

A CUSTOMER COMMUNICATION APPLICATION FOR ORGANISATIONS

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the requirements for the degree of Master of Business Administration**

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DECLARATION

I, **Shumani Netangaheni**, declare that this business venture proposal is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Shumani Netangaheni

Signed at Johannesburg

On the **25th** day of August 2022

DEDICATION

This thesis is dedicated to my partner Sipho Mthimunye who brainstormed this idea with me during initiation stage. He also gave me the time needed to focus on my research. I would also like to dedicate this thesis to my children Sbusiso, Azania and Lwazi who were forever understanding that I needed to work on this.

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I would also like to thank my partner and children for allowing me to lock myself in the study to focus on my thesis. I would also like to thank my sisters who took the kids for the weekend to give me an opportunity to focus.

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ABSTRACT

The aim of this study was to investigate the need for an integrated communication application dedicated to service communication for organisations as well as to determine factors that users consider important for the adoption of a new communication mobile application system. This study is important to the building of an application where resources are constrained and need to be traded off. The growth of social media has seen a rise in the need for consumers to instantly want access to information that is of importance to them. It is for this reason that communication has become a commodity that organisations invest in to build stronger relationships with their customers. However, it is not always easy for organisations to get it right as the communication methods they rely on may not be efficient or cost effective. It is for this reason that theoretical work was consulted to determine a need for a central communication application which various organisations can plug into to publish messages when they have service failure or recovery. The literature advised of a need but for a different problem. Primary data was collected from respondents using a survey where respondents were asked if they would use an integrated mobile application dedicated to communication when their service providers have service failure and when the service has recovered.

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CHAPTER 1. INTRODUCTION

1.1 Motivation for the study

Organisations reach out to their customers to communicate different messages, ranging from campaigns, service failure or service changes. They use various communication medium like short message service (SMS), eMail, organisation website or social media. The introduction of 'Treating Customer Fairly (TCF)' by the Financial Services Conduct Authority (FSCA), which TCF Outcome 3 states that "Customers are given clear information and are kept appropriately informed before, during and after the time of contracting", has elevated the need for organisations to communicate to their customers when they are unable to meet the promised service (Financial Services Board, 2014).

Social media has also increased the need for organisations to communicate more frequently to their customers than they had done in the past. However, the use of social media has mainly focused on organisation branding, advertising, promotion, and handling customer queries (Farzana et al., 2015).

Organisations have decided to continue communicating service failure mainly by sending email or SMS, while social media is usually reserved for positive engagements. This, however, is contradictory as service failure usually spread on social media through word of mouth giving opportunity for social media users to spread misinformation or negative information (Grégoire et al., 2015). Organisations do use social media for post crisis management to apologise or to set the record straight and rebuild relationship with its customers (Triantafillidou & Yannas, 2020).

Social media is used for both Person to Person (P2P) and Business to Customer (B2P) communication, therefore introduces a dilemma of clutter. Customers must surf through information they are interested in, and at times such information of

interest is not available. This then moves the communication to contact centre, where customers call in to find information they are looking for (Ukpabi et al., 2019).

The challenge with contact centre is that it is customer service personnel dependent which is both cost intensive and may lead to customer dissatisfaction if the personnel is not well trained (Ukpabi et al., 2019). To improve customer communication, there is a need for a communication channel designated to customer communication where there is no information overload, and it is costs effective (Cai et al., 2020).

Organisations website and mobile apps would have served this purpose well, however, to respond faster, organisations would need to make real time updates on their websites or mobile apps. This also does not provide the centrality provided by the likes of Twitter and Facebook as each organisation would need to manage their own website and mobile app content real time (Dwivedi, et al., 2021).

Studies have been conducted by Cai et al (2020) and others to determine the need for central communication systems as well as studies by Rehncrona (2022) and others on factors that influence technology adoption using technology adoption model (TAM). However, studies conducted by Rehncrona (2022) and others focused on specific industries other than customer failure communication. This research aimed to bridge this gap in the body of knowledge by investigating a need for a cost-effective central communication system that can be used by all willing organisations to update their consumers of service failure real time. The study also leveraged technology adoption model to give users opportunity to rank factors they consider important on a service failure communication App to ensure high adoption rate.

1.2 Research Problem

There are two main research problems which are to investigate from consumers the need for a central service failure communication system and determining characteristics of the applications users find more important for adoption.

When there is service failure, organisations would like to communicate to their customers using communication mediums that are efficient and effective (Zhang et al., 2018). Organisations have a choice to send communication through SMS, eMail, organisation website, in App messages or social media platforms like Facebook and Twitter (Claeys & Coombs, 2020). SMSes and eMails are reliant on the accuracy of customer data and could be cost intensive for organisation with high number of customers, while social media is a shared platform used by businesses as well as personal use (Chen & Aklikokou, 2020). eMails and SMSes also increase the risk of fraud as they are susceptible to phishing (Moore & Clayton, 2007).

Organisations that fail to communicate when there is service failure risk having customers calling in to find the information. This could increase the cost of doing business as it is customer service personnel dependent and customer satisfaction is dependent on the level of training and the experience of the personnel (Schwager & Meyer, 2007).

Social media platforms like Facebook and Twitter have proven there is a desire for people to access information instantly and frequently, which most organisations have tried to respond by registering their organisations into these platforms to communicate with their customers and potential customers (Chen & Aklikokou, 2020). However, the use of social media has mainly focused on marketing and public relations rather than customer service (Sutherland et al., 2020). Users of social media also do not go to social media platforms to see if their organisations have messages for them but to socialise with family and friends (Kowal et al., 2020).

To overcome the challenges of social media clutter while making sure customer is communicated to instantly during service failure, the business venture aims to build a central mobile application (App) that various organisations can utilise to communicate to their customers in an event of service failure. Jayarathna & Hettige (2013), argued the need for a multi-agent technology for communication among related persons. The argument by Jayarathna & Hettige (2013) for multi-agent communication technology was raised for agricultural sector only indicating a gap for other sectors . A study was conducted to investigate the need for an integrated communication App dedicated to service communication for organisations. The study revealed there is a need for a single App that can be used by various organisations to communicate to their consumers when they are unable to meet the service level agreement. This business venture will be developing this App to respond to the need identified.

The shared mobile application will be accessible to all organisations that provide services and would like to post messages to their consumers. Consumers of services will also have access to the mobile application to view messages from their service providers. The challenge with building a new mobile application or technology is getting users to utilise the application. The other challenge with building a new system is not knowing how to utilise resources to focus on technological factors users of technology consider important. To overcome this challenge, building a new technology while navigating resource constraints requires an organisation to do trade-offs and put more resources on factors that users consider more important. A study done by Luo et al. (2013) on technology adoption trade-offs ranked perceived usefulness number one and risk was ranked last at number eight. This study was generic, not specific technology focused. This study gave users an opportunity to rank factors they consider important for technology adoption to ensure factors with high ranking are given high priority when developing the new communication mobile application (App), and most respondents indicated they want the technology to work, and it must be

free of charge. When this business venture develops this communication App, the highly ranked technology characteristics will be given high priority.

1.3 Research objectives

Objective 1: To investigate the need for an integrated communication application dedicated to service communication for organisations.

Objective 2: To determine factors that users consider important for the adoption of a new communication mobile application system

1.4 Significance of the study

Literature review revealed that there are enough studies on the adoption of technology, however, studies conducted focused on specific industries other than customer failure communication. Other studies looked at the need for a central communication, however, the targeted audience were not for consumer communication when an organisation has a service failure. This research aims to build on the technology adoption model and provide rankings of the technology characteristics users find important by asking users to directly rank the factors against each other. This study is important to the building of an application where resources are constrained and need to be traded off.

1.5 Conceptualisation of central research themes

The initial focus was theoretical work with literature review (chapter two) on customer communication theory exploring why organisations see the need to communicate to their customers and the benefits they hope to derive from communicating. Customer communication will then be narrowed down to customer communication when there is service failure and the mediums used to communicate. The agility and the effectiveness of the available mediums will be reviewed. The focus will then shift to platform business analysing factors critical to the success of the platform business. Few examples will be analysed to see how those businesses made a success of platform business. The last part of the literature review will focus on what users are looking for in a technological

application platform and what drive them to accept the new application. Literature review will be expanded to the ranking of factors that customers consider important to application adoption.

Research methodology (chapter three) explores to determine best practice in designing research questions; method used to collect the data; tools used to analyse the data; and what how to ensure the data collected answers the research question by testing validity and reliability of the instrument used to collect the data.

Chapter four presents the findings with the aim of finding out what the respondents said in relation to the questions asked to address the research problem identified.

Chapter five discusses the results findings with the aim of finding out what the respondents said in relation to the questions asked to address the research problem identified. Results are analysed to determine the outcome of the study. Statistical test was also conducted to ensure validity and reliability of the internal factors.

Chapter six discusses the business opportunity identified and how the business venture will be setup. This chapter also analyses industry forces that can help or hinder the success of the business. Marketing plan and venture financials are also provided.

Chapter seven will discuss the limitations of the study and provide a conclusion of the study and as well as the opportunity of building a business venture.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

The existence of an organisation rests on its customers or those it provides services to (Fader, 2020). Organisations include those who provide service for profit, non-profit, public, or private sectors. Without its customers, organisations would not exist for long. It is for this reason; organisation would like to be perceived by its customers or potential new customers to be providing a good service to continue serving them or acquire (Edvardsson & Olsson, 1996).

Every organisation that provides goods and services has an inherent risk of unplanned and possibly unforeseen service failure or planned interrupted service for maintenance or service upgrade. Depending on the nature of the relationship between the customer and the organisation, the customer understanding of the service failure will vary, therefore organisations should keep service interruptions to a minimal (Hess, Ganesan, & Klein, 2003). The diagram below depicts the service ecosystem showing how customer service influence economic exchange and value creation.

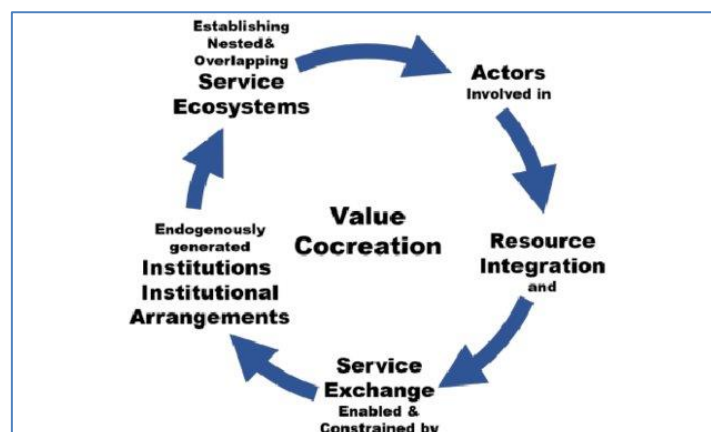


Figure 1: Core processes of service dominant logic

Source: (Fujita et al., 2018)

The service dominant logic framework encompasses resource integrations and actors coming together to create service exchange facilitated by institutions, to

create a service ecosystem. In an event an organisation is unable to meet the promised service level or customer's needs, there could be negative consequences such as customer complaints, negative word of mouth and customer loss (Kruger et al., 2015).

The growth of social media and search engines facilitated by the internet revolution has created new customer expectations. There is an expectation that information would be available instantly and customers can easily compare organisation responses in an event of a crisis. Organisations that are perceived to be doing better attract more customers (Barnes & Cumby, 2002). Products and services are also reviewed online before customer makes a purchasing decision, therefore organisations with negative or no digital footprint suffer the consequences of losing out a sale to their competitors (Kushwaha et al., 2020)

This literature review will critically evaluate the literature in the context of customer communication; mediums used by organisations to communicate to their customers during service failure; analyse platform business model and factors that influence users to adopt new technological platform and their ranking.

2.2 Customer communication Theory

Communication facilitates information sharing between parties (Lin, 2003). Communication has become a commodity that organisations invest in to build stronger relationships with their customers (Barnes & Cumby, 2002). Crisis management communication focuses on managing public perception than company strategy (Marsen, 2020).

The rise of social media and platform business have seen more organisations pushing out messages to their customers than before (Wright et al., 2010). Communication channels are mainly used to sell or cross sell products, increasing brand visibility and occasionally used to manage service failure. Influenced by data science, organisations have access to a wide variety of

customer data they can slice and dice and monetise. Organisations see marketing as a way of building relationship with their customers or customer relationship management where visibility is important (Kushwaha et al., 2020).

When a customer takes up a product or service, organisations aim to keep that customer for life (Osterwalder et al., 2014). Organisations invest in customer lifetime value (Fader, 2020). The relationship is two-way, with customer spending their money and the organisation providing the service customer paid for to generate profit (this is for profit organisation). If the relationship is not working either the customer or the organisation will exit the relationship (Sashi, 2012). Looking at it from the customer's side, if they are promised a service but service provided is substandard or not met, customer will seek similar service from competitors (Fader, 2020).

The extensive use of data science for advertising and marketing should be extended to customer communication when there is service failure to improve the relationship between organisations and their customers.

2.3 Customer communication during service failure

2.3.1 How should organisations organise themselves for agile communication

Organisations used to decide when and how they would like to engage their customers. The rise of digital media has, however, driven organisations to relook their process as customers have become co-creators of their value through interactions and positive word of mouth. If customer is not satisfied with a service from an organisation, the converse applies where they become a destroyer of value, brand, and reputation (Zhang et al., 2018).

Digital media communication is instant and reaches a wider audience including those that may not be impacted by the communication at the time but could have interest in the organisation in future. Digital communication leaves permanent footprint and accessible to all including those who may want to enhance their purchasing decision process (Zhang et al., 2018).

The agility of social media means information spreads instantly with or without the organisation in question aiding the discussion. In the absence of alternative narrative, social media users repeat information within their reach irrespective of the validity of the information. The reach makes it difficult for organisation to consider pursuing the defamation lawsuit. Either way, the damage would have been done (Bergh, 2019).

To manage the social media narrative, there is a need for organisations to align themselves with the evolution of technology, which has consequently led their customers adapting their engagement need to instant information. The need for instant communication needs to be serviced and the information gap is best filled by the organisations themselves (Coombs, 2020).

When there is service failure be it planned or unplanned, organisation would know about this before their customers do. Organisations that are agile set themselves up for a faster communication and not only to communicate service failure but service recovery as well. This way they become the leaders of the discussion and manage responses based on what they have shared with their customers and not what customers think might have transpired (del Río-Lanza et al., 2009).

2.3.2 Forms of customer communication

Organisations use technology to facilitate communication between themselves and their customers (Lin, 2003). Communication technology has over the years

evolved from pigeon to now digital media. Organisations have over the years tried to keep up with the different communication mediums.

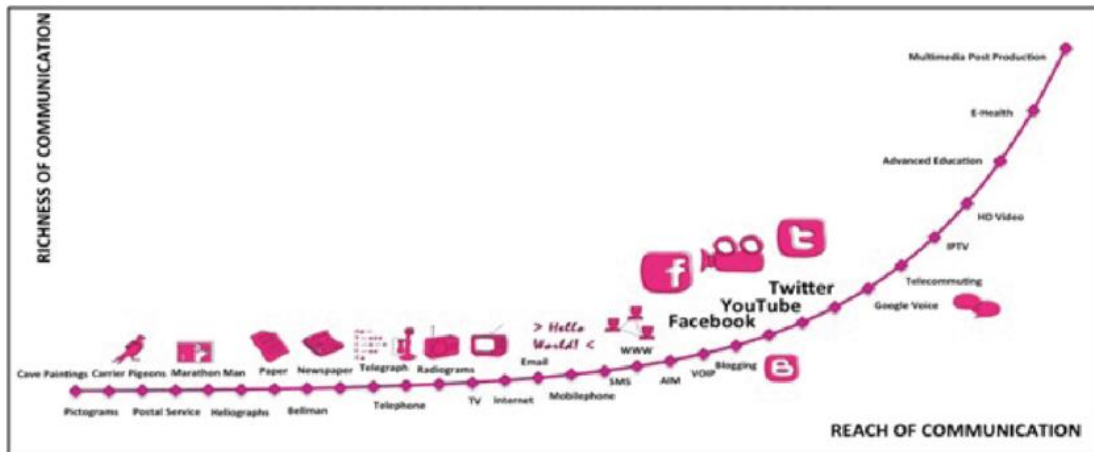


Figure 2: Communication Technology Evolution

Source: (Liew et al., 2014)

The communication technology evolution in figure 1 is based on data collected in Malaysia, however, the migration is similar globally. The study by Liew, Vaithilingam, & Nair (2014) shows that Facebook which is the media of the day is generally used for personal use with users looking to socialise or entertainment. 97% of the respondents surveyed showed they joined Facebook to socialise with family and friends, entertainment or to have fun. This study was supported by studies done by other researchers including a study done by Kowal et al. (2020), that included 46 countries and 60 authors, which concluded that most of the respondents visit Facebook to connect to friends and family.

This means customers who visit social media are not necessarily trying to get in touch with organisations that provide them services or actively trying to find out what organisations are saying to their customers. They visit social media for personal use.

When organisations are faced with a crisis, they are often faced with time pressure and information overload having to deal with a crisis and decide next steps like sending notifications to their customers. Organisations that may choose to communicate struggle to decide the on the effective medium (Claeys & Coombs, 2020).

Organisations that may choose to communicate through SMS or eMail face the limitations of having to first identify impacted customers and depend on the quality of the contact details at their disposal, to reach their customers. Public organisations like electricity and water suppliers face the challenge of magnitude where they service the entire country. Use of email and SMS is not economical (Reason et al., 2015). The other challenge with SMS is the character limitation that organisations may be restricted to, limiting the content they may want to send out (Kisteneva et al., 2020).

eMail also create a challenge of phishing, which has led organisations limiting its usage as a communication medium (Moore & Clayton, 2007).

Organisations that may choose to communicate through social media risk their messages not being noticed as people visit social media sites for social and entertainment purposes, not necessarily to find out what organisations are saying (Liew et al., 2014). The other challenge is social media users have multiple products that it may not be practical for them to search their service providers one by one searching for what their providers are saying.

A single platform that can be used by both private and public sector will solve the issue of clutter faced by other social media platforms and the issue of cost faced by communication through eMail and SMS. Studies have been done on the use of social media by organisations to communicate to their customers but there isn't enough data on the use of a central shared communication platform that only

focuses on organisations communicating to their customers in an event of planned or unplanned service interruptions.

2.4 Platform business structure

In the past ten years there has been exponential growth in platform business model with the likes of Uber, Air BnB, PayPay and Alipay being the most familiar to consumers all over the world. Platform businesses have disrupted some of the pipeline businesses like hotels that have been disrupted by Air BnB and private taxis that have been disrupted by Uber (Mody et al., 2020).

The advantage of a platform business is that it does not necessarily need to own assets. For example, Amazon provides a platform for buyers and sellers to meet and exchange value. Amazon does not own a warehouse for the dispatch of goods. The assets are owned by the seller, who comes to the platform to meet potential buyers and buyers pay the delivery fee.

Platform business consists of two-sided market and reliant on network effect with a strong ecosystem. Platform allows more than one stakeholder to participate where the supplier of service or product targets a particular consumer. Suppliers and consumers meet on the platform and exchange value (Kim, Platform adoption factors in the internet industry, 2018). This value could be content sharing and consumption or selling and buying of goods and services.

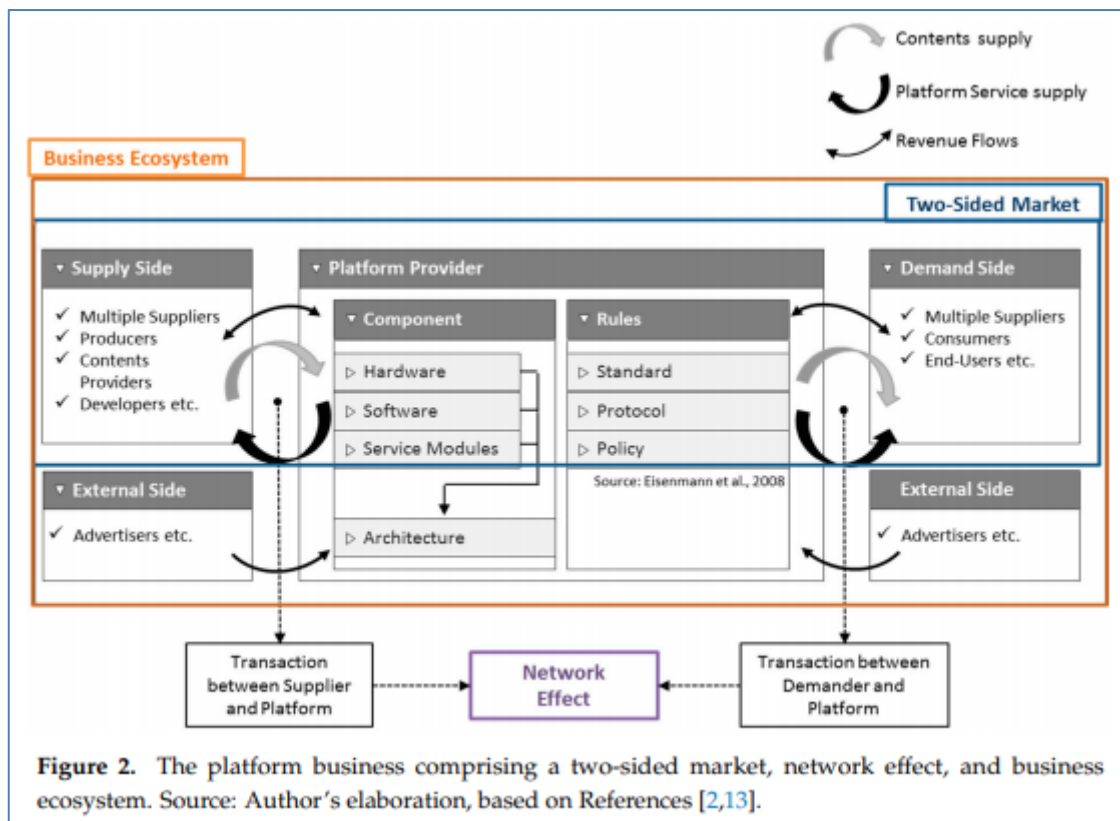


Figure 3: Platform Business Structure

Source: (Kim, Platform adoption factors in the internet industry, 2018)

The platform provider facilitates the transactions between the supplier and consumer and charges a facilitation fee (Fu et al., 2021). Platform providers should build strong relationships with their stakeholders and understand their needs for them to continue providing content to the platform (Kim, 2014).

Businesses that own platforms like Uber, AliPay, Paypal and Apple, have seen growth and high profits in past few years due to network effects. The more people use the platform, the more users find it valuable and willing to pay usage fee (Gregory et al., 2021). A platform business like Pay Pal has seen its number of transaction doubling between 2017 and 2020. Similar growth was seen with the Chinese platform business Alipay, which doubled number of users from 451 million to 900 million, between 2016 and 2019 (Rehncrona, 2022).

Organisations that leverage platforms have seen the cost of transaction reduce while they have access to more consumers. This is because the platform functions as intermediary between the seller and the buyer who utilise the same platform to do business (Mody et al., 2020).

Organisations that choose to continue to communicate using traditional methods like SMS and eMail risk being perceived as they do not value their customers and the need for agile communication when they cannot meet the agreed service level. Traditional communication method is also expensive, leading organisations passing the cost to the customer increasing the prices of the products they offer (Sebastian, et al., 2020). This may lead customers to switch their businesses to low-cost offerings.

The role of the platform owner is to convince more consumers to join the platform, so organisations may derive value from the utilisation of the platform (Rehncrona, 2022). For example, for Uber to convince a driver to sign up and pay a fee, they must prove that the driver will receive customers who need transport and will use the service.

Network effects alone may not be enough to keep users interested. To ensure users stay on the platform, the platform must be attractive to all users by providing quality content or goods and services (Hagiu & Rothman, 2016).

Ali et al. (2020), critically evaluate businesses that may benefit from the network effect by quantifying network effects, which assists the platform owner in deciding which service provider to promote.

Tucker (2019) analyses the negative impact of network effects where the technological platforms with high number of customers may suffer from customer data compromise and the impact it may have on the user trust. This means that though network effect has a positive impact on business revenue, it provides a higher impact when consumer data is compromised, leading consumers to have trust issues with technological platforms.

Network effects are dependent on the decisions users make to adopt the platform. The platform owner is responsible for bringing the users on the two sides of the market together, therefore responsible for making sure the platform is adoptable (Belleflamme & Peitz, 2018).

2.5 Platform user adoption

2.5.1 Factors influencing new technology adoption

The success of a platform is dependent on adoption by users (Rehncrona, 2022). Xie et al. (2021) identified social influence, facilitating conditions, perceived value and perceived risk as factors that influence customer's intention to adopt a platform. Liang et al. (2021) highlighted transaction costs and perceived benefits as the drivers of perceived value.

A study by Chen & Aklikokou (2020) identified perceived usefulness of the technology and perceived ease of use as critical factors that influence consumer adoption of the new technology. The study concluded that perceived usefulness and perceived ease of use integrate other factors like social influence, trust and other variables that lead to the outcome of intention to use.

Most authors who have done studies on adoption of new technology or technological innovation acknowledge the social makeup of the usership influences the acceptance of new technology. A study that was done in Benin by

Su (2013) analysed computer literacy and access to internet as a potential impediment to the development and adoption of technology in the country.

When COVID-19 hit, South Africa was faced with a challenge of the need for learners to learn at home, and an article written by Hanekom (2020), who is a life sciences facilitator and ICT coordinator at the Centre for Pedagogy at Stellenbosch University, revealed only 37% of households have consistent access to internet. The cost of data was stated as one of the causes of the limited access to the internet. Study by Lin (2003) supports user cost being an impediment to technology access.

A study conducted by Hamari et al. (2020) on freemium services concluded that the more users enjoy the service, the less willing they are to pay for it, but will highly likely adopt it. Example of this is social media like Twitter and Facebook who may likely lose usership if they introduce usership fee. Users, however, place social value high and are willing to pay for it when they have exhausted their free passes. Examples would be gamers who are willing to pay for the service.

Jiang et al. (2021) found that consumer reviews, reputation of the developers and peer influence play a role in influencing perceived value and subsequently affect users intention to adopt the application. The implication of this is that platform owners should make the application easy to discover and should be differentiable from other applications. According to Zhu et al. (2017), study results indicated self-efficacy, social value, functional value, and emotional as key factors influencing perceived value and therefore intention to adopt the application. Implication is that platform owner should make the application easy to use without requiring a manual.

On perceived usefulness, a study conducted by Kim (2018) focused on speed of finding content and the quality of the content with respondent showing that when users perceive the platform to be providing good quality information that is quick to find they are highly likely to use it. The study also focused on perceived ease of use with ease of finding information, ease of platform use, and ease of explaining the use of platform to other users with responses not showing significant relationship between perceived ease of use and adoption intention. However, a study conducted by Kamal et al. (2020) on telemedicine concluded that perceived ease of use is a critical factor to adoption. The study was based on rural patients.

Another study conducted in India by Sharma (2020) concluded that users of telecommunication perceive the use of technology to acquire information being the most important, therefore meeting their needs. This means when the application meets consumer needs is considered useful.

Platform users are also concerned with application security and privacy, therefore their perception on these items could hinder adoption. The study by Kim (2018) has explored user perception on security focusing on leaking of personal or transaction information and system hacks or virus attacks. The study concluded that if people perceive a system to be lacking security, they are highly likely not to adopt it. This outcome was supported by the telemedicine study conducted by Kamal et al. (2020). Security and privacy issues contribute critically to trust, where if users do not trust the system, they would highly likely not adopt it.

Facilitating conditions focus on ability for organisation's technological infrastructure to support user adoption of new technology. The success of adoption of communication application would be dependent on the presence of adequate technological infrastructure (Kamal et al., 2020).

A study done by AlHogail (2018) identified trust as the driver of technological adoption. Factors were grouped into quantifiable and non-quantifiable factors which are social related factors, product related factors and security related factors with each factor having sub-factors that drive the behaviour. If a user trusts that product related factors and security related factors will perform as perceived, they are highly likely to adopt a new technology.

There is extensive research on factors impacting adoption of new technology or application, but the research is limited to other industries and focus on services like communication is lacking. Sharma (2020) also indicated for future consideration, 'intention to adopt a new technology' study could be expanded to sectors such as services sector.

Studies that impact user adoption are also limited in South Africa. Most studies conducted have been done in the Asia region. This research will build on already existing theories and models of technological adoption, which will be expanded to service failure communication application focusing on ranking factors that influence new technological adoption.

2.5.2 Ranking of factors influencing new technology adoption

Building a new technology while navigating resource constraints requires an organisation to do trade-offs and put more resources on factors that users consider more important. A study done by Luo et al. (2013) on technology adoption trade-offs ranked perceived usefulness number one and risk was ranked last at number eight. This study was generic, not specific technology focused. This study was supported by Ehrari et al. (2020) whose study concluded that perceived benefits of technology outweigh perceived risk.

Literature on the ranking of factors where factors are measured against each other is limited. It is from this limitation that this research will be conducted to fill

the gap. The research will leverage models that are already existence and build on those.

2.6 Hypothesis

2.6.1 Research Model

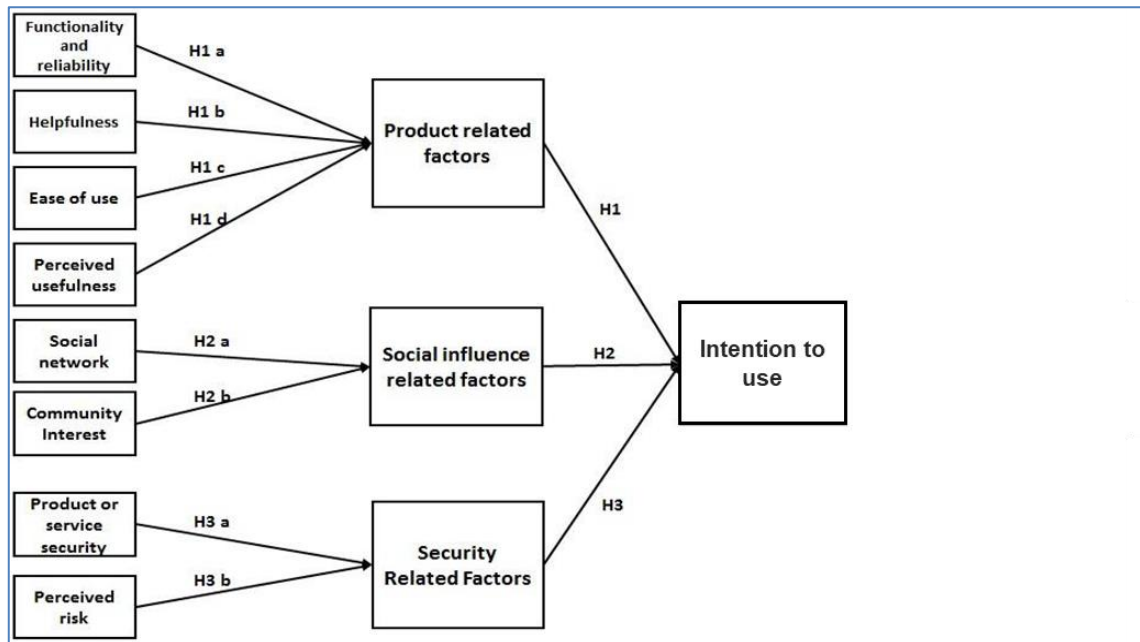


Figure 4: Proposed Research Model for Adoption

Source: (AlHogail, 2018)

2.6.2 Hypothesis

Factor	Hypothesis
Usage (H0)	H0a: There is a positive relationship between number of Apps downloaded and integrated App usage H0b: There is a negative relationship between number of Apps downloaded and integrated App usage

Product related factors (H1)	H1a: functionality and reliability are the most important factors for the communication app.
	H1b: helpfulness is the most important factor for the communication app.
	H1c: Ease of use is the most important factor for the communication app.
	H1d: perceived usefulness use is the most important factor for the communication app.
Social influence related factors (H2)	H2a: Intention to use communication app will be positively influenced by interest in trying out new technology.
	H2b: Intention to use communication app will be positively influenced by social network.
Security related factors (H3)	H3a: product security is the most important factor for the communication app
	H3b: perceived risk is the most important factor for the communication app

Table 1: Description of hypothesis for the proposed research model for adoption

Source: (AlHogail, 2018)

2.7 Summary

Organisation that provides goods and services has an inherent risk of unplanned and possibly unforeseen service failure or planned interrupted service for maintenance or service upgrade. The growth of social media and search engines facilitated by the internet revolution has created new customer expectations where customer expects agile communication from their service provider. This dilemma was worsened by the introduction of 'Treating Customer Fairly (TCF)' by the Financial Services Conduct Authority (FSCA), which TCF Outcome 3 states that "Customers are given clear information and are kept appropriately informed before, during and after the time of contracting". When organisations are faced with a crisis, they are often faced with time pressure and information overload having to deal with a crisis and decide next steps like sending notifications to their customers. Literature was interrogated to see if there is a solution to this problem. A single platform that can be used by both private and public sector was identified as the solution.

Platform business consists of two-sided market and reliant on network effect with a strong ecosystem. The platform provider facilitates the transactions between the supplier and consumer and charges a facilitation fee. Network effects are dependent on the decisions users make to adopt the platform. These decisions include facilitating conditions, perceived value, perceived risk and social influence.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Introduction

Data collection is a process of gathering information, which is then measured to determine answers to questions the researcher may be interested in. The data collection leads the collector to new information that would not necessarily be discovered (Lalehzari, 2021).

This chapter focuses on the research methodology followed to answer the research objectives and the hypothesis listed in the previous chapter. Research approach and design will be outlined as well as data collection method and instrument. Population and sample size as well as data analysis and limitations will be discussed. Approach to ensure validity and reliability of the data will also be discussed. In conclusion the ethical question around the research will be addressed as well as the cost of conducting the research.

3.2 Research approach

The aim of this study was to answer the question if there is a need for an integrated communication application that can be used by multiple organisations to communicate to their consumers when they are faced with service failure or recovery. Though the application can be expanded to other use cases like advertisements by organisation, the immediate use case to be fulfilled was communication during service failure. Jayarathna & Hettige (2013) argued for a need to have an integrated communication platform, though their study was limited to agriculture sector.

Jayarathna & Hettige (2013) conducted quantitative research to test system user satisfaction focusing on the usefulness of the system and efficiency. The study wanted to test how the system should be designed to meet the needs of the users. This study will also conduct quantitative research to determine factors that users

consider important for the adoption of a new communication mobile application system. This is to ensure factors with high ranking are given high priority when developing the new communication mobile application, taking into consideration resource constraints.

Quantitative method was chosen considering the time constraint and the size of the sample to be consulted, which aimed to reach many potential App users. The use of quantitative method during time constraint and larger sample is supported by Rahman (2020). The other advantage of quantitative data collection method is that it allows for randomisation of respondents (Faems, 2020).

A survey was used to investigate the need for a communication hub and the information users of the platform would like to see in the communication App. System factors like ease of use and perceived usefulness together with security and privacy were queried to determine factors that may give App adoption uplift and factors that may hinder the adoption. This was to find out how best to position the platform for adoption.

According to Groves, et al. (2011), surveys have been used for the past 60-80 years with the purpose of gathering information from a sample to construct quantitative descriptors that represent a larger population. Surveys can be used to analyse the whole population, however, for this study only a sample will be measured. Surveys are widely used to test theories of behaviours. In surveys, information is gathered from a subset of a population by asking a selected number of people questions, which answers aim to represent the entire population. This study focused on gathering information from a sample of the population, which will be used to represent the whole population.

3.3 Research design

The aim of this study was to determine if there is a need for integrated communication platform and the characteristics that influence a user to adopt a new application (system). To answer this, descriptive study designs will be used. According to Omair (2015), descriptive study has ability to generalise a representative sample finding into a larger target population. Descriptive design does not seek to compare a sample with another group. Quantitative method with descriptive design is dependent on numbers and calculations to derive an answer. It involves the calculation of mean, median, mode, correlation etc. Quantitative method produces numbers to arrive at a conclusion (Lalehzari, 2021).

According to Groves, et al (2011), descriptive statistics are used to measure the spread and size of various attributes in a population and how some attributes are related by measuring how the movement of one attribute impacts the movement of the related attribute. Kaur, Stoltzfus, & Yellapu (2018), argued that descriptive statistics describe the relationship between variables in a sample population. Data is condensed into a summary to allow for a specific population to be manageable (Sarka, 2021).

Descriptive statistics makes the presentation of data easier to understand and helps to identify patterns (Groves, et al., 2011). Descriptive design was chosen for this study because it fits the outcome of the research, which is to determine characteristics of the system that are important to the users of the system in a manageable manner.

3.4 Data collection method and instrument

Primary data was collected from respondents using a survey where respondents were asked if they would use an integrated mobile application dedicated to communication when their service providers have service failure and when the

service has recovered. Respondents were also asked to rank mobile application factors by order of importance to measure factors that must be prioritised when the mobile application is developed.

Respondents were sent a questionnaire through social media and Wits university student portal with pre-populated options. Questionnaire is classified under primary data collection as it allows for data to be collected from the primary source (the respondent) (Hox & Boeijs, 2005). Questionnaire is customisable and allows for a wider reach with little effort. The use of online questionnaire has reduced the cost of data collection as there is no longer a need to go onsite and do the capturing after the collection (Lalehzari, 2021).

This method is chosen considering the time constraint and the size of the sample to be consulted, which aims to have a larger reach. The use of quantitative during these conditions is supported by Rahman (2017). The other advantage of quantitative data collection method is that it allows for randomisation (Faems, 2020). Since quantitative survey is now conducted online, there is risk of the method being abused where the researcher can write computer algorithm to generate responses (Moises Jr, 2020). To mitigate this risk, Qualtrics which is a reputable survey tool endorsed by Wits University was used to collect data for this study, to ensure the integrity of data collected is maintained. Respondents were only given one opportunity to complete the survey to ensure data is only collected once from a respondent.

3.5 Population and sample

3.5.1 Population

Population is a whole group the researcher is trying to find answers from to draw a conclusion (Nardi, 2018). The population for this study is smartphone and web browser users from around the world. The survey was shared via social media (Facebook, LinkedIn and WhatsApp) and Wits students via Wits email distribution

list. Though the survey was shared online with people from different countries, the assumption is that majority of the respondents are from South Africa. The use of online tools like Qualtrics survey tool to conduct survey is the new normal, more especially since the Covid-19 pandemic started, which prevented face to face meetings (Moises Jr, 2020).

3.5.1 Sampling method and size

Sampling method

Sample is a subset of a population which is chosen to represent the larger population since due to time, cost, and resource constraints, it is difficult to consult the whole population for a conclusion. Sampling methodology, sample size and response rate have an impact of the representativeness of the sample (Acharya, et al, 2013). Using probability sampling, the researcher can generalise the finding from a sample to reflect the views of the target population. Probability sampling gives everyone in the population an opportunity of being selected for a study to represent the population (Singh, 2003). Probability sampling requires minimal knowledge of the population, and data is easy to analyse with high internal and external validity (Acharya, et al, 2013). Probability sampling has further classification which includes multiphase sampling (forms part of cluster sampling) that allows the researcher to collect information from a whole sample and another part from a sub-sample (Etikan & Bala, 2017). For example, only users that select 'yes' in the previous question are asked the next set of questions. This sampling method is purposeful and increases response rate (Acharya, et al, 2013). Highlighted in red below is the visual explanation of the sampling method used for this study.

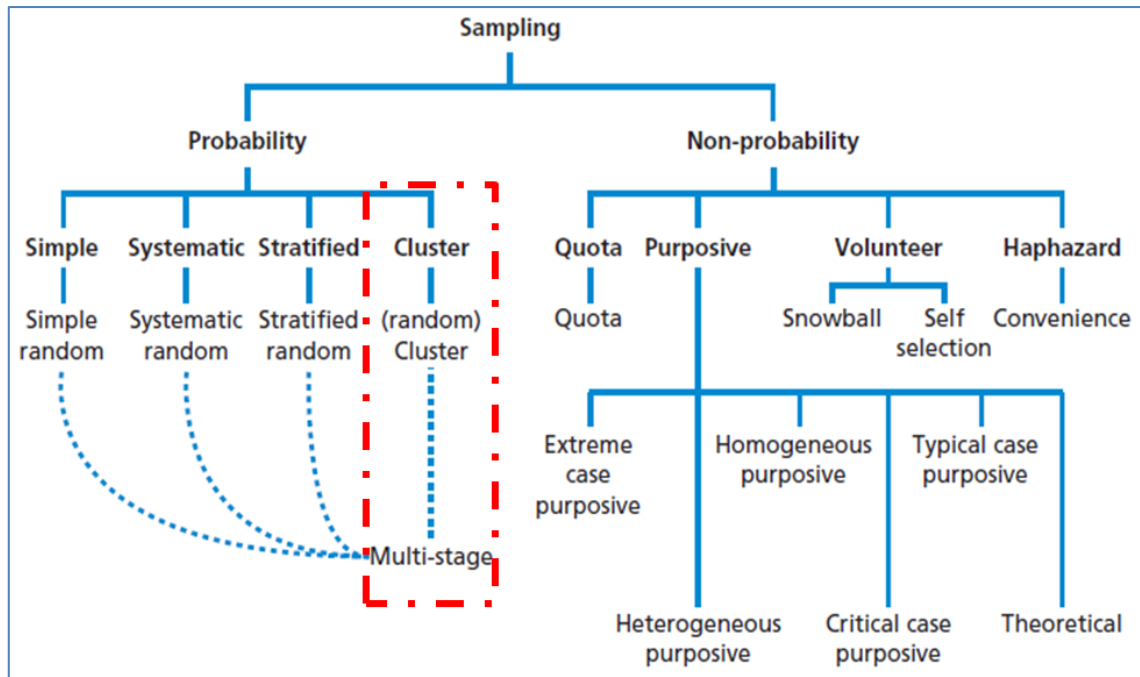


Figure 5: Sampling Techniques Diagram

Source: (Mmbengwa, et al, 2021)

This study investigates the need for integrated communication application for organisations. If a respondent selects 'yes' or 'maybe' indicating there is a need for a single service failure communication App, they are then asked to rank the features of the application to ensure the important characteristics of the application are prioritised first. If the respondent selects 'no', they are not asked further questions since they are not seen as the target market. Respondents are first asked number of years of using a smartphone before being presented with a question that asks about a need for a single communication App. If the respondent has never owned a smartphone, they were not asked the next questions as the target market is only smartphone users. This method of sampling is called probability multistage sampling.

Sample size

Data was collected from a total of 717 respondents. 139 of the 717 respondents started the survey but never completed the survey, therefore incomplete data was deleted, and only 582 responses were analysed. 576 indicated they have used a smartphone before, therefore could continue to the next question. When asked if

there is a need for an integrated communication App, 522 respondents indicated there is a need and therefore could continue to answer communication App related questions.

3.6 Data collection process

3.6.1 Introduction

Data collection is a process of getting information from the respondents to measure variables that answer the research question and test hypotheses. Information on variables of interest is gathered and measured in a systematic manner to evaluate outcomes (Granello & Wheaton, 2004). Below diagram shows end to end data collection process.

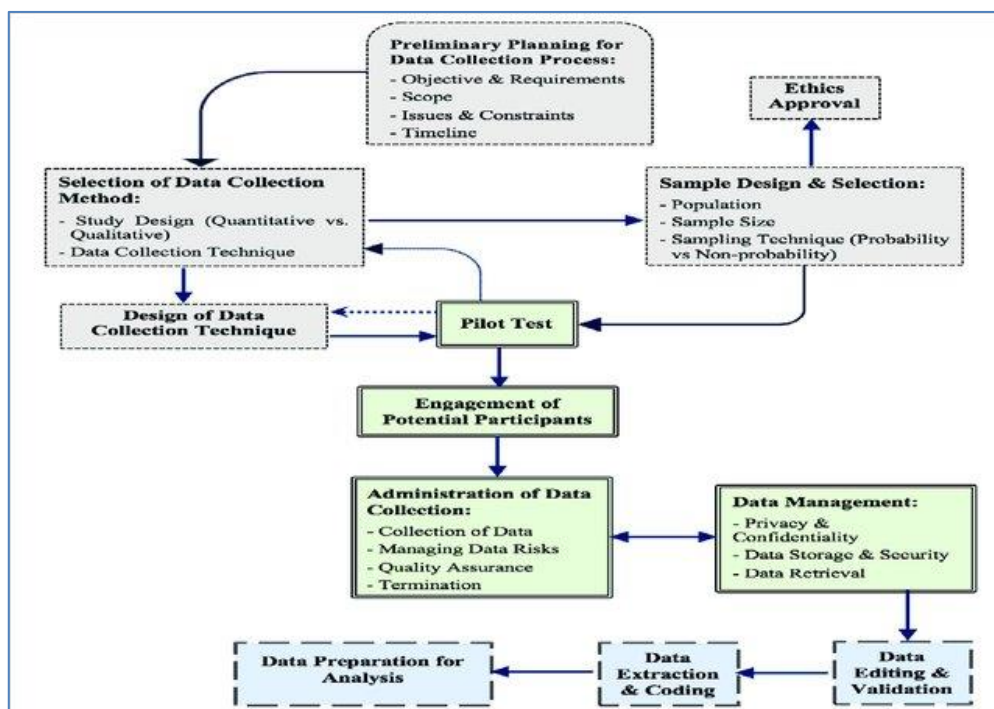


Figure 6: Planning and Collection Process for Primary Data Collection Techniques

Source: (Aljohani & Thompson, 2020)

Data collection process for this study ensured each question is responded to before the respondent could proceed to the next question. This was to ensure high data quality where the respondent might skip a question rushing to finish the survey or skip if they find a question difficult without first applying themselves.

3.6.2 Data collected

Sample size and demographics

To test hypothesis ***H0***, it was determined that to establish if there is a need for an integrated communication application respondents who use smartphones will have to be interviewed as they are the target market of the finished product. If they agree there is a need, they will then be asked to rank application features to ensure their needs are catered for in order of importance taking into consideration resource constraints when building a new system application. Respondents were first asked how long they have been using smartphone as per below. If a respondent selects that they have never used a smartphone the survey ends as the respondent is not the target market. Of the 582 respondents that answered this question, 576 respondents were able to continue with the survey as they use a smartphone.

Respondents were then asked to provide demographic information. Demographic information collected was age, gender, and education. Demographic information was collected to determine if people of the same age group or gender or level of education have the same needs. This was to check if responses are influenced by demographic information.

Hypothesis H0 – App usage

Respondents were asked number of Apps they have downloaded. This is number of Apps that did not come embedded on the phone. The assumption is that high number of Apps indicate that a respondent generally likes trying out new Apps and low number of Apps indicate the respondent would appreciate an integrated App where they do not have to download too many Apps to find out what their service providers are saying. Respondents were also asked the types of Apps they mostly use to determine the kind of Apps they are interested in and understand the kind of Apps the integrated App will be competing with for attention. Four Apps from the previous question were then selected for respondents to rank in order of usage. This was to determine which Apps are

used the most daily. This question was designed to help decide how best to position the new integrated communication App. Majority of respondents (58%) indicated they mainly use social media Apps, therefore even though this is a service App, it will be positioned to potential users as a social media App with service failure information, to give it a competitive advantage.

Considering the many Apps users must consult to find out why they are unable to access services from their service providers, respondents were asked if there is a need for an integrated App that notifies them when their service provider has service failure. If respondent selects 'no' the survey ends as the respondent is not the target market. Of the 576 respondents that answered this question, 522 respondents were able to continue with the survey as they have responded with a yes (372) there is a need for an integrated communication App, or they have responded that maybe (150) there is a need.

Hypothesis H1 – Product related factors

Respondents were asked to rank characteristics of the App they consider important. Respondents had to rank 6 App characteristics with 1 being the highest and 6 being the lowest. These 6 characteristics are grouped under product features and when the App is developed resources will be prioritised to the highest ranked features. Options included were that the App must work; the App must be reliable; the App must be helpful; the App must be easy to use; the App must be useful; and the App must be free of charge to the end user. Respondents could only select a number once to ensure they do not repeat the same ranking on other option. This means true ranking was applied.

Hypothesis H2 – Security related factors

Respondents were also asked to rank security related features to understand between protection against virus and to have their data protected, which they consider more important. This was to measure where resources are needed the most for user protection. Both factors will, however, be given high priority. Protection of financial details is one of the features that could have been added

under security ranking, however, this App will not be holding end user financial data. This can be considered at a later stage when users are already entrenched in the system.

Hypothesis H3 – Social related factors

Lastly, respondents were asked social related questions to check if they are people who influence others to use a new App or if they are influenced by family and friends or influencers. This question is to help with marketing positioning of the new communication App. This will also help determine the cost of marketing depending on approach.

3.6.3 Pilot study

Pilot study allows for the researcher to collect data at a small scale to determine if the study will yield the intended results (Malmqvist, et al, 2019). The questionnaire was shared with 5 respondents to test the viability of the study. The questionnaire was then refined before sharing with the rest of the group. However, statistical testing was not done during the pilot study. The pilot was done to ensure respondents can understand the questions.

3.6.4 Data collection tools and timeframe

Respondents were sent Qualtrics questionnaire through social media (Facebook, LinkedIn, and WhatsApp) and Wits university student portal with pre-populated options. Respondents were given a month to complete the survey. If a respondent starts the survey but does not complete it, records were deleted after a week of incompleteness.

3.7 Data analysis

3.7.1 Introduction

Data analysis is process of cleaning, transforming, and modelling the information collected to support the decision-making process and suggest conclusion. There

are different types of data analysis which include exploratory data analysis (EDA), descriptive statistics and confirmatory data analysis (CDA) (Pal, 2017). According to Ho (2006) there are two primary considerations to be made when choosing the appropriate statistical test, which are “(1) the nature of the hypothesis and (2) the levels of measurement of the variables to be tested”. A determination should be made if the intention of the hypothesis is to measure the mean score differences between groups or testing relationships. Depending on the aim of the research, the appropriate statistical test must be selected. Level of measurements must also be considered together with nature of the hypothesis to be tested (Ho, 2006). This study has adopted descriptive statistics with frequency distribution.

3.7.2 Data analysis technique

Descriptive analysis allows data to be presented in a quantitative form that is easily accessible, and the rationale associated with the quantification is established. Observations are converted into numerical figures (Pal, 2017). Raw data collected was exported from Qualtrics to Excel spreadsheet where summaries and charts were created to give a visual output of the data to answer the research question. Correlations and scale reliability were also used to analyse the data for viability and reliability.

3.7.3 Data analysis tools

Statistical Package for the Social Sciences (SPSS) data analysis tool was used to run statistical procedures. SPSS has been in existence since 1968 and widely used in educational research. Though software like Microsoft Excel can be used to run some statistical data, SPSS has ability to run complex data analysis, which makes it a preferred tool.

3.8 Limitations

In quantitative studies, surveys tend to be the most preferred due to their low-cost nature and high representativeness of the population. However, the reliability of the study is dependent on the structure of the questions and the accuracy of the responses given by the respondents (Queirós et al., 2017). The concern of

the representativeness was also raised by Hox & Boieje (2005). For this study, sample questions were tested with potential respondents before distributing to larger respondents. Questions were then refined to remove ambiguity. The tool used to construct questions, however, had limitations in terms of how some questions could be structured to ensure the right responses are collected. Some questions could not be structured correctly due to the limitation of the tool used, which increased number of incomplete responses. Incomplete responses make up 19% of the responses. Though the survey was considered difficult to complete by some of the respondents, conclusion could not be drawn that the entire 19% dropout is due to the level of difficulty of the of the survey.

3.9 Validity and reliability

3.9.1 Validity

Quantitative research using surveys is vulnerable to errors where the questions asked may lead to the deviation from the desired outcome of the survey. Type of questions asked, who answers the questions and how the data is collected can compromise the quality of the results (Groves, et al., 2011). Heale and Twycross (2015) define validity as the accuracy of the outcome of the quantitative study. They divide validity into three categories, which are, content validity that measures the instrument if it covers all the content of the variable; construct validity that checks if inferences can be drawn from the concept being studied; and criterion validity which is an instrument that measures same variable and checks the extent of the relationship between measures derived from the survey and other external criteria which external criteria can be concurrent or predictive. This study measured criterion validity with the focus on concurrent validity. Known-group validity was used to test the categorical external criteria.

3.9.1 Reliability

According to Heale and Twycross (2015), reliability is the accuracy of the instrument used in a quantitative study to determine the outcome of the study. If the instrument is used consistently in the same situation repeatedly, it is expected

to produce same results for it to be considered reliable. Heale and Twycross (2015) divide reliability into three categories, which are homogeneity, stability, and equivalence. Homogeneity is assessed by checking if one construct can be measured using all items in a scale. It is recommended that Cronbach's α is used to determine consistency of the instrument. If the Cronbach's score is 0.7 and above, then the instrument is considered reliable. The source of acceptability of Cronbach's score of 0.7 and above is the original study done by Cronbach in 1951. This study adopted Cronbach's score of 0.7.

Cronbach's Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable
Source: Cronbach (1951)	

Figure 7: Cronbach's Alpha Rule of Thumb

Source: (Chan, 2020)

Stability is determined by doing repeated testing and check if the results generated are consistent. An instrument that is stable has a high correlation between scores each time the test is completed. An instrument that is considered stable has a correlation coefficient of 0.5. Correlation of 0.3 to 0.5 is considered moderate and anything less than 0.3 is considered weak.

3.10 Research ethics

Respondents took a survey online and were not requested to disclose personal information and responses cannot be tied to a particular individual. Explanation was given that confidentiality will be maintained and anonymity will be retained in the data. There are no additional researchers that conducted or have access to view the data. No privileged information was requested from the respondents. Sensitive information or information that falls within vulnerable category was not

requested from the respondents. No formal permission was required, and the research was conducted online through online questionnaire. Only demographic information like gender, age and income was collected to determine the target market.

Digitally collected and stored data is easy to access for future, however, the storage of the data should be done in compliance with ethical requirements reference (Golinelli, et al., 2020). Data collected for this study will be stored in a password protected computer and on online database that is accessed using a password. The password for the computer and the database changes every three months. Data will be purged after five years from the online database.

3.11 Summary

The aim of this study was to answer the question if there is a need for an integrated communication application that can be used by multiple organisations to communicate to their consumers when they are faced with service failure or recovery. Quantitative method was chosen considering the time constraint and the size of the sample to be consulted, which aimed to reach many potential App users. A survey was used to investigate the need for a communication hub and the information users of the platform would like to see in the communication App. Data was collected from a total of 717 respondents and 522 respondents indicated there is a need for a communication hub.

CHAPTER 4. PRESENTATION OF FINDINGS

4.1 Introduction

The aim of this study was to determine if there is a need for integrated communication platform and the characteristics that influence a user to adopt a new application (system). To answer this, respondents were asked a set of questions, which the responses will be presented in this chapter. Hypothesis were made before data was collected. Analysis of the data will reveal if the hypotheses were met or not. Statistical test was also performed to determine validity and reliability of the study, which results of the test will also be presented in this chapter.

The study attracted over 700 respondents whom only 582 completed the survey. The rest started the survey but never completed, therefore the responses were discarded including those that were already 95% complete. Some respondents indicated the survey was difficult on questions that required a ranking scale. This feedback was used as a lesson that firstly, technology users do not necessarily read instructions and secondly, when one is building a technological system, they must consider the lowest common user to make the technology easy to use, which increases adoption. Technology adoption is something this study is trying to solve for; therefore, the difficulty of the survey was considered in the outcome of the investigation.

4.2 Sample size and demographics

The interest of this study was on respondents that use smartphones. To determine smartphone usage, respondents were asked how long they have been using a smartphone. Results below show the number of respondents that have used a smartphone who could be allowed to continue with the survey and form part of the study. Where a respondent selected that they have never used a smartphone the survey ended as the respondent was not the target market. Of the 582 respondents that answered this question, 575 (99%) respondents were

able to continue with the survey as they have used a smartphone before. The 7 (1%) respondents who have never owned a smartphone were dropped from the sample. To see if people of the same age group or gender or level of education have the same needs, respondents were grouped into demographics, which was age, gender, and education. Below is a view of gender, age and level education combined to form a matrix. The demographic information below shows the type of people who completed the survey. Majority (30%) of those who completed the survey were between the age of 18 and 24, which majority of the respondents (55%) were female and had only a high school qualification (25%) or honours/postgraduate qualification (25%). The reason for majority of respondents being young (18-24) with no post high school qualification or respondents between ages of 35 and 44 (29%) is because some data was collected through the Wits university distribution list with only students targeted. This group of respondents was followed by those with post graduate qualification for similar reasons. This skewness of respondents was not seen as a concern because young people tend to adopt technology faster and get the adults in the family to also adopt as well. Responses below are 565 which is less than the question that follows, because initially demographic questions were at the end, then moved to the top to accommodate respondents that would be dropped off the survey earlier depending on their responses. Demographic was combined where age, gender and education level were grouped together to show full demographic of a respondent. Majority of the respondents (15%) are females between the age of 18 and 24 who are high school graduates followed by high school graduate males of the same age at 7%. The gap between male respondents and female respondents of the same age and qualification is almost double with females leading. Similar observation was made in the next age group set where more females responded to the survey and majority either had a 4-year degree or honours/postgraduate. As the ages progressed, more males than females completed the survey and tended to have higher qualifications like master's and doctorate than females.

Categories	Items	Frequency	Percentage
Gender	Male	252	44.68%
	Female	308	54.61%
	Non-binary / third gender	2	0.35%
	Prefer not to say	2	0.35%
Age	18-24	170	30.14%
	25-34	142	25.18%
	35-44	166	29.43%
	45-54	66	11.70%
	55-64	19	3.37%
	65+	1	0.18%
Education	Less than High School	0	0.00%
	High school graduate	143	25.35%
	College graduate with Certificate	24	4.26%

	Diploma Graduate	36	6.38%
	3-year degree	84	14.89%
	4-year degree	49	8.69%
	Honours/Postgraduate	142	25.18%
	Master's degree	74	13.12%
	Doctorate	12	2.13%
Mobile Experience	Never owned one	1.20%	7
	1-3 years	3.61%	21
	4-7 years	17.35%	101
	7-10 years	21.13%	123
	10+ years	56.70%	330

Table 2: Demographic and mobile experience

4.3 Need for an integrated communication application

Respondents were asked number of Apps they have downloaded, and majority (52%) indicated they have downloaded between 10 and 20 Apps. The finding below indicates people generally download lower number of Apps.

Number of Apps - How many downloaded Apps do you currently have on your phone/tablet?			
#	Answer	%	Count
1	10-20	51.83%	298
2	21-40	29.74%	171
3	41-60	8.70%	50
4	61-80	4.87%	28
5	81-100	2.61%	15
6	100+	2.26%	13
	Total	100%	575

Table 3: Number of Apps downloaded

Respondents were asked the types of Apps they mostly use and were allowed to select multiple Apps. The most selected Apps were social networking Apps and service Apps with 16% and 15% respectively, then transport at 12%.

App preference - What type of Apps do you mostly have? You can select multiple			
#	Answer	%	Count
1	Social networking (Facebook, Twitter, WhatsApp, etc)	15.90%	551
2	Services I consume (Banking, telecoms, water, electricity, etc)	14.72%	510
3	Entertainment (TV, radio, movies, etc)	10.53%	365
4	Games	7.22%	250
5	News	7.27%	252
6	Sports	4.13%	143
7	Educational	7.82%	271
8	Spiritual	6.87%	238
9	Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	10.16%	352
10	Transport (Uber, Bolt, etc)	12.35%	428
11	Other	3.03%	105
	Total	100%	3465

Table 4: App type preference

The above Apps were then trimmed to allow respondents to rank them in order of usage to determine which Apps respondents use daily. The four Apps chosen were randomly selected with the assumption that respondents will rank them highest in the previous question. Majority of respondents (58%) indicated they mainly use social media Apps followed by services App.

App ranking - Which of the following Apps do you use the most daily? Rank all options in order of importance, with 1 being the highest and 4 the lowest. A number can only be selected once										
#	App	1		2		3		4		Total
1	Social networking (Facebook, Twitter, WhatsApp, etc)	57.91%	333	11.65%	67	8.00%	46	22.43%	129	575
2	Services I consume (Banking, telecoms, water, electricity, etc)	13.04%	75	44.70%	257	28.70%	165	13.57%	78	575
3	Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	16.52%	95	18.96%	109	29.04%	167	35.48%	204	575
4	Entertainment (TV, radio, movies, etc)	12.52%	72	24.70%	142	34.26%	197	28.52%	164	575

Table 5: App type ranking

Respondents were asked - If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify them when their service provider is having service failure, would they use it. 65% of respondents answered 'yes' they would use it and 26% answered 'maybe' they would use it. That made a total of 91% respondents that would probably use it. The 9% that answered 'no' they would not use it, were not presented with the next set of questions as they were not considered target market.

Communication App - If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify you when your service provider is having service failure, would you use it?			
#	Answer	%	Count
1	Yes	64.52%	371
2	Maybe	26.09%	150
3	No	9.39%	54
	Total	100%	575

Table 6: Communication App need

4.4 Factors influencing application adoption

4.4.1 Product related factors

Respondents were asked to rank characteristics of the App they consider important. Respondents had to rank 6 App characteristics with 1 being the highest and 6 being the lowest. These 6 characteristics are grouped under product features. The characteristics included 'work', which meant the user requires the App to do what it is intended to do; 'be reliable' which means the App should be available all the time when expected to be available; 'helpful' which means the App should provide information that adds value to the users; 'be easy to use' which means the App must not be too complex and should be easy to navigate without the need of a manual; 'be useful' meaning the App must provide information that is useful to the users; and 'free of charge' which means users must not be charged to access the App. Free of charge had the highest ranking at number 1 with 25.91% followed by reliability at number 2 with 25.72%; then helpful followed at ranking number 3 with 23% which was then followed by easy to use at 20% and usefulness at number 5 with 24%. Free of charge seems to either be very important or not important at all as it scored highest on ranking 1 and highest on ranking 6. This means respondents felt strongly about being charged. Option 1 (work) ranked high on ranking 1 but free of charge ranked the highest in the same ranking, therefore that the App must work could not be said to have ranked the highest on ranking one though ranking 1 is option 1 highest ranking. Option one could not rank highest on other options either, therefore it would be placed as the last ranking 6 though ranking 6 is the lowest ranking of option 1 (work). It could be said respondents may have interpreted option 1 and option 2 as fulfilling the same need, therefore their ranking is closely related in each ranking.

Usage Ranking - If the new service failure communication App is built, rank all of the following App features in order of importance, with 1 being the highest and 6 the lowest. A number can only be selected once. The App must:														
#	Question	1		2		3		4		5		6		Total
1	Work	23.80%	124	17.47%	91	14.20%	74	13.44%	70	18.43%	96	12.67%	66	521
2	Be reliable	21.11%	110	25.72%	134	16.12%	84	14.01%	73	12.86%	67	10.17%	53	521
3	Helpful	9.40%	49	10.56%	55	23.42%	122	23.80%	124	20.15%	105	12.67%	66	521
4	Be easy to use	12.28%	64	16.70%	87	19.58%	102	20.15%	105	16.51%	86	14.78%	77	521
5	Be Useful	7.49%	39	19.77%	103	17.85%	93	17.66%	92	23.80%	124	13.44%	70	521
6	Free of charge	25.91%	135	9.79%	51	8.83%	46	10.94%	57	8.25%	43	36.28%	189	521

Table 7: App characteristics ranking

4.4.2 Security related factors

Security related questions were asked to the respondents where they had an option of protection against viruses or to have their data protected. 87% of the respondents chose to have their personal details protected showing that though people do not mind being online, they prefer anonymity.

Security Ranking - When it comes to using a new service failure communication App, select one of the following:			
#	Answer	%	Count
1	My personal details must be protected	86.95%	453
2	My phone/tablet must be protected from virus and malware	13.05%	68
	Total	100%	521

Table 8: App security characteristics ranking

4.4.3 Social related factors

The last question of the survey dealt with social related questions where respondents were asked how they get to know about a new technology or application if they are the first ones to discover it and share with others; if they hear about a technology from family and friends and are highly likely to take advice from family and friends or if they listen to celebrities to use a new technology. This was to determine if respondents are people who influence others to use a new a new application or if they are influenced by family and friends or

influencers. 42% in the first ranking indicated they discover the technology and tell others about it while in ranking 2 41% of the respondents indicated they would follow their friends and family, and lastly respondents indicated they would listen to celebrities and influencers.

Social - When it comes to using the new service failure communication App, rank all options in order of importance, with 1 being the highest and 3 the lowest. A number can only be selected once.								
#	Question	1		2		3		Total
1	If my family and friends use a technology, I would also use	39.92%	208	41.27%	215	18.81%	98	521
2	I trust a technology that is used by celebrities and influencers	17.47%	91	25.14%	131	57.39%	299	521
3	I am a person who discovers a new App and tell others to use it	42.61%	222	33.59%	175	23.80%	124	521

Table 9: Social characteristics ranking

4.5 Statistical testing

4.5.1 Validity and Reliability

Internal reliability integrity scale was investigated using Cronbach's alpha. The results indicated that the alpha for the total scale on 7 items was equal to .501 which is considered poor as the acceptable result is 0.7 and higher. A total of 584 items were tested and 62, which is 10% were excluded from the analysis as they form part of respondents that could not continue with the survey based on the answers given in the previous question. The low Cronbach's alpha indicates low reliability on the scales used in the questionnaire. Cronbach's alpha can be improved by removing 'usage ranking' scale which improves it to 0.527. This result indicates that items are poorly homogenous, and they do not comprise exceptional variance to not be similar in form and relations with each other.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.501	.407	7

Table 10: Reliability testing

If some of the scales are deleted and only 3 scales, which are 'mobile experience', 'age' and 'education' are used, Cronbach's alpha improves to 0.658 with a Cronbach's alpha on standardised items at 0.744.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.658	.744	3

Table 11: Reliability testing – with deleted items

Correlation test was also conducted, and it was observed that correlation between number of years respondent has been using a smartphone and number of Apps the respondent has downloaded are significantly correlated with a p-value = 0.01. Similar observation was made between the adoption of communication App and ranking of security features with a p-value = 0.05. This indicates that it is not by chance that number of years of experience drives number of Apps the respondent would download, and communication App adoption drives how the respondent would rank security features.

Correlations					
		Usage Ranking	Age	Education	Mob experie
Pearson Correlation	Usage Ranking	1.000	-.062	-.066	
	Age	-.062	1.000	.559	
	Education	-.066	.559	1.000	
	Mobile experience	-.060	.467	.439	
	Number of Apps	.025	.107	.137	
Sig. (1-tailed)	Usage Ranking	.	.078	.067	
	Age	.078	.	.000	
	Education	.067	.000	.	
	Mobile experience	.086	.000	.000	
	Number of Apps	.287	.007	.001	
N	Usage Ranking	522	522	522	
	Age	522	522	522	
	Education	522	522	522	
	Mobile experience	522	522	522	
	Number of Apps	522	522	522	

Table 12: Correlations (mobile experience, number of Apps, usage ranking, age, education)

One-way ANOVA was conducted at alpha level of 0.05 to determine if number of Apps influences new communication App adoption. There was no significance difference between number of Apps downloaded and App adoption with $F(5,570) = 5.33$, $p=0.75$, partial $\eta^2 = 0.005$ and mean of 0.437. This means number of Apps downloaded does not influence communication App adoption.

ANOVA					
Communication App					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.166	5	.233	.533	.751
Within Groups	249.271	570	.437		
Total	250.437	575			

Table 13: ANOVA (number of downloaded Apps and communication App)

Regression analysis was conducted testing if age, gender, number of years of mobile usage and number of Apps downloaded influence how respondents rank product features of a new technology, results showed that there was no

relationship with a regression of 0.657 which is less than 0.7. This means predictors are not multilinear. Predictors are observed to be less than 0.3 which means there is a linear relationship. Residual is within 3 and -3 miscalculating by 0.007 points. Durbin-Watson is 1.981 which is below 2 therefore an indication that there is no auto correlation. The instrument is therefore not considered stable.

Model Summary ^b							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.086 ^a	.007	.000	.412	.007	.966	4
Change Statistics							
Model	df2		Sig. F Change		Durbin-Watson		
1	517		.426		1.981		

Table 14: Regression analysis

4.6 Summary

Over seven hundred (700) respondents took part in the survey. Respondents were asked - If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify them when their service provider is having service failure, would they use it. 65% of respondents answered 'yes'. Respondents were then asked to rank characteristics of the App they consider important as per technology adoption model (TAM) and respondents ranked that the App should 'work' the highest.

CHAPTER 5. DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the research findings in relation to the stated objectives and the hypothesis. Each objective and accompanied hypothesis are analysed.

5.2 Need for an integrated communication application

5.2.1 Introduction

This section analyses the need for an integrated communication application dedicated to service failure for organisations. This section compares responses from the survey with the literature around integrated service applications and communication theory.

5.2.2 Integrated App Usage

The literature consulted indicates that though organisations use social media to reach out to their clients, most organisations mainly use social media to market their products. In an event of service failure, organisations still largely rely on the use of eMail and SMSes to notify their clients. However, this has proven to be a challenge as it is both costly and not real time. Literature indicated there is a need to communicate to clients when an organisation cannot meet the promised service levels and the communication should be done real time to manage customer perceptions.

Literature also indicated that some organisations use social media to communicate service failure, however, since most service consumers use social media to interact with family and friends, social media may not be an effective tool for organisations to rely on for service failure communication. Literature, therefore recommended an integrated application that organisations can use to focus on service failure communication to avoid relying on cluttered platforms like social media or usage of SMSes and eMail that may not be real time.

Responding to the need identified in literature, a survey was conducted through questionnaire where respondents were first asked if they have used a smartphone before, number of Apps they have personally downloaded, Apps they use frequently and if they would use an integrated App if it was to be launched. Ninety nine percent (99%) of the respondents who took the survey indicated they have used a smartphone before which was expected as the survey was conducted online. Of those who had a smartphone, eighty two percent (82%) had downloaded less than forty (40) Apps on their smartphones or tablets with fifty two percent (52%) of those having downloaded less than twenty (20) Apps, indicating people are not too fond of downloading too many Apps considering according to Apple (2022), App store has about 1.96 million active Apps while according to Buildfire (2022), Google play store has about 2.97 million active Apps available for download. Answering which Apps, they use the most, thirty one percent (31%) of the respondents indicated they use social media and services the most though social media was the highest ranked. When asked to rank in order of usage, fifty-eight (58%) of respondents ranked social media number one. This shows when people are on their phones they are mostly trying to connect with family and friends than concerning themselves with what their service providers are saying.

Respondents were asked if they would use an integrated service failure App if it were to be made available and sixty five percent (65%) responded with a 'yes' while twenty six percent (26%) responded with a 'maybe'. Together this makes ninety one percent (91%) of respondents that indicated the need for a single App that various organisations can use to communicate to their clients when they cannot meet the agreed service level. This shows smartphones users prefer a single point of contact to get information that is important to them. This need is currently being fulfilled through social media which literature has indicated is not ideal as most users use it to socialise and therefore cluttered with social material and marketing material from organisations. Single communication App that can

be used by organisation becomes a necessity for consumers to get information real time that is focused on service failure and in an organised manner.

Hypothesis (*H0a*) tested if there is a positive relationship between number of Apps downloaded and integrated communication App usage to see if users with low number of Apps would adopt the combined App as they are not fond of downloading too many Apps. The results showed there is no relationship between number of Apps downloaded and preference of combined App. This means the assumption that consumers with lower number of Apps downloaded will highly likely adopt the communication App was not met. This, however, just means any user irrespective of number of Apps they have is highly likely to adopt the new communication App.

In conclusion, there is a need for an integrated App that can be used by organisations to communicate service failure to their service consumers real time. Schwager & Meyer (2007) highlighted the risk of having customers calling in to find information in an event service has been interrupted which could increase the cost of doing business as it is customer service personnel dependent. Ukpabi et al (2019) highlighted challenge with the use of contact centre that it is customer service personnel dependent and is both cost intensive and may lead to customer dissatisfaction if the personnel is not well trained. Moore & Clayton (2007) highlighted the risk of fraud and phishing with the use of eMails and SMSes for customer communication. To improve customer communication, Cai et al (2020) indicated there is a need for a communication channel designated to customer communication where there is no information overload, and it is costs effective. Therefore, this study supports the literature that there is a need for a designated communication channel.

5.3 Factors influencing application adoption

5.3.1 Introduction

As it was seen above that both the App store and Google play store have millions of Apps, yet the eighty two percent (82%) of the respondents have indicated they have downloaded less than forty (40) Apps on their phones or tablet, indicating the App adoption remains an issue. This section analyses factors that are considered important for App adoption. These factors are grouped into three sections which the first one is product related factors that deals with the functionality of the App which include that the App must work, it must be reliable, helpful, easy to use, useful and must be available at no cost to the user. The second group deals with security related factors to determine security features most important to the App users, and these include that the users details must be protected and that the user device must be protected from viruses and malware. Financial details security feature was not included because the plan is not to request users' financial details. The last group deals with social related factors exploring who the users listen to use a new application with questions assessing if the respondent is the one that tries out new apps and tell others about it, find out about a new App from family and friends and take their recommendations and if they listen to influencers to try out a new App. Each grouping has hypotheses that were tested which will be discussed below.

5.3.2 Product related factors

When building an application, resources are limited and therefore important features of the application should be given higher priority. Respondents were given six options to rank in order of importance to ensure when building the application factors that the users rank higher are given higher priority.

Hypothesis *H1a* had assumed that functionality and reliability are the most important factors for App adoption and will be ranked higher than the other factors. These were tested by asking respondents to rank that the App must work,

and it must be reliable. Of the six options respondents were given, respondents ranked “App must work” which was option 1 and “App must be reliable” which was option 2 a total of 45%, which was the highest ranking. This means the assumption that functionality and reliability are the most important factors of the communication App were met. Functionality and reliability were also identified by Xie et al. (2021) as important factors of technology adoption.

Hypothesis *H1b* had assumed that “helpfulness” is the most important factor for App adoption. This was tested by asking respondents to rank that “App must be helpful” and it must “be free of charge”. Of the six options respondents were given, respondents ranked “App must be helpful” which was option 3 and “App must be free of charge” which was option 6 a total of 35%, and it was the second highest ranking. This means the assumption that helpfulness and free of charge are the most important factors of the communication App was not met. However, free of charge on its own received the highest ranking of 26%, which means users consider cost of using the App more important. Cost of usage was also highlighted by Liang et al. (2021) as an important factor to technology adoption. This was supported by Lin (2003) and Hanekom (2020).

Hypothesis *H1c* had assumed that ease of use is the most important factor for App adoption. This was tested by asking respondents to rank that App must be easy to use. Of the six options respondents were given, respondents ranked App must be easy to use number 3 with 12%. This means the assumption that ease of use is most important factor of the communication App was not met. A study conducted by Kim (2018) focusing on perceived ease of use with ease of finding information, ease of platform use, and ease of explaining the use of platform to other users concluded that there is insignificant relationship between perceived ease of use and adoption intention. However, a study conducted by Kamal et al. (2020) on telemedicine concluded that perceived ease of use is a critical factor to adoption. What can be concluded from this is that it depends on the type of technology as some technologies may be considered complex and some simple

to navigate. Integrated communication App was therefore considered simple as users ranked ease of use low for adoption intention.

Hypothesis *H1d* had assumed that usefulness is the most important factor for App adoption. This was tested by asking respondents to rank that App must be useful. Of the six options respondents were given, respondents ranked App must useful number 4 with 7%. This means the assumption that usefulness is most important factor of the communication App was not met. Usefulness was ranked last, meaning users are more satisfied with an App that works and that they can rely on when in need. A study by Chen & Aklikokou (2020) had identified perceived usefulness as a critical factor to technology adoption. This study did not support this view.

In conclusion, users will adopt an App that works, that they can rely on, and do not have to pay for it. The importance of functionality was supported by Xie et al (2021). The importance of providing the App free of charge was supported by Hamari et al. (2020) who did a study on freemium services and concluded that the more users enjoy the service, the less willing they are to pay for it, but will highly likely adopt it. This is the combination revealed by this study where users want an App they can rely on at no cost.

5.3.1 Social influence related factors

Literature indicated that social factors influence technology adoption. Social factors are not necessarily impacted by resource constraints but considered for marketing purposes to understand how to target users. Social factors were ranked to understand marketing strategy of the service failure communication App.

Hypothesis *H2a* had assumed that interest in trying out new technology is the most important factor for App adoption. This was tested by asking respondents if they are people who discover a new App and influence others to use it. Of the three options respondents were given, respondents ranked that they are the first ones to discover an App number 2 with 43%. This means the assumption that intention to use communication App will be positively influenced by interest in trying out new technology is not met.

Hypothesis *H2b* had assumed that social network is the most important factor for App adoption. This was tested by asking respondents if they would use a technology because family and friends are using it and if they trust a technology because influencers are using it. Of the three options respondents were given, respondents ranked the two options combined at number 1 with 57%. This means the assumption that intention to use communication App will be positively influenced by social network was met. However, the option that users discover Apps and tell others to use it ranks higher if social network factors are not combined. Meaning largely users discover Apps themselves. This means the marketing strategy should focus on discovery of the App.

Jiang et al. (2021) found that consumer reviews, reputation of the developers and peer influence play a role in influencing perceived value and subsequently affect users intention to adopt the application. The implication of this is that platform owners should make the application easy to discover and should be differentiable from other applications. According to Zhu et al. (2017), study results indicated self-efficacy, social value, functional value, and emotions as key factors influencing perceived value and therefore intention to adopt the application. This is supported by this study showing that users are highly likely to adopt an App that has been recommended either by friends and family or influencers. Discovery of technology is also important; however, it can also be achieved through reading reviews which is considered a social network.

5.3.2 Security related factors

Literature consulted indicated that security is one of the factors considered important for App adoption. However, when dealing with resource constraints it is important to understand where most resources should be utilised to ensure users adopt the App when it is launched. All security factors will be considered, the difference will be scale of consideration.

Hypothesis *H3a* had assumed that product security is the most important factor for App adoption. This was tested by asking respondents to rank that their personal details must be protected. Of the two options respondents were given, respondents ranked that their personal details must protected number 1 with 87%. This means the assumption that product security is most important factor of the communication App was met.

Hypothesis *H3b* had assumed that perceived risk is the most important factor for App adoption. This was tested by asking respondents to rank that their device must be protected from virus and malware. Of the two options respondents were given, respondents ranked that their device must protected from virus and malware number 2 with 13%. This means the assumption that perceived risk is most important factor for the communication app was not met.

In conclusion, users understand that their devices are exposed to the risk of being attacked by viruses and malware when they are online but believe protection of information rests with the App provider, therefore want the App provider to protect their information. If a user feels their information is not being protected, they will highly likely not use the App. The study by Kim (2018) has explored user perception on security focusing on leaking of personal or transaction information and system hacks or virus attacks. The study concluded that if people perceive a system to be lacking security, they are highly likely not to adopt it. This outcome

was supported by the telemedicine study conducted by Kamal et al. (2020). Considering respondents were given only 2 options to choose from, both personal information protection and protection from virus could be considered important but protection of personal information was considered more important.

Though security is important, Ehrari et al. (2020) concluded in their study that perceived benefits of technology outweigh perceived risk. That means users are willing to live with the risks if they believe that the benefits from the use of technology are higher than the risks of having their personal information being compromised or their devices being attacked by viruses and malware.

5.4 Summary of findings

Integrated application will be based on platform principles where there are users that will supply the content, and this will be service providers (organisations) and there will be consumers of the content who will be users who either have services with the service providers or have interest on certain service providers. The study focused on the consumer of service due to limited time. This will be used as a basis to negotiate prices with the suppliers of content who will be expected to pay for uploading messages. These are messages they will publish announcing a service failure or recovery to notify their service consumers or those that may have interest in the messages from their organisations.

Platform business model where a fee is charged to either the content provider or content consumer is highlighted in the literature by Fu et al (2021). Kim (2014) advises platform providers to build strong relationships with the stakeholders and understand their needs for them to continue providing content to the platform (Kim, 2014). According to Gregory et al (2021), The more people use the platform, the more users find it valuable and willing to pay usage fee. Mody et al (2020) highlighted that organisations that have ability to leverage platforms have

seen the cost of transaction reduce while they have access to more consumers. This study was conducted to ensure the communication App is built in such a way that is attractive to the users and therefore increase adoption. Factors that are ranked higher will be given high priority as users consider high priority for adoption.

CHAPTER 6. BUSINESS PLAN

6.1 Description of the opportunity

There is an opportunity to develop an application (App) that works as a communication bridge between multiple organisations and consumers where organisations can publish their messages on the App to notify their consumers when they have a service failure and are unable to meet service level agreement to their consumers. This App will work as a single point of entry for all organisations that are willing to subscribe to publish messages to their consumer's real time. Literature and the study both agree that having a dedicated platform that focuses on service failure communication will be beneficial to both the organisation and the consumers of services. To ensure users adopt the App, the App should be offered free of charge as it was the highest ranked feature of the App followed by App should work. Users are sensitive of their data being compromised; therefore, the data warehouse should have high security to ensure data is not stolen. Most users discover Apps themselves; therefore, direct marketing should be considered followed by reliance on word of mouth.

Platform business is two-sided, but the study only focused on the content consumer side of the market. Assumption to be made that the content provider will be willing to pay to publish communication to their service consumers as it is important to their business. According to Barnes & Cumby (2002), communication is a commodity that organisations invest in to build stronger relationships with their customers while Marsen (2020) supports this by saying crisis management communication focuses on managing public perception than company strategy. Supported by literature, it can be assumed that organisations will pay to publish service failure information or service recovery if they believe there are audience that can be reached through publishing of information on the integrated communication application.

Responding to the need identified in literature and research, shareholders saw an opportunity to assist organisations with a platform that will make it easier to communicate to their consumers in an event of service failure. The growth of technology has also afforded an opportunity to create platform businesses and smart cities connecting people from all corners of the world and making it simpler to do business. It is for this reason that a technological company called Novac will be registered with CIPC as Novac (Pty) Ltd which will focus on developing a central service failure communication App that will be marketed to both service providers and service consumers.

The rise of social media has made it easier for information to spread fast, therefore, expanding the effects of word of mouth. Where there is little to no information, a negative opportunity to spread fake news is created. This platform will afford organisations an opportunity to be the bearer of their own news and avert the risk of negative word of mouth when there is a service failure.

The business venture aims to build a platform that will be used to connect organisations to their customers. The reason for a central platform is to connect organisations from all industries with their customers that are all over the world. Any organisation can sign up to publish their message which can be viewed by all app users. Organisations will be charged a fee to publish the messages and will also be given an opportunity to advertise their services at a cost.

Users will be given an opportunity to select organisation they would like to be notified if there is a new message from that organisation. Users who do not subscribe will be able to view all messages as well. End users will access this service free of charge.

The App will be called 'The Wall'

6.2 Industry and market analysis

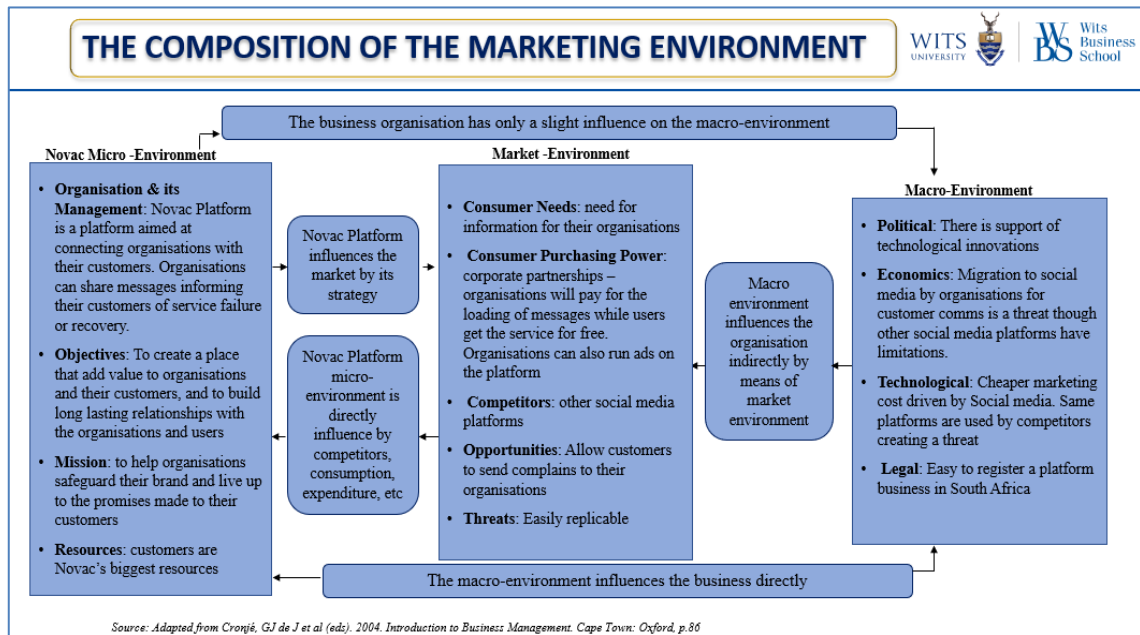


Figure 8: Market Analysis and Environment Analysis

6.2.1 Industry Factors

Economic Factors: The service will be provided for free to the end users. The current economic conditions that resulted from Covid-19 will have little impact to the end users except for cost of data that they will require to access the platform. The option to allow users to access the platform using free mode will be explored.

Government Factors: Government has interest in seeing high adoption of technology and therefore their influence on the growth of Novac platform will be positive. Novac will seek partnership with government institutions who are also service providers to the citizens. Governments stands to benefit as well from the success of Novac platform

Threats of new Entrants and Competition: Since the success of Uber, platform businesses have mushroomed and are easy to replicate. Businesses that succeed are those who know how to position their services for adoption. Novac platform faces high threat of new entrants and competition and its retention strategy lie in relationship building with the clientele is going to acquire, to ensure they do not switch to competitors.

Social / Demographic factors: This platform is open to everyone who has a smartphone. Whether they have any services we a service provider, is not a matter of concern. Younger generations can access the platform to source information for the adults who may not be techno savvy but interested on the information. Information could a simple announcement from a municipality about service interruptions, therefor the platform is open to everyone.

Consideration for Market size and Market Share: In its current form, this kind of App currently does not exist in South Africa, therefore there is no data to measure the size of the market and possible market share. There are other messaging systems and other platforms which are used by organisations, but these are seen as platforms that will co-exist at most, rather than compete.

6.2.2 Core Competencies

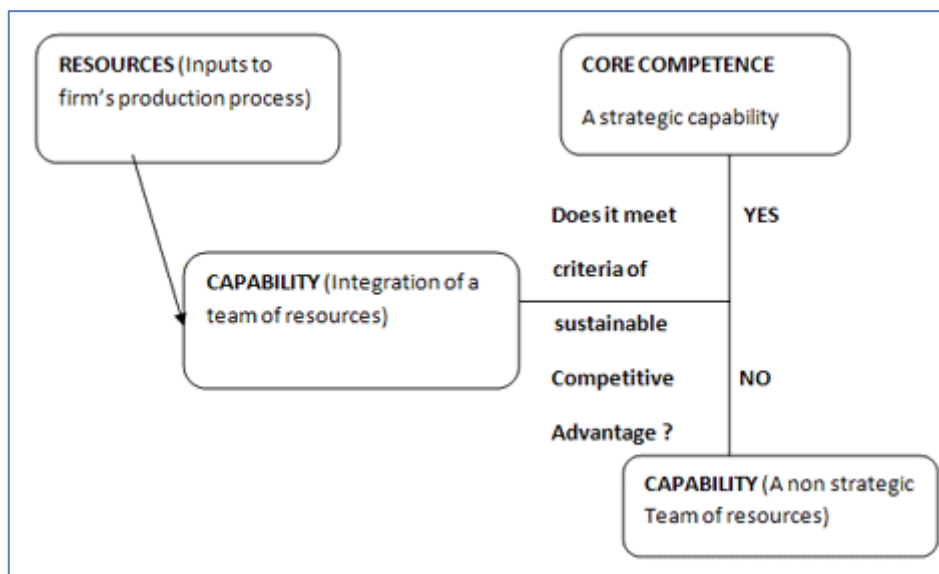


Figure 9: Core Competence Decision

Source: (Juneja, 2015)

According to Hamel & Prahalad (2006), core competence is the ability by an organisation to put together its technological resources and skills to be able to add value to the organisation. Juneja (2015) advised organisations to play to their strength to succeed in a competitive environment. Core competence adds a higher degree of value to the customer benefit; difficult to imitate by competitors; and can access more business opportunities (Enginoğlu & Arıkan, 2016).

Novac has identified relationships with its customers (organisations) as its key competence. Organisations provide content that is consumed by the end users. Novac aims to build strong relationships with its customers. It is easy to replicate a platform, but strong relationships are what sustains the business.

6.3 Marketing plan

Novac acknowledges that it will be a challenge signing up those first 10 customers (organisations) who will share the content and create the need for users to subscribe. It is for this reason that Novac will actively source information from other public platform that has been shared by organisations and consolidate into 'The Wall'. Organisations that seem to post information on various platforms will be approached for partnership.

Research will be done on other organisations that may seem to experience issues that result in customer complaints but there is no information indicating customers were notified of the issues or there are high number of complaints from customers indicating they were never notified of service interruptions. These organisations will be approached for partnership.

Organisations that pride themselves with providing quality services for their customers and transparency will also be approached for partnership.

The approach that will be used to acquire new customers (organisations) is that of one-on-one relationship. Novac will directly approach potential customers and present to them the product construct and the benefits. The focus will be the benefits of communicating to customers when there is service failure.

Social media platforms such as Facebook, Twitter and LinkedIn, and Google Analytics will be used to reach out to potential users. Partnerships with the

organisations that have signed up for the service will also be leveraged for them to direct their customers to 'The Wall' for service failure communication.

6.4 Financial plan

6.4.1 Projected initial costs

Initial investment of R556 000 will be required with monthly running costs of R77 050. Shareholders will be required to contribute the full R1 300 000 to cater for worst case scenario where the company will need to sustain itself in year one with no clients. There will be a 50/50 shareholder split between the founders of Novac and the investor who will invest half of the funds.

Attributes of NOVAC Cost Structure						
	Key Activities	Cost per activity	Outsourced & handled inhouse activities indicator	Key Resources	Cost per resource	Outsourced & handled inhouse resources indicator
Fixed Costs	Research and Development	R 50 000.00	In-house	Cloud Servers	R 9 600.00	Annual Contract
	Customer acquisition & support	R 100 000.00	In-house	Human Resource	R 680 000.00	Annual In-house
	Product development & management	R 300 000.00	In-house			
	Company Registration	R 1 000.00	Once-off			
Totals		R 451 000.00			R 689 600.00	
Variable Costs	Sales and Marketing	R 50 000.00	Outsourced & In-house Social	Unlimited Wi-Fi	R 30 000.00	Annual Contract
	Partnership Management (Legal fees)	R 10 000.00	Outsourced			
	Talent Sourcing (sourcing fee)	R 45 000.00	Outsourced			
Totals		R 105 000.00			R 30 000.00	
<i>*Costs per year</i>		R 556 000.00			R 719 600.00	

Table 15: Cost structure

6.4.2 Projected financials

Organisations that want to publish information will be charged a once off joining fee of R10 000 with an annual fee of R5000. To publish messages, organisations will be charged R700 per message. A tiered rate will be worked out for organisations that publish at least 10 messages a month. Prices are subject to increase in line with inflation. For purpose of this document, projected price increase will be 6% every year.

Messages will be archived after 72 hours, and after 2 years of service, messages will be archived after 48 hours of publishing.

Organisations that want to advertise will pay R700 per advert that lasts 48 hours, and R0.50 per customer that requests to be contacted.

Users will subscribe and interact with the platform for free.

		Expected Volume and Revenue									
Item	Cost	Year 1		Year 2		Year 3		Year 4		Year 5	
Sign on fee	R10 000	10	R100 000	10	R100 000	15	R150 000	20	R200 000	10	R100 000
Annual renewal fee	R5 000		R0	10	R50 000	20	R100 000	35	R175 000	55	R275 000
Publish Fee	R700	1200	R840 000	3000	R2 100 000	4200	R2 940 000	6600	R4 620 000	7800	R5 460 000
Advertising fee	R700	240	R168 000	480	R336 000	840	R588 000	1320	R924 000	1560	R1 092 000
Successful Referral	R50.00	1500	R75 000	2000	R100 000	3000	R150 000	4500	R225 000	8000	R400 000
		R1 183 000		R2 686 000		R3 928 000		R6 144 000		R7 327 000	

Table 16: Expected volume and revenue

6.4.3 Projected income statement

NOVAC PLATFORM											
Projected Income Statement for the period 2022-2026											
	2022		2023		2024		2025		2026		
Revenue		1 183 000		2 686 000		3 928 000		6 144 000		7 327 000	
Cash	1 183 000		2 686 000		2 598 000		4 814 000		5 997 000		
Credit	-		-		1 330 000		1 330 000		1 330 000		
Cost		205 000		217 300		460 676		488 317		722 616	
Gross Profit		978 000		2 468 700		3 467 324		5 655 683		6 604 384	
Expenses		719 600		765 580		801 359		846 027		887 078	
General Admin & Salaries	680 000		714 000		749 700		787 185		826 544		
Utilities	39 600		41 580		43 659		45 842		48 134		
Depreciation	-		10 000		8 000		13 000		12 400		
Operating profit (PBIT)		258 400		1 703 120		2 665 965		4 809 656		5 717 306	
Interest paid		-		-		-		-		-	
PBT		258 400		1 703 120		2 665 965		4 809 656		5 717 306	
Taxation	28%	72 352	28%	476 874	28%	746 470	28%	1 346 704	28%	1 600 846	
EAT(PAT)		186 048		1 226 246		1 919 495		3 462 953		4 116 460	
Dividend	0%	-	0%	-	15%	287 924	30%	1 038 886	35%	1 440 761	
Retained Earnings		186 048		1 226 246		1 631 571		2 424 067		2 675 699	

Table 17: Projected income statement

6.4.4 Projected balance sheet

NOVAC PLATFORM					
Projected Statement of Financial Position					
	2022	2023	2024	2025	2026
ASSETS					
Non-current assets	50 000	40 000	30 000	65 000	62 000
Property, plant and equipment	50 000	40 000	30 000	65 000	62 000
Current assets	10 878	15 097	9 010	12 230	10 550
Inventories	-	-	-	-	-
Trade and other receivables	-	-	-	-	-
Cash and cash equivalents	10 878	15 097	9 010	12 230	10 550
Total assets	60 878	55 097	39 010	77 230	72 550
EQUITY AND LIABILITIES					
Capital and reserves	1 486 048	2 526 246	2 931 571	3 724 067	3 975 699
Share capital	1 300 000	1 300 000	1 300 000	1 300 000	1 300 000
retained earnings	186 048	1 226 246	1 631 571	2 424 067	2 675 699
Non- current liabilities	-	-	-	-	-
Long-term portion of borrowings	-	-	-	-	-
Current liabilities	-	-	1 330 000	1 330 000	1 330 000
Trade and other payables	-	-	1 330 000	1 330 000	1 330 000
Short-term portion of banking liabilities	-	-	-	-	-
Total equity and liabilities	1 486 048	2 526 246	4 261 571	5 054 067	5 305 699

Table 18: Projected financial position

6.4.5 Projected return on investment

Performance Ratios						
Ratio		2022	2023	2024	2025	2026
RONA	Operating Profit	R258 400	R1 703 120	R2 665 965	R4 809 656	R5 717 306
	Net Assets	60 878	55 097	39 010	77 230	72 550
		424.46%	3091.13%	61.76%	124.93%	61.76%
	YoY % Change		628%	-98%	102%	-51%
ROE	Profit After Tax	R186 048	R1 226 246	R1 919 495	R3 462 953	R4 116 460
	Total Equity	1 486 048	2 526 246	2 931 571	3 724 067	3 975 699
		12.52%	48.54%	11.81%	17.89%	11.81%
	YoY % Change		288%	-76%	52%	-34%

Table 19: Performance ratios

6.5 How the app will work

- Organisation will load a message
- Customer who has subscribed to receive message from the organisation will receive notification
- Customer will login and select message to view
- If end user hasn't subscribed for a notification, they will be given option to subscribe.

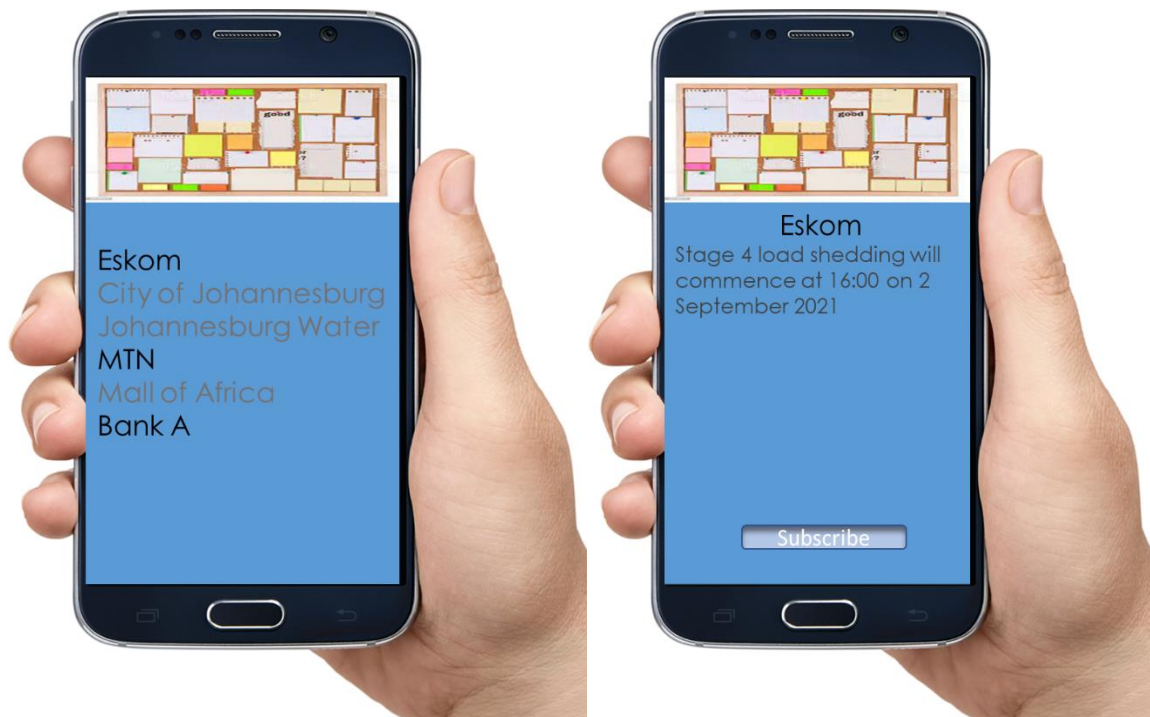


Figure 10: How communication App works

CHAPTER 7. LIMITATION AND CONCLUSION

7.1 Limitation

Platform business is a two-sided market dependent on network effects, therefore, to get maximum benefit, both sides of the market should be studied. This study only focused on the consumer of the content to understand what their needs are to ensure adoption when the App launches, and assumption was made that content providers (organisations) will be willing to sign up if promised that users believe there is a need for the service. There is opportunity in future to study the content provider side of the market to understand their needs and how best to position the communication application for organisation adoption. This study was also specific to communication App adoption. The study can be expanded to other markets impacted by technology adoption.

7.2 Conclusion

Bringing together the literature, research, and the business plan it can be concluded that launching an integrated application that can be used by various organisation to communicate to their consumers when they have a service failure will not only benefit this business venture but the businesses who wish to communicate real time to their consumers in an efficient and cost-effective manner. The central service failure communication App will also benefit service consumers who do not want to download too many Apps but wish to find out from their service providers when they have service failures.

Next step should be to build this application to respond to the need identified, while taking into consideration what is important to the users of application and the resource constraints. The business venture promises high returns for little investment as the business is not heavy on assets. This business venture is therefore considered ideal and practical.

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Appendix A: Questionnaire and consent form

Dear Madam/Sir

My name is Shumani Netangaheni. I am currently studying Master of Business Administration (MBA) at Wits Business School. I am conducting a research on the adoption of new communication application as well as features of the application users consider to be more important.

I would like to kindly invite you to participate in this online survey that will take about 7 minutes of your time to complete. This survey will be confidential and anonymous, and your responses will be used strictly for the purpose of this research project.

By clicking the button below, you acknowledge:

- Your participation in the study is voluntary.
- You are 18+ years of age.
- You are aware that you may choose to terminate your participation at any time for any reason.

☐ Mobile experience

 Skip to

End of Survey if Never owned one Is Selected

How many years have you been using a smartphone?

☐ Never owned one

☐ 1-3 years

☐ 4-7 years

☐ 7-10 years

☐ 10+ years

Age

Select your age group

- ☐ 18-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65+

Gender

Select your gender

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer not to say

Education

Select your highest level of Education

- ☐ Less than High School
- ☐ High school graduate
- ☐ College graduate with Certificate
- ☐ Diploma Graduate
- ☐ 3 year degree
- ☐ 4 year degree
- ☐ Honours/Post graduate
- ☐ Master degree
- ☐ Doctorate

Number of Apps

How many downloaded Apps do you currently have on your phone/tablet?

- ☐ 10-20
- ☐ 21-40
- ☐ 41-60
- ☐ 61-80
- ☐ 81-100
- ☐ 100+

What type of Apps do you mostly have? You can select multiple

	Select multiple
Social networking (Facebook, Twitter, WhatsApp, etc)	☐
Services I consume (Banking, telecoms, water, electricity, etc)	☐
Entertainment (TV, radio, movies, etc)	☐
Games	☐
News	☐
Sports	☐
Educational	☐
Spiritual	☐
Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	☐
Transport (Uber, Bolt, etc)	☐
Other	☐

App ranking



Which of the following Apps do you use the most on a daily basis? Rank **all** options in order of importance, with **1** being the highest and **4** the lowest. **A number can only be selected once**

	1	2	3	4
Social networking (Facebook, Twitter, WhatsApp, etc)	☐	☐	☐	☐
Services I consume (Banking, telecoms, water, electricity, etc)	☐	☐	☐	☐
Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	☐	☐	☐	☐
Entertainment (TV, radio, movies, etc)	☐	☐	☐	☐

Communication App

★

Skip to

End of Survey if No Is Selected

If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify you when your service provider is having service failure, would you use it?

☐ Yes
 ☐ Maybe
 ☐ No

Usage Ranking

★

If the new service failure communication App is built, rank all of the following App features in order of importance, with 1 being the highest and 6 the lowest. **A number can only be selected once.** The App must:

	1	2	3	4	5	6
Work	☐	☐	☐	☐	☐	☐
Be reliable	☐	☐	☐	☐	☐	☐
Helpful	☐	☐	☐	☐	☐	☐
Be easy to use	☐	☐	☐	☐	☐	☐
Be Useful	☐	☐	☐	☐	☐	☐
Free of charge	☐	☐	☐	☐	☐	☐

☐ Security Ranking

★

When it comes to using a new service failure communication App, select one of the following:

☐ My personal details must be protected
 ☐ My phone/tablet must be protected from virus and malware

Social

★

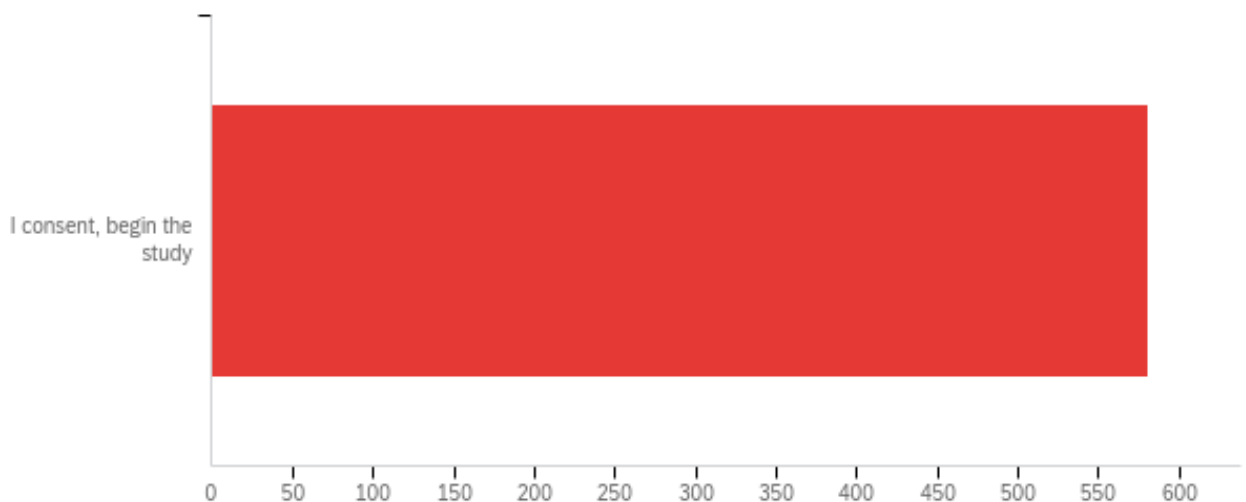
When it comes to using the new service failure communication App, rank all options in order of importance, with 1 being the highest and 3 the lowest. **A number can only be selected once.** The App must:

	1	2	3
If my family and friends use a technology, I would also use	☐	☐	☐
I trust a technology that is used by celebrities and influencers	☐	☐	☐
I am a person who discovers a new App and tell others to use it	☐	☐	☐

Appendix B: Data output

Qualtrics

Consent - Welcome to the research study! Dear Madam/Sir My name is Shumani Netangaheni. I am currently studying Master of Business Administration (MBA) at Wits Business School. I am conducting a research on the adoption of new communication application as well as features of the application users consider to be more important. I would like to kindly invite you to participate in this online survey that will take about 7 minutes of your time to complete. This survey will be confidential and anonymous, and your responses will be used strictly for the purpose of this research project. By clicking the button below, you acknowledge: Your participation in the study is voluntary. You are 18+ years of age. You are aware that you may choose to terminate your participation at any time for any reason.

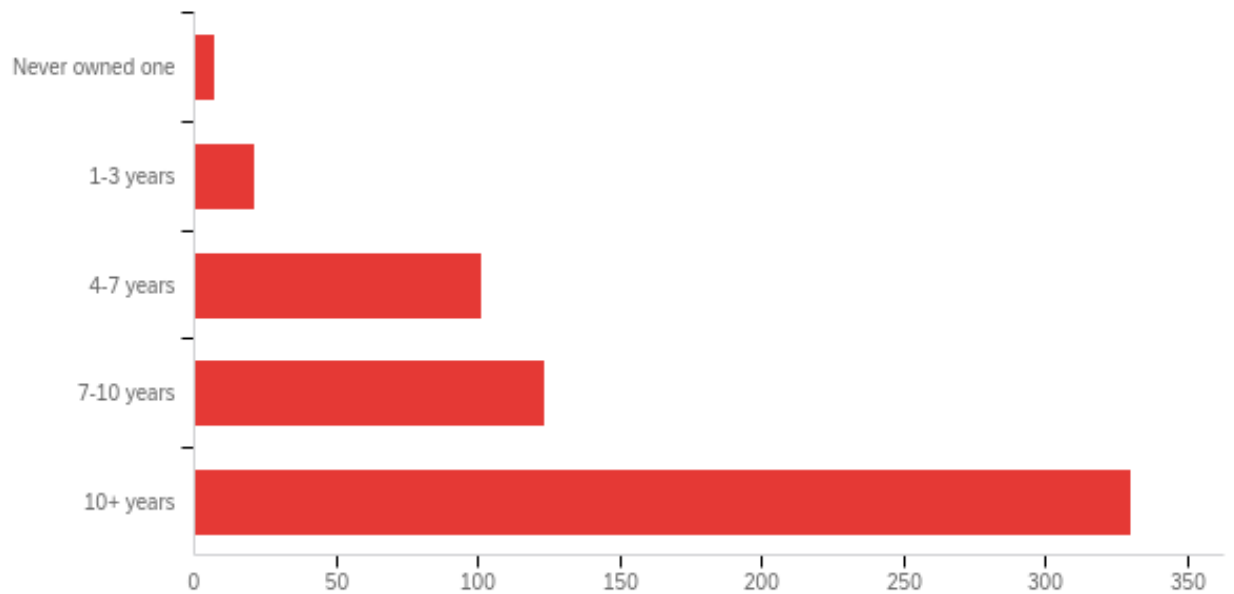


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Welcome to the research study! Dear Madam/Sir My name is Shumani Netangaheni. I am currently studying Master of Business Administration (MBA) at Wits Business School. I am conducting a research on the	1.00	2.00	1.00	0.04	0.00	582

adoption of new communication application as well as features of the application users consider to be more important. I would like to kindly invite you to participate in this online survey that will take about 7 minutes of your time to complete. This survey will be confidential and anonymous, and your responses will be used strictly for the purpose of this research project. By clicking the button below, you acknowledge: Your participation in the study is voluntary. You are 18+ years of age. You are aware that you may choose to terminate your participation at any time for any reason.						
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#	Answer	%	Count
1	I consent, begin the study	100.00%	581
	Total	100%	581

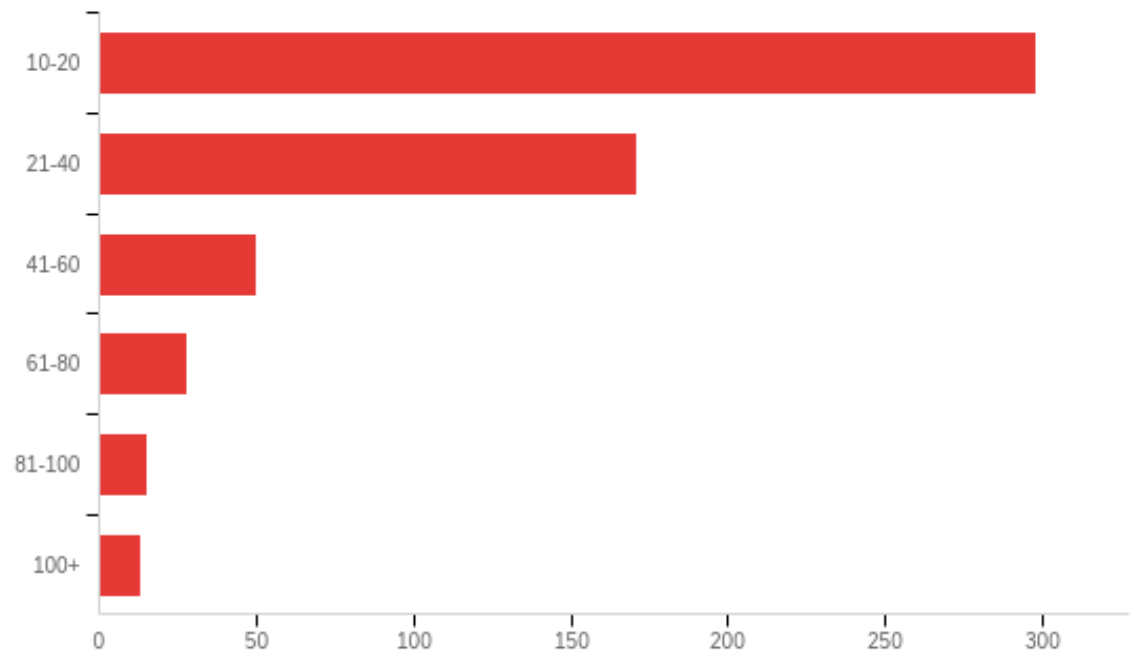
Mobile experience - How many years have you been using a smartphone?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many years have you been using a smartphone?	1.00	5.00	4.29	0.95	0.91	582

#	Answer	%	Count
1	Never owned one	1.20%	7
2	1-3 years	3.61%	21
3	4-7 years	17.35%	101
4	7-10 years	21.13%	123
5	10+ years	56.70%	330
	Total	100%	582

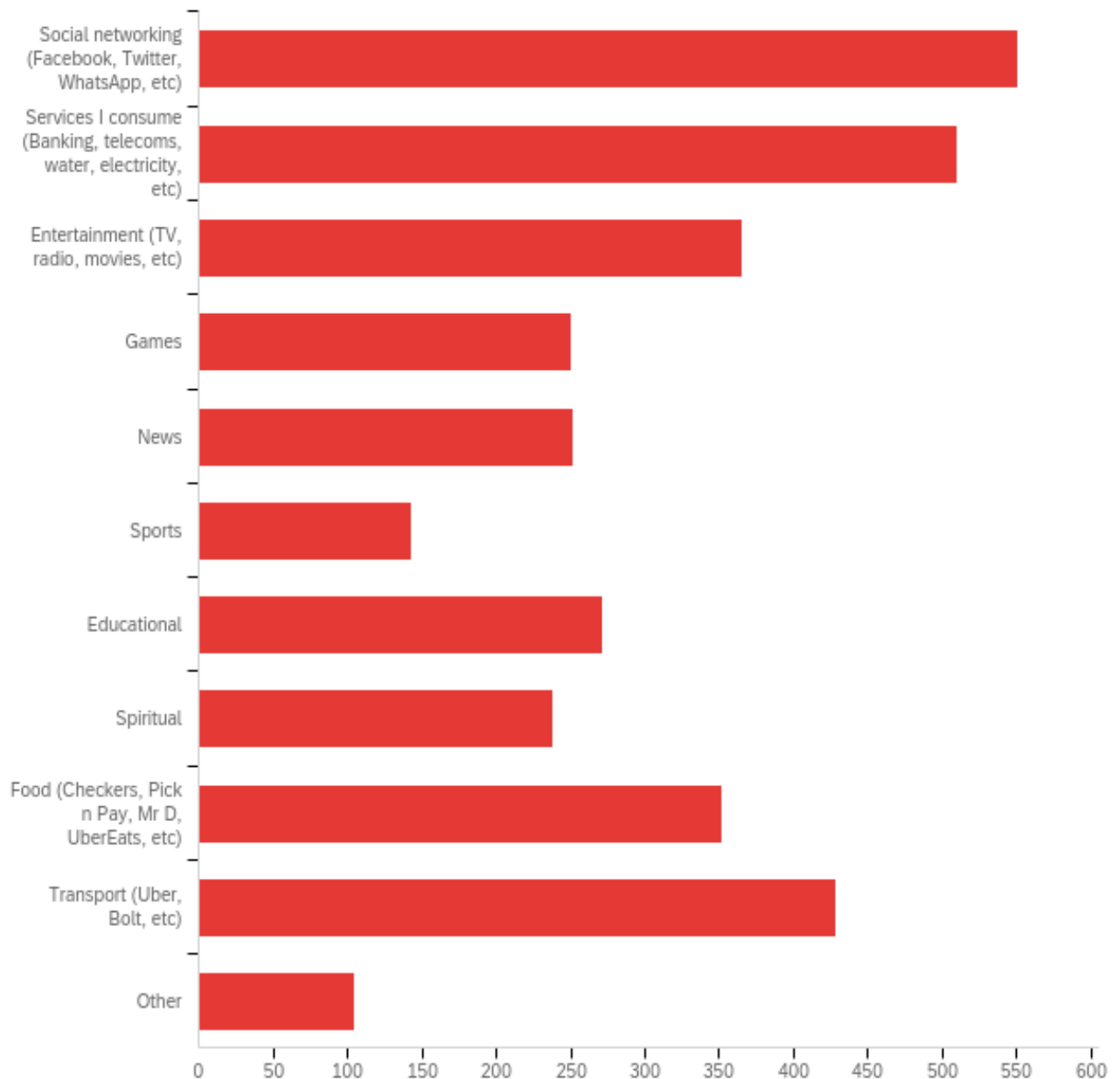
Number of Apps - How many downloaded Apps do you currently have on your phone/tablet?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many downloaded Apps do you currently have on your phone/tablet?	1.00	6.00	1.83	1.17	1.37	575

#	Answer	%	Count
1	10-20	51.83%	298
2	21-40	29.74%	171
3	41-60	8.70%	50
4	61-80	4.87%	28
5	81-100	2.61%	15
6	100+	2.26%	13
	Total	100%	575

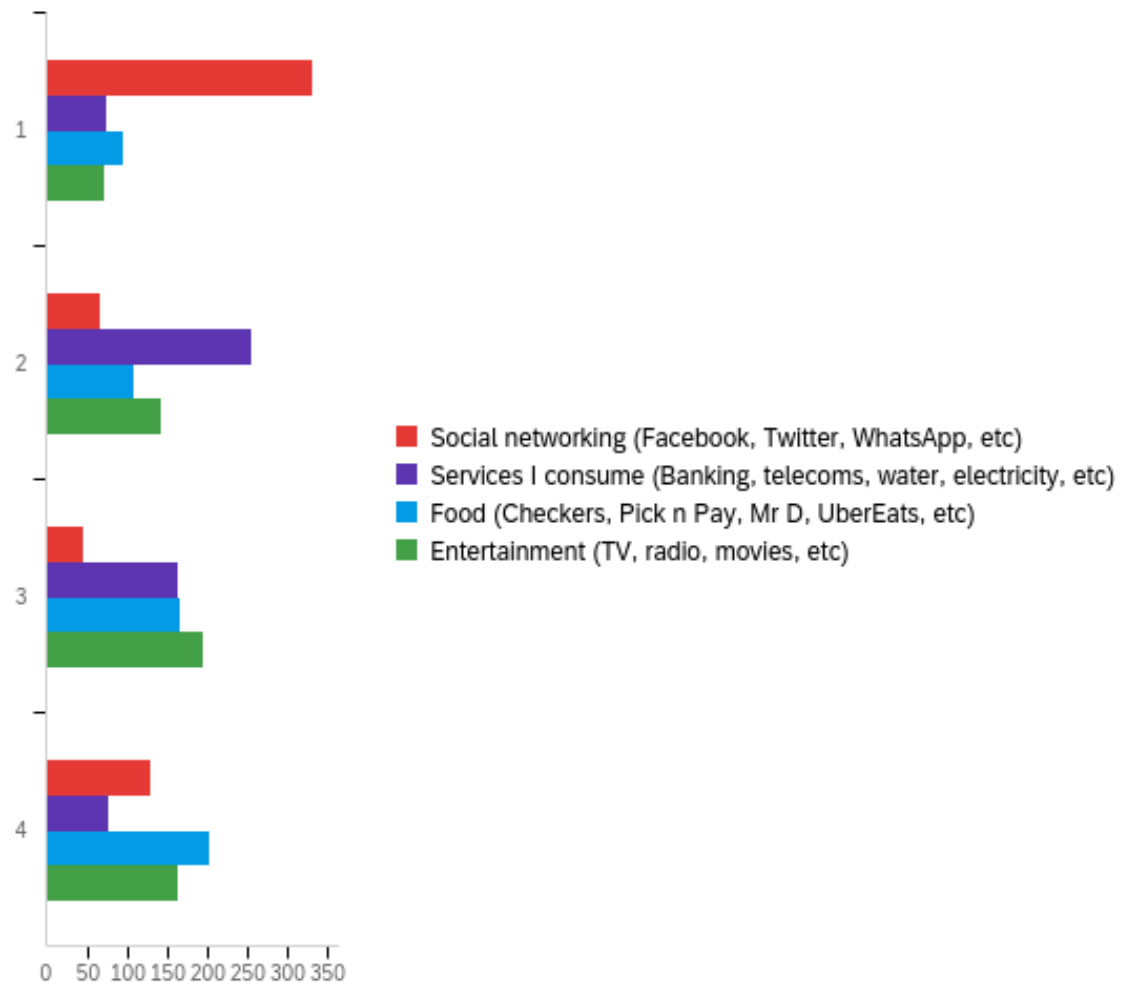
App preference - What type of Apps do you mostly have? You can select multiple



#	Answer	%	Count
1	Social networking (Facebook, Twitter, WhatsApp, etc)	15.90%	551
2	Services I consume (Banking, telecoms, water, electricity, etc)	14.72%	510
3	Entertainment (TV, radio, movies, etc)	10.53%	365
4	Games	7.22%	250

5	News	7.27%	252
6	Sports	4.13%	143
7	Educational	7.82%	271
8	Spiritual	6.87%	238
9	Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	10.16%	352
10	Transport (Uber, Bolt, etc)	12.35%	428
11	Other	3.03%	105
	Total	100%	3465

App ranking - Which of the following Apps do you use the most on a daily basis? Rank all options in order of importance, with 1 being the highest and 4 the lowest. A number can only be selected once

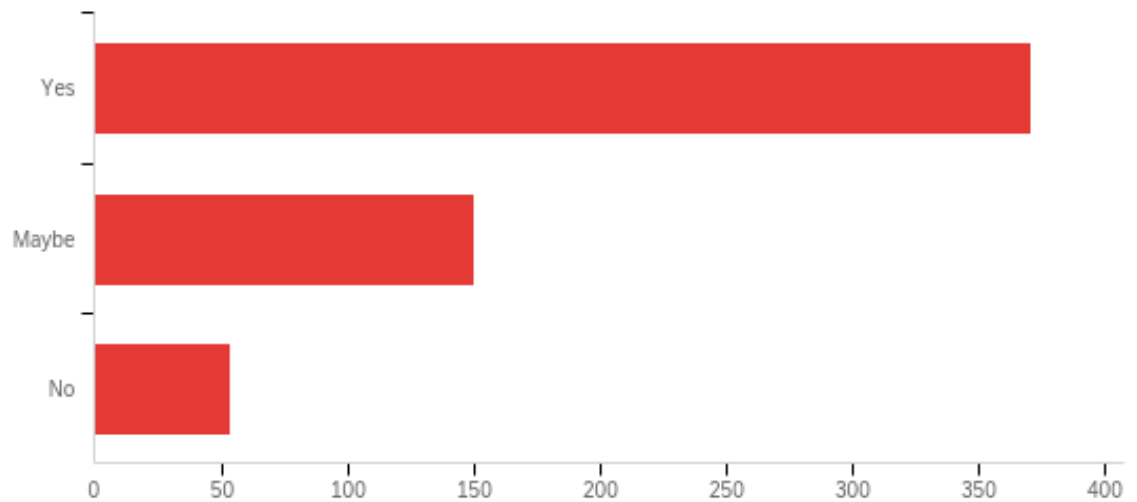


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Social networking (Facebook, Twitter, WhatsApp, etc)	1.00	4.00	1.95	1.25	1.55	575
2	Services I consume (Banking, telecoms, water, electricity, etc)	1.00	4.00	2.43	0.88	0.78	575
3	Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	1.00	4.00	2.83	1.09	1.18	575

4	Entertainment (TV, radio, movies, etc)	1.00	4.00	2.79	0.99	0.99	575
---	--	------	------	------	------	------	-----

#	Question	1		2		3		4		Total
1	Social networking (Facebook, Twitter, WhatsApp, etc)	57.91 %	33 3	11.65 %	67	8.00%	46	22.43 %	12 9	575
2	Services I consume (Banking, telecoms, water, electricity, etc)	13.04 %	75	44.70 %	25 7	28.70 %	16 5	13.57 %	78	575
3	Food (Checkers, Pick n Pay, Mr D, UberEats, etc)	16.52 %	95	18.96 %	10 9	29.04 %	16 7	35.48 %	20 4	575
4	Entertainme nt (TV, radio, movies, etc)	12.52 %	72	24.70 %	14 2	34.26 %	19 7	28.52 %	16 4	575

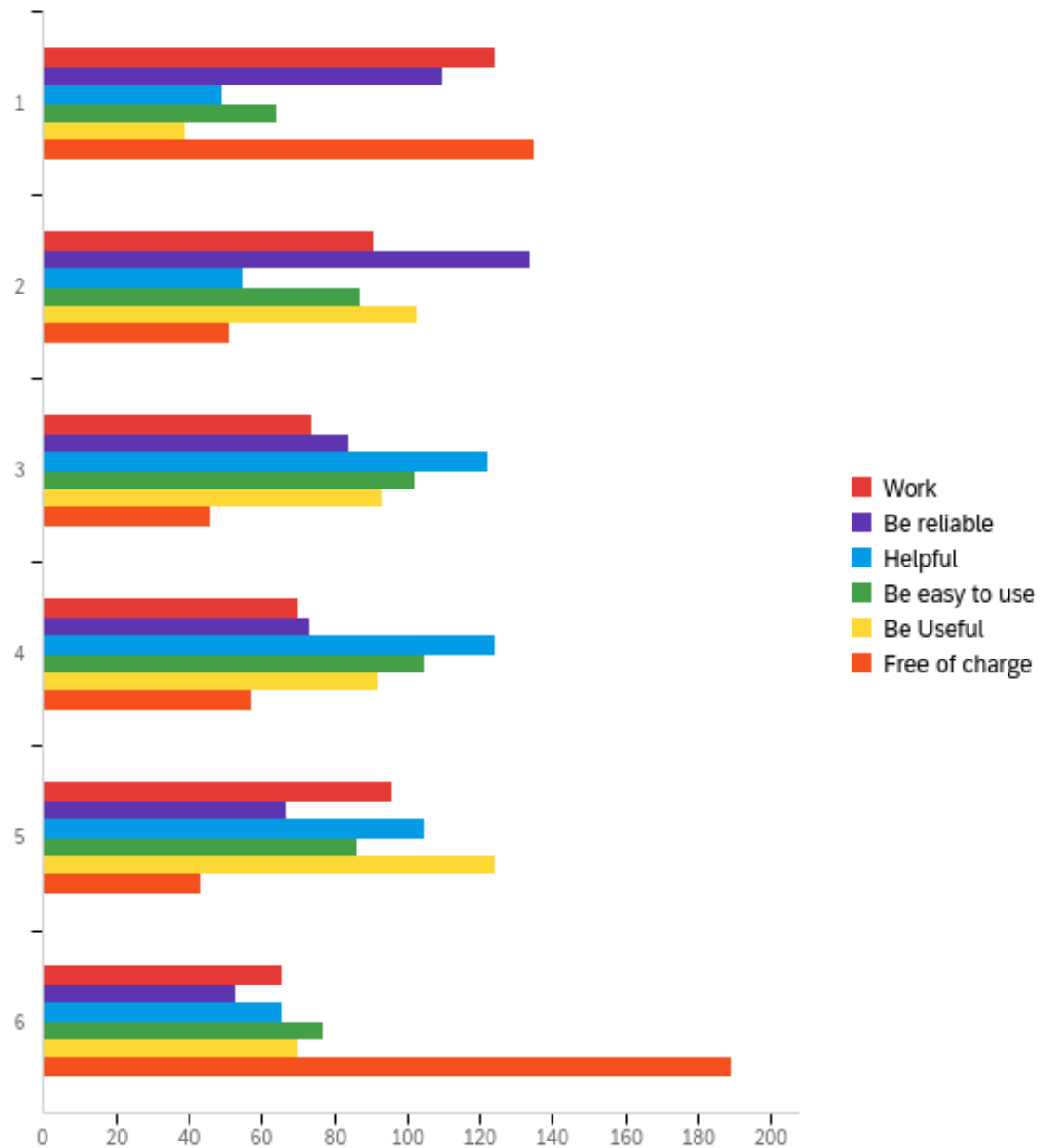
Communication App - If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify you when your service provider is having service failure, would you use it?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If there is one App (service failure communication App) that combines all the services (Banking, telecoms, water, electricity, etc), to notify you when your service provider is having service failure, would you use it?	1.00	3.00	1.45	0.66	0.44	575

#	Answer	%	Count
1	Yes	64.52%	371
2	Maybe	26.09%	150
3	No	9.39%	54
	Total	100%	575

Usage Ranking - If the new service failure communication App is built, rank all of the following App features in order of importance, with 1 being the highest and 6 the lowest. A number can only be selected once. The App must:

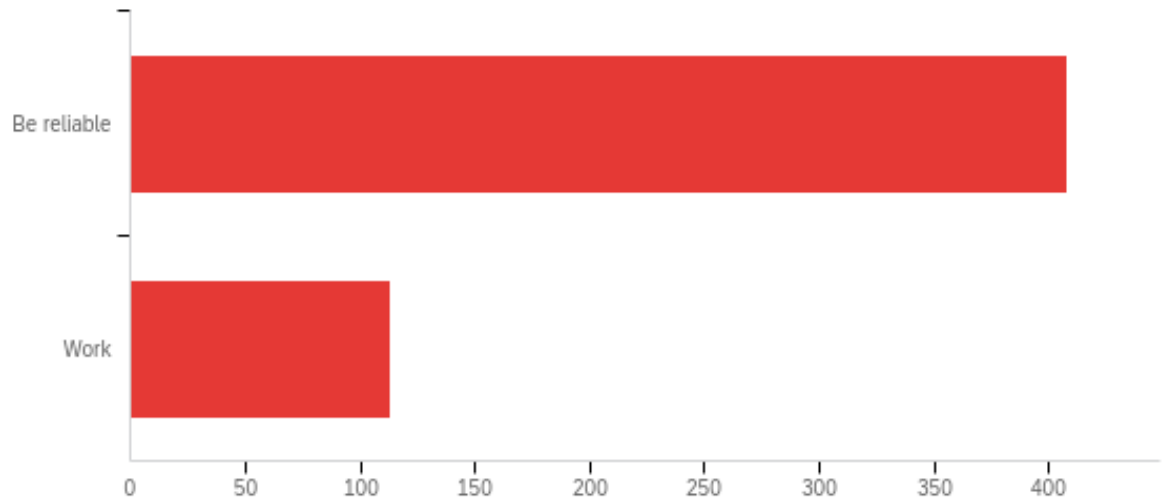


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Work	1.00	6.00	3.23	1.76	3.08	521
2	Be reliable	1.00	6.00	3.02	1.63	2.67	521
3	Helpful	1.00	6.00	3.73	1.46	2.14	521

4	Be easy to use	1.00	6.00	3.56	1.59	2.53	521
5	Be Useful	1.00	6.00	3.71	1.53	2.33	521
6	Free of charge	1.00	6.00	3.75	2.07	4.28	521

#	Question	1		2		3		4		5		6		Total
1	Work	23.80%	124	17.47%	91	14.20%	74	13.44%	70	18.43%	96	12.67%	66	521
2	Be reliable	21.11%	110	25.72%	134	16.12%	84	14.01%	73	12.86%	67	10.17%	53	521
3	Helpful	9.40%	49	10.56%	55	23.42%	122	23.80%	124	20.15%	105	12.67%	66	521
4	Be easy to use	12.28%	64	16.70%	87	19.58%	102	20.15%	105	16.51%	86	14.78%	77	521
5	Be Useful	7.49%	39	19.77%	103	17.85%	93	17.66%	92	23.80%	124	13.44%	70	521
6	Free of charge	25.91%	135	9.79%	51	8.83%	46	10.94%	57	8.25%	43	36.28%	189	521

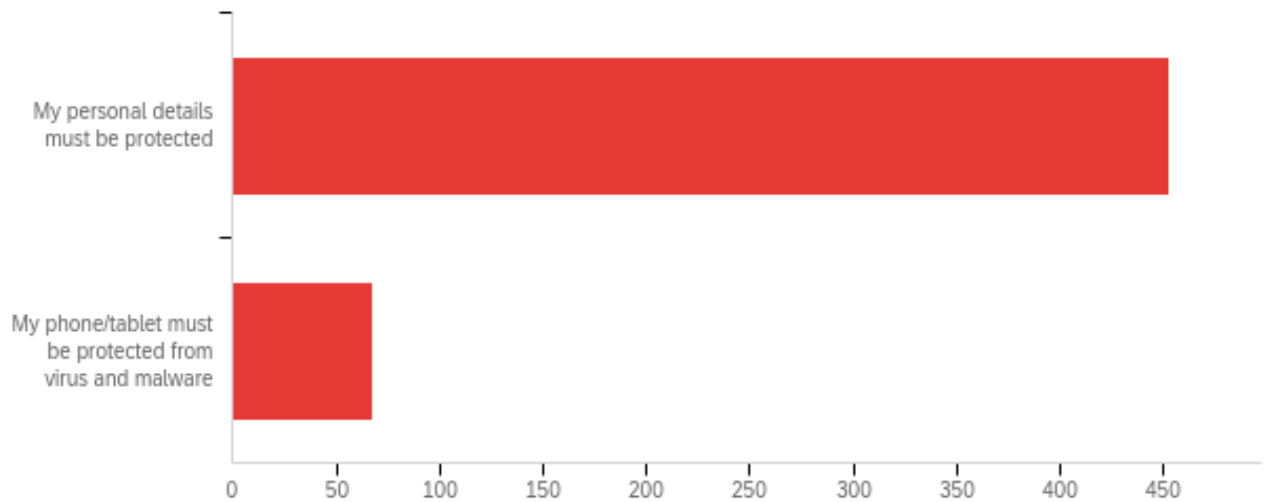
Usage Ranking - When it comes to using a new service failure communication App, select one of the following. App must:



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	When it comes to using a new service failure communication App, select one of the following. App must:	1.00	2.00	1.22	0.41	0.17	521

#	Answer	%	Count
1	Be reliable	78.31%	408
2	Work	21.69%	113
	Total	100%	521

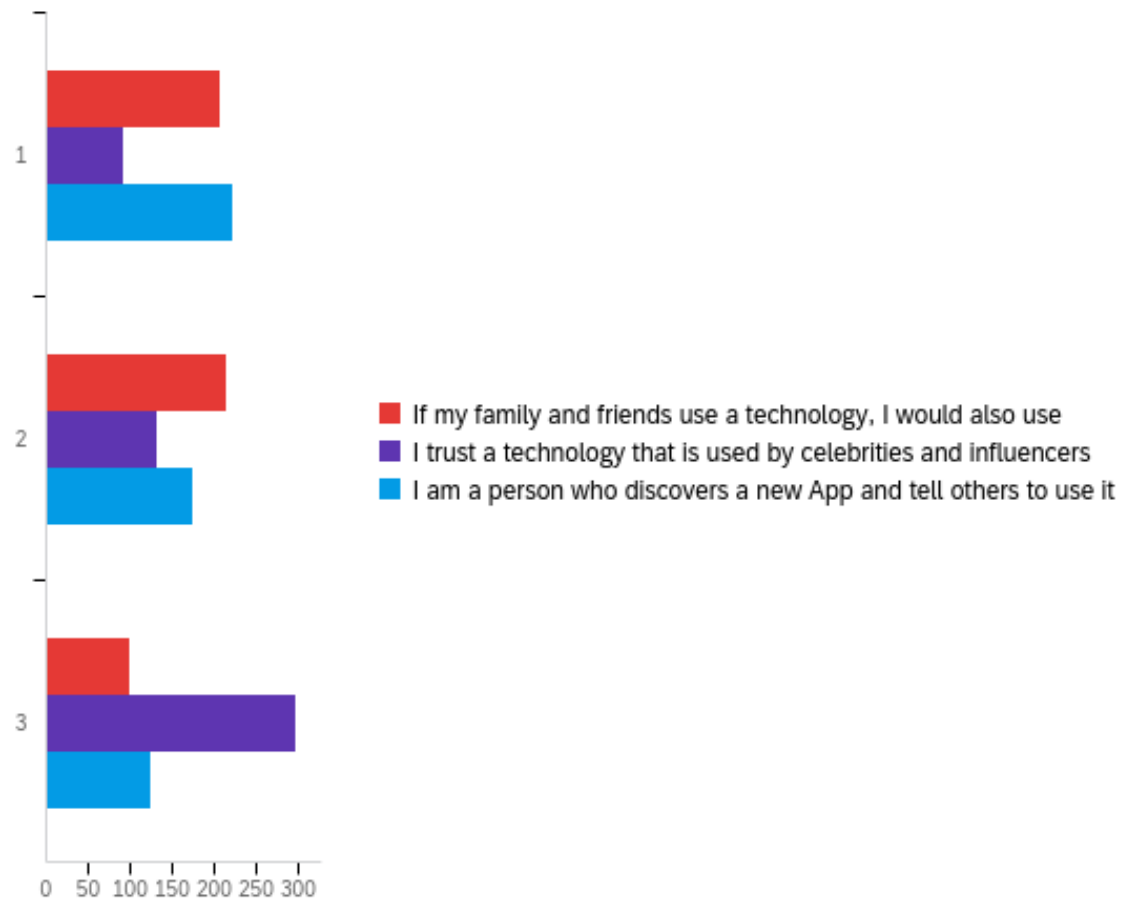
Security Ranking - When it comes to using a new service failure communication App, select one of the following:



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	When it comes to using a new service failure communication App, select one of the following:	1.00	2.00	1.13	0.34	0.11	521

#	Answer	%	Count
1	My personal details must be protected	86.95%	453
2	My phone/tablet must be protected from virus and malware	13.05%	68
	Total	100%	521

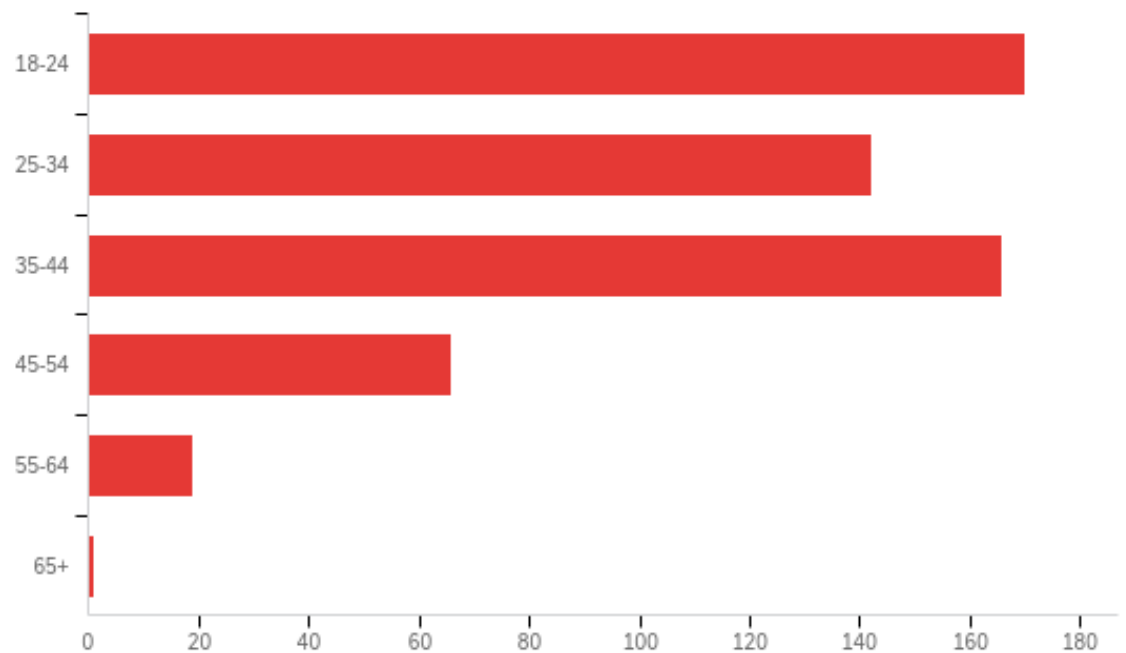
Social - When it comes to using the new service failure communication App, rank all options in order of importance, with 1 being the highest and 3 the lowest. A number can only be selected once. The App must:



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	If my family and friends use a technology, I would also use	1.00	3.00	1.79	0.74	0.54	521
2	I trust a technology that is used by celebrities and influencers	1.00	3.00	2.40	0.77	0.59	521
3	I am a person who discovers a new App and tell others to use it	1.00	3.00	1.81	0.79	0.63	521

#	Question	1		2		3		Total
1	If my family and friends use a technology, I would also use	39.92%	208	41.27%	215	18.81%	98	521
2	I trust a technology that is used by celebrities and influencers	17.47%	91	25.14%	131	57.39%	299	521
3	I am a person who discovers a new App and tell others to use it	42.61%	222	33.59%	175	23.80%	124	521

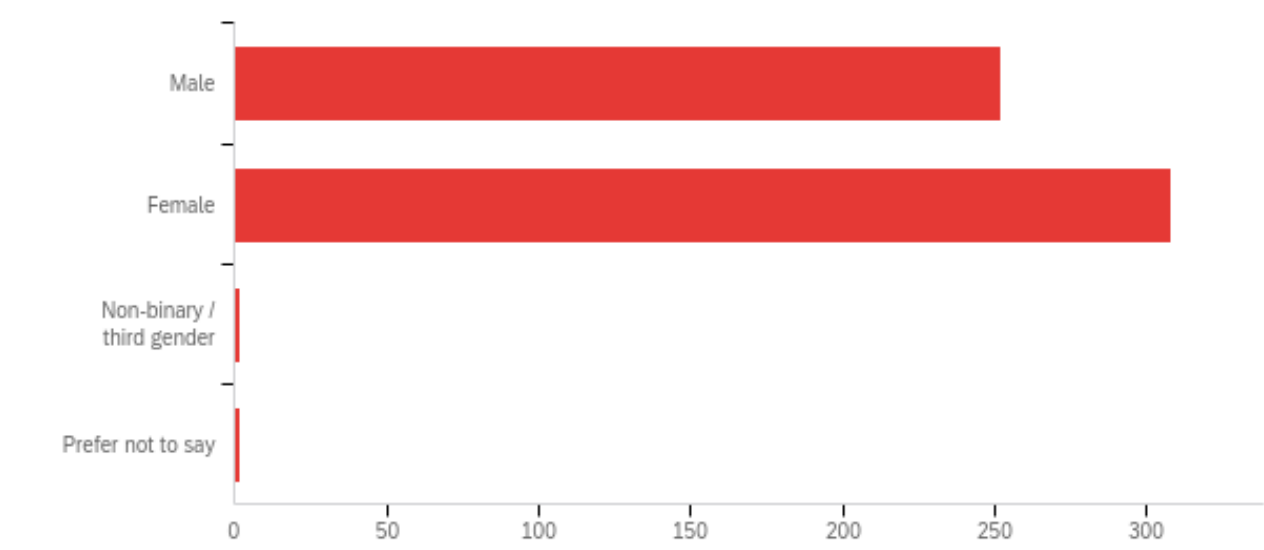
Age - Select your age group



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Select your age group	1.00	6.00	2.34	1.13	1.28	564

#	Answer	%	Count
1	18-24	30.14%	170
2	25-34	25.18%	142
3	35-44	29.43%	166
4	45-54	11.70%	66
5	55-64	3.37%	19
6	65+	0.18%	1
	Total	100%	564

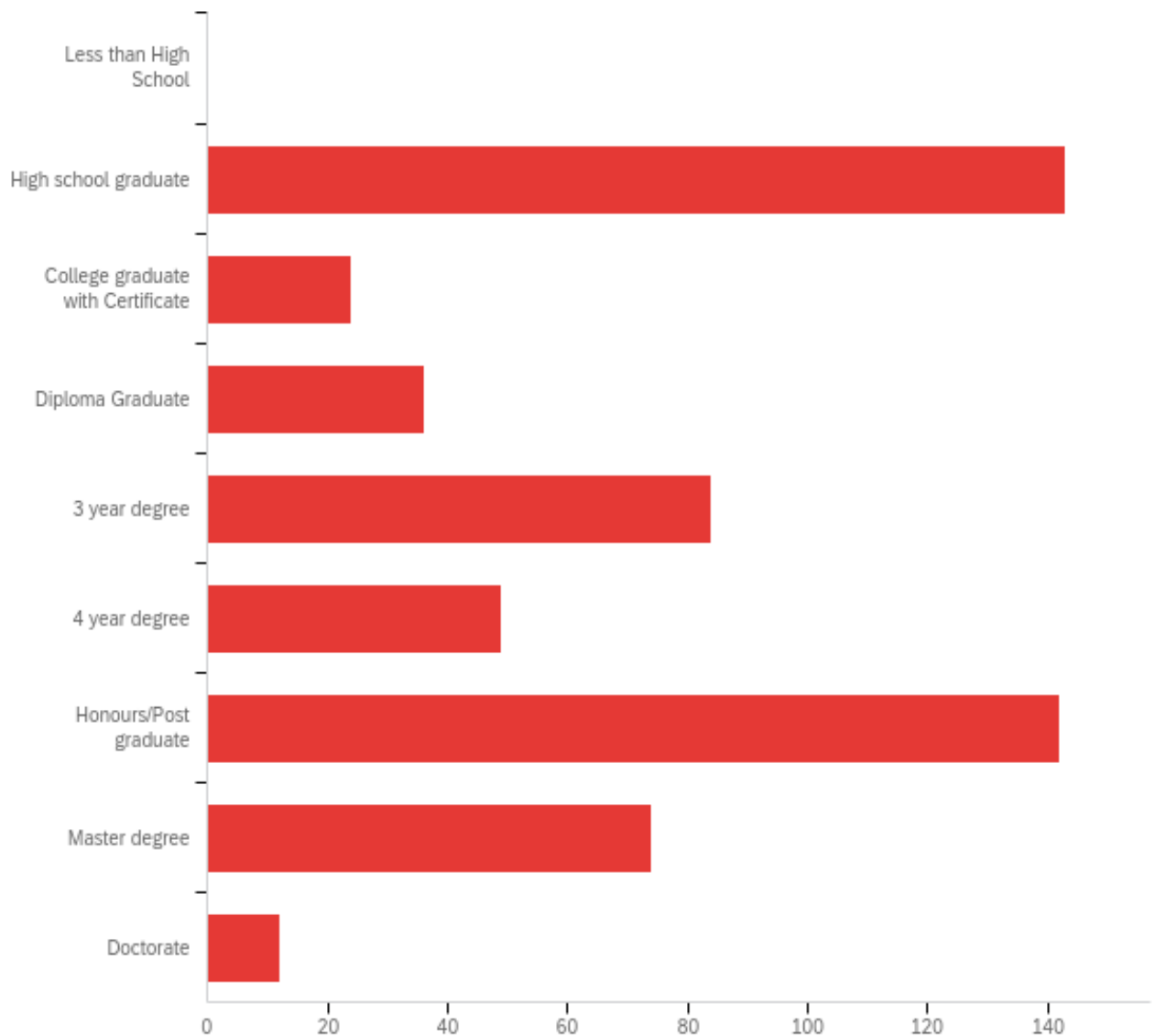
Gender - Select your gender



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Select your gender	1.00	4.00	1.56	0.52	0.27	564

#	Answer	%	Count
1	Male	44.68%	252
2	Female	54.61%	308
3	Non-binary / third gender	0.35%	2
4	Prefer not to say	0.35%	2
	Total	100%	564

Education - Select your highest level of Education



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Select your highest level of Education	2.00	9.00	5.16	2.26	5.11	564

#	Answer	%	Count
1	Less than High School	0.00%	0

2	High school graduate	25.35%	143
3	College graduate with Certificate	4.26%	24
4	Diploma Graduate	6.38%	36
5	3-year degree	14.89%	84
6	4-year degree	8.69%	49
7	Honours/Postgraduate	25.18%	142
8	Master degree	13.12%	74
9	Doctorate	2.13%	12
	Total	100%	564

SPSS

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	522	89.4
	Excluded ^a	62	10.6
	Total	584	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.501	.407	7

Item Statistics

	Mean	Std. Deviation	N
Mobile experience	4.34	.882	522

Usage Ranking	1.22	.412	522
Age	2.35	1.128	522
Education	5.25	2.250	522
Number of Apps	1.82	1.159	522
Communication App	1.29	.453	522
Security Ranking	1.13	.337	522

Inter-Item Correlation Matrix

	Mobile experience	Usage Ranking	Age	Education	Number of Apps
Mobile experience	1.000	-.060	.467	.439	.166
Usage Ranking	-.060	1.000	-.062	-.066	.025
Age	.467	-.062	1.000	.559	.107
Education	.439	-.066	.559	1.000	.137
Number of Apps	.166	.025	.107	.137	1.000
Communication App	.005	.077	-.057	.070	-.027
Security Ranking	-.020	.059	-.026	-.014	-.014

Inter-Item Correlation Matrix

	Communication App	Security Ranking
Mobile experience	.005	-.020
Usage Ranking	.077	.059
Age	-.057	-.026
Education	.070	-.014
Number of Apps	-.027	-.014
Communication App	1.000	.106
Security Ranking	.106	1.000

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	2.485	1.130	5.245	4.115	4.641	2.732
Item Variances	1.278	.114	5.061	4.947	44.581	3.050
Inter-Item Correlations	.089	-.066	.559	.625	-8.521	.032

Summary Item Statistics

	N of Items
Item Means	7
Item Variances	7
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach Alpha if Item Deleted
Mobile experience	13.06	11.930	.486	.275	.3
Usage Ranking	16.18	15.651	-.047	.016	.5
Age	15.04	10.480	.536	.382	.3
Education	12.15	5.310	.511	.366	.3
Number of Apps	15.57	13.001	.158	.036	.4
Communication App	16.11	15.340	.035	.036	.5
Security Ranking	16.26	15.569	-.006	.014	.5

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
17.39	15.667	3.958	7

ANOVA with Tukey's Test for Nonadditivity

		Sum of Squares	df	Mean Square	F
Between People		1166.101	521	2.238	
Within People	Between Items	8556.634	6	1426.106	1275.926
	Residual Nonadditivity	1085.641 ^a	1	1085.641	1408.725
	Balance	2408.297	3125	.771	
	Total	3493.938	3126	1.118	
	Total	12050.571	3132	3.848	
Total		13216.672	3653	3.618	

ANOVA with Tukey's Test for Nonadditivity

Sig

Between People			
Within People	Between Items		.000
	Residual	Nonadditivity Balance	<.001
	Total		
	Total		
Total			

Grand Mean = 2.48

a. Tukey's estimate of power to which observations must be raised to achieve additivity = -.567.

Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig
6796.267	1121.841	6	516	<,001

Correlations

Correlations

		Mobile experience	Communication App	Security Ranking
Mobile experience	Pearson Correlation	1	-.035	-.020
	Sig. (2-tailed)		.404	.652
	N	583	576	522
Communication App	Pearson Correlation	-.035	1	.106*
	Sig. (2-tailed)	.404		.015
	N	576	576	522
Security Ranking	Pearson Correlation	-.020	.106*	1
	Sig. (2-tailed)	.652	.015	

	N	522	522	522
Usage Ranking	Pearson Correlation	-.060	.077	.059
	Sig. (2-tailed)	.173	.077	.177
	N	522	522	522
Number of Apps	Pearson Correlation	.149**	.007	-.014
	Sig. (2-tailed)	<.001	.872	.747
	N	576	576	522

Correlations

		Usage Ranking	Number of Apps
Mobile experience	Pearson Correlation	-.060	.149**
	Sig. (2-tailed)	.173	<.001
	N	522	576
Communication App	Pearson Correlation	.077	.007
	Sig. (2-tailed)	.077	.872
	N	522	576
Security Ranking	Pearson Correlation	.059	-.014
	Sig. (2-tailed)	.177	.747
	N	522	522
Usage Ranking	Pearson Correlation	1	.025
	Sig. (2-tailed)		.575
	N	522	522
Number of Apps	Pearson Correlation	.025	1
	Sig. (2-tailed)	.575	
	N	522	576

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Reliability

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	565	96.7
	Excluded ^a	19	3.3
	Total	584	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.658	.744	3

Item Statistics

	Mean	Std. Deviation	N
Mobile experience	4.32	.891	565
Age	2.33	1.134	565
Education	5.15	2.263	565

Inter-Item Correlation Matrix

	Mobile experience	Age	Education
Mobile experience	1.000	.470	.441
Age	.470	1.000	.564
Education	.441	.564	1.000

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Item Means	3.934	2.333	5.154	2.821	2.209	2.099
Item Variances	2.401	.794	5.123	4.329	6.451	5.618
Inter-Item Correlations	.491	.441	.564	.123	1.278	.003

Summary Item Statistics

	N of Items
Item Means	3
Item Variances	3
Inter-Item Correlations	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Mobile experience	7.49	9.303	.502	.266	.600
Age	9.47	7.696	.611	.378	.400
Education	6.65	3.030	.593	.357	.600

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
11.80	12.826	3.581	3

ANOVA with Tukey's Test for Nonadditivity

			Sum of Squares	df	Mean Square	F
Between People			2411.266	564	4.275	
Within People	Between Items		2371.629	2	1185.815	809.830
	Residual	Nonadditivity	240.094 ^a	1	240.094	191.686
		Balance	1411.610	1127	1.253	
		Total	1651.704	1128	1.464	
	Total		4023.333	1130	3.560	
Total			6434.599	1694	3.798	

ANOVA with Tukey's Test for Nonadditivity

	Sig
Between People	

Within People	Between Items		<,001
	Residual	Nonadditivity Balance	<,001
		Total	
		Total	
Total			

Grand Mean = 3.93

a. Tukey's estimate of power to which observations must be raised to achieve additivity = -.049.

Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig
2885.491	1440.187	2	563	<,001

Regression

Descriptive Statistics

	Mean	Std. Deviation	N
Usage Ranking	1.22	.412	522
Age	2.35	1.128	522
Education	5.25	2.250	522
Mobile experience	4.34	.882	522
Number of Apps	1.82	1.159	522

Correlations

Usage Ranking	Age	Education	Mobile experience
---------------	-----	-----------	-------------------

Pearson Correlation	Usage Ranking	1.000	-.062	-.066	-.060
	Age	-.062	1.000	.559	.467
	Education	-.066	.559	1.000	.439
	Mobile experience	-.060	.467	.439	1.000
	Number of Apps	.025	.107	.137	.166
Sig. (1-tailed)	Usage Ranking	.	.078	.067	.086
	Age	.078	.	.000	.000
	Education	.067	.000	.	.000
	Mobile experience	.086	.000	.000	.
	Number of Apps	.287	.007	.001	.000
N	Usage Ranking	522	522	522	522
	Age	522	522	522	522
	Education	522	522	522	522
	Mobile experience	522	522	522	522
	Number of Apps	522	522	522	522

Correlations

		Number of Apps
Pearson Correlation	Usage Ranking	.025
	Age	.107
	Education	.137
	Mobile experience	.166
	Number of Apps	1.000
Sig. (1-tailed)	Usage Ranking	.287
	Age	.007
	Education	.001
	Mobile experience	.000
	Number of Apps	.
N	Usage Ranking	522
	Age	522
	Education	522
	Mobile experience	522
	Number of Apps	522

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Number of Apps, Age, Mobile experience, Education ^b		. Enter

a. Dependent Variable: Usage Ranking

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df
1	.086 ^a	.007	.000	.412	.007	.966	

Model Summary^b

Change Statistics

Model	df2	Sig. F Change	Durbin-Watson
1	517	.426	1.981

Oneway

ANOVA

Communication App

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.166	5	.233	.533	.751
Within Groups	249.271	570	.437		
Total	250.437	575			

ANOVA Effect Sizes^{a,b}

	Point Estimate	95% Confidence Interval	
		Lower	Upper
Eta-squared	.005	.000	.012

Communication App	Epsilon-squared	-.004	-.009	.003
	Omega-squared Fixed-effect	-.004	-.009	.003
	Omega-squared Random-effect	-.001	-.002	.001

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.