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The Impact of Business Intelligence System on The United Arab Emirates' SMEs Innovative Work Behaviour

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Abstract

In the UAE, small and medium-sized businesses account for more than 95% of all operating businesses. These enterprises lack local and global expansion, which is attributable to their low level of innovative work behavior. Also, the lack of an effective business intelligence system has contributed to the low level of innovative work behavior within the UAE small and medium enterprises. This study aims to investigate the impact of business intelligence systems on the innovative work behavior of small and medium enterprises, both directly and through the mediation role of knowledge sharing and innovation. The model development of this study relies mainly on the technology, organization, and environment frameworks. This study adopts the quantitative method. The cross-sectional time horizon used to collect the data was 386 owners, managers, and shareholders who took the initiative to implement and enforce business intelligence systems. The data collected were analysed using Partial Least Square Structural Equation Modeling (PLS-SEM) using Smart PLS software. The findings of this study revealed a significant and positive impact of the business intelligence system on innovative work behaviors. Also, knowledge sharing and SME innovation mediate the impact between the business intelligence system and innovative work behavior. This study contributes to the technology, organization, and environment framework by exploring the mediation role of knowledge sharing and SMEs' innovation toward improving innovative work behaviors. It was recommended that knowledge sharing inside the workplace be a part of the management of SMEs since it improves team performance and provides a source of competitive advantage.

Keywords: Business Intelligence, Knowledge Sharing, Smes Innovation,, Innovative Work Behavior, UAE.

Introduction

Small and medium-sized enterprises (SMEs) are the backbone of every economy, and they play a vital and dynamic role in the economic growth of a nation (Gherghina, 2020). Small and medium-sized businesses (SMEs) do not have a single, generally recognised, and widely

accepted definition (Gherghina, 2020). The definition of a small and medium-sized enterprise (SME) in the United Arab Emirates has been approved by "Emirate SME," a branch of the Emirate Economy – Department of Economic Development (DED). According to the definition, a small and medium-sized enterprise (SME) is defined as an entity engaged in economic activity that has a legal form (registered as a business with a commercial registry such as the DED or with a free or industrial zone) and that meets the thresholds for employee headcount and turnover as applicable to the industry group it belongs to (trading, manufacturing, or services) (Choshin, 2017).The main reason for lower productivity levels in UAE SMEs is a lack of focus on business process improvements and reengineering to improve innovative work behavior (SME, 2022). Also, there is a limited focus by businesses on training, development, and upskilling of employees due to the transient nature of the workforce. Besides, the limited adoption by businesses of advanced enterprise-level ICT systems (such as business intelligence systems) within the SME sector in the UAE.

Business Intelligence (BI) is defined as a collective term that combines different technologies, applications, and tools used for the gathering of data from sources, storing, analyzing and visualizing it, with the purpose of helping users to make better decisions (Eidizadeh et al, 2017). In the last few years, data has been increasing rapidly, and with the ease of acquiring and storing this data, organizations have started to leverage it for enhancing the decision making the process. In such cases, only those firms survive and elevate their positions that concentrate on all the aspects of competition, i.e., quality, price, speed, customer responsiveness and innovation so that they stay ahead of their competitors by accomplishing sustainable competitive advantage (Darroch et al., 2014). Moreover, changes in customers' expectations put firms under pressure and pose significant challenges ahead. Efficient resource allocation, improved competency and ability, and gaining sustainable competitive advantage allow firms to provide better products and services compared with other rivals. Taking the successful firms into consideration, we learn that most of them have capabilities that make them able to compete in today's fluctuating markets (Eidizadeh et al, 2017); Darroch et al., 2014).BI's objective is transforming data to information through analysis to meet the business objective of the user (Eidizadeh et al, 2017), by enabling the user to interactively manipulate the data, and apply different analysis in the way she/he needs for extracting information, and get valuable insights from the data.

In turn, KS leads to the exchange of experiences and skills between employees, contributes to collective learning and evokes reflection on current knowledge (Michna, 2018). Thus, KS increases the chances of becoming involved in additional, non-routine activities, such as innovative work behaviors (Anser et al., 2020). As Kmieciak (2021) noted, in most cases the employee has too little knowledge and too few opportunities to implement innovations himself/herself. It is only by collaboration with other employees that a synergy effect appears and innovative ideas can be implemented successfully. SMEs innovation and innovative work behavior are the results that organizations fight to get, but which one is affecting the other, and which one is more importance to organizations. Most of researchers identified SMEs innovation as antecedent to innovative work behavior such as Kmieciak et al. (2021); however, in other studies, SMEs innovation is considered as the ultimate goal for competitive advantage.

Literature review shows that many researchers have engaged into the research and discussion of innovative work behavior so far. However, according to Kmieciak, (2021) innovative work behavior is a buzzword that causes confusion to consultants, business executives and academics. Although the concept of innovative work behavior is the most taken-for-granted concept in the field of strategic management (Hughes et al., 2018); however, innovative work behavior is not always predictable and those capabilities and resources leading to superior profitability and innovative are unclear (Spanuth and Wald, 2017). The purpose of this research is to investigate the impact between business intelligence, knowledge sharing, SMEs innovation, and innovative work behavior. To the best of our knowledge, there has as yet been no study focusing on the impact between these variables in the framework of a structural equation model. Present research contributes to the existing literature that will help future BI, knowledge sharing and innovation researchers especially in achieving innovative work behavior.

Theoretical Literature and Hypothesis Development

The success of the United Arab Emirates as a diverse and growing economy may be attributed mainly to a large number of small and medium-sized businesses (SMEs) that operate in the country (Zarrouk et al., 2021). In the United Arab Emirates, small and medium-sized enterprises (SME) account for 99.2 per cent of all establishments, and they together employ 51 per cent of the workforce while contributing about 46 per cent to the emirate's gross domestic product (GDP) (Gherghina, 2020). Small and medium-sized companies (SMEs) have long acted as an effective conduit for the UAE's entrepreneurial potential, allowing entrepreneurs to turn their ideas into feasible ventures and, eventually, into internationally competitive firms via their efforts. This has, however, changed dramatically in recent years (Zarrouk et al., 2021).

New and complicated information arising from continually occurring changes in the environment provides a challenge for SMEs in terms of information management. As a result, SMEs must exchange and analyse data in order to determine the scope of the effects of those changes that may help them implement new work practises (Ahmad et al., 2020). Businesses employ BI to perceive difficulties associated to creative work behaviour because of its effective use for disseminating, digesting, and analysing information (Asghari et al., 2020). For creative work behaviour to become a reality, BI as the primary application must provide the appropriate degree of information accuracy and confidentiality (Bach et al., 2016), resulting in useful knowledge. Information regarding what has happened, what is occurring, and what could happen is presented in knowledge (Bhatiasevi and Naglis, 2018). Knowledge, according to Caseiro and Coelho (2018), provides the foundation for innovative work behaviour in terms of what to do and how to accomplish it. Indeed, BI has emerged as a logical facilitator of information management, which is a critical requirement for SMEs to engage in creative work behaviour. This study relies on the knowledge-based theory, to develop a conceptual model of the impacts between BI, knowledge sharing, SMEs innovation and innovative work behavior.

Innovative Work Behavior

Organizational innovativeness results from individual innovativeness (Hughes et al., 2018; Spanuth and Wald, 2017). Therefore, there is great interest in innovative work behavior as the source of organizational success (Kmieciak, 2021). Following Janssen (2000), and Yuan

and Woodman (2010), innovative work behaviors is defined here as the intentional creation and application of new ideas or innovations (new products or processes) in the workplace to improve individual, group, or organization performance. The definition indicates that innovative work behavior is closely related with other concepts in the literature, such as employee innovativeness, innovative job performance and on-the-job innovation (Spanuth and Wald, 2017). Innovative work behavior is a complex concept that may include such behavioral activities as idea exploration, generation, promotion and implementation (Ahmad et al., 2022; Kmieciak, 2021; Spanuth and Wald, 2017). Consequently, innovative work behavior is regarded as one (Hughes et al., 2018), two, or even four (Spanuth and Wald, 2017) dimensional construct.

Idea generation is defined as a creative behavior aimed at searching for and generating new, original approaches and solutions to problems, including new working methods and techniques. Idea realization refers to implementing new ideas in the form of new products or processes in an organization. Kmieciak. (2021) noted that the distinction between idea generation and idea realization has reasoning in a different etiology. Idea generation depends on individual characteristics (an individual's creativity, self-confidence, job knowledge and job demands) than group and organizational characteristics. In contrast, idea realization, as a social process, affects other employees. Its success depends on the other's approval, engagement and support. Simple innovations are usually introduced by individual employees, but more complex ones need cooperation, and various knowledge inputs and competences (Jansen, 2000). Innovation is perceived as a multi-stage process, with the general agreement that idea generation is followed by idea realization (Hughes et al., 2018; Spanuth and Wald, 2017).

Business Intelligence

Business intelligence (BI) as a new approach in SMEs architecture is defined based on the speed in information analysis to take accurate and intelligent business decisions in the minimum possible time that includes a collection of functional and analytical programs. Referring to operational and analytical databases, BI deals with decision making for intelligent (Eidizadeh et al, 2017). business activities (Eidizadeh et al, 2017). BI is a business framework, including different processes, instruments, and technologies that is designed to move from data to information and from information to knowledge and adds value to the organisation. Using the obtained knowledge, organizations' managers can make better decisions and do business activities more efficiently with the aid of designing practical plans for the organisation (Sharda et al., 2014). The real value of business intelligence is when one can easily manage SMEs processes and apply new business rules by the decisions drawn from the results of business intelligence. This will be simply possible through business process management system (Azoff and Charlesworth, 2004)

According to Eidizadeh et al. (2017), business intelligence has impact on knowledge improvement. An effective BI system enhances and promotes knowledge and improves the mental model of the decision maker. BI goes beyond the sharing of policies or database but it also involves employee's expertise and sharing. BI can be considered as an effective enabler of knowledge sharing used by employees in the organisation (Sharma and Djiaw, 2011). Business intelligence systems have different positive SMEs consequences (Eidizadeh et al, 2017; Arefin et al., 2015). BI systems help firms to store, analyze and retrieve large amounts

of information (Eidizadeh et al, 2017). Knowledge obtained about the competitors, costumers, and new technologies can be used to create new products or to improve processes. Therefore, business intelligence increases innovation in the firm.

Although in the strategic management literature has been emphasized on the concept of business intelligence as a critical competitive tool. However, the effect of business intelligence on the sustainability of the firms' IWB has not been well researched (Ahmad, 2015). BI is very useful in gaining information about competitive environment especially in market forces, public policy, new technology and competitors, and valuable to predict the future environment in which a company will operate (Eidizadeh et al, 2017). Business intelligence allow companies to build specific skills among workers to promote many facets of innovation and, as a result, establish and sustain competitive advantages. This theoretical discussion and debate, along with the cur-rent empirical proof, leads to the three hypotheses, therefore, would be:
H1. Business intelligence impacts knowledge sharing.
H2. Business intelligence impacts SMEs innovation.
H3. Business intelligence impacts innovative work behavior.

Knowledge Sharing
One of the chief and common processes in different structures introduced for knowledge management is knowledge sharing (Kmieciak, 2021). Knowledge sharing as a complex but value adding activity in knowledge management is the fundamental of many SMEs strategies (Zhao et al., 2020). One of the main objectives of managers in using knowledge management in SMEs is improving knowledge sharing among individuals within the organisation. Efficient knowledge sharing among organization's members leads to the reduction of costs in knowledge production and is a guarantee for the sharing of best working practices within the organisation and makes the organisation able to solve its problems. Sharing knowledge means the exchange and transfer of experience within several SMEs units.

The literature review confirms that knowledge sharing is an important process influencing the improvement of innovativeness both at the organizational level (cf. Michna, 2018; Zhao et al., 2020) and at the individual level (cf. Anseret al., 2020; Kim and Park, 2017; Kmieciak, 2021; Rao Jada et al., 2019). This importance is due to the fact that knowledge plays an important role in creating innovation. Expert knowledge, including knowledge about past solutions and events, can be the basis and inspiration for new solutions. By sharing knowledge with colleagues, the knowledge base of other employees is increased and the chance for the emergence of innovative ideas increases. As noted by Radaelli et al. (2014), "idea generation is a process of knowledge creation that requires recombining internal and external knowledge into new forms"(p. 401). The implementation of ideas cannot usually be accomplished by a single person, but requires cooperation and the knowledge, skills and perspectives of various employees, resulting in a synergy effect (Rao Jada et al., 2019). The ability to accumulate knowledge is important for creating new solutions. For example, the knowledge about clients and their needs gathered by the marketing department is passed to the research and development department, where, in addition to technical knowledge, it is the basis for the development of new products. From the point of view of cognitive psychology, the effective absorption of new knowledge requires its cognitive restructuring or elaboration by the learner (Michna, 2018). Sharing knowledge triggers these processes,

because the recipient of the knowledge has to connect and integrate the new knowledge with his or her current knowledge (Husseini, et al., 2019). As a result, knowledge sharing can cause reflection on current knowledge, its verification, and its reinterpretation. As Zhao et al. (2020) claimed, the knowledge recombination and re-elaboration embedded in knowledge sharing stimulate idea generation and application. Research conducted in Poland among team members confirmed that tacit knowledge sharing has a positive influence on team creativity (Kucharska and Kowalczyk, 2018). Knowledge sharing can also benefit the innovative behavior of knowledge receivers. The recipient collects knowledge gained by other people, including their experience and proven and useful solutions and practices. Through the learning process, the recipient of the knowledge combines the knowledge gained from others with his or her own knowledge, which leads to the reinterpretation of the knowledge, updates and even the questioning and rejection of obsolete knowledge. Consequently, the acquired knowledge stimulates the creativity and innovative behavior of the recipient of the knowledge (Lai et al., 2016). Research conducted among managers and staff of 148 retail units in China showed that the highest level of employees' innovative behavior was achieved when there was a balance between knowledge outflow from the business unit and knowledge inflow into the business unit (Lai et al., 2016). These considerations lead to the following hypotheses:
H4. Knowledge sharing impacts innovative work behavior.

SMEs Innovation

To maintain an SMEs innovation, SMEs are urged to establish a foundation for innovation, which may involve modifications to the organization's operations in order to develop an appropriate culture and guide SMEs through periodic periods of change. An SMEs innovation that fosters creativity may encourage workers to maintain a high quality of work, which in turn promotes the development of new goods and processes (Eidizadeh et al, 2017). Additionally, an SMEs innovation magnifies the importance of empowering employees and encouraging them to be creative and develop skills that result in new goods and services. It is not surprising that today; innovation is regarded as the key factor in organization's sustainable competition (Sharma and Djiaw, 2011). Hence, many authors consider innovation as the basis of today's competitive economy. Several specialists engaged in the field of innovation, argue that only those SMEs that focus on innovation by creating competitive advantage can live long (Eidizadeh et al, 2017). Based on Hill et al. (2015) one of the sources of creating competitive advantage is innovation.Therefore, the following hypothesis is introduced.
H5. SMEs innovation impacts innovative work behavior.

BI system helps organizations to create, capture and leverage their needed knowledge (Rao, 2012) and shares it (Sharma and Djiaw, 2011). In addition, it helps organizations to obtain knowledge about the competitors, costumers, and new technologies and foster organizational innovation. Consequently, knowledge sharing (Eidizadeh et al, 2017) and innovation (Hill et al., 2015) can improve SMEs competitiveness. Therefore, the following hypothesis is introduced.

H6. Knowledge sharing act as mediators in the impact between business intelligence and innovative work behavior.
H7. SMEs innovation act as mediators in the between impact business intelligence and innovative work behavior.

Table 1
Relevant studies to the research context

Author/Year	Title	Findings
Maghrabi et al. (2011)	The role of business intelligence (BI) in service innovation: an ambidexterity perspective	Research findings stress the role of business intelligence in service innovation
Azma and Mostafapour (2012)	Business intelligence as a key strategy for SMEs' change	Business intelligence is a key factor for any organisation to gain competitive advantage
Meihami and Meihami (2014)	Knowledge Management a way to gain a competitive advantage in firms(evidence of manufacturing companies)	Knowledge management influences the level of SMEs performance.
Mola et al. (2015)	Business Intelligence System Design and its Consequences for Knowledge Sharing, Collaboration, and Decision Making: An Exploratory Study.	Designing SMEs business intelligence systems influences knowledge sharing, collaboration, and decision making.
Eidizadeh et al, 2017	Analysing the Role of Business Intelligence, Knowledge Sharing and SMEs Innovation on Gaining Competitive Advantage.	The results showed that business intelligence has a positive and significant effect on competitive advantage through knowledge sharing and SMEs innovation.
Kmieciak., (2021)	Trust, knowledge sharing, and innovative work behavior: empirical evidence from Poland.	Research findings stress the role of Knowledge sharing in innovative work behavior.

Source(s): The study's authors

Research Framework

BI, as a new method in SMEs design, is defined by the speed with which data is analysed in order to make precise and intelligent business choices in the shortest amount of time feasible, and it consists of a collection of functional and analytical programmes. BI refers to operational and analytical databases and is concerned with intelligent business decision-making (Eidizadeh et al., 2017). BI is a business framework that includes many processes, tools, and technology to help SMEs move from data to information and knowledge to knowledge and provide value. With the help of establishing realistic plans for the organisation, managers may be more inventive, make better judgments, and carry out business tasks more effectively using the information gained (Kmieciak, 2021).

The true benefit of BI is realised when it is simple to manage SMEs processes and apply new business rules based on BI choices. A business process management system will make this simple and achievable (Pradhan et al., 2017). BI has an influence on knowledge development, according to Asghari et al. (2020). An efficient BI system improves the decision maker's mental model by enhancing and promoting knowledge. BI encompasses not just the sharing of rules and databases, but also the expertise and sharing of personnel. BI can be seen of as an effective facilitator of knowledge exchange across company personnel (Han et al.,

2016). Businesses may benefit from BI systems in a variety of ways (Ahmad et al., 2020, Bach et al., 2016, Bhatiasevi and Naglis, 2018).

BI systems assist businesses in storing, analysing, and retrieving enormous volumes of data (Caseiro and Coelho, 2018). Competitor, customer, and new technology information may be leveraged to develop new goods or enhance procedures. As a result, BI boosts company and work process innovation. Although, in the literature on strategic management, the notion of BI as a tool for creative work behaviour has received a lot of attention.

Sharing knowledge entails the sharing of information and expertise among various SMEs units. Knowledge sharing is described by Eidizadeh et al. (2017) as "knowledge exchange activities among SMEs units for present and future advantages." In addition, information sharing happens through SMEs at various SMEs levels and inside or across different units, both formally and informally, and in two modes of transmission, tacit and explicit knowledge sharing. Expertise sharing, according to (Farzaneh et al., 2018), is a process in which employees share their knowledge and information across the organisation so that individuals may exchange knowledge and collaborate to develop new knowledge.

Human resource management systems, according to Gonzales and Wareham (2019), can lead to creative work behaviours. One of the most essential systems in this respect is the knowledge management system. Knowledge management is an important method for enhancing SMEs innovation, since some studies believe it is the only way to achieve innovative work behaviour in the twenty-first century (Hamidinava et al., 2021). In reaction to a complex and ambiguous environment, SMEs in the twenty-first century are evolving into new forms based on knowledge and networks (Han et al., 2021). Knowledge-based assets are the cornerstone of success and the basis of inventive work behaviour in such circumstances, according to the knowledge-based view theory (Ahmad, 2015). Knowledge sharing, according to Hellström and Ramberg (2019), increases innovative work behaviour. Sharing difficult-to-codify, tacit, and sticky information leads to more creative job behaviour.

Schumpeter and Nichol (1934) was the first to use scientific concepts to describe innovation. In reality, he sought to comprehend the aspects that influence a country's economic progress, and he identified the vital and significant significance of innovation in the expansion of SMEs. One of the most distinguishing characteristics of a creative mind is the abandoning of old routines. Organizations with strong innovation capacity will be able to adapt to environmental difficulties sooner and better than non-innovative SMEs, which will improve the organization's self-efficiency. Based on theoretical background, the research model is developed (see Figure 1). As it is observed, BI as an independent variable, knowledge sharing and SMEs innovation as mediating variables, and IWB as dependent variable are considered in this framework. Hence, it would lead to generate higher level of innovative work behavior.

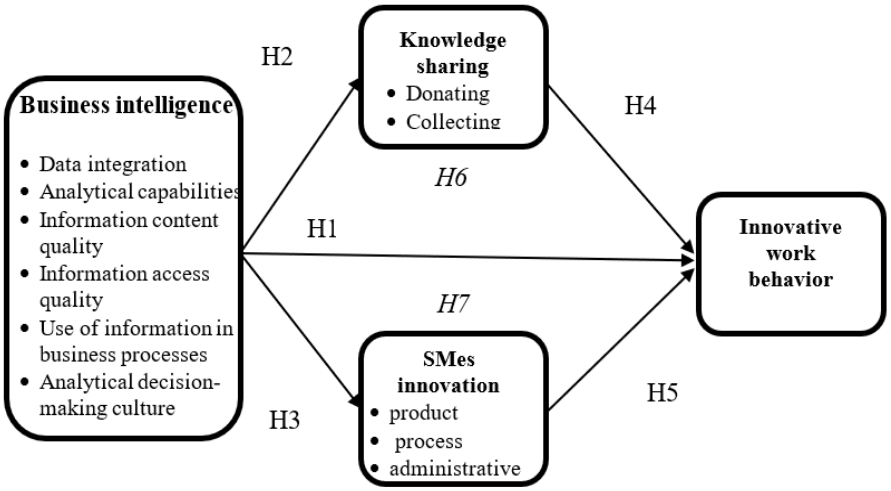

Figure 1. Research Framework

Data and Methodology

Respondents of the present research are 386 owners, managers, and shareholders who took the initiative to implement and enforce business intelligence systems. However, considering the results of the pilot research, the actual field sample was modified to increase the chances of reaching this minimum sample by the end of the survey. For the purpose of reducing the unusable questionnaire and improving the responding rate, 500 questionnaires were distributed to the sample. From the distributed questionnaires, 432 were returned and collected, 386 questionnaires were the net re-turned and usable questionnaires with a percentage of 77.3 %, as 46 questionnaires are neglected due to incomplete information. Nonetheless, the minimum sample requirement for generalisation was met. A period of six (6) weeks was allocated to collect data. The results were downloaded from the online data collection platform and analyzed with Analysis of (Smart PLS). The collected data was originally entered into the online data collection platform based on the weights of the various responses.

Demographic Analysis

Table 2 shows the respondents profile for those who participated in the research. As shown in the table, 71.4% of the participants belong to the male gender category and (n=275), while 28.6% of the participants belong to the female gender category and (n=111). The result confirms that male respondents were the majority. In terms of the age of the participants, it has been noted that most of the respondents were in the range of 36-45 years old with n = 166 presenting 43.1%. It also found that there were 20 participants were in the range of 18-25 years old presenting 5.4%. There were 87 participants were in the range of 26-35 years old presenting 22.6%. And finally, there were 113 participants were in the age of above 45 years old presenting 28.9%.According to the results showed in table 4.7, most of the participants hold bachelor certificates with a percentage of 59.4% and n = 229, The study also found that there were 71 participants hold master certificates with a percentage of 18.4%. There were 7 participants hold PhD certificates with a percentage of 1.8%. Finally, there were also, 79 participants hold secondary school certificates with a percentage of 20.4%. It ensures that all the participants were well educated. The experience of the participants ranged between less

than 1 years and more than 5 years, there were 1.2% of the participants who had experience less than 1 year with n = 4, 13.7% of the participants had an experience with 1 to 3 years with n = 52, 29.4% of the participants had an experience from 3 to 5 years with n = 113, and finally, 55.7% of the participants had an experience more than 5 years with n = 217. Most of the respondents were well experienced.

Table 2
Profile of Respondents (N = 386)

	n	**%**		**n**	**%**
Gender			**Education Level**		
Male	275	71.4	Secondary school	79	20.4
Female	111	28.6	Bachelor	229	59.4
			Master	71	18.4
Work Experiences			PhD	7	1.8
Less than 1 year	4	1.2	**Age**		
1 to 3 years	52	13.7	18-25 years old	20	5.4
3 to 5 years	113	29.4	26-35 years old	87	22.6
More than 5 years	217	55.7	36-45 years old	166	43.1
			46 years old and above	113	28.9

Measurement Model Evaluation

For the current research, the value used to test the convergent validity is the average variance extracted (AVE). When the value of AVE is greater than 0.5 then the variable shows good construct validity. According to the following table 3 below, it can be observed that the composite reliability, factor loadings and Cronbach's alpha for each construct is more than the required threshold which indicates that the measurements are reliable, where the variables (business intelligence, knowledge sharing, SMEs innovation, and innovative work behaviour) have got acceptable results. The Cronbach's alpha for the variables were ranged between 0.721 and 0.897, while the composite reliability values were ranged between 0.807 and 0.901.

Table 3
Profile of Respondents (N = 381)

Factors	Items	Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Business intelligence	BIS1	0.672	0.875	0.901	0.765
	BIS2	0.601			
	BIS3	0.783			
	BIS4	0.903			
	BIS5	0.564			
	BIS6	0.872			
	BIS7	0.592			
	BIS8	0.684			
	BIS9	0.789			
	BIS10	0.758			
	BIS11	0.683			
	BIS12	0.963			
	BIS13	0.932			
	BIS14	0.588			
	BIS15	0.637			
	BIS16	0.721			
	BIS17	0.854			
	BIS18	0.875			
	BIS19	0.693			
	BIS20	0.841			
	BIS21	0.543			
Knowledge sharing	KS1	0.767	0.705	0.878	0.593
	KS2	0.782			
	KS3	0.877			
	KS4	0.660			
	KS5	0.824			
	KS6	0.709			
SMEs innovation	SMEI1	0.778	0.812	0.854	0.631
	SMEI2	0.853			
	SMEI3	0.980			
	SMEI4	0.695			
	SMEI5	0.879			
	SMEI6	0.964			
	SMEI7	0.857			
	SMEI8	0.603			
	SMEI9	0.599			
Innovative work behaviour	IWB1	0.806	0.793	0.807	0.762
	IWB2	0.797			
	IWB3	0.696			
	IWB4	0.803			
	IWB5	0.613			
	IWB6	0.768			
	IWB7	0.883			

CR= Composite Reliability; AVE= Average Variance Extracted

Discriminant Validity

When evaluating novel tests, they emphasized the need of employing both discriminant and convergent validation procedures. A satisfactory discriminant validity research demonstrates that a concept test is not substantially associated with other tests measuring conceptually distinct ideas. According to the following table 4, the variables have shown non correlation because all the variables obtained values of r = greater than 0.4. The values found for the variables (business intelligence, knowledge sharing, SMEs innovation, and innovative work behaviour) were in the range of 0.787 and 0.887.

Table 4

Main Model – Results of Discriminant Validity by Fornell-Larcker Criterion

	TQMP	ERPS	IC	IWB
Business intelligence system	**0.887**			
Knowledge sharing	0.425	**0.845**		
SMEs innovation	0.438	0.365	**0.787**	
Innovative work behaviour	0.622	0.313	0.114	**0.839**

Where: BI; business intelligence, KS; knowledge sharing, SMEI; SMEs innovation, and IWB; innovative work behaviour.

Finally, the measurement model of the research is presented in figure 2 below. Based on the above discussion, it can be confirmed that the measurement is valid for further analysis as suggested by Hair et al. (2019).

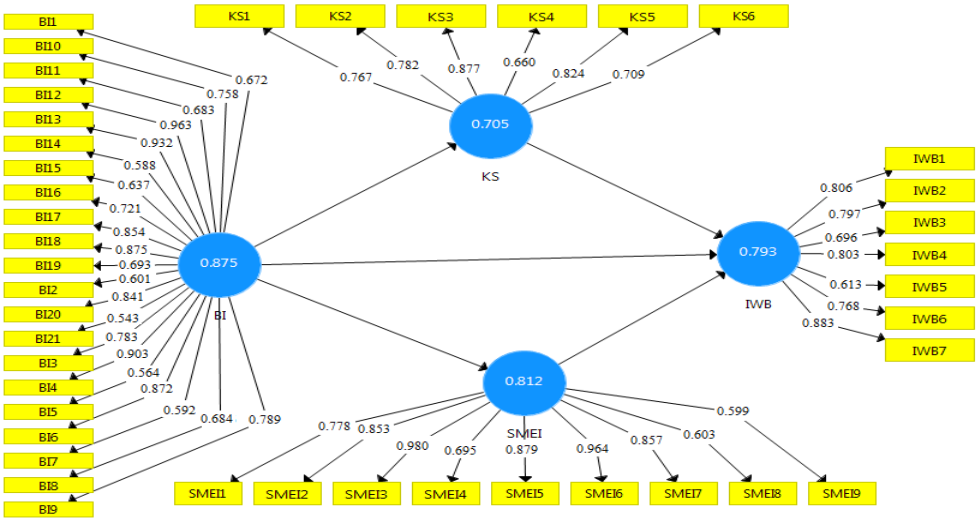

Figure 2 Measurement Model of the Research

Hypotheses Testing

Testing hypotheses is the most important test in the current research since it shows whether or not the goals of the research were met. Since there is a mediation in the current research, the direct effect test, and the indirect effect test will be used to examine the hypotheses. The following figure 3 shows the results of the direct effect test followed by some explanations.

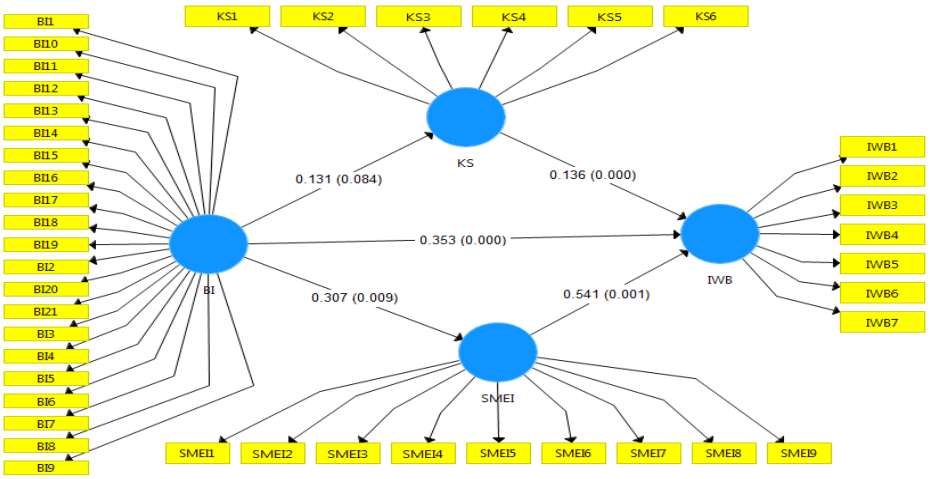

Figure 3 Structural Model of the Research

Through the use of PLS-SEM, all of the research's hypotheses have been verified. A good match is suggested by the statistical finding. There are a total of seven hypotheses in the entire model. The t-value is taken into account when evaluating the structural impacts between the variables that have been identified for this research. Hair et al. (2019) state that for a t-value to be deemed statistically significant, it must be 1.96 or above (one-tailed). The direct effect test, one sort of hypothesis testing, was employed in this research.

Hypothesis Testing (Direct Effect)

This section presents the result of hypotheses testing for direct effect. The direct effect test aims to examine the impacts between the independent variables and the dependent variable. The results are presented in table 4 and explained in the following conclusions.

Table 5

Summary of the Direct Effect

Paths	Beta	SD	T	P Values
BIS -> IWB	0.353	0.080	4.436	0.000
BIS -> KS	0.131	0.056	2.339	0.004
BIS -> SMEI	0.307	0.096	3.192	0.009
KS -> IWB	0.136	0.049	2.783	0.000
SMEI -> IWB	0.541	0.108	5.022	0.001

Where: BI; business intelligence, KS; knowledge sharing, SMEI; SMEs innovation, and IWB; innovative work behaviour.

According to results showed in the above table 5, the following conclusions were drawn:

- There is a positive and significant impact between business intelligence system and innovative work behaviour in the UAE small and medium enterprises with beta = 0.353, t = 4.436, and p = 0.000.
- There is a positive and significant impact between business intelligence system and knowledge sharing with beta = 0.131, t = 2.339, and p = 0.004 in the UAE small and medium enterprises.

- There is a positive and significant impact between business intelligence system and SMEs innovation in the UAE small and medium enterprises with beta = 0.307, t = 3.192, and p = 0.009.
- There is a positive and significant impact between knowledge sharing and innovative work behaviour in the UAE small and medium enterprises with beta = 0.136, t = 2.783, and p = 0.000.
- There is a positive and significant impact between SMEs innovation and innovative work behaviour in the UAE small and medium enterprises with beta = 0.541, t = 5.022, and p = 0.001.

Hypothesis Testing (Mediation Effect)

In this section, the results on assessing the mediation effect of knowledge sharing and SMEs innovation on the impacts between (business intelligence) and innovative work behaviour in the UAE small and medium enterprises. Table 6 shows the result of the mediating effects (Indirect Effect) followed by some conclusions.

Table 6
Mediation Testing (Indirect Effect)

Paths	Path a	Path b	Indirect Effect	SE	t-value	Decision
BIS ->KS-> IWB	0.385	0.381	0.551	0.123	4.479	Mediation
BIS ->SMEI-> IWB	0.431	0.223	0.486	0.069	7.082	Mediation

The PLS-SEM was also utilized to test the mediating effect and the following conclusions were found:

- Knowledge sharing mediates the impact between business intelligence system and innovative work behaviour in the UAE small and medium enterprises with (beta = 0.551, T value = 4.479, lower level = 0.111 and upper level = 0.496).
- SMEs innovation mediates the impact between business intelligence system and innovative work behaviour in the UAE small and medium enterprises with (beta = 0.486, T value = 7.082, lower level = 0.912 and upper level = 1.962).

Discussion and Conclusion

The purpose of this research was to investigate the role of business intelligence, knowledge sharing and SMEs innovation on innovative work behavior . The results demonstrated that business intelligence has effect on knowledge sharing. This finding is consistent with the results of studies done by Drelichowski et al. (2012) and Mola et al. (2015). Business intelligence is characterised by collecting, processing and storing information so that all levels of an organisation can access it with respect to their needs and help them in its future formation and protect them against competitive behaviors. Therefore, one of the main goals of business intelligence is collecting information and sharing it throughout the organisation. Hence, business intelligence affects knowledge sharing in the organisation.

The Previous research showed that business intelligence has effect on SMEs innovation, which resonates the findings of Eidizadeh et al, (2017). It can be said that business intelligence provides the necessary conditions for innovation in the organisation through providing data,

knowledge, and information. Therefore, necessary knowledge to coordinate with changes, transformations, and innovation will be provided using business intelligence system in the organisation.

The results of Previous research revealed that business intelligence has effect on innovative work behavior. This finding is in line with the findings of Zheng et al. (2012). Business intelligence leads to movement from data into information and from information to designed knowledge through different processes, tools, and technologies and adds value to the organisation. Using the obtained knowledge, the organization's managers can opt for better decisions and operate business activities more efficiently by designing practical plans for the organisation and consequently they innovative work behavior for the organisation.

Previous research suggests that employees' knowledge sharing has a positive impact on the innovative work behavior of both the knowledge receiver (Kmieciak, 2021) and knowledge sender (Akram et al., 2018). However, an under-researched issue is which knowledge sharing behavior, knowledge collecting or knowledge donating, is more strongly related to IWB. For a knowledge sender, the positive impact of knowledge donating on IWB might be explained by the self-learning mechanism (Lai et al., 2016). The sender plays the role of a teacher who, before passing knowledge to others, should organize his or her knowledge and codify it so that it is understandable to others. This preparation may trigger reflection on the possessed knowledge, and may lead to the rejection of obsolete knowledge and the clarification of doubts as to the possessed knowledge and cause-and-effect impacts. These processes support the creation of new knowledge, which is the base for innovative solutions. Moreover, the sender usually receives feedback on the knowledge donated. In this way, the sender's knowledge is verified in terms of truthfulness, accuracy and comprehensiveness. The transferred knowledge may not apply under certain conditions. In this case, the feedback provided by the recipients of the knowledge allows the sender to update the original knowledge and contribute to innovative behavior. However, a sender who engages in too much knowledge donating might be less innovative because the sender has no time to develop innovative ideas.

The effect of knowledge sharing on innovative work behavior, without examining impacts between components of knowledge sharing and components of innovative work behavior. Although this study confirms previous empirical studies that proved that knowledge sharing supports IWB (Akram et al., 2018; Kim and Park, 2017; Kmieciak, 2021), it also provides some interesting results. As expected, knowledge donating is positively related to idea generation, but, contrary to expectations, the relation between knowledge collecting and idea generation is not significant. This finding is partly inconsistent with a previous study that suggested that both knowledge outflows from and knowledge inflows into the business unit affect employee innovative behavior (Lai et al., 2016).

Another research finding is that SMEs innovation influences innovative work behavior. This finding is consistent with the results of the studies of Eidizadeh et al, (2017). This finding shows that SMEs inevitably have to be creative and innovative in order to survive and gain competitive advantage. Said another way, in the dynamic and changing environments of today SMEs innovation is the key to gain competitive advantage, reach high performance, and endure in the global economy. In other words, the requisite to outperform and compete

with rivals is to create and innovate in commercializing processes, products and new business systems. Thus, for SMEs, innovation is an important factor to innovative work behavior in the world to survive.

The results showed that knowledge sharing and SMEs innovation have mediating role in the impact between business intelligence and innovative work behavior. Therefore, business intelligence impacts the innovative work behavior through knowledge sharing and SMEs innovation. Eidizadeh et al, (2017). asserted that one of the key advantages of business intelligence is the quality of better information for decision making; SMEs that are committed to effective development of business intelligence show a tendency to advanced analyses and careful integration of data all over the organisation (Kmieciak, 2021) that leads to the improvement of quality to access information and consequently innovative work behavior for the organisation.

Managerial Implications

The findings of this study have some significant managerial implications. To start, organizational leaders should encourage people to take part in knowledge-giving and knowledge-collecting work activities in order to create a sharing and inventive atmosphere. Various people have different motivations for sharing information. Therefore, recognizing the primary motivators for the majority of workers is crucial in the SME sector. Some people give their expertise merely for the sake of social approval, while others want to learn something new in return. Therefore, building and fostering a culture of information sharing inside a company will benefit from the proper identification of the motivating reasons. Additionally, developing such a knowledge-sharing environment is crucial for sectors that are product- and service-driven. Organizations must establish a business-intelligent environment and launch a knowledge-driven organizational environment in order to enhance idea development, promotion, and execution.

Additionally, this study produced a number of contributions. First, this study clarifies the connection between business intelligence system and creative work behaviour in greater depth. This study came to the conclusion that business intelligence system might boost creative work behaviour. Furthermore, research on creative business behaviour and SMEs in the UAE has greatly benefited from new findings made possible by information exchange and the creativity of SMEs as mediating variables. Second, this study offers advice for SMEs' employees in the UAE on how to innovate, and managers should pay more attention to employee suggestions and viewpoints. In order to encourage employees to share ideas more freely, SMEs also requires a culture of excellent information sharing in the workplace.

Conclusion

The impact of Business Intelligence (BI) systems on innovative work behavior in SMEs (Small and Medium-sized Enterprises) in the United Arab Emirates (UAE) is a fascinating area of study, particularly given the region's rapid technological advancements and economic diversification efforts.

SMEs are vital to the UAE economy, contributing significantly to GDP and employment. The UAE government actively supports innovation and entrepreneurship, creating a conducive.

BI systems provide data-driven insights that can enhance the quality of decisions made by employees, leading to more innovative outcomes.BI tools facilitate better communication and collaboration among teams, fostering a culture of innovation. By analyzing market data, SMEs can identify emerging trends and customer needs, prompting innovative product and service development.BI systems can help SMEs optimize their resources, allowing more focus on research and development activities.

This study can contribute valuable knowledge to both academic literature and practical applications, helping UAE SMEs leverage BI systems to drive innovation and growth in an increasingly competitive market.

The study on the impact of Business Intelligence (BI) systems on innovative work behavior in the United Arab Emirates' SMEs is significant for several reasons:

Economic Diversification: The UAE is striving to diversify its economy away from oil dependence. SMEs are vital for this transition, and understanding how BI systems can foster innovation within these businesses is crucial for economic growth.

Competitive Advantage: As SMEs face increasing competition, leveraging BI systems can enhance decision-making and operational efficiency, ultimately promoting innovative practices.

Cultural Context: The unique socio-economic and cultural context of the UAE provides a rich backdrop for studying how technological adoption influences innovative behavior, contributing to broader discussions on innovation in the Middle East.

Theoretical Insights: The study contributes to existing literature by exploring the relationship between BI systems and innovative work behavior, filling a gap in understanding how technology can drive innovation in SMEs specifically in the UAE context.

Practical Implications: Findings can guide SME owners and managers in implementing BI systems effectively, highlighting best practices that enhance innovation and improve business outcomes.

Policy Recommendations: The study may inform policymakers about the importance of supporting BI initiatives within SMEs, helping to create a conducive environment for innovation.

Framework Development: By developing a framework linking BI systems to innovative work behavior, the study can serve as a foundation for future research and practical applications in other regions and sectors. Overall, this study aims to illuminate the transformative potential of BI systems in enhancing innovation among SMEs in the UAE, contributing to both academic discourse and practical business strategies.

A study focusing on UAE startups found that BI systems positively influence new startup performance, with innovativeness serving as a mediating factor. This suggests that BI systems enhance a firm's innovative capabilities, leading to improved performance. Additionally, research indicates that BI tools significantly impact knowledge management processes, which in turn affect innovative work behavior. By improving knowledge sharing and utilization, BI systems create an environment conducive to innovation.

In the context of SMEs in the UAE, BI systems significantly contribute to innovative work behavior by enhancing decision-making, knowledge management, employee empowerment, and organizational agility. These contributions are aligned with the UAE's strategic goals to boost innovation, digital transformation, and competitiveness within the SME sector.

Limitations and Directions for Future Research

This research has several restrictions. First, data was gathered at random since it was difficult to access the personnel databases. Therefore, it is recommended that future research, if at all feasible, concentrate on different probability sampling techniques to provide conclusions that can be more broadly generalised. Second, as this was a cross-sectional study, future longitudinal research may analyse more specifics on the benefits of innovation, business intelligence, and knowledge sharing. Future research might also concentrate on additional antecedents that influence innovative work behaviour favourably or negatively in order to learn more. In knowledge- and innovation-intensive sectors, analysis of both positive and negative aspects may be utilised to enhance innovative work behaviour.

According to several researchers the lack of semantic content has always been an issue in IWB definition (Kmieciak, 2021; Spanuth and Wald, 2017). Currently it seems that practicing managers are not aware of the concept of IWB and are walking in darkness concerning their attempts of finding and developing IWB (Kmieciak, 2021). Therefore, SMEs should try to improve the awareness of their managers regarding IWB and future research is encouraged to find solutions to this problem. Recognizing the need for an appropriate business intelligence system for improving IWB is just a first step and the real challenge is to make it an integral part of decision making process. Building BI can be a time-consuming, expensive and complex task. Therefore, more research is needed to empirically find the factors influencing the successful deployment of BI and its impact with IWB.

Based on the obtained results and understanding of the topic, the researcher recommends the following:

To encourage new work behaviour, identify areas where business intelligence system tools will be useful and put them into behaviour there. Knowledge sharing inside the workplace must be a part of the management of SMEs since it improves team performance and provides a source of competitive advantage. Knowledge sharing improves competence and quality, especially within the teams that drive productivity and innovation. Because SMEs have a limited amount of resources, their owners and managers need to be aware of the extra advantages of innovative work behaviour beyond skill and knowledge development. SMEs seek innovations in ambiguous situations and more significant completion. Employees may help the organization perform better for sustainability and growth if they exhibit creative work behaviour. Organizing training programs that help develop the innovation of the SMEs employees.

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