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**A critical review of AI adoption for digital transformation in small to medium businesses  
(SMB's) in South Africa**

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## **Chapter 1: Introduction**

### **1.1 Purpose of the study:**

The purpose of this study is to review: (1) the current state of AI adoption for digital transformation in SMB's in SA, (2) the perceived benefits of AI adoption for digital transformation in SMB's in SA, (3) the perceived barriers to AI adoption for digital transformation in SMB's in SA, and (4) the current AI adoption frameworks used for digital transformation in SMB's in SA.

### **1.2 Context of the study:**

A 2022 research paper by Schoeman and Seymour (2022) studied the low adoption rates of AI in medium sized organizations in SA and found anecdotal evidence to suggest that even when SME's have access to AI tools as part of their ERP software, they still choose not to adopt these tools due to certain inhibiting factors that prevent the adoption thereof. As AI is predicted to boost business performance and operational efficiency in most global organizations by nearly 40% year ending 2035 (Oclarino, 2021), Schoeman and Seymour (2022) saw the low AI adoption rates in medium sized organizations in SA as a major source of concern for the South African economy, as the South African economy critically depends on local SME's to both initiate and sustain economic development and growth within the country.

As Schoeman and Seymour (2022) continued to investigate the most common enabling and inhibiting factors to AI adoption in medium sized organizations in SA, their study was limited not only by the lack of a compelling business case in medium sized organizations in SA, but also by the total number of medium sized organizations that participated in the study, the diversity of medium sized organizations that participated in the study and the general lack of reaching theoretical saturation around the topic of AI adoption in SMB's in SA.

As such, Schoemand and Seymour (2022) recommended that future investigations include more SME's to the investigative scope of their projects, though with differentiating characteristics and sizes than what was used for the purpose of their study, identify additional themes around critical enabling and inhibiting factors to AI adoption decisions in SME's in SA, and commit to reaching theoretical saturation through the presentation of new information, insights and perspectives.

### **1.3 Research problem:**

Since publication of the paper by Schoeman and Seymour in 2022, AI as a digital technology for digital transformation has seen some significant development and growth with new industry applications like AI-augmented development, AI risk and security management and generative AI (Chui, Issler, Roberts, & Yee, 2023). As such, this research project assumes that the current state, benefits and barriers to AI adoption for digital transformation in SMB's in SA have changed equally and in relation to the fast growing and everchanging environment that is the introduction of new AI technologies to innovative industry trends. Since no new studies around the extent, benefits or barriers to AI adoption for digital transformation in SMB's in SA have been formulated to either prove, disprove or supplement the results of the coherent findings of the study by Schoeman and Seymour (2022), it only further substantiates the need for a critical review and current understanding of both the extent and the impact of these changes on the AI adoption process from a SA SMB's perspective.

### **1.4 Research objectives:**

The research objectives of this study can therefore be categorized as below:

#### **1.4.1 Main objective:**

To critically review the current state of AI adoption for digital transformation in SMB's in SA.

#### **1.4.2 Sub-objective 1**

To critically review the perceived benefits of AI adoption for digital transformation in SMB's in SA.

#### **1.4.3 Sub-objective 2**

To critically review the perceived barriers to AI adoption for digital transformation in SMB's in SA.

#### **1.4.4 Sub-objective 3**

To critically review the use of AI adoption frameworks for digital transformation in SMB's in SA.

## **1.5 Significance of the study:**

The theoretical significance of this study is to use the technological, organizational and environmental (TOE) framework to discern which AI adoption themes (i.e. enabling and inhibiting factors) are still relevant to current AI adoption decisions for digital transformation in SMB's in SA. It will extend our current theoretical knowledge and understanding of AI adoption for digital transformation in SMB's in SA and provide additional insights into the mindset of local SMB owners towards embracing the 4IR as an equal opportunity to compete, both locally and globally. It will also contribute to the theoretical saturation of AI adoption for digital transformation in SMB's in SA. The practical significance of this study is to provide local SMB owners with the necessary guidance through new information, insights and perspectives, as to what inhibiting factors need to be conquered before successful AI adoption for digital transformation in SA SMB's can be achieved. It will inform their decision-making process through practical assessment.

## **1.6 Delimitations of the study**

1. This study will follow an interpretive philosophical approach, whereby semi-structure interviews with any participants will be supplemented by other forms of secondary (field) data, which might not be available.
2. This study will focus on non-industry specific SMB's in the Gauteng region, as most SMB's in SA are situated either in and around Johannesburg as the economic hub of the country (Magodi, Daniyan, & Mpofu, 2023).
3. This study will exclude entrepreneurships (or start-ups) and large enterprises, as a different set of defining parameters apply to the size classification categories according to the National Small Business Act of 1996 (The National Small Business Act, 1996). SMB's also have a unique set of challenges posed by digital transformation, which do not apply to the aforementioned.
4. This study will not adopt a longitudinal approach due to time constraints.

## **1.7 Assumptions**

The following assumption has been made regarding this study:

1. It is assumed that the extent, the benefits and the barriers to AI adoption for digital transformation in SMB's in SA have changed since publication of the paper by Schoeman and Seymour in 2022 and that the subsequent advancement of new AI technologies have shifted the paradigm around AI adoption in SMB's in SA from a passive to a more active approach in both the perception and the minds of SMB owners.

## **Chapter 2: Literature review**

### **2.1 Introduction**

This study critically evaluates the current state, benefits, barriers and organizational frameworks for AI adoption in SMB's in SA as part of their digital transformation journey. As such, this literature review will provide context for the various subjects by examining prior research on AI as an individual digital technology for digital transformation, the classification of SMB's from within a South African context and the existence of organizational frameworks for AI adoption in SMB's in SA.

### **2.2 Theoretical review**

#### **2.2.1 Definition of artificial intelligence**

In reference to the study by Schoeman and Seymour in 2022, AI can be defined as a set of computerized programs that both act and engage in human-like thought processes, as adapted from the definition by Kok et al., (2009), which described AI more as a continuously evolving term that can be classified into one of the following categories of artificially intelligent systems: (1) systems that think like humans, (2) systems that act like humans, (3) systems that think rationally, or (4) systems that act rationally. However, since 2022 the concept of AI has grown significantly and now includes an even wider range of definitions and associated terminologies depending on the application. Generative artificial intelligence (GIA) for example is one such terminology that have gained significant popularity and use since 2022 as an emerging subspecies of AI defined as "a type of artificial intelligence technology that can produce various types of content including text, imagery, audio and video from basic input prompts as synthetic data (Booth, Donohew, Wlezien, & Wu, 2024) (Feuerriegel, Hartmann, Janiesch, & Zschech, 2023).

#### **2.2.2 Definition of South African small and medium businesses (SMB's)**

The definition of small and medium business categories in South Africa, according to The National Small Business Act 102 of 1996, can be defined as (The National Small Business Act, 1996):

- Small businesses are generally more established and exhibit more complex business practices than entrepreneurships, micro- and very small businesses and have an upper limit of 50 employees.

- Medium businesses are often characterized by the decentralization of power to an additional management layer, with a maximum number of employees of 100 or 200 for the mining, electrical, manufacturing and construction sectors.

According to Leboea (2017), The National Small Business Act's definition of SMB's in South Africa can be summarized as set out in **Table 1** below:

**Table 1** – Definition of SMB's according to the National Small Business Act of 1996 as sourced by (*The National Treasury, 2023*) and adapted by (*Leboea, 2017*).

Enterprise Size	Number of Employees	Annual Turnover (ZAR)	Gross Assets (Excluding Fixed Property)
Small	Less than 50	Less than R 2 million to R25 million – industry dependent.	Less than R2 million to R4.5 million – industry dependent.
Medium	Less than 100 to 200 – industry dependent.	Less than R4 million to R50 million – industry dependent.	Less than R2 million to R18 million – industry dependent.

## 2.3 Conceptual review

### 2.3.1 Organizational AI adoption frameworks

Many theoretical frameworks for technology adoption exists, including the technology acceptance model (TAM), the theory of planned behaviour (TPB), the theory of reasoned action (TRA) and the technological, organizational and environmental (TOE) framework. As the TAM, TPB and the TRA frameworks focusses mainly on an individual's adoption of technology's perspective, the TOE framework allows for an organizational view of implementation (Smit & Eybers, 2022). For this reason, Schoeman and Seymour (2022) used the TOE framework by Depietro et al., (1990) for assessing low AI adoption in medium sized organizations in SA, as it provided more of a holistic overview and approach towards AI adoption than any of the other mentioned frameworks.

As the TOE framework includes three concepts, the technology concept specifically describes both the availability and the characteristics of the technology that influences the adoption decision, the organizational concept describes the organization including its inherent characteristics and the internal decision-making processes, whilst the environmental concept refers to the space that the organization operates in (Depietro, Wiarda, & Fleischer, 1990). According to Wang et al., (2010), the

only critique to this framework is that the major concepts are not clearly defined, whereas Frambach and Schillewaert (2002) considers limitations to the framework as not considering supplier marketing efforts and social networks as significant characteristics that could influence its perceived innovation characteristics.

In the South African context, where informal networks and casual relationships form key enablers to basic business activity within the local SMB space, the TOE framework might fall short or even fail to fully capture the relevant drivers needed for successful AI adoption. Alternative frameworks like the Resource-Based View (RBV) (Barney, 1991) or Dynamic Capabilities Theory (DCT) (Kahneman & Tversky, 1979) might therefore be more suited to assess whether local SMB's can successfully leverage AI adoption for digital transformation. The TOE framework, whilst appropriate, should be considered in combination with or supplemented by an alternative theories or additional frameworks for future research.

## **2.4 Conclusion**

As current academic literature focusses on addressing the topics of AI, digital transformation and technological adoption frameworks, either individually or from a global perspective, there is a clear lack of coherent research around the topic of AI adoption for digital transformation from a SA SMB's perspective.

## **2.5 Research propositions**

### **2.5.1 Proposition 1**

Current adoption of AI for digital transformation in SMB's in SA is slow due to the perceived benefits of AI adoption being overshadowed by its perceived risks, which includes the lack of a compelling business case to support the adoption initiative.

### **2.5.2 Proposition 2**

Current benefits of AI adoption for digital transformation in SMB's in SA include staff reductions, increased operational efficiency and enhanced business performance.

### **2.5.3 Proposition 3**

Current barriers to AI adoption for digital transformation in SMB's in SA include a lack of IT maturity or preparedness, scarce resource skills and capabilities, associated costs and an inherent fear of

the humanly unknown.

#### **2.5.4 Proposition 4**

The most common organizational framework used for AI adoption in SMB's in SA is the TOE framework.

## **Chapter 3: Research methodology**

### **3.1 Introduction**

This chapter presents details of the entire research proposal, process and approach as used to conduct the investigative portion of this study.

### **3.2 Research design**

The main research methodology will include a qualitative study of non-numerical data (or interpretive information) through the application of interpretive philosophy as a suitable qualitative research technique. It will use interpretivism to understand the different concepts, opinions and experiences as obtained from semi-structured face-to-face and online interviews that use open-ended questions as a means to adapt to the responses of interviewees for additional insights and perspectives into the mindset of local SMB owners when considering AI adoption for digital transformation in SMB's in SA. As AI adoption decisions are subjective in nature, it justifies the need for a qualitative study to interpret human experiences within a broad social context.

### **3.3 Data collection methods**

Primary data will be collected by means of semi-structured face-to-face and online interviews. The reason for this approach is the ensuing flexibility and adaptability owed to the researcher during the conduction of the interview process, as it allows the researcher the ability to gain additional information and insights through probing, if and where applicable (Adams, 2015). Predetermined semi-structured interview questions will be sent to each participant well before conduction of the interview to allow them to think about their responses and give the most accurate account of the information required.

Due to the investigative nature of this study, a secondary method of data collection will be used to triangulate the results. Secondary data will be in the form of field data to support primary data as collected during the interview process and may include annual reports, financial statements, analyst reports, board presentations or any other credible forms of information.

### **3.4 Population**

The population of the study will include senior IT managers, CIO's and SMB owners of SMB's specifically located within the Gauteng region of SA. As the identified population represents the

primary decision-makers of individual digital technology adoption for digital transformation in SMB's in SA, the representative population is seen as suitable for gaining the necessary information and insights as envisioned for the purpose of this study.

### **3.5 Sample size**

The sample size selected will include ten SMB's (i.e. C1 – C10) in SA. The sample size was justified by variability, diversity and data saturation considerations (Creswell & Poth, 1994), selecting ten SMB's with a broad range of coverage across multiple industries to include at least one growth industry (information technology) and one declining industry (steel manufacturing) to inform both the upper and the lower limits of the selected sample size, as well as ensure a diverse industry position and representation. In no specific order, the ten SMB's selected were representative of the following industries: information technology (IT), mining, renewable energy, health, consulting, security, accounting, marketing, manufacturing and retail. Time, budget and resource constraints also informed the selected sample size, as a non-longitudinal study does not allow for much of either of these considerations.

### **3.6 Sampling method**

The method of sampling will include purposive sampling, whereby identified participants were all pre-selected to fit the abovementioned sampling criteria. This is to utilise the advantages of purposive sampling, which includes the availability of a wide range of sampling techniques, the justification of generalizations, the inclusion of multiple sampling phases and the overall time- and cost-effectiveness when compared to other sampling methods or techniques (Rai & Thapa, 2015).

### **3.7 Research instrument**

The research instrument for this study will include a semi-structure interview guide. The interview guide will be designed to address all aspects of the TOE adoption framework as a means to understand the AI adoption process in SMB's in SA. Each question will include an aspect of either technological, organizational or environmental considerations to AI adoption decisions in SMB's in SA. The interview guide will be proof read and piloted by 3 to 5 colleagues to ensure that the intent and the meaning behind each question is clearly understood, as well as to discern an appropriate time limit for said guide. The semi-structured interview guide is as provided in Appendix A.

### **3.8 Data analysis strategy**

The dominant data analysis strategy will follow a thematic analysis approach as proposed by Braun and Clarke (2006), as to inductively identify any reoccurring themes within the set or subset of qualitative data collected during the interview process. After identifying any reoccurring themes, each theme will be classified as either a “driver” or an “inhibitor” to the AI adoption decision-making process for digital transformation in SMB’s in SA and listed according the broad literature classifications as defined by Schoeman and Seymour 2022 and other related academic literature.

### **3.9 Data interpretation technique**

The researcher will begin by familiarizing himself with the collected dataset by listening to the interview recordings as collected during the interview process and revising it against any associated notes taken. Recorded interviews will then be transcribed onto a spreadsheet and analysed to identify any emerging factors or trends. A review of the identified trends will be conducted with the aim of refining the aforementioned. Trends will be named, categorized and analysed to interpret the resultant observational findings. Finally, the researcher will use this information to draw meaningful conclusions about and from the data. Secondary data will be coded in very much the same process as to verify any of the primary findings as mentioned above.

### **3.10 Limitation**

Interviews will be limited to a single interview with one participant per selected SMB (C1-C10), as a second interview was found to be relatively insignificant or mostly ineffective in most organizations (Seymour & Jansen van Vuuren, 2014). Due to time constraints and a general lack of supporting quantitative data availability, the study will limit itself to a purely qualitative approach. Further limitations include qualitative research biases such as sampling bias, interview bias and culture bias. This study will account for these research biases by means of the below quality assurances.

### **3.11 Quality assurance**

#### **3.11.1 Transferability**

The process of data collection will be homogenous throughout the study and the researcher will ensure that external validity is not compromised during any point of the interview process. The use of an interview guide will ensure consistency in the selected data collection method. The researcher

acknowledges the absence of a universal interpretation method for qualitative data, yet emphasizes the data analysis procedure's ability to aid the transferability of this study.

### **3.11.2 Credibility**

To validate the findings from the interviewees, the researcher will perform a triangulation exercise using any available secondary data. Secondary data will be in the form of annual reports, financial statements, analyst reports, board presentations or any other credible forms of information.

### **3.11.3 Dependability**

To guarantee reliability of the findings, a systematic or methodical approach towards data analysis will facilitate the replication thereof by future researchers aiming to duplicate the results or the study itself. It should however be acknowledged that any alteration to the study's original conditions could impact its general reproducibility in the field.

## **3.12 Justification**

A qualitative research design was selected to explore the nuanced, contextual perceptions of AI adoption for digital transformation amongst local SMB decision-makers. The reason for pursuing a qualitative research design for the purpose of this study is due to the lack of existing quantitative data within literature, especially from a South African perspective. The selected approach therefore allows for rich, interpretive insights into how participants both understand and navigate AI adoption related decisions, particularly given the emotional and perceptual nature of many of the identified barriers. The use of semi-structured interviews supports this depth by offering flexibility to probe complex responses and capture unforeseen themes, which would not be possible with rigid survey instruments for example. Additionally, purposive sampling also ensures that participants hold decision-making roles relevant to AI adoption within their respective businesses or industries, thus aligning the data collection method with the study's exploratory and practice-oriented objectives.

## **3.13 Ethical considerations**

- Securing approval from the ethics board at the University before initiating the interview or any interview process.
- Using an interview protocol to standardize how the interview setting is both established and contextualized to maintain consistency across all interview instances and processes.
- The purpose of the interview will be explained to each participant and research permission letters

will be completed in line with the University's requirements.

- Approval will be obtained from the interviewees for the researcher to record the interviews.
- Interviewees can withdraw from the interview at any stage during the process or refuse to take part.
- All data collected will be stored anonymously and without reference to the individual or company interviewed.
- The name of individuals and organizations interviewed will not be included in the final report, as the final report will refer to them as C1 to C10.
- Interviews will be uploaded to Otter.ai for transcription.
- Transcripts will be uploaded to OneDrive Cloud.
- The researcher will sign a plagiarism declaration form and will provide the Turnitin report to show that no plagiarism has taken place.

## Chapter 4: Research Analysis

According to the TOE framework, new technology adoption decisions within an organization is considered under three main pillars of sustainable organizational existence namely: technological, organizational and environmental (Bryan & Zuva, 2021). This study will therefore assess the results of the research findings under the same theoretical framework as guidance, first considering the technological context, then the organizational context and finally the environmental influence.

### 4.1. Technological context

#### 4.1.1. Technological understanding, awareness and adoption

According to Depietro et al., (1990), understanding technology is a prerequisite to its adoption. In other words, a deep understanding of the technology in question is first required before adoption can even be considered. All ten participants (i.e. C1 – C10) showed a high-level understanding of AI, including a broad or a general understanding of its definition, its role and the potential benefits as an innovative technology for digital transformation. Evidence of their understanding is most notably reflected in their early-interview responses, offering the following types of insights for the purpose of this study: (1) the first insight relates to AI's use as a tool for enhanced workplace performance by means of accurately gathering, analysing and storing large sets of data over extended periods of time, (2) the second insight refers to AI's ability to supersede known human operational capabilities by providing more accurate results and general outputs over shorter periods of time, (3) the third insight revolves around AI's general replacement capabilities to automatically complete repetitive daily, weekly or monthly tasks that previously required some sort of human intervention and finally, (4) the fourth insight considers AI's overall predictive potential in recommending potential future outcomes independent or voided of any human intervention.

*“Artificial intelligence is taking large sets of data and distilling it through analytics into something that's a little bit more readable” [C2] “...an autonomous, process-driven approach towards analysing any form of input data and providing a well-defined, structured output” [C6] “...anything that mimics human intelligence” [C5] “...a tool that helps people process and solve intricate and complex mathematical and computational problems based on a set of input data, queries and prompts” [C8] “...takes a very mundane, repetitive and everyday task and then converts it into a time saving process or result” [C7].*

Participant responses therefore reflect a good theoretical understanding of AI, including its definition, its role and the potential benefits as an innovative technology for digital transformation. A good

general understanding of AI technology can therefore not be seen as an inhibiting factor to the AI adoption decision-making process for digital transformation in SMB's in SA and is therefore labelled as an enabler, or rather an enabling factor, to the overall adoption process.

Whilst a good understanding of AI technology and its definition, role and potential benefits were high, awareness around existing AI applications, tools and vendor solutions within each industry or sector was relatively low with eight participants (i.e. C3, C4, C5, C6, C7, C8, C9 & C10) admitting to having very little or no knowledge of “where” or “how” to acquire these tools, nor how to successfully implement or deploy them within their respective organizations. Two participants (i.e. C1 & C2) however, have confirmed active deployment of AI technologies within their respective organizations. C1 implemented an AI application which helps with customer cloud data usage modelling and prediction, whilst C2 implemented an AI tool which tracks daily, weekly and monthly operational anomalies to both manage and reduce unwanted operational costs. As AI technology adoption within both organizations only occurred within the last year, the level of implementation or deployment completion was measured at varying degrees of success as both participants agreed that a bespoke solution trumps that of a simple “plug-and-play”, as is often seen offered with simple vendor solutions.

*“I think we have the same challenge as our customers, we know that the technology is out there, we just don't know how or where to use it” [C8] “...the hiccup with a plug-and-play solution is that it's just not bespoke and you will almost never find something off-the-shelf that just works for you” [C2].*

Both participants (i.e. C1 & C2) relied on informal networks and “casual relationships” to guide their AI technology adoption strategy, including implementation and deployment. Of the other eight participants (i.e. C3, C4, C5, C6, C7, C8, C9 & C10), only three (i.e. C3, C6 & C10) showed some interest in the potential future benefit of AI technology adoption, though with no indication or commitment to implementation timelines or strategies. The rest showed very little to no interest in future AI adoption, implementation or deployment, though all agreed that it was inevitable. The lack of awareness around existing AI technologies and its implementation or deployment, can largely be attributed to either or a combination of the following insights drawn from the thematic analysis of participant responses: (1) the first being attributed to the potential failure of existing technology vendors to successfully market and promote their AI applications, tools and / or solutions to the SA SMB market, (2) the second considers a lack of internal drive from local SMB owners, decision-makers and other leadership structures to both promote and drive innovation and technology development within their respective organizations and finally (3) the general lack or scarcity of local skills and resources to successfully implement and deploy these AI applications, tools and / or solutions as part of the digital transformation process and journey. This evidence supports current

literature, which provide similar insights into the low uptake of digital technologies within local organizations (Adao, Vincent, & Davies, 2019) (Schoeman & Seymour, 2022).

*“...developing the skill set has a cost implication and unfortunately not many organizations in South Africa are willing to commit to the investment” [C2] “...currently the skills are all sitting in very expensive markets, like consultancies for example, which means that access to these skills are very limited” [C7] “...the skills you need from an AI perspective are very different to the skills we currently have available, internally” [C1].*

Participant responses therefore reflect a general disconnect between understanding AI as an innovative technology for digital transformation and their awareness of how to effectively implement it. A lack of AI technology solution and implementation awareness can therefore be seen as a major inhibiting factor to the AI adoption decision-making process for digital transformation in SMB’s in SA, one which requires significant attention and potential future research and investigation beyond the scope of this study.

#### 4.1.2. Perceived technological benefits, risks and prerequisites

The thematic analysis of participant responses revealed a wide range of perceived benefits from the adoption of AI technologies, the likes of which include: (1) an enhanced workplace performance, (2) achievement of operational excellence, (3) increased output and predictive potential, (4) reduction in staff or human error, and (5) both short-and-long-term competitive sustainability within their respective markets. **Table 2** below summarizes the results of the thematic analysis and includes a list of the most commonly identified perceived benefits of AI adoption for digital transformation in SMB’s in SA, as well as the frequency of occurrence amongst all ten participants (i.e. C1 – C10).

**Table 2** – A list of occurrences of the most commonly identified perceived benefits of AI adoption for digital transformation in SMB's in SA according to the thematic analysis of participant responses.

Perceived Benefits:	Participants									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Enhanced workplace performance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased operational efficiency	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased outputs & predictive potential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reduction in staff / human error	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Improved competitive sustainability & market position	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Enhanced governance & regulatory compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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\*Note: (✓) Identified; (□) Unidentified

Of the two organizations (i.e. C1 & C2) that have already implemented some sort of AI technology as part of their operational capacity, both confirmed a clear increase in productivity as a result of achieving operational efficiency, though C2 also included regulatory compliance and sustainable governance as an unexpected benefit to their new technological capability.

*“...not only does it increase the accuracy and consistency of our data, but it also speeds up the analytical process” [C1] “...to me it’s compliance, because once you’ve written the rule, it reproduces the same result without the introduction of any human error” [C2].*

The perceived risks of AI technology adoption however, seemed to evoke a much stronger emotive or empathic response from the majority of participants, including examples of concern like: (1) local resource skills and availability, (2) the lack of vendor solution marketing, (3) data privacy, (4) data management and monitoring issues, (5) the need for informal “advisory” networks, (6) the lack of existing use cases with a positive return on investment, and (7) financial cost implications. **Table 3** below summarizes the results of the thematic analysis and includes a list of the most commonly identified perceived barriers to AI adoption for digital transformation in SMB’s in SA, as well as the frequency of occurrence amongst all ten participants (i.e. C1 – C10).

**Table 3** – A list of occurrences of the most commonly identified perceived barriers to AI adoption for digital transformation in SMB's in SA according to the thematic analysis of participant responses.

Perceived Risks:	Participants									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Local resource skills & availability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lack of vendor solution marketing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data privacy & outsourcing	✓	□	✓	✓	□	✓	✓	✓	✓	✓
Data management & monitoring	✓	✓	✓	□	✓	□	✓	✓	✓	✓
Need for informal networks	□	□	✓	✓	✓	✓	✓	✓	✓	✓
Lack of existing use cases	✓	✓	□	✓	✓	✓	□	□	✓	✓
Financial cost implications	□	✓	✓	□	□	□	✓	✓	□	□
Socio-economic impact / concerns	□	□	□	□	□	□	□	□	□	□

\*Note: (✓) Identified; (□) Unidentified

The underlying theme amongst most participant included a feeling of zero trust in that which they do not yet fully comprehend or even understand and as such, the complexity of the technology itself can be seen as a potential barrier to the AI adoption decision-making process for digital transformation in SMB's in SA. It is worth mentioning however, that some of these concerns were also raised without any substantial evidence or factual backing, which only further alludes to the general risk aversion of that which we do not understand. A lack of trust and fear of AI technology can therefore be seen as a secondary inhibiting factor to the AI adoption decision-making process.

*"...so, to an extent, I would say that you're never going to be free of some sort of human intervention. You will never get to a point where there is complete trust in AI, well not for me anyway" [C2] "I mean, how do I know that AI is actually doing the job of let's say 20 people and on top of that, how do I know that it's actually doing it correctly?" [C5] "I would say that without the oversight of any human intervention, my trust in AI as a tool for operational accuracy is quite low" [C7] "Let me turn the question around, would you trust AI to take the call if your life was on the line or depending on it? I don't think so" [C6] "...as South Africans, trust is not in our DNA and of course it's a problem in many aspects of our society, but speaking directly to adoption of AI, can I trust the data? You will have to convince me" [C8].*

Even though the perceived benefits of AI adoption for digital transformation in SMB's in SA are clearly understood and well-articulated by the majority of participants, the perceived risks significantly outweigh or overshadow the perceived benefits due to their general emotive and empathic origin. Human beings as decision-makers are generally driven more by emotion than by logic, which is why trust in the form of credible use cases is seen as an important prerequisite for future AI technology adoption in SMB's in SA.

The majority of participants viewed their current information technology (IT) infrastructure as sufficient for both immediate and future AI technology adoption, yet all displayed low levels of IT maturity. Each participant had business-critical processes and other data repositories that ran outside of their dedicated ERP system / central IT stack, which excludes the possibility of immediate AI adoption. Failure to obtain certain the standard fundamentals like hosting a mature IT environment can therefore be seen as another barrier or inhibiting factor to the AI adoption decision-making process for digital transformation in SMB's in SA. According to literature, certain prerequisites are necessary for the successful implementation of AI technology adoption the likes of which include (1) the existence of mature business intelligence (BI), (2) the input of good clean quality base data, (3) the management of big data tools, and (4) the implementation of technology adoption frameworks (Kinkel, Baumgartner, & Cherubini, 2022). Neither of these prerequisites could be provided nor confirmed by any of the participants in this study, including C1 & C2, which

significantly reduces the level of confidence for effective or successful future AI technology adoption in any of the organizations as interviewed for the purpose of this study.

As most participants had a clear cognisant awareness of the need for good clean quality base data, most saw this as a significant challenge, especially within the SA SMB space, as this requires both significant financial and resource investment, the likes of which were deemed either too costly or too low on the priority list. C3 for example was happy with their current system of manual data input and capturing, even mentioning a level of trust that could not or would not likely be replaced by any digital system. C7 & C8 equally shared this sentiment, as they deemed any system of data input or capturing without the intervention of human oversight as somewhat “untrustworthy”. As such, the majority of participants showed no intent or clear commitment towards ensuring that these prerequisites were being met, though all agreed on the importance of robust data for successful future AI technology adoption. Bad quality input data, whether historic, archived or new, was simply seen as an unavoidable consequence of doing business, the likes of which human error introduced and business accepted (i.e. not worth the resource and financial investment). As an inherent risk to successful AI adoption, the need for robust information and good clean quality data is seen barrier or an inhibiting factor to the AI adoption decision-making process for digital transformation in SMB’s in SA.

*“...incorrect input data, would just give you incorrect output data and there’s no way around it” [C1]*  
*“...everybody has implementation issues due to bad prompts, that’s just the nature of the game” [C2]*  
*“...I don’t think we’ve ever looked at our historical and thought, mmm...maybe we should clean this up. There’s no point, it’s just not worth it” [C7]*  
*“...there’s no investment or commitment to cleaning up data or getting to the point where you can actually determine whose fault it is in the first place” [C5].*

Considering the use of technology adoption frameworks as a strategy or a tool for successful AI technology adoption for digital transformation in SMB’s in SA, none of the ten participants (i.e. C1 – C10) identified nor confirm the use of a technology adoption framework in support of their digital transformation strategy or technology adoption approach. **Table 4** below summarizes the results of the thematic analysis and includes a list of the most commonly identified prerequisites to AI adoption for digital transformation in SMB’s in SA, as well as the frequency of occurrence amongst all ten participants (i.e. C1 – C10).

**Table 4** – A list of occurrences of the most commonly identified prerequisites to AI technology adoption for digital transformation in SMB's in SA according to the thematic analysis of participant responses.

Prerequisites:	Participants									
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Mature business intelligence (BI)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Good quality input data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management of big data tools	✓	□	□	✓	✓	✓	✓	✓	✓	✓
Use of technology adoption frameworks	□	□	□	□	□	□	□	□	□	□

\*Note: (✓) Identified; (□) Unidentified

Five participants (i.e. C1, C5, C6, C7 and C8) however, did mention the implementation of a bespoke or in-house technology adoption strategy as part of their digital transformation strategy, though could not identify nor confirm its implementation, boundaries or comparability against any of the formal or existing technology adoption frameworks as proposed by academic literature. This gap in technology adoption by means of academic frameworks and support suggests a general disconnect between organization’s acknowledgement of the significance of technology adoption for digital transformation and their active engagement in leveraging technology adoption frameworks as a strategy or a tool for enhanced digital transformation.

*“We don't really follow any formal technology adoption frameworks, though we have developed our own sort of, internal approach that aligns with our technological or digital strategy as part of our operational needs” [C6] “...our technology adoption strategy is built in-house as part of our digital transformation strategy, though I don't really know how that compares against more formal models or frameworks or whatever, in fact, I don't think I know of any” [C5].*

To summarize the influence of technology on the AI adoption decision-making process for digital transformation in SMB’s in SA, it can be concluded that participant feedback generally reflected a negative response towards AI adoption with the identification of more barriers (or inhibiting factors) than enablers. Even though a good understanding of AI technology and its perceived benefits was widely accepted as a primary enabler to the AI adoption decision-making process, the fear of implementation and loss of control over certain business-critical processes far outweighed the potential benefits as a primary inhibitor. Risk adversity in this case, was mostly driven by emotion rather than logic, which agrees with current academic literature, as Goasduff (2019) identified “a fear of the unknown” as one of the biggest challenges or barriers to both local and global adoption. A lack of IT maturity in the form of inadequate BI, poor quality input data, failed data management

processes and non-existent technology adoption frameworks also presented significant barriers to the overall AI adoption decision-making process. The failure of local SMB's to meet certain pre-adoption criteria is seen as a major barrier to future adoption and implementation, as no participants showed any indication or commitment towards IT infrastructure investment. Academic literature agrees that successful adoption requires both the investment and the implementation of mature IT systems (Wamba-Taguimdje, Wamba, Kamdjoug, & Wanko, 2020).

## 4.2. Organizational context

### 4.2.1. Characteristics of SMB's

SMB's in SA are generally quite small with very little to no influence on local skills development. As a result, all ten participants (i.e. C1 – C10) considered local resource skills and availability a major barrier to the AI adoption decision-making process. Two participants (i.e. C1 & C2) however, considered themselves as having some sort of internal resource skills and availability, though confirmed low levels of confidence in their actual technical ability as they were “...*mostly operating unsupervised as experts in their own field [C2]*”. Barring these two participants (i.e. C1 & C2), none of the other participants seemed to have the necessary internal resource skills available to readily consider AI technology adoption or implementation, with local resource constraints largely attributed to a lack of local resource skills development, financial investment or successful recruitment. General insight gained from participant responses is that: (1) due to the size of SA SMB's, (2) their operational capacity and (3) their financial position, most SMB's in SA often find it either too advanced, too laborious or too expensive to consider the adoption and implementation risk.

*“...a lot of the time, it's just purely a capacity thing or the fact that the technology is too early for SMB's to consider adopting” [C3] “...I think we are in a transitional period where AI skills of the layman still needs to be developed and until we get to a place where AI tools are used at a sort of DIY level, you won't see real application or uptake” [C6] “...do we want to invest that much time and attention, I don't know, I don't think so” [C5] “...a lot of SMB's simply just don't have the time or even the appetite for it” [C8]*

As oppose to the lack of local resource skills development and availability, financial resource and capital investment on the other hand is seen as much less of a barrier, though not inconsequential. Three participants (i.e. C3, C7 and C8) voiced financial resource constraints as a potential barrier to future technology adoption and investment. It is however, worth mentioning that all three participants (i.e. C3, C7 and C 8) displayed very conservative views around AI technology adoption and innovation, deeming it inconsequential or non-critical to their core business and future business

development and growth strategy. The rest of the participants however, showed less of a concern for future financial investment and rather considered the lack of an existing or valid use case as the main barrier for adoption. The lack of a valid or existing use case(s) with a positive return on investment (ROI) is therefore seen as both an inhibiting factor, as well as a prerequisite to the AI adoption decision-making process for digital transformation in SMB's in SA.

*“...maybe I haven't done enough to investigate, but I don't know of any other legit use cases” [C1]*  
*“...unless I have cost estimates and at least 10 or more use cases with a significant return on investment on each of them, I simply won't venture or even consider AI adoption” [C4]* *“...very few companies have the ability to identify valid use cases within their respective organizations” [C5]*  
*“...it's not about finding a use case, it's about picking the right one for your organization” [C9].*

Two participants (i.e. C9 & C10) reflected on their need for high volume or high intensity data, especially considering their operational objective of playing within the retail and online shopping space. This agrees with academic literature, as many academic authors reviewed the intrinsic value of big data, especially in gaining a sustainable competitive advantage during the fourth industrial revolutions (4IR) (Lim, et al., 2018). A high-level analysis of fast-moving consumer goods and sales data for example, is pivotal to large retail suppliers like C9 & C10, as they rely on this information and internal sales data analysis to drive key business operations and strategic decisions. The need for high volume or high intensity data is therefore seen as a potential enabler to the AI adoption decision-making process for digital transformation in SMB's in SA as it might increase the potential for future adoption.

*“...we need something that can help us analyse fast-moving trends and sales patterns for example, so that we can personalize our offering and improve on our customer experience” [C9]* *“access to real-time data would enable us to make informed decisions more quickly and probably adapt to the market more effectively” [C10].*

Understanding the intrinsic value of your historic, archived or stored data was also expressed as a potential enabler or enabling factor to the AI adoption decision-making process, although not confirmed nor agreed upon by every participant of this study. Some participants were of the opinion that in order to successfully adopt AI technology, they would rather start anew and had no interest, commitment or investment in both understanding or cleaning up old historic data as part of the AI adoption process or digital transformation journey.

#### 4.2.2. The role of SMB's decision-makers

According to literature, adoption decisions within small businesses are a direct consequence or a true reflection of the dominant leadership style within the business, taking into account their attitude towards innovation, development and growth (Thong & Yap, 1995). During the thematic analysis of all participant responses, evidence seemed to both agree and disagree with this statement, not supporting the link between leadership and innovation, but rather their approach and overall risk aversion. All ten participants (i.e. C1 – C10) deemed their dominant leadership style as competitive, sustainable and forward-thinking, however displayed different views on their innovative approach as a result of their internal risk aversion. Eight participants (i.e. C1, C3, C4, C6, C7, C8, C9 and C10) were more risk averse than others and therefore preferred their innovation initiatives to happen in-house, where they had full control over their data, systems and processes. The other two participants (i.e. C2 and C5) however, were less risk averse and considered a consultative approach whereby industry experts, technology consultants or solution service providers both drive and inform their technology initiatives. This suggests that there exists no direct link between the leadership style of an individual making the decisions and their attitude towards innovation, but rather their approach as a direct result of their internal risk appetite or adversity. As not all participants were happy to receive information about South African use cases or existing vendor solutions, the role of decision-makers was seen as an enabling factor to the AI adoption decision-making process for digital transformation in SMB's in SA, though not through innovation as a driver, but rather risk version as an inhibitor.

*“Data privacy is a big concern, yes obviously, but it has been for a very long time“ [C4] “...that would involve outsourcing and I just don't know if it's worth the risk of having something so core to our business, sitting outside the premises” [C1] “ Look, personally I have a very low risk appetite so I am happy to take the risk, especially if there's benefit to be gained from it” [C2] “...so my data leaves the premises, so what? People are too precious about non-important information, they should get over it” [C5].*

#### 4.2.3. The need for informal networks

Another potential inhibiting factor, according to literature, is the inherent need for informal networks and “casual relationships” to inform the decision-making process around AI technology adoption in SA, especially amongst local SMB's (Mpofu & Watkins-Mathys, 2011). Participant responses varied widely around this topic, as some participants agreed whole-heartedly with this statement, relating the success of their business and operations to the strong relationships they've built over the years with both partners and suppliers. The opposite response emotively disagreed as they claimed equal

information share amongst all business-critical and non-business-critical shareholders, which includes professional bodies, formal networks and other product vendors for example. As most participants did however have some sort of informal network or “casual relationship” informing their day-to-day digital adoption strategy, the need for these types of relationships is still seen as some sort of inhibiting factor the AI adoption decision-making process for digital transformation in SMB’s in SA, especially considering the strong relational nature of SA businesses from within a SA context. One participant in particular (i.e. C1) provided a personal opinion or insight on the potential benefit of informal networks within a SA context and that is that they currently provide more useful input than any other formal network or professional body in country. This could potentially leverage informal networks as a future enabling factor to the AI adoption decision-making process, although not enough evidence exists to confirm this statement and would require additional research and further investigation beyond the scope of this project.

*“We acquired them by word-of-mouth or rather, they were recommended to us by a friend...but we trust in their skills and capabilities, I mean, they have been incredible useful to us” [C1] “...we were recommended an off-the-shelf sort of plug-and-play solution, though it didn’t go exactly according to plan and we’re still teething with it even a year later” [C2].*

#### **4.2.4. The lack of vendor solution marketing**

Vendor solution marketing presented itself as a potential barrier to the AI adoption decision-making process for digital transformation in SMB’s in SA, due to a lack of mention, acknowledgement or consideration in any of the participant responses pertaining to access, sales or vendor engagement. During the interview process, no participant mentioned nor confirmed acknowledgement of any existing AI vendor solutions and neither did they know of any active marketing campaigns or sales incentives to promote adoption within their respective businesses or immediate industries. As vendor solutions do exist and are mostly globally driven from a global competitive strategy, the lack of local vendor solution marketing is seen as a potential inhibiting factor to the AI technology adoption decision-making process for digital transformation in SMB’s in SA.

*“No, I don’t know of any other vendor solutions, I will have to do some more market research” [C2] “Personally, I don’t think current vendor solutions are a good market fit” [C3] “...I think vendors are purposely not marketing these tools, because we’re currently in a test-phase where they’re making everything publicly available to see behavioural patterns of how people use it” [C4] “...accessibility and visibility is important and I just don’t think that people are at a point where they’ve had either” [C8] “I think if you are not far enough down the digital transformation curve, then you simply won’t*

*know how or where to engage with these vendors, which means that you will need to consider changing either your procurement or engagement strategy entirely” [C8].*

To summarize the organizational influence on the AI adoption decision-making process for digital transformation in SMB's in SA, it can be concluded that participant feedback generally reflected a negative response towards AI adoption with the identification of more barriers (or inhibiting factors) than enablers. For most participants, financial resource availability and future capital investment was not seen as a major barrier to adoption, however local resource and skills availability played a major role as a primary inhibiting factor within the organizational context. This re-enforces current academic literature, which classifies SMB's ability to effectively secure and managed skilled adoption resources as the single most identified inhibiting factor to the AI adoption decision-making process (Goasduff, 2019). This coupled with the lack of a valid or existing use case with a positive ROI in the SA SMB market further challenged adoption locally. On the other hand, the need for high volume or high intensity data, as well as a good understanding of archived information was seen as a potential enabler, though confirmed by unanimous consensus. These were seen as only beneficial to participants within the fast-moving consumer goods space, like retail or online shopping for example. Leadership style as a result of personal risk aversion rather than innovative drive, was seen as another inhibiting factor, along with the need for informal networks and a lack of appropriate vendor marketing.

### **4.3. Environmental context**

All ten participants (i.e. C1 – C10) considered their direct business environment as being highly competitive, though only two participants (i.e. C1 & C2) focussed on AI technology adoption to create a sustainable competitive advantage within their respective organizations. A competitive business environment can therefore be seen as a weak enabler to the AI adoption decision-making process for digital transformation in SMB's in SA, as many participants seem to prefer a different competitive strategy with regards to gaining sustainability within the market.

Literature suggests that relatively untransformed organizations often struggle with large power distances between their managerial structure and their employees, which results in a culture that is less inclined to both foster and pursue innovation (Graham, 2010; Hofstede, 2001). Most participants of this study disagreed with literature, in arguing that transformation has nothing to do with innovation and vice versa. Nine participants however (i.e. C1, C3, C4, C5, C6, C7, C8, C9 and C10) were considered to be inadequately transformed, with historical inequalities still clearly visible or represented within their managerial structures. It is hard to determine the effect thereof on innovation within each organisation, as the longitudinal nature of this study does not provide enough evidence

or data to either dispute or defend this statement, which falls outside the scope of this project. This could potentially be an opportunity for further or future research.

Finally, the potential socio-economic impact of AI technology adoption within each organization was not readily considered or seen as a major barrier by any of the ten participants (i.e. C1 – C10). The potential socio-economic impact of job losses for example, as a result of machine learning, automation and / or AI technology adoption, was ultimately seen as inevitable and in some cases, even beneficial to the competitive sustainability of each organization. The reasons largely being attributed to the intrinsic complexities of South African labour laws and the ramifications of local labour unions. Others argued that the potential socio-economic impact on SMB's in SA were simply just too small and could not compare to larger, enterprise-type, corporations.

## **Chapter 5: Research Findings**

### **5.1. Conceptual Model**

Considering the abovementioned findings of the thematic analysis and the corresponding research results (i.e. participant responses from semi-structured face-to-face and online interviews), certain themes were derived and classified as either enablers (i.e. enabling factors) or inhibitors (i.e. inhibiting factors) to the AI adoption decision-making process for digital transformation in SMB's in SA. In keeping with the TOE theoretical framework, the most significant themes were used to create a conceptual model for better understanding the impact of these themes on the overall AI adoption decision-making process as illustrated in **Figure 1** below.

According to the inductively derived conceptual model (as shown in **Figure 1**), the most significant themes under guidance of the TOE theoretical model or framework includes technological understanding and awareness, internal and external organizational characteristics and the competitive and regulatory environment. These six themes were identified to have the biggest or most significant impact on the AI adoption decision-making process for digital transformation in SMB's in SA, as each theme has its own set of enablers (+) and / or inhibitors (-) to guide or influence the process. Understanding AI technology for example, is seen as a primary enabler to the AI adoption-decision making process due to the positive influence of perceived benefits. Implementation awareness around existing AI technologies on the other hand, is seen as a major primary inhibitor due to its highly emotive reaction and empathic response to the perceived risks, associated prerequisites and a feeling of zero trust in the form of fear of the unknown. Implementation awareness as a primary inhibitor to the AI adoption decision-making process therefore completely overshadows technology understanding as a primary enabler, mainly due to

its emotional pull and long list of barriers. Furthermore, inhibiting factors of the internal and external themes of organizational characteristics far outweigh that of enablers and includes a long list of inhibitors like: the lack of local resources and skills, the cost of financial investment, the scarcity of existing use cases, the inadequacies of vendor solution marketing and leadership's risk adversity mixed with a culture of non-transformational equality. Finally, the SA SMB environment poorly moderates the AI adoption decision-making process, as the need for competitive sustainability and socio-economic concerns counterbalance each other in a net effect of zero drive towards AI technology adoption, being considered both a weak inhibitor and a weak enabler to the AI adoption decision-making process for digital transformation in SMB's in SA, respectively.

The effects of enabling and inhibiting factors on the identified themes play an important role on the AI adoption decision-making process for digital transformation in SMB's in SA, as the entire process hinges on the notion that enablers need to outweigh inhibitors before AI technology adoption can be considered. Emotion drives fear and fear drives resistance, so until the emotive feeling around participant responses can be eliminated, the AI technology adoption decision will always be met with some level or degree of resistance (i.e. inhibitors need to be converted into enablers).

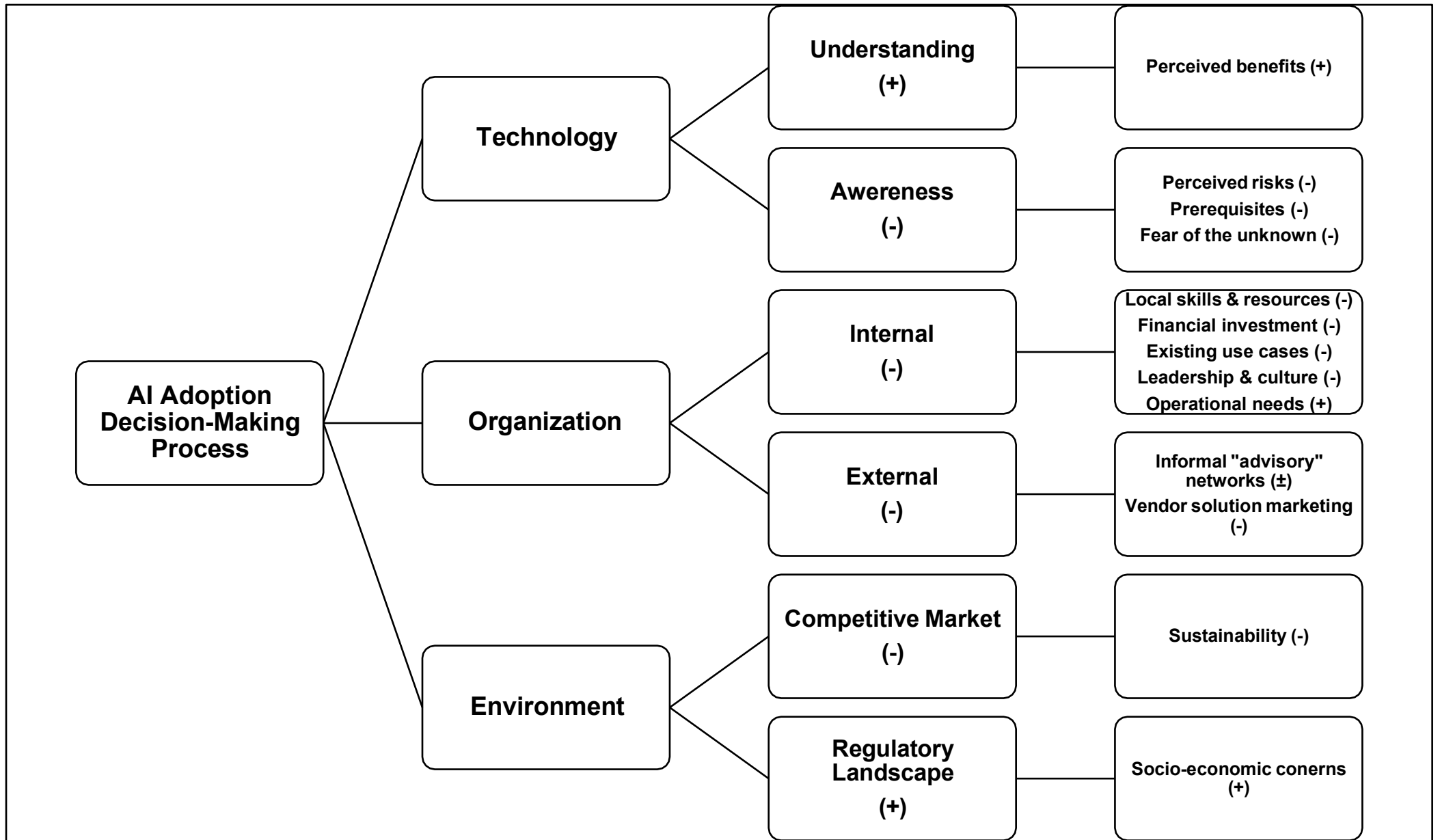
## **5.2. Final Discussion**

Academic literature attributes the slow adoption of AI technology for digital transformation in SMB's in SA to the overshadowing power of perception when considering risk versus reward (Schoeman & Seymour, 2022). This is reflected in the research findings of this study as many of the participants downplayed the potential benefits of AI adoption for digital transformation in SMB's in SA, due to their emotional concerns and empathic response to the perceived risks. The most frequently identified potential benefits included an enhanced workplace performance, improved operational efficiency and a reduction in staff or human error, which aligns closely with existing academic literature as previous studies both identified and reflected on similar advantages with related positive outcomes (Makridakis, 2017; Schoeman & Seymour, 2022). Perceived risks identified were not only consistent with existing academic literature, but also expanded on the theoretical knowledge or results of previous studies by including additional barriers like a high reliance on informal "advisory" networks, inadequate vendor solution marketing and concerns around data privacy, management and monitoring (Gqoboka, Anakpo, & Mishi, 2022).

Finally, a significant gap in the absence of formal technology adoption frameworks emerged as an unexpected misalignment between theoretical knowledge and practical implementation. Contrary to the proposed academic belief, none of the study's participants reported the use or implementation of any technology adoption frameworks to help guide or drive their technology adoption initiatives.

Propositions 1 to 3 relating to the reason for slow AI adoption, the potential benefits and perceived barriers, were therefore supported by the results of the research findings, not only reinforcing prior academic insights, but also supplementing existing knowledge for theoretical saturation. Proposition 4 relating the use of the TOE framework as a popular technology adoption framework in practice was not identified nor confirmed by any of the participants of this study, whom seemed to prefer the use of other informal, bespoke or in-house technology adoption strategies, rather than those that are formally available and readily exist (Depietro, Wiarda, & Fleischer, 1990; Smit & Eybers, 2022). This exposes a significant gap in the theo-practical alignment of using technology adoption frameworks for digital transformation in SMB's in SA and creates a potential or new opportunity for future academic research, as well as practical development and implementation.

In summary, the study's research findings aligned closely with existing academic literature, emphasizing both the potential and challenges of AI adoption for digital transformation in SMB's in SA. The study's propositions were largely confirmed, though highlighted the need for practically implemented AI adoption frameworks, improved IT maturity or preparedness, as well as targeted resource skills and availability to both develop and unlock AI's true transformative potential. Bridging the gap between theory and practice by addressing these challenges will allow SMB's in SA the opportunity to harness the sustainable growth potential of AI in an otherwise fast-evolving and digitally-competitive environment.



**Figure 1** - Conceptual model inductively derived from the thematic analysis of research findings or results, showcasing the most significant enabling and inhibiting factors to the AI adoption decision-making process for six identified themes under the TOE framework.

*\*Note: (+) enabler; (-) inhibitor; (±) both.*

## Chapter 6: Conclusion

This study critically reviewed the current state of AI adoption for digital transformation in SMB's in SA. It used semi-structured interviews with ten IT decision-makers across multiple industries to explore common themes around the AI adoption decision-making process. A thematic analysis revealed key trends or insights into the potential benefits, perceived risks and use of technology adoption frameworks for AI adoption in SMB's in SA. Although all ten participants acknowledged the importance of digital transformation for future competitive sustainability, AI adoption in SMB's in SA remain remarkably slow due to various inhibiting factors categorized under the Technology-Organization-Environment (TOE) framework.

While participants understood the potential benefits of AI adoption for digital transformation in SMB's in SA to include enhanced workplace performance, improved operational efficiency and reduced human error, most made no attempt at implementation, therefore leaving the potential advantages to be mostly unrealized. Two participants did however introduce AI initiatives within their respective organizations, though to varying degrees of success and with a mixed measure of results. The primary reason for the slow adoption of AI in SMB' in SA, was ultimately attributed to the overpowering perception of risk. Barriers like a lack of local resource skills and availability, financial cost constraints, IT infrastructure and maturity, as well as uncertainty about the potential return on investment, far outweighed that of the potential benefits. Emotional resistance, fear of the unknown and a general mistrust in AI technology without any sort of human intervention or complete oversight were additional challenges that hindered the local adoption process.

The study also identified a lack of formal AI adoption frameworks as a significant barrier to the AI adoption decision-making process, as none of the participants reported the use of any pre-existing frameworks as a means to drive or guide their AI adoption initiatives. While some had mentioned the use of certain in-house technology adoption strategies, these were mostly informal and not well-aligned with established academic frameworks, which lead to an ad-hoc or fragmented adoption process. This highlights a strategic gap in the leverage of potential or existing frameworks to effectively scale AI technology adoption for digital transformation in SMB's in SA.

While the thematic analysis effectively identified recurring patterns in participant responses, a more critical reflection reveals that several key insights, such as the dominance of emotionally driven risk perceptions and the high reliance on informal networks, extend far beyond superficial trends and point to deeper systemic and contextual challenges. The emotional intensity associated with perceived risks, for example, suggests that traditional rational driven models of technology adoption may be insufficient to explain local SMB's behaviour in the context of driving digital transformation. Furthermore, the consistent absence of formal theoretical frameworks among

participants indicates not just a lack of awareness, but a potential disconnect between academic literature and business practicality, which may limit the applicability of existing models like the TOE framework without adaptation. These findings underscore the importance of interpreting thematic data not just as descriptive categories, but as reflections of underlying organizational culture, organizational capacity and market positioning, all elements that should inform both policy interventions and future academic research.

## **Chapter 7: Recommendations**

Based on the findings of this study, several recommendations in the form of new opportunities for future academic research around AI adoption for digital transformation in SMB's in SA were identified. The first opportunity considers the development and practical application of formal AI adoption frameworks within the SA SMB space. Understanding how formal adoption frameworks can be used to assist local SMB's with their digital transformation journey is critical in understanding how to achieve operational sustainability and competitive success. The second opportunity focusses on the role of infrastructure preparedness, as low levels of IT maturity were identified as a significant barrier to the AI adoption decision-making process. Investigating how SMB's can use this opportunity to incrementally improve their existing IT systems in order to support their internal AI initiatives, is critical in understanding the way forward. Third, a deeper exploration into the socio-economic impact and local concerns of AI adoption, such as job losses and union disputes for example, within the SA context could potentially provide additional insights into the broader implications of AI adoption on the local workforce. Finally, future research could investigate the specific use cases of AI adoption in different industries to provide SMB's with concrete examples with return on investment estimates, which were noted as a critical prerequisite to the AI adoption decision-making process. It is highly recommended that future research and upcoming studies address these gaps in order to provide more comprehensive guidance and informative support to local SMB's aiming to successfully adopt AI technologies for enhanced digital transformation.

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## **Appendix A**

### **Research instrument: semi-structured interview guide**

#### **1. General background questions:**

- 1.1. Can you provide a brief overview of your current business and operations?
- 1.2. How long have you been in business and what are your main products or services?
- 1.3. What does digital transformation mean to your business and how does it impact your current operations?
- 1.4. What does AI mean to your business and have you considered adopting AI technologies for digital transformation within your business and operations?

#### **2. AI adoption strategy and approach:**

- 2.1. What is the current AI adoption strategy or approach within your business?
- 2.2. What factors influenced your decision-making process regarding AI adoption within your business and operations (e.g. industry trends, competitor actions, technological advancements)?
- 2.3. How do you prioritize AI initiatives within your overall business strategy and goals?

#### **3. Current state of AI adoption:**

- 3.1. What AI technologies or applications have you adopted or implemented within your business and operations?
- 3.2. How would you describe the current level of AI adoption within your business (e.g. early, explorative, pilot projects, full integration)?
- 3.3. What outcomes or benefits have you observed from the current AI initiatives within your business (e.g. increased business performance, operational efficiency)?

#### **4. Perceived benefits of AI adoption:**

- 4.1. What do you perceive as the potential benefits or advantages of adopting AI technologies within your business and operations?
- 4.2. Have you noticed any improvements in productivity, efficiency or customer satisfaction as a result of AI adoption within your business and operations?
- 4.3. How do you anticipate new AI technologies will impact your sustainable business growth and competitiveness in the immediate and long-term future?

## **5. Barriers and challenges to AI adoption:**

- 5.1. What are the main challenges or barriers to AI adoption within your business and operations?
- 5.2. Are there any specific concerns or reservations with regards to AI adoption within your business and operations (e.g. cost, complexity, data privacy)?
- 5.3. How do you address or mitigate any potential risks associated with AI adoption and implementation within your business and operations (e.g. data security, workforce displacement)?

## **6. AI adoption frameworks:**

- 6.1. What current technology adoption frameworks are you aware of within your business and operations?
- 6.2. What current AI adoption frameworks do you implement or use within your business and operations?
- 6.3. How has your preferred AI adoption framework helped increase your digital transformation journey within your business and operations?
- 6.4. How has your preferred AI adoption framework limited or failed your digital transformation journey within your business and operations?

## **7. Resource allocation and investment:**

- 7.1. How do you allocate resources towards AI adoption initiatives within your business and operations (e.g. budget, personnel, time)?
- 7.2. What criteria do you use to evaluate the return on investment (ROI) of AI initiatives within your business and operations?
- 7.3. Are there any plans to scale up or expand AI adoption initiatives in the immediate and long-term future for your business and operations?

## **8. Collaboration and partnerships:**

- 8.1. Do you collaborate with any external partners or vendors to facilitate AI adoption within your business and operations?
- 8.2. How do you identify and select AI solution providers or technology partners for the AI adoption requirements or needs of your business and operations?

8.3. What role do industry networks or other relationships play in advising or supporting the AI adoption journey within your business and operations?

**9. Learning and adaptation:**

9.1. How do you stay informed about new AI technologies, trends and best practices relevant to your business and operations?

9.2. How do you encourage learning and skills development among your employees to support sustainable AI adoption within your business and operations?

9.3. Have you encountered any unexpected learnings or insights during the AI adoption process within your business and operations?

9.4. How can AI adoption be used to foster governance and sustainability within your business and operations?