

The role of intelligent technologies on the growth of emerging enterprises in South Africa

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Abstract

This study explored the role of Intelligent Technologies in the growth of emerging enterprises in South Africa from the perspectives of business intelligence, market intelligence, and competitive intelligence. Utilising a quantitative research approach based on the Dynamic Capabilities as well Intelligent Enterprise Theories, the study evaluated the impact of these technologies on SMEs' growth and development, considering variables such as company size, industry sector, and job level.

Key findings revealed in terms of evaluation of technological capabilities, models, and systems that larger enterprises show a more sophisticated use of Intelligent Technologies compared to smaller ones, indicating a correlation between company size and technology adoption levels. This highlights the need for scalable solutions tailored to the diverse needs of SMEs. With regards to the role and influence of Intelligent Technologies, there is broad recognition of the value of Intelligent Technologies across all industry sectors and job levels, emphasizing their role in enhancing operational efficiency, strategic decision-making, and competitive positioning.

In terms of challenges related to adoption, key barriers to technology adoption include resource limitations, knowledge gaps, and varying capabilities based on company size, which are critical considerations for SMEs aiming to leverage these technologies for growth.

In conclusion, Intelligent Technologies are integral to the growth and competitiveness of emerging enterprises. A strong foundation for future adoption and integration exists, although disparities in adoption based on company size highlight the necessity for tailored strategies to maximize benefits. The study underscores the importance of strategic investment in Intelligent Technologies tailored to specific business contexts. Future research should explore causal relationships between specific technologies and growth outcomes, providing sector-specific insights and tracking long-term impacts.

Declaration

I, the undersigned, **Thabiso Mokoena**, hereby declare that this research is my own, unaided work. It is being submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

I hereby further declare that:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.

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Dedication

I extend my gratitude and dedication to those who supported, encouraged and motivated me throughout my journey of study.

I am sincerely grateful for your sacrifices and patience.

Keywords

Emerging Enterprises, Small and Medium Enterprises, Intelligent Technologies, Business Intelligence, Market Intelligence

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION.....	1
1.1 STATEMENT OF PURPOSE	1
1.2 BACKGROUND OF THE STUDY.....	1
1.3 RESEARCH PROBLEM	2
1.4 RESEARCH QUESTIONS	5
1.5 RESEARCH OBJECTIVES	5
1.6 RATIONALE.....	6
1.7 DELIMITATIONS OF THE STUDY	6
1.8 DEFINITION OF TERMS	7
1.8.1 INTELLIGENT TECHNOLOGIES:.....	7
1.8.2 EMERGING ENTERPRISES:.....	7
1.8.3 BUSINESS INTELLIGENCE:.....	7
1.8.4 MARKET INTELLIGENCE:	7
1.9 CHAPTER OUTLINE	8
CHAPTER 2. SYSTEMATIC REVIEW OF LITERATURE.....	10
2.1 INTRODUCTION	10
2.2 EMPIRICAL REVIEW OF LITERATURE	10
2.2.1 BUSINESS INTELLIGENCE AND BUSINESS PROCESS MANAGEMENT	11
2.2.2 MARKET INTELLIGENCE	12
2.2.3 COMPETITIVE INTELLIGENCE.....	13
2.3 INTELLIGENT TECHNOLOGIES ON EMERGING ENTERPRISES.....	15
2.4 A BRIEF REVIEW OF EMERGING ENTERPRISES IN SOUTH AFRICA	18
2.5 THEORETICAL FRAMEWORK OF THE STUDY.....	19
2.5.1 THE DEVELOPMENT OF THE THEORETICAL FRAMEWORK.....	22
2.5.2 THE CONCEPTUAL MODEL ELABORATION.....	23
CHAPTER 3. RESEARCH METHODOLOGY	26
3.1 INTRODUCTION	26
3.2 RESEARCH APPROACH.....	27
3.3 RESEARCH DESIGN / PARADIGM	27
3.3.1 USEFUL INSTRUMENTS FOR THE STUDY	27
3.3.2 QUESTIONNAIRE DESIGN.....	28
3.3.3 TARGET POPULATION	28
3.3.4 SAMPLING METHOD	29
3.3.5 SAMPLE SIZE.....	30
3.3.6 DATA ANALYSIS	30
CHAPTER 4. RESULTS AND DISCUSSIONS.....	31
4.1 INTRODUCTION	31

4.2	DESCRIPTIVES	31
4.3	FACTOR ANALYSIS	34
4.4	TESTS FOR NORMALITY OF RESULTS.....	35
4.5	COMPARISON TESTS	40
4.5.1	COMPANY SIZE COMPARISONS:.....	41
4.5.2	ENTERPRISE INDUSTRY/SECTOR COMPARISONS:	49
4.5.3	JOB LEVEL COMPARISONS:	52
4.6	CORRELATION TESTS.....	57
4.7	FREQUENCY ANALYSES.....	61

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS68

5.1	ACHIEVEMENT OF RESEARCH OBJECTIVES	68
5.1.1	EVALUATION OF TECHNOLOGICAL TOOLS, MODELS, AND SYSTEMS.....	68
5.1.2	DETERMINATION OF THE ROLE AND INFLUENCE OF INTELLIGENCE TECHNOLOGIES	69
5.1.3	INVESTIGATION OF CHALLENGES HAMPERING THE USE OF INTELLIGENT	
TECHNOLOGIES		69
5.1.4	CONCLUSION.....	69
5.1.5	IMPLICATIONS FOR FUTURE RESEARCH AND PRACTICE	70
5.2	RECOMMENDATIONS	70
5.2.1	FOR EMERGING ENTERPRISES	71
5.2.2	FOR EMERGING ENTERPRISES	71
5.2.3	FOR ACADEMIC AND RESEARCH INSTITUTIONS	72
5.2.4	FOR ACADEMIC AND RESEARCH INSTITUTIONS	72
5.3	MANAGERIAL IMPLICATIONS.....	73
5.3.1	STRATEGIC ALIGNMENT AND IMPLEMENTATION	73
5.3.2	CAPACITY BUILDING AND ORGANISATIONAL CULTURE	73
5.3.3	LEVERAGING DATA FOR DECISION MAKING	74
5.3.4	ADDRESSING IMPLEMENTATION CHALLENGES.....	74
5.3.5	POLICY AND REGULATORY CONSIDERATIONS:	74
5.3.6	CONCLUSION:.....	75

Bibliography.....76

LIST OF TABLES

<i>Table 1: Empirical Literature Research Gaps</i>	11
<i>Table 2: Test for normality for Section B survey questions</i>	36
<i>Table 3: Test for normality for Section C survey questions</i>	37
<i>Table 4: Test for normality for Section D survey questions</i>	38
<i>Table 5: Test for normality for Section E survey questions</i>	39
<i>Table 6: Test for normality for Section F survey questions</i>	40
<i>Table 7: The Company Size Descriptive table for Comparisons</i>	41
<i>Table 8: The Company Size Homogeneity of Variances Analyses</i>	43
<i>Table 9: The Company Size ANOVA Analysis</i>	45
<i>Table 10: The Company Size Multiple Comparisons</i>	46
<i>Table 11: Enterprise Industries Homogeneity of Variance Analyses</i>	49
<i>Table 12: ANOVA analysis for Enterprise Industries</i>	51
<i>Table 13: Descriptive Analyses for the Job level of participants</i>	53
<i>Table 14: The Job level Homogeneity of Variances Analyses</i>	55
<i>Table 15: Correlation Tests</i>	59
<i>Table 16: Frequencies Analyses of the Situational Analysis of Emerging Enterprises</i>	62
<i>Table 17: Frequencies Analyses of Technological Capability and Readiness of Emerging Enterprises</i>	63
<i>Table 18: Frequencies Analyses of Business Intelligence in SA Emerging Enterprises</i>	64
<i>Table 19: Frequencies Analyses of Competitive Intelligence in SA Emerging Enterprises</i>	65
<i>Table 20: Frequencies Analyses of Market Intelligence in SA Emerging Enterprises</i>	66

LIST OF FIGURES

<i>Figure 1: Contribution of Small Businesses by Industry (StatsSA, 2020)</i>	3
<i>Figure 2: Building dynamic capabilities for digital transformation: A process model (Warner and Wäger, 2019)</i>	16
<i>Figure 3: Characteristics of an Intelligent Technologies driven enterprise (Łobaziewicz, 2016)</i>	17
<i>Figure 4: SMMEs by Industry as at 2022 Q3 (SEDA, 2022)</i>	18
<i>Figure 5: Employment Trend in South Africa (SEDA, 2022)</i>	19
<i>Figure 6: Simplified schema of dynamic capabilities, business models and strategy (Teece, 2018)</i>	20
<i>Figure 7: Emerging Intelligent Enterprise Theoretical Framework (own model)</i>	22
<i>Figure 8: Company Size Descriptives</i>	33
<i>Figure 9: Industry/Sector of Enterprises Descriptives</i>	33

LIST OF ABBREVIATIONS

SME	Small and Medium-sized Enterprise
SMME	Small, Medium and Micro Enterprise
BI	Business intelligence
CI	Competitive Intelligence
MI	Market Intelligence
GDP	Gross domestic product
Statssa	Statistics South Africa
SEDA	Small Enterprise Development Agency

CHAPTER 1. INTRODUCTION

1.1 Statement of purpose

This study employed quantitative approaches to investigate the role Intelligent Technologies play on the developmental growth of emerging enterprises in South Africa.

1.2 Background of the study

Emerging Enterprises, also largely referred to as Small and Medium-sized Enterprises (SMEs) assume a very pivotal role in terms of direct contribution into the mainstream economy of South Africa and across the globe. According to (Kalidas, Shakeel; Magwentshu, Nomfanelo; Rajagopaul, Agesan, 2020) SMEs are representative of more than 98% of the total business enterprises within South Africa, whilst they employed approximately 50% to 60% of the total labour force across all the economic sectors. The SMEs significant contribution largely on developing economies remains notably extensive and valuable, with approximately 90% of the business ventures globally, making up the majority of enterprises, creating employment and positively driving economies (World Bank, 2022). The development and growth of emerging enterprises therefore remains a very critical area to be focused on, given the importance these ventures hold just from an economic and job creation perspective in the South African context.

This study sought to investigate the extent to which emerging enterprise exploit Intelligent Technologies capabilities to advance their business ventures from a growth perspective. The concept of Intelligent Technology is described as utilisation of systematic intelligence for the execution of decision driven activities in the absence of human involvement (IGI Global Publisher of Timely Knowledge, n.d.). According to (Marinov, New Intelligent Technologies—Interactivity and Information Issues, 2019) Intelligent systems are sophisticated computerised machines that are able to gather data, evaluate it and interface with other technologies through the internet, and in the process learn to respond to

scenarios on their own based on the data collected from patterns of its own experiences. Intelligent technologies enable firms to access their in-depth data repositories, engage in analytics and develop business insights (Rheinwerk Publishing, 2022).

Intelligent technologies encompass a broad range of advanced technological tools and concepts that could be explored, relevant to Industry 4.0. The focus of this study was on the role of Business Intelligence, Market and Competitive Intelligence as Intelligent Technologies and their contribution on the growth of emerging enterprises.

The theoretical context in which this study was premised from and guided by is the Intelligent Enterprise Theory, which provides capabilities for organisations to function optimally even in their simultaneous application of operational and tactical interventions, whilst processing extensive information, navigating challenges, and making exceptionally competitive business decisions (Thannhuber, 2005). A concept that represents present-day organisations that effectively utilise advance emerging technologies to develop and exploit compelling intelligence (Jagreet Kaur, 2023). The Intelligence Enterprise Theory was used as a guiding theory for the study of how intelligent technologies could best be employed to impactfully contribute a meaningful role in the growth of emerging enterprises within South Africa.

1.3 Research problem

This research project intends to study the role of Intelligent Technologies on the growth of emerging enterprises, typically known as SMEs in South Africa. This is in the context of considering significant challenges SMEs are generally confronted with, posing threats to their survival and growth such as technological limitations, barriers to accessing finance, economic instability, barriers of market entry including others.

Where are small businesses making a contribution?

Percentage contribution to total turnover in the formal business sector by industry and enterprise size, 2013 and 2019

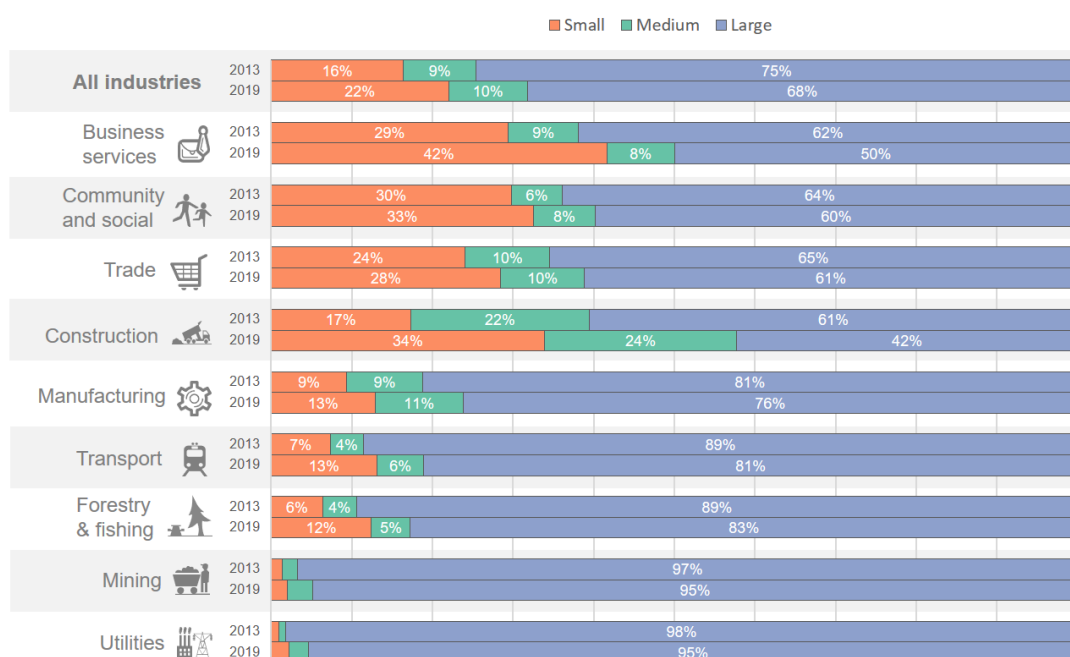


Figure 1: Contribution of Small Businesses by Industry (StatsSA, 2020)

The impact of the contribution made by SMEs in any given economy, including South Africa on the other hand should be acknowledged in terms of employment creation, economic development, social development, entrepreneurial innovation and others.

Emerging enterprises in South Africa are generally faced with challenges hampering their development, sustainability and growth. This is as a result of numerous factors, varied from internal forces of an individual start-up business venture to broader external macro environmental challenges. Most SMEs that have not been long into business are highly likely to be confronted with mountains of challenges in terms of securing capital in the form of funding or business loans. Consequently, such ventures lose business opportunities and are unable to grow.

Furthermore, barriers of entry into the market across various sectors also remained some of the challenges known. Approximately 20% of small enterprises in South Africa collapse within their first year of existence, whilst 30% are also doomed with failure by second year, due to challenges such as barriers of entry in securing business from state entities, bureaucracies of acquiring funding and delays in payment of invoices (Mataitsane, 2021). While it is arguably

acknowledged that emerging enterprises contribute impactfully to employment creation, there is a strong probability that a new business venture will not live on beyond a five-year period (Zondi, 2017).

From a macro level point of view, the country's prevalent challenges of Loadshedding and electricity crisis which at some point has been declared a national state of disaster have led to many small businesses shutting down eventually. This is notwithstanding the slow recovery from the severe impact of the global Covid-19 pandemic, that has also seen even some major corporations shutting down, as well as the general slow economic growth the country has been faced with. While SMEs play a significant role in economies, they are the most vulnerable in moments of crisis, with up to 60% projected for possible closure due to minimal cashflows, fewer clients and incapacity to absorb economic extensive pressures (Kalidas, Shakeel; Magwentshu, Nomfanelo; Rajagopaul, Agesan, 2020).

Despite extensive research made by various institutions on the economic contributions made by SMEs, there is very little research encountered particularly from a South African context that investigated the factors that really impact and threaten the survival and growth of SMEs, and thereby suggest how these enterprises can overcome such challenges and consequently realise business growth.

SMEs are well positioned to benefit from the adoption of intelligent technologies' capabilities. For instance, data analytics solutions can provide SMEs with key insights related to operational performance, consumer behaviour and improved decision making; whereas certain Artificial Intelligence capabilities can reduce costs significantly through automation and optimisation of certain repetitive activities that are costly to a small business. Furthermore, SMEs could benefit greatly from understanding and analysing market patterns and competitive dynamics for opportunities and business growth using intelligent technologies.

The impact faced by emerging enterprises is substantially demonstrated by just a few challenges highlighted above, whilst on the other hand intelligent technologies present opportunities SMEs may gain substantial advantages from.

These are some amongst the reasons this study sought to investigate the role of intelligent technologies on stimulating the growth of Small and Medium Enterprises.

1.4 Research questions

The following research questions were central to this study's objectives:

- What impact does technology have on the growth of emerging enterprises in South Africa?
- What is the value of Intelligent Technologies on SA's emerging technologies?
- What is the impact of Business, Market and Competitive Intelligence on the growth of emerging enterprises in SA?
- How can an optimal model for the growth of emerging enterprises in SA be developed through integrated Business, Market and Competitive Intelligence technologies?

1.5 Research objectives

The objectives of this study are:

- To critically evaluate technological tools, models and systems used by emerging enterprises.
- To determine the role and influence of Business, Market and Competitive Intelligence as Intelligent Technologies on the growth of emerging enterprises.
- To investigate the challenges hampering the use of Intelligent Technologies by emerging enterprises in South Africa.

1.6 Rationale

This study is premised on the importance and value placed on the contribution of emerging enterprises to the economy and society of South Africa. Despite the significance of SMEs nationally and globally, these enterprises unfortunately are the most fragile in terms of uncertainties of economies, political stability, and other related crises. At any point, there are strong possibilities of SMEs failing for whichever cause, therefore having to shut down business.

Numerous studies have indeed been undertaken related to challenges and opportunities of emerging enterprises, indicative of the importance of these ventures. This research sought to contribute further to this subject area, with specific focus on investigating the role and influence of intelligent technologies in the context of Business, Market and Competitive Intelligence on the growth of emerging enterprises. Intelligent technologies present advanced solutions derived from relevant and latest Industry 4.0 concepts. It was therefore anticipated that meaningful contribution would be made by research into this area.

1.7 Delimitations of the study

This study was intentionally limited to investigating the role and influence of intelligent technologies on the growth of emerging enterprises, focusing only on business, market and competitive intelligence capabilities.

This study was focused on emerging enterprises operating across few industries such as information technology, consulting, project management, construction and commodities supply. It is understood that there are vast opportunities for emerging enterprises to grow through the application of intelligent technologies across numerous industries.

The study was limited due to time as well as financial constraints. Time constraints are such that this study had to be completed within the duration of a one-year academic period. With regards to financial limitations, there were communication, equipment, travelling, printing, WiFi and data costs incurred in

order for this study to be completed successfully. These resource requirements were carefully planned for and managed with tools such as the research plan and the detailed work breakdown structure to track the use of resources against the allocated budget and time.

1.8 Definition of terms

1.8.1 *Intelligent Technologies:*

The concept of Intelligent Technology is described as utilisation of systematic intelligence for the execution of decision driven activities in the absence of human involvement. Intelligent systems are sophisticated computerised machines that can gather data, evaluate it and interface with other technologies through the internet, and in the process learn to respond to scenarios on their own based on the data collected from patterns of its own experiences.

1.8.2 *Emerging Enterprises:*

These are small and medium-sized enterprises, which are in the categories of business ventures that fall in the category of micro, small and medium enterprises by turnover thresholds as gazetted per specific sector.

1.8.3 *Business Intelligence:*

This is a technological process used through computer systems to collect, analyse, interpret business data and present information such that business owners are able to make insightful business decisions with the information.

1.8.4 *Market Intelligence:*

This refers to data and information collected by an organisation about the market within which it operates. It may include market trends, patterns and changes. This information is beneficial for segmentation and strategic business growth opportunities.

1.9 Chapter Outline

The overall outline of the main research followed the below structure:

Chapter 1: Introduction of the study

This chapter introduces the overall study in the context of the significance of emerging enterprises (SMEs) to economies globally and their vulnerability to instability as a result of numerous factors. The importance and the problem statement justifying the role of intelligent technologies in the growth of emerging enterprises is discussed.

Chapter 2: Literature Review

A systematic review of various concepts related to SMEs, intelligent technologies such as business intelligence, competitive intelligence, market intelligence is undertaken with research gaps identified as part of the empirical review of literature.

Chapter 3: Research Methodology

The research design is elaborated in the context of research tools and techniques, methodology, sampling techniques, population and questionnaires that formed part of the research methodology.

Chapter 4: Results and Discussion of Findings

The analytical tools that were used such as SPSS software package to analyse data, generate results and test for reliability and inferential statistics formed part of this chapter.

Chapter 5: Conclusion

This chapter concluded the entire study, contextualising how the study was conducted, research objectives achieved and summing up results with conclusions.

References

This entails the list of all the referenced work from various citation sources across multiple channels. The reference list includes citations from publication journals, conference proceedings, books, internet sources, company and academic reports.

CHAPTER 2. SYSTEMATIC REVIEW OF LITERATURE

2.1 Introduction

The review of literature on theories, concepts, frameworks and models was conducted on below section and its related subsections. This review is broken down into the empirical review of literature with relevant themes drawn from concepts. Concepts related to business intelligence, market intelligence, competitive intelligence and intelligent technologies on emerging enterprises are reviewed on the systematic review section whereas the empirical review of literature specifically review the literature from empirical studies on related topics as well.

2.2 Empirical Review of Literature

The empirical review was undertaken on literature supporting the role of intelligent technologies and their contribution to emerging enterprises. Theories such as business intelligence and business process management, market intelligence, competitive intelligence and intelligent technologies were reviewed, and research gaps identified for future studies. A total of 31 papers were reviewed, with 15 articles providing more relevant empirical studies useful for our review. The gaps identified vary from one theme to the other, whereby some studies require further impact to be evaluated, whilst others seek exploration of the role of other variables in contributing further to research areas, including others.

Table 1: Empirical Literature Research Gaps

Theme	No. of Articles	References	Research Gap
Business Intelligence and Business Process Management	3	• Bach, Vuksic, Vugec, & Stjepić, 2019 • (Llave, Hustad, & Olsen, 2018) • (Kerremans, Marc; Kitson, Nicholas, 2012)	• The impact of business intelligence and business process management on performance of SMEs • The use of various sources of data to analyse performance of SME key operations. • Lack of studies to evaluate readiness of SMEs for Business Intelligence and Analytics
Market Intelligence	5	• (Abbass & Mehmood, 2020) • (Falahat, T., Soto-Acosta, & Lee, 2020) • (Mashingaidze & Backhouse, 2017) • (Alford & Page, 2015)	• To probe the possibility of mass customisation for implementation of cost leadership and differentiation strategies concurrently • The impact of other potential competitive advantages applicable to export focused SMEs • The study of drivers of capabilities contributing to SME competitiveness on international markets. • The role of small entrepreneurial networks on empowering owner-managers with sustainable knowledge of adopting marketing technologies
Competitive Intelligence	5	• (Bulger, 2016) • (de Almeida, Lesca, & Canton, 2016) • (Cavallo, Sanasi, Ghezzi, & Rangone, 2021) • (Köseoglu, Ross, & Okumus, 2016) • (Calof, Arcos, & Sewdass, 2018)	• Investigation of situational factors affecting information behaviour in shared knowledge platforms • Increased scope on competitive intelligence and strategy development • The analysis of relationships between competitive intelligence practices and the hospitality industry • The impact of competitive intelligence practices on business performance
Intelligent Technologies on Emerging Enterprises	2	• (Llave, 2017) • (Grabova, Darmont, Chauchat, & Zolotaryova, 2010)	• The evaluation of benefits of Business Intelligence and Analytics technologies • The study of success and failure statistics to determine capabilities of Business Intelligence and Analytics

2.2.1 Business Intelligence and Business Process Management

(Bach, Vuksic, Vugec, & Stjepić, 2019) evaluated the alignment of Business Intelligence and Business Process Management (BPM) in relation to their effect towards the growth of SMEs success; they cited various sources and determined success imperatives such as leadership commitment, investment strategies, data

capabilities and readiness for adoption to be key factors for consideration. This study concluded that there is a significant correlation between the advancement states of BI and BPI capabilities and augmented business performance, which indicated that BI and BPI integrations could drive SME improvements.

(Llave, Hustad, & Olsen, Creating Value from Business Intelligence and Analytics in SMEs: Insights from Experts, 2018) argue that typical functional organograms of SMEs have negative implications on the adoption of process driven techniques. Many SMEs do not have adequate personnel in their structures, influencing poorly defined roles and responsibilities in their companies, therefore positions for BI and BPM project specialists are not practical which presented limitations (Boonsiritomachai, McGrath, & Burgess, 2016). Business Intelligence should be integrated with Business Process Management capabilities through a closed loop configuration, for businesses to maximise high potential value from BI tools (Kerremans, Marc; Kitson, Nicholas, 2012). This implies that a systematic and seamless interoperability between actual processes, data environment and BI applications, as opposed to fragmented BPM and BI interventions. Businesses are able to make timeous decisions, analyse multidimensional causal implications over business scenarios and innovate analytics business growth decisions.

2.2.2 Market Intelligence

Marketing intelligence involves the use of integrated techniques, software programs, tools, designs applications and processes for gathering, processing, analysing and interpreting data for informed marketing related business decision purposes (Mashingaidze & Backhouse, 2017). A study on the effects of Internet of Things (IoT) and marketing intelligence contributions on company policy suggest that both variables have a positive impact on cost focused and differentiation policies. It highlighted that on one marketing intelligence enable businesses to develop competitive costing models and unique product value propositions and determine customer segments appropriate for specific costing and differentiated strategic policies, whilst on the other hand IoT provided tools

for businesses to synthesise readily available market data, thereby formulate competitive policies and strategies (Abbass & Mehmood, 2020).

Effective utilisation of market intelligence interventions activates an opportunity for entrepreneurially improved performance in the development of outside opportunities and business grown in the global market (Mishra & Zachary, 2015). (Falahat, T., Soto-Acosta, & Lee, 2020) reported that market intelligence (MI), innovation and pricing competency drivers are three fundamentally important aspects that accelerated SME business growth in Malaysian markets. Export focused SMEs who were able to exploit MI efficiencies to capture intelligence about the markets, thereafter, respond effectively to opportunities and develop innovative competitive solutions based on affordable pricing models realised the benefits of competitive advantages. Furthermore, that pricing was discovered to be the only variable that shown independent or contrasting impact to SMEs global outlook since pricing remained a key factor on international markets, and could be managed through innovative process optimization interventions driven by data gathered through MI interventions

Small enterprises have shown high interest in adopting marketing technologies, since they provided for increased opportunities to gain deeper insights about their clients and be able to engage with the market patterns more decisively and interact with customers intimately. However, the managing directors were generally encountered with limitations such that they had limited awareness about the importance of these technologies and their investment benefits would be quantified (Alford & Page, 2015).

2.2.3 Competitive Intelligence

The concept of competitive intelligence refers to a sophisticated integration of knowledge systems capabilities derived from intelligence repositories cutting across various business functional areas, that are synthetically analysed to develop detailed business insights about the current and potential direction of a market, for the purposes of growing a company's competitive advantage (Bulger, 2016). It is a process of developing actionable intelligence about the company,

and its related macro environment to enable the firm to make strategic (de Almeida, Lesca, & Canton, 2016).

A multiple case comparison analysis conducted between four companies from various industries such as banking, healthcare and commercial marketing revealed that there was a widespread appreciation of increased focus on competitive intelligence adoption, influenced by dynamic market environments and the need to remain competitive regardless of the firm size (Cavallo, Sanasi, Ghezzi , & Rangone, 2021). Some amongst the tactical competitive intelligence capabilities these companies displayed included real time integrated analytics of operations performance and integrated reporting, well developed IT infrastructure, extensive market analytics, intelligence driven tactical strategies, customer satisfaction analytics and as such the study proposed that companies consider implementing an inclusive model that integrates competitive intelligence initiatives with strategic development processes (Cavallo, Sanasi, Ghezzi , & Rangone, 2021).

According to (Köseoglu, Ross, & Okumus, 2016), the hospitality industry particularly hotels demonstrated very little awareness about competitive intelligence (CI) and its importance, and merely applied its capabilities for tactical objectives, rather than strategic imperatives. This study discovered that the management team lacked knowledge and required focused training interventions since their academic background was also limited.

A study conducted to assess the application of CI by European firms made a comparative analysis of the state of practices ten years prior and in 2015, which was ten years later with a targeted sample of strategic and CI professionals. The study concluded that there were consistent parallels in CI application methods on the comparisons over the period in areas such as analytics tools used and decision-making criteria, whilst the CI had become increasingly official. However, advancements were also noted on the growth of CI use industrywide, whereby consumer focused intelligence, technology, market analytics and innovative interventions were some of the drivers of intelligence strategies (Calof, Arcos, & Sewdass, 2018).

2.3 Intelligent Technologies on Emerging Enterprises

While SMEs contribute and represent so much business and employment footprint in economies globally, they remain even more exposed to economic instabilities and consequently close down due to limitations challenges. Various researchers have developed models for adoption by SMEs to adopt Business Intelligence and Analytics solutions effectively with approaches that would limit business failures. A collaborated data warehousing model is one of the methodologies proposed whereby SMEs could share resources and infrastructure, then minimize cost exposures (Llave, Business Intelligence and Analytics in Small and Medium-sized Enterprises: A Systematic Literature Review Enterprises: A Systematic Literature Review, 2017). Various open-source web-based Business Intelligence solutions were also analysed and compared to determine and propose the most effective and practical as solutions for considerations and use by SMEs (Grabova, Darmont, Chauchat, & Zolotaryova, 2010).

Cloud based frameworks such as Software as a Solution Business Intelligence open access intelligence and analytics systems, were also suggested including frameworks with automated data capabilities which would bring reduced costs for SMEs consideration and implementation (Llave, Business Intelligence and Analytics in Small and Medium-sized Enterprises: A Systematic Literature Review Enterprises: A Systematic Literature Review, 2017).

A study focused on how SMEs could achieve intelligent transformation using Artificial Intelligence in China focused on areas such as intelligent transformation, technology diffusion theories and factors influencing intelligent technologies' adoption discovered that while the SMEs are keen, they were confronted with multiple limitations in-house as well as from the external environment (Wang, Lu, Fan , Hu, & Wang, 2022). External challenges included resource limitations, technology convenience shortfalls and very little policy support from the macro environment. From an internal perspective, among challenges were developmental costs, leadership involvement and human capital costs (Aarstad & Saidl, 2019).

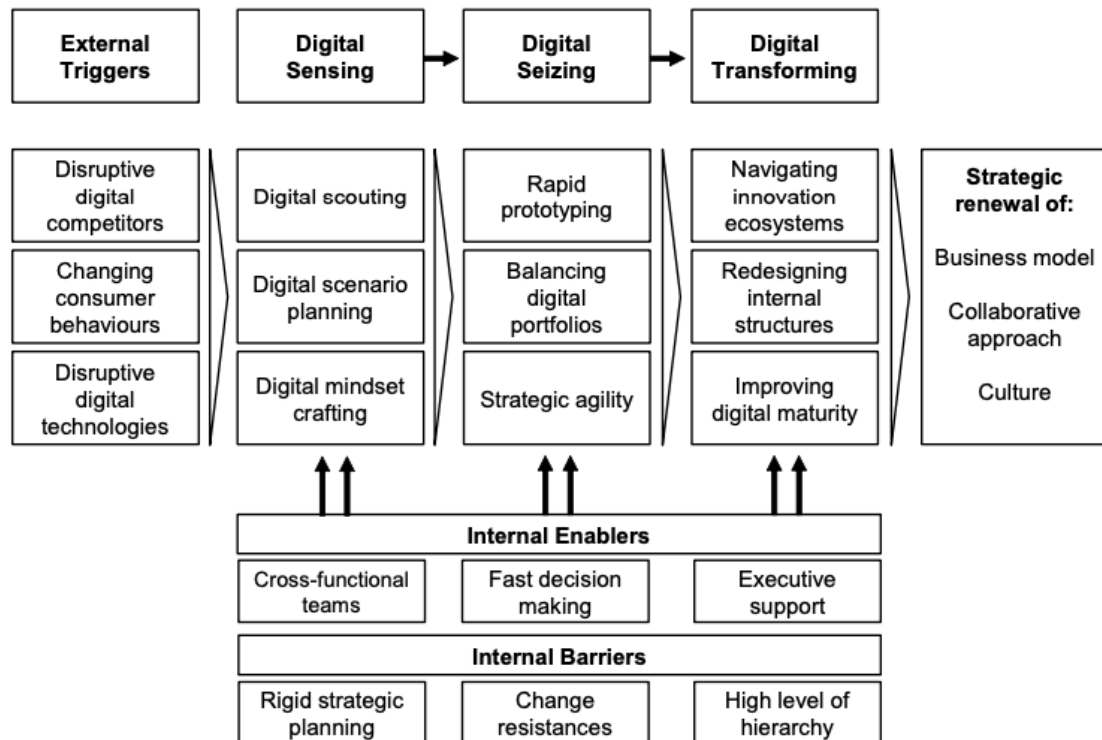


Figure 2: Building dynamic capabilities for digital transformation: A process model (Warner and Wäger, 2019)

Figure 2 is a process model for developing dynamic digital solutions suggesting that business would require to strategically plan for new capabilities, employ data analytics and artificial intelligence tools to determine customer focused trends, capacitate integrated networks and foster digitised cultures for digital transformation to be successful. Enabling variables such as collaborative innovative teams, agile decision making, and leadership support should also form part of the digitisation initiatives, whilst barriers are eliminated (Warner & Wäger, 2019).

SMEs can leverage Business Intelligence from Big Data capabilities to better determine emerging market trends, consumer insights, competitive dynamics and further adapt swiftly to market changes with highly agile innovative capabilities.

Intelligent enterprises are better able to predict future scenarios and accordingly surpass their industry peers in terms of performance growth and first mover innovations, based data exploited from previous and present activities.

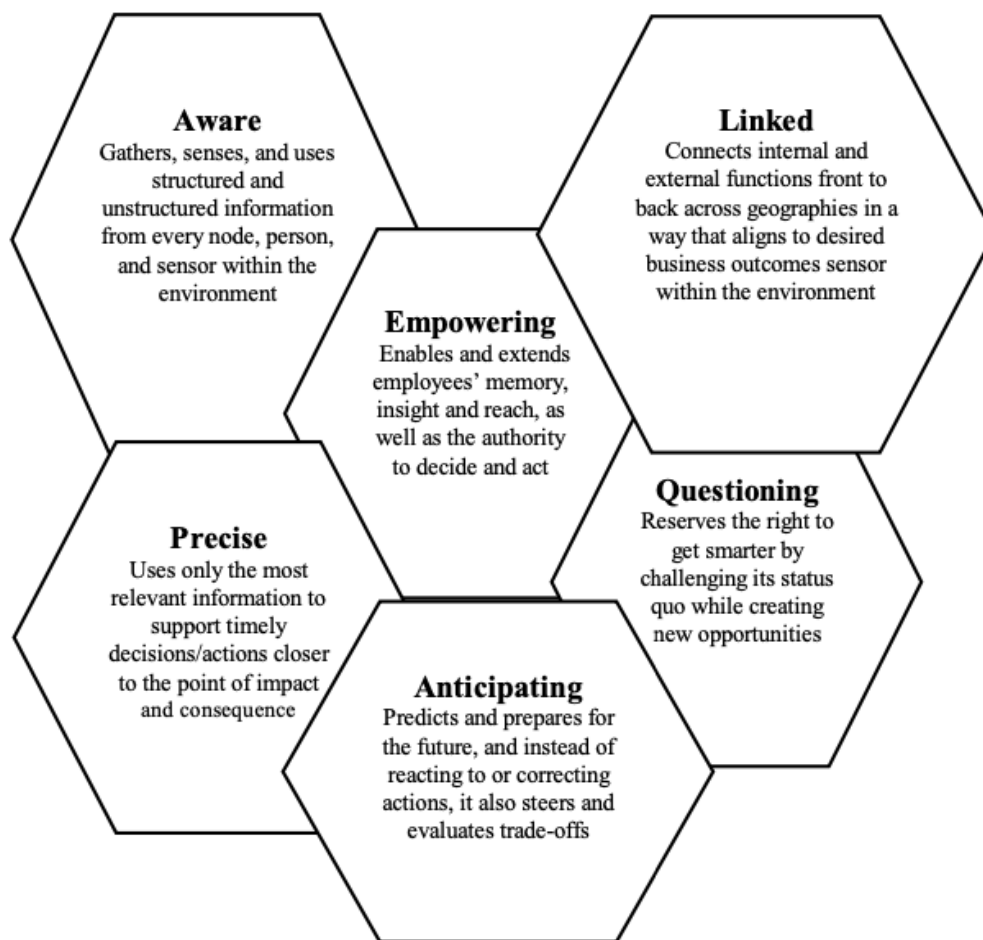


Figure 3: Characteristics of an Intelligent Technologies driven enterprise (Łobaziewicz, 2016)

Some of the key drivers of intelligent enterprises according to IBM include conversion of data to Business Intelligence, scalability and adaptation, real-time collaboration, virtualised workplace models, mobile integrated people and flexible business solutions (Łobaziewicz, 2016). The primary attributes of such technologies are premised around the ability to self-learn from its own events and adapt towards forward thinking solutions based on data acquired (Marinov, New Intelligent Technologies—Interactivity and Information Issues, 2019). Businesses with the vision of pursuing advanced capabilities have embarked on developing intelligent enterprises and will thus be positioned to surpass their competitors (Steve LaValle, 2009). Key components to an intelligent enterprise include awareness gathered from the intelligence, integration across all fronts of the business, interrogation of activities, anticipation of the future, precision and empowerment of people with new insights and decision-making powers.

2.4 A brief review of emerging enterprises in South Africa

The emerging enterprises (SMEs) landscape in South African remains important in terms its contribution to the country's GDP and economy. The SMMEs accounted for by quarter three of year 2022 were to a total of approximately 2.7 million, both in the formal and informal sectors. There was significant growth noted from certain industries such as tourism and construction for the same period, which were positive indicators for the economy (Small Enterprise Development Agency, 2022).

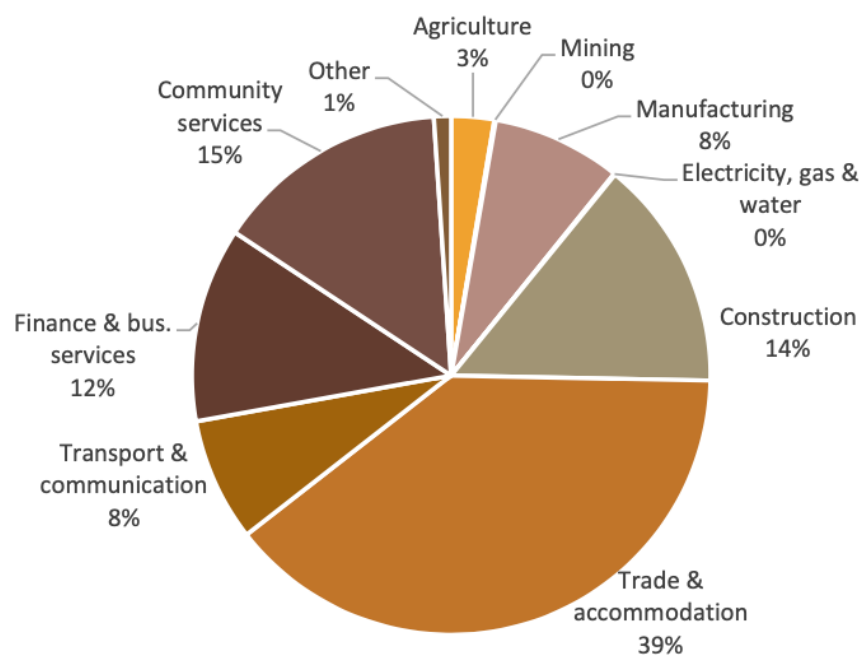


Figure 4: SMMEs by Industry as at 2022 Q3 (SEDA, 2022)

In terms of further analysis, it has been reported by a study conducted that SMEs in South Africa have one of the lowest rates of operational businesses based on the statistics reflected on local employment, whereby almost half of the SMEs employed between 2 to 5 people, whilst 39% were only operated by owners. Furthermore, the landscape was perceived to be tough in terms of access to markets, with very high competition, with a low survival rate (SME South Africa, 2018).

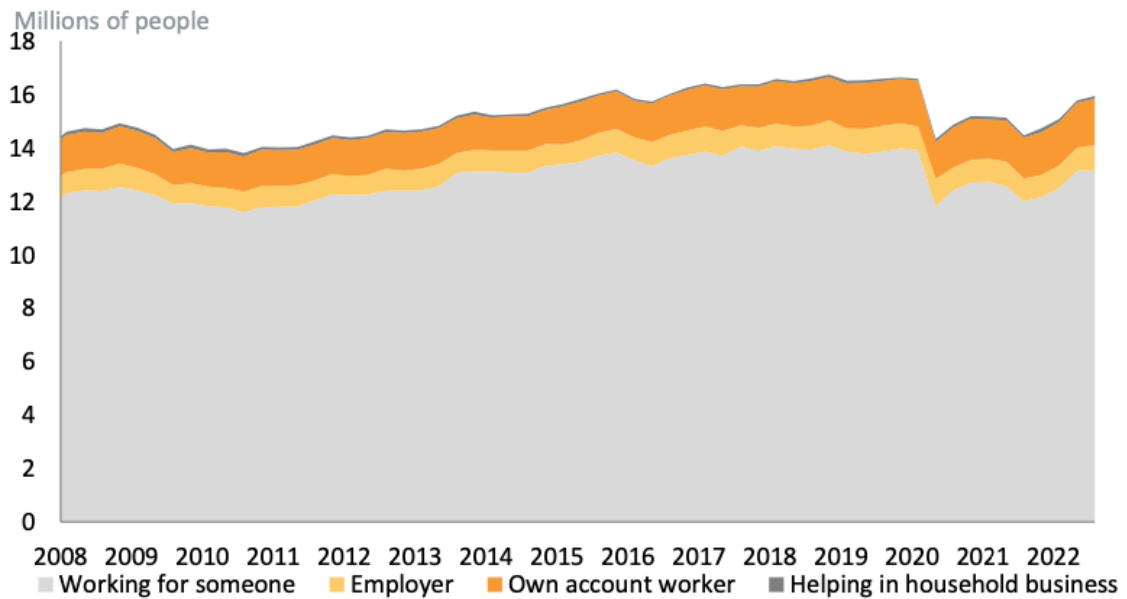


Figure 5: Employment Trend in South Africa (SEDA, 2022)

SMMEs were reported to have provided up to 9.31 million jobs by quarter two of 2022, which constituted about 59% of total employment in South Africa for the period (Small Enterprise Development Agency, 2022). On the other hand, it was pointed out that the increased rate of unemployment has pushed an increase on entrepreneurial activities due to the need for survival, and as such the relationship is reciprocal in that increased stimulation would consequently imply growth for SMEs and ultimately an even more economic growth (Lobetti, 2022).

2.5 Theoretical Framework of the Study

This study adopted the principles and components of a few theoretical frameworks given its nature, focus and objectives. The Dynamic Capabilities Theory in particular is one that this study ascribed to given the study's title, problem statement and research objectives. This study seeks to investigate the role of intelligent technologies on the growth of emerging enterprises, commonly known as SMEs.

The Dynamic Capabilities Framework is centred around a company's ability to develop, integrate and reconstruct its internal and external efficacies with an objective to capitalise on rapidly changing dynamics of its environment. As it has

been pointed out, to strategically plan for new capabilities, adopt intelligent technology capabilities to determine customer focused trends, capacitate integrated networks and foster digitised cultures for digital transformation to be successful (Warner & Wäger, 2019).

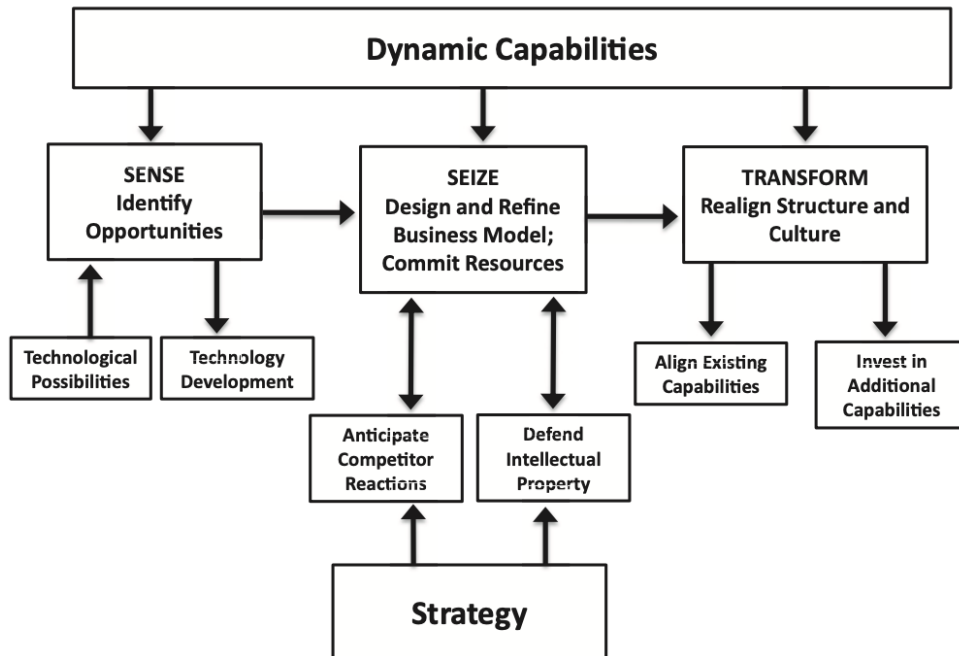


Figure 6: Simplified schema of dynamic capabilities, business models and strategy (Teece, 2018)

As demonstrated by Figure 6, dynamic capabilities are about a business' ability to sense, seize and reconstruct its capabilities in order to respond effectively to and take advantages of the changes in its environment. This also involves resource coordination, customer needs analysis and harnessing all other technological capabilities in redeveloping its strategic value proposition (Teece, 2018). This theoretical theory enables the articulation of how SMEs can thus develop dynamic capabilities through intelligent technologies and able to rapidly respond to market dynamics such as competitive pressures, changing consumer needs and trends, economic pressures and other challenges.

From the research topic, the main dependant variable which is 'intelligent technologies' was determined as a point of departure, with the independent variable being 'emerging enterprises. This enabled the development of further sub-constructs within the concepts of intelligent technologies and the growth of emerging enterprises, as well as the determination of relationships between the

variables which lead to the development of a comprehensive theoretical framework for this study.

From the concept of intelligent technologies, few variables that were focused on have been drawn which are business intelligence, market intelligence and competitive intelligence. The study explored the role of business intelligence, market intelligence and competitive intelligence and their impact on the growth of emerging enterprises, which consequently implied that these were regarded as dependant variables. Each variable was further be broken down to specific explorative areas through the development of the survey questionnaire, and subconstructs or factors were drawn from the data. The definitions of key variables employed on this study have been articulated below:

Business Intelligence could be described as an Information Technology driven process undertaken by an organisation utilising application systems to gather, analyse, deduce data and draw or develop impactful business decisions with the information generated. Competitive intelligence refers to a sophisticated integration of knowledge systems capabilities derived from intelligence repositories cutting across various business functional areas, that are synthetically analysed to develop detailed business insights about the current and potential direction of a market, for the purposes of growing a company's competitive advantage (Bulger, 2016). Market intelligence can be defined as data and information gathered by a company about the market within which it operates. It may include market trends, patterns and changes instrumental for segmentation and strategic business growth opportunities.

The perspective taken by this study was such that an organisation that seamlessly ingests business intelligence, market and competitive intelligence technologies, including other digital solutions into its business and functional capabilities would be regarded as an intelligent enterprise with dynamic capabilities. This is the bases from which the conceptual and theoretical framework of this study has been formulated.

2.5.1 The development of the Theoretical Framework

A theoretical framework is the next necessary step after the completion of the review of literature. It demonstrates the researcher's ideology of how constructs of a specific research discipline formulate associative logical patterns amongst one another, integrating the theories and variables of the conceptual model to make up a complete theoretical research framework (Sekaran & Bougie, 2016). Taking into account the review of published literature on intelligent enterprises, very little of either conceptual or theoretical frameworks were found on the process-based frameworks, with the exception of very few software applications related such as ERP Intelligent Enterprise architectures and those similar. A theoretical framework is therefore formulated on the following sections:

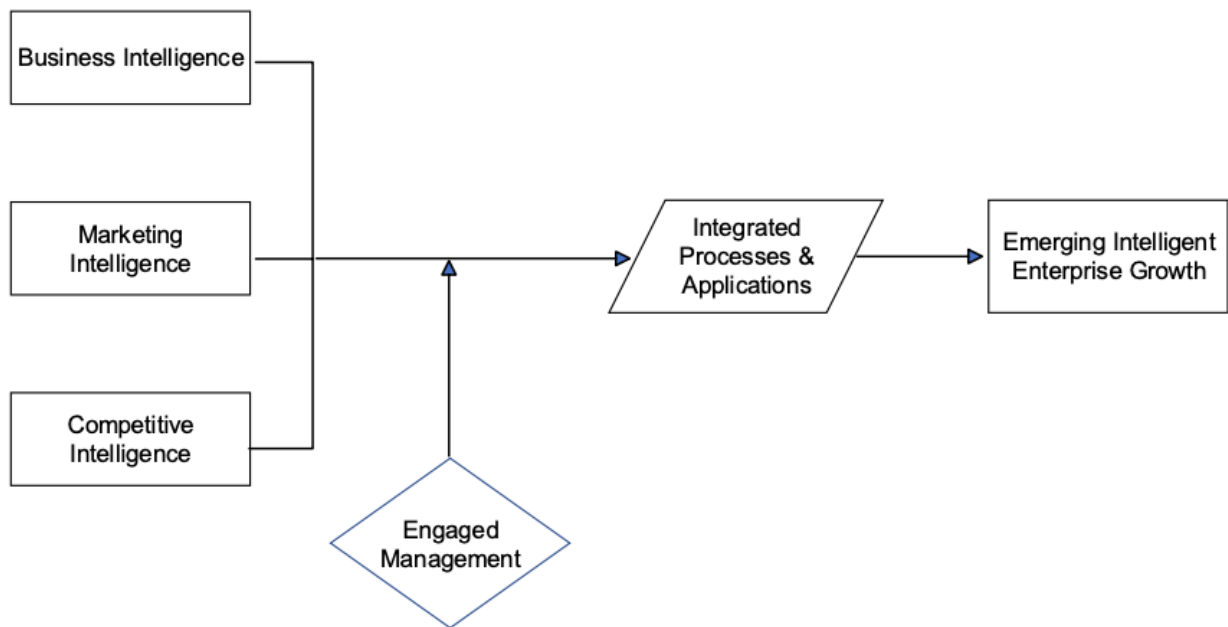


Figure 7: Emerging Intelligent Enterprise Theoretical Framework (own model)

The theoretical framework on figure 7 represents a conceptual thought process used as the framework for this study. The study investigates the role of intelligent technologies on the growth of emerging enterprises. Based on our theoretical framework, the concept of intelligent technologies was made up by a integration of technological capabilities, which are business intelligence, market intelligence and competitive intelligence.

These were therefore classified as key variables to the conceptual framework. Business intelligence, market intelligence and competitive intelligence are dependent variables, since the role and quantifiable functionality of each variable against specific performance indicators defined would have an effect on the outcome of the independent variable, which in this case is the growth of an emerging intelligent enterprise.

The framework takes into account that the dependent variables alone cannot be adequate to enable the achievement of the framework's goals being to influence the growth of emerging intelligent enterprises. The moderating variable was therefore also developed for the purpose of functionalising the successful implementation of the dependent variables. The moderating variable was thus defined as engaged management, referring to actively involved leaders of emerging enterprises in driving the development and deployment process through unlocking barriers, providing strategic and tactical support, guiding the implementation and leading the innovation process. The mediating variable was also defined as the integration of processes and applications, which seeks to align and bring together the software application capabilities and organisational process capabilities together for the successful development and growth of an effective intelligent emerging intelligent enterprise.

2.5.2 The Conceptual Model Elaboration

The conceptual model/framework developed in this research on the role of Intelligent Technologies in the growth of emerging enterprises in South Africa provides a comprehensive understanding of how these technologies influence SME development. The framework integrates Business Intelligence (BI), Market Intelligence (MI), and Competitive Intelligence (CI) as pivotal components, underpinning the growth dynamics of SMEs. The below are key insights derived from this conceptual framework:

Integration of Intelligence Technologies:

- **Holistic Approach:** The framework highlights the importance of a holistic approach to integrating Intelligent Technologies. It illustrates how

Business, Market, and Competitive Intelligence, when integrated, offer a multifaceted view of the enterprise environment, enabling more informed decision-making and strategic planning.

- **Interconnection of Components:** The interrelated nature of BI, Market Intelligence, and Competitive Intelligence is highlighted, showing that advancements in one area can bolster capabilities and insights in the others, thus amplifying their collective impact on enterprise growth.

Role of Engaged Management:

- **Strategic Leadership and Support:** The model suggests that engaged management act as a moderating variable, emphasising that the active involvement of leadership is critical in navigating the adoption and implementation of Intelligent Technologies. Leadership's commitment to fostering an innovative culture and investing in technology infrastructure is crucial for realizing the potential of these technologies.
- **Overcoming Barriers to Adoption:** The framework suggests that management engagement is key to overcoming barriers to technology adoption, such as resource constraints, skills gaps, and resistance to change. By prioritising technological advancement and facilitating organizational readiness, managers can drive successful technology integration.

Process and Application Integration:

- **Operational Alignment:** The conceptual framework identifies the integration of processes and applications as a mediating variable, stressing the need for alignment between technology solutions and business processes. This integration ensures that Intelligent Technologies are not just added on but are embedded within the operational workflows, enhancing efficiency and effectiveness.
- **Continuous Improvement and Innovation:** It also hints at the necessity for continuous improvement and the iterative refinement of technological

tools and processes. This ongoing integration fosters an environment of innovation, where data-driven insights continually inform business strategies and operations.

Impact on SME Growth:

- **Enhanced Competitive Advantage:** The framework demonstrates how the effective utilization of Intelligent Technologies can significantly enhance the competitive advantage of SMEs. By leveraging insights from BI, Market, and Competitive Intelligence, businesses can identify unique growth opportunities, tailor their offerings to meet market needs, and strategically position themselves against competitors.
- **Sustainability and Performance:** It also shows the potential of these technologies to improve the sustainability and operational performance of SMEs. Through informed decision-making and strategic alignment, enterprises can achieve greater efficiency, cost-effectiveness, and resilience in the face of market changes.

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Introduction

Taking into account the study undertaken, and its related contributory components, the research methodology can be put together as a guideline of the research roadmap and instruments to be used throughout this study. (Maxwell, 2012) highlights that research methodology is focused on articulating critical aspects of what the researcher should be doing in terms of specific activities, such the design, the coarse of action and the instruments to be utilised in conducting the study through gathering, analysis and interpretation of data into research results.

Publications from several authors such as (Sreejesh, Anusree, & Mohapatra, 2014) and (Saunders, Lewis, Thornhill, & Bristow, 2016) indicated that there is generally a variety of methods researchers could employ in conducting research studies, and these are informed about the type and nature of research undertaken. The research approaches could either follow a quantitative, qualittative or mixed-methods approach, whereas the methods could vary from surveys, focus groups, experiments, interviews, case study, grounded theory, action research, narrative inquiry, ethnography and archival studies.

The following sections unpack the research methodology followed by this study, which was a quantitative approach involving instruments such as a survey questionnaire and making use of analytical tools such as SPSS software application to analyse data into various forms of statistical results for deductive interpretation.

A survey method was employed for this study, which involved the design and collection of data employing the survey questionnaire tool. The questionnaire was administered through the online platform using online survey tool named Qualtrics, which allowed for the distribution to various participants who were actively involved in the undertakings of emerging enterprises during the time of

this study. Consultations and engagements with some SMEs have taken place for arrangements to undertake the study.

3.2 Research Approach

This study adopted a quantitative approach, which involved a survey design that allowed the use of deductive analytical approaches based on the quantitative data that was gathered and analysed through descriptive and inferential statistical techniques (Saunders, Lewis, Thornhill, & Bristow, 2016).

The quantitative research approach followed a process of formulating a survey questionnaire, that is linked to the study's main research questions and objectives. The questionnaire was therefore employed to gather data, which was analysed through research statistical guidelines whereby descriptive and inferential statistics were employed to achieve the results of the study. These results were also tested for reliability, normality and validity prior further use to ensure the credibility of the study.

3.3 Research Design / Paradigm

This study followed a positivist research paradigm, which was used to guide the formulation and development of instruments used in this study. Quantifiable data was collected from SMEs based on the topic and variables of research and analysed for findings and results of the study. Quantitative techniques were employed in that the survey and statistical analyses were conducted to determine causal relationships and accordingly results used to generalise the findings for the broader population.

3.3.1 *Useful instruments for the study*

This study was structured to make use of both primary and secondary data as key inputs to it. The collection and utilisation of primary data involved undertaking preliminary observations from few of the total emerging enterprises that were sampled so as to capture an understanding of their dynamics, business

undertakings, processes and related activities. The use of secondary data was based on data from journals, conference papers, enterprise reports, books, dissertations and various related sources.

The tools that were used for the study involved the development of the questionnaire aligned to the study's research topic, questions and objectives. An online survey platform was utilised to administer the questionnaire and the IBM SPSS software application was used to generate and analyse data for meaningful interpretation and discussions of the results of the study.

Since this study was of a quantitative approach, statistical techniques were employed to analyse the data. Statistical constructs, variables and factors were generated for analysis based on the role of emerging intelligent technologies in the growth of emerging enterprises.

This delivery of this study was managed through project management techniques to ensure monitoring, tracking and efficient management of the research deliverables at every phase of the study.

3.3.2 Questionnaire Design

A questionnaire relevant for the study was designed through consultation and benchmark of survey development guidelines. The survey questionnaire was thereafter administered through internet, web application platforms and email. The questionnaire was made up of various sections including demographics and sections related to specific areas of the study. The questionnaire was distributed to respondents across various emerging enterprises where participants from different business specialisations, levels and expertise participated in the survey.

3.3.3 Target Population

According to (Saunders, Lewis, Thornhill, & Bristow, 2016), a population is described as a total group of cases from which sampling is drawn to make up reliable research findings. The population of this study was made up of emerging

enterprises in South Africa. These involved a variety of SMMEs where respondents who participated differed in categories from owners to employees.

This study's population involved all organisations that are within the categories of SMEs with South Africa. By quarter three of 2022, there were approximately 2.68 million SMMEs that were accounted as registered and contribution to employment in South Africa (Small Enterprise Development Agency, 2022). These are what makes up the population of this study, taking into account that SMMEs extended to almost all the industries of the economy.

With regards to participant, this study extended invitations to 240 respondents including the Wits student community who formed part of companies that are within the SMME category.

3.3.4 Sampling Method

A sample is a generally a smaller representative group of people drawn from the population of the study for research purposes. Sampling involves specific techniques that vary depending on the approach and objectives of the research. (Rahman, 2015) suggested that there are generally two predominant categories, which sampling is dissected to; these involve probability and non-probability sampling, which could also be regarded as random and non-random sampling.

A combined sampling approach involving probability and non-probability sampling was used for this study to capitalise on the benefits of both methods, whilst mitigating the weakness of a single method. These involved simple random sampling, purposive sampling and convenience sampling. Random participants were selected across different work areas of the emerging enterprises, and they varied in categories based on their specialisations, occupational levels, knowledge and skills.

Convenience and purposive sampling was carried out such that respondents who are in leadership roles such as owners, executives and senior management were deliberately invited to participate on the study to capture their perceptions on the research subject areas.

3.3.5 Sample Size

A sample totalling to 240 respondents from various emerging enterprises were invited to participate on this study. These respondents varied from small business owners, managers and employees, who were regarded knowledgeable and understanding of the broader aspects of their organisations as well as basic understanding on the concepts of various technologies.

3.3.6 Data Analysis

Data was analysed with the use of SPSS software application and further broken down into descriptive and inferential statistics. Descriptive statistics were used to describe and categorise the data for collection, tabulation and summarisation purposes. Inferential statistics for further detailed analyses were also used for the study. The study made use of factor analysis, test for normality, comparison tests, correlation tests as well as frequency analyses in this regard.

CHAPTER 4. RESULTS AND DISCUSSIONS

4.1 Introduction

The analysis of research results is a very critical phase of the study such that the data collected is evaluated to validate whether the hypotheses developed have been substantiated (Sekaran & Bougie, 2016). The analysis of data takes place at the end of data collection from representative sample and aims to examine the hypothesis and respond to specific questions that were defined for the study (Ochara, 2016). This chapter explored in-depth quantitative analysis of the results of this study; responses gathered through the survey questionnaire have been analysed, interpreted and discussed.

Data was analysed through the SPSS software application whereby various statistical explorations were undertaken including descriptive statistics, normality analyses, reliability, factor analysis, comparisons, correlations and regression analysis.

4.2 Descriptives

This section discusses descriptive analyses whereby demographic profile data representing the sample size and related respondents as well as the emerging enterprises' background were analysed. Graphical charts were used to analyse demographical data of respondents, which included the size of companies they worked for, their job levels and the industries their companies belonged to. Descriptive data was collected with caution and ensuring that there are no discriminations, no confidentiality and no ethical requirements violated.

A total of 240 responses were received from respondents who participated on this study. Of this total number of 240, 110 respondents fully completed and

finished the survey, whereas 130 respondents completed most of the questions and ignored or skipped some. Reliability and normality tests were thus undertaken to verify the accuracy and reliability of results for use.

With regards to representation of businesses by industry categories, a total of 26 responses were from Consulting/professional Services firms; 20 responses were gathered from Consumer Goods companies, 21 responses were gathered from Information and Communications Technology firms, 11 responses were collected from firms in the mining industry, 7 responses were gathered from Transport and Logistics companies, 7 from financial services, 6 responses from banking, 7 responses from education, 5 responses from manufacturing companies, 5 from construction companies, 4 responses from the automotive industry, 4 from energy based companies.

A number of other industries were represented with scores lower where respondents were from firms in agriculture, aviation, beauty and personal care, engineering, public services, insurance, oil and gas, non-profit, research, property management, water and sanitation, tyre repairs, philanthropy and promo products.

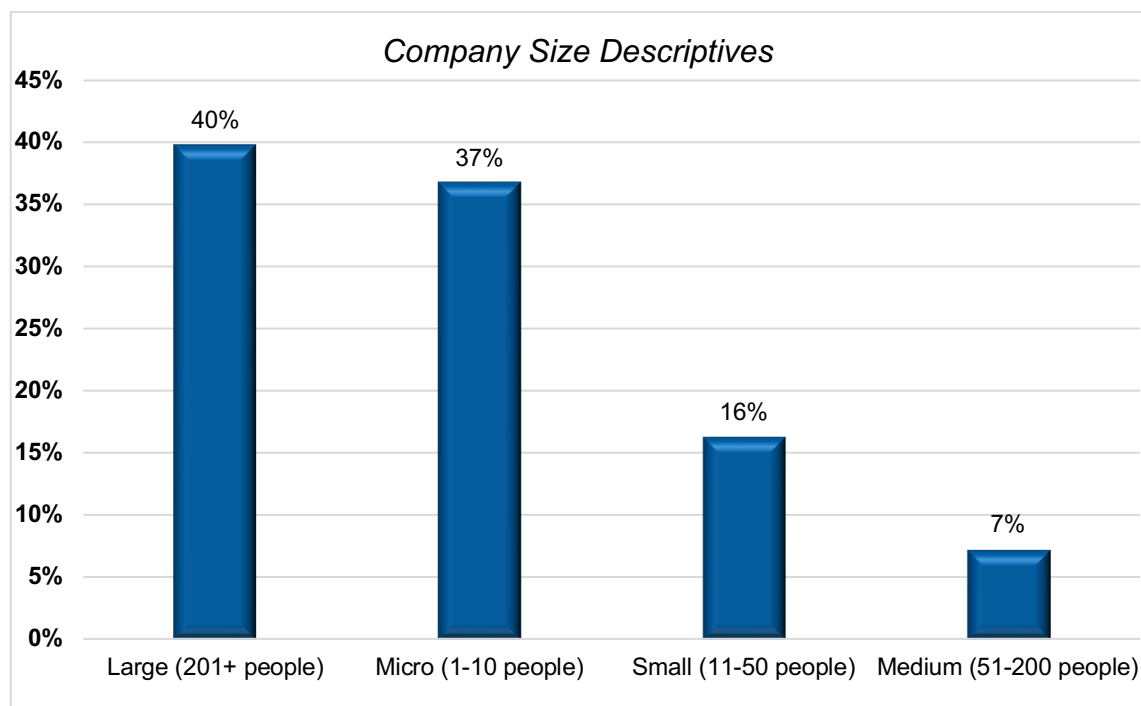


Figure 8: Company Size Descriptives

With regards to company size, the largest proportions of respondents were from micro-sized companies (1-10 people) and large companies (201+ people), with 37% and 40% respectively. Small (11-50 people) and medium (51-200 people) sized companies were less represented at 16% and 7%.

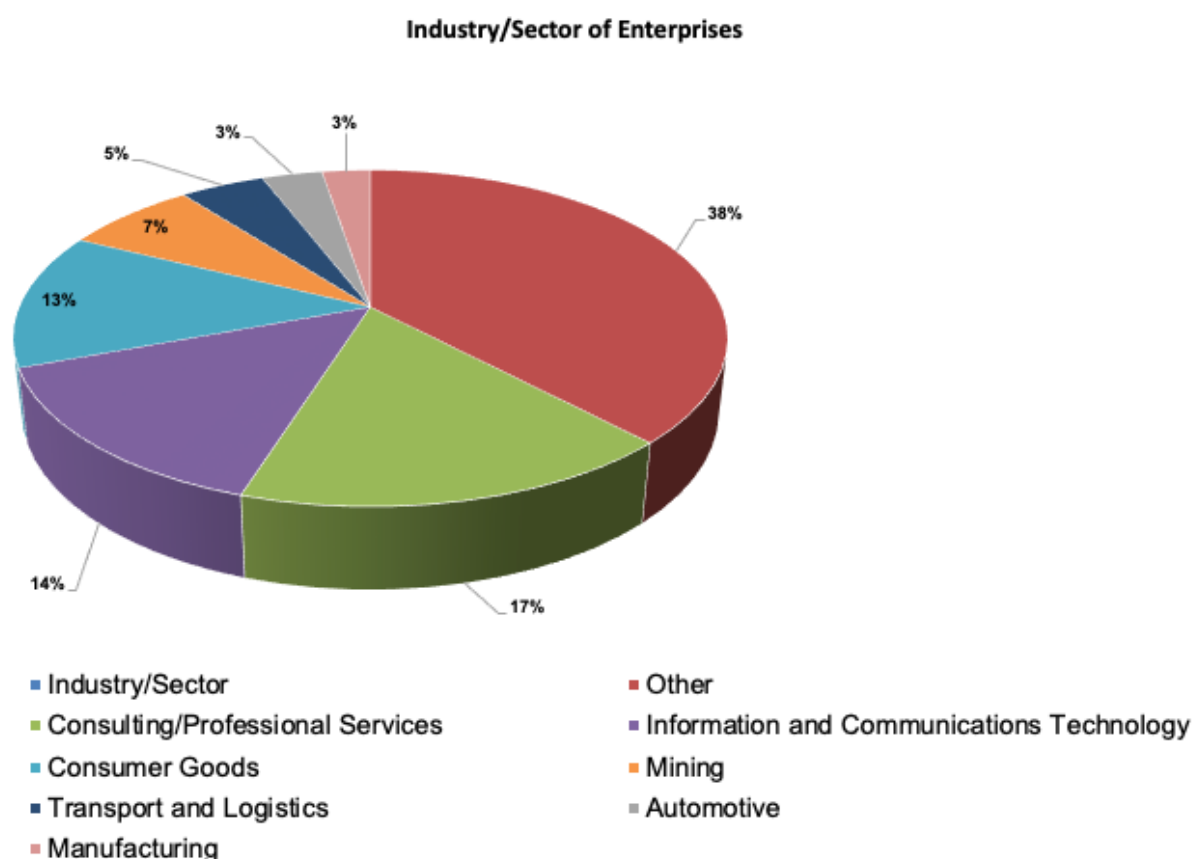


Figure 9: Industry/Sector of Enterprises Descriptives

With regards to industry and/or sector of emerging enterprises, a significant 38% of respondents specified other industries, indicating a diverse array of sectors. the second highly represented industry among respondents was Consulting/Professional Services at 17%. Information and Communications Technology and Consumer Goods also had notable representation at 14% and 13%. In terms of "Please specify if other" category, it included a wide variety of sectors such as Financial Services, Education, Government, Healthcare, Energy, Construction, and Agriculture. This diversity suggests that the survey reached a

broad cross-section of industries, which is beneficial for gathering comprehensive insights.

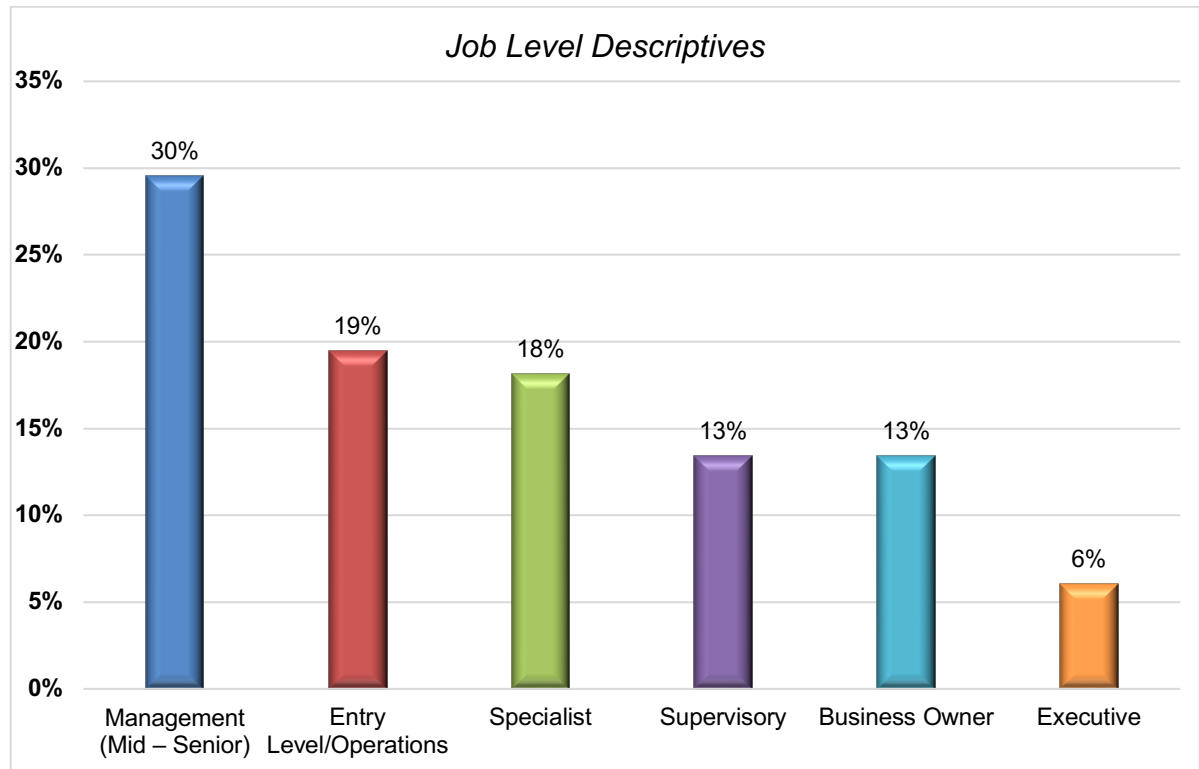


Figure 4: Job Level Descriptives

In terms of job level analysis, the largest group of respondents were in Management (Middle – Senior) at 30%. Entry Level and Specialist roles were also well represented at 19% and 18% respectively. The least respondents were in the Business Owner and Executive and categories, at 13% and 6%.

4.3 Factor Analysis

The data gathered was further subjected to factor analysis with the aim of assessing if specific interrelated themes can also be determined from the variables. The Principal Component Analysis (PCA) method was therefore employed to extrapolate data further and a number of factors were identified across all the sections of the survey questionnaire. The data's suitability and

ability to effectively process factor analysis had also been assessed prior undertaking the PCA analysis; the Kaiser-Meyer-Okin Measure of Sampling Adequacy (KMO) was utilised to validate the values exceed the recommended 0,6 value across all the factors identified. The Bartlett's sphericity tests were also verified to be significant.

The KMO's sampling adequacy results for section B of the questionnaire was 0,810 at 0,000 significant value; for Section C the KMO was 0,740 at sig. value of 0,000; for Section D, the KMO was 0,916 at 0,000 sig. value; for Section E, the KMO was 0,839 at 0,000 sig. value; with regards to Section F, the KMO was also adequate at 0,923 with 0,000 sig. value. The adequacy across all the section's results indicated that the Bartlett's test of Sphericity achieved statistical significance and accordingly supported the factorability of correlation matrices in for the identified factors this regard.

All the factors extracted from the Principal Components Analysis were also verified to have eigenvalues above the value of 1 as recommended by statistical guidelines. Section B of the survey extracted three factors with a total variance of 60,31% explained; Section C extracted four factors with a total variance of 70,87% explained; Section D extracted one factor with 56,54%; Section E two factors with 62,07% and Section F extracted one factor with a total variance of 70,09% explained. Furthermore, the Varimax with Kaiser normalisation rotation technique was employed for running the analysis and identifying the highest loading components across all the sections of the survey questions.

4.4 Tests for Normality of Results

The evaluation of the results' normality was also undertaken to validate the reliability, accuracy and robustness of the data before continuing with additional analyses. This exercise is of importance for statistical analytical methods in that data distributions are confirmed for normality and justification for use through this process. This section discussed and illustrated the analyses for normality drawn and analysed based on the factors extracted from key rotated components.

Table 2: Test for normality for Section B survey questions

Test of Normality							
Factors Extracted		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
F1_SME Sustainability & Performance	Micro (1-10 people)	0,091	34	.200 [*]	0,988	34	0,963
	Small (11-50 people)	0,253	13	0,023	0,865	13	0,045
	Medium (51-200 people)	0,250	7	.200 [*]	0,910	7	0,394
	Large (201+ people)	0,081	36	.200 [*]	0,986	36	0,920
F2_Business Growth & Strategic Alignment	Micro (1-10 people)	0,121	34	.200 [*]	0,958	34	0,215
	Small (11-50 people)	0,123	13	.200 [*]	0,966	13	0,845
	Medium (51-200 people)	0,311	7	0,039	0,835	7	0,090
	Large (201+ people)	0,105	36	.200 [*]	0,975	36	0,589
F3_Business Viability and Market Success	Micro (1-10 people)	0,111	34	.200 [*]	0,972	34	0,520
	Small (11-50 people)	0,145	13	.200 [*]	0,944	13	0,510
	Medium (51-200 people)	0,145	7	.200 [*]	0,980	7	0,960
	Large (201+ people)	0,122	36	0,198	0,944	36	0,066

Table 2 reflects analyses of results for three extracted factors from the section of the questionnaire that focused on the state and situational analysis of the emerging enterprises. The three factors extracted were themed *F1-SME Sustainability & Performance*; *F2-Business Growth & Strategic Alignment* and *F3- Business Viability and Market Success*. The analyses of these components was explored against categorical variables focused on the sizes of enterprises that varied between micro, small, medium and large businesses.

Shapiro-Wik analyses were utilised to test normality across all categorical variables given that the values on degrees of freedom (*df*) were lower than 50. The distribution scores from this analysis indicated normality for most of the subscales across the factors, with the exception of one subscale. For F1-SME Sustainability & Performance, micro, medium and large enterprises distribution scores were normally distributed respectively at significant values of (0,963; 0,394; 0,920) all of which were greater than the statistically recommended significant value of 0,05 (sig. $p \geq 0,05$). The small enterprises subscale was the exception that was not normally distributed in this regard at 0,045 lesser than the required sig. value of (sig. $p \geq 0,05$).

In terms of the F2-Business Growth & Strategic Alignment as well as F3-Business Viability and Market Success factors, the distribution scores were normally distributed across all categorical subscales with values higher the significant (sig. $p \geq 0,05$).

Table 3: Test for normality for Section C survey questions

Tests of Normality							
Factors Extracted		Statistic	Kolmogorov-Smirnov ^a		Shapiro-Wilk		
			df	Sig.	Statistic	df	Sig.
F1_Technology Integration & Business Operations	Micro (1-10 people)	0,113	34	.200*	0,911	34	0,009
	Small (11-50 people)	0,185	13	.200*	0,911	13	0,191
	Medium (51-200 people)	0,168	7	.200*	0,965	7	0,858
	Large (201+ people)	0,207	36	0,000	0,894	36	0,002
F2_Awareness of Intelligent Technologies	Micro (1-10 people)	0,175	34	0,010	0,934	34	0,040
	Small (11-50 people)	0,178	13	.200*	0,898	13	0,125
	Medium (51-200 people)	0,219	7	.200*	0,926	7	0,520
	Large (201+ people)	0,109	36	.200*	0,960	36	0,210
F3_SME Growth Opportunities & Challenges	Micro (1-10 people)	0,092	34	.200*	0,961	34	0,263
	Small (11-50 people)	0,167	13	.200*	0,936	13	0,409
	Medium (51-200 people)	0,172	7	.200*	0,945	7	0,688
	Large (201+ people)	0,160	36	0,021	0,935	36	0,036
F4_SME Financial Sustainability & Operational Efficacy	Micro (1-10 people)	0,084	34	.200*	0,986	34	0,936
	Small (11-50 people)	0,143	13	.200*	0,962	13	0,780
	Medium (51-200 people)	0,297	7	0,062	0,819	7	0,063
	Large (201+ people)	0,103	36	.200*	0,963	36	0,262

Table 3 above is a representation of results analysed from the section of the survey that evaluated the technological capabilities and readiness of emerging enterprises. In this area four factors were extracted with the themes F1- *Technology Integration & Business Operations*; F2- *Awareness of Intelligent Technologies*; F3- *SME Growth Opportunities & Challenges* and F4- *SME Financial Sustainability & Operational Efficacy*. These components were also analysed against different sizes of enterprises as categorical variables to evaluate normality of data across different groups of enterprises varying in sizes.

Most of the distribution scores were also normally distributed across the factors extracted and subscales concerned, having exceeded the required minimum sig. value of 0,05 (sig. $p \geq 0,05$), thereby indicative of normality of data for further use. A few subscales' distribution scores were lower than the recommended statistical sig. value of 0,05. These were noted from the F1-Technology Integration & Business Operations factor both under the micro (*sig. value of 0,009*) and large enterprise (*sig. value of 0,002*) subscales, as well as the F2_Awareness of Intelligent Technologies factor with micro enterprise subscale at sig. value of 0,040, and the F4_SME Financial Sustainability & Operational Efficacy factor also on the large enterprise subscale results at sig. value of 0,036.

It should be highlighted that the above results pointed that some areas of the data scores were not normally distributed, therefore calling for further comparison analyses to be undertaken to establish there are significant variability of the results.

Table 4: Test for normality for Section D survey questions

Tests of Normality							
Factors Extracted		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
F1_SME Business Intelligence Capabilities	Micro (1-10 people)	0,140	34	0,090	0,949	34	0,116
	Small (11-50 people)	0,155	13	.200*	0,951	13	0,618
	Medium (51-200 people)	0,278	7	0,108	0,854	7	0,134
	Large (201+ people)	0,113	36	.200*	0,930	36	0,025

With regards to section D of the survey questionnaire, only one factor was extracted by the Principal Component Analysis Matrix method, which was F1_SME Business Intelligence Capabilities. The Shapiro-Wik tests were also considered to assess normality across all categorical variables degrees of freedom (df), which remained lower than 50.

The data distribution scores were also found to be normally distributed for most of the subscales, exclude the large enterprises group similarly in this this case,

which was at a sig. value of 0,025 being lower than the recommended sig. value of 0,05 (sig. $p \geq 0,05$) for statistical significance.

Table 5: Test for normality for Section E survey questions

<i>Tests of Normality</i>							
Factors Extracted		<u>Kolmogorov-Smirnov^a</u>			<u>Shapiro-Wilk</u>		
		Statistic	df	Sig.	Statistic	df	Sig.
F1_Competitive Intelligence and Enterprise Strategy	Micro (1-10 people)	0,104	34	.200 [*]	0,984	34	0,877
	Small (11-50 people)	0,163	13	.200 [*]	0,948	13	0,574
	Medium (51-200 people)	0,341	7	0,014	0,761	7	0,016
	Large (201+ people)	0,130	36	0,130	0,941	36	0,055
F2_Strategic Industry Intelligence and Awareness	Micro (1-10 people)	0,200	34	0,001	0,925	34	0,023
	Small (11-50 people)	0,140	13	.200 [*]	0,956	13	0,689
	Medium (51-200 people)	0,241	7	.200 [*]	0,791	7	0,034
	Large (201+ people)	0,132	36	0,117	0,894	36	0,002

In terms of Section E, two factors were extracted by the PCA extraction method and were themed F1-Competitive Intelligence and Enterprise Strategy, and F2-Strategic Industry Intelligence and Awareness based on their attributable constructs. Some Shapiro-Wik distribution scores indicated normality across different subscales, whilst other subscale groups indicated sig. values below the required 0,05 (sig. $p \geq 0,05$), therefore violating normality. These were found on the medium group of the Competitive Intelligence and Enterprise Strategy factor at sig. value 0,016 as well as the Strategic Industry Intelligence and Awareness factor with the micro, medium and large enterprise groups at sig. values of 0,023, 0,034 and 0,002 consecutively.

Table 6: Test for normality for Section F survey questions

Tests of Normality							
Factors & Variables		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
F1_Market Intelligence for Business Growth	Micro (1-10 people)	0,109	34	.200*	0,967	34	0,389
	Small (11-50 people)	0,227	13	0,066	0,940	13	0,462
	Medium (51-200 people)	0,301	7	0,055	0,797	7	0,038
	Large (201+ people)	0,169	36	0,011	0,860	36	0,000

With regards to section F, only one factor was extracted by PCA and it was related to F1-Market Intelligence for Business Growth. The Micro and Small enterprises groups were normally distributed with 0,389 and 0,462 distribution scores consecutively, being greater than the minimum recommended value of 0,05 (sig. $p \geq 0,05$). The medium and large enterprises subscales were both not normally distributed at sig. values of 0,038 and 0,000, violating the minimum recommended sig. value of value of 0,05 (sig. $p \geq 0,05$) as per Shakiro-Wik tests requirements.

Having considered all the normality results across various factors that were extracted; it was also noted that at individual variables level of the results, most distribution scores were normally distributed with rather very rather very variables few variables that were not normally distributed. Furthermore, as per statistical guidelines, this is reasonably normal for large statistical samples. Further analyses were however conducted to assess the extent of abnormality and assess whether different assessment instruments would reveal normality.

4.5 Comparison Tests

Given some of the distribution scores that did not achieve normality tests on the previous section above, this particular section focused on determining if actual

variability existed between categorical groups of respondents in relation to how they would have perceived the subjects in question on the study. The comparison analysis took both the parametric and non-parametric tests into account for the methods of comparison used below, depending on the distribution of scores extracted and normality extents thereof; however the application of parametric tests was undertaken for testing and comparison of groups as opposed to non-parametric tests, given that parametric test are generally considered sufficiently robust for use as they draw more reliable comparisons even on distributions that have normality shortfalls.

An assessment of whether respondents gave widely varied feedback between categorical groups they identified with (company sizes, company sector/industry, job level and type of work environment) was therefore undertaken. An analysis of their perspectives with regards to Intelligent Technologies' contribution towards the growth of emerging enterprises was accordingly executed.

4.5.1 Company Size Comparisons:

Table 7: The Company Size Descriptive table for Comparisons

Descriptives									
		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Min	Max
CF3_SME Growth Opportunities & Challenges	Micro (1-10 people)	40	0,320	1,023	0,162	-0,008	0,647	-2,570	1,716
	Small (11-50 people)	20	-0,139	0,979	0,219	-0,597	0,319	-1,923	1,523
	Medium (51-200 people)	9	-0,183	1,267	0,422	-1,157	0,791	-1,829	1,686
	Large (201+ people)	48	-0,192	0,897	0,129	-0,453	0,068	-1,682	1,564
	Total	117	-0,007	1,001	0,093	-0,191	0,176	-2,570	1,716
BF1_SME Sustainability & Performance	Micro (1-10 people)	42	-0,606	1,024	0,158	-0,925	-0,287	-3,370	1,602
	Small (11-50 people)	22	0,103	0,882	0,188	-0,288	0,495	-1,186	2,012
	Medium (51-200 people)	10	0,336	0,752	0,238	-0,202	0,874	-0,877	1,301
	Large (201+ people)	53	0,374	0,848	0,116	0,140	0,607	-1,706	2,328
	Total	127	0,000	1,000	0,089	-0,176	0,176	-3,370	2,328

BF2_Business Growth & Strategic Alignment	Micro (1-10 people)	42	0,084	0,914	0,141	-0,201	0,369	-1,876	1,996
	Small (11-50 people)	22	-0,596	1,152	0,246	-1,107	-0,085	-3,040	1,308
	Medium (51-200 people)	10	0,534	0,661	0,209	0,062	1,007	-0,811	1,228
	Large (201+ people)	53	0,080	0,967	0,133	-0,186	0,347	-2,512	1,897
	Total	127	0,000	1,000	0,089	-0,176	0,176	-3,040	1,996
BF3_Business Viability & Market Success	Micro (1-10 people)	42	0,133	0,856	0,132	-0,133	0,400	-1,430	2,003
	Small (11-50 people)	22	-0,069	0,917	0,195	-0,475	0,338	-2,259	1,326
	Medium (51-200 people)	10	-0,253	1,551	0,490	-1,362	0,857	-3,894	1,574
	Large (201+ people)	53	-0,030	1,030	0,141	-0,313	0,254	-2,418	1,950
	Total	127	0,000	1,000	0,089	-0,176	0,176	-3,894	2,003
CF1_Technology Integration & Business Operations	Micro (1-10 people)	40	-0,284	0,855	0,135	-0,558	-0,011	-2,964	1,126
	Small (11-50 people)	20	-0,469	1,113	0,249	-0,990	0,051	-3,018	1,249
	Medium (51-200 people)	9	0,630	0,545	0,182	0,211	1,049	-0,356	1,420
	Large (201+ people)	48	0,312	0,997	0,144	0,022	0,601	-3,979	1,484
	Total	117	-0,001	1,004	0,093	-0,185	0,183	-3,979	1,484
CF2_Awareness of Intelligent Technologies	Micro (1-10 people)	40	-0,018	1,059	0,167	-0,356	0,321	-2,913	1,396
	Small (11-50 people)	20	0,067	1,110	0,248	-0,453	0,586	-1,872	1,465
	Medium (51-200 people)	9	-0,241	1,123	0,374	-1,104	0,622	-2,799	1,357
	Large (201+ people)	48	0,008	0,897	0,129	-0,252	0,269	-2,039	1,755
	Total	117	-0,010	0,999	0,092	-0,193	0,173	-2,913	1,755
CF4_SME Financial Sustainability & Operational Efficacy	Micro (1-10 people)	40	0,304	1,015	0,160	-0,020	0,629	-1,893	2,609
	Small (11-50 people)	20	-0,064	0,945	0,211	-0,506	0,378	-1,890	1,453
	Medium (51-200 people)	9	-0,251	1,118	0,373	-1,110	0,609	-1,343	2,410
	Large (201+ people)	48	-0,177	0,968	0,140	-0,458	0,104	-2,141	1,894
	Total	117	0,001	1,004	0,093	-0,183	0,185	-2,141	2,609
DF1_SME Business Intelligence Capabilities	Micro (1-10 people)	39	-0,299	0,954	0,153	-0,608	0,011	-2,312	1,575
	Small (11-50 people)	17	-0,045	0,993	0,241	-0,555	0,466	-2,516	1,575
	Medium (51-200 people)	8	-0,570	1,138	0,402	-1,521	0,381	-2,592	0,707
	Large (201+ people)	44	0,389	0,912	0,137	0,112	0,667	-2,054	1,575
	Total	108	0,002	1,005	0,097	-0,190	0,193	-2,592	1,575
EF1_Competitive Intelligence and Enterprise Strategy	Micro (1-10 people)	38	0,022	0,935	0,152	-0,286	0,329	-1,905	2,118
	Small (11-50 people)	17	-0,157	0,862	0,209	-0,600	0,286	-1,962	1,277
	Medium (51-200 people)	7	-0,581	1,509	0,570	-1,976	0,815	-3,778	0,630
	Large (201+ people)	42	0,139	1,018	0,157	-0,178	0,456	-2,410	1,968
	Total	104	-0,001	1,005	0,099	-0,196	0,195	-3,778	2,118

EF2_Strategic Industry Intelligence and Awareness	Micro (1-10 people)	38	-0,223	1,089	0,177	-0,581	0,134	-2,859	1,519
	Small (11-50 people)	17	-0,037	0,935	0,227	-0,518	0,443	-1,889	1,298
	Medium (51-200 people)	7	0,073	0,447	0,169	-0,341	0,486	-0,275	0,996
	Large (201+ people)	42	0,173	0,987	0,152	-0,135	0,481	-3,349	1,530
	Total	104	-0,013	0,996	0,098	-0,207	0,181	-3,349	1,530
FF1_Market Intelligence for Business Growth	Micro (1-10 people)	36	-0,188	0,847	0,141	-0,474	0,099	-2,673	1,328
	Small (11-50 people)	16	0,006	0,685	0,171	-0,359	0,371	-1,475	1,328
	Medium (51-200 people)	7	-0,347	1,783	0,674	-1,996	1,303	-4,104	1,328
	Large (201+ people)	41	0,221	1,045	0,163	-0,108	0,551	-3,612	1,328
	Total	100	0,000	1,000	0,100	-0,198	0,198	-4,104	1,328

Table 7 above gives a summarised representation view of the number of respondents per categorical subscale, the statistical mean and standard deviation scores for all the factors as well as groups for all factors extracted have also been demonstrated. All related samples were also confirmed to be correct and accurate, thereby would not have negative implications over the results of analyses that followed thereafter.

Table 8: The Company Size Homogeneity of Variances Analyses

<i>Tests of Homogeneity of Variances</i>					
		Levene Statistic	df1	df2	Sig.
CF3_SME Growth Opportunities & Challenges	Based on Mean	0,870	3	113	0,459
BF1_SME Sustainability & Performance	Based on Mean	0,709	3	123	0,549
BF2_Business Growth & Strategic Alignment	Based on Mean	0,995	3	123	0,398
BF3_Business Viability & Market Success	Based on Mean	1,813	3	123	0,148
CF1_Technology Integration and Business Operations	Based on Mean	1,282	3	113	0,284
CF2_Awareness of Intelligent Technologies	Based on Mean	1,016	3	113	0,389
CF4_SME Financial Sustainability & Operational Efficacy	Based on Mean	0,036	3	113	0,991
DF1_SME Business Intelligence Capabilities	Based on Mean	0,284	3	104	0,837

EF1_Competitive Intelligence & Enterprise Strategy	Based on Mean	0,294	3	100	0,830
EF2_Strategic Industry Intelligence and Awareness	Based on Mean	1,743	3	100	0,163
FF1_Market Intelligence for Business Growth	Based on Mean	1,828	3	96	0,147

A one way between subscale groups Analysis of Variance was also drawn to explore and ascertain whether there is an influence informed by different company sizes in terms of how each company size group perceived various components extracted from the survey study focused on the Intelligent Technologies and Emerging Enterprises. The subscales representative of the company (enterprise) sizes were clustered into four groups which involved group 1 micro (1-10 people), group 2 small (11-50 people), group 3 medium (51-200 people) and group 4 large (201+ people) enterprise.

Table 8 represents the Levene's Homogeneity of Variances Analysis which was therefore employed to evaluate the extent of equality on variance indicators across all extracted components as well as the subscale groups concerned. As per table 8, the summary results indicated that all the factors assumed equality of variances since all significant values were above the recommended value of (sig. $p \geq 0,05$) as per statistical guidelines.

This implied that the sizes of companies varying from micro to large size did not have an impact on how the participants perceived the contribution of Intelligent Technologies towards Emerging Enterprises across all the factors and related variables. The company size categorical subscale across all the factors therefore did not indicate inequality, as a result the distribution scores of the data were reasonably normal for use, therefore no further variance and comparative analyses required on this construct.

Table 9: The Company Size ANOVA Analysis

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
CF3_SME Growth Opportunities and Challenges	Between Groups	6,539	3	2,180	2,245	0,087
	Within Groups	109,706	113	0,971		
	Total	116,245	116			
BF1_SME Sustainability & Performance	Between Groups	24,189	3	8,063	9,741	0,000
	Within Groups	101,811	123	0,828		
	Total	126,000	126			
BF2_Business Growth & Strategic Alignment	Between Groups	11,307	3	3,769	4,042	0,009
	Within Groups	114,693	123	0,932		
	Total	126,000	126			
BF3_Business Viability and Market Success	Between Groups	1,536	3	0,512	0,506	0,679
	Within Groups	124,464	123	1,012		
	Total	126,000	126			
CF1_Technology Integration and Business Operations	Between Groups	15,882	3	5,294	5,917	0,001
	Within Groups	101,101	113	0,895		
	Total	116,984	116			
CF2_Awareness of Intelligent Technologies	Between Groups	0,618	3	0,206	0,202	0,895
	Within Groups	115,053	113	1,018		
	Total	115,670	116			
F4_SME Financial Sustainability and Operational Efficacy	Between Groups	5,866	3	1,955	1,988	0,120
	Within Groups	111,120	113	0,983		
	Total	116,986	116			
DF1_SME Business Intelligence Capabilities	Between Groups	12,785	3	4,262	4,656	0,004
	Within Groups	95,188	104	0,915		
	Total	107,973	107			
EF1_Competitive Intelligence and Enterprise Strategy	Between Groups	3,607	3	1,202	1,198	0,315
	Within Groups	100,389	100	1,004		
	Total	103,996	103			
EF2_Strategic Industry Intelligence and Awareness	Between Groups	3,197	3	1,066	1,076	0,363
	Within Groups	98,994	100	0,990		
	Total	102,191	103			
FF1_Market Intelligence for Business Growth	Between Groups	4,118	3	1,373	1,389	0,251
	Within Groups	94,882	96	0,988		
	Total	99,000	99			

Table 9 above reflects a one-way between groups ANOVA analysis which was also conducted to further explore the perspectives of company sizes on Intelligent Technologies, and also for testing whether actual variances existed on the mean

scores between different company sizes that participated on the study. Significant differences were found on the mean scores between the company size groups for few of the factors that were extracted; this is as a result of their sig. values being lower than the required (sig. $p \geq 0,05$).

The factors that revealed significance difference were BF1-SME Sustainability & Performance at sig. value of 0,000, BF2-Business Growth & Strategic Alignment at sig. value 0,009, CF1-Technology Integration and Business Operations at sig. 0,001 and DF1-SME Business Intelligence Capabilities at sig. value 0,004; these were lower than the required (sig. $p \geq 0,05$). This therefore implied that company sizes had a contributing effect to how respondents perceived factors such as (*SME Sustainability & Performance, Business Growth & Strategic Alignment, Technology Integration and Business Operations and SME Business Intelligence Capabilities*) towards the growth of emerging enterprises in South Africa.

The significant differences that existed on the mean scores between the groups' variables required Multiple Comparisons to be conducted in order to establish the specific groups with significant differences.

Table 10: The Company Size Multiple Comparisons

Multiple Comparisons							
Tukey HSD							
Dependent Variable	(I) Q1	(J) Q1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
BF1_SME Sustainability & Performance	Micro (1-10 people)	Small (11-50 people)	-0,709*	0,239	0,019	-1,333	-0,086
		Medium (51-200 people)	-0,942*	0,320	0,020	-1,776	-0,108
		Large (201+ people)	-0,980*	0,188	0,000	-1,469	-0,490
	Small (11-50 people)	Micro (1-10 people)	0,709*	0,239	0,019	0,086	1,333
		Medium (51-200 people)	-0,233	0,347	0,908	-1,136	0,671
		Large (201+ people)	-0,270	0,231	0,646	-0,871	0,331
	Medium (51-200 people)	Micro (1-10 people)	0,942*	0,320	0,020	0,108	1,776
		Small (11-50 people)	0,233	0,347	0,908	-0,671	1,136
		Large (201+ people)	-0,038	0,314	0,999	-0,855	0,779

	Large (201+ people)	Micro (1-10 people)	0,980*	0,188	0,000	0,490	1,469
		Small (11-50 people)	0,270	0,231	0,646	-0,331	0,871
		Medium (51-200 people)	0,038	0,314	0,999	-0,779	0,855
BF2_Business Growth & Strategic Alignment	Micro (1-10 people)	Small (11-50 people)	,680*	0,254	0,042	0,018	1,342
		Medium (51-200 people)	-0,451	0,340	0,548	-1,336	0,434
		Large (201+ people)	0,004	0,199	1,000	-0,516	0,523
	Small (11-50 people)	Micro (1-10 people)	-,680*	0,254	0,042	-1,342	-0,018
		Medium (51-200 people)	-1,130*	0,368	0,014	-2,090	-0,171
		Large (201+ people)	-,676*	0,245	0,033	-1,314	-0,038
	Medium (51-200 people)	Micro (1-10 people)	0,451	0,340	0,548	-0,434	1,336
		Small (11-50 people)	1,130*	0,368	0,014	0,171	2,090
		Large (201+ people)	0,454	0,333	0,524	-0,413	1,321
	Large (201+ people)	Micro (1-10 people)	-0,004	0,199	1,000	-0,523	0,516
		Small (11-50 people)	,676*	0,245	0,033	0,038	1,314
		Medium (51-200 people)	-0,454	0,333	0,524	-1,321	0,413
CF1_Technology Integration and Business Operations	Micro (1-10 people)	Small (11-50 people)	0,185	0,259	0,892	-0,491	0,860
		Medium (51-200 people)	-,915*	0,349	0,048	-1,825	-0,005
		Large (201+ people)	-,596*	0,203	0,020	-1,124	-0,068
	Small (11-50 people)	Micro (1-10 people)	-0,185	0,259	0,892	-0,860	0,491
		Medium (51-200 people)	-1,099*	0,380	0,023	-2,089	-0,109
		Large (201+ people)	-,781*	0,252	0,013	-1,438	-0,125
	Medium (51-200 people)	Micro (1-10 people)	,915*	0,349	0,048	0,005	1,825
		Small (11-50 people)	1,099*	0,380	0,023	0,109	2,089
		Large (201+ people)	0,318	0,344	0,791	-0,578	1,214
	Large (201+ people)	Micro (1-10 people)	,596*	0,203	0,020	0,068	1,124
		Small (11-50 people)	,781*	0,252	0,013	0,125	1,438
		Medium (51-200 people)	-0,318	0,344	0,791	-1,214	0,578
DF1_SME Business Intelligence Capabilities	Micro (1-10 people)	Small (11-50 people)	-0,254	0,278	0,798	-0,980	0,472
		Medium (51-200 people)	0,272	0,371	0,884	-0,698	1,241
		Large (201+ people)	-,688*	0,210	0,008	-1,237	-0,139
	Small (11-50 people)	Micro (1-10 people)	0,254	0,278	0,798	-0,472	0,980
		Medium (51-200 people)	0,526	0,410	0,577	-0,545	1,597
		Large (201+ people)	-0,434	0,273	0,389	-1,147	0,279
	Medium (51-200 people)	Micro (1-10 people)	-0,272	0,371	0,884	-1,241	0,698
		Small (11-50 people)	-0,526	0,410	0,577	-1,597	0,545
		Large (201+ people)	-0,960	0,368	0,050	-1,920	0,000
	Large (201+ people)	Micro (1-10 people)	,688*	0,210	0,008	0,139	1,237

Small (11-50 people)	0,434	0,273	0,389	-0,279	1,147
Medium (51-200 people)	0,960	0,368	0,050	0,000	1,920

Given the significant differences established with ANOVA on few abovementioned variables, further post-hoc analyses were undertaken to identify specific differences amongst company size groups. The post-hoc comparison test undertaken on table 10 using Tukey method revealed statistically different results for some of the company size groups. In terms of the SME Sustainability and Performance factor, the mean scores for the micro sized companies' group ($M=-0,606$; $SD=1,024$) were statistically different from three groups which were small ($M=0,103$; $SD=0,882$), medium ($M=0,336$; $SD=0,752$) and large companies' groups ($M=0,374$; $SD=0,848$). The mean score differences highlighted are indicated on the Descriptives table 10, and it should be noted that although statistical differences on the mean scores were found between the micro sized companies' group against other groups, the actual differences on the scores were quite little as highlighted.

With regards to the Business Growth and Strategic Alignment variable, the mean scores for small sized companies' group ($M=-0,596$; $SD=1,152$) statistically differed from the other three company size groups which were the micro sized ($M=0,084$; $SD=0,914$), medium sized ($M=0,534$; $SD=0,661$) and large sized companies' groups ($M=0,080$; $SD=0,967$). The actual mean score differences in this case as indicated per group against the small sized companies on the results were also very small to make a differentiated impact in this regard.

In terms of the Technology Integration and Business Operations factor, the mean scores for micro sized companies' group ($M=-0,284$; $SD=0,855$) were also statistically different from the medium sized companies ($M=0,630$; $SD=0,545$) and the large size companies' groups ($M=0,312$; $SD=0,997$). Furthermore, the small size companies' subscale ($M=-0,469$; $SD=1,113$) mean scores also indicated statistical difference from the medium size and large companies groups as well. Having a look at the mean scores for all these variations, it can again be deduced that although differences were identified, the actual significance of the differences were little with all the scores ranging at decimals below one.

With regards to the Business Intelligence Capabilities factor which was also lastly identified to have significance difference during the ANOVA analysis, the mean scores for the micro size companies' group ($M=-0,299$; $SD=0,954$) statistically differed at ($p<0,05$) with the large size companies' category ($M=0,389$; $SD=0,912$). These were the only two groups that differed in terms of perceptions on concepts and factors related to Business Intelligence Capabilities towards the growth of emerging enterprises.

The above overall analyses revealed that people differed on perceptions based on the different sizes of their companies. The perspectives of respondents from micro sized companies differed from other company size groups such as medium and large in some instances while in other cases other certain groups varied likewise with other different sized companies. These differences were related to how respondents differed in their perceptions on SME sustainability and performance, business growth and Strategic Alignment, technology integration and business operations, and business intelligence capabilities factors towards the growth of emerging enterprises.

It was further noted that the extent of their differences on each occasion were quite little based on the mean score variances, thereby having little impact on the overall normality results given the sample size of the study. Furthermore, the micro and small sized firms seemingly were the ones with most differences against other groups, which may have been due to the number of respondents' sample sizes for these particular groups.

4.5.2 Enterprise Industry/Sector Comparisons:

A Comparative analysis was also conducted for the industry or sector, which respondents belonged to various industry groups. The descriptives analysis were also confirmed in terms of statistical mean, standard deviation scores and samples that were confirmed to be correct and accurate for further analysis across all the extracted factors and their related industry groups.

Table 11: Enterprise Industries Homogeneity of Variance Analyses

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
BF1_SME Sustainability & Performance	Based on Mean	0,645	7	119	0,718
BF2_Business Growth & Strategic Alignment	Based on Mean	0,931	7	119	0,486
BF3_Business Viability and Market Success	Based on Mean	1,496	7	119	0,175
CF1_Technology Integration and Business Operations	Based on Mean	2,091	7	109	0,050
CF2_Awareness of Intelligent Technologies	Based on Mean	0,842	7	109	0,555
CF3_SME Growth Opportunities and Challenges	Based on Mean	1,954	7	109	0,068
CF4_SME Financial Sustainability and Operational Efficacy	Based on Mean	0,859	7	109	0,541
DF1_SME Business Intelligence Capabilities	Based on Mean	0,662	7	100	0,704
EF1_Competitive Intelligence and Enterprise Strategy	Based on Mean	0,745	7	96	0,634
EF2_Strategic Industry Intelligence and Awareness	Based on Mean	0,411	7	96	0,893
FF1_Market Intelligence for Business Growth	Based on Mean	0,840	7	92	0,557

A one way between groups ANOVA was also conducted for the industries or sectors the groups of enterprises belonged to as well, given the importance of ensuring normality of statistical data across all the subscales and related factors. The aim was to also assess if there could be a comparatively variable pattern identified on how respondents from various enterprise industries perceived Intelligent Technologies' influence on Emerging Enterprises based on their different industry backgrounds.

With regards to this analysis, the subscales of industry types were broken down into group 1 - Consulting/Professional Services, group 2 - Information and Communications Technology, group 3 - Automotive, group 4 - Mining, group 5 - Transport and Logistics, group 6 - Manufacturing, group 7 - Consumer Goods, and group 8 as the last open-ended category for any other industries. Table 11 above is an analysis of Levene's Homogeneity of Variances tests conducted across all extracted factors and related subscales whereby the extent of equality on variance scores was assessed.

The results reveal that all factors have proven equality with sig. values above the recommended sig. value of 0,05 as well. The lowest equality scores were noted on the CF1-Technology Integration and Business Operations factor at sig. value of exactly 0,05, which however shown equality.

Table 12: ANOVA analysis for Enterprise Industries

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
BF1_SME Sustainability & Performance	Between Groups	4,668	7	0,667	0,654	0,710
	Within Groups	121,332	119	1,020		
	Total	126,000	126			
BF2_Business Growth & Strategic Alignment	Between Groups	11,923	7	1,703	1,777	0,098
	Within Groups	114,077	119	0,959		
	Total	126,000	126			
BF3_Business Viability & Market Success	Between Groups	6,385	7	0,912	0,908	0,503
	Within Groups	119,615	119	1,005		
	Total	126,000	126			
CF1_Technology Integration & Business Operations	Between Groups	4,589	7	0,656	0,636	0,725
	Within Groups	112,394	109	1,031		
	Total	116,984	116			
CF2_Awareness of Intelligent Technologies	Between Groups	5,377	7	0,768	0,759	0,623
	Within Groups	110,293	109	1,012		
	Total	115,670	116			
CF3_SME Growth Opportunities & Challenges	Between Groups	8,922	7	1,275	1,294	0,260
	Within Groups	107,323	109	0,985		
	Total	116,245	116			
CF4_SME Financial Sustainability & Operational Efficacy	Between Groups	8,210	7	1,173	1,175	0,323
	Within Groups	108,775	109	0,998		
	Total	116,986	116			
DF1_SME Business Intelligence Capabilities	Between Groups	4,348	7	0,621	0,599	0,755
	Within Groups	103,625	100	1,036		
	Total	107,973	107			
EF1_Competitive Intelligence & Enterprise Strategy	Between Groups	4,263	7	0,609	0,586	0,766
	Within Groups	99,732	96	1,039		
	Total	103,996	103			
EF2_Strategic Industry Intelligence & Awareness	Between Groups	5,917	7	0,845	0,843	0,555
	Within Groups	96,274	96	1,003		

	Total	102,191	103			
F1_Market Intelligence for Business Growth	Between Groups	3,672	7	0,525	0,506	0,828
	Within Groups	95,328	92	1,036		
	Total	99,000	99			

A one-way between groups ANOVA analysis was also conducted for industry/sector groups comparisons as demonstrated by Table 12 above in addition to homogeneity of variance analysis. This was to further explore the differences of respondents' perceptions influenced by their industry backgrounds on Intelligent Technology factors.

There were no significant differences found on the mean scores between various industry/sector groups as well as their related variables in this regard. All the groups' sig. values were higher than the recommended (sig. $p \geq 0,05$), indicating that there were no statistically significant differences found between different groups' perceptions in relation to all the factors and concepts of Intelligent Technologies (*SME Sustainability & Performance, Business Growth & Strategic Alignment, Business Viability & Market Success, Technology Integration & Business Operations, Awareness of Intelligent Technologies, SME Growth Opportunities & Challenges, SME Financial Sustainability & Operational Efficacy, SME Business Intelligence Capabilities, Competitive Intelligence & Enterprise Strategy, Strategic Industry Intelligence & Awareness and Market Intelligence for Business Growth*) This also reflected a reasonably normally distributed data for use.

4.5.3 Job Level Comparisons:

This section analysed and discussed the comparative tests of the roles and job levels participants occupied in their companies. The below table...xxx depicts the descriptive statistics that were conducted for all the factors extracted for this study across various groups representative of the levels of job occupations.

The statistical data including means scores and standard deviations were also accounted for, whilst the samples for all the variables and related subscale

groups were also confirmed correct and accurate. Parametric tests were also used to compare for job level grouping comparisons, given their proven reputation of robustness and even more reliable results.

Table 13: Descriptive Analyses for the Job level of participants

Descriptives									
		N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
BF1_SME Sustainability & Performance	Entry Level /Operations	22	0,004	1,063	0,227	-0,467	0,475	-1,934	1,755
	Supervisory	16	-0,154	1,001	0,250	-0,688	0,379	-2,381	2,012
	Specialist	22	0,454	0,857	0,183	0,074	0,834	-1,440	2,328
	Management (Mid – Senior)	39	0,066	1,055	0,169	-0,276	0,408	-3,370	1,851
	Executive	8	-0,058	0,946	0,334	-0,849	0,733	-1,419	1,602
	Business Owner	18	-0,485	0,884	0,208	-0,924	-0,045	-2,402	0,907
	Total	125	0,008	1,005	0,090	-0,170	0,186	-3,370	2,328
BF2_Business Growth & Strategic Alignment	Entry Level /Operations	22	-0,100	1,089	0,232	-0,583	0,383	-3,040	1,308
	Supervisory	16	0,062	1,122	0,280	-0,535	0,660	-2,512	1,897
	Specialist	22	0,051	1,227	0,262	-0,493	0,595	-2,991	1,897
	Management (Mid – Senior)	39	-0,025	0,850	0,136	-0,300	0,251	-2,479	1,308
	Executive	8	-0,064	0,930	0,329	-0,841	0,713	-1,515	1,228
	Business Owner	18	0,128	0,855	0,202	-0,297	0,553	-1,650	1,996
	Total	125	0,006	0,992	0,089	-0,170	0,182	-3,040	1,996
BF3_Business Viability & Market Success	Entry Level /Operations	22	0,018	0,949	0,202	-0,403	0,438	-1,430	1,485
	Supervisory	16	-0,168	1,263	0,316	-0,841	0,505	-2,418	1,950
	Specialist	22	0,178	1,100	0,235	-0,310	0,666	-1,638	2,003
	Management (Mid – Senior)	39	-0,095	1,061	0,170	-0,439	0,249	-3,894	1,574
	Executive	8	0,175	0,701	0,248	-0,411	0,761	-0,681	1,394
	Business Owner	18	-0,014	0,740	0,174	-0,382	0,353	-1,402	1,309
	Total	125	-0,008	1,006	0,090	-0,186	0,170	-3,894	2,003
CF1_Technology Integration & Business Operations	Entry Level /Operations	19	-0,240	0,900	0,207	-0,674	0,194	-2,123	0,952
	Supervisory	14	0,112	0,992	0,265	-0,461	0,685	-2,082	1,484
	Specialist	19	0,608	0,652	0,149	0,294	0,922	-1,416	1,341
	Management (Mid – Senior)	39	-0,029	1,172	0,188	-0,409	0,351	-3,979	1,420
	Executive	7	-0,024	0,802	0,303	-0,766	0,718	-1,214	1,126
	Business Owner	17	-0,493	0,898	0,218	-0,955	-0,031	-2,964	0,699

	Total	115	-0,010	1,011	0,094	-0,196	0,177	-3,979	1,484
CF2_Awareness of Intelligent Technologies	Entry Level /Operations	19	0,086	1,081	0,248	-0,435	0,607	-2,039	1,465
	Supervisory	14	-0,509	0,808	0,216	-0,975	-0,042	-1,932	0,990
	Specialist	19	0,440	0,789	0,181	0,060	0,821	-1,434	1,425
	Management (Mid – Senior)	39	-0,121	1,010	0,162	-0,449	0,206	-2,799	1,755
	Executive	7	-0,177	0,998	0,377	-1,099	0,746	-1,266	1,380
	Business Owner	17	0,004	1,119	0,271	-0,572	0,579	-2,913	1,396
	Total	115	-0,026	0,998	0,093	-0,211	0,158	-2,913	1,755
CF3_SME Growth Opportunities & Challenges	Entry Level /Operations	19	0,377	0,735	0,169	0,023	0,732	-0,921	1,507
	Supervisory	14	-0,108	0,965	0,258	-0,665	0,449	-1,923	1,091
	Specialist	19	-0,246	0,983	0,225	-0,720	0,227	-1,590	1,523
	Management (Mid – Senior)	39	-0,052	1,083	0,173	-0,403	0,299	-1,824	1,686
	Executive	7	0,677	1,056	0,399	-0,300	1,654	-1,055	1,716
	Business Owner	17	-0,354	0,974	0,236	-0,854	0,147	-2,570	1,122
	Total	115	-0,020	1,005	0,094	-0,206	0,165	-2,570	1,716
CF4_SME Financial Sustainability & Operational Efficacy	Entry Level /Operations	19	0,432	0,802	0,184	0,046	0,819	-1,074	1,510
	Supervisory	14	0,267	0,819	0,219	-0,206	0,740	-1,243	1,211
	Specialist	19	-0,223	0,818	0,188	-0,617	0,172	-1,381	1,457
	Management (Mid – Senior)	39	-0,245	1,032	0,165	-0,580	0,089	-2,141	2,410
	Executive	7	-0,167	1,065	0,402	-1,151	0,818	-1,567	1,560
	Business Owner	17	0,407	1,098	0,266	-0,157	0,972	-1,179	2,609
	Total	115	0,034	0,981	0,091	-0,147	0,215	-2,141	2,609
DF1_SME Business Intelligence Capabilities	Entry Level /Operations	19	0,153	1,038	0,238	-0,347	0,653	-2,312	1,575
	Supervisory	11	-0,117	0,707	0,213	-0,592	0,358	-1,820	0,896
	Specialist	21	0,701	0,752	0,164	0,359	1,044	-0,695	1,575
	Management (Mid – Senior)	33	-0,216	1,125	0,196	-0,615	0,183	-2,592	1,471
	Executive	7	-0,053	0,462	0,175	-0,480	0,375	-0,923	0,452
	Business Owner	15	-0,657	0,875	0,226	-1,142	-0,172	-2,102	0,607
	Total	106	-0,009	1,010	0,098	-0,204	0,185	-2,592	1,575
EF1_Competitive Intelligence and Enterprise Strategy	Entry Level /Operations	17	-0,074	0,914	0,222	-0,544	0,396	-1,896	1,277
	Supervisory	11	-0,208	0,956	0,288	-0,851	0,435	-1,540	0,999
	Specialist	20	0,265	0,947	0,212	-0,178	0,708	-2,410	1,968
	Management (Mid – Senior)	32	-0,185	1,117	0,198	-0,588	0,218	-3,778	1,944
	Executive	7	0,902	0,684	0,258	0,269	1,534	0,197	2,118
	Business Owner	15	-0,261	0,907	0,234	-0,763	0,241	-1,905	1,154
	Total	102	-0,017	1,006	0,100	-0,215	0,180	-3,778	2,118
EF2_Strategic Industry Intelligence & Awareness	Entry Level /Operations	17	-0,111	1,002	0,243	-0,626	0,405	-1,886	1,298
	Supervisory	11	0,021	0,698	0,210	-0,448	0,489	-1,273	0,746
	Specialist	20	0,125	1,301	0,291	-0,484	0,734	-3,349	1,399
	Management (Mid – Senior)	32	-0,039	0,839	0,148	-0,341	0,264	-2,810	1,530

FF1_Market Intelligence for Business Growth	Executive	7	-0,455	0,878	0,332	-1,266	0,357	-1,873	0,704
	Business Owner	15	0,040	1,171	0,302	-0,608	0,689	-2,859	1,519
	Total	102	-0,029	0,998	0,099	-0,225	0,167	-3,349	1,530
	Entry Level /Operations	16	-0,114	1,167	0,292	-0,736	0,508	-2,673	1,328
	Supervisory	10	0,234	0,485	0,153	-0,112	0,581	-0,507	1,328
	Specialist	19	0,239	1,189	0,273	-0,334	0,812	-3,612	1,328
	Management (Mid – Senior)	32	-0,129	1,098	0,194	-0,525	0,267	-4,104	1,328
	Executive	7	-0,033	0,649	0,245	-0,633	0,567	-1,118	0,981
	Business Owner	14	-0,126	0,750	0,200	-0,559	0,307	-1,388	1,190
	Total	98	-0,011	1,004	0,101	-0,212	0,190	-4,104	1,328

A one way between groups Analysis of Variance (ANOVA) was also explored for the job level construct as well to verify whether there could be influence related to how participants perceived Intelligent Technologies' effect on Emerging Enterprises based on their varied levels of occupation, taking into account a person's job level may be attributable to varied levels of knowledge, skills and expertise.

Table 14: The Job level Homogeneity of Variances Analyses

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
BF1_SME Sustainability & Performance	Based on Mean	0,379	5	119	0,862
BF2_Business Growth & Strategic Alignment	Based on Mean	0,869	5	119	0,504
BF3_Business Viability and Market Success	Based on Mean	1,623	5	119	0,159
CF1_Technology Integration and Business Operations	Based on Mean	1,222	5	109	0,304
CF2_Awareness of Intelligent Technologies	Based on Mean	0,436	5	109	0,823
CF3_SME Growth Opportunities and Challenges	Based on Mean	1,084	5	109	0,373
CF4_SME Financial Sustainability and Operational Efficacy	Based on Mean	0,848	5	109	0,519
DF1_SME Business Intelligence Capabilities	Based on Mean	1,736	5	100	0,133
EF1_Competitive Intelligence and Enterprise Strategy	Based on Mean	0,426	5	96	0,829
EF2_Strategic Industry Intelligence and Awareness	Based on Mean	1,004	5	96	0,420
FF1_Market Intelligence for Business Growth	Based on Mean	1,377	5	92	0,240

In this case, the subscales of job levels were broken down into 6 groups which entailed group 1 (entry level/operations), group 2 (supervisory), group 3 (specialist), group 4 (management {middle – senior}), group 5 (executive) and group 6 (business owner) levels. The Levene's Homogeneity of Variances Analysis which was also explored to assess the extent of equality on variance indicators across all extracted components as well as related subscale groups resulted to equality of all the factors extracted. The significant values across all the components were above the recommended sig. value of 0,05 in this regard. The highest equality results were noted from the BF1-SME Sustainability and Performance factor at sig. value of 0,862 followed by EF1-Competitive Intelligence and Enterprise Strategy factor with sig. value of 0,829.

The results of this analysis also therefore suggested that the absence of inequalities on sig. values data implied that there is no variability of respondents' perspectives across their different levels of jobs, specifically based and informed by the different levels of jobs on the subject of the influence of Intelligent Technologies on Emerging Enterprises. Therefore, if any differing views existed, they would not be as a result of varying job levels of respondents but perhaps other factors.

Furthermore, this also indicated that the distribution scores of data between factors, groups and mean results were normal for further use. This is also affirmed by proven assertions that whilst preliminary normality test may indicate data not to be normal, on studies that involved large samples the overall results would be normal for further use.

Taking into consideration of all the analysis conducted across the three main categories, which were the company size groups, job level groups and industry/sector type groups; consistent instruments of analysis were employed in that parametric test were used across all the sections because they are robust enough for use and generation of reliable analyses.

The results' sample size scores were confirmed correct and accurate for all the categories, factors and their subscale groups, including mean scores and standard deviation results. Furthermore, the Levene's homogeneity of variance

tests were also conducted and the one-way between groups analysis of variance also conducted given groups that were more than two groups in each category. The Tukey multiple comparisons were also conducted where ANOVA analyses revealed statistically different mean score results between groups. The general comparison results identified groups with differences on specific constructs, however the differences were proven not too statistically different to warrant for further analysis and concerns related to the normality of results.

4.6 Correlation Tests

Correlation tests were also conducted across all the factors extract and established from the research questions. Non-parametric correlation tests were considered better for application, taking into consideration that some factor's distribution values were not normally distributed per normality analyses undertaken earlier above. The Spearman's Rank Order Correlation (ρ) method was therefore applied since it is a non-parametric method of analysis and is not based on specific distribution assumptions, which made an appropriate instrument given that the variables correlated were extracted and rotated components (factors) involving numerous components, some of which may have not been completely linear.

The conditions of measure applicable to this analysis were taken into consideration and affirmed to be correct and precise before proceeding; this included the measures of coefficients (r), the sizes of absolute values, the sample sizes (N), the relationships between the components in the analysis and the general significance level (sig. (2-tailed)) in this case. For the purpose of this analysis, only the variables (factors) that were significantly correlated highly were discussed and pointed out in the analysis section below.

Based on table 15 below, a very strong positive correlation was noted between the Awareness of Intelligent Technologies factor and the Strategic Industry Intelligence and Awareness factor ($r=0,658$, $n=100$, $p<0,05$); This suggested that a strong association between the two variables existed and that respondents

perceived that both the Awareness of Intelligent Technologies and Strategic Industry Intelligence and Awareness should be aligned towards the growth of emerging enterprises, since a positive outcome of one will consequently lead to a positive achievement of the other.

There was also a strong positive correlation between the Awareness of Intelligent Technologies and the Market Intelligence for Business Growth factors ($r=0,537$, $n=95$, $p<0,05$), which also suggested a strong positive relationship and alignment between the two constructs and indicating that the awareness and effective use of Market Intelligent Technologies would have positive outcomes the growth of emerging businesses.

Furthermore, a strong positive correlation was also established between the SME Business Intelligence Capabilities factor and the Competitive Intelligence and Enterprise Strategy factor at ($r=0,512$, $n=103$, $p<0,05$), indicating that a strong alignment exist between the two constructs such that internal Business Intelligence capabilities would also have positive contributions to Competitive Intelligence and enterprise strategies for SME growth.

Another strong positive correlation was observed between the SME Business Intelligence (BI) Capabilities and Market Intelligence for Business Growth factors ($r=0,585$, $n=99$, $p<0,05$) also indicating a high positively aligned association between BI capabilities and Market Intelligence initiatives driving business growth in emerging enterprises.

Furthermore, Competitive Intelligence and Enterprise Strategy was also strongly, positively correlated with the Market Intelligence for Business Growth factor ($r=0,501$, $n=98$, $p<0,05$), suggesting that a strong association between the two variables existed and that Competitive Intelligence, Enterprise Strategy and Market Intelligence would together have a positive influence amongst each other if they were implemented as initiatives for business growth in SMEs.

Table 15: Correlation Tests

Non-parametric Correlations

Spearman's rho		BF1_SME Sustain & Performa	BF2_Busi Growth & Strategic Alignment	BF3_Busi Viability & Market Success	CF1_Tech Integratio & Busi Operati	CF2_Aware ness of Intellig Tech	CF3_SME Growth Opp & Challenges	CF4_SME Financ Sustainab & Oper Effic	DF1_SME Business Intelligence Capabilities	EF1_Compe titiv Intellig & Enterp Strategy	EF2_Strat egic Ind Intellig & Awaren	FF1_Mark et Intellig for Bus Growth
BF1_SME Sustainability & Performance	Correlation Coefficient	1,000	0,038	0,043	.250**	0,070	-.193*	-.240**	.359**	.217*	0,104	.249*
	Sig. (2-tailed)		0,675	0,630	0,007	0,452	0,038	0,010	0,000	0,027	0,295	0,012
	N	127	127	127	116	116	116	116	108	104	104	100
BF2_Business Growth & Strategic Alignment	Correlation Coefficient	0,038	1,000	0,034	.255**	0,159	0,066	0,041	.304**	.246*	.217*	.289**
	Sig. (2-tailed)	0,675		0,702	0,006	0,088	0,481	0,662	0,001	0,012	0,027	0,003
	N	127	127	127	116	116	116	116	108	104	104	100
BF3_Business Viability & Market Success	Correlation Coefficient	0,043	0,034	1,000	0,093	.225*	0,068	-0,028	.214*	.264**	0,167	.245*
	Sig. (2-tailed)	0,630	0,702		0,321	0,015	0,468	0,762	0,026	0,007	0,091	0,014
	N	127	127	127	116	116	116	116	108	104	104	100
CF1_Technology Integration & Business Operations	Correlation Coefficient	.250**	.255**	0,093	1,000	-0,069	-0,045	-0,056	.436**	.317**	0,080	0,183
	Sig. (2-tailed)	0,007	0,006	0,321		0,459	0,630	0,549	0,000	0,001	0,427	0,076
	N	116	116	116	118	118	118	118	104	100	100	95
CF2_Awareness of Intelligent Technologies	Correlation Coefficient	0,070	0,159	.225*	-0,069	1,000	-0,005	0,005	.395**	0,189	.658**	.537**
	Sig. (2-tailed)	0,452	0,088	0,015	0,459		0,956	0,954	0,000	0,060	0,000	0,000
	N	116	116	116	118	118	118	118	104	100	100	95
CF3_SME Growth	Correlation Coefficient	-.193*	0,066	0,068	-0,045	-0,005	1,000	0,043	0,095	.210*	-0,094	0,002

Opportunities & Challenges	Sig. (2-tailed)	0,038	0,481	0,468	0,630	0,956		0,642	0,336	0,036	0,352	0,985
	N	116	116	116	118	118	118	118	104	100	100	95
CF4_SME Financial Sustainability & Operational Efficacy	Correlation Coefficient	-.240**	0,041	-0,028	-0,056	0,005	0,043	1,000	-0,105	-0,043	-0,053	0,010
	Sig. (2-tailed)	0,010	0,662	0,762	0,549	0,954	0,642		0,288	0,668	0,603	0,922
	N	116	116	116	118	118	118	118	104	100	100	95
DF1_SME Business Intelligence Capabilities	Correlation Coefficient	.359**	.304**	.214*	.436**	.395**	0,095	-0,105	1,000	.512**	.451**	.585**
	Sig. (2-tailed)	0,000	0,001	0,026	0,000	0,000	0,336	0,288		0,000	0,000	0,000
	N	108	108	108	104	104	104	104	109	103	103	99
EF1_Competitive Intelligence & Enterprise Strategy	Correlation Coefficient	.217*	.246*	.264**	.317**	0,189	.210*	-0,043	.512**	1,000	0,078	.501**
	Sig. (2-tailed)	0,027	0,012	0,007	0,001	0,060	0,036	0,668	0,000		0,429	0,000
	N	104	104	104	100	100	100	100	103	105	105	98
EF2_Strategic Industry Intelligence & Awareness	Correlation Coefficient	0,104	.217*	0,167	0,080	.658**	-0,094	-0,053	.451**	0,078	1,000	.558**
	Sig. (2-tailed)	0,295	0,027	0,091	0,427	0,000	0,352	0,603	0,000	0,429		0,000
	N	104	104	104	100	100	100	100	103	105	105	98
FF1_Market Intelligence for Business Growth	Correlation Coefficient	.249*	.289**	.245*	0,183	.537**	0,002	0,010	.585**	.501**	.558**	1,000
	Sig. (2-tailed)	0,012	0,003	0,014	0,076	0,000	0,985	0,922	0,000	0,000	0,000	
	N	100	100	100	95	95	95	95	99	98	98	100

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

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

A strong, positive correlation was again noted between the Strategic Industry Intelligence and Awareness factor and the Market Intelligence for Business Growth factor ($r=0,558$, $n=98$, $p<0,05$) indicating high association between the two variables in the context that enterprises that are pursuing Market Intelligence initiatives for business growth should also explore and gather strategic industry insights, since both would yield positive results towards SME business growth.

In overall a few factors also revealed medium, positive correlations between other factors such as the Technology Integration and Business Operations with SME Business Intelligence Capabilities, as well as the SME Business Intelligence Capabilities and the Strategic Industry Intelligence & Awareness factors. Other correlation results indicated low association between factors concerned, suggesting a disconnect between the concept in that regard.

4.7 Frequency Analyses

An analysis of statistical frequencies was also conducted across all the sections of the survey questionnaire. The multiple response analysis tool was employed to analyse the frequency of responses, taking into account the Likert's scale that was utilised for the survey as the dimension of measure against the percentages of respondents' perceptions on the subject matters of the survey.

The intent was to draw analysis of respondent's direct views on the actual research questions, with the objective of being able to draw even more explicit insights from the study and clearly demonstrate the alignment to research objectives from related results inferences.

Mainly the survey questionnaire studied the role of Intelligent Technologies on the growth of emerging enterprises in South Africa from these perspectives, *Section B: The State and Situational Analysis of Emerging Enterprises; Section C: The Technological Capability and Readiness of Emerging Enterprises; Section D: Business Intelligence in SA Emerging Enterprises; Section E: Competitive*

Intelligence in SA Emerging Enterprises and *Section F: Market Intelligence in SA Emerging Enterprises*. The following results were established:

Table 16: Frequencies Analyses of the Situational Analysis of Emerging Enterprises

Section B: The State and Situational Analysis of Emerging Enterprises							
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1. There is a steady growth outlook in your business	Count	6	9	32	53	30	130
	Row N %	4,6%	6,9%	24,6%	40,8%	23,1%	100,0%
2. The company is on course with its business objectives	Count	4	12	20	59	34	129
	Row N %	3,1%	9,3%	15,5%	45,7%	26,4%	100,0%
3. The business has a stable cashflow	Count	5	20	35	41	28	129
	Row N %	3,9%	15,5%	27,1%	31,8%	21,7%	100,0%
4. The costs are well managed by your company	Count	9	13	28	55	24	129
	Row N %	7,0%	10,1%	21,7%	42,6%	18,6%	100,0%
5. There are employees working for the organisation	Count	5	9	6	46	62	128
	Row N %	3,9%	7,0%	4,7%	35,9%	48,4%	100,0%
6. Business opportunities often require collaborative relationships with other stakeholders	Count	1	3	6	50	68	128
	Row N %	0,8%	2,3%	4,7%	39,1%	53,1%	100,0%
7. There is a potential for growth in your industry	Count	0	3	14	48	63	128
	Row N %	0,0%	2,3%	10,9%	37,5%	49,2%	100,0%
8. Your Products/Services are easily accessible by customers	Count	0	8	18	56	46	128
	Row N %	0,0%	6,3%	14,1%	43,8%	35,9%	100,0%
9. There is a good market for your products and services	Count	0	2	10	58	58	128
	Row N %	0,0%	1,6%	7,8%	45,3%	45,3%	100,0%
10. There is good profitability in your business	Count	0	10	17	59	42	128
	Row N %	,0%	7,8%	13,3%	46,1%	32,8%	100,0%

Table 16 analysed the situational assessment of emerging enterprises in South Africa; respondents predominantly gave an indication that their enterprises are steadily growing and are in course with their business objectives. A significant number of respondents however provided an indication they are strongly disagreeing, disagreeing and neutral at 46,5% combined about their businesses having a stable cashflow; although the majority still both agreed and strongly agreed at 53,5%, this was notably a large percentage with negative sentiments.

A great amount of respondents also indicated that a good potential for growth of their businesses at 49,2% agreeing and 37,5% strongly agreeing which was encouraging. It was also revealed that accessibility of goods and services also

gave a positive indication at 79,7% of respondents both agreeing and strongly agreeing combined. Furthermore, the responses also indicated that there is a good market and good profitability made by their businesses at both significantly high percentages who both agreed and strongly agreed.

Table 17: Frequencies Analyses of Technological Capability and Readiness of Emerging Enterprises

Section C: The Technological Capability and Readiness of Emerging Enterprises

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
	Count	2	2	5	31	83	123
1. The use of technology is important for your business	Row N %	1,6%	1,6%	4,1%	25,2%	67,5%	100,0%
	Count	4	4	9	41	65	123
2. There is data generated by your business operations (e.g. volume of products, customers, consulting hours, etc)	Row N %	3,3%	3,3%	7,3%	33,3%	52,8%	100,0%
	Count	0	6	7	41	69	123
3. Software application systems are important for your business activities	Row N %	0,0%	4,9%	5,7%	33,3%	56,1%	100,0%
	Count	5	8	13	42	55	123
4. Your company uses software applications	Row N %	4,1%	6,5%	10,6%	34,1%	44,7%	100,0%
	Count	11	31	22	36	23	123
5. Your activities are largely manually driven	Row N %	8,9%	25,2%	17,9%	29,3%	18,7%	100,0%
	Count	2	13	19	45	43	122
6. Systems automation is required by your business	Row N %	1,6%	10,7%	15,6%	36,9%	35,2%	100,0%
	Count	1	9	15	56	42	123
7. You are aware of what Business Intelligence is all about	Row N %	0,8%	7,3%	12,2%	45,5%	34,1%	100,0%
	Count	2	13	15	58	34	122
8. You are aware of what Competitive Intelligence is	Row N %	1,6%	10,7%	12,3%	47,5%	27,9%	100,0%
	Count	1	13	21	56	31	122
9. You are aware of what Market Intelligence is	Row N %	0,8%	10,7%	17,2%	45,9%	25,4%	100,0%
	Count	1	12	24	57	27	121
10. You are aware of Intelligent Technologies developments	Row N %	,8%	9,9%	19,8%	47,1%	22,3%	100,0%
	Count	4	16	21	44	37	122
11. Your business model requires funding/financing for growth	Row N %	3,3%	13,1%	17,2%	36,1%	30,3%	100,0%
	Count	9	26	24	45	17	121
12. There are barriers of entry impacting the growth of your company	Row N %	7,4%	21,5%	19,8%	37,2%	14,0%	100,0%
	Count	8	31	21	47	13	120
13. There are barriers of entry preventing your business from opportunities	Row N %	6,7%	25,8%	17,5%	39,2%	10,8%	100,0%

In terms of the technological readiness and capability analysis, table 17 provides an snippet of respondents views, which mostly were gave a positive indication of

respondents' awareness of technological concepts and their enterprises' technological capabilities. A significant 67,5% of the total respondents indicated that the use of technology is important for their business; whilst 52,8% also indicated that their enterprises generate business and operational data. When synthesising results, a total of 52% of respondents collectively strongly disagreed, disagreed and also remained neutral on their enterprises being largely manually driven.

A significant number of respondents also indicated that their enterprise business models require funding or financing to grow, whilst most respondents also highlighted that there are barriers of entry impacting the growth of their businesses, preventing them from growth. The majority of respondents further agreed and strongly agreed to have knowledge and insights on Intelligent Technologies, Business Intelligence, Competitive Intelligence and Market Intelligence subject matters.

Table 18: Frequencies Analyses of Business Intelligence in SA Emerging Enterprises

Section D: Business Intelligence in SA Emerging Enterprises

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1. Business intelligence is important for your business activities	Count	1	4	8	55	43	111
	Row N %	0,9%	3,6%	7,2%	49,5%	38,7%	100,0%
2. Your company is able to exploit insights from internal performance data	Count	4	8	21	51	27	111
	Row N %	3,6%	7,2%	18,9%	45,9%	24,3%	100,0%
3. Decision making is largely driven by data and objective facts	Count	7	11	14	46	33	111
	Row N %	6,3%	9,9%	12,6%	41,4%	29,7%	100,0%
4. Your company uses business intelligences application systems	Count	7	22	20	40	21	110
	Row N %	6,4%	20,0%	18,2%	36,4%	19,1%	100,0%
5. Company strengths and weaknesses are better managed with business intelligence capabilities	Count	5	10	27	48	21	111
	Row N %	4,5%	9,0%	24,3%	43,2%	18,9%	100,0%
6. There is a strong focus on data quality and accuracy in your business	Count	5	12	13	50	31	111
	Row N %	4,5%	10,8%	11,7%	45,0%	27,9%	100,0%
7. Business Intelligence positively improves the performance of the company	Count	1	7	19	48	36	111
	Row N %	0,9%	6,3%	17,1%	43,2%	32,4%	100,0%
8. Data analytics reduces inefficiencies within your business processes	Count	1	11	23	51	25	111
	Row N %	0,9%	9,9%	20,7%	45,9%	22,5%	100,0%
	Count	0	8	17	63	23	111

9. Internal data trends enable your company to develop growth opportunities	Row N %	0,0%	7,2%	15,3%	56,8%	20,7%	100,0%
10. You use specific business intelligence indicators to monitor business performance (e.g. Profitability, Customer Satisfaction, Efficiency, Growth)	Count	2	8	16	47	38	111
	Row N %	1,8%	7,2%	14,4%	42,3%	34,2%	100,0%
11. Quantifiable benefits have been achieved using Business Intelligence tools	Count	1	10	27	47	25	110
	Row N %	,9%	9,1%	24,5%	42,7%	22,7%	100,0%

With regards to the Business Intelligence in SA emerging enterprises frequencies, the majority of respondents 56,8% of the total indicated that internal data trends enable their enterprises to develop growth opportunities, whilst 20,7% strongly agreed. A significant percentage of respondents agreed that Business Intelligence (BI) is pivotal for their business activities; that their companies exploit insights from performance data, decisions are largely data driven, BI improves company performances, and that they use specific BI tools which have resulted to achieving quantifiable benefits.

It was also noted that a combined significant number of 44,5% of the total respondents disagreed, strongly disagreed and remained neutral on their companies using BI application systems, whereas 55.5% both agreed and strongly agreed.

Table 19: Frequencies Analyses of Competitive Intelligence in SA Emerging Enterprises

Section E: Competitive Intelligence in SA Emerging Enterprises

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1. You are aware of what Competitive Intelligence is all about	Count	2	11	23	48	23	107
	Row N %	1,9%	10,3%	21,5%	44,9%	21,5%	100,0%
2. You are aware of the benefits of Competitive Intelligence for businesses	Count	2	9	20	55	21	107
	Row N %	1,9%	8,4%	18,7%	51,4%	19,6%	100,0%
3. There is a lot of competition in your business landscape	Count	2	13	17	36	39	107
	Row N %	1,9%	12,1%	15,9%	33,6%	36,4%	100,0%
4. You understand the strategies of your competitive rivals	Count	3	10	24	55	15	107
	Row N %	2,8%	9,3%	22,4%	51,4%	14,0%	100,0%
5. Knowledge about your competition has a positive impact to your enterprise	Count	3	6	17	53	28	107
	Row N %	2,8%	5,6%	15,9%	49,5%	26,2%	100,0%
	Count	0	9	17	59	22	107

6. You know the future direction your sector is headed towards	Row N %	0,0%	8,4%	15,9%	55,1%	20,6%	100,0%
	Count	3	17	26	39	22	107
7. There are tools/systems you use to analyse competition in your sector	Row N %	2,8%	15,9%	24,3%	36,4%	20,6%	100,0%
	Count	3	10	18	54	22	107
8. Gathering and understanding competitive intelligence is important for your company	Row N %	2,8%	9,3%	16,8%	50,5%	20,6%	100,0%
	Count	2	11	15	52	27	107
9. Competitive intelligence helps to better shape your enterprise strategy	Row N %	1,9%	10,3%	14,0%	48,6%	25,2%	100,0%
	Count	2	8	15	55	26	106
10. You are aware of the latest trends and technologies within your industry	Row N %	1,9%	7,5%	14,2%	51,9%	24,5%	100,0%
	Count	1	9	18	51	27	106
11. Competitive intelligence systems enable the growth of your enterprise	Row N %	,9%	8,5%	17,0%	48,1%	25,5%	100,0%

With regards to Competitive Intelligence in SA emerging enterprises, the majority of respondents indicated and agreed to awareness about Competitive Intelligence concepts, understanding competitive rivals' strategies, knowledge about the future direction of their industries awareness of latest technological trends in their landscape. However, most respondents also disagreed, strongly disagreed and took a neutral position about tools and systems to being in place to analyse competition in their sector.

Table 20: Frequencies Analyses of Market Intelligence in SA Emerging Enterprises

Section F: Market Intelligence in SA Emerging Enterprises

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1. Market intelligence is an important driver of differentiating your products/services	Count	3	2	16	47	33	101
	Row N %	3,0%	2,0%	15,8%	46,5%	32,7%	100,0 %
2. Market insights enable the development of competitive pricing strategies	Count	2	3	9	54	32	100
	Row N %	2,0%	3,0%	9,0%	54,0%	32,0%	100,0 %
3. You have a market intelligence tool for your enterprise	Count	7	19	26	32	17	101
	Row N %	6,9%	18,8%	25,7%	31,7%	16,8%	100,0 %
4. Market knowledge systems simplify segmenting customers for your enterprise	Count	2	7	22	47	22	100
	Row N %	2,0%	7,0%	22,0%	47,0%	22,0%	100,0 %
5. Market intelligence enhances opportunities for business growth	Count	2	3	12	55	29	101
	Row N %	2,0%	3,0%	11,9%	54,5%	28,7%	100,0 %

6. Market knowledge is an important driver of innovation for emerging enterprises	Count	2	5	12	52	31	102
	Row N %	2,0%	4,9%	11,8%	51,0%	30,4%	100,0 %
7. Market intelligence enables a better understanding of customer needs	Count	1	2	10	48	41	102
	Row N %	1,0%	2,0%	9,8%	47,1%	40,2%	100,0 %
8. Market insights drive continuous improvement of product/service quality	Count	1	5	11	48	37	102
	Row N %	1,0%	4,9%	10,8%	47,1%	36,3%	100,0 %
9. Market knowledge optimises effective marketing strategies development	Count	1	3	10	56	32	102
	Row N %	1,0%	2,9%	9,8%	54,9%	31,4%	100,0 %

The analysis of the Market Intelligence frequencies presented predominant perceptions of respondents who significantly agreed that Market Intelligence is an important enabler for differentiating their products and services; 54% of respondents agreed that market insights enable competitive pricing strategies, whilst 32% strongly agreed, stimulate business growth opportunities, drive innovation for emerging enterprises, enable better understanding of customer expectations, drive continuous improvement of products and service quality and that market insights optimise the development of effective marketing strategies.

The results also reveal a significant 51,5% of total respondents who in combination were not sure/neutral, disagreed and strongly disagreed on their enterprises having market intelligence tools, whereas 48,5% both agreed and strongly agreed.

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

This study utilised numerous instruments and techniques such as academic literature, research methods and guidelines, quantitative research techniques, statistical software applications and other research means to support the case and work towards research results.

This research set out to explore the role of Intelligent Technologies from perspectives and context of business intelligence, market intelligence, and competitive intelligence in the growth of emerging enterprises in South Africa. Through a quantitative approach, premised in the Dynamic Capability as well as Intelligent Enterprise Theories, the study aimed to establish the role and impact of these technologies on Emerging Enterprises (SMEs) growth and development, considering variables such as company size, industry sector, and job level.

5.1 Achievement of Research Objectives

5.1.1 Evaluation of Technological Tools, Models, and Systems

The study thoroughly examined the current utilisation of Intelligent Technologies among SMEs, highlighting a varied uptake based on company size. Larger enterprises demonstrated a more sophisticated application of these technologies compared to their smaller counterparts, indicating a direct correlation between company size and the adoption level of intelligent technologies. This finding aligns with the objective of evaluating the technological landscape within emerging enterprises, illustrating the need for scalable solutions that cater to the diverse needs of SMEs.

5.1.2 Determination of the Role and Influence of Intelligence Technologies

By analysing responses from different industries/sectors and job levels, the study affirmed a broad acknowledgment of the value provided by intelligent technologies across all industry sectors, irrespective of the job hierarchy within companies. This universal recognition underscores the pivotal role of Intelligent Technologies in enhancing operational efficiency, strategic decision-making, and competitive positioning, fulfilling the objective of identifying their impact on enterprise growth.

5.1.3 Investigation of Challenges Hampering the Use of Intelligent Technologies

The research identified key barriers to the adoption of Intelligent Technologies, including resource limitations, knowledge gaps, and the varying capabilities associated with company sizes. These challenges are critical considerations for emerging enterprises aiming to leverage intelligent technologies for growth, meeting the objective of uncovering impediments to technology utilization.

5.1.4 Conclusion

The research substantiates that Intelligent Technologies are integral to fostering the growth and competitiveness of emerging enterprises in South Africa. It has illuminated a significant relationship between the deployment of intelligent technologies and enhanced business performance, albeit influenced by factors like company size and availability of resources. Notably, the widespread acknowledgment of the importance of these technologies across different sectors and job levels suggests a strong foundation for future adoption and integration.

However, the disparities in technology adoption based on company size highlight the necessity for a much more bespoke and customised approach to technology implementation. Tailored strategies that consider the unique needs and capacities of SMEs are essential to maximize the benefits of intelligent

technologies. This adaptation ensures that smaller enterprises are not left behind in the digital transformation journey.

Furthermore, the strong correlations between different constructs of Intelligent Technologies suggest that a holistic approach, integrating business, market, and competitive intelligence, can significantly amplify growth outcomes. This interconnectedness advocates for a strategy that leverages the collaborative potential of Intelligent Technologies to foster comprehensive enterprise development.

5.1.5 *Implications for Future Research and Practice*

This study contributes to the academic discourse on the association of technology and business growth, offering a foundational understanding that stakeholders can build upon. For SME owners and business practitioners, the findings underscore the critical importance of strategic investment in intelligent technologies tailored to their specific business context.

Future research could delve deeper into the causal relationships between specific technologies and growth outcomes, potentially offering sector-specific insights. Additionally, prospective studies could track the evolution of technology adoption and its long-term impact on SMEs in varying economic climates.

In conclusion, as South Africa's emerging enterprises navigate an increasingly digitalised global economy, confronted with high economic instability and uncertainty in current times, the strategic application of intelligent technologies emerges as a key driver of sustainable growth, however the costs of investment being a key factor. This research has laid the groundwork for further exploration and application of these technologies, paving the way for a new era of Intelligent Emerging Enterprises development.

5.2 Recommendations

Based on the insights derived from this study on the role of Intelligent Technologies in the growth of emerging enterprises in South Africa, the following

recommendations are proposed to maximise the benefits of these technologies and address the identified challenges.

5.2.1 *For Emerging Enterprises*

- **Strategic Adoption of Intelligent Technologies:** Businesses, especially SMEs, should prioritize the strategic adoption of Business Intelligence, Market Intelligence, and Competitive Intelligence. Tailored adoption plans that consider the company's size, industry or sector, and specific business needs can enhance operational efficiency and strategic decision-making.
- **Capacity Building and Training:** Invest in training for staff at all levels to enhance digital literacy and understanding of intelligent technologies. This ensures that the entire organisation can contribute to and benefit from the implementation of these technologies.
- **Leveraging Synergies:** Explore and exploit the collaborative potential of integrating Business, Market, and Competitive Intelligence Technologies. This integrated approach can provide a more comprehensive understanding of the market and operational environment, leading to better strategic decisions.
- **Innovation and Continuous Learning:** Encourage a culture of innovation and continuous learning within the organization to keep pace with technological advancements and maintain competitiveness in a rapidly evolving digital landscape.

5.2.2 *For Emerging Enterprises*

- **Developing Scalable Solutions:** Create scalable and flexible technology solutions that can be tailored to the needs of SMEs of different sizes and at various stages of growth. This includes offering modular, customisable platforms that can grow with the business.
- **Providing Support and Training:** Offer comprehensive support and training services to ensure that emerging enterprises can effectively

implement and utilize intelligent technologies. This includes technical support, user training, and resources for best practices.

5.2.3 *For Academic and Research Institutions*

- **Focused Research on SMEs and Technology:** Conduct further research on the barriers to technology adoption specific to SMEs and the impact of different technologies on SME growth. This research should aim to provide actionable insights that can guide technology implementation strategies.
- **Partnerships for Knowledge Transfer:** Establish partnerships with industry to facilitate the transfer of knowledge and technology between academia and SMEs. This can help bridge the gap between theoretical research and practical application.

5.2.4 *For Academic and Research Institutions*

- **Fostering a Supportive Ecosystem:** Academic institutions could develop policies and initiatives that support the adoption of Intelligent Technologies by SMEs. This could include financial incentives, grants for technology upgrades, and programs that reduce the digital divide.
- **Promoting Collaboration:** Encourage collaboration between SMEs, technology providers, academic institutions, and government agencies to foster innovation and the exchange of knowledge regarding Intelligent Technologies.
- **Infrastructure and Regulatory Support:** Work towards improving digital infrastructure and providing a regulatory environment that supports digital transformation and the secure use of intelligent technologies.

5.3 Managerial Implications

The findings of this research on the role of Intelligent Technologies in the growth of Emerging Enterprises carry substantial managerial implications. These implications provide actionable insights for managers and business leaders aiming to navigate the complexities of adopting and integrating Intelligent Technologies within their organisations. Here are the key managerial implications derived from the study:

5.3.1 *Strategic Alignment and Implementation*

- **Customised Technology Strategy:** Managers should develop customised technology strategies that align with their companies' specific needs, size, and growth stage. This involves identifying the right mix of Business Intelligence, Market Intelligence, and Competitive Intelligence Technologies that can drive strategic objectives.
- **Integration for Synergy:** There's a need for an integrated approach to implementing Intelligent Technologies. Managers should seek to create synergies between different technological domains to enhance overall business performance, rather than viewing each technology in isolation.

5.3.2 *Capacity Building and Organisational Culture*

- **Investment in Training:** Building the capacity of employees across all levels is crucial for the effective utilisation of intelligent technologies. Managers should invest in training programs to enhance digital literacy and ensure that their teams can leverage these technologies to their full potential.
- **Fostering a Culture of Innovation:** Encouraging a culture of continuous learning and innovation within the organisation is essential. Managers should promote an environment where employees are encouraged to experiment with new technologies and contribute ideas for their application.

5.3.3 *Leveraging Data for Decision Making*

- **Data-Driven Culture:** Managers should foster a data-driven culture within their organisations, where decision-making is grounded in insights derived from Business Intelligence. This involves not only the collection of relevant data but also its analysis and interpretation to inform strategic decisions.
- **Competitive and Market Insights:** Utilising competitive and market intelligence to stay ahead of industry trends and competitor strategies is critical. Managers should implement systems for monitoring and analysing market data to identify opportunities for growth and differentiation.

5.3.4 *Addressing Implementation Challenges*

- **Resource Allocation:** Recognising that resource constraints can hinder the adoption of Intelligent Technologies, especially for smaller enterprises, managers should strategically allocate resources to prioritise investments in technologies that offer the most significant potential for impact.
- **Collaboration and Partnerships:** Managers should seek collaborations with technology providers, industry associations, and other enterprises to overcome barriers to technology adoption. This can include participating in shared learning platforms, technology consortia, or joint ventures.

5.3.5 *Policy and Regulatory Considerations:*

- **Navigating Regulatory Environments:** Managers must stay informed about the regulatory environment related to digital technologies and data usage. Ensuring compliance with data protection regulations and ethical guidelines is paramount for maintaining stakeholder trust and avoiding legal repercussions.
- **Advocacy for Supportive Policies:** Business leaders should engage in advocacy efforts with policymakers to promote the development of a supportive ecosystem for the adoption of Intelligent Technologies. This

can include lobbying for incentives, infrastructure improvements, and policies that facilitate digital transformation.

5.3.6 Conclusion:

The managerial implications of this research underscore the necessity for strategic, informed, and integrated approaches to adopting Intelligent Technologies within emerging enterprises. By addressing these areas, managers and business leaders can better position their organizations to leverage the transformative potential of these technologies, driving growth and ensuring sustainable competitive advantage in the digital era.

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