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Identifying obstacles to evaluating business intelligence in Micro-Small Apparel Enterprises: a case study in Durban, South Africa

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ABSTRACT

The escalating financial burdens faced by the Small Medium and Micro Enterprise (SMME) sector necessitate a perpetual pursuit of enhanced managerial efficacy. For enhanced financial management, client relationship management and inventory control, it is necessary for businesses to utilise various technologies and methodologies. One approach involves the utilisation of business analytical technologies, such as Business Intelligence (BI). Business Intelligence (BI) serves as a valuable tool for enterprises, aiding in the examination and interpretation of data to facilitate informed decision-making processes aimed at enhancing overall business efficacy. The eThekwini region encompasses a significant presence of micro-small enterprises within the apparel manufacturing and retail sector. The primary aim of this research was to identify and analyse the many issues that hinder the evaluation of business intelligence (BI) in micro-small apparel enterprises located in Durban, a city in Kwa-Zulu Natal, South Africa. A cross-sectional quantitative study was undertaken to examine a cohort of 161 small apparel business owners. The participants were chosen through the utilisation of a judgemental sampling technique. The data was gathered through the utilisation of anonymous questionnaires. The data was analysed by utilising multiple linear regression analysis to determine the characteristics that hinder the evaluation of business intelligence (BI) in the small apparel industry. The study employs the Technology-Organisation-Environment (TOE) framework as its conceptual framework. The researcher identified several obstacles that hinder the evaluation of business intelligence in micro-small textile enterprises in South Africa. These factors include perceived relative advantage, cost, organisational data environment, organizational decision-making culture, and external support. However, there are numerous governmental institutions that are intended to provide support for micro-small companies. Therefore, it is recommended that these institutions establish training initiatives aimed at educating apparel SMMEs on BI. The implementation of target-driven training has the potential to significantly contribute to the achievement of vision 2030 for fostering the growth of small, medium, and micro enterprises (SMMEs) to enhance the South African economy.

Introduction

There has been an increase in the need for real time data and advanced technology, which has required businesses to operate in a fast paced and dynamic environment. However, too much data without proper analysis can cause complexities in the business operations (Ain, Vaia, DeLone and Waheed 2019). To address some of the challenges of the modern business environment, businesses need to examine a wide range of data. It is also vital for businesses to manage and protect their background data, because it is the most essential part of the business.

The analytics industry has experienced a substantial increase in market size in recent years. According to the "Worldwide Semi-annual Big Data and Analytics Spending Guide" report (International Data Corporation 2019), it is projected that the size of the global analytics market will reach $274.3 billion by the year 2022, with a compound annual growth rate of 13.2% over the period of 2017-2022. These findings emphasise the importance for businesses, regardless of size, to utilise business analytical tools such as BI. This motivates the need to conduct this study regarding the evaluation of BI for small apparel businesses.

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According to Becerra-Godinez, et al., (2019), BI can be defined as a decision-making system that provides various options for an organisation to choose from, which can then be customised to accommodate their business needs. Therefore, without the appropriate software systems in place, the management of data can be problematic for small businesses that do not have a BI in their organisations. BI contributes towards business for several reasons in business success, firstly it generates competitive advantage, which obtains central data and presents and manipulates it into information that may be utilised for managerial decision-support by highlighting areas that need attention (Hatta et al. 2015). Puklavec, et al., (2018), stated that businesses utilise BI to improve their organisational agility, which helps them to respond to the demands of the competitive and quick-paced market of today. Additionally, Afolayan and de la Harpe (2019) assert that SMMEs must find and invest in technologies such as BI, that can help boost the effectiveness and development of business processes. The authors further assert that the influence of technology on organisational performance becomes evident through several criteria such as profitability, efficiency, market value, productivity, quality, and competitive advantages. When BI is implemented in a company, the intention is for it solve issues it is thought to solve an issue and improve the environment for making decisions. Despite all the benefits associated with BI, research has shown that small, medium and micro businesses, do not possess the necessary technical and organisational expertise that would allow them to take advantage of such tools efficiently and above all effectively (Raj, et al., 2016). However, Llave (2018), concurs that despite the existing volumes of BI research on Small, Micro and Medium Enterprises (SMMEs) this observation seems to be consistent. In addition, minimal research has been extended to smaller organisations within the apparel sector. These observations have motivated the need to conduct this study in the micro-small apparel retail sector.

When an innovation is considered for adoption in an organisation, it first has been evaluated. This is where the owner/managers of the businesses need to identify their business needs and determine all the problems they are dealing with, so that they can find a suitable BIS to assist in this regard. According to Puklavec, et al., (2019), there are three stages considered in the diffusion of innovation framework namely: evaluation, adoption, and use. For the purposes of this paper, the researchers sought to investigate the factors that affect the evaluation of BI, particularly in the case of retailers in the apparel sector where not much research has been conducted.

Literature Review

Challenges and barriers faced by SMMEs in South Africa

According to the SMME Quarterly Update by SEDA (2022), there has been an increase in the total number of SMMEs in South Africa. However, even with this increase of the number of operating SMMEs, there has been a decline of 3% in employment compared to 2020. This decline accounts for 75% of the job losses experienced over this period. The GDP, and more importantly employment, recovery in the South African economy has lagged that of the global experience. The GDP in 2021 was still 1.7% below the pre-COVID level in 2019, with total employment still down more than 10% compared to pre-covid levels. This is a very challenging business environment for SMMEs to operate in. While the economic recovery is set to continue with 1.9% growth in 2022 and 2023, there are significant downside risks to this outlook. Other downside risks to SMMEs, include load shedding, the high likelihood of further COVID waves, and the threat of more social unrest as experienced in July 2021.

Other challenges affected by SMMEs include supply disruptions which continued to hinder manufacturing activity in China following the Omicron COVID-19 variant. Simultaneously, extra fiscal and monetary policy stimulus measures are slowly being pulled back. Therefore, global growth was expected to slow to 4.4% in and 3.8% in 2023. The sub-Saharan African region was expected to see a slowdown in growth from 4% in 2021 to 3.7% in 2022 before picking up to 4% in 2023 once again.

The move to virtual businesses and e-commerce proved to be a necessity to survive during the height of the pandemic. This provided an opportunity for SMMEs to move to online marketplaces and use social media to reach new customers. However, data costs remain a challenge as well as the technical knowledge of utilising online platforms. Therefore, this type of move requires an investment in technology and skilled staff, which can be a financial challenge for SMMEs, often requiring some form of support. In support of this, It is unlikely that the amount of funding for SMEs will increase without taking into account elements that are critical to guaranteeing their success and sustainability, such as market access, business and management abilities, and financial education, according to the Organisation for Economic Cooperation and Development (2022). Therefore, it is important to take into account a more comprehensive type of developmental support, particularly to encourage the formalisation of SMMEs.

The Department of Small Business Development (2020) has reported that due to high financial constraints and lack of financial literacy amongst SMMEs in South Africa, 70%-80% of small businesses fail in the first year and only about half of the survivors last for the subsequent five years. Additionally, the FinMark Trust MSME survey (2020) shows that around 58% of businesses operate as informal enterprises in South Africa. Therefore, as business owners in this industry are not always aware of and understand the benefits of formalisation, the high incidence of informality also contributes to the lack of access to capital. In addition, informality plays a role in financial exclusion from official financial service providers. Only about 28% of enterprises are informally served while 15% are financially excluded (Organisation for Economic Cooperation and Development 2022).

In conclusion, lack of financial access for SMMEs remains a huge challenge in South Africa, which results in business failure. Low access to financing is caused by a number of factors, such as the dearth of appropriate formal finance products for small businesses, the difficulty in obtaining credit information, the perception of the risk associated with small business financing, and the seeming dearth of suitable assets for small businesses to use as collateral. Which means, the more SMME businesses fail, the less contribution to the economy.

According to SME South Africa, (2022), government support has been identified as a major contributor to the sustainability of SMMEs, particularly regarding financial support. The government has several campaigns available in the form of support agencies and funding institutions. Some of these institutions include the Industrial Development Corporation (IDC), the Small Enterprise Finance Agency (SEFA), and the National Urban Reconstruction and Housing Agency (NURCHA).

South African SMME management is understood to lack knowledge regarding their organisation's financial performances and/or financial position, often only relying on bank statements when making business decisions (Nxumalo 2021). Additionally, SMME owners and managers struggle with stock control, financial reporting, costing, production planning and communication. Furthermore, owners and managers of SMMEs often do not understand their financial statements, which makes it difficult to calculate their ROI and possible losses. Business performance can be measured using both financial (sales growth, profitability) and non-financial (market share, new products, product quality, market effectiveness and value added) measures (Veliu and Manxhari 2017). Given these challenges, SMMEs can look to the adoption of technology where possible, to help avoid some of the pitfalls that befall them.

Challenges Faced by SMMEs: A Global Perspective

Small and medium-sized businesses (SMEs) have made enormous contributions to society worldwide that should not be undervalued (Sanjo & Ibrahim, 2017; Jibril, et al. 2019). It is often recognised that SMEs contribute roughly 40% of GDP and 70% of new job possibilities created (Qalati et al. 2021; Virglerova et al. 2020; Kiram & Saputra 2021). Small and medium-sized enterprises (SMEs) are crucial to the growth and development of both developed and developing nations (Lazányi, & Amoah, 2020). According to Amoah et al., 2021 many studies have been conducted on the factors that affect the sustainability of SMEs, particularly in developed and developing nations. Due to the vital role SMEs play in reducing poverty, creating jobs, and fostering social cohesion, governments in both rich and developing nations have given SMEs considerable attention since the global economic crisis of 2008–2009 (Qalati et al., 2021). However, these mitigating variables restrict SMEs' ability to sustain themselves over time as they go through different stages. These elements inevitably have an impact on SMEs' sustainability, which makes it challenging for entrepreneurs and business owners to reap long-term rewards. Therefore, it is crucial and helpful to comprehend how these elements affect SME sustainability and how to reduce or enhance them over time.

Small and medium-sized enterprises (SMMEs) must recognise and acquire technology that support the growth and efficiency of business processes (BP). IT is a tool that helps small and medium-sized enterprises (SMMEs) grow steadily by improving cross-border connections and international trade, according to the OECD (2019a). Small and medium-sized enterprises (SMMEs) must find and acquire technology that can help boost BP's development and efficiency. Technology has a discernible effect on the profitability, efficiency, market value, productivity, quality, and competitive advantages of an organisation. The OECD (2019b) highlights the significance of small and medium-sized enterprises (SMMEs) staying up to date with current developments, noting that SMME adoption of digital technology is lacking.

Due to their limited use of digitalization, SMMEs are missing out on the advantages of doing business internationally. Among other digital and emerging technologies, SMMEs should make proactive investments in business intelligence, big data analytics, and Internet of Things apps (OECD 2019a). A large organisation can function more profitably when business and Technology Evaluation (TE) adoption strategies are aligned. In a study on SMMEs in manufacturing in West Virginia, USA, Mittal et al., (2018) found that there was no motivation for SMMEs to adopt smart technologies. Eze et al., (2018) contend that anxiety and uncertainty around technology acquisition had a major role in similar decision-making issues encountered in the UK. Erasmus, et al., concurs that this predicament results from inadequate planning and assessment of the technology. To bridge the technological divide and stay competitive, SMMEs must plan and assess technology in relation to their business strategy and internal procedures. They must also embrace innovation as a tactic.

Evaluation of Technology

The evaluation of technology, which is a concern for companies, plays a major role in the adoption processes of BI. Due to the uncertainty and lack of knowledge in this area by SMMEs, further discussion is warranted. For users to fully adopt and accept new technological systems such as BI in their businesses, they need to undergo an evaluation and decision-making process that takes place at different stages of the adoption process. According to Puklavec, et al., (2018), at the evaluation stage, top managers weigh up an innovation to determine whether it will aid in the formulation of organisational goals and objectives.

The evaluation stage can be described as the persuasive (pre-adoption) stage. The integration of the innovation begins when a business evaluates the innovation. This stage focuses on identifying and emphasising the needs and issues a business face. In the case of BI, the evaluation process would consider whether a BI tool would be of benefit to an organisation (Puklavec, et al., 2018). For example, BIS evaluation could be described as the assessment of the importance of utilising BIS in an organisation to improve business operations regarding cost reduction and market development. Mthembu, et al., (2018) stated that technology evaluation in African

countries still lags other markets. Additionally, the use of the internet for business practices has meant that the characteristics of infrastructural, socio-economic and socio-cultural factors have created a difference in the evaluation of technology. Moreover, the technological infrastructure, as well as socio-economic, socio-cultural, and political regulations in some countries, might serve as inhibiting factors that impede the process of technology evaluation.

Afolayan and de la Harp (2019) found that the primary obstacle faced by business managers in evaluating BI in SMMEs is the uncertain nature of return on investment (ROI) associated with BI. This uncertainty makes it challenging for managers to accurately assess the likelihood and significance of the risks involved. Moreover, SMMEs exhibit a cautious approach towards BI due to their apprehensions regarding emerging technological innovations and the associated risk factors. In summary, it was determined that the ability of SMMEs to evaluate and implement business intelligence (BI) for organizational benefit is restricted by a deficiency in knowledge regarding the new technology. Mavutha (2024) indicates that most enterprises in the eThekwini region had not assessed business intelligence. Restricting resources can be the obstacle because most of these companies are sole proprietorships with one to five staff. They may take a while to complete a trial run. It's interesting that, given that the majority of respondents had looked into the advantages and applicability of BI, perceived relative advantage did not influence opinion.

Theoretical Framework

With regards to the evaluation of new technologies, there are various theories that have been used by researchers. These include the DOI theory, the theory of planned behaviour (TPB), the technology acceptance model (TAM), and the technology-organisation-enhancement model (Puklavec, et al., 2019). DOI theory describes the social dissemination of an innovation. The adoption of an innovation is part of dissemination. The DOI hypothesis explores how a potential adopter's psychological or personal traits and technology viewpoints may affect diffusion or adoption. Schiffman and Wisenblit (2019) define the DOI as a macro process that occurs over time as social system members adopt an invention. Rogers (1983) established the DOI theory to identify factors affecting innovation distribution and adoption (Ain, et al. 2019). The DOI theory states that prospective users evaluate innovations based on their perceptions and decide whether to adopt them according to their levels of have relative advantage, complexity, compatibility, trialability, or observability.

However, the DOI theory has been censured for placing more attention on the technological component of the adoption process. According to Alrousan, et al., (2020), the understanding of the critical determinants that arise during the phases of the adoption process is inhibited by several limitations, indicating the need for further research. Therefore, the authors suggested that other variables need to be included, such as structural factors, like administrative intensity, internal and external integration, as well as organisational factors, such as technical knowledge resources and lastly characteristics of top managers.

These factors are not covered in the DOI theory, hence several researchers have adapted the TOE framework, because it focuses on all the critical factors that influence innovation adoption, particularly BI. Pichlak (2015) suggested that future research should explore the relationships between the technological, organisational, and environmental factors, as critical determining factors for the adoption of innovation process in different contexts, industries, and cultures in other developing economies.

In summary, the TOE framework offers a valuable analytical framework for examining how various forms of IT innovation are adopted in a variety of technological, organisational, and external situations (Oliveria and Martins cited by Pukalavec, et al., 2018). The technological context in relation to the TOE framework is comprised of innovations and technological readiness. The organisational framework consists of both official and informal structures, collaboration, resource accessibility, and management perspectives on the acceptability of technology. The technological support infrastructure, industry features, market structure, and governmental laws are all part of the environmental context Puklavec, et al., (2018), these factors are illustrated in Figure 1. Due to BI technology's increasing affordability and organisations' desire to make decisions quickly, the use of BI technology to help enterprises has increased. Therefore, SMMEs today need BI just as much as large businesses do. However, SMME adoption is still lagging in comparison to larger organisation. Considering their low adoption rate, SMMEs may find it harder to compete with larger businesses and maintain their competitive edge (Chaudhuri, Dayal, and Narasayya cited by Pukalavec, et al., 2018).

Conceptual Framework

Existing literature indicates a need for BI systems in micro-small apparel businesses. BI can benefit businesses for better management of finances and inventory and so play an important role in business growth. Without an appropriate reporting system, it becomes difficult for businesses to track down historical data and calculate their return on investment (ROI). However, Puklavec, et al., (2018) state that the adoption factors and processes regarding BI in SMMEs are still understudied. Most of the existing BI adoption research concentrated on the adoption of BI in large-sized organisations, seeking to pinpoint organisational factors that were unique to SMMEs that would influence the creation and testing of a framework for BI adoption in the setting of SMMEs. The literature seems to support the use of the TOE theory which expands on the claims made by the DOI theory. As such, further investigations into the subject of innovation evaluation may be grounded in the TOE theory. Therefore, to meet the objectives of this study, the researcher has adopted the TOE theory as the conceptual framework.

Figure 1 illustrates the factors that will be considered for each of the three contexts in the TOE framework, derived from a study conducted by Puklavec, et al., 2018).

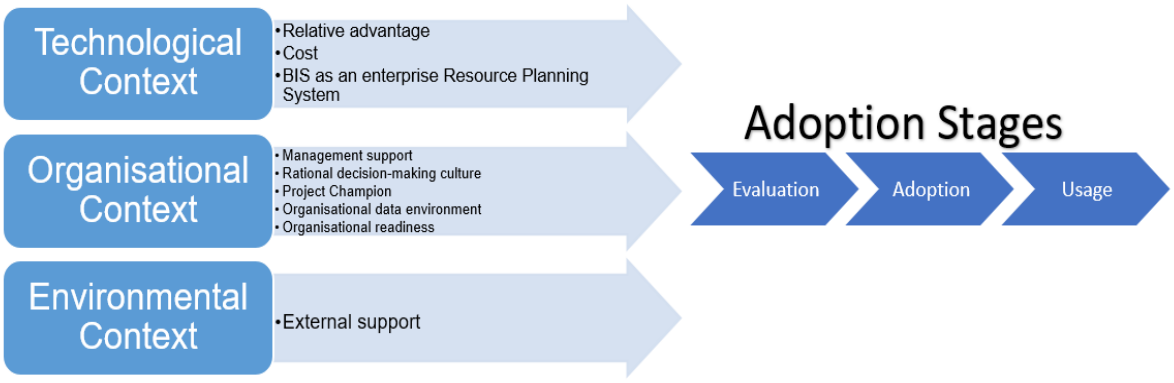

Figure 1: Conceptual Framework; *Source:* Adapted from Puklavec Oliveira, and Popovič (2018)

The technological context

According to Shahadat, et al., (2023), the technological context is made up of the elements that have an impact on the actual invention and its advantages. According to the TOE theory, this emphasises relative advantage, compatibility, trialability, and observability and then adds information technology skills and financial resources to enable adoption of the technology. The aspects of relative advantage, cost, and BIS as components of enterprise resource planning were employed by Ghaleb et al. (2021) in their model to demonstrate the adoption of BI in SMMEs and the importance benefits of improving business performance.

The degree to which a technology, like BI, is seen as be efficient is known as relative advantage. Accroding to Puklavec, et al., (2018), the framework demonstrates that the relative benefit of business intelligence (BI) is one of the predictors that is most commonly used in information systems (IS) adoption studies. However, the results from their study rejected their hypothesis that relative advantage predicts BIS adoption in the adoption phases. Ahmed et al. (2020) found that cost was still a major barrier to the adoption of BIS and therefore organisations must weigh the costs and benefits (Ahmad et al., 2020).This includes the long-term benefits of their BI investment compared to short-term costs (Egbelakin et al., 2022). However, Puklavec, et al., (2018) disagreed, arguing that based on their understanding of the factors that influence the phases of BI system adoption for SMEs, cost was not a factor.

Organisational context

The management support factor in an organsiational context can be identified as evidence of clear encouragement from senior management towards the introduction of advanced technological innovation. Thus, the adoption of a BIS is positively correlated with management support (Saleem, et al., 2021). Additional studies support the idea that management support could be a significant factor in BI adoption, due to the role that they play in securing resources towards the adoption of an innovation (Puklavec, et al., 2018).

According to Egbelakin et al. (2022), management support may play a significant role in each of the three phases of the adoption process for business intelligence. Additionally, Ahmad et al. (2020) suggested that management support has a positive impact on BIS evaluation, adoption, and usage. Puklavec et al. (2018), however, found that management support is positively and significantly correlated with evaluation and utilisation in a SME environment.

There are several additional factors that have been identified as influential in the organisational context. These include the presence of a fact-based decision-making culture (Kulkarni et al., 2017); the presence of a project champion (Owusu et al. 2017) and the presence of an organizational data environment (Puklavec et al., 2018). Additionally, organisational preparedness and organisational readiness were also included in the list of influencers in the adoption of BI Ahmad et al., (2020). The findings regarding the influence of these factors have shown varied results and therefore necessitates further investigation.

Environmental context

External support is acknowledged as a crucial factor for BI adoption in an environmental context. The term external support describes the support that is required when adopting and making use of technological innovation. (Maroufkhani et al., 2020). Outsourcing and third-party help are proven to have a major impact on the adoption of BI as organisations become more prepared for the risks of introducing new technologies, provided that an appropriate vendor or third-party assistance for the innovation is available (Chatterjee et al., 2021). One major obstacle to the evaluation of advanced BI in SMMEs is the dearth of internal IT expertise inside these organisations. BI evaluation is promoted through external support. However, Puklavec et al. (2018) found that none of the three adoption stages have a positive influence in the environmental context regarding external support.

Research and Methodology

The design for this research was a quantitative cross-sectional study, which investigates the connection between two factors. To describe and evaluate the frequency and distribution of one or more outcomes in a specific population using descriptive cross-sectional studies, the reason for conducting a cross-sectional study is due it's cost and time implications. Research that uses descriptive cross-sectional methods ascertain the prevalence, degree, or severity of a given characteristic within a given population at a given moment in time (Simkus, 2021). The primary aim of this research was to identify and analyse the many issues that hinder the adoption of business intelligence (BI) in micro-small apparel enterprises located in South Africa.

Population & Sampling

The study's population comprised the micro-small apparel industry in the eThekwini region, encompassing micro-small cut, make, and trim clothing manufacturers in addition to micro-small retail fashion boutiques. The researcher visited various businesses in Durban central as well as surrounding shopping malls in eThekwini. Non-probability sampling was used for this investigation. Purposive sampling was chosen for this study, with the use of a total of 200 apparel businesses registered at the eThekwini Micro Enterprise Support – Informal Economy Support Programme. A sample size of 132 respondents was deemed to be enough for this study. However, it should be noted that as this is an informal association, it was not compulsory for businesses to register their businesses.

Data Collection & Analysis

A cross-sectional study was carried out where the researcher collected data by means of a structured questionnaire survey set in a Likert scale format. The researcher collected the data by personally visiting selected micro-small apparel business owners in the great eThekwini region. Descriptive and inferential statistics were used to analyse data for this study, by means of the Statistical Package for Social Sciences (SPSS) Version 13.0 software program.

To achieve the objectives outlined by the study, several tests were conducted, including univariate, bivariate and multivariate analysis. The tests conducted included a chi-goodness of square, t-tests exploratory factor analysis and regression of co-efficient tests.

Ethical Considerations

The ethics committee of Durban University of Technology (DUT) gave the approval for this study to take place in 2019. At the start of the survey, the participants were sent a letter requesting their permission to conduct the study in their place of business, a letter of information, and a letter of consent. Every responder received a detailed explanation of the study's purpose. Although the topic may not be controversial, the participants were made aware that anonymity and confidentiality would be assured.

Findings

This section will be an analysis of the results of this study, which are divided into sections according to the structure of the questionnaire. The questionnaire had two sections (namely Section A and B) which represented the dependent and independent variables of the study. Section A investigated the evaluation of BI, section B consisted of the independent variables of the study which are technological, organisational, and environmental.

Measures of significance

The dependent variable for this study was evaluation, therefore, using statements in Section A of the questionnaire. Respondents were asked to score their situation in each category using remarks from previous literature. Each statement was rated on a 6-point Likert scale from strongly disagree (1) to strongly agree (6).

Results analysis began with item frequencies and percentages. Mean scores were calculated using these figures. One sample t-testing was then utilised to see if a mean score was significantly different from a value. The average significant score was compared to the centre score of 3.5 using one sample t-testing. major agreement was indicated by a mean >3.5, whereas major disagreement was indicated by a mean <3.5. The one sample t-test is used when the population standard deviation is unknown or the sample size is small, as in this case. After reporting these numbers, further research was done to create a credible composite measure for each dependent variable, table 2 shows the results for the significance of evaluation.

Table 2: Significance of evaluation

No	Statements	Mean	Standard Deviation	p-value
A1.1	Our business is in the process of gathering information on BI with the possible intention of adopting it	4.01	1.367	**<.001***
A1.2	Our business has conducted a trial run to evaluate a BIS.	2.78	1.512	**<.001***
A1.3	Our business has investigated the benefits of using BI -	4.12	1.619	**<.001***
A1.4	Our business has investigated the feasibility of using BI (e.g., having the resources such as skills and finances needed to adopt it)	4.21	1.583	**<.001***
A1.5	**Our business has investigated different kinds of systems that support BI.**	**3.31**	**1.634**	**.149**

**indicates significance at the 95% level*

The results indicate that there is significant agreement that businesses are in the process of gathering information on BI with the possible intention of adopting and using it, that businesses have investigated the benefits of using BI and that they investigated the feasibility of using BI. In all these cases p<.001. However, the results also show that there is significant disagreement with the statement that companies have conducted a trial run to evaluate a BIS, p<.001. There is neither significant agreement nor significant disagreement with the statement that businesses have investigated different types of systems that support BI (p = 0.149 >.001).

Table 3: Frequencies of evaluation

No	Evaluation	Responses as Frequency (%)					
		Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	**Strongly agree**
A1.1	Our business is in the process of gathering information on BI with the possible intention of adopting it	9 (5.6)	25 (15.6)	1 (0.6)	64 (15.0)	43 (26.9)	**18 (11.3)**
A1.2	Our business has conducted a trial	17	84	26	1	14	**18**
	run to evaluate a BIS.	(10.6)	(52.5)	(16.3)	(0.6)	(8.8)	**(11.3)**
A1.3	Our business has investigated the	17	17	18	15	64	**29**
	benefits of using BI -	(10.6)	(10.6)	(11.3)	(9.4)	(40.0)	**(18.1)**
A1.4	Our business has investigated the	17					
	feasibility of using BI (e.g. having	(10.6)	17	9	14	79	**24**
	the resources such as skills and finances needed to adopt it)		(10.6)	(5.6)	(8.8)	(49.4)	**(15.0)**
A1.5	Our business has investigated different kinds of systems that support BI.	26 (16.3)	36 (22.5)	25 (15.6)	24 (15.0)	33 (20.6)	16 (10.0)

The results gathered in Table 3 indicate that from amongst the respondents that were interviewed, 53.2% agreed that their businesses were in the process of gathering information on BI with the possible intention of adopting it, while 46,8% of the respondents disagreed with this statement. From the respondents that participated in this survey, 79.4 % disagreed with the statement that their businesses have conducted a trial run to evaluate a BI. These results also indicate that 67.5% agree with the statement that their businesses have investigated the benefits of using BI, and 73% of the respondents agree that their businesses have investigated the feasibility of using BI. Only 45.6% of the respondents agree with the statement that their businesses have investigated different kinds of BIS, while 54.4% disagree with the same statement.

Exploratory factor analysis

The categories of the items under each construct were found using factor analysis with promax rotation in order to obtain single composite measures for both dependent variables. The average of the agreement scores obtained from the items included in the composite factor was used to create composite measures. Throughout the procedure, items that crossed-loaded or did not load firmly enough were eliminated.

To assess the composite measure's reliability, Cronbach's alpha was employed. Any value below 0.6 is seen as indicating less than adequate internal consistency, or reliability. The Cronbach's alpha coefficient ranges from 0 to 1. According to Saunders, Lewis, and Thornhill, scores above 0.7 are ideally indicative of internal consistency amongst statements in a group.

The results for evaluation as a dependent construct in this study are summarised in Table 4.

Table 4: Summary of the exploratory factor analysis

Construct	**KMO**	**Percentage variance extracted**	**Items retained**	**Cronbach's alpha**
Evaluation	.823	74.15	1.1 – 1.5	.929

As can be seen in Table 4, evaluation measures are reliable (Cronbach's alpha >.7). In addition, a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was run to see how appropriate the factor analysis was. A KMO of >.7, indicates that the factor analysis was successful. During the process of factor analysis items that either cross load or do not load strongly enough are removed.

Table 5 details the items for the dependent variables that were retained once the factor analysis had taken place.

Table 5: Items retained post factor analysis for the dependent variables

Construct	**Item**	**Statement**
Evaluation	1.1	Our business is in the process of gathering information on BI with the possible intention of using it.
	1.2	Our business has conducted a trial run to evaluate a BIS.
	1.3	Our business has investigated the benefits of using BI – e.g., better analysis in decision making; increased organisational efficiency; improved business performance; and increased customer satisfaction.
	1.4	Our business has investigated the feasibility of using BI (e.g., having the resources, such as skills and finances, needed to adopt it).
	1.5	Our business has investigated different kinds of systems that support BI.

Regression analysis

To address the objectives, regression analysis was applied to test for the effect of the independent variables (technological, organisational and environmental factors) on the three dependent variable (evaluation). Table 6 shows the results of the regression analysis for dependent variable evaluation to test the effect of the dependent variables.

Table 6: Regression analysis for evaluation

IV	R2	F	df1; df2	p-value	B (regression coefficient)	t	p-value
T Perceived Relative Advantage	.811	120.497	7; 152	<.001	-.054	-.750	**.455**
T_Cost					-.047	-.758	**.450**
O_Organisational Readiness					.417	7.625	**<.001**
O_Rational Decision-making Culture					-.704	-10.322	**<.001**
O_Management Support					.448	8.664	**<.001**
O_Organisational Data Environment					.818	12.638	**<.001**
E_Environmental Support					**-.030**	**-5.542**	**.538**

Based on the results from the respondents, these seven independent variables/factors account for 81.1% of the variance of evaluation (R2 = .811), F (7, 152) = 103.824, p<.001. Organisational readiness (β = .417, p<.001); management support (β = .448, p<.001); and organisational data environment (β = .818, p<.001) are all significant predictors of adoption. Factors that influence evaluation negatively are perceived relative advantage (β -.054, p= 0.455; cost (β -.2047, p= 0.450); rational decision- making culture (β = -.704, p<.001); and external support (β = -.030, p =.538).

Discussion

The key findings from this study are discussed in this section. The main objective of this paper was to determine factors hindering evaluation of BI for micro-small apparel businesses in the eThekwini Region. It is interesting to note that perceived relative advantage has no significant impact on evaluation. This finding is supported by Afolayan and de la Harpe (2019), where they established that lack of knowledge and understanding of BI limits the ability of SMMEs to evaluate BI to support the business. The assumption for this would be that owner/managers in the micro-small apparel sector do not have the time to learn about new technological systems, as they are working in a fast-paced environment, where they are constantly pushing production and meeting customer demands. A study by Eze et al., (2018) noted that hesitation is found in UK SMMEs as well, with regards to a concern and uncertainty about evaluating BI. Erasmus, et al., (2019) suggested that this problem results from BI considerations that lack sufficient planning and evaluation. This implies that operating in a fast-paced environment makes it challenging for micro-small apparel business owners to evaluate BI and its benefits.

This study also found that 79.4% of the micro-small apparel businesses had not conducted a trial run to evaluate a BI, indicating that they have not investigated different kinds of BI to discover ones that are suitable for their business needs. Afolayan and de la Harpe (2019) established that SMMEs often end up failing to fully evaluate BI due to the overwhelming amount of information required when considering BI utilisation. Jakliča, et al., (2018) added that aligning BI to the changing needs and expectations of users and the way they like to work can be difficult.

This study established that factors that cause hindrances to evaluation were perceived relative advantage, rational decision-making culture and external support. The assumption to the findings in the micro-small apparel sector, would be that these businesses take a conservative attitude towards BI because of their perceptions towards new technological advances and the weight of the risk that might be associated with them. Challenges found in the literature, concur that SMMEs frequently worry about their understanding of BI dynamics and operational design, as well as the degree to which it applies to the business process (Erasmus, et al., 2019; Afolayan and de la Harpe 2019).

Due to their impressions of new technology developments and the significance of the risk that goes along with a cautious attitude toward BI, SMMEs lack a systematic process or approach for figuring out business requirements that would ensure their understanding of how new technology might accomplish company objectives (Afolayan and de la Harpe 2019; Puklavec, et al., 2018). This is indicative of reasons why there is a negative relationship of perceived relative advantage and rational decision- making culture with regards to the evaluation of BI in the eThekwini micro-small apparel sector.

This study also found that external support is one of the factors that hinder the evaluation of BI amongst the micro-small apparel sector in eThekwini. This could be attributed to the fact that most of the businesses in this sector are classified as informal. Informality contributes significantly to financial exclusion from formal financial service providers for business classified as informal in South Africa. The 2020 FinMark Trust MSME survey shows that around 58% of businesses operate as informal enterprises in South Africa and as a result most of these businesses are excluded from dealing with formal financial service providers.

Implications

Theoretical Implications

The adoption of BI in South Africa's micro-small garment industry is the first of several aspects that this study has looked at to add to the existing body of knowledge. The three stages of adoption—evaluation, adoption, and usage—are highlighted by the Technology-Organization-Environment (TOE) framework, which is used in this study to investigate the factors influencing BI evaluation. Examining the micro-small clothing businesses in the eThekwini area of KwaZulu-Natal, South Africa, is the main goal of this study. As a result, this study makes a significant contribution to the field by providing an original perspective in comparison to other research projects conducted in South Africa and globally.

Practical Implications

This study found that BI suppliers do not support the micro-small apparel sector, a niche market that may maximise profit. BI tools providers could cooperate with businesses in this industry to provide tailored BI tools. The micro-small apparel business is large, offering many partnership prospects. Businesses must invest in BI software as part of the retail digital transformation and the 4th industrial revolution begins.

Since many customers shop online, data analytics are crucial to corporate success. Thus, walk-ins are unsustainable for retail firms, especially micro-small garment retailers. Over the past two years, many online firms have launched, therefore, BI software is needed to manage data and get a competitive edge by knowing client wants and building rapport. Without software development and BI vendor relationships, micro-small apparel businesses cannot sustain themselves in the long run.

According to the findings of this research, there are insufficient government incentives for such initiatives. While there are numerous government funding opportunities and business support mechanisms, respondents indicated that government incentives do not support the adoption of BI and all the factors that must be considered during the adoption process. These factors include training programmes and funding for training programmes.

Utilising BI in the South African context could significantly contribute to the country's GDP and generate growth opportunities for SMMEs on the global market. Government support for such an initiative would help reduce South Africa's high unemployment rate, as more jobs would be generated by these projects throughout the country. It is believed that South African SMMEs contribute approximately 50% of the national gross domestic product and provide employment opportunities for a conservative estimate of 60% of the national labour force (Taljaard and Van Der Walt, 2018; Bruwer and Mason, 2020). The NDP (2020) identifies SMMEs as a crucial component for furthering inclusive growth and development in South Africa. The NDP emphasises the importance of SMMEs for job creation, innovation, and competitiveness, with the aim that by 2030, 90% of new jobs in South Africa will be created by SMMEs. South Africa's SMMEs are of paramount importance, particularly from a socioeconomic standpoint (Manete, 2018). Therefore, the South African government must invest more in technological innovations for SMMEs.

Conclusions

The purpose of this study was to identify factors hindering the evaluation of business intelligence in South African micro-small apparel retailers in eThekwini. This was a cross-sectional survey involving 161 small independent apparel retailers who were selected using a judgmental sampling technique. Using an anonymous survey, data were collected. Multiple linear regression was employed to determine the factors that hinder BI evaluation in the small apparel industry. This study made use of the Technology-Organisation-Environment (TOE) conceptual framework. The key findings of study discovered that perceived relative advantage, costs, organizational data environment, organizational decision-making culture, and external support hindered the evaluation of business intelligence small apparel retailers in eThekwini. From the results of the study, the researcher recommend that the government should develop training programs to prepare SMMEs to utilise business intelligence. Implementing goal-oriented training could significantly contribute to the 2030 objective of strengthening the South African economy through the development of SMMEs.

Limitations and recommendations for future research

A future research recommendation from this project would be a comparative analysis of BI adoption between online micro-small enterprises and those with physical stores. It is also recommended that an investigation be conducted to determine if there are differences between the perceived simplicity of use and acceptance of BI between these business operations. It was difficult to conduct the analysis for this study because it concentrated solely on adoption factors and did not compare the various types of business operations. Given the similarity in the findings of the empirical studies discussed in this paper, it would be fascinating to determine whether BI is necessary for SMMEs despite its well-known benefits for large organisations. Although, SMMEs appear to

have evaluated and chosen to employ BI, there are still a significant number of SMMEs that have not effectively implemented BI. Therefore, an investigation into whether SMMEs truly require BI for the sustainability of their enterprises is strongly suggested. The major limitation to the study was lack of literature of studies conducted in the exact same context. Most of the research reviewed in this study has been conducted in other regions of around the globe, mostly in manufacturing SMMEs, and E-commerce SMMEs. There is not enough research into micro-small businesses, particularly those operating in the apparel retail sector. Other studies conducted in the South African context also focused on SMMEs in general, with no research having been conducted on BI adoption by micro-small businesses. Additionally, future studies could explore intervention studies that test the effectiveness of specific strategies designed to overcome the identified barriers. Investigating the role of digital literacy and its impact on the effective use of BI tools in small businesses could be another fruitful area of research.

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