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Barriers and Enablers to Competitive Intelligence Adoption in South African SMEs: A Contextual Analysis of Challenges and Opportunities

Abstract

Small and Medium Enterprises (SMEs) are key drivers of economic growth, job creation, and new ideas in South Africa. However, they still cannot use and integrate Competitive Intelligence (CI). CI is a strategic tool that helps businesses become more sustainable and responsive to the market. The objective of this study was to examine how SMEs in South Africa are currently using CI. The study further identifies the main factors that make it easier or harder to use CI. The research specifically examines the impact of structural difficulties, including financial limitations, insufficient management and technical competence, inadequate infrastructure, and regulatory complications, on the strategic utilisation of CI for the sustainability of SMEs. A quantitative study design was utilised, employing a self-administered web-based questionnaire sent to 400 SMEs in Gauteng and KwaZulu-Natal, yielding 179 valid replies. To ensure the data were reliable and to identify relevant patterns, descriptive statistics, exploratory factor analysis, and Cronbach's alpha were used. The results show significant gaps in CI awareness, resource allocation, and strategy integration. Results further show that there are ways to improve through focused interventions, capacity building, and support for legislative frameworks. This study enhances comprehension of CI dynamics in resource-limited SMEs contexts and offers practical guidance for policymakers, development agencies, and SMEs stakeholders. The research supports the strategic development of SMEs in line with South Africa's National Development Plan (NDP) and its objectives for inclusive economic transformation by addressing obstacles and leveraging the facilitators of CI adoption.

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1. Introduction

SMEs are globally known as engines of economic growth, job creation, and new ideas. SMEs make up the majority of businesses in the world, and they make a big difference to the national Growth Domestic Product (GDP) and job market. Even though they are important, SMEs face problems that make it hard for them to grow, compete, and use strategic tools like CI. CI is a process of gathering and analyzing of information about competitors, market trends, and outside factors in a systematic way. CI eanbles businesses to stay in business and make strategic decisions. However, a number of structural and contextual barriers still make it hard for SMEs to adopt CI. Resource constraints, such as financial limitations, insufficient skilled personnel, and inadequate technological infrastructure, frequently hinder the incorporation of CI into SMEs operations (Wu et al., 2023; Liu et al., 2022). These limitations make it hard for SMEs to set up standard CI processes and use data-driven insights to get ahead of the competition. Furthermore, because CI is considered as an ad hoc or secondary function by SME owners and managers, it is difficult for them to use it strategically (Kettani & Aljandali, 2022). The digital divide, especially in developing countries, makes this problem worse because many SMEs do not have the infrastructure or technical skills to set up advanced CI systems (Dutta, Kumar, Sindhwani & Singh, 2020; Singh, Telukdarie & Mongwe, 2024).

Beyond the digital divide, SMEs in South Africa also experience the following challenges: limited access to capital; insufficient managerial and technical expertise; restricted capacity for innovation; unfavourable regulatory conditions; inadequate infrastructure; and heightened competitive pressures (Lwesya, 2021; Pulka & Gawuna, 2022; Enaifoghe & Vezi-Magigaba, 2023; Hasan, Chy, Johora, Ullah & Saju, 2024; Zide & Jokonya, 2022; Frances, Ogbo, & Tanimu, 2023; Maghfirah & Eni, 2024). These systemic challenges make it harder for SMEs to run smoothly, adopt and benefit from CI practices.

Access to finance is still one of the biggest problems for SMEs around the world and in South Africa. Many SMEs depend on informal funding sources like personal savings, family, and friends because it is hard to get affordable and accessible financing from formal institutions (Msomi & Olarewaju, 2021; Rajamani, Jan, Subramani & Raj, 2022; Epede & Wang, 2023; Owusu, Owusu Ansah, Djan & Anin, 2021; Liu, Dilanchiev, Xu & Hajiyeva, 2022; Purwidianti, Pramuka, Laksana & Wiwiek, 2023). High interest rates and strict collateral requirements make it difficult for SMEs to secure funding (Manzoor et al., 2021; Rajamani et al., 2022; Serrasqueiro, Leitão & Smallbone, 2021; Nicolas, 2022; Finnegan & Kapoor, 2023). This lack of access to money hinders investments in CI tools and technologies that improves competitiveness and strategic flexibility (Amadasun & Mutezo, 2022; Nicolas, 2022; Vlassas, Kallandranis & Anastasiou, 2023; Shaikh, Khoso & Jummani, 2024).

In addition, SMEs often do not have the skills or knowledge required to use CI effectively. The lack of marketing, technology, and strategic management skills makes it hard for SMEs to use CI frameworks (Elhusseiny & Crispim, 2022; Anoke, Onu & Agagbo, 2022; Phiri & Ramasimu, 2025; Demirkan, Srinivasan & Nand, 2022; Shaik, A.S., Alshibani, Mishra, Papa & Cuomo, 2023; Iyelolu et al., 2024). SMEs with strong human resource capabilities tend to adopt and use CI for competitiveness and survival (Xin, Khan, Dagar & Qian, 2023

SMEs' lack of money, technical know-how, or support systems lead to limited innovation (Hanaysha, Al-Shaikh, Joghee & Alzoubi, 2022; Liu et al., 2024; Jahanger, Usman, Murshed, Mahmood & Balsalobre-Lorente, 2022; Maher, Yarnold & Pushpamali, 2023; Wongsansukcharoen & Thaweepaiboonwong, 2023; Iyelolu et al., 2024). Limited innovation of SMEs causes less use of CI digital tools and strategic tasks (Anshari & Almunawar, 2022; Elhusseiny & Crispim, 2022). Government policies on taxes, licenses, labour laws, and building infrastructure can either help or hurt the growth of SMEs (Zhang & Ayele, 2022; Olayemi & Folajimi, 2021). SMEs in South Africa often have to deal with bureaucratic red tape and inconsistent policy implementation making it difficult to use CI and other strategic tools.

Moreover, bad service delivery in electricity, water, and transportation raises costs and lowers productivity of SMEs (Xiong, 2024; Mthiyane, Wissink & Chiwawa, 2022; Li, Gu & Meng, 2023; Oguanobi & Joel, 2024).

These challenges make it difficult for SMEs to access markets, deliver goods on time, and stay competitive. SMEs often have a hard time keeping their market share and getting new customers because they have limited resources compared to bigger companies (Amadasun & Mutezo, 2022; Enaifoghe, 2024; Mugano & Dorasamy, 2024; Zheng & Khalid, 2022). To counter these challenges, SMEs rely on strategic tools such as CI.

CI helps SMEs deal with complicated market situations, make better choices, and generate new ideas. Hence, SMEs should adopt and use CI to gain competitive advantage over their rivals (Enaifoghe & Vezi-Magigaba, 2023; Sagar, Anand, Perumalla Varalaxmi & Raj, 2023; Kuteesa, Akpuokwe & Udeh, 2024).

This research seeked to examine the challenges and opportunities of CI adoption by South African SMEs. The research aimed to offer actionable insights for policymakers, support agencies, and SMEs stakeholders by analyzing the structural, financial, technological, and policy-related factors that affect CI adoption. The results may enhance the discourse on SMEs competitiveness and sustainability in emerging economies and facilitate the achievement of national development objectives, exemplified by South Africa's NDP(Mhlongo & Daya, 2023; Ogujiuba, Eggink & Olamide, 2023; Durokifa, 2024).

2. Literature Review

This section provides an extensive examination of the current literature pertaining to the implementation of CI within South African SMEs. It starts by explaining what CI is and why it is important for businesses to stay competitive and stay in business. The review then looks at the many problems that make it hard for SMEs to adopt CI, such as limited access to finance, a lack of managerial and technical skills, low levels of innovation and technology adoption, regulatory burdens, poor infrastructure, and strong competition. Each of these impediments is analysed through empirical research and theoretical frameworks to underscore their influence on the strategic integration of CI. The literature also points out many opportunities for SMEs to implement CI in the midst of challenges. These encompass the increasing acknowledgment of CI as a catalyst for innovation, the prospects for digital transformation, and the significance of conducive policy frameworks and capacity-building programs. This review synthesizes perspectives to establish a contextual framework for comprehending the current state of CI in South African SMEs. Table 1 provides CI definitions.

Table 1 : CI définitions

Author	Definitions
Zaidan et al. (2022)	"CI is defined as a method for scanning and analysing information on rivals' activities and work trends to gain a competitive advantage"
Köseoglu et al. (2021)	"CI is defined as "the process of identifying key competitors; assessing their objectives, strengths and weaknesses, strategies and reaction patterns; and selecting which competitors to attack or avoid."
Nenzhelele (2023)	"CI is defined as "a process or practice that produces and disseminates actionable intelligence by planning, ethically and legally collecting, processing, and analysing information from and about the internal and external or competitive environment to help decision-makers in decision-making and to provide a competitive advantage to the enterprise"

CI Adoption challenges of SMEs

The effectiveness implementation of CI by SMEs is met with some challenges (Wu et al., 2023). These challenges include financial constraints, limited personnel, and insufficient human capital (Liu et al., 2022). Morover, SMEs owners and managers perceive CI function as an ad hoc or alternative approach rather than a well-developed strategy (Kettani & Aljandali, 2022). The research study conducted from India by Dutta, Kumar, Sindhwani and Singh (2020) and Singh and Rahman (2025) show that the CI digital gap in SMEs is

also a major hurdle, as these enterprises often lack the appropriate infrastructure, or technical skills required to use advanced systems. Additional challenges experienced by SMEs in implementing CI include constrained access to finance, deficient abilities and awareness, lack of innovation and adopting suitable technologies, adverse regulatory environment, inadequate infrastructure and competitive pressure (Lwesya, 2021; Pulka & Gawuna, 2022; Zide & Jokonya, 2022; Frances, Ogbo, & Tanimu, 2023; Enaifoghe & Vezi-Magigaba, 2023; Hasan, Chy, Johora, Ullah & Saju, 2024; Maghfirah & Eni, 2024).

Constrained access to finance

Access to finance remains a hope for many SMEs globally (Msomi & Olarewaju, 2021; Rajamani, Jan, Subramani & Raj, 2022; Epede & Wang 2023). A lack of access to finance is widely acknowledged as a major burden to the survival and growth of SMEs (Zide & Jokonya, 2022; Wansi & Burrell, 2023; Mugano & Dorasamy, 2024). It is often difficult for SMEs to obtain accessible and affordable finance from financial institutions (Manzoor et al., 2021; Rajamani et al., 2022). SMEs with limited access to finance may be further discouraged from investing in appropriate technologies (Amadasun & Mutezo, 2022; Nicolas, 2022; Vlassas, Kallandranis & Anastasiou, 2023; Shaikh, Khoso & Jummani, 2024). SMEs may face financial constraints because of high interest rates and a restricted capacity to provide collateral (Serrasqueiro et al., 2021; Nicolas, 2022; Finnegan & Kapoor, 2023). The main source of income for SMEs stems from savings, family and friends (Owusu, Owusu Ansah, Djan & Anin, 2021; Liu, Dilanchiev, Xu & Hajiyeva, 2022; Purwidianti, Pramuka, Laksana & Wiwiek, 2023).

Deficient abilities and awareness

The scarcity of skills, knowledge and experience can present a significant barrier for the growth of SMEs and CI practice (Elhusseiny & Crispim, 2022). SMEs with an educated workforce and suitable skills perform competently (Anoke, Onu & Agagbo, 2022; Phiri & Ramasimu, 2025). In addition, SMEs that are highly developed in terms of human resource capacities are more successful and may experience higher productivity, long-term survival and sustainability (Xin, Khan, Dagar & Qian, 2023). However, numerous SMEs experience a lack of skills and knowledge in respect to marketing and current technological developments, making SMEs more vulnerable to failure in comparison to larger enterprises (Demirkan, Srinivasan & Nand, 2022; Shaik, A.S., Alshibani, Mishra, Papa & Cuomo, 2023; Iyelolu et al., 2024).

Innovation and adopting suitable technologies

Innovation is crucial for businesses to improve business performance and sustain its market position (Hanaysha, Al-Shaikh, Joghee & Alzoubi, 2022; Kelečević & Lesjak, 2025). Failure to innovate may render SMEs uncompetitive and obsolete in their operating environment (Liu et al., 2024). Jahanger, Usman, Murshed, Mahmood and Balsalobre-Lorente (2022) state that lower levels of investments are directed towards innovation in developing countries compared to developed countries. Financial, environmental and human resource challenges prevent SMEs from becoming innovative in CI practice (Maher, Yarnold & Pushpamali, 2023; Wongsansukcharoen & Thaweepaiboonwong, 2023). In addition, the limited adoption of appropriate technologies may also hinder SMEs from becoming innovative (Iyelolu et al., 2024; Engstrom & Engelschiøn, 2025). It has been said that successful SMEs practice innovation by adopting technologies that create a competitive edge (Anshari & Almunawar, 2022; Zemljak, Čampelj, Martinc & Kerneža, 2025). Elhusseiny and Crispim (2022) found that SMEs experience technology challenges due to high costs and inability to use the technology. SMEs that do not embrace innovation and technology can have a detrimental effect on their business performance (Liu et al., 2024; Vuorio, Reiman, Kekkonen & Lampela, 2025).

Adverse regulatory environment

According to Zhang and Ayele (2022), government laws, policies, rules and regulations on wages, tax rates, licences, technological support and infrastructure determine success or failure of SMEs. Too many rules and regulations may hinder CI practice and growth of SMEs (Olayemi & Folajimi, 2021).

Inadequate infrastructure

The quality of infrastructure in developing countries may pose a significant obstacle to the growth prospects of SMEs (Xiong, 2024). Infrastructure challenges include key barriers such as poor service delivery of electricity, water and poor infrastructure (Mthiyane, Wissink & Chiwawa, 2022). Li, Gu and Meng (2023) point out that poor infrastructure such as undeveloped roads, railways, bridges and airports make transportation less dependable in terms of timely delivery and increases costs for SMEs. In addition, Oguanobi and Joel (2024) highlights that electricity supply is central to SMEs operation and cost efficiency.

Competitive pressure

Increased and robust competition may pose a threat to SMEs growth and CI practice (Amadasun & Mutezo, 2022). SMEs competitiveness may be obstructed due to lack of skills and training, access to finance and increased production costs (Enaifoghe, 2024). SMEs face competition from larger, well-established enterprises which can make it challenging for them to increase their market share (Mugano & Dorasamy, 2024). Zheng and Khalid (2022) argue that SMEs should focus on well-developed strategic tools such as CI to effectively withstand competitive pressure.

CI Adoption Opportunities for SMEs

SMEs play a key role in both developing and developed countries and are identified as significant contributors to global economic development and employment (Enaifoghe & Vezi-Magigaba, 2023; Sagar, Anand, Perumalla Varalaxmi & Raj, 2023; Kuteesa, Akpuokwe & Udeh, 2024). SMEs account for approximately 90% of enterprises worldwide (across all sectors) and contribute about 50% to GDP and around 70% to employment (Chetty, Boojhawon, Bhagwant & Levy, 2024; Munyemana, Mung'atu & Ruranga, 2024; Yazeer & Sachithra, 2024; Dhiman, & Arora, 2024; Dinku, Singh & Singh, 2024; Durst, Foli & Edvardsson, 2024). In the EU, for instance, approximately 99% of enterprises are SMEs, contributing over 50% to GDP (Enaifoghe, 2024; Maman, Dias, & Bassi, 2024; Sharma, Ilavarasan & Karanasios, 2024). SMEs account for approximately two-thirds (67%) of employment within the EU, with micro enterprises accounting for 30%, SMEs accounting for 20%, and medium enterprises accounting for 17% (Aguzzi, Ianole-Calin & Durst, 2024).

In Malaysia, SMEs account for about 98.5% of all enterprises, contributing approximately 38.2% to GDP and 50% to employment (Munyemana, Mung'atu, & Ruranga, 2024). The contribution of SMEs to economic growth in Malaysia is driven mainly by the services sector, specifically wholesale and retail trade (Hidzir, Ismail, Nor & Sahiq, 2024). India's economy consists of more than 90% of SMEs, contributing approximately 30% and 50% to the country's GDP and employment respectively (Somani, 2024).

In the US, around 99% of all enterprises are SMEs, contributing approximately 56% to the country's GDP and 52% to employment (Akinwale & Alshraim, 2024). In China, SMEs account for over 90% of enterprises (Sharma et al., 2024). SMEs in China continue to demonstrate their resilience by recording a significant contribution of 60% to the country's GDP and more than 80% to employment (Tieng et al., 2024).

In South Africa, there are varying estimates regarding the contribution of SMEs to the economy; as a result, further research is required (Akoh, 2024). Based on recent statistics, SMEs in South Africa account for over 90% of formalised enterprises, contributing between 37.4% and 50% toward the GDP and 47-59% to employment (Azam & Abdullah, 2024; Madzvamuse, Kadyamatimba & Munyoka, 2024; Okeke, 2024).

The NDP has envisioned that South African SMEs will contribute approximately 90% of the 11 million expected new jobs by 2030 (Mhlongo & Daya, 2023; Ogujiuba, Eggink & Olamide, 2023; Durokifa, 2024). In support of this NDP goal, the Department of Small Business Development (DSBD) coordinates and promotes the creation of a favourable environment for SMEs to thrive (Ajani, Khumatake & Gamede, 2023; Nomafu, van Vuuren & Davies, 2023).

The DSBD houses support agencies such as the Small Business Development Agency (SBDA) and the Small Business Finance Agency (SEFA) to ensure the promotion of SMEs (Boks & Mazenda, 2023; Molope, Ladzani & Seeletse, 2024; Weilbach, & Visser, 2024). SEDFA provides non-financial support to SMEs while SEFA provides financial support services (Ogunsola, Potwana & Chikosha, 2023; Nkoana & Mashamaite, 2024). Although there are government initiatives in place to support SMEs, there is still a need to increase awareness of these initiatives and their level of effectiveness in implementation (Permatasari & Gunawan, 2023; Rawindaran, Jayal, Prakash, & Hewage, 2023; Nazir, & Khan, 2024).

According to recent analysis, the SME sector in South Africa is not flourishing at an efficient pace and would need to grow at an annual rate of at least 20% in order to achieve the targets set out by the NDP (Msomi & Kandolo, 2023; Peter, Pradhan & Mbohwa, 2023; Akoh, 2024). South Africa's future economic success depends mostly on new and growing SMEs (Enaifoghe & Ramsuraj, 2023; Mankgele, 2023). Ramsuraj (2023); Sibiya, van der Westhuizen, and Sibiya (2023); Okeke (2024) argued that the sustainability of SMEs is imperative for the economy of South Africa. Furthermore, Xiong (2024) emphasises that SMEs play a crucial role in resolving the country's developmental challenges.

SMEs are the key engine of growth, reducing the unemployment rate and driving economic growth and development (Ricci, Battaglia & Neirotti, 2021; Hu, & Kee, 2022; Jeong & Chung, 2023; Komolafe et al., 2024; Arthur-Sam, 2025). SMEs foster competitiveness and discovering new markets by introducing new products and services (Cosenz & Bivona, 2021; Marinho & Costa Melo, 2022). SMEs can adapt to changing preferences and trends more rapidly compared to larger enterprises (Klein & Todesco, 2021; Su, Zhang & Wu, 2023; Iyelolu et al., 2024). SMEs are vital for poverty alleviation by providing opportunities for aspiring entrepreneurs and creating a source of income (Dzingirai, 2021; Dahliah, Tjan & Rahmi, 2023). SMEs play a more significant role in developing countries through generating wealth, developing infrastructure, and increasing business opportunities for local communities (Manzoor et al., 2021; Endris, & Kassegn, 2022; Enaifoghe & Vezi-Magigaba, 2023; Shah, Zehri, Saraih, Abdelwahed & Soomro, 2024).

SMEs have very distinct characteristics compared to larger enterprises, they are more flexible, open to change, and have a simple, flat/organic organisational structure (Alasiri & AlKubaisy, 2022; Zhang, 2022). Adobor (2020); Mahmud, Soetanto, and Jack (2021); and Angeles, Perez-Encinas and Villanueva (2022) argue that having a flat or organic organisational structure may result in higher visibility, quick decision-making, rapid implementation of management strategies, and a better understanding and swift response to customer's needs. Furthermore, Kiss (2020) alludes that flat or organic organisational structure is characterised by a lower level of specialisation, standardisation, and formalisation which may inspire innovativeness and allow SMEs to respond and adapt to the environment better than larger enterprises.

SMEs have a greater willingness to take risks and are more result oriented. SMEs can establish strong relationships with the community through increased personalisation (Pappas, Caputo, Pellegrini, Marzi & Michopoulou, 2021; Beckmann, Garkisch & Zeyen, 2023; Kedi, Ejimuda, Idemudia & Ijomah, 2024). In addition, SMEs provide employees with diverse learning experiences compared to larger enterprises that are more focused on specialised jobs (Sinha, Saunders, Raby & Dewald, 2022; Vives, 2022; Idris, Saridakis & Johnstone, 2023).

While some characteristics of SMEs make them more flexible, other characteristics such as size may increase the vulnerability of SMEs to internal and external events (Iborra, Safón & Dolz, 2020; Weaven, Quach, Thaichon, Frazer, Billot & Grace, 2021; Miklian & Hoelscher, 2022; Verreynne, Ford & Steen, 2023; Abid, 2025). SMEs operate in a context where there is growing uncertainty due to factors such as the global pandemic (COVID-19), economic and political stability, rapid advancements in technology, and laws and regulations (Zutshi, Mendy, Sharma, Thomas, & Sarker, 2021; Hossain, Akhter & Sultana, 2022; Kaftan,

Kandalov, Molodtsov, Sherstobitova & Strielkowski, 2023). As a result, Paeleman, Vanacker and Zahra (2024) indicate that SMEs continue to face several challenges that may deter their growth and impact their long-term survival.

Theoretical Framing: Organizational Learning Theory and Competitive Intelligence

To contextualize the strategic adoption of CI within South African SMEs, this study draws on Organizational Learning Theory (OLT) as a guiding framework. OLT provides a lens through which the processes of knowledge acquisition, interpretation, and application can be examined in relation to CI integration. Given the volatile and resource-constrained environment in which South African SMEs operate, OLT offers critical insights into how internal capabilities and external conditions shape the effectiveness of CI as a learning mechanism. The following section explores how absorptive capacity, human capital, financial investment, technological readiness, regulatory conditions, and competitive dynamics influence organizational learning and CI implementation, thereby contributing to the broader goals of inclusive economic transformation outlined in South Africa's National Development Plan (NDP).

OLT serves as a fundamental framework to explain how South African SMEs can use CI for better strategic response in their unstable economic environment. The adoption of CI faces barriers because organizations struggle to implement their knowledge acquisition and interpretation, and application processes. SMEs fail to maximize CI potential because they view it as an outside function which prevents them from building learning-focused cultures and using collected data for decision-making (Wu et al., 2023; Liu et al., 2022; Kettani & Aljandali, 2022). The research reveals two main weaknesses in CI implementation and strategy implementation because organizations lack sufficient absorptive capacity to recognize and implement new knowledge. Financial restrictions, insufficient technical expertise, and inadequate infrastructure prevent SMEs from building CI systems that aid in strategic decisions (Dutta et al., 2020; Singh, Telukdarie & Mongwe, 2024).

The organizational learning process becomes stalled because of these restrictions which prevent change adoption. The research shows that human capital stands as the essential element which determines learning readiness within organizations. The insufficient marketing, technological, and strategic management competencies of SMEs staff members prevent them from properly understanding CI data. Organizations with better human resource capabilities achieve higher learning results and demonstrate better adaptability (Elhusseiny & Crispim, 2022; Phiri & Ramasimu, 2025; Xin, Khan, Dagar & Qian, 2023). OLT requires organizations to develop learning systems through strategic investments. South African SMEs operate under continuous financial instability because they depend on informal funding sources while facing elevated interest rates and strict collateral requirements. The financial constraints prevent SMEs from acquiring CI technology and training which restricts their learning capacity (Msomi & Olarewaju, 2021; Rajamani et al., 2022; Amadasun & Mutezo, 2022; Shaikh, Khoso & Jummani, 2024). Organizational learning requires innovation and technological adoption as fundamental elements.

The identification of market gaps and emerging trends through CI leads to innovation. However, most SMEs fail to implement suitable technologies because of their limited technical expertise and insufficient resources. The high expenses and complicated usage of digital CI systems create obstacles for organizations to implement these systems (Hanaysha et al., 2022; Liu et al., 2024; Anshari & Almunawar, 2022). The learning process of organizations depends heavily on the rules and regulations that exist in their environment. The combination of slow bureaucratic processes and inconsistent policies and unfavourable tax systems creates barriers for SMEs to experiment with new strategies and adapt their CI approaches based on policy feedback (Zhang & Ayele, 2022; Olayemi & Folajimi, 2021). The quality of infrastructure networks determines how efficiently organizations can learn. The poor delivery of electricity and water services and transportation systems creates information bottlenecks which increase operational expenses and makes it difficult for SMEs to maintain continuous learning and apply CI insights (Xiong, 2024; Li, Gu & Meng, 2023; Oguanobi & Joel, 2024).

The competitive environment should normally drive organizations to develop their learning abilities but most SMEs lack the necessary infrastructure and competencies to respond effectively. The intense competition from larger companies requires CI-based learning solutions to help SMEs detect business opportunities and enhance their strategic approaches (Mugano & Dorasamy, 2024; Zheng & Khalid, 2022). This research investigates how resource-limited South African SMEs implement OLT-based learning systems to prove that learning systems can scale across different organizational contexts. The research shows that organizations need both internal talent development and external supportive conditions to achieve successful CI implementation. The research further investigates how different factors including absorptive capacity and human capital and financial support and environmental conditions affect South African SMEs' organizational learning processes. The research supports the National Development Plan's strategic objectives through its analysis of how CI can enhance inclusive economic growth (Mhlongo & Daya, 2023; Durokifa, 2024).

3. Research Methodology

Research methodology is the belief that establishes the methods in which research should be performed in order to achieve the defined purposes (Pandey & Pandey, 2015). Research methods include qualitative, quantitative, and mixed (Creswell & Creswell, 2017). In quest of achieving the objective of this research, a quantitative method was employed. The quantitative design approach enhances the accuracy of results through statistics analysis (Myers, Well & Lorch Jr, 2013) and avoids the elements of subjectivity associated with the qualitative approach (Ratner, 2002). A self-administered questionnaire was designed and used to collect data for the purpose of fulfilling the objectives of this study. The questionnaire consisted of closed-ended questions. A five-point Likert scale ("Strongly disagree" (1) to "Strongly agree" (5)) was used to establish the level of agreement to variable items. The questionnaire was designed from scratch as there was no existing comprehensive one that would address the objectives of this research. The questionnaires were administered to SMEs in Gauteng and Kwazulu Natal province of South Africa, targeting those who are currently active in the SMEs economy. Probability sampling, specifically random sampling was used to select a sample of SMEs. According to Small Enterprise Development and Finance Agency SOC Limited (2024) published in 26 September 2024, there was 2 683 602 registered SMEs in South Africa. Gauteng and KZN province have most registered SMEs, and they constituted 51% from total number of registered SMEs. Four hundred (400) SMEs were sampled for the purpose of this research. A web-based questionnaire was developed based on literature review and expert validation before it was distributed to 400 SMEs across Gauteng and KwaZulu-Natal provinces. 179 response received yielding response rate of 44.8%. A quantitative positivist approach was used in this study to evaluate the effects of CI on SMEs sustainability. Collected data was captured, organised, and coded on Microsoft Excel before being exported to Statistical Packages for Social Sciences (SPSS). To ensure the validity of the data, exploratory factor analysis was performed (Howard, 2016). Cronbach's alpha was used to ensure the reliability of data (Hair et al., 2021). Malhotra (2020) recommends that the lowest recognized composite reliability value should be 0.70. The satisfactory value for the Cronbach alpha coefficient should also be greater than 0.70 (Gournelos, 2019). Descriptive statistics were used to describe valid and reliable data. The mean and standard deviation were used to describe data in this research (Hair et al., 2021). Ethical clearance was obtained for this study prior to the collection of data. Respondents participated in this study voluntarily. All respondents by continuing to complet the online survey they gave the consent to participate in this study as stipulated in the web cover page.

4. Research Results

Data validity

This research used exploratory factor analysis (EFA) to test the validity of the collected data. EFA was employed to identify underlying constructs and reduce data dimensionality, aligning with the study's objective to assess CI adoption challenges and opportunities (Howard, 2016). Katz et al (2021) advocates for a safety sample size of 300 cases, and a minimum of at least 150 cases. Successful responses from 179 SMEs were secured for this research, which is considered suitable for factor analysis (Hair Jr et al., 2021). To measure the appropriateness of the factor analysis, the Kaiser-Meyer-Olkin Measure (KMO) of Sampling Adequacy and Bartlett's Test of Sphericity were conducted as shown in Table 3. The minimum threshold of the KMO value is 0.5. In this study, the KMO had a value of 0.857 which is above the threshold. The Bartlett's Test of Sphericity had a chi-square value of 4.635.450 with 465 degrees of freedom and a p-value of less than 0.001 which is highly significant at a 5% level of significance. There are sufficient correlations among the variables since the Bartlett's Test of Sphericity null hypothesis was rejected, therefore factor analysis is appropriate.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.857
Bartlett's Test of Sphericity	Approx. Chi-Square	4635.450
	df	465
	Sig.	<.001

Data reliability

The Cronbach alpha was used to assess the internal consistency of the status of CI through challenges and opportunities related to the adoption of CI among South African SMEs in table 4. The coefficient was 0.875 and consisted of seven items; a Cronbach's alpha above .8 is considered good reliability, as proposed by Ahmed and Ishtiaq (2021). This indicates that the response values for each respondent across the seven items is consistent and highly reliable. Table 4 shows the Item-Total statistics that assesses the individual performance of each item in CI through challenges and opportunities related to the adoption of CI among South African SMEs construct. The corrected item-total correlations indicated that all items had a very strong positive correlation that ranged from. 0.580 to 0.722, which is above the .30 threshold proposed by Field (2024) and Hair Jr et al (2021). This validates that items contribute meaningfully to the construct. The Cronbach alpha if item deleted ranged from 0.852 to 0.866 which is lower or equal to the overall Cronbach alpha therefore none of the items are deleted since no item reducing reliability. The item-total statistics in Table 4 contain the scale mean if item deleted, scale variance if item deleted, corrected item-total correlation and Cronbach's Alpha if item deleted.

Table 4: Summary of reliability test results of total statistics items for CI challenges and opportunities

Item-Total Statistics				
	Scale mean if item deleted	Scale variance if item deleted	Corrected Item-total correlation	Cronbach's alpha if Item deleted

The availability of resources will influence the adoption of CI in our business	24.47	14.981	.683	.854
Senior management support is essential for the successful implementation of CI in our business	24.41	15.311	.580	.866
There is a direct relationship between the use of CI and the financial performance of our business	24.79	14.314	.650	.858
CI will help our business to identify new market opportunities	24.52	14.847	.616	.862
CI will contribute to the long-term sustainability of our business	24.50	13.982	.722	.847
Our business will improve its operational efficiency through the use of CI	24.42	14.538	.688	.852
CI practices will enhance our ability to respond to competitive pressures?	24.44	14.888	.647	.858

Source: (Author's own compilation)

Table 5 and figure 1 reveal the descriptive statistics and spread of responses for the challenges and opportunities related to the adoption of CI among South African SMEs, respectively. Seven items of the dependent factor to the adoption of CI among South African SMEs are valid and reliable. Their central tendencies are analysed hereunder.

C1. The availability of resources influences the adoption of CI in our business: the SD, skewness and kurtosis for this element are 0.762, -0.905 and 1.490, respectively. The respondents perceive that the availability of resources influences the adoption of CI in the business. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that the availability of resources influences the adoption of CI in the business.

C2. Senior management support is essential for the successful implementation of CI in our business: the SD, skewness and kurtosis for this element are 0.801, -1.196 and 2.297, respectively. The respondents perceived that senior management support is essential for the successful implementation of CI in our business. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondent's views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that senior management support is essential for the successful implementation of CI in our business.

E1. There is a direct relationship between the use of CI and the financial performance of our business: the SD, skewness and kurtosis for this element are 0.906,-0.565 and 0.477, respectively. The respondents perceived that there was a direct relationship between the use of CI and financial performance in business. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode

indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that there is a direct relationship between the use of CI and financial performance in the business.

E2. The CI helps our business identify new market opportunities: the SD, skewness and kurtosis for this element are 0.848, -0.921 and 1.099, respectively. The respondents perceive that CI helps businesses identify new market opportunities. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that CI will help businesses identify new market opportunities.

E3. The CI contributes to the long-term sustainability of our business: the SD, skewness and kurtosis for this element are 0.891, -0.959 and 0.823, respectively. The respondents perceive that CI will contribute to the long-term sustainability of our business. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that CI will contribute to the long-term sustainability of our business.

E4. Our business will improve its operational efficiency through the use of CI: the SD, skewness and kurtosis for this element are 0.831, -1.214 and 2.322, respectively. The respondents perceived that business would improve its operational efficiency through the use of CI. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that business will improve its operational efficiency through the use of CI.

E5. CI practices enhance our ability to respond to competitive pressures: the SD, skewness and kurtosis for this element are 0.810, -1.115 and 2.281, respectively. The respondents perceive that CI practices enhance our ability to respond to competitive pressures. This indicates that there is moderate variability within the responses. A low standard deviation suggests that respondents' views are consistent with a few outliers. Reliability is supported by this consistency, which indicates a deeper understanding of the implementation of CI within the organisation and the importance of its implementation by management. The mode, median and mean for this element are 4.1. The mode indicates that the most selected answer to this element was "agree." Thus, the mean and median indicate that the majority of South Africa SMEs endorse that CI practices enhance our ability to respond to competitive pressures.

All the items are negatively skewed, which means that a larger proportion of the responders selected higher agreement levels, which is supported by the high mean values and suggests that there is an overall agreement on implementing CI within the business. The responses are close to the mean because the kurtosis values range from 0.477--2.322, which means that the distribution is mesokurtic to slightly leptokurtic. Kurtosis and skewness further support evidence that respondents agree with the implementation of CI within the organisation and the importance of its implementation by management. The descriptive statistics show

consistent and positive perceptions among respondents, further supporting the internal consistency and construct validity of the organisational competitiveness factor.

Table 5: Descriptive statistics for CI challenges and opportunities

Item	Mode	Median	Mean	SD	Skewness	Kurtosis	Response count	Agreement Level
C1.	4	4	4.12	.762	-.905	1.490	179	Agree
C2.	4	4	4.18	.801	-1.196	2.297	179	Agree
E1.	4	4	3.80	.906	-.565	.477	179	Agree
E2.	4	4	4.07	.848	-.921	1.099	179	Agree
E3.	4	4	4.09	.891	-.959	.823	179	Agree
E4.	4	4	4.17	.831	-1.214	2.322	179	Agree
E5.	4	4	4.15	.810	-1.115	2.281	179	Agree

Source: (Author's own compilation)

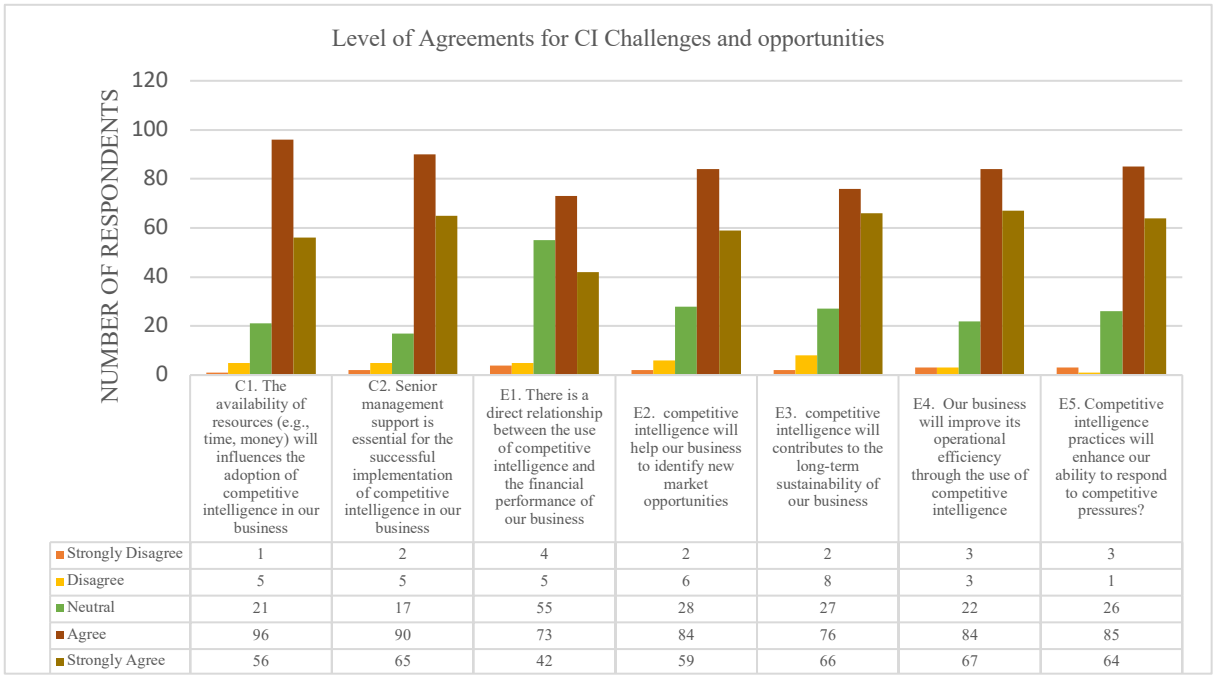

Figure 1: Level of agreement of CI challenges and opportunities (Source: Author's own compilation)

CI challenges and opportunities were assessed using seven items, and the level of agreement according to the guidelines of Sekhon, Cartwright & Francis (2022) are shown in figure 1. Approximately 84.9% of the respondents agreed that the availability of resources influences the adoption of CI in business, 11.7% of the respondents were neutral, and 3.4% disagreed. Similarly, 86.3% of the respondents agreed that senior management support is essential for the successful implementation of CI in business, 9.5% were neutral,

and 3.9% disagreed. For the statement "There is a direct relationship between the use of CI and the financial performance of our business," 64.3% agreed that most respondents perceive that there is a direct relationship between the use of CI and financial performance; however, 30.7% of the respondents were neutral, which is almost half of those who agreed, only 5% disagreed, and 6.1% were neutral. For the statement "CI will help our business identify new market opportunities," 79.9% were in agreement, with 15.6% neutral and 4.5% disagree. While there is a lower level of agreement than the others do, this may reveal an understanding of sustainability within the business. Approximately 79.4% agreed that CI contributes to the long-term sustainability of their business, with 15.1% neutral and 5.6% disagree. Approximately 84.3% agreed that their business would improve its operational efficiency through the use of CI, with 12.3% being neutral and 3.4% disagreeing. The statement "We believe that CI practices will enhance our ability to respond to competitive pressure" received strong support, with 83.3% agreeing. This suggests that the majority of respondents recognise CI in strengthening responsiveness to SMEs challenges. Only 14.5% remained neutral, indicating some uncertainty or lack of direct experience with CI practices, while a very small minority 2.3% disagreed expressed skepticism.

5. Discussion

The research study uncovered the challenges and opportunities which South African SMEs encounter. The economy benefits from SMEs because they establish employment opportunities and generate income while fighting poverty and enhancing national competitiveness. The unemployed population finds employment through SMEs which enables entrepreneurial activities and promotes innovative practices (Abisuga-Oyekunle et al., 2020; Munyo & Veiga, 2024; Surya et al., 2021). The economic sector of South Africa depends on SMEs because they produce 40% of GDP while employing more than 60% of the workforce (Chigbu & Nekhwevha, 2021). The economy becomes more innovative and competitive because SMEs continue to fill market gaps quickly (Anshari & Almunawar, 2022). South African SMEs have not achieved successful implementation of CI. The research confirms earlier studies on developing economies, showing that CI adoption exists through separate segments which operate as unofficial practices instead of organized business systems (Wu et al., 2023; Liu et al., 2022; Kettani & Aljandali, 2022). Developed economy SMEs use CI through structured methods, but South African SMEs lack this level of integration. Senior management support is the key determinant of CI success. Global research shows that CI requires managerial backing to become a fundamental element of strategic decision-making (Kettani & Aljandali, 2022). The findings of this study indicate that without leadership support, CI initiatives fail to influence business results. Moreover, South African SMEs believe CI improves financial performance, a view supported internationally where CI enhances competitiveness and profitability. Financial constraints prevent SMEs from acquiring CI technology (Amadasun & Mutezo, 2022; Nicolas, 2022). This study reveals that SMEs use CI to identify new market opportunities. This isconsistent with global findings that CI helps organizations discover untapped markets and achieve entry. South African SMEs fail to implement CI because of limited innovation and technological progress. SMEs endorse CI as a survival strategy for long-term operations. Research supports this, showing CI functions as a strategic capability for survival in unstable markets (Frances et al., 2023; Enaifoghe & Vezi-Magigaba, 2023). South African SMEs sustainability is constrained by stringent regulatory barriers and insufficient infrastructure compared to other countries (Zhang & Ayele, 2022; Xiong, 2024). South African SMEs link CI to operational efficiency, consistent with global evidence that CI enhances decision-making and operational excellence. In South Africa, however, unstable power supply and poor transport networks increase costs and reduce efficiency (Mthiyane et al., 2022; Li et al., 2023). Research shows SMEs face high competition due to limited strategic resources (Amadasun & Mutezo, 2022; Enaifoghe, 2024; Mugano & Dorasamy, 2024). To withstand market threats, SMEs must develop CI systems. South Africa faces the same CI implementation difficulties as other developing nations. Financial restrictions, talent deficits, regulatory obstacles, infrastructure problems, and market competition mirror findings from India, Nigeria, and Tanzania (Dutta et al., 2020; Singh & Rahman,

2025; Lwesya, 2021; Pulka & Gawuna, 2022; Zide & Jokonya, 2022). South Africa's infrastructure and regulatory challenges are more severe than in peer countries. In contrast, SMEs in developed economies achieve greater CI success due to stronger resources and higher innovation levels. Although CI practice provides multiple benefits such as competitiveness, sustainability, and innovation capabilities, South African SMEs face multiple CI adoption obstacles. The implementation of practical localized CI methods (Lopez-Torres, 2023; Wu et al.,2023) and AI-based CI systems (Cavallo et al., 2021) is challenged by limited resources of South African SMEs. Research by Patel (2021) and Pattanayak (2022) provides infrastructure and resource management solutions to SMEs. The path to successful CI implementation depends on purposeful employee training and strategic planning integration and active leadership backing (Maluleka & Chummun, 2023b; Sishuba, 2020; Vuorio et al.,2025). South African SMEs fail to implement proper CI because of difficulties in making CI part of business operations and staff members who do not understand its value and strategic importance. The sector needs to solve seven major obstacles which include financial constraints,employee understanding, technological adoption, regulatory compliance, infrastructure development, market competition, and leadership support. Reducing and elimination of these challenges will enhance the establishment of CI frameworks that boost competitiveness and better decision-making.

6. Conclusion

The research shows that South African SMEs maintain economic growth through job creation and product innovation, but their implementation of CI faces challenges because of company internal processes and outside business environment factors. CI adoption depends on seven interconnected factors which affect SMEs competitiveness. The study established that financial constraints prevent SMEs from acquiring CI systems and processes because they lack sufficient resources. Survey participants verified that CI results in financial expansion, yet they encounter ongoing difficulties when attempting to obtain sufficient funding. Insufficient skills and knowledge levels represent a major obstacle because most SMEs lack qualified management staff and their employees demonstrate insufficient understanding of CI methods. The research indicates that SMEs require dedicated training programs which teach them to develop their CI abilities. The research established that SMEs can identify new business possibilities through CI by implementing technological innovations. The complete potential of CI remains out of reach because SMEs show inconsistent adoption of new technologies. SMEs require digital infrastructure development to establish their base for creating CI systems which support their operational activities. The research indicates that economic and social policy changes need to be implemented to create an environment which supports CI adoption instead of preventing its implementation. Poor infrastructure creates additional problems because weak systems and insufficient CI institutionalization lead to decreased operational performance. The successful operation of CI depends on improved digital connectivity and technological readiness. The research revealed that businesses need to handle challenges which market competition creates to succeed. The research included 179 participants who worked at SMEs based in Gauteng and KwaZulu-Natal provinces of South Africa. The limited geographic scope and participant numbers restrict the study's ability to represent all South African SMEs. The quantitative data collection might have missed important details which qualitative research approaches could have revealed. The research demonstrates that South African SMEs face multiple obstacles which prevent them from adopting CI such as financial constraints, skill deficits, insufficient infrastructure, and regulatory issues. The findings demonstrate that CI adoption can be improved through specific training programs, financial backing, infrastructure development, and collaborative innovation between government entities, academic institutions, and industrial partners. The implementation of CI within national development policies and institutional frameworks will enable businesses to achieve enhanced competitiveness and sustainability. Future research needs to perform mixed-method studies across all provinces to determine the full extent of CI adoption in SMEs. Longitudinal studies will evaluate permanent CI effects on small business operations over time. The research indicates that South African SMEs need to overcome their CI adoption obstacles to achieve strategic agility, sustainability, and better market competitiveness in their challenging business setting.

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