability to access their mobile apps from another device so that they can delete information in the event that the device is stolen.
- Some participants noted that creating a 'duress' profile by accessing the app with a specific password or fingerprint may assist in customer comfort (for example, if the customer is in a compromised situation, they can use their 'duress' profile to log in to the mobile app, which may lead them to an interface with reduced information and limited balances).

Mobile-app adoption strategies must cater for the needs of different target groups. The user decision-making process is unique and their personal experiences will drive the level of comfort they will have when using mobile apps. Businesses must seek to understand these and try to address them at each significant level.

8.4.8 Protection of Personal Information (Privacy)

Protection of personal information was a key concern for many participants in the study. Participants noted that they felt businesses ought to do more to protect their personal information. They felt that well-known brands, such as Facebook and banking apps, are vulnerable to interception, and have created increased uncertainty regarding the safety of their information. Participants noted that they expect businesses to conform to privacy laws and regulations, and they should strive to protect the personal information of their consumers.

Participants were aware of regulatory authorities and noted that they agree with the fact that businesses are liable to pay fines in cases of non-compliance. For this reason, it is worthwhile for businesses to spend their time and money ensuring that their mobile apps meet industry security standards, and that any possibility for negligent design is eliminated. Failing to do so may cost a business much more than it realises. The recommendations noted from participants are by no means exhaustive and they present an opportunity for further research as it pertains to creating awareness in emerging markets.

8.4.9 Convenience and Digital Value Proposition (Perceived Usefulness)

The increased use of mobile apps in emerging markets has created many opportunities for businesses and provided convenience for users. Participants noted that mobile apps save them time, and the efficiencies of certain apps that store their preferences add value to their daily activities and improve their quality of life. Businesses should therefore focus their attention on the value proposition provided by the app, and the core functions that would be made easier by using it.

Other aspects that participants found beneficial were the value-added services that apps provide. One participant provided the example of being able to purchase airtime or Lotto tickets through the bank. Mobile apps are also seen as being omnipresent (in other words, they provide

real-time information at the point in time that the customer requires it). Businesses should therefore understand *when* content may be rendered to customers and at what times this should be rendered. This presents a golden opportunity for m-commerce, although it could expose the business to reputational risk if implemented incorrectly.

The ability for mobile apps to communicate with customers was another significant driver of perceived usefulness. Participants noted that the ability to track the progress of a service request or an order saved them from having to contact companies and talk to people in their call centres. Location-based services also form part of this value. An example provided by one of the participants was that it would be useful for retailers to inform them of promotions when they are near the store, but the trick was to inform them of that which they deemed relevant. Businesses should look to obtain data on customers and ensure all communication that takes place is relevant at that point in time. Location-based messaging may enhance the complete value chain for m-commerce opportunities, as customers grow to appreciate the benefits from information-pertinent location-based services.

Another useful aspect was the unique offering to customers (personalisation). Participants stated that if the apps provided data and offers unique to the customer, it would certainly add value to their daily activities. If, for example, one orders food and has a family of five, they should be shown the family offers first when accessing the app after hours. However, when accessing the food app during working hours, the single-meal lunch specials ought to be shown first.

Of all the aspects noted by participants, the themes of ‘effortlessness’ and ‘seamlessness’ were common. Participants stated that they want mobile apps to be effortless, from registration to daily usage, returns, and feedback. Should businesses design the mobile app and the operational processes to support the mobile app effectively, the mobile app is likely to be perceived favourably by consumers, and provide the utility they seek from mobile apps.

8.4.10 Cost Associated With Digital Adoption and Usage (Affordability)

It is important for businesses attempting to make an impact in emerging markets to understand the impact that awareness has when mediated by affordability. As alluded to earlier, a company’s value proposition is pivotal to ensuring that awareness is perceived positively by

consumers. Creating desirability and ensuring that businesses have a strong brand will assist in user adoption.

Even though LSM is lower in emerging markets, these markets are aspirational in nature. An example of this is low-earning workers in South Africa and India owning mobile phones that are higher in price than their monthly wage. This was attributed to the quality guarantee and value proposition that it provides.

Businesses should be cognisant that emerging market consumers are not global citizens. As a result, international brands may not always have prestige in emerging markets. Should companies want to make an impact in these markets, they must use well-established brands that are known within these markets. An example of this is Parmalat, who leveraged the success of its brand in the milk category into different product areas that include biscuits, juices, and cereals. Thus, brand proposition is key to affordability, i.e. the price a consumer is willing to pay for a product within an emerging market.

Table 96

Summary of the Factors That Drive Digital Adoption in South Africa and India

Model Variable	South Africa	India
Access	No	Yes
Affordability	No	No
Awareness	Yes	No
Customer feedback	No	Yes
Lifestyle integration	Yes	No
Perceived ease of use	Yes	Yes
Privacy	Yes	No
Perceived risk	Yes	No
Perceived usefulness	Yes	Yes
Trialability	No	No
User environment	Yes	No

The difference in the outputs from the model may be explained by feedback from the qualitative study, whereby respondents in India were more familiar with mobile-app adoption and usage while participants in South Africa were only beginning to utilise mobile apps. It is assumed that those who frequently use mobile apps expect certain features (such as awareness) to exist, and that other factors (such as customer feedback) become more important as frequent users utilise mobile apps.

8.5 Practitioner Suggestions

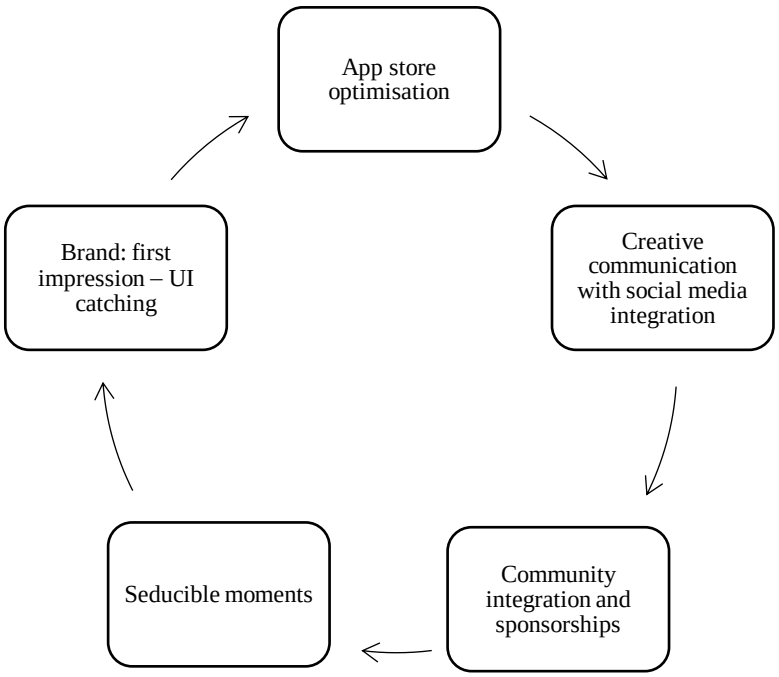
Some suggestions from the proposed model in the framework are discussed below in terms of participant feedback and the researcher's experience in the field of digital adoption in South Africa.

8.5.1 Create awareness of your value proposition

For businesses to offer meaningful value, they must create awareness with potential customers. Participants suggested that businesses should consider the factors outlined in Figure 32.

Figure 32

Factors to Create Awareness



The following sections elaborate on each of the suggested awareness techniques:

8.5.1.1 Focus on App Store Optimisation

App store optimisation (ASO) is a philosophy that applies to any technology provider (for example, Apple app stores and Google Play stores). Interviewed candidates noted that they mainly use app store searches to search for new mobile apps. It is imperative that every company looking to enhance awareness of their respective mobile-app offerings remembers that target users typically search for required apps using these app stores, and thus they may be seen as the 'Google' of apps. In the same way that AdWords is used on Google, app stores carry functionality that allows an organisation to be at the top of search results for potential customers.

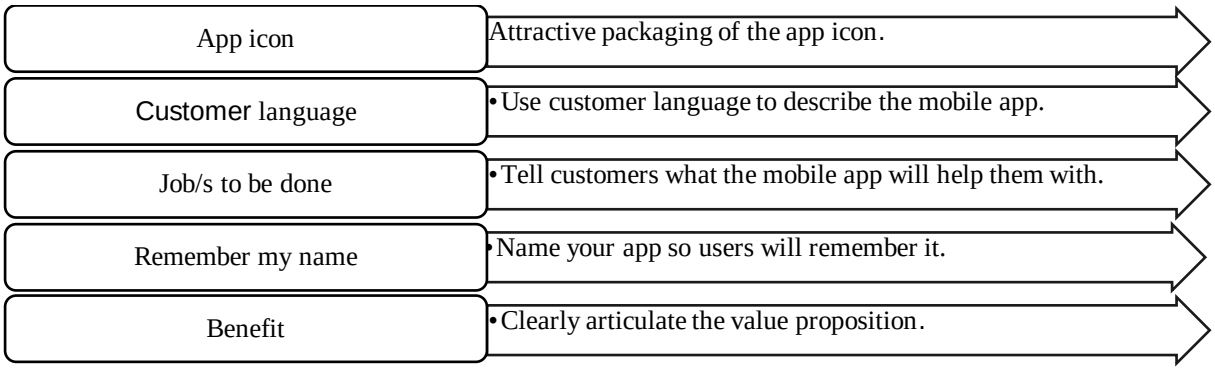
Companies must consider search engine optimisation (SEO), and couple that with app store optimisation to truly realise benefits. This will result in companies focusing on the following:

- App store analysis, in conjunction with websites and mobi sites
- Understanding customer 'pain points' and addressing these at relevant spaces
- AdWords or key word searches
- Descriptions of mobile apps and content
- Measurement and reporting.

Businesses should focus on ensuring they leverage ASO to gain the attention of the target customer base and drive adoption of their respective mobile apps. The feedback that users of apps provide is also important, and companies must provide users with the ability to provide feedback, typically after a positive experience (for example, rating an app after completing a successful transaction). These reviews are used by the app stores to position apps and recommend other apps to potential users. This ensures downloads occur naturally, as the company receives more hits on app search engines. The factors highlighted in Figure 33 may assist in drawing attention to apps.

Figure 33

Factors That Assist in Drawing Attention to Apps



Businesses must remember that ASO allows their mobile apps to be found by customers when they need them. The search is not the only criterion customers use. They may also consider the mobile-app rating, the reviews provided about the app's rating, and the comments received.

8.5.1.2 Users who are Typically Offline

Many participants noted that they only go online (onto the Internet) if they have a need to. For these customers, businesses should consider using leaflets, posters, stickers, and printed material to advertise their mobile apps and the benefits they provide. The use of QR codes will make it simpler to direct a customer from a physical source to the app store. As for online campaigns, it is important to understand where to distribute the physical material to ensure that it reaches the target audience.

8.5.1.3 Seducible Moments

These are moments that allow businesses to reach their clients at the point in time when a client needs a product or service. For example, Uber Eats could provide customers with waiting times at a food court when they enter a shopping mall close to lunch time. Clients will be prompted to use Uber Eats to pre-order food in order to reduce these long waiting times. Such communication can take place in the form of screens placed in shopping malls, push notifications, or messaging through tagging services, and company ambassadors who interact with potential customers face-to-face.

8.5.1.4 A Creative Mobile App Brand and User Interface Catching Icons

Companies should offer personalised apps for specific demographics within their target market. For instance, a bank may offer a children's banking app, an app for seniors, and a mobile app. These apps should be created with icons and colour schemes that appeal to the target audience. For example, the children's banking app could have a Disney 'look and feel', while the senior's app could use large fonts and a simple interface. What is key from a business perspective is to follow design and development principles that allow a company to offer one app in different ways, to minimise the cost of hosting multiple apps. The philosophy should be 'one app rendered with different interfaces'. Some key principles that would assist businesses in this regard include the following:

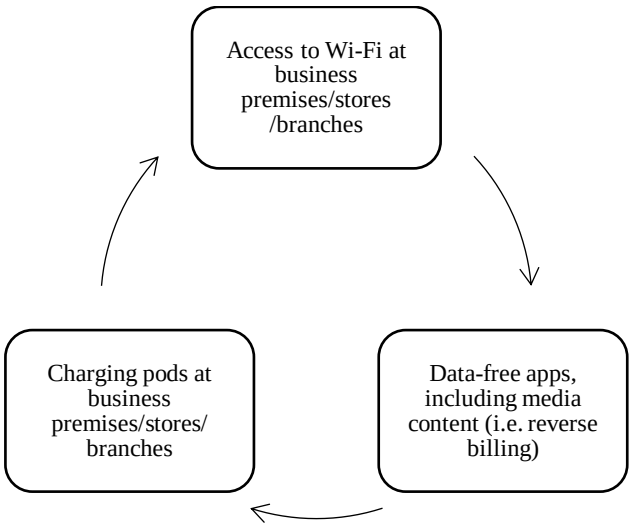
- Provide a description of the mobile app on offer.
- Use eye-catching icons and colour schemes relevant to the brand.
- Have an easy navigation path to the app, from download to usage.
- Provide short 'how-to' videos to help customers with the setup.
- Ensure the mobile app is responsive and quick to use (device-specific apps could be used).

8.5.2 Data and Wi-Fi

The study noted that individuals found certain mobile apps to be data-intensive in terms of usage, either when downloading or using the app. Thus, business may benefit from considering the recommendations outlined in Figure 34.

Figure 34

Requested Areas of Improvement Regarding Mobile Apps



8.5.3 Lifestyle Integration/Ecosystems

Ecosystems will assist mobile apps, as they pertain to mobile-app users' demands for client-centric, personalised, efficient, and superior mobile-app experiences that meet known and unknown demands. It is important that businesses find a way to create platforms that lifestyle partners can work on, and intelligently match customer needs to suppliers. This is depicted in Figure 36.

Figure 35

Mobile App Ecosystem

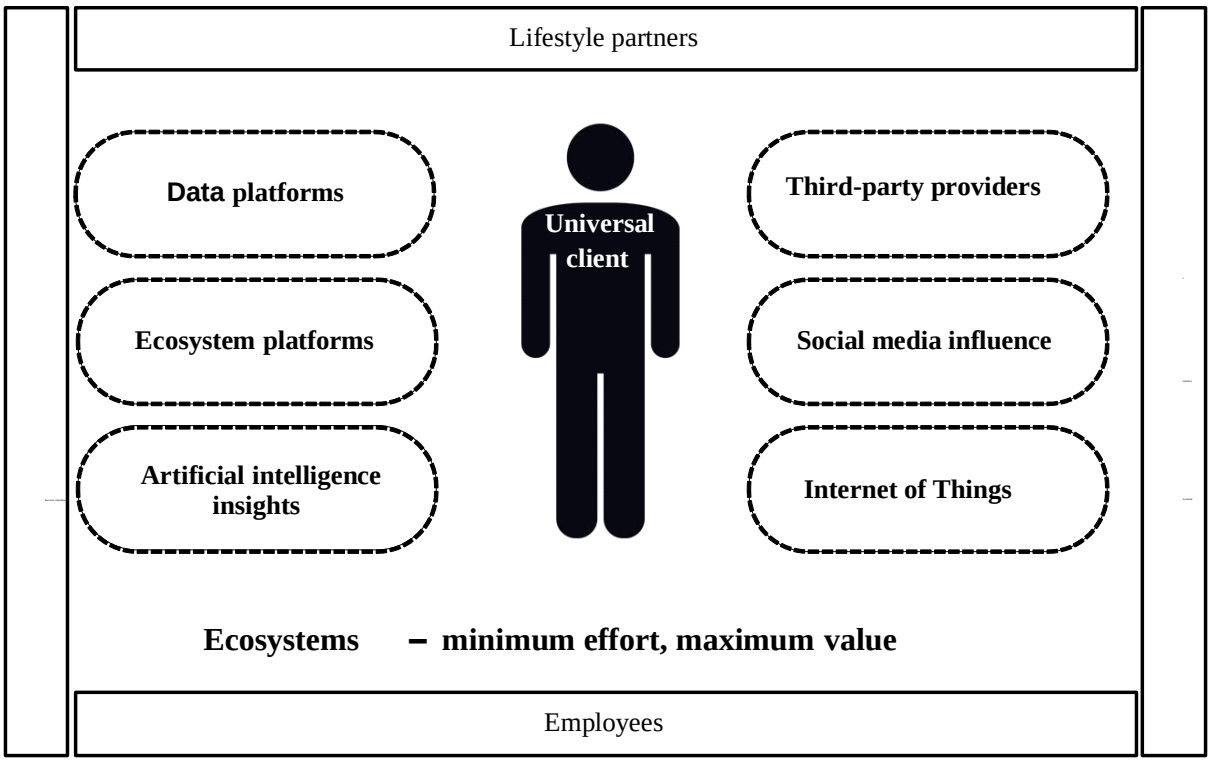
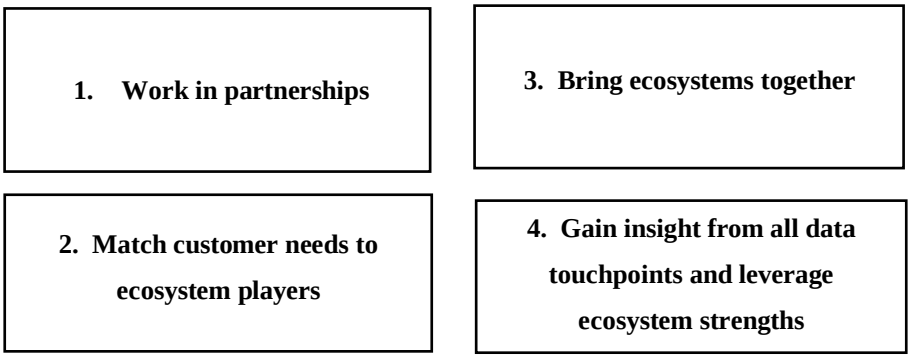


Figure 36

Ecosystems and Mobile Apps

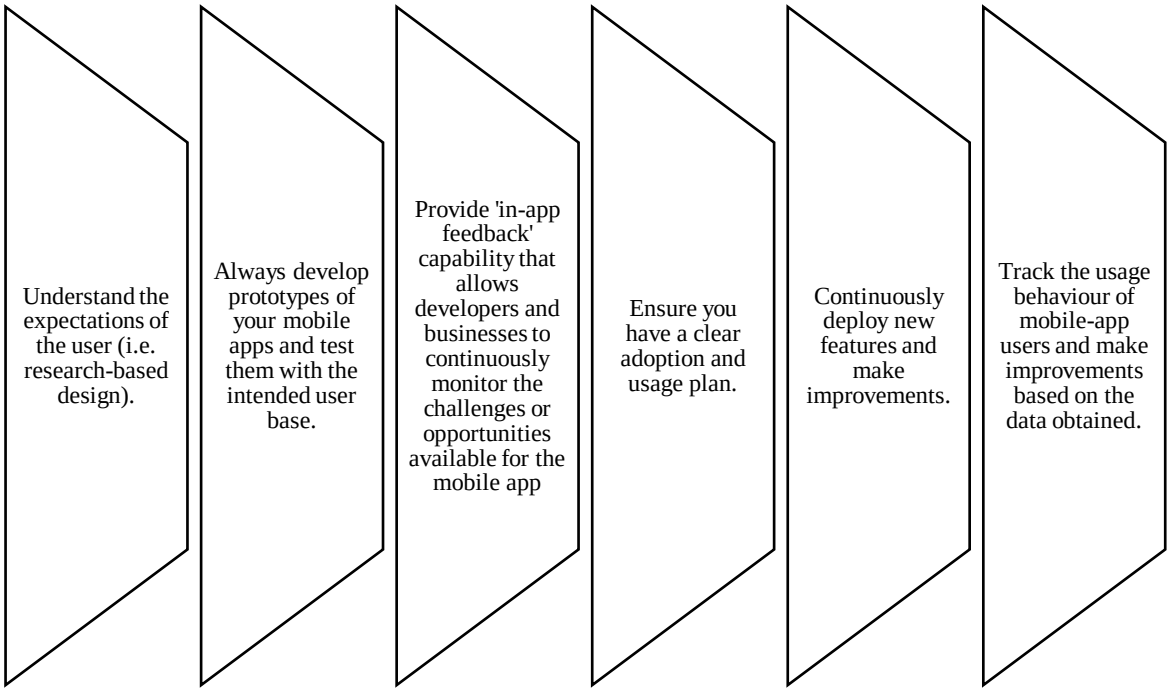


8.5.3.1 Continuous Improvement based on Customer Feedback

This is challenging for most organisations, as businesses and developers alone cannot understand the ever-changing needs of the consumer. Recommendations for improving customer feedback, provided by the researcher, are outlined in Figure 37.

Figure 37

How to Improve Customer Feedback



Prototyping and in-app feedback may offer insights into intended users' engagement preferences. There is no 'one-and-done' solution for mobile-app developers. Businesses must consider user feedback and continuously effect changes to cater to user expectations and demands.

The benefits of using the suggested approach include the following:

- Cost-saving: initially developed markets thought that emerging markets could not afford to utilise mobile phones and data, but the research suggests they can. Any assumptions may therefore be removed from the actual customer feedback.

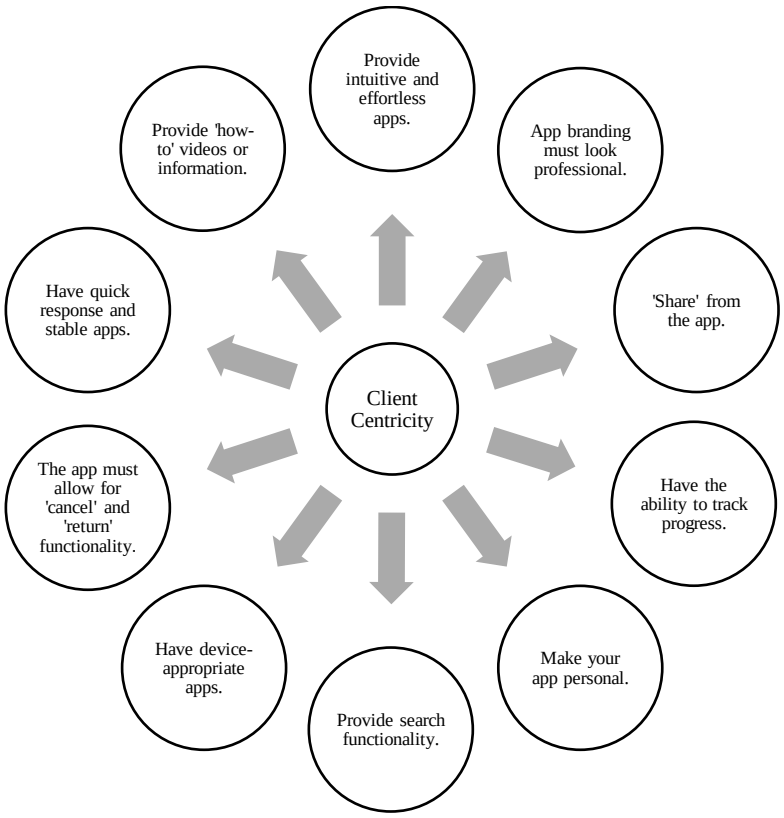
- Understand the customer: in-app feedback allows for quick insights from consumers, helping the business understand what matters to customers. This guarantees that customers continuously use the mobile app.
- Efficiency: obtaining first-hand information through in-app feedback will ensure that businesses prioritise their delivery on customer requirements and expectations. This will save the time involved in researching every feature, and assist the business with the delivery roadmap.

8.5.3.2 Make your App Intuitive

Mobile apps are not a new phenomenon. People are familiar with the various options available, and have ever-changing needs in terms of the user experience. 'Ease of use' drives customers' continued use of downloaded mobile apps. Participants provided insight into what they believe businesses should consider when offering mobile apps to emerging markets. Figure 38 outlines some key suggestions for businesses.

Figure 38

Model for Ease of Use (Participants' Point of View)



8.5.3.3 Intuitive and Effortless Mobile Apps

Businesses must consider participants' feedback to ensure that the mobile app is centred on the problem it is solving for the customer and the value proposition it is attempting to deliver. The mobile app must be created in a way that is self-directing and does not require much training to use. This includes the mobile app catering for learnability and memorability of the user's behaviour.

The cognitive load of the mobile app's users must also be considered. Businesses must not overwhelm the user by providing too much information, which would distract the user from the action they are trying to perform. Customers tend to delete mobile apps that are too complex or inefficient. The user interface should be clear and easy to navigate.

8.5.3.4 App Branding

Branding is just as important as the technology behind it. Businesses must consider the target market too.

Participants noted some key guidelines for mobile-app branding:

- The description of the app must be clear.
- The logos must be affiliated with the brand or depict the functionality of the mobile-app offering.
- It should be clearly stated how the mobile app will provide value in the description.
- The mobile app should be easily found if searched for using keywords (thus, keywords are important).
- The mobile app's brand should speak to the offering.

8.5.3.4.1 'Share' From the App

Participants mentioned that having the ability to 'share' information from mobile apps was important to them (in other words, integration with social media apps, such as WhatsApp, WeChat, and Instagram). They felt it provided a seamless experience. They also noted that complaints and compliments could be associated with this feature.

8.5.3.4.2 Have the Ability to Track Progress

Participants suggested that one of the features they typically appreciated was the ability to track progress or workflow for orders or cancellations. Mobile-app providers should ensure that all transactions or services are displayed on the mobile app, and all key milestones are shown. Users should also have the ability to escalate issues from the app, if required.

8.5.3.4.3 Make Your App Personal

One of the aspects noted in the study was personalisation. Participants stated that they enjoyed mobile apps that offered them experiences and insights that were unique to their needs, and products that would be of specific interest to them. Businesses must ensure that data points are utilised from the user history and behaviour analytics.

In-app analytics will assist in the personalisation of how the mobile app is rendered (in other words, frequent functions used are displayed first for the specific user). This will guarantee that customers are more engaged with the mobile-app offering.

8.5.3.4.4 Have 'Device-Appropriate' Apps

Another good insight from participants was that the mobile app should operate within the ecosystem of platforms they use. They noted that laptops, tablets, wearables, appliances, and mobile phones should have the same functionality offered in different ways. One participant noted that wearables should operate more with voice, while laptops with holistic displays of meaningful information would add value over and above the basic function being performed.

8.5.3.4.5 'Cancel' and 'Return' Functionality

Some participants noted that the fear of making a mistake still worried them, and that simple aspects, such as a 'back button' or an easy option to 'cancel' or 'return', were important to them. These actions should also provide knowledge to the user as to how the specific action will take place (in other words, how the item will be collected and by whom). In terms of orders or services being tracked, participants stated that they would like to know when the agreed

timelines would be breached. Mobile-app providers should either compensate them for extending delivery times or provide them with the option to cancel.

8.5.3.4.6 Quick Response and Stable Apps

Participants felt that certain mobile-app providers must consider the response times of their apps, and ensure that the mobile apps are 'always on'.

8.5.3.4.7 Provide 'How-To' Videos

Participants noted that new features or help functions within mobile apps would be best rendered via 'how-to' videos. They felt that watching a short clip would assist in alleviating potential language and education barriers. These videos should be rendered in the app and mobile-app providers should offer reverse billing for the data used to consume these short 'how-to' videos. This would also assist in limiting interaction with the business's call centres or front-line staff.

8.5.4 Mobile-App Adoption in Existing Businesses

Table 97 outlines questions that businesses should ask themselves in relation to the adoption of mobile apps.

Table 97

Questions Businesses Should Consider Regarding Mobile-App Adoption

1.	How do you intend to drive mobile-app adoption?
2.	What are the platforms that your business wants to push?
3.	How will you drive adoption across your business (i.e. stores, branches, etc.)?
4.	Do you sufficiently understand digital adoption in terms of who you should target and what problem you will be solving? Also consider segmentation.
5.	How will you ensure that the adoption plan is not a once-off event?
6.	How will you equip the business for the 'push' of mobile-app usage (i.e. training, support, operations, etc.)?

7.	How do you ensure sustainability of your mobile app?
8.	What initiatives will drive mobile-app adoption?
9.	Is forced adoption an option (i.e. if the customer does not have it, they cannot continue services)? Capitec South Africa is an example.
10.	How does the company culture align to a digital service model?
11.	What factors would prevent the success of your mobile app?
12.	What are your digital key performance indicators?
13.	How would customer experience be measured after mobile-app adoption?
14.	Have you defined commercial targets for digital adoption?
15.	Do you have company ambassadors (champions) for your mobile app?
16.	Do you have support tools and material to assist employees and customers?

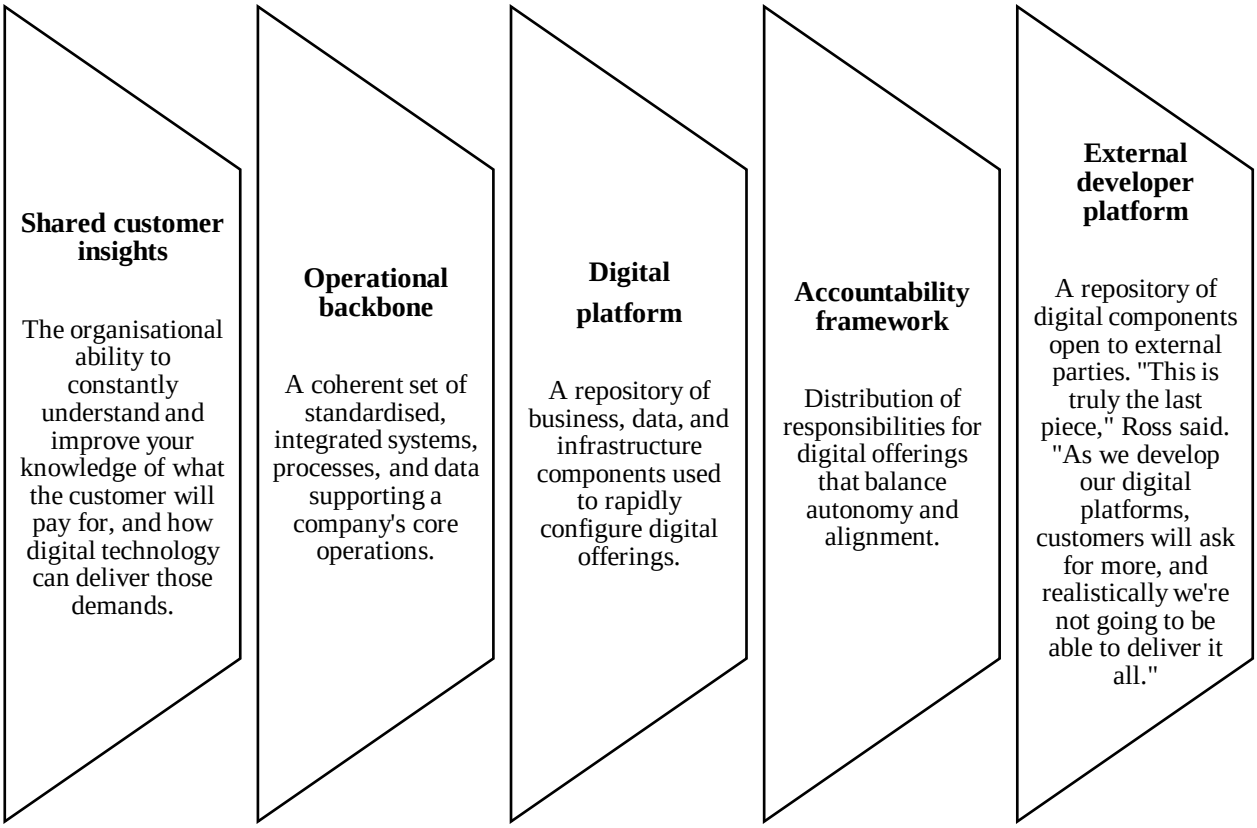
8.5.5 Key Steps to Ensure Digital Transformation

The rate of technological change has affected many businesses. With significant investments being made in digital transformation, businesses must ensure that the return on these investments is realised. The adoption of digital services (mobile apps) has confounded many businesses to date. The speed of technological change and consumer behaviour has forced businesses to be more agile. According to MIT (2019), "although digital technologies can enhance business efficacy, using digital technologies for that purpose doesn't transform a company into a digital business". Businesses need to know how to structure their organisations to maximise the benefits that may be realised from digitisation and mobile-app offerings.

MIT (2019) outlines five building blocks that may assist companies in digital transformation, which may enhance the value proposition of their respective mobile apps. These building blocks are outlined in Figure 39.

Figure 39

Five Building Blocks for Digital Transformation



Note. The Five Building Blocks of Digital Transformation. From *Five building blocks of digital transformation*, by MIT, 2019, retrieved from: https://cisr.mit.edu/publication/2018_0601_BuildingBlocks_RossMockerBeath.

According to MIT (2019), "[t]hree of the five are technology platforms: an operational backbone, a digital platform, and an external developer platform. The other two are organisational capabilities: shared customer insights, and an accountability framework that coordinates the efforts of autonomous teams."

The building blocks discussed offer an effective way for businesses to understand what needs to be done in order to succeed with the rapid changes in the digital environment. Businesses must be cognisant of the capabilities required to succeed with mobile-app offerings and deliver on the digital value propositions promised to customers.

It is important to note that *external developer platforms* speak to lifestyle integration, while *digital platforms* speak to perceived usefulness, which this research proved to be an indicator for mobile-app adoption and enhanced value delivery for the customer.

8.5.6 Merit of Research and Contribution to the Field of Study

There is substantial GDP growth in emerging economies. It is therefore imperative that one understands the impact of growth and globalisation on the consumer. These consumers may be encouraged to adopt digital channels to enhance corporate and business profit, while reducing the cost to serve. In addition, annual consumption in emerging markets will reach US$30 trillion by 2025 – the biggest growth opportunity in the history of capitalism (Atsmon et al., 2012).

It is therefore essential that digital adoption is enhanced in emerging markets. This will assist in the growth of emerging market economies as consumers gain access to new products and services. To date, digital adoption models have not catered for the millennial mindset of potential digital consumers, as the predictive models are dated and incomplete.

Businesses have invested substantially in IT infrastructure to cater for the needs of mobile-app consumers, but the real benefit of digital adoption has yet to be realised in South Africa and India. As outlined in this research, an effective digital adoption model must cater for all three of the following:

1. The technological factors (TAM factors)
2. Social conditions (DT)
3. Emerging market characteristics (BOP characteristics).

Simply put, adoption has commonly been considered from a technological perspective, but as consumers become more sophisticated in their use of technology, adoption models need to incorporate the consumer environment, ecosystem expectation, and cater to value demand. The characteristics of emerging markets differ substantially from those of developed economies and, as such, require their own adoption framework. This research outlined the factors that influence mobile-app adoption in emerging markets, and these can be leveraged by both

developed and developing countries. In so doing, the annual consumption projection within emerging markets of US$30 trillion by 2025 may be reached sooner.

8.6 Limitations and Areas for Future Research

Limitations can involve generalisation, applications to practice, and/or utility of findings that were the result of the ways in which the internal and external validation was conducted based on research (Price & Murnan, 2004). Like most studies, this study has limitations. This section discusses these limitations and presents opportunities for future research.

The six limitations associated with this study were as follows:

1. Even though two countries were researched, these were not representative of the situation in all provinces or states. As such, a large population of rural and other urban communities may not be represented in the data. There are therefore future research opportunities for studies to be conducted in these other areas.
2. The study was a cross-sectional study. In other words, the participant sample for each phase of the study was different (new samples were used for each phase of the research). Future research may benefit from undertaking a longitudinal study (i.e. using the same sample for both the qualitative and quantitative research).
3. On account of time constraints, additional countries could not be included in the study. Future research may benefit from conducting studies in additional emerging countries, using a larger research sample for the quantitative study.
4. External and internal factors within the qualitative and quantitative research process may have impacted the environment and mindset of the individuals involved in the study; i.e. their frame of mind, bias, conflicts arising from cultural bias, and other personal issues between the field workers and respondents.
5. The study only analysed the factors of behavioural intent. Further studies may benefit from expanding on behavioural intent and investigating actual usage of mobile apps in emerging markets.
6. The instrument designed from the qualitative analysis resulted in a slight lack of discriminant validity in India. However, this worked well in South Africa. Future research could improve the questionnaire so that the format and language of the instrument is understood in the market in which it is being used.

8.7 Recommendations for Further Research

This research helps to determine the factors that drive digital adoption in emerging markets, while considering not only technology adoption factors but the ecosystem of the user in an emerging market context. The derived framework may benefit businesses that are looking to introduce digital solutions in emerging markets.

This study will assist future research on digital adoption, which could address additional factors applicable to ecosystems and emerging market characteristics, as it has validated the amalgamation of technology, ecosystems, and emerging market characteristics. Future research may also benefit from conducting a study between emerging markets and developed markets or between different emerging markets.

8.8 Conclusion

Emerging markets are primed for economic growth on account of globalisation. The sum of retail annual sales across surveyed emerging markets is envisaged to reach US$3.5 trillion in the next few years (Credit Suisse, 2015). Substantial growth will be realised in emerging markets, and mobile apps will play an important role in m-commerce. The evolution of technology and adoption of mobile apps in emerging markets will change the way corporates and businesses operate and deliver services to their consumers.

The study illustrates that mobile apps enhance the use of consumers' devices and add value to their day-to-day activities. The findings show that participants spend the majority of their time on retail-service-type mobile apps, ranging from big brands to smaller local mobile-app offerings.

Corporates and businesses must ensure that they use mobile apps to maximise value from their target markets and expand their markets beyond geographic constraints. In addition, they should keep the mobile-app value chain in mind throughout their product and service development lifecycle (from design to operations, support, and feedback). A philosophy of continuous improvement of mobile apps ought to be adopted to keep customers engaged.

This study is not only important for understanding that current technology adoption models are incomplete, but also contributes to the field of mobile-app adoption from an emerging market perspective. The recommendations provided will assist businesses in maximising the value that their respective mobile apps offer.

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APPENDICES

APPENDIX A: CONSENT LETTER AND ELECTRONIC CONSENT FORM

Consent Letter and Electronic Consent Form

Dear Participant,

I am currently registered for the degree of Doctor of Philosophy, which I am completing by thesis in the School of Economics and Business Sciences at the University of the Witwatersrand. I would like to invite you to take part in this research. My study investigates the potential contributors for digital technology adoption within emerging markets. The proposed research will include interviews with participants and also survey research. The survey research will entail the distribution of questionnaires to individuals within South Africa and India (Johannesburg and Delhi, as main metropolis areas respectively).

The research will attempt to contribute to an improved understanding of the factors that improve digital adoption as a channel for consumers in India and South Africa to enhance consumer convenience. The study is for academic publication purposes only. The results of the study will be reported in my thesis, which will be published by the University of the Witwatersrand.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study, or if you withdrawal from participating at any time, you will not be penalised.

The procedure involves filling in an online survey that will take approximately 30 minutes. Your responses will be confidential, and I will not collect identifying information such as your name, email address or IP address. I will do my best to keep your information confidential. All data is stored in a password-protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. The results of this study will be used for scholarly purposes only and may be shared with Qualtrics and university representatives.

If you have any questions about the research study, please contact me:

Student: Muhommed Riyaaz Patel
Mobile: +27 72 574 2782
Email: Muhommed.patel@standardbank.co.za

Supervisor: Prof Chris Callghan
Contact Number: +27 11 717 8066
Email: Chris.Callaghan@wits.ac.za

ELECTRONIC CONSENT:

PROCEEDING WITH THE INTERVIEW STIPULATES THAT YOU:

1. have read the information above.
2. voluntarily agree to participate.
3. are at least 18 years of age.

If you do not wish to participate in the research study, please exit the survey.

APPENDIX B: INTERVIEW GUIDE

DEVELOPING AND TESTING A FRAMEWORK FOR DIGITAL CHANNEL ADOPTION IN EMERGING MARKETS

INTERVIEW SCHEDULE

The researcher will attempt to make the participant/interviewee feel welcome and relaxed. The participant and the interviewer will have a conversation to help the participant feel comfortable. Background and objectives of the study will be discussed with the participant. Thereafter, the researcher will indicate the expected length of the interview.

Interview Schedule for Digital Adoption Participant

I. Opening

A. **(Establish Rapport)** [Shake hands] My name is Muhommed Riyaaz Patel and, as a PhD student, I am trying to establish the rationale/feelings and attitude people have towards digital adoption (mobile apps) within your city.
B. **(Purpose)** I would like to ask you some questions about your background, your education and some experiences you have had with digital technology. As you are the typical intended consumer of digital technology, your insights will be very useful.
C. **(Motivation)** Your feedback will assist me in completing my research, which may be used by emerging markets to improve economic conditions within emerging markets.
D. **(Timeline)** The interview should take about 60 minutes. Are you available to respond to some questions at this time?

(Transition: Let me begin by asking you some questions about where you live and your family.)

II. Body

A. General demographic information

A1. What is your name?
A2. How long have you lived in this city?
A3. How old are you?
A4. What racial demographic do you affiliate with?
A5. What is the highest level of education you have received?

(Transition to the next topic: Thank you for this information. Would you be comfortable for us to move to the next section of the interview?)

B. Technology Acceptance Model

B1. How do you feel about using mobile apps?
B2. Is technology important to you, and why?
B3. Do you often trial technologies in stores?
B4. Do you own a mobile phone or tablet?
B5. How often do you download new apps from bank/retail stores, etc.?
B6. Why do you download them/why don’t you download them?

B7. Do you enjoy incentives for mobile-app usage?
B8. How do you come across new technologies?
B9. How do you feel about digital/technology?
B10. Do you think that technology, such as mobile phones and tablets, is easy to use?
B11. Do you often require assistance when using technologies, such as mobile phones, computers or tablets?
B12. Why would you use digital technology?
B13. What are the benefits you believe digital technology offers you?
B14. What are the aspects that deter you from utilising technology?

C. Domestication theory

C1. How often do you try or buy technology because a friend or family member has recommended it to you?
C2. How often do you download apps on your devices because a friend or family member has recommended them to you?
C3. Do you believe that digital technology can be used daily? Where, how, when and why?
C4. Do you have access to Wi-Fi or cellular data daily?
C5. Is access at home a key aspect for you to use digital apps? Why?
C6. Do you often provide feedback to technology providers and retailers around what you believe will make your life easier?
C7. Are you likely to use a mobile app if it has been offered because of a suggestion you made?
C8. Are you likely to use a mobile app if it has been offered because of a suggestion your friend or family member has made? Why?
C9. Do religious institutions, such as temples/church, influence your decision to take up mobile apps, products and services in your community? How?
C10. Are you comfortable with using mobile apps for everyday chores (i.e. banking, ordering an Uber, purchasing on Amazon/Alibaba)? Why?

D. Emerging market characteristics

D1. Are you aware of the mobile apps offered to you by your bank?
D2. Are you aware of the mobile apps offered to you by retailers in your area?
D3. Do you know the benefits of using mobile apps?
D4. What inhibits you from taking up mobile apps?
D5. How do you feel about the manner in which digital devices are priced?
D6. Do you believe that obtaining devices from the US would be cheaper for you?
D7. Do you use other brands of digital devices (other than Samsung and Apple)? Why?
D8. Do you have fast Internet connectivity in your area?
D9. Do you always have access to an Internet network?
D10. How do you feel about the cost of Internet connectivity?
D11. Is it easy for you to maintain a digital device (i.e. access to electricity, repair stores and retailers that sell them)?
D12. Does security/cybercrime worry you? Why?

(Transition: Well, it has been a pleasure finding out more about you. Let me briefly summarise the information that I have recorded during our interview.)

III. Closing

A. **(Summarise)** You are pro/against digital adoption because of _____.

B. **(Maintain Rapport)** I appreciate the time you gave up to attend this interview. Is there anything else you think would be helpful for me to know as it pertains to the reason why individuals in your community may or may not use digital service offerings?

C. **(Action to be taken)** I should have all the information I need. Would it be alright for me to email you if I have any more questions, or for further clarification?

Thank you once again.

APPENDIX C: QUESTIONNAIRE

PhD Research Survey

This survey forms part of Muhommed Patel's PhD Degree at the University of the Witwatersrand, Johannesburg, South Africa. The results are for academic purposes only. Your assistance in completing this questionnaire would be greatly appreciated.

Instructions:

Please follow the instructions set out below to ensure that your responses are recorded correctly.

1. Please select the answer that best describes your response.
2. Kindly answer all questions in the survey.
3. You must be 18 years or older to participate.
4. The survey should take approximately 30 minutes to complete.
5. Should you allow your photograph to be taken, your photograph will be used for validation purposes.
6. Participation in this survey constitutes consent.
7. Please contact Muhommed Riyaaz Patel (at muhommed.patel@standardbank.co.za) should you have any further queries.

Thank you for your participation.

1. Are you based in South Africa or India?

South Africa
India

2. Are you answering this survey with the help of a research facilitator or by yourself?

By myself
With the help of a research facilitator

3. Gender

Male
Female
Other

4. Your age. Only input a numeric value (i.e. 30). Do not write the word ‘years’ after your answer.

5. Home language

English
Afrikaans
Xhosa
Zulu
Venda
Ndebele
Sepedi
Setswana
Southern Sesotho
Swati
Tsonga
Bengali
Telugu
Marathi
Hindi
Tamil
Urdu
Kannada
Gujarati
Malayalam
Sanskrit
Odia

6. Your highest level of education

Pre-Matric
Matric
Diploma
Degree
Honours
Master’s
PhD

7. Do you live in a farm (rural) area or city (urban)?

Non-urban (farm area)
Urban (city)

8. Which demographic do you identify with?

Black
White
Coloured
Indian (SA-based)
Indian (Based in India)

9. I would classify my total monthly income (gross income) range as:

Note: South African Rands denoted by ‘R’; Indian Rupee denoted by ‘INR’. No one will know who you are; you will remain anonymous.

R0 to R1 000/INR 0 – 5 000
R1 001 – R2 000/INR 5 001 – 10 000
R2 001 – R3 000/INR 10 001 – 15 000
R3 001 – R4 000/INR 15 001 – 20 000
R4 001 – R5 000/INR 20 001 – 25 000
R5 001 – R6 000/INR 25 001 – 30 000
R6 001 – R7 000/INR 30 001 – 35 000
R7 001 – R8 000/INR 35 001 – 40 000
R8 001 – R9 000/INR 40 001 – 45 000
R9 001 – R10 000/INR 45 001 – 50 000
R10 001 – R11 000/INR 50 001 – 55 000
R11 001 – R12 000/INR 55 001 – 60 000
R12 001 – R13 000/INR 60 001 – 65 000
R13 001 – R14 000/INR 65 001 – 70 000
R14 001 – R15 000/INR 70 001 – 75 000
R15 001 – R16 000/INR 75 001 – 80 000
R16 001 – R17 000/INR 80 001 – 85 000
R17 001 – R18 000/INR 85 001 – 90 000
R18 001 – R19 000/INR 90 001 – 95 000
R19 001 – R20 000/INR 95 001 – 100 000

R20 001 – R21 000/INR 100 001 – 105 000
R21 001 – R22 000/INR 105 001 – 110 000
R22 001 – R23 000/INR 110 001 – 115 000
R23 001 – R24 000/INR 115 001 – 120 000
R24 001 – R25 000/INR 120 001 – 125 000
R25 001 – R26 000/INR 125 001 – 130 000
R26 001 – R27 000/INR 130 001 – 135 000
R27 001 – R28 000/INR 135 001 – 140 000
R28 001 – R29 000/INR 140 001 – 145 000
R29 001 – R30 000/INR 145 001 – 150 000
More than R30 000/INR 150 000 per month

10. What is your monthly total income (i.e. R400/R2 500/R3 000/R4 100/R6 750/R50 000 or INR 1 000/INR 4 000 /INR 8 000, etc.)? Note: No one will know who you are; you will remain anonymous.

11. Do you own a mobile phone, tablet, computer or smart device? You may select more than one answer.

Mobile phone
Tablet
Computer
Smart device (e.g. Smart TV, etc.)
None

12. How often (frequency) do you use mobile apps (e.g. WhatsApp, Facebook, etc.)?

Once an hour
Several times an hour
Once a day
Several times a day
Once a week
Several times a week
Once a month
Several times a month
Never

13. For how long have you used mobile apps? Please input the number of years only, without writing the word "years" next to your response (i.e. 5, or 7, or 15, etc.).

14. Which features do you use often on your digital devices (i.e. mobile phone or tablet)? You may select more than one.

WhatsApp
Social media (e.g. Facebook, Twitter, etc.)
Search for information (e.g. Google, Yahoo, etc.)
Entertainment (e.g. YouTube, music, etc.)
Mobile banking
Gaming (e.g. Angry Birds, Candy Crush, etc.)
Online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)
Lifestyle needs (e.g. Uber, logging a complaint, etc.)

Technology acceptance model

Trialability – I understand how to use mobile apps, but a demonstration of the app would still be useful.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have opportunities to try various mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I know where I can go to review mobile apps.

Strongly Disagree
Disagree

Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I like to try a mobile app before I purchase it (try-before-you-buy).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Learning to navigate mobile apps would be easy for me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Perceived value – mobile apps are useful to me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps would make my life easier/more convenient.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps improve the quality of tasks I perform.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps allow me to make better decisions in my life because of the information they provide.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps allow for better control of tasks/activities I perform.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile-app incentives are important to me (i.e. rewards for using the mobile app).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Perceived ease of use – it is easy for me to learn how to use mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I find it easy to complete a task on a mobile app.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

My interaction with mobile apps is clear and understandable.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Learning to operate mobile apps is easy for me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I would find it easy to get mobile apps to do what I want them to do.

Strongly Disagree
Disagree

Slightly Disagree
Slightly Agree
Agree
Strongly Agree

It is easy to search for and download a mobile app.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I understand how to use all my mobile app features.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I understand how to navigate the mobile apps I download (i.e. I know where to find the features/information I'm looking for).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I know what to do if something on my mobile app does not work.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree

Agree
Strongly Agree

Interacting with mobile apps would NOT require a lot of my mental effort (i.e. thinking).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Perceived risk – I will not download a mobile app that is not worth the cost.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

It is possible that I might download a mobile app and not enjoy the mobile app, due to poor performance.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Using mobile apps may expose me to financial loss (i.e. my phone could be compromised and I could lose money).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

It is uncertain whether mobile apps would be as effective as I think.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Compared to other technologies, mobile apps do not have more uncertainties.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Privacy and credibility – mobile apps may result in me losing my personal information.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps do not always protect my privacy.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am comfortable with the security on mobile apps (i.e. banking apps, Facebook, etc.).

Strongly Disagree
Disagree

Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Authorisation mechanisms (e.g. passwords on mobile apps) make me feel comfortable.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am comfortable accepting recommendations that my mobile app may offer me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am comfortable with my information being backed up to the Cloud (i.e. my mobile app provider stores my information for me).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Intention to use – I intend to continue using mobile apps in the future.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree

Agree
Strongly Agree

I will always try to use mobile apps in my daily life.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I plan to continue using mobile apps frequently.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I plan to use mobile apps often in the future.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I would recommend mobile apps to others.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I feel I am part of the community of people using mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Domestication theory

User environment – mobile apps are used frequently in my city/community.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I use mobile apps based on advice given to me by the people in my city/community.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I gain social status (prestige) when I use some mobile apps in my city/community.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

People whose opinions I value prefer that I use mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

People who influence my behaviour think that I should use mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Using mobile apps is entirely within my control.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Lifestyle integration – the mobile apps that remember my frequent usage make my life easier (e.g. previous purchases and transactions).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

The mobile apps that connect me to my family and friends add value to my everyday life (e.g. Uber rides being ordered for a family member).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

It is beneficial for my social media platforms to recommend mobile apps that are based on my lifestyle needs.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

My tradition/culture/religion has influenced my decision to download a mobile app.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps fit into my daily routine.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps are compatible with other technologies I use.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Customer feedback – I use mobile apps more when I am able to provide feedback on what does not work.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

For me to continue using a mobile app, frequent improvements are necessary.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I normally look at mobile app ratings before I download the app (i.e. other people's feedback is important to me).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I would use my mobile apps more if I could provide feedback in the mobile app itself (i.e. in-app feedback).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Emerging market characteristics

Awareness – I have used channels such as YouTube, wikiHow, or similar, to make myself aware of the different features provided on my mobile apps, but these would be useful to me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am aware of the features/benefits my mobile apps offer me.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am aware of the options I have to seek assistance on the mobile apps I use (i.e. mobile app support number, etc.)

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have downloaded certain mobile apps because I knew about them, or was told about them by a friend or family member.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I am aware of what I need to do to download a mobile app.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I always have access to the Internet, either on Wi-Fi or through mobile phone data (i.e. 3G/4G).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have access to electricity to charge my mobile phone or tablet so that I can use my mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have repaired my mobile phone or tablet previously, in the area I live, so that I can continue using my mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have everything I need in order to use mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Affordability – mobile apps are always good value for money.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I always use my data to download mobile apps that I need and find valuable.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I would pay for a mobile app that I need and find valuable.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Mobile apps are expensive to use, as they consume a lot of mobile data or airtime.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Data is expensive at the current price.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

Access – I can access my mobile apps because the community in which I live has access to electricity/charging stations.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have access to my mobile apps because the community in which I live always has Internet connectivity (i.e. Wi-Fi or cell data).

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have purchased airtime or data in the area that I live so that I can use my mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have accessed a mobile phone repair service in the area in which I live.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

I have access to everything I need in order to use mobile apps.

Strongly Disagree
Disagree
Slightly Disagree
Slightly Agree
Agree
Strongly Agree

APPENDIX D: STUDY DATA

Table D1

Gender of Participants

Country	Gender	Frequency	Valid percent
India	Female	319	30.3
	Male	731	69.5
	Other	2	0.2
	Total	**1 052**	**100.0**
South Africa	Female	511	50.6
	Male	497	49.3
	Other	1	0.1
	Total	**1 009**	**100.0**

Table D2

Overall Age of Participants

Age	
India	**South Africa**
Mean	Mean
30	33

Table D3

Area in Which Participants Resided

Area			
Country	**Area**	**Frequency**	**Valid percent**
India	Non-urban (farm area)	248	23.6
	Urban (city)	804	76.4
	Total	1 052	100.0
South Africa	Non-urban (farm area)	113	11.2
	Urban (city)	896	88.8
	Total	**1 009**	**100.0**

Table D4

Gross Income of Participants

Gross income per month			
Country		**Frequency**	**Valid percent**
India	R0 to R1 000 /INR0 – 5 000	38	3.6
	R1 001 – R2 000/INR5 001 – 10 000	52	4.9
	R2 001 – R3 000/INR10 001 – 15 000	114	10.8
	R3 001 – R4 000/INR15 001 – 20 000	186	17.7
	R4 001 – R5 000/INR20 001 – 25 000	196	18.6
	R5 001 – R6 000/INR25 001 – 30 000	150	14.2
	R6 001 – R7 000/INR30 001 – 35 000	106	10.1
	R7 001 – R8 000/INR35 001 – 40 000	86	8.2
	R8 001 – R9 000/INR40 001 – 45 000	43	4.1
	R9 001 – R10 000/INR45 001 – 50 000	27	2.6
	R10 001 – R11 000/INR50 001 – 55 000	14	1.3
	R11 001 – R12 000/INR55 001 – 60 000	13	1.2
	R12 001 – R13 000/INR60 001 – 65 000	12	1.1
	R13 001 – R14 000/INR65 001 – 70 000	9	0.9
	R14 001 – R15 000/INR70 001 – 75 000	2	0.2
	R15 001 – R16 000/INR75 001 – 80 000	4	0.4
	R16 001 – R17 000/INR80 001 – 85 000	1	0.1
	Total	**1 053**	**100.0**
South Africa	R0 to R 1 000/INR0 – 5 000	43	4.3
	R1 001 – R2 000/INR5 001 – 10 000	21	2.1
	R2 001 – R3 000/INR10 001 – 15 000	58	5.7
	R3 001 – R4 000/INR15 001 – 20 000	63	6.2
	R4 001 – R5 000/INR20 001 – 25 000	47	4.7
	R5 001 – R6 000/INR25 001 – 30 000	39	3.9
	R6 001 – R7 000/INR30 001 – 35 000	36	3.6
	R7 001 – R8 000/INR35 001 – 40 000	39	3.9
	R8 001 – R9 000/INR40 001 – 45 000	34	3.4
	R9 001 – R10 000/INR45 001 – 50 000	27	2.7
	R10 001 – R11 000/INR50 001 – 55 000	22	2.2
	R11 001 – R 12 000/INR55 001 – 60 000	27	2.7
	R12 001 – R 13 000/INR60 001 – 65 000	25	2.5
	R13 001 – R 14 000/INR65 001 – 70 000	17	1.7
	R14 001 – R15 000/INR70 001 – 75 000	16	1.6
	R15 001 – R16 000/INR75 001 – 80 000	20	2.0
	R16 001 – R17 000/INR80 001 – 85 000	10	1.0
	R17 001 – R18 000/INR85 001 – 90 000	19	1.9
	R18 001 – R19 000/INR90 001 – 95 000	24	2.4

	R19 001 – R20 000/INR95 001 – 100 000	22	2.2
	R20 001 – R21 000/INR100 001 – 105 000	17	1.7
	R21 001 – R22 000/INR105 001 – 110 000	15	1.5
	R22 001 – R23 000/INR110 001 – 115 000	20	2.0
	R23 001 – R24 000/INR115 001 – 120 000	43	4.3
	R24 001 – R25 000/INR120 001 – 125 000	40	4.0
	R25 001 – R26 000/INR125 001 – 130 000	26	2.6
	R26 001 – R27 000/INR130 001 – 135 000	29	2.9
	R27 001 – R28 000/INR135 001 – 140 000	25	2.5
	R28 001 – R29 000/INR140 001 – 145 000	16	1.6
	R29 001 – R30 000/INR145 001 – 150 000	31	3.1
	More than R30 000/INR150 000 per month	138	13.7
	Total	**1 009**	**100.0**

Table D5

Devices Used by Participants

Devices			
Country		**Frequency**	**Valid percent**
India	Mobile phone	584	55.5
	Mobile phone; computer	365	34.7
	Mobile phone; computer; smart device (i.e. Smart TV)	27	2.6
	Mobile phone; smart device (i.e. smart TV)	8	0.8
	Mobile phone; tablet	29	2.8
	Mobile phone; tablet; computer	25	2.4
	Mobile phone; tablet; computer; smart device (i.e. smart TV)	11	1.0
	Mobile phone; tablet; smart device (i.e. smart TV)	1	0.1
	None	3	0.3
	Total	**1 053**	**100.0**
South Africa	Mobile phone	226	22.4
	Mobile phone; computer	222	22.0
	Mobile phone; computer; smart device (i.e. smart TV)	89	8.8
	Mobile phone	1	0.1
	Mobile phone; smart device (i.e. smart TV)	85	8.4
	Mobile phone; tablet	24	2.4
	Mobile phone; tablet; computer	32	3.2
	Mobile phone; tablet; computer; smart device (i.e. smart TV)	292	28.9
	Mobile phone; tablet; smart device (i.e. smart TV)	33	3.3
	Tablet; computer	1	0.1

	Tablet; computer; smart device (i.e. smart TV)	2	0.2
	Tablet; smart device (i.e. smart TV),	2	0.2
	Total	**1 009**	**100.0**

Table D6

Frequency of Mobile-App Use by Participants

How often do you use mobile apps?			
Country		**Percent**	**Valid percent**
India	Several times an hour	21.8	21.9
	Several times a day	76.1	76.3
	Once a week	0.5	0.5
	Several times a week	0.1	0.1
	Several times a month	0.8	0.8
	Never	0.5	0.5
	Total	**99.7**	**100.0**
South Africa	Once an hour	1.2	1.2
	Several times an hour	20.0	20.0
	Once a day	0.5	0.5
	Several times a day	42.4	42.5
	Once a week	0.2	0.2
	Several times a week	18.4	18.5
	Once a month	9.1	9.1
	Several times a month	6.7	6.7
	Never	1.3	1.3
	Total	**99.9**	**100.0**

Table D7

Features on Digital Devices Used Most Often By Participants

Which features do you often use on your digital devices (i.e. mobile phone or tablet)? Note: you may select more than one option.			
Country		**Frequency**	**Valid percent**
India	Entertainment (e.g. YouTube, music, etc.)	8	0.8
	Search for information (e.g. Google, Yahoo, etc.)	1	0.1
	Social media (e.g. Facebook, Twitter, etc.)	1	0.1
	WhatsApp	4	0.4
	WhatsApp; entertainment (e.g. YouTube, Music, etc.)	9	0.9
	WhatsApp; entertainment (e.g. YouTube, Music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	4	0.4
	WhatsApp; entertainment (e.g. YouTube, Music, etc.); mobile banking	2	0.2
	WhatsApp; gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; mobile banking	1	0.1
	WhatsApp; mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, Music, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, Music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); mobile banking	2	0.2
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.)	8	0.8
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	9	0.9
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	6	0.6
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	4	0.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.)	9	0.9

	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	21	2.0
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	7	0.7
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	19	1.8
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking	11	1.0
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	37	3.5
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	7	0.7
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	224	21.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	419	39.8
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; lifestyle needs (e.g. Uber, logging a complaint, etc.)	4	0.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	75	7.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	127	12.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	8	0.8
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	4	0.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking	2	0.2

	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	3	0.3
	Total	**1 053**	**100.0**
South Africa	Gaming (e.g. Angry Birds, Candy Crush, etc.)	4	0.4
	Search for information (e.g. Google, Yahoo, etc.)	10	1.0
	Search for information (e.g. Google, Yahoo, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	Social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	Social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp	125	12.4
	WhatsApp; entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; mobile banking	7	0.7
	WhatsApp; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.)	3	0.3
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	7	0.7
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); mobile banking	2	0.2
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; search for information (e.g. Google, Yahoo, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.)	39	3.9

	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	4	0.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking	64	6.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	8	0.8
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	4	0.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	13	1.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.)	12	1.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.)	3	0.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	3	0.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking	23	2.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	19	1.9
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking;	9	0.9

	gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)		
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	484	48.0
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	5	0.5
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); entertainment (e.g. YouTube, music, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	51	5.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking	35	3.5
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.)	3	0.3
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; gaming (e.g. Angry Birds, Candy Crush, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats; lifestyle needs (e.g. Uber, logging a complaint, etc.)	2	0.2
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; lifestyle needs (e.g. Uber, logging a complaint, etc.)	1	0.1
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	10	1.0
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); mobile banking; online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats); lifestyle needs (e.g. Uber, logging a complaint, etc.)	24	2.4
	WhatsApp; social media (e.g. Facebook, Twitter, etc.); search for information (e.g. Google, Yahoo, etc.); online shopping (e.g. Amazon, Takealot, Flipkart, Uber Eats)	1	0.1
	Total	**1 009**	**100.0**

APPENDIX E: MODEL VARIABLE ANALYSIS

South Africa

Trialability

Table E1

Trialability (South Africa)

Statements	Mean	Std. deviation	Interpretation
Trialability (overall results)	**4.45**	**0.99**	According to the results, the majority of the participants tend to agree with the statements of trialability (m = 4.45). The results could mean that people in South Africa who contributed to this study agree to have tried using mobile apps.
I understand how to use mobile apps, but a demonstration of the app would still be useful.	4.46	1.35	
I have the opportunity to try various mobile apps.	4.30	1.32	
I know where I can go to review mobile apps.	4.52	1.21	
I like to try a mobile app before I purchase the mobile app (try-before-you-buy).	4.39	1.26	
Learning to navigate mobile apps would be easy for me.	4.57	1.16	

Perceived Usefulness

Table E2

Perceived Usefulness (South Africa)

Statements	Mean	Std. deviation	Interpretation
Perceived usefulness (overall results)	**4.55**	**0.92**	The results indicate that most of the participants tend to agree that mobile apps are useful (m = 4.55).
Mobile apps are useful to me.	4.64	1.15	
Mobile apps would make my life easier/more convenient.	4.61	1.17	
Mobile apps improve the quality of tasks I perform.	4.67	1.10	
Mobile apps allow me to make better decisions in my life because of the information they provide.	4.60	1.15	
Mobile apps allow for better control of tasks/activities I perform.	4.63	1.13	
Mobile app incentives are important to me (i.e. rewards for using the mobile app).	4.18	1.42	

Perceived Ease of Use

Table E3

Perceived Ease of Use (South Africa)

Statements	Mean	Std. deviation	Interpretation
Perceived ease of use (overall results)	**4.57**	**0.91**	The results show that the majority of the participants tend to agree that mobile apps are easy to use (m = 4.57).
It is easy for me to learn how to use mobile apps.	4.49	1.13	
I find it easy to complete a task on a mobile app.	4.60	1.06	
My interaction with mobile apps is clear and understandable.	4.54	1.13	
Learning to operate mobile apps would be easy for me.	4.58	1.11	
I find it easy to get mobile apps to do what I want them to do.	4.58	1.07	
It is easy to search for and download a mobile app.	4.61	1.05	

Perceived Risk

Table E4

Perceived Risk (South Africa)

Statements	Mean	Std. deviation	Interpretation
Perceived risk (overall results)	**4.40**	**0.82**	On a scale from 1 to 6, participants were asked to state the extent to which they agree or disagree with the statements of perceived risk. The results indicate that the majority of participants tend to agree with the statements. Most of the participants stated that they would not download mobile apps that are not worth the cost (mean = 4.62).
I will not download a mobile app that is not worth the cost.	4.62	1.18	
It is possible that I might download a mobile app and not enjoy the mobile app due to poor performance.	4.52	1.07	
Using mobile apps may expose me to financial loss (i.e. my phone could be compromised and I could lose money).	4.06	1.41	
It is uncertain whether mobile apps would be as effective as I think.	4.39	1.15	
Compared to other technologies, mobile apps do not have more uncertainties.	4.43	1.15	

Protection of Personal Information

Table E5

Protection of Personal Information (South Africa)

Statements	Mean	Std. deviation	Interpretation
Protection of personal information (overall results)	**4.04**	**0.90**	The results demonstrate that the majority of participants tend to agree with the statements of protection of personal Information (mean = 4.04).
Mobile apps may result in me losing my personal information.	3.78	1.52	
Mobile apps do not always protect my privacy.	3.71	1.56	
I am comfortable with the security of mobile apps (i.e. banking apps, Facebook, etc.).	3.96	1.47	
Authorisation mechanisms (e.g. passwords) on mobile apps make me feel comfortable.	4.23	1.26	
I am comfortable accepting recommendations that my mobile app may offer me.	4.13	1.27	
I am comfortable with my information being backed up to the Cloud (i.e. my mobile app provider stores my information for me).	4.43	1.27	

Behavioural Intention

Table E6

Behavioural Intention (South Africa)

Statements	Mean	Std. deviation	Interpretation
Behavioural intention (overall results)	**4.66**	**0.81**	The results (mean = 4.66) show that the majority of the participants tend to agree with the statements of behavioural intention, meaning that most of the participants intend to use mobile apps. They also agree that they would use mobile apps in the future (mean = 4.75).
I intend to continue using mobile apps in the future.	4.52	1.09	
I will always try to use mobile apps in my daily life.	4.68	1.00	
I plan to continue using mobile apps frequently.	4.64	1.00	
I will often use mobile apps in the future.	4.75	0.94	
I would recommend others to use mobile apps.	4.71	0.93	
I feel I am part of the community of people using mobile apps.	4.66	1.08	

User Environment

Table E7

User Environment (South Africa)

Statements	Mean	Std. deviation	Interpretation
User environment (overall results)	**4.36**	**0.88**	Here, the results (mean = 4.36) demonstrate that many of the participants tend to agree with the statements of user environment.
Mobile apps are used frequently in my city/community.	4.79	1.00	
I use mobile apps based on advice given to me by the people in my city/community.	4.22	1.24	
I gain social status (prestige) when I use some mobile apps in my city/community.	4.16	1.32	
People whose opinions I value prefer that I use mobile apps.	4.18	1.28	
People who influence my behaviour think that I should use mobile apps.	4.17	1.34	
Using mobile apps is entirely within my control.	4.64	1.11	

Lifestyle Integration

Table E8

Lifestyle Integration (South Africa)

Statements	Mean	Std. deviation	Interpretation
Lifestyle integration (overall results)	**4.20**	**0.86**	The descriptive results (mean = 4.20) of lifestyle integration explain that the majority of the participants tend to agree with the statements. However, the results also show that there are some participants who tend to slightly disagree or slightly agree with some of the statements, such as "[m]y tradition/culture/religion has influenced my decision to download a mobile app'' (mean = 3.05).
The mobile apps that remember my frequent usage make my life easier (for example, previous purchases and transactions).	4.47	1.15	
The mobile apps that connect me to my family and friends add value to my everyday life (for example, Uber rides being ordered for a family member).	4.40	1.25	
It is beneficial for my social media platforms to recommend mobile apps that are based on my lifestyle needs.	4.41	1.16	
My tradition/culture/ religion has influenced my decision to download a mobile app.	3.05	1.64	
Mobile apps fit into my daily routine.	4.35	1.23	
Mobile apps are compatible with other technologies I use.	4.55	1.08	

Customer Feedback

Table E9

Customer Feedback (South Africa)

Statements	Mean	Std. deviation	Interpretation
Customer feedback (overall results)	**4.35**	**0.99**	Looking at the outcome of the construct customer feedback (mean = 4.35), most of the participants tend to agree with the statements on customer feedback.
I use mobile apps more when I am able to provide feedback on what does not work.	4.34	1.21	
For me to continue using a mobile app, frequent improvements are necessary.	4.51	1.13	
I normally look at mobile app ratings before I download mobile apps (i.e. other people's feedback is important to me).	4.22	1.31	
I would use my mobile apps more if I could provide feedback in the mobile app itself (i.e. in-app feedback).	4.32	1.23	

Awareness

Table E10

Awareness (South Africa)

Statements	Mean	Std. deviation	Interpretation
Awareness (overall results)	**4.26**	**0.93**	The results (mean = 4.26) show that most of the participants tend to agree with the statements regarding awareness.
I have used channels such as YouTube, wikiHow or similar to make myself aware of the different features provided on my mobile apps, and these are useful to me.	3.80	1.61	
I am aware of the features/benefits my mobile apps offers me.	4.26	1.21	
I am aware of the options I have to seek assistance on the mobile apps I use (i.e. mobile app support number, etc.).	4.29	1.25	
I have downloaded certain mobile apps because I knew or was told about them by a friend or family member.	4.38	1.22	
I am aware of what I need to do to download a mobile app.	4.57	1.10	

Affordability

Table E11

Affordability (South Africa)

Statements	Mean	Std. deviation	Interpretation
Affordability (overall results)	**4.39**	**0.76**	The majority of the participants tend to agree with the statements on affordability. The mean results are above 3.5 (mean = 4.39).
Mobile apps are always good value for money.	3.71	1.61	
I always use my data to download mobile apps that I need and find valuable.	4.29	1.24	
I would pay for a mobile app that I need and find valuable.	4.52	1.13	
Mobile apps are expensive to use, as they consume a lot of mobile data or airtime.	4.55	1.09	
Data is expensive at the current price.	4.89	1.07	

Access

Table E12

Access (South Africa)

Statements	Mean	Std. deviation	Interpretation
Access (overall results)	**4.29**	**0.80**	The mean of 4.29 shows that the majority of the participants tend to agree with the statements regarding access, meaning that they can access their mobile apps should the need arise.
I can access my mobile apps because the community in which I live has access to electricity/charging stations.	4.68	0.99	
I have access to my mobile apps because the community in which I live always has Internet connectivity (i.e. Wi-Fi or cell data).	3.82	1.47	
I have purchased airtime or data in the area I live in so that I can use my mobile apps.	4.77	0.87	
I have accessed a mobile phone repair service in the area in which I live.	4.17	1.38	
I have access to everything I need in order to use mobile apps.	4.02	1.43	

India

Trialability

Table E13

Trialability (India)

Statements	Mean	Std. deviation	Interpretation
Trialability (overall results)	**4.29**	**1.08**	The majority of the participants tended to agree with the trialability statements (mean = 4.29).
I understand how to use mobile apps, but a demonstration of the app would still be useful.	4.19	1.52	
I have the opportunity to try various mobile apps.	4.45	1.27	
I know where I can go to review mobile apps.	4.38	1.28	
I like to try a mobile app before I purchase the mobile app (try-before-you-buy).	4.04	1.44	
Learning to navigate mobile apps would be easy for me.	4.38	1.35	

Perceived Usefulness

Table E14

Perceived Usefulness (India)

Statements	Mean	Std. deviation	Interpretation
Perceived usefulness (overall results)	**4.42**	**1.06**	Most of the participants tended to agree with the statements of perceived usefulness (mean = 4.42).
Mobile apps are useful to me.	4.38	1.36	
Mobile apps would make my life easier/more convenient.	4.35	1.31	
Mobile apps improve the quality of tasks I perform.	4.39	1.35	
Mobile apps allow me to make better decisions in my life because of the information they provide.	4.43	1.34	
Mobile apps allow for better control of tasks/activities I perform.	4.45	1.33	
Mobile-app incentives are important to me (i.e. rewards for using the mobile app).	4.51	1.32	

Perceived Ease of Use

Table E15

Perceived Ease of Use (India)

Statements	Mean	Std. deviation	Interpretation
Perceived ease of use (overall results)	**4.42**	**1.07**	Participants seemed to agree with the statements of perceived ease of use (mean = 4.42).
It is easy for me to learn how to use mobile apps.	4.45	1.33	
I find it easy to complete a task on a mobile app.	4.40	1.30	
My interaction with mobile apps is clear and understandable.	4.37	1.31	
Learning to operate mobile apps would be easy for me.	4.48	1.34	
I would find it easy to get mobile apps to do what I want them to do.	4.47	1.34	
It is easy to search for and download a mobile app.	4.34	1.36	

Perceived Risk

Table E16

Perceived Risk (India)

Statements	Mean	Std. deviation	Interpretation
Perceived risk (overall results)	**4.25**	**1.06**	The results indicate that most of the participants tended to agree with the statements of perceived risk (4.25).
I will not download a mobile app that is not worth the cost.	4.51	1.32	
It is possible that I might download a mobile app and not enjoy the mobile app due to poor performance.	4.43	1.34	
Using mobile apps may expose me to financial loss (i.e. my phone could be compromised and I could lose money).	3.84	1.56	
It is uncertain whether mobile apps would be as effective as I think.	4.22	1.33	
Compared to other technologies, mobile apps do not have more uncertainties.	4.24	1.35	

Protection of Personal Information

Table E17

Protection of Personal Information (India)

Statements	Mean	Std. deviation	Interpretation
Protection of personal information (overall mean)	**4.39**	**1.04**	The results indicate that most of the participants who participated in this study tended to agree with the statements of protection of personal information (mean = 4.39).
Mobile apps may result in me losing my personal information.	4.33	1.35	
Mobile apps do not always protect my privacy.	4.28	1.33	
I am comfortable with the security of mobile apps (i.e. banking apps, Facebook, etc.).	4.35	1.33	
Authorisation mechanisms (e.g. passwords on mobile apps) make me feel comfortable.	4.40	1.29	
I am comfortable accepting recommendations that my mobile app may offer me.	4.45	1.31	
I am comfortable with my information being backed up to the Cloud (i.e. my mobile app provider stores my information for me).	4.51	1.35	

Behavioural Intention

Table E18

Behavioural Intention (India)

Statements	Mean	Std. deviation	Interpretation
Behavioural intention (overall results)	**4.41**	**1.03**	The results indicate that most of the participants tended to agree with the statements of behavioural intention (mean = 4.41).
I intend to continue using mobile apps in the future.	4.46	1.30	
I will always try to use mobile apps in my daily life.	4.42	1.28	
I plan to continue using mobile apps frequently.	4.40	1.34	
I will often use mobile apps in the future.	4.44	1.30	
I will recommend mobile apps to others.	4.42	1.34	
I feel I am part of the community of people using mobile apps.	4.35	1.36	

User Environment

Table E19

User Environnent (India)

Statements	Mean	Std. deviation	Interpretation
User environment (overall results)	**4.22**	**1.05**	According to the results (mean = 4.22), the majority of participants tended to agree with the statements.
Mobile apps are used frequently in my city/community.	4.45	1.32	
I use mobile apps based on advice given to me by the people in my city/community.	4.22	1.36	
I gain social status (prestige) when I use some mobile apps in my city/community.	3.99	1.41	
People whose opinions I value prefer that I use mobile apps.	4.11	1.42	
People who influence my behaviour think that I should use mobile apps.	4.16	1.39	
Using mobile apps is entirely within my control.	4.40	1.34	

Lifestyle Integration

Table E20

Lifestyle Integration (India)

Statements	Mean	Std. deviation	Interpretation
Lifestyle integration (overall results)	**4.37**	**1.01**	The results indicate that most of the participants tended to agree with the statements of lifestyle integration (mean = 4. 37).
The mobile apps that remember my frequent usage make my life easier (e.g. previous purchases and transactions).	4.45	1.27	
The mobile apps that connect me to my family and friends add value to my everyday life (e.g. Uber rides being ordered for a family member).	4.42	1.30	
It is beneficial for my social media platforms to recommend mobile apps that are based on my lifestyle needs.	4.45	1.33	
My tradition/culture/religion has influenced my decision to download a mobile app.	4.14	1.43	
Mobile apps fit into my daily routine.	4.41	1.32	
Mobile apps are compatible with other technologies I use.	4.32	1.25	

Customer Feedback

Table E21

Customer Feedback (India)

Statements	Mean	Std. deviation	Interpretation
Customer feedback (overall results)	**4.34**	**1.08**	According to the results, most of the participants tended to agree with the statements related to customer feedback (mean = 4.34).
I use mobile apps more when I am able to provide feedback on what does not work.	4.34	1.33	
For me to continue using a mobile app, frequent improvements are necessary.	4.45	1.31	
I normally look at mobile app ratings before I download apps (i.e. other people's feedback is important to me).	4.17	1.42	
I would use my mobile app more if I could provide feedback in the mobile app itself (i.e. in-app feedback).	4.41	1.31	

Awareness

Table E22

Awareness (India)

Statements	Mean	Std. deviation	Interpretation
Awareness (overall results)	**4.47**	**1.05**	The results indicate that most of the participants tended to agree with the statements related to awareness (mean = 4.47).
I have used channels such as YouTube, wikiHow or similar to make myself aware of the different features provided on my mobile apps, but these would be useful to me.	4.67	1.36	
I am aware of the features/benefits my mobile apps offer me.	4.49	1.26	
I am aware of the options I have to seek assistance on the mobile apps I use (i.e. mobile app support number, etc.).	4.31	1.29	
I have downloaded certain mobile apps because I knew or was told about them by a friend or family member.	4.46	1.32	
I am aware of what I need to do to download a mobile app.	4.43	1.30	

Affordability

Table E23

Affordability (India)

Statements	Mean	Std. deviation	Interpretation
Affordability (overall results)	**4.00**	**0.85**	According to the results, the majority of participants tended to agree with the statements related to affordability (mean = 4.00). However, the results revealed that some of the participants tended to disagree with the statement that data is expensive at the current price (mean = 2.53).
Mobile apps are always good value for money.	4.25	1.52	
I always use my data to download mobile apps that I need and find valuable.	4.51	1.25	
I would pay for a mobile app that I need and find valuable.	4.42	1.24	
Mobile apps are expensive to use, as they consume a lot of mobile data or airtime.	4.29	1.28	
Data is expensive at the current price.	2.53	1.22	

Access

Table E24

Access (India)

Statements	Mean	Std. deviation	Interpretation
Access (overall results)	**4.47**	**1.07**	The results indicated that the majority of participants tended to agree with the statements related to access (mean = 4.47).
I can access my mobile apps because the community in which I live has access to electricity/charging stations.	4.43	1.40	
I have access to my mobile apps because the community in which I live always has Internet connectivity (i.e. Wi-Fi or cell data).	4.50	1.34	
I have purchased airtime or data in the area I live in so that I can use my mobile apps.	4.53	1.29	
I have accessed a mobile phone repair service in the area in which I live.	4.47	1.25	
I have access to everything I need to use mobile apps.	4.40	1.20	

APPENDIX F: NORMALITY TEST RESULTS

Table F1

Skewness and Kurtosis Coefficients That Appear in the Final Model

Items	Skewness	Kurtosis
South Africa		
TB1	-1.03	0.07
TB2	-0.89	-0.36
TB3	-1.32	0.81
TB4	-1.05	0.05
TB5	-1.38	1.14
PU1	-1.46	1.50
PU2	-1.34	1.07
PU3	-1.50	1.84
PU4	-1.38	1.23
PU5	-1.46	1.54
PU6	-0.65	-0.90
PEU1	-1.35	0.96
PEU2	-1.56	1.70
PEU3	-1.45	1.27
PEU4	-1.48	1.43
PEU5	-1.58	1.76
PEU6	-1.56	1.86
CT1	-1.29	0.51
CT2	-1.35	0.96
CT3	-1.35	0.89
CT4	-1.12	0.04
CT5	-0.99	-0.44
PR1	-1.38	1.10
PR2	-1.44	1.24
PR3	-0.73	-0.90
PR4	-1.20	0.37
PR5	-1.24	0.59
PPI1	-0.40	-1.32
PPI2	-0.31	-1.39
PPI3	-0.66	-0.99
PPI4	-0.79	-0.56
PPI5	-0.80	-0.59
PPI6	-1.06	0.10
BI1	-1.43	1.34

BI2	-1.84	3.09
BI3	-1.74	2.46
BI4	-1.94	4.00
BI5	-1.91	3.80
BI6	-1.60	2.09
UE1	-1.80	3.42
UE2	-0.92	-0.49
UE3	-0.79	-0.82
UE4	-0.90	-0.66
UE5	-0.82	-0.79
UE6	-1.45	1.57
LI1	-1.36	0.81
LI2	-1.15	-0.01
LI3	-1.33	0.63
LI4	0.69	-1.10
LI5	-1.10	0.09
LI6	-1.57	1.54
CF1	-1.20	0.16
CF2	-1.44	1.10
CF3	-0.87	-0.66
CF4	-1.15	0.01
AWS1	-0.17	-1.63
AWS2	-0.97	-0.35
AWS3	-1.04	-0.30
AWS4	-1.12	-0.04
AWS5	-1.55	1.53
AFF1	-0.11	-1.50
AFF2	-1.02	-0.24
AFF3	-1.52	1.26
AFF4	-1.38	1.37
AFF5	-1.56	2.40
ACC1	-1.82	3.15
ACC2	-0.29	-1.58
ACC3	-2.30	5.77
ACC4	-0.80	-0.95
ACC5	-0.48	-1.32
India		
TB1	-0.48	-1.13
TB2	-1.06	0.29
TB3	-0.83	-0.11
TB4	-0.45	-0.86
TB5	-0.98	0.00
PU1	-0.98	0.09

PU2	-1.00	0.29
PU3	-0.97	0.10
PU4	-1.14	0.39
PU5	-1.13	0.44
PU6	-1.13	0.45
PEU1	-1.07	0.33
PEU2	-0.90	0.03
PEU3	-0.99	0.20
PEU4	-1.12	0.47
PEU5	-1.11	0.40
PEU6	-1.04	0.12
CT1	-1.12	0.18
CT2	-1.01	0.05
CT3	-0.98	0.10
CT4	-0.84	0.04
CT5	-1.22	0.66
PR1	-1.20	0.54
PR2	-1.05	0.21
PR3	-0.26	-1.23
PR4	-0.89	0.01
PR5	-0.69	-0.45
PPI1	-0.80	-0.16
PPI2	-0.87	-0.02
PPI3	-0.94	0.10
PPI4	-1.04	0.33
PPI5	-1.14	0.40
PPI6	-1.15	0.41
BI1	-0.97	0.17
BI2	-0.92	0.13
BI3	-1.02	0.15
BI4	-1.09	0.37
BI5	-1.08	0.23
BI6	-1.00	0.03
UE1	-1.01	0.18
UE2	-0.61	-0.62
UE3	-0.34	-0.94
UE4	-0.46	-0.88
UE5	-0.61	-0.65
UE6	-0.98	0.10
LI1	-1.12	0.45
LI2	-1.09	0.34
LI3	-1.17	0.46
LI4	-0.46	-0.97

LI5	-0.86	-0.11
LI6	-0.97	0.21
CF1	-0.95	0.02
CF2	-1.18	0.52
CF3	-0.64	-0.70
CF4	-1.22	0.60
AWS1	-1.20	0.49
AWS2	-1.10	0.37
AWS3	-0.82	-0.06
AWS4	-1.09	0.37
AWS5	-1.09	0.38
AFF1	-0.42	-1.16
AFF2	-1.13	0.47
AFF3	-1.10	0.52
AFF4	-0.89	0.16
AFF5	1.29	1.30
ACC1	-1.05	0.07
ACC2	-1.13	0.37
ACC3	-1.13	0.52
ACC4	-1.23	0.64
ACC5	-1.26	0.86

APPENDIX G: ANOVA RESULTS

Level of Education

Perceived Ease of Use

Table G1

ANOVA Table of 'Perceived Ease of Use' According to Level of Education (India)

ANOVA						
Perceived ease of use						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	There is significant difference in mean scores across the times for mobile-app usage (p-value = .000 < 0.05).
Between groups	65.797	4	16.449	15.255	0.000	
Within groups	1125.708	1 044	1.078			
Total	**1191.505**	**1 048**				

Table G2

Tukey's Test of 'Perceived Ease of Use' According to Level of Education (India)

Multiple comparisons							
Dependent variable: perceived ease of use							
Tukey HSD							
(I) Frequency_2	**(J) Frequency_2**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		**Conclusion**
					Lower bound	**Upper bound**	
Several times an hour	Several times a day	-.440*	.078	.000	-.65	-.23	The perceived ease of use average score of people who use mobile apps several times an hour is significantly higher than the average score of people who use mobile apps several times a day (p = < 0.05).
	Once a week	.167	.469	.997	-1.12	1.45	
	Several times a month	.246	.373	.965	-.77	1.27	

Several times a day	Several times an hour	.440*	.078	.000	.23	.65	The perceived ease of use average score of people who use mobile apps several times a day is significantly higher than the average score of people who use mobile apps several times an hour (p = < 0.05).
	Once a week	.607	.466	.689	-.67	1.88	
	Several times a month	.686	.369	.340	-.32	1.69	
Once a week	Several times an hour	-.167	.469	.997	-1.45	1.12	There is no significant difference in the score of perceived ease of use for people who use mobile apps once a week and at other times (p = > 0.05).
	Several times a day	-.607	.466	.689	-1.88	.67	
	Several times a month	.079	.592	1.000	-1.54	1.70	
Several times a month	Several times an hour	-.246	.373	.965	-1.27	.77	There is no significant difference in the score of perceived ease of use for people who use mobile apps several times and at other times (p = > 0.05).
	Several times a day	-.686	.369	.340	-1.69	.32	
	Once a week	-.079	.592	1.000	-1.70	1.54	
	Several times a day	-2.440*	.466	.000	-3.71	-1.17	
	Once a week	-1.833*	.657	.042	-3.63	-.04	
	Several times a month	-1.754*	.592	.026	-3.37	-.14	
*. The mean difference is significant at the 0.05 level.							

Behavioural Intention

Table G3

Descriptive Table of 'Behavioural Intention' According to Level of Education (South Africa)

Descriptive							
Behavioural Intention							
	Mean	**Std. deviation**	**95% confidence interval for mean**		**Min.**	**Max.**	**Conclusion**
			Lower bound	**Upper bound**			
Once an hour	5.31	0.554	4.95	5.66	4	6	The average score of behavioural intention of use seems to differ according to mobile-app usage.
Several times an hour	4.93	0.525	4.85	5.00	2	6	
Once a day	4.87	0.492	4.26	5.48	4	5	
Several times a day	4.81	0.629	4.75	4.87	1	6	
Once a week	4.67	0.236	2.55	6.78	5	5	
Several times a week	4.70	0.707	4.60	4.80	2	6	
Once a month	4.37	0.353	4.29	4.44	3	5	
Several times a month	3.60	1.281	3.29	3.91	2	6	
Total	**4.69**	**0.747**	**4.65**	**4.74**	**1**	**6**	

Table G4

ANOVA Table of 'Behavioural Intention' According to Level of Education (South Africa)

ANOVA						Conclusion
Behavioural intention						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	112.429	7	16.061	35.810	.000	There is significant difference in mean scores across the times for mobile-app usage (p-value = .000 < 0.05).
Within groups	442.690	987	.449			

Table G5

Tukey's Test of 'Behavioural Intention' According to Level of Education (South Africa)

Multiple comparisons							Conclusion
Dependent variable							
Tukey HSD							
(I) Frequency	**(J) Frequency**	**Mean difference (I-J)**	**Std. error**	**p-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
Once an hour	Several times an hour	.378	.199	.551	-.23	.98	The behavioural intention average score of people who use mobile apps once an hour is significantly higher than the average score of people who use mobile apps several times a week, once a month, and several times a month (p = < 0.05).
	Once a day	.439	.356	.923	-.64	1.52	
	Several times a day	.498	.196	.181	-.10	1.09	
	Once a week	.639	.512	.917	-.91	2.19	
	Several times a week	.604	.199	.051	.00	1.21	
	Once a month	.940*	.206	.000	.32	1.56	
	Several times a month	1.705*	.210	.000	1.07	2.34	
Several times an hour	Once an hour	-.378	.199	.551	-.98	.23	The behavioural intention average score of people who use mobile apps several times an hour is
	Once a day	.061	.303	1.000	-.86	.98	
	Several times a day	.119	.057	.423	-.05	.29	
	Once a week	.261	.476	.999	-1.18	1.71	

	Several times a week	.226*	.068	.021	.02	.43	significantly higher than the average score of people who use mobile apps several times a week, once a month, and several times a month (p = < 0.05).
	Once a month	.561*	.084	.000	.31	.82	
	Several times a month	1.327*	.094	.000	1.04	1.61	
Once a day	Once an hour	-.439	.356	.923	-1.52	.64	The behavioural intention average score of people who use mobile apps once a day is significantly higher than the average score of people who use mobile apps several times a month (p = < 0.05).
	Several times an hour	-.061	.303	1.000	-.98	.86	
	Several times a day	.059	.301	1.000	-.86	.97	
	Once a week	.200	.560	1.000	-1.50	1.90	
	Several times a week	.165	.304	.999	-.76	1.09	
	Once a month	.501	.308	.733	-.43	1.43	
	Several times a month	1.266*	.310	.001	.32	2.21	
Several times a day	Once an hour	-.498	.196	.181	-1.09	.10	The behavioural intention average score of people who use mobile apps several times a day is significantly higher than the average score of people who use mobile apps once a month, and several times a month (p = < 0.05).
	Several times an hour	-.119	.057	.423	-.29	.05	
	Once a day	-.059	.301	1.000	-.97	.86	
	Once a week	.141	.475	1.000	-1.30	1.58	
	Several times a week	.106	.059	.614	-.07	.29	
	Once a month	.442*	.077	.000	.21	.68	
	Several times a month	1.208*	.087	.000	.94	1.47	
Once a week	Once an hour	-.639	.512	.917	-2.19	.91	There is no significant difference in the score of behavioural intention for people who use mobile apps once a week and at other times (p = > 0.05).
	Several times an hour	-.261	.476	.999	-1.71	1.18	
	Once a day	-.200	.560	1.000	-1.90	1.50	
	Several times a day	-.141	.475	1.000	-1.58	1.30	
	Several times a week	-.035	.476	1.000	-1.48	1.41	
	Once a month	.301	.479	.998	-1.15	1.75	
	Several times a month	1.066	.480	.341	-.39	2.53	
	Once an hour	-.604	.199	.051	-1.21	.00	

Several times a week	Several times an hour	-.226*	.068	.021	-.43	-.02	The behavioural intention average score of people who use mobile apps several times a week is significantly higher than the average score of people who use mobile apps once an hour, several times an hour, once a month, and several times a month (p = < 0.05).
	Once a day	-.165	.304	.999	-1.09	.76	
	Several times a day	-.106	.059	.614	-.29	.07	
	Once a week	.035	.476	1.000	-1.41	1.48	
	Once a month	.336*	.085	.002	.08	.59	
	Several times a month	1.101*	.095	.000	.81	1.39	
Once a month	Once an hour	-.940*	.206	.000	-1.56	-.32	The behavioural intention average score of people who use mobile apps once a month is significantly higher than the average score of people who use mobile apps once an hour, several times an hour, several times a week, and several times a month (p = < 0.05).
	Several times an hour	-.561*	.084	.000	-.82	-.31	
	Once a day	-.501	.308	.733	-1.43	.43	
	Several times a day	-.442*	.077	.000	-.68	-.21	
	Once a week	-.301	.479	.998	-1.75	1.15	
	Several times a week	-.336*	.085	.002	-.59	-.08	
	Several times a month	.765*	.107	.000	.44	1.09	
Several times a month	Once an hour	-1.705*	.210	.000	-2.34	-1.07	The behavioural intention average score of people who use mobile apps several times a month is significantly higher than the average score of people who use mobile apps once an hour, several times an hour, once a day, several times a day, several times a week, and once a month (p = < 0.05).
	Several times an hour	-1.327*	.094	.000	-1.61	-1.04	
	Once a day	-1.266*	.310	.001	-2.21	-.32	
	Several times a day	-1.208*	.087	.000	-1.47	-.94	
	Once a week	-1.066	.480	.341	-2.53	.39	
	Several times a week	-1.101*	.095	.000	-1.39	-.81	
	Once a month	-.765*	.107	.000	-1.09	-.44	
*. The mean difference is significant at the 0.05 level.							

Table G6

Descriptive Table of 'Behavioural Intention' According to Level of Education (India)

Descriptive						
Behavioural intention						
	Mean	**Std. deviation**	**95% confidence interval for mean**		**Min.**	**Max.**
			Lower bound	**Upper bound**		
Several times an hour	4.14	1.237	3.98	4.30	2	6
Several times a day	4.52	0.934	4.46	4.59	2	6
Once a week	3.70	0.893	2.59	4.81	3	5
Several times a month	3.31	0.530	2.87	3.76	3	4
Never	2.20	0.758	1.26	3.14	1	3
Total	**4.42**	**1.033**	**4.35**	**4.48**	**1**	**6**

Table G7

ANOVA Table of 'Behavioural Intention' According to Level of Education (India)

ANOVA					
Behavioural intention					
	Sum of squares	**df**	**Mean square**	**F**	**Sig.**
Between groups	63.672	4	15.918	15.752	.000
Within groups	1055.001	1044	1.011		
Total	**1118.673**	**1 048**			

Table G8

Tukey's Test of 'Behavioural Intention' According to Level of Education (India)

Multiple comparisons						
Dependent variable: behavioural intention						
Tukey HSD						
(I) Frequency_2	**(J) Frequency_2**	**Mean difference (I-J)**	**Std. error**	**Sig.**	**95% confidence interval**	
					Lower bound	**Upper bound**
Several times an hour	Several times a day	-.384*	.075	.000	-.59	-.18
	Once a week	.441	.454	.869	-.80	1.68
	Several times a month	.828	.362	.149	-.16	1.82
	Never	1.941*	.454	.000	.70	3.18
Several times a day	Several times an hour	.384*	.075	.000	.18	.59
	Once a week	.824	.451	.358	-.41	2.06
	Several times a month	1.212*	.357	.006	.24	2.19
	Never	2.324*	.451	.000	1.09	3.56
Once a week	Several times an hour	-.441	.454	.869	-1.68	.80
	Several times a day	-.824	.451	.358	-2.06	.41
	Several times a month	.388	.573	.962	-1.18	1.95
	Never	1.500	.636	.127	-.24	3.24
Several times a month	Several times an hour	-.828	.362	.149	-1.82	.16
	Several times a day	-1.212*	.357	.006	-2.19	-.24
	Once a week	-.388	.573	.962	-1.95	1.18
	Never	1.112	.573	.296	-.45	2.68
Never	Several times an hour	-1.941*	.454	.000	-3.18	-.70
	Several times a day	-2.324*	.451	.000	-3.56	-1.09
	Once a week	-1.500	.636	.127	-3.24	.24
	Several times a month	-1.112	.573	.296	-2.68	.45
*. The mean difference is significant at the 0.05 level.						

Racial Group

Perceived Usefulness

Table G9

Descriptive Table of 'Perceived Usefulness' According to Racial Group (South Africa)

Perceived usefulness	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Black	4.5498	1.01388	4.4773	4.6223	1.00	6.00	The average score of perceived usefulness seems to differ according to mobile-app usage from one racial group to another.
White	5.0321	.51539	4.9356	5.1286	2.80	6.00	
Coloured	4.6891	1.00406	4.4994	4.8788	1.00	6.00	
Indian (SA-based)	4.8727	.45776	4.7104	5.0350	3.80	6.00	
Total	**4.6292**	**.96841**	**4.5693**	**4.6890**	**1.00**	**6.00**	

Table G10

ANOVA Table of 'Perceived Usefulness' According to Racial Group (South Africa)

ANOVA						Conclusion
Perceived usefulness						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	25.283	3	8.428	9.206	**.000**	There is a significant difference in mean scores across racial groups for mobile-app usage (p-value = .000 < 0.05).
Within groups	919.099	1004	.915			
Total	**944.382**	**1 007**				

Table G11

Tukey's Test of 'Perceived Usefulness' According to Racial Group (South Africa)

Multiple comparisons							Conclusion
Dependent variable: perceived usefulness							
Tukey HSD							
(I) RacialGroup_2	**(J) RacialGroup_2**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
Black	White	-.48234*	.09690	**.000**	-.7317	-.2330	The perceived usefulness average score of black people who use mobile apps is significantly higher than the average score of white people who use mobile apps (p = < 0.05).
	Coloured	-.13929	.09766	.483	-.3906	.1120	
	Indian (SA-based)	-.32293	.17017	.230	-.7608	.1150	
White	Black	.48234*	.09690	**.000**	.2330	.7317	The perceived usefulness average score of white people who use mobile apps is significantly higher than the average score of black people who use mobile apps (p = < 0.05).
	Coloured	.34305*	.12844	.038	.0125	.6736	
	Indian (SA-based)	.15942	.18951	.835	-.3283	.6471	
Coloured	Black	.13929	.09766	.483	-.1120	.3906	The perceived usefulness average score of coloured people who use mobile apps is significantly higher than
	White	-.34305*	.12844	**.038**	-.6736	-.0125	
	Indian (SA-based)	-.18364	.18990	.768	-.6723	.3050	

							the average score of white people who use mobile apps (p = < 0.05).
Indian (SA-based)	Black	.32293	.17017	.230	-.1150	.7608	There is no significant difference in the score of perceived usefulness for Indian (South African-based) people who use mobile apps (p = > 0.05).
	White	-.15942	.18951	.835	-.6471	.3283	
	Coloured	.18364	.18990	.768	-.3050	.6723	
*. The mean difference is significant at the 0.05 level.							

Table G12

Descriptive Table of 'Perceived Usefulness' According to Racial Group (India)

Perceived ease of use	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Black	4.48	.958	4.41	4.55	1	6	The average score of perceived ease of use seems to differ from one racial group's mobile-app usage to another's mobile-app usage.
White	4.97	.489	4.88	5.06	3	6	
Coloured	4.64	.898	4.47	4.81	2	6	
Indian (SA-based)	4.94	.399	4.80	5.09	4	6	
Total	**4.57**	**.913**	**4.51**	**4.62**	**1**	**6**	

Table G13

ANOVA Table of 'Perceived Usefulness' According to Racial Group (India)

ANOVA						Conclusion
Perceived ease of use						
	Sum of squares	df	Mean square	F	P-value	
Between groups	29.578	3	9.859	12.217	**.000**	There is a significant difference in mean scores across racial groups for mobile-app usage (p-value =.000 < 0.05).
Within groups	810.267	1 004	.807			
Total	**839.845**	**1 007**				

Table G14

Tukey's Table of 'Perceived Usefulness' According to Racial Group (India)

Multiple comparisons							
Dependent variable: perceived ease of use							
Tukey HSD							
(I) RacialGroup_2	**(J) RacialGroup_2**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		**Conclusion**
					Lower bound	**Upper bound**	
Black	White	-.493*	.091	**.000**	-.73	-.26	The perceived ease of use average score of black people who use mobile apps is significantly higher than the average score of white people who use mobile apps (p = < 0.05).
	Coloured	-.165	.092	.274	-.40	.07	
	Indian (SA-based)	-.467*	.160	.019	-.88	-.06	
White	Black	.493*	.091	**.000**	.26	.73	The perceived ease of use average score of white people who use mobile apps is significantly higher than the average score of black and coloured people who use mobile apps (p = < 0.05).
	Coloured	.328*	.121	**.034**	.02	.64	
	Indian (SA-based)	.026	.178	.999	-.43	.48	
Coloured	Black	.165	.092	.274	-.07	.40	The perceived ease of use average score of coloured people who use mobile apps is significantly higher than the average score of white people who use mobile apps (p = < 0.05).
	White	-.328*	.121	**.034**	-.64	-.02	
	Indian (SA-based)	-.302	.178	.327	-.76	.16	
Indian (SA-based)	Black	.467*	.160	**.019**	.06	.88	The perceived ease of use average score of Indian (SA-based) people who use mobile apps is significantly higher than the average score of coloured people who use mobile apps (p = < 0.05).
	White	-.026	.178	.999	-.48	.43	
	Coloured	.302	.178	.327	-.16	.76	
*. The mean difference is significant at the 0.05 level.							

Behavioural Intention

Table G15

Descriptive Table of 'Behavioural Intention' According to Racial Group (South Africa)

Behavioural intention	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Black	4.57	.859	4.51	4.63	1	6	The average score of behavioural intention seems to differ from one racial group's mobile-app usage to another's mobile-app usage.
White	5.00	.400	4.93	5.08	4	6	
Coloured	4.81	.734	4.67	4.95	2	6	
Indian (SA-based)	4.98	.488	4.81	5.16	4	6	
Total	**4.66**	**.812**	**4.61**	**4.71**	**1**	**6**	

Table G16

ANOVA Table of 'Behavioural Intention' According to Racial Group (South Africa)

ANOVA						
Behavioural intention						
	Sum of squares	**df**	**Mean square**	**sF**	**P-value**	**Conclusion**
Between groups	25.228	3	8.409	13.204	**.000**	There is a significant difference in mean scores across racial groups for mobile-app usage (p-value = .000 < 0.05).
Within groups	639.432	1 004	.637			
Total	**664.660**	**1 007**				

Table G17

Tukey's Test of 'Behavioural Intention' According to Racial Group (South Africa)

Multiple comparisons							Conclusion
Dependent variable: behavioural intention							
Tukey HSD							
(I) RacialGroup_2	(J) RacialGroup_2	Mean difference (I-J)	Std. error	P-value	95% confidence interval		
					Lower bound	Upper bound	
Black	White	-.432*	.081	**.000**	-.64	-.22	The behavioural intention average score of black people who use mobile apps is significantly higher than the average score of white, coloured and Indian (South Africa-based) people who use mobile apps (p = < 0.05).
	Coloured	-.241*	.081	**.016**	-.45	-.03	
	Indian (SA-based)	-.416*	.142	**.018**	-.78	-.05	
White	Black	.432*	.081	**.000**	.22	.64	The behavioural intention average score of white people who use mobile apps is significantly higher than the average score of black people who use mobile apps (p = < 0.05).
	Coloured	.191	.107	.283	-.08	.47	
	Indian (SA-based)	.017	.158	1.000	-.39	.42	
Coloured	Black	.241*	.081	**.016**	.03	.45	The behavioural intention average score of coloured people who use mobile apps is significantly higher than the average score of black people who use mobile apps (p = < 0.05).
	White	-.191	.107	.283	-.47	.08	
	Indian (SA-based)	-.174	.158	.690	-.58	.23	
Indian (SA-based)	Black	.416*	.142	**.018**	.05	.78	The behavioural intention average score of Indian (South Africa-based) people
	White	-.017	.158	1.000	-.42	.39	
	Coloured	.174	.158	.690	-.23	.58	

							who use mobile apps is significantly higher than the average score of black people who use mobile apps (p = < 0.05).
* The mean difference is significant at the 0.05 level.							

Language

Perceived Usefulness

Table G18

Descriptive Table of 'Perceived Usefulness' According to Language (South Africa)

Perceived usefulness	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
English	4.95	.687	4.84	5.07	1.00	6.00	The average score of perceived usefulness seems to differ with mobile-app usage from people speaking other languages.
Afrikaans	4.76	.879	4.60	4.92	1.60	6.00	
Xhosa	4.67	1.041	4.51	4.82	1.00	6.00	
Zulu	4.44	1.027	4.31	4.57	1.00	6.00	
Venda	4.74	1.028	4.38	5.10	2.00	6.00	
Ndebele	4.96	.785	4.66	5.27	2.00	5.80	
Sepedi	4.70	1.090	4.50	4.90	1.00	6.00	
Setswana	4.92	.903	4.57	5.27	2.00	6.00	
Southern Sesotho	4.07	.827	3.92	4.23	1.80	5.80	
Swati	4.95	.433	4.62	5.26	4.20	5.60	
Tsonga	4.98	.581	4.61	5.35	3.80	5.80	
Bengali	4.80	.200	4.30	5.30	4.60	5.00	
Hindi	4.69	.414	4.30	5.07	4.20	5.40	
Total	**4.63**	**.969**	**4.57**	**4.69**	**1.00**	**6.00**	

Table G19

ANOVA Table of 'Perceived Usefulness' According to Language (South Africa)

ANOVA						Conclusion
Perceived usefulness						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	67.003	12	5.584	6.324	**.000**	There is a significant difference in mean scores across languages for mobile-app usage (p-value = .000 < 0.05).
Within groups	875.852	992	.883			
Total	**942.855**	**1 004**				

Table G20

Tukey's Test of 'Perceived Usefulness' According to Language (South Africa)

Multiple comparisons							Conclusion
Dependent variable: perceived usefulness							
Tukey HSD							
(I) Language	**(J) Language**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
English	Afrikaans	.19328	.11884	.922	-.2014	.5879	The perceived usefulness average score of English-speaking people who use mobile apps is significantly higher than the average score of Zulu- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Xhosa	.28457	.10891	.304	-.0771	.6463	
	Zulu	.50966*	.10039	**.000**	.1763	.8430	
	Venda	.21211	.18004	.994	-.3858	.8100	
	Ndebele	-.01100	.19488	1.000	-.6582	.6362	
	Sepedi	.24989	.11801	.652	-.1420	.6418	
	Setswana	.03186	.19488	1.000	-.6153	.6790	
	Southern Sesotho	.87551*	.12091	**.000**	.4740	1.2770	
	Swati	-.00227	.32334	1.000	-1.0760	1.0715	
	Tsonga	-.03005	.28288	1.000	-.9695	.9094	
	Bengali	.15328	.54841	1.000	-1.6679	1.9745	
	Hindi	.26757	.36411	1.000	-.9416	1.4767	
Afrikaans	English	-.19328	.11884	.922	-.5879	.2014	

	Xhosa	.09129	.11443	1.000	-.2887	.4713	The perceived usefulness average score of Afrikaans-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Zulu	.31638	.10635	.133	-.0368	.6696	
	Venda	.01882	.18343	1.000	-.5903	.6280	
	Ndebele	-.20429	.19802	.998	-.8619	.4533	
	Sepedi	.05661	.12313	1.000	-.3523	.4655	
	Setswana	-.16143	.19802	1.000	-.8190	.4962	
	Southern Sesotho	.68222*	.12591	**.000**	.2641	1.1003	
	Swati	-.19556	.32524	1.000	-1.2756	.8845	
	Tsonga	-.22333	.28505	1.000	-1.1700	.7233	
	Bengali	-.04000	.54953	1.000	-1.8649	1.7849	
	Hindi	.07429	.36580	1.000	-1.1405	1.2891	
Xhosa	English	-.28457	.10891	.304	-.6463	.0771	The perceived usefulness average score of Xhosa-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.09129	.11443	1.000	-.4713	.2887	
	Zulu	.22509	.09513	.469	-.0908	.5410	
	Venda	-.07246	.17716	1.000	-.6608	.5159	
	Ndebele	-.29557	.19222	.947	-.9339	.3428	
	Sepedi	-.03468	.11357	1.000	-.4118	.3425	
	Setswana	-.25272	.19222	.985	-.8911	.3856	
	Southern Sesotho	.59093*	.11658	**.000**	.2038	.9781	
	Swati	-.28684	.32174	1.000	-1.3553	.7816	
	Tsonga	-.31462	.28106	.996	-1.2480	.6187	
	Bengali	-.13129	.54747	1.000	-1.9494	1.6868	
	Hindi	-.01700	.36269	1.000	-1.2215	1.1875	
Zulu	English	-.50966*	.10039	**.000**	-.8430	-.1763	The perceived usefulness average score of Zulu-speaking people who use mobile apps is significantly higher than the average score of English- and Southern Sesotho-
	Afrikaans	-.31638	.10635	.133	-.6696	.0368	
	Xhosa	-.22509	.09513	.469	-.5410	.0908	
	Venda	-.29756	.17205	.882	-.8689	.2738	
	Ndebele	-.52066	.18753	.215	-1.1434	.1021	
	Sepedi	-.25977	.10543	.400	-.6099	.0904	
	Setswana	-.47781	.18753	.344	-1.1006	.1449	
	Southern Sesotho	.36584*	.10867	**.043**	.0050	.7267	
	Swati	-.51193	.31896	.928	-1.5712	.5473	
	Tsonga	-.53971	.27787	.770	-1.4625	.3831	
	Bengali	-.35638	.54584	1.000	-2.1691	1.4563	

	Hindi	-.24209	.36023	1.000	-1.4384	.9542	speaking people who use mobile apps (p = < 0.05).
Venda	English	-.21211	.18004	.994	-.8100	.3858	The perceived usefulness average score of Venda-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.01882	.18343	1.000	-.6280	.5903	
	Xhosa	.07246	.17716	1.000	-.5159	.6608	
	Zulu	.29756	.17205	.882	-.2738	.8689	
	Ndebele	-.22311	.23979	.999	-1.0194	.5732	
	Sepedi	.03779	.18289	1.000	-.5696	.6452	
	Setswana	-.18025	.23979	1.000	-.9766	.6161	
	Southern Sesotho	.66340*	.18478	**.021**	.0498	1.2770	
	Swati	-.21438	.35224	1.000	-1.3841	.9554	
	Tsonga	-.24216	.31551	1.000	-1.2899	.8056	
	Bengali	-.05882	.56593	1.000	-1.9382	1.8206	
	Hindi	.05546	.39000	1.000	-1.2397	1.3506	
Ndebele	English	.01100	.19488	1.000	-.6362	.6582	The perceived usefulness average score of Ndebele-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.20429	.19802	.998	-.4533	.8619	
	Xhosa	.29557	.19222	.947	-.3428	.9339	
	Zulu	.52066	.18753	.215	-.1021	1.1434	
	Venda	.22311	.23979	.999	-.5732	1.0194	
	Sepedi	.26090	.19752	.984	-.3951	.9168	
	Setswana	.04286	.25113	1.000	-.7911	.8768	
	Southern Sesotho	.88651*	.19927	**.001**	.2248	1.5483	
	Swati	.00873	.36005	1.000	-1.1870	1.2044	
	Tsonga	-.01905	.32421	1.000	-1.0957	1.0576	
	Bengali	.16429	.57082	1.000	-1.7314	2.0599	
	Hindi	.27857	.39707	1.000	-1.0401	1.5972	
Sepedi	English	-.24989	.11801	.652	-.6418	.1420	The perceived usefulness average score of Sepedi-speaking people who use mobile apps is
	Afrikaans	-.05661	.12313	1.000	-.4655	.3523	
	Xhosa	.03468	.11357	1.000	-.3425	.4118	
	Zulu	.25977	.10543	.400	-.0904	.6099	
	Venda	-.03779	.18289	1.000	-.6452	.5696	
	Ndebele	-.26090	.19752	.984	-.9168	.3951	
	Setswana	-.21804	.19752	.997	-.8740	.4379	

	Southern Sesotho	.62561*	.12513	**.000**	.2101	1.0412	significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Swati	-.25217	.32494	1.000	-1.3312	.8269	
	Tsonga	-.27994	.28471	.999	-1.2254	.6655	
	Bengali	-.09661	.54935	1.000	-1.9210	1.7277	
	Hindi	.01768	.36553	1.000	-1.1962	1.2316	
Setswana	English	-.03186	.19488	1.000	-.6790	.6153	The perceived usefulness average score of Setswana-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.16143	.19802	1.000	-.4962	.8190	
	Xhosa	.25272	.19222	.985	-.3856	.8911	
	Zulu	.47781	.18753	.344	-.1449	1.1006	
	Venda	.18025	.23979	1.000	-.6161	.9766	
	Ndebele	-.04286	.25113	1.000	-.8768	.7911	
	Sepedi	.21804	.19752	.997	-.4379	.8740	
	Southern Sesotho	.84365*	.19927	**.002**	.1819	1.5054	
	Swati	-.03413	.36005	1.000	-1.2298	1.1616	
	Tsonga	-.06190	.32421	1.000	-1.1386	1.0147	
	Bengali	.12143	.57082	1.000	-1.7742	2.0171	
	Hindi	.23571	.39707	1.000	-1.0829	1.5543	
Southern Sesotho	English	-.87551*	.12091	**.000**	-1.2770	-.4740	The perceived usefulness average score of Southern-Sesotho speaking people who use mobile apps is significantly higher than the average score of English-, Afrikaans-, Xhosa-, Zulu-, Venda-, Ndebele-, Sepedi- and Setswana-speaking people
	Afrikaans	-.68222*	.12591	**.000**	-1.1003	-.2641	
	Xhosa	-.59093*	.11658	**.000**	-.9781	-.2038	
	Zulu	-.36584*	.10867	**.043**	-.7267	-.0050	
	Venda	-.66340*	.18478	**.021**	-1.2770	-.0498	
	Ndebele	-.88651*	.19927	**.001**	-1.5483	-.2248	
	Sepedi	-.62561*	.12513	**.000**	-1.0412	-.2101	
	Setswana	-.84365*	.19927	**.002**	-1.5054	-.1819	
	Swati	-.87778	.32600	.258	-1.9604	.2048	
	Tsonga	-.90556	.28592	.079	-1.8551	.0440	
	Bengali	-.72222	.54998	.985	-2.5487	1.1042	
	Hindi	-.60794	.36648	.910	-1.8250	.6091	

							who use mobile apps (p = < 0.05).
Swati	English	.00227	.32334	1.000	-1.0715	1.0760	There is no significant difference in the score of perceived usefulness for Swati-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	.19556	.32524	1.000	-.8845	1.2756	
	Xhosa	.28684	.32174	1.000	-.7816	1.3553	
	Zulu	.51193	.31896	.928	-.5473	1.5712	
	Venda	.21438	.35224	1.000	-.9554	1.3841	
	Ndebele	-.00873	.36005	1.000	-1.2044	1.1870	
	Sepedi	.25217	.32494	1.000	-.8269	1.3312	
	Setswana	.03413	.36005	1.000	-1.1616	1.2298	
	Southern Sesotho	.87778	.32600	.258	-.2048	1.9604	
	Tsonga	-.02778	.41434	1.000	-1.4038	1.3482	
	Bengali	.15556	.62642	1.000	-1.9247	2.2358	
	Hindi	.26984	.47353	1.000	-1.3027	1.8424	
Tsonga	English	.03005	.28288	1.000	-.9094	.9695	There is no significant difference in the score of perceived usefulness for Tsonga-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	.22333	.28505	1.000	-.7233	1.1700	
	Xhosa	.31462	.28106	.996	-.6187	1.2480	
	Zulu	.53971	.27787	.770	-.3831	1.4625	
	Venda	.24216	.31551	1.000	-.8056	1.2899	
	Ndebele	.01905	.32421	1.000	-1.0576	1.0957	
	Sepedi	.27994	.28471	.999	-.6655	1.2254	
	Setswana	.06190	.32421	1.000	-1.0147	1.1386	
	Southern Sesotho	.90556	.28592	.079	-.0440	1.8551	
	Swati	.02778	.41434	1.000	-1.3482	1.4038	
	Bengali	.18333	.60653	1.000	-1.8309	2.1976	
	Hindi	.29762	.44689	1.000	-1.1864	1.7817	
Bengali	English	-.15328	.54841	1.000	-1.9745	1.6679	There is no significant difference in the score of perceived usefulness for Bengali-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	.04000	.54953	1.000	-1.7849	1.8649	
	Xhosa	.13129	.54747	1.000	-1.6868	1.9494	
	Zulu	.35638	.54584	1.000	-1.4563	2.1691	
	Venda	.05882	.56593	1.000	-1.8206	1.9382	
	Ndebele	-.16429	.57082	1.000	-2.0599	1.7314	
	Sepedi	.09661	.54935	1.000	-1.7277	1.9210	
	Setswana	-.12143	.57082	1.000	-2.0171	1.7742	
	Southern Sesotho	.72222	.54998	.985	-1.1042	2.5487	
	Swati	-.15556	.62642	1.000	-2.2358	1.9247	
	Tsonga	-.18333	.60653	1.000	-2.1976	1.8309	
	Hindi	.11429	.64841	1.000	-2.0390	2.2676	
Hindi	English	-.26757	.36411	1.000	-1.4767	.9416	There is no significant
	Afrikaans	-.07429	.36580	1.000	-1.2891	1.1405	

	Xhosa	.01700	.36269	1.000	-1.1875	1.2215	difference on the score of perceived usefulness for Hindi-speaking people who use mobile apps and people who speak other languages (p > 0.05).
	Zulu	.24209	.36023	1.000	-.9542	1.4384	
	Venda	-.05546	.39000	1.000	-1.3506	1.2397	
	Ndebele	-.27857	.39707	1.000	-1.5972	1.0401	
	Sepedi	-.01768	.36553	1.000	-1.2316	1.1962	
	Setswana	-.23571	.39707	1.000	-1.5543	1.0829	
	Southern Sesotho	.60794	.36648	.910	-.6091	1.8250	
	Swati	-.26984	.47353	1.000	-1.8424	1.3027	
	Tsonga	-.29762	.44689	1.000	-1.7817	1.1864	
	Bengali	-.11429	.64841	1.000	-2.2676	2.0390	
*. The mean difference is significant at the 0.05 level.							

Table G21

Descriptive Table of 'Perceived Usefulness' According to Language (India)

Perceived usefulness	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Bengali	4.77	.341	4.72	4.82	3	6	The average score of perceived usefulness seems to differ with mobile-app usage from people speaking other languages.
English	4.90	.149	4.71	5.09	5	5	
Gujarati	4.04	1.468	3.76	4.32	2	6	
Hindi	4.46	.995	4.37	4.55	1	6	
Marathi	4.27	1.185	4.07	4.47	2	5	
Telugu	4.12	1.329	3.87	4.38	2	5	
Total	**4.42**	**1.056**	**4.36**	**4.48**	**1**	**6**	

Table G22

ANOVA Table of 'Perceived Usefulness' According to Language (India)

ANOVA						Conclusion
Perceived usefulness						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	54.753	5	10.951	10.245	**.000**	There is a significant difference in mean scores across Indian languages for mobile-app usage (p-value = .000 < 0.05).
Within groups	1116.929	1045	1.069			
Total	**1171.682**	**1 050**				

Table G23

Tukey's Test of 'Perceived Usefulness' According to Language (India)

Multiple comparisons							Conclusion
Dependent variable: perceived usefulness							
Tukey HSD							
(I) Language	**(J) Language**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
Bengali	English	-.131	.468	1.000	-1.47	1.21	The perceived usefulness average score of Bengali-speaking people who use mobile apps is significantly higher than the average score of Gujarati-, Hindi-, Marathi- and Telugu-speaking people who use mobile apps (p = < 0.05).
	Gujarati	.726*	.123	**.000**	.37	1.08	
	Hindi	.311*	.086	**.004**	.07	.56	
	Marathi	.501*	.113	**.000**	.18	.82	
	Telugu	.644*	.123	**.000**	.29	1.00	
English	Bengali	.131	.468	1.000	-1.21	1.47	There is no significant difference
	Gujarati	.857	.473	.459	-.49	2.21	

	Hindi	.442	.465	.933	-.88	1.77	in the score of perceived usefulness for English-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Marathi	.632	.471	.761	-.71	1.98	
	Telugu	.775	.473	.573	-.58	2.13	
Gujarati	Bengali	-.726*	.123	**.000**	-1.08	-.37	The perceived usefulness average score of Gujarati-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking people who use mobile apps (p = < 0.05).
	English	-.857	.473	.459	-2.21	.49	
	Hindi	-.415*	.110	**.002**	-.73	-.10	
	Marathi	-.225	.132	.534	-.60	.15	
	Telugu	-.081	.141	.993	-.48	.32	
Hindi	Bengali	-.311*	.086	**.004**	-.56	-.07	The perceived usefulness average score of Hindi-speaking people who use mobile apps is significantly higher than the average score of Bengali-, Gujarati- and Telugu- speaking people who use mobile apps (p = < 0.05).
	English	-.442	.465	.933	-1.77	.88	
	Gujarati	.415*	.110	**.002**	.10	.73	
	Marathi	.190	.099	.391	-.09	.47	
	Telugu	.334*	.110	**.031**	.02	.65	
Marathi	Bengali	-.501*	.113	**.000**	-.82	-.18	The perceived usefulness average score of Marathi-speaking people who use mobile apps is significantly higher than the average score of Bengali-speaking people who use mobile apps (p = < 0.05).
	English	-.632	.471	.761	-1.98	.71	
	Gujarati	.225	.132	.534	-.15	.60	
	Hindi	-.190	.099	.391	-.47	.09	
	Telugu	.143	.133	.890	-.24	.52	

Telugu	Bengali	-.644*	.123	**.000**	-1.00	-.29	The perceived usefulness average score of Telugu-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking people who use mobile apps ($p = < 0.05$).
	English	-.775	.473	.573	-2.13	.58	
	Gujarati	.081	.141	.993	-.32	.48	
	Hindi	-.334*	.110	**.031**	-.65	-.02	
	Marathi	-.143	.133	.890	-.52	.24	
*. The mean difference is significant at the 0.05 level.							

Perceived Ease of Use

Table G24

Descriptive Table of 'Perceived Ease of Use' According to Language (South Africa)

Perceived ease of use	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
English	4.97	.530	4.88	5.06	2	6	The average score of perceived ease of use seems to differ with mobile-app usage from people speaking other languages.
Afrikaans	4.64	.859	4.48	4.80	2	6	
Xhosa	4.63	.954	4.48	4.78	2	6	
Zulu	4.38	.966	4.26	4.51	1	6	
Venda	4.66	1.003	4.31	5.01	2	6	
Ndebele	4.90	.728	4.62	5.18	3	6	
Sepedi	4.55	1.012	4.36	4.73	1	6	
Setswana	4.74	.856	4.41	5.07	2	6	
Southern Sesotho	4.02	.848	3.86	4.18	2	6	
Swati	5.04	.261	4.84	5.24	5	5	
Tsonga	5.07	.463	4.78	5.36	4	6	
Bengali	4.50	.764	2.60	6.40	4	5	
Hindi	4.67	.419	4.28	5.05	4	5	
Total	4.56	.913	4.51	4.62	1	6	

Table G25

ANOVA Table of 'Perceived Ease of Use' According to Language (South Africa)

ANOVA						Conclusion
Perceived ease of use						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	72.869	12	6.072	7.875	**.000**	There is a significant difference in mean scores across South African languages for mobile-app usage (p-value = .000 < 0.05).
Within groups	764.917	992	.771			
Total	**837.787**	**1 004**				

Table G26

Tukey's Test of 'Perceived Ease of Use' According to Language (South Africa)

Multiple comparisons							Conclusion
Dependent variable: perceived ease of use							
Tukey HSD							
(I) Language	**(J) Language**	**Mean difference (I-J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
English	Afrikaans	.330	.111	.133	-.04	.70	The perceived ease of use average score of English-speaking people who use mobile apps is significantly higher than the average score of Zulu- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Xhosa	.342*	.102	**.045**	.00	.68	
	Zulu	.586*	.094	**.000**	.27	.90	
	Venda	.308	.168	.835	-.25	.87	
	Ndebele	.071	.182	1.000	-.53	.68	
	Sepedi	.420*	.110	.009	.05	.79	
	Setswana	.231	.182	.988	-.37	.84	
	Southern Sesotho	.946*	.113	**.000**	.57	1.32	
	Swati	-.067	.302	1.000	-1.07	.94	
	Tsonga	-.100	.264	1.000	-.98	.78	
	Bengali	.470	.513	.999	-1.23	2.17	
	Hindi	.303	.340	1.000	-.83	1.43	
Afrikaans	English	-.330	.111	.133	-.70	.04	The perceived ease of use average score of Afrikaans- speaking
	Xhosa	.011	.107	1.000	-.34	.37	
	Zulu	.256	.099	.328	-.07	.59	

	Venda	-.023	.171	1.000	-.59	.55	people who use mobile apps is significantly higher than the average score of Southern Sesotho speaking-people who use mobile apps (p = < 0.05).
	Ndebele	-.260	.185	.974	-.87	.35	
	Sepedi	.090	.115	1.000	-.29	.47	
	Setswana	-.099	.185	1.000	-.71	.52	
	Southern Sesotho	.616*	.118	**.000**	.23	1.01	
	Swati	-.398	.304	.985	-1.41	.61	
	Tsonga	-.430	.266	.925	-1.31	.45	
	Bengali	.139	.514	1.000	-1.57	1.84	
	Hindi	-.028	.342	1.000	-1.16	1.11	
Xhosa	English	-.342*	.102	**.045**	-.68	.00	The perceived ease of use average score of Xhosa-speaking people who use mobile apps is significantly higher than the average score of English- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.011	.107	1.000	-.37	.34	
	Zulu	.244	.089	.228	-.05	.54	
	Venda	-.034	.166	1.000	-.58	.52	
	Ndebele	-.271	.180	.954	-.87	.33	
	Sepedi	.078	.106	1.000	-.27	.43	
	Setswana	-.110	.180	1.000	-.71	.49	
	Southern Sesotho	.605*	.109	**.000**	.24	.97	
	Swati	-.409	.301	.980	-1.41	.59	
	Tsonga	-.442	.263	.902	-1.31	.43	
	Bengali	.128	.512	1.000	-1.57	1.83	
	Hindi	-.039	.339	1.000	-1.16	1.09	
Zulu	English	-.586*	.094	**.000**	-.90	-.27	The perceived ease of use average score of Zulu-speaking people who use mobile apps is significantly higher than the average score of English- and Southern Sesotho-speaking people who use mobile apps (p = < 0.0).
	Afrikaans	-.256	.099	.328	-.59	.07	
	Xhosa	-.244	.089	.228	-.54	.05	
	Venda	-.278	.161	.882	-.81	.26	
	Ndebele	-.515	.175	.145	-1.10	.07	
	Sepedi	-.166	.099	.901	-.49	.16	
	Setswana	-.355	.175	.717	-.94	.23	
	Southern Sesotho	.360*	.102	**.024**	.02	.70	
	Swati	-.654	.298	.597	-1.64	.34	
	Tsonga	-.686	.260	.287	-1.55	.18	
	Bengali	-.117	.510	1.000	-1.81	1.58	
	Hindi	-.283	.337	1.000	-1.40	.83	
Venda	English	-.308	.168	.835	-.87	.25	The perceived ease of use average score of Venda-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-
	Afrikaans	.023	.171	1.000	-.55	.59	
	Xhosa	.034	.166	1.000	-.52	.58	
	Zulu	.278	.161	.882	-.26	.81	
	Ndebele	-.237	.224	.998	-.98	.51	
	Sepedi	.112	.171	1.000	-.46	.68	
	Setswana	-.076	.224	1.000	-.82	.67	

	Southern Sesotho	.639*	.173	**.014**	.07	1.21	speaking people who use mobile apps
	Swati	-.375	.329	.996	-1.47	.72	(p = < 0.05).
	Tsonga	-.408	.295	.977	-1.39	.57	
	Bengali	.162	.529	1.000	-1.59	1.92	
	Hindi	-.005	.364	1.000	-1.22	1.21	
Ndebele	English	-.071	.182	1.000	-.68	.53	The perceived ease of use average score of Ndebele-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.260	.185	.974	-.35	.87	
	Xhosa	.271	.180	.954	-.33	.87	
	Zulu	.515	.175	.145	-.07	1.10	
	Venda	.237	.224	.998	-.51	.98	
	Sepedi	.349	.185	.800	-.26	.96	
	Setswana	.161	.235	1.000	-.62	.94	
	Southern Sesotho	.876*	.186	**.000**	.26	1.49	
	Swati	-.138	.336	1.000	-1.26	.98	
	Tsonga	-.171	.303	1.000	-1.18	.84	
	Bengali	.399	.533	1.000	-1.37	2.17	
	Hindi	.232	.371	1.000	-1.00	1.46	
Sepedi	English	-.420*	.110	**.009**	-.79	-.05	The perceived ease of use average score of Sepedi-speaking people who use mobile apps is significantly higher than the average score of English- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.090	.115	1.000	-.47	.29	
	Xhosa	-.078	.106	1.000	-.43	.27	
	Zulu	.166	.099	.901	-.16	.49	
	Venda	-.112	.171	1.000	-.68	.46	
	Ndebele	-.349	.185	.800	-.96	.26	
	Setswana	-.189	.185	.998	-.80	.42	
	Southern Sesotho	.526*	.117	**.001**	.14	.91	
	Swati	-.488	.304	.928	-1.50	.52	
	Tsonga	-.520	.266	.762	-1.40	.36	
	Bengali	.049	.513	1.000	-1.66	1.75	
	Hindi	-.117	.342	1.000	-1.25	1.02	
Setswana	English	-.231	.182	.988	-.84	.37	The perceived ease of use average score of Setswana- speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.099	.185	1.000	-.52	.71	
	Xhosa	.110	.180	1.000	-.49	.71	
	Zulu	.355	.175	.717	-.23	.94	
	Venda	.076	.224	1.000	-.67	.82	
	Ndebele	-.161	.235	1.000	-.94	.62	
	Sepedi	.189	.185	.998	-.42	.80	
	Southern Sesotho	.715*	.186	**.008**	.10	1.33	
	Swati	-.299	.336	1.000	-1.42	.82	
	Tsonga	-.331	.303	.997	-1.34	.67	

	Bengali	.238	.533	1.000	-1.53	2.01	
	Hindi	.071	.371	1.000	-1.16	1.30	
Southern Sesotho	English	-.946*	.113	**.000**	-1.32	-.57	The perceived ease of use average score of Southern Sesotho-speaking people who use mobile apps is significantly higher than the average score of English-, Afrikaans-, Xhosa-, Zulu-, Venda-, Ndebele-, Sepedi-, Setswana-, Swati- and Tsonga-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.616*	.118	**.000**	-1.01	-.23	
	Xhosa	-.605*	.109	**.000**	-.97	-.24	
	Zulu	-.360*	.102	**.024**	-.70	-.02	
	Venda	-.639*	.173	**.014**	-1.21	-.07	
	Ndebele	-.876*	.186	**.000**	-1.49	-.26	
	Sepedi	-.526*	.117	**.001**	-.91	-.14	
	Setswana	-.715*	.186	**.008**	-1.33	-.10	
	Swati	-1.014*	.305	**.049**	-2.03	.00	
	Tsonga	-1.046*	.267	**.006**	-1.93	-.16	
	Bengali	-.477	.514	.999	-2.18	1.23	
	Hindi	-.644	.342	.808	-1.78	.49	
Swati	English	.067	.302	1.000	-.94	1.07	The perceived ease of use average score of Swati-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.398	.304	.985	-.61	1.41	
	Xhosa	.409	.301	.980	-.59	1.41	
	Zulu	.654	.298	.597	-.34	1.64	
	Venda	.375	.329	.996	-.72	1.47	
	Ndebele	.138	.336	1.000	-.98	1.26	
	Sepedi	.488	.304	.928	-.52	1.50	
	Setswana	.299	.336	1.000	-.82	1.42	
	Southern Sesotho	1.014*	.305	**.049**	.00	2.03	
	Tsonga	-.032	.387	1.000	-1.32	1.25	
	Bengali	.537	.585	.999	-1.41	2.48	
	Hindi	.370	.443	1.000	-1.10	1.84	
Tsonga	English	.100	.264	1.000	-.78	.98	The perceived ease of use average score of Tsonga-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.430	.266	.925	-.45	1.31	
	Xhosa	.442	.263	.902	-.43	1.31	
	Zulu	.686	.260	.287	-.18	1.55	
	Venda	.408	.295	.977	-.57	1.39	
	Ndebele	.171	.303	1.000	-.84	1.18	
	Sepedi	.520	.266	.762	-.36	1.40	
	Setswana	.331	.303	.997	-.67	1.34	
	Southern Sesotho	1.046*	.267	**.006**	.16	1.93	
	Swati	.032	.387	1.000	-1.25	1.32	
	Bengali	.569	.567	.999	-1.31	2.45	
	Hindi	.403	.418	.999	-.98	1.79	
Bengali	English	-.470	.513	.999	-2.17	1.23	There is no significant difference in the score of
	Afrikaans	-.139	.514	1.000	-1.84	1.57	

	Xhosa	-.128	.512	1.000	-1.83	1.57	perceived ease of use for Bengali-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Zulu	.117	.510	1.000	-1.58	1.81	
	Venda	-.162	.529	1.000	-1.92	1.59	
	Ndebele	-.399	.533	1.000	-2.17	1.37	
	Sepedi	-.049	.513	1.000	-1.75	1.66	
	Setswana	-.238	.533	1.000	-2.01	1.53	
	Southern Sesotho	.477	.514	.999	-1.23	2.18	
	Swati	-.537	.585	.999	-2.48	1.41	
	Tsonga	-.569	.567	.999	-2.45	1.31	
	Hindi	-.167	.606	1.000	-2.18	1.85	
Hindi	English	-.303	.340	1.000	-1.43	.83	There is no significant difference in the score of perceived ease of use for Hindi-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	.028	.342	1.000	-1.11	1.16	
	Xhosa	.039	.339	1.000	-1.09	1.16	
	Zulu	.283	.337	1.000	-.83	1.40	
	Venda	.005	.364	1.000	-1.21	1.22	
	Ndebele	-.232	.371	1.000	-1.46	1.00	
	Sepedi	.117	.342	1.000	-1.02	1.25	
	Setswana	-.071	.371	1.000	-1.30	1.16	
	Southern Sesotho	.644	.342	.808	-.49	1.78	
	Swati	-.370	.443	1.000	-1.84	1.10	
	Tsonga	-.403	.418	.999	-1.79	.98	
	Bengali	.167	.606	1.000	-1.85	2.18	
*. The mean difference is significant at the 0.05 level.							

Table G27

Descriptive Table of 'Perceived Ease of Use' According to Language (India)

Perceived ease of use	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Bengali	4.81	.367	4.76	4.86	2	6	The average score of perceived ease of use seems to differ with mobile-app usage from people who speak other languages.
English	4.90	.091	4.79	5.01	5	5	
Gujarati	4.01	1.561	3.71	4.31	1	6	
Hindi	4.45	.971	4.37	4.54	1	6	
Marathi	4.29	1.182	4.09	4.49	2	6	
Telugu	4.07	1.372	3.81	4.33	2	6	
Total	**4.42**	**1.072**	**4.35**	**4.48**	**1**	**6**	

Table G28

ANOVA Table of 'Perceived Ease of Use' According to Language (India)

ANOVA						Conclusion
Perceived ease of use						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	
Between groups	66.557	5	13.311	12.211	**.000**	There is a significant difference in mean scores across Indian languages for mobile-app usage (p-value = .000 < 0.05).
Within groups	1139.184	1045	1.090			
Total	**1205.741**	**1050**				

Table G29

Tukey's Test of 'Perceived Ease of Use' According to Language (India)

Multiple comparisons							Conclusion
Dependent variable: perceived ease of use							
Tukey HSD							
(I) Language	(J) Language	Mean difference (I-J)	Std. error	P-value	95% confidence interval		
					Lower bound	Upper bound	
Bengali	English	-.089	.473	1.000	-1.44	1.26	The perceived ease of use average score of Bengali-speaking people who use mobile apps is significantly higher than the average score of Gujarati-, Hindi-, Marathi- and Telugu-speaking people who use mobile apps (p = < 0.05).
	Gujarati	.801*	.124	**.000**	.45	1.16	
	Hindi	.359*	.087	**.001**	.11	.61	
	Marathi	.522*	.114	**.000**	.20	.85	
	Telugu	.739*	.125	**.000**	.38	1.09	
English	Bengali	.089	.473	1.000	-1.26	1.44	There is no significant difference on the score of perceived ease of use for English-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Gujarati	.891	.478	.425	-.47	2.25	
	Hindi	.448	.469	.932	-.89	1.79	
	Marathi	.612	.475	.792	-.74	1.97	
	Telugu	.828	.478	.509	-.54	2.19	
Gujarati	Bengali	-.801*	.124	**.000**	-1.16	-.45	The perceived ease of use average score of Gujarati-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking people who use mobile apps (p = < 0.05).
	English	-.891	.478	.425	-2.25	.47	
	Hindi	-.443*	.111	**.001**	-.76	-.13	
	Marathi	-.279	.134	.296	-.66	.10	
	Telugu	-.062	.142	.998	-.47	.34	
Hindi	Bengali	-.359*	.087	**.001**	-.61	-.11	The perceived ease of use average score of Hindi-speaking people
	English	-.448	.469	.932	-1.79	.89	
	Gujarati	.443*	.111	**.001**	.13	.76	

	Marathi	.164	.100	.574	-.12	.45	who use mobile apps is significantly higher than the average score of Bengali-, Gujarati- and Telugu-speaking people who use mobile apps (p = < 0.05).
	Telugu	.380*	.111	**.009**	.06	.70	
Marathi	Bengali	-.522*	.114	**.000**	-.85	-.20	The perceived ease of use average score of Marathi- speaking people who use mobile apps is significantly higher than the average score of Bengali-speaking people who use mobile apps (p = < 0.05).
	English	-.612	.475	.792	-1.97	.74	
	Gujarati	.279	.134	.296	-.10	.66	
	Hindi	-.164	.100	.574	-.45	.12	
	Telugu	.216	.134	.589	-.17	.60	
Telugu	Bengali	-.739*	.125	**.000**	-1.09	-.38	The perceived ease of use average score of Telugu-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking people who use mobile apps (p = < 0.05).
	English	-.828	.478	.509	-2.19	.54	
	Gujarati	.062	.142	.998	-.34	.47	
	Hindi	-.380*	.111	**.009**	-.70	-.06	
	Marathi	-.216	.134	.589	-.60	.17	
*. The mean difference is significant at the 0.05 level.							

Behavioural Intention

Table G30

Descriptive Table of 'Behavioural Intention' According to Language (South Africa)

Behavioural intention	Mean	Std. deviation	95% confidence interval for Mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
English	4.96	.511	4.88	5.05	2	6	The average score of behavioural intention seems to differ with mobile-app usage from people who speak other languages.
Afrikaans	4.86	.673	4.73	4.98	2	6	
Xhosa	4.67	.834	4.54	4.80	2	6	
Zulu	4.51	.883	4.40	4.62	1	6	
Venda	4.72	.865	4.42	5.02	2	6	
Ndebele	4.93	.383	4.79	5.08	4	6	
Sepedi	4.69	.844	4.54	4.85	1	6	
Setswana	4.76	.826	4.44	5.08	2	6	
Southern Sesotho	4.10	.854	3.94	4.26	2	6	
Swati	4.83	.264	4.63	5.04	5	5	
Tsonga	5.07	.399	4.82	5.32	5	6	
Bengali	4.72	.347	3.86	5.58	4	5	
Hindi	4.93	.460	4.50	5.35	4	6	
Total	**4.65**	**.812**	**4.60**	**4.71**	**1**	**6**	

Table G31

ANOVA Table of 'Behavioural Intention' According to Language (South Africa)

ANOVA						Conclusion
Behavioural intention						
	Sum of squares	df	Mean square	F	P-value	
Between groups	61.598	12	5.133	8.478	**.000**	There is a significant difference in mean scores across South African languages for mobile-app usage (p-value =.000 < 0.05).
Within groups	600.624	992	.605			
Total	**662.222**	**10 04**				

Table G32

Tukey's Test of 'Behavioural Intention' According to Language (South Africa)

Multiple comparisons							Conclusion
Dependent variable: behavioural intention							
Tukey HSD							
(I) Language	(J) Language	Mean difference (I-J)	Std. error	P-value	95% confidence interval		
					Lower bound	Upper bound	
English	Afrikaans	.110	.098	.996	-.22	.44	The behavioural intention average score of English-speaking people who use mobile apps is significantly higher than the average score of Zulu- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Xhosa	.293	.090	.062	-.01	.59	
	Zulu	.452*	.083	**.000**	.18	.73	
	Venda	.244	.149	.918	-.25	.74	
	Ndebele	.030	.161	1.000	-.51	.57	
	Sepedi	.271	.098	.215	-.05	.60	
	Setswana	.209	.161	.987	-.33	.74	
	Southern Sesotho	.864*	.100	**.000**	.53	1.20	
	Swati	.131	.268	1.000	-.76	1.02	
	Tsonga	-.105	.234	1.000	-.88	.67	
	Bengali	.242	.454	1.000	-1.27	1.75	
	Hindi	.036	.302	1.000	-.97	1.04	
Afrikaans	English	-.110	.098	.996	-.44	.22	The behavioural intention average score of Afrikaans- speaking people who use mobile apps is significantly higher than the average score of Zulu- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Xhosa	.183	.095	.775	-.13	.50	
	Zulu	.342*	.088	**.007**	.05	.63	
	Venda	.134	.152	1.000	-.37	.64	
	Ndebele	-.079	.164	1.000	-.62	.47	
	Sepedi	.162	.102	.935	-.18	.50	
	Setswana	.099	.164	1.000	-.45	.64	
	Southern Sesotho	.755*	.104	**.000**	.41	1.10	
	Swati	.022	.269	1.000	-.87	.92	
	Tsonga	-.214	.236	1.000	-1.00	.57	
	Bengali	.133	.455	1.000	-1.38	1.64	
	Hindi	-.073	.303	1.000	-1.08	.93	
Xhosa	English	-.293	.090	.062	-.59	.01	The behavioural intention average score of Xhosa-speaking people who use mobile apps is significantly higher than
	Afrikaans	-.183	.095	.775	-.50	.13	
	Zulu	.159	.079	.723	-.10	.42	
	Venda	-.049	.147	1.000	-.54	.44	
	Ndebele	-.263	.159	.913	-.79	.27	

	Sepedi	-.022	.094	1.000	-.33	.29	the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Setswana	-.084	.159	1.000	-.61	.44	
	Southern Sesotho	.571*	.097	**.000**	.25	.89	
	Swati	-.162	.266	1.000	-1.05	.72	
	Tsonga	-.398	.233	.891	-1.17	.38	
	Bengali	-.050	.453	1.000	-1.56	1.46	
	Hindi	-.257	.300	1.000	-1.25	.74	
Zulu	English	-.452*	.083	**.000**	-.73	-.18	The behavioural intention average score of Zulu-speaking people who use mobile apps is significantly higher than the average score of English-, Afrikaans- and Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.342*	.088	**.007**	-.63	-.05	
	Xhosa	-.159	.079	.723	-.42	.10	
	Venda	-.208	.142	.965	-.68	.27	
	Ndebele	-.421	.155	.246	-.94	.09	
	Sepedi	-.180	.087	.687	-.47	.11	
	Setswana	-.243	.155	.940	-.76	.27	
	Southern Sesotho	.413*	.090	**.000**	.11	.71	
	Swati	-.320	.264	.992	-1.20	.56	
	Tsonga	-.556	.230	.432	-1.32	.21	
	Bengali	-.209	.452	1.000	-1.71	1.29	
	Hindi	-.416	.298	.975	-1.41	.58	
Venda	English	-.244	.149	.918	-.74	.25	The behavioural intention average score of Venda-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.134	.152	1.000	-.64	.37	
	Xhosa	.049	.147	1.000	-.44	.54	
	Zulu	.208	.142	.965	-.27	.68	
	Ndebele	-.214	.199	.997	-.87	.45	
	Sepedi	.027	.151	1.000	-.48	.53	
	Setswana	-.035	.199	1.000	-.69	.62	
	Southern Sesotho	.620*	.153	**.004**	.11	1.13	
	Swati	-.113	.292	1.000	-1.08	.86	
	Tsonga	-.349	.261	.983	-1.22	.52	
	Bengali	-.002	.469	1.000	-1.56	1.55	
	Hindi	-.208	.323	1.000	-1.28	.86	
Ndebele	English	-.030	.161	1.000	-.57	.51	The behavioural intention average score of Ndebele- speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people
	Afrikaans	.079	.164	1.000	-.47	.62	
	Xhosa	.263	.159	.913	-.27	.79	
	Zulu	.421	.155	.246	-.09	.94	
	Venda	.214	.199	.997	-.45	.87	
	Sepedi	.241	.164	.962	-.30	.78	
	Setswana	.179	.208	1.000	-.51	.87	
	Southern Sesotho	.834*	.165	**.000**	.29	1.38	

	Swati	.101	.298	1.000	-.89	1.09	who use mobile apps (p = < 0.05).
	Tsonga	-.135	.268	1.000	-1.03	.76	
	Bengali	.212	.473	1.000	-1.36	1.78	
	Hindi	.006	.329	1.000	-1.09	1.10	
Sepedi	English	-.271	.098	.215	-.60	.05	The behavioural intention average score of Sepedi-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.162	.102	.935	-.50	.18	
	Xhosa	.022	.094	1.000	-.29	.33	
	Zulu	.180	.087	.687	-.11	.47	
	Venda	-.027	.151	1.000	-.53	.48	
	Ndebele	-.241	.164	.962	-.78	.30	
	Setswana	-.062	.164	1.000	-.61	.48	
	Southern Sesotho	.593*	.104	**.000**	.25	.94	
	Swati	-.140	.269	1.000	-1.03	.75	
	Tsonga	-.376	.236	.932	-1.16	.41	
	Bengali	-.029	.455	1.000	-1.54	1.48	
	Hindi	-.235	.303	1.000	-1.24	.77	
Setswana	English	-.209	.161	.987	-.74	.33	The behavioural intention average score of Setswana- speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	-.099	.164	1.000	-.64	.45	
	Xhosa	.084	.159	1.000	-.44	.61	
	Zulu	.243	.155	.940	-.27	.76	
	Venda	.035	.199	1.000	-.62	.69	
	Ndebele	-.179	.208	1.000	-.87	.51	
	Sepedi	.062	.164	1.000	-.48	.61	
	Southern Sesotho	.656*	.165	**.005**	.11	1.20	
	Swati	-.077	.298	1.000	-1.07	.91	
	Tsonga	-.313	.268	.995	-1.21	.58	
	Bengali	.034	.473	1.000	-1.54	1.60	
	Hindi	-.173	.329	1.000	-1.26	.92	
Southern Sesotho	English	-.864*	.100	**.000**	-1.20	-.53	The behavioural intention average score of Southern Sesotho-speaking people who use mobile apps is significantly higher than the average score of English-, Afrikaans-, Xhosa-, Zulu-, Venda-, Ndebele-, Sepedi-, Setswana- and Tsonga-speaking people who use mobile apps
	Afrikaans	-.755*	.104	**.000**	-1.10	-.41	
	Xhosa	-.571*	.097	**.000**	-.89	-.25	
	Zulu	-.413*	.090	**.000**	-.71	-.11	
	Venda	-.620*	.153	**.004**	-1.13	-.11	
	Ndebele	-.834*	.165	**.000**	-1.38	-.29	
	Sepedi	-.593*	.104	**.000**	-.94	-.25	
	Setswana	-.656*	.165	**.005**	-1.20	-.11	
	Swati	-.733	.270	.246	-1.63	.16	
	Tsonga	-.969*	.237	**.003**	-1.76	-.18	
	Bengali	-.622	.455	.979	-2.13	.89	
	Hindi	-.828	.303	.239	-1.84	.18	

							(p = < 0.05).
Swati	English	-.131	.268	1.000	-1.02	.76	There is no significant difference on the score of behavioural intention for Swati-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	-.022	.269	1.000	-.92	.87	
	Xhosa	.162	.266	1.000	-.72	1.05	
	Zulu	.320	.264	.992	-.56	1.20	
	Venda	.113	.292	1.000	-.86	1.08	
	Ndebele	-.101	.298	1.000	-1.09	.89	
	Sepedi	.140	.269	1.000	-.75	1.03	
	Setswana	.077	.298	1.000	-.91	1.07	
	Southern Sesotho	.733	.270	.246	-.16	1.63	
	Tsonga	-.236	.343	1.000	-1.38	.90	
	Bengali	.111	.519	1.000	-1.61	1.83	
	Hindi	-.095	.392	1.000	-1.40	1.21	
Tsonga	English	.105	.234	1.000	-.67	.88	The behavioural intention average score of Tsonga-speaking people who use mobile apps is significantly higher than the average score of Southern Sesotho-speaking people who use mobile apps (p = < 0.05).
	Afrikaans	.214	.236	1.000	-.57	1.00	
	Xhosa	.398	.233	.891	-.38	1.17	
	Zulu	.556	.230	.432	-.21	1.32	
	Venda	.349	.261	.983	-.52	1.22	
	Ndebele	.135	.268	1.000	-.76	1.03	
	Sepedi	.376	.236	.932	-.41	1.16	
	Setswana	.313	.268	.995	-.58	1.21	
	Southern Sesotho	.969*	.237	**.003**	.18	1.76	
	Swati	.236	.343	1.000	-.90	1.38	
	Bengali	.347	.502	1.000	-1.32	2.02	
	Hindi	.141	.370	1.000	-1.09	1.37	
Bengali	English	-.242	.454	1.000	-1.75	1.27	There is no significant difference on the score of behavioural intention for Bengali-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Afrikaans	-.133	.455	1.000	-1.64	1.38	
	Xhosa	.050	.453	1.000	-1.46	1.56	
	Zulu	.209	.452	1.000	-1.29	1.71	
	Venda	.002	.469	1.000	-1.55	1.56	
	Ndebele	-.212	.473	1.000	-1.78	1.36	
	Sepedi	.029	.455	1.000	-1.48	1.54	
	Setswana	-.034	.473	1.000	-1.60	1.54	
	Southern Sesotho	.622	.455	.979	-.89	2.13	
	Swati	-.111	.519	1.000	-1.83	1.61	
	Tsonga	-.347	.502	1.000	-2.02	1.32	
	Hindi	-.206	.537	1.000	-1.99	1.58	
Hindi	English	-.036	.302	1.000	-1.04	.97	There is no significant difference on the score of behavioural intention for
	Afrikaans	.073	.303	1.000	-.93	1.08	
	Xhosa	.257	.300	1.000	-.74	1.25	

	Zulu	.416	.298	.975	-.58	1.41	Hindi-speaking people who use mobile apps and people who speak other languages (p = > 0.05).
	Venda	.208	.323	1.000	-.86	1.28	
	Ndebele	-.006	.329	1.000	-1.10	1.09	
	Sepedi	.235	.303	1.000	-.77	1.24	
	Setswana	.173	.329	1.000	-.92	1.26	
	Southern Sesotho	.828	.303	.239	-.18	1.84	
	Swati	.095	.392	1.000	-1.21	1.40	
	Tsonga	-.141	.370	1.000	-1.37	1.09	
	Bengali	.206	.537	1.000	-1.58	1.99	
*. The mean difference is significant at the 0.05 level.							

Table G33

Descriptive Table of 'Behavioural Intention' According to Language (India)

Behavioural intention	Mean	Std. deviation	95% confidence interval for mean		Min.	Max.	Conclusion
			Lower bound	Upper bound			
Bengali	4.78	.439	4.72	4.84	2	6	The average score of behavioural intention seems to differ with mobile-app usage from people speaking other languages.
English	4.93	.190	4.70	5.17	5	5	
Gujarati	4.07	1.481	3.79	4.36	2	6	
Hindi	4.44	.938	4.36	4.53	1	6	
Marathi	4.27	1.159	4.08	4.47	2	6	
Telugu	4.09	1.295	3.85	4.34	2	5	
Total	**4.41**	**1.033**	**4.35**	**4.48**	**1**	**6**	

Table G34

ANOVA Table of 'Behavioural Intention' According to Language (India)

ANOVA						
Behavioural intention						
	Sum of squares	**df**	**Mean square**	**F**	**P-value**	**Conclusion**
Between groups	55.126	5	11.025	10.815	**.000**	There is a significant difference in mean scores across Indian languages for mobile-app usage (p-value = .000 < 0.05).
Within groups	1065.333	1 045	1.019			
Total	**1120.459**	**1 050**				

Table G35

Tukey's Test of 'Behavioural Intention' According to Language (India)

Multiple comparisons							
Dependent variable: behavioural intention							
Tukey HSD							
(I) Language	**(J) Language**	**Mean difference (I–J)**	**Std. error**	**P-value**	**95% confidence interval**		
					Lower bound	**Upper bound**	
Bengali	English	-.156	.457	.999	-1.46	1.15	The behavioural intention average score of Bengali-speaking people who use mobile apps is significantly higher than the average score of Gujarati-, Hindi-, Marathi- and Telugu- speaking people who use mobile apps (p = < 0.05).
	Gujarati	.703*	.120	**.000**	.36	1.05	
	Hindi	.334*	.084	**.001**	.09	.57	
	Marathi	.506*	.111	**.000**	.19	.82	
	Telugu	.684*	.120	**.000**	.34	1.03	
English	Bengali	.156	.457	.999	-1.15	1.46	There is no significant difference in the score of behavioural intention for English-speaking people who use mobile apps and people who speak other languages (p > 0.05).
	Gujarati	.859	.462	.427	-.46	2.18	
	Hindi	.490	.454	.889	-.81	1.79	
	Marathi	.662	.460	.702	-.65	1.97	
	Telugu	.840	.462	.454	-.48	2.16	
Gujarati	Bengali	-.703*	.120	**.000**	-1.05	-.36	The behavioural intention average score of Gujarati-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking
	English	-.859	.462	.427	-2.18	.46	
	Hindi	-.369*	.107	**.008**	-.68	-.06	
	Marathi	-.197	.129	.647	-.57	.17	
	Telugu	-.019	.138	1.000	-.41	.37	

							people who use mobile apps (p = < 0.05)
Hindi	Bengali	-.334*	.084	**.001**	-.57	-.09	The behavioural intention average score of Hindi-speaking people who use mobile apps is significantly higher than the average score of Bengali-, Gujarati- and Telugu-speaking people who use mobile apps (p = < 0.05).
	English	-.490	.454	.889	-1.79	.81	
	Gujarati	.369*	.107	**.008**	.06	.68	
	Marathi	.172	.097	.484	-.10	.45	
	Telugu	.350*	.108	**.015**	.04	.66	
Marathi	Bengali	-.506*	.111	**.000**	-.82	-.19	The behavioural intention average score of Marathi-speaking people who use mobile apps is significantly higher than the average score of Bengali-speaking people who use mobile apps (p = < 0.05).
	English	-.662	.460	.702	-1.97	.65	
	Gujarati	.197	.129	.647	-.17	.57	
	Hindi	-.172	.097	.484	-.45	.10	
	Telugu	.178	.130	.743	-.19	.55	
Telugu	Bengali	-.684*	.120	**.000**	-1.03	-.34	The behavioural intention average score of Telugu-speaking people who use mobile apps is significantly higher than the average score of Bengali- and Hindi-speaking people who use mobile apps (p = < 0.05).
	English	-.840	.462	.454	-2.16	.48	
	Gujarati	.019	.138	1.000	-.37	.41	
	Hindi	-.350*	.108	**.015**	-.66	-.04	
	Marathi	-.178	.130	.743	-.55	.19	
*. The mean difference is significant at the 0.05 level.							

Table G36

VIF Analysis from SmartPLS

The following table provides a view of the variance inflation factors (VIF). The general rule of thumb is that VIFs exceeding '4' warrant further investigation, while VIFs exceeding '10' are signs of serious multicollinearity, requiring correction.

Items	VIF India	Items	VIF SA
ACC1	2.169	ACC1	1.655
ACC2	2.425	ACC2	2.267
ACC3	2.487	ACC3	1.560
ACC4	2.777	ACC4	1.731
ACC5	2.535	ACC5	2.103
AFF1	1.453	AFF1	1.531
AFF2	2.225	AFF2	2.132
AFF3	2.012	AFF3	2.179
AFF4	1.865	AFF4	1.345
AWS1	2.166	AWS1	1.449
AWS2	2.364	AWS2	2.220
AWS3	2.006	AWS3	2.357
AWS4	2.233	AWS4	2.220
AWS5	2.173	AWS5	1.950
Awareness * Access	1.000	Awareness * Access	1.000
Awareness * Affordability	1.000	Awareness *Affordability	1.000
BI1	2.201	BI1	2.492
BI2	2.145	BI2	2.917
BI3	2.311	BI3	3.197
BI4	2.501	BI4	3.286
BI5	2.339	BI5	3.250
BI6	1.981	BI6	2.545
CF1	2.141	CF1	2.453
CF2	2.239	CF2	2.663
CF3	1.738	CF3	1.912
CF4	2.022	CF4	2.277

Customer feedback * Access	1.000	Customer feedback * Access	1.000
Customer feedback * Affordability	1.000	Customer feedback * Affordability	1.000
Gender	1.000	Gender	1.000
Highest Education Level	1.000	Home Language	1.000
Home Language	1.000	Income	1.000
LI1	2.303	LI1	2.409
LI2	2.397	LI2	2.125
LI3	2.226	LI3	2.382
LI4	1.723	LI4	1.274
LI5	2.217	LI5	2.105
LI6	2.144	LI6	2.441
Lifestyle integration * Access	1.000	Lifestyle integration * Access	1.000
Lifestyle integration * Affordability	1.000	Lifestyle integration * Affordability	1.000
Income	1.000	PEU1	2.691
PEU1	2.445	PEU2	2.974
PEU2	2.411	PEU3	3.065
PEU3	2.417	PEU4	3.035
PEU4	2.301	PEU5	3.304
PEU5	2.496	PEU6	3.274
PEU6	2.378	PPI1	2.350
PPI1	2.171	PPI2	2.285
PPI2	2.378	PPI3	2.331
PPI3	2.154	PPI4	2.866
PPI4	2.209	PPI5	2.589
PPI5	2.263	PPI6	2.341
PPI6	2.304	PR1	1.992
PR1	2.155	PR2	1.868
PR2	2.131	PR3	1.528
PR3	1.649	PR4	2.223
PR4	2.175	PR5	2.047
PR5	2.085	PU1	2.814

PU1	2.095	PU2	2.756
PU2	2.344	PU3	3.403
PU3	2.228	PU4	2.739
PU4	2.383	PU5	3.012
PU5	2.288	PU6	1.399
PU6	2.174	TB1	1.767
TB1	2.258	TB2	2.163
TB2	2.355	TB3	2.872
TB3	1.975	TB4	2.251
TB4	1.835	TB5	2.238
TB5	2.012	UE1	2.088
UE1	1.856	UE2	2.126
UE2	2.101	UE3	2.674
UE3	2.313	UE4	3.179
UE4	2.211	UE5	3.183
UE5	2.247	UE6	1.755
UE6	2.034	User environment * Access	1.000
User environment * Access	1.000	User environment * Affordability	1.000
User environment * Affordability	1.000	Your highest education level	1.000