

# Can Business Intelligence Promote the Radical and Incremental Innovation? Knowledge Management and Agility Organization in a Moderated Mediation Model

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v13-i9/17925> DOI:10.6007/IJARBSS/v13-i9/17925

**Published Date:** 16 September 2023

## Abstract

**Purpose:** This paper investigates the relationship between business intelligence (BI) and the radical and incremental innovation of Jordanian industrial firms through the mediating role of knowledge management capability and the moderating role of organizational agility.

**Design/methodology/approach:** A self-administered questionnaire was used to collect data from 314 respondents in the industrial sector. Analyzing the data was performed using SmartPLS using a bootstrapping method. It was observed that knowledge management capability had a mediating effect and organizational agility had a moderating effect

**Findings :** Due to the statistical significance of the relationships between the constructs, the proposed moderated-mediation model was accepted. According to the data analysis, business intelligence is positively correlated with innovation capability, and knowledge management plays a mediating role. A moderating relationship is found between knowledge management and radical or incremental innovation in terms of organization agility. As a result of these results, BI and KMC are key components of enhancing radical and incremental innovation in the context of organizational agility Research

**limitations/implications:** There are methodological limitations that affect the generalization of the results of this cross-sectional study, as well as the fact that the results are restricted to one sector

**Originality/value :** In this study, BI, KMC, organizational agility, and radical and incremental innovation were integrated into a theoretical model. The concept of moderated mediation is tested in the industrial sector in this paper, adding new theoretical and practical contributions to the innovation literature. Differentiating this study from other studies, it focuses on BI and KMC's role in enhancing organizational advantages in the Jordanian industrial sector through integral and incremental innovation

**Keywords:** Business Intelligence, Radical Innovation, Incremental Innovation, Knowledge Management, Agility Organization, Jordan

**Introduction**

Innovation has been broadly recognized as a crucial factor enhancing a firm's competitive advantage (Than et al., 2022). A firm's ability to adapt to change depends on its innovation capability, which makes it more effective and flexible (Abualoush et al., 2022). The ability to innovate allows firms to better serve consumers, compete more effectively, identify market opportunities, align the strengths of the firm, and leverage market opportunities, particularly in light of rapid technological change, globalization, and intense competition (Le et al., 2020). Whether it is through the development of new services and products, the exploration of new market segments, the identification of new business opportunities, or the identification of new business models, innovation may provide organizations with a chance to survive and grow (Ali et al., 2022). Due to the crucial role innovation plays in overcoming volatile environments, a large number of companies have been looking for ways to enhance their innovation capabilities (AlMulhim, 2021). As a result, practitioners and scholars have become increasingly interested in how to improve innovation capabilities (Abualoush et al., 2022), and have endeavored to understand the antecedents or critical factors that influence and foster the innovation capability of a business, in order to improve performance and develop new products, services, and procedures that deliver business value and secure competitive advantages (Jafari et al., 2022).

In current literature, it has been revealed that innovation capability is determined by a variety of factors (Qaffas et al., 2022; Talaoui et al., 2021; Abualoush et al., 2022a). Business intelligence and knowledge management capabilities (KMC) have been widely acknowledged as the key to fostering innovation capability, boosting effectiveness and retaining competitive edge (Panda et al., 2021; Khan et al., 2022). KMC increases innovation capacity through employee skill development and cross-sector collaboration (Shehzad et al., 2022). Innovation capability is stimulated by KMC through various means, including identifying gaps in knowledge, synthesizing internal and external knowledge, and making it more accessible and available (Than et al., 2022). Besides providing opportunities and ideas for innovation (Talaoui et al., 2021), KMC activities in organizations also develop effective solutions for implementing innovation (Nguyen et al., 2022). Meanwhile, with BI systems, companies can store, analyze and retrieve vast amounts of data, as well as use competitor knowledge to develop new products or improve processes. As a result, BI improves organizational innovation (Abusweilem and Abualoush, 2019). Specifically pointing to emerging and developing countries (Abualoush et al., 2018), a number of scholars noted that academics must be more motivated to examine factors that are effective and less costly to increase firms' innovation capabilities in developing countries than they would in developed countries, as most of these companies are small and medium-sized and have limited resources and capital for innovation. Based on the following reasons (Abualoush et al., 2022b), KMC, BI, Agility, and innovation capability theory will be significantly expanded by the paper for a number of reasons.

There is a wide variation in the organizational resources that organizations use to increase innovation capability. An organization's IT resources, such as BI capability, can help it gain crucial advantages and succeed against its competitors (Ganbold et al., 2021). Experts in information systems claim that business intelligence has become a significant field of study for practitioners as well as researchers to address data-driven business challenges facing organizations today (Khan et al., 2022). Due to its immense potential for business success, business intelligence has witnessed an increase in utilization in recent years (Shehzad et al., 2022). By combining both business intelligence and analytics, business firms can make

effective and accurate business decisions (Qaffas et al., 2022). The role of business intelligence is to assist decision-makers in making productive, fast, and improved decisions. Because of this, companies can use it to learn more about their clients, develop marketing plans, create potential adaptations, and see opportunities and problems in real time (Khan et al., 2022). Moreover, from an IT perspective, innovation occurs when humans use BI to improve or establish new organizational resources that assist businesses in coming up with new products (Shehzad et al., 2022). Organizations must use knowledge assets as inputs and create new knowledge resources as outputs in order to innovate (Abusweilem and Abualoush, 2019). It implies that innovation is dependent on the core tasks involved in gathering, analyzing, integrating, and utilizing an organization's resources (Mikalef et al., 2019), and the processes of collection, analysis, integration, and utilization rely heavily on organizational BI capabilities (Talaoui and Kohtamäki, 2021). BI provides open and flexible affordances that can serve as drivers of innovation (Qaffas et al., 2022). The importance of IT-enabled knowledge management in improving organizational capabilities, innovation, and competitive advantage has been emphasized in several studies (Abusweilem and Abualoush, 2019). According to researchers, by easing processes and stimulating innovation, businesses can use BI systems to increase organizational performance or gain a competitive edge. Hence, the resource-based view indicates that organizational competitiveness may be affected by different BI capabilities. In light of the facts, it is crucial to examine the role of BI capability as an antecedent of innovation capability (Panda and Rath, 2021). Research studies have shown that only a limited number of studies have been conducted on how organizations leverage BI capability for different aspects of innovation (Shehzad et al., 2022), especially in relation to developing nations like Jordan. The purpose of this research is to address this gap by exploring whether BI capability impacts innovation in different aspect radical and incremental.

Literature considered KMC the main driving force and essential ingredient to enrich firm's knowledge resources for improving firm's innovation and key outcomes (Ie, 2020). Due to KMC importance as a determinant of innovation, it is crucial to understand how KMC impacts innovation ability (Turulja et al., 2018). Due to this, little research has investigated the direct relationship between KMC and innovation capability (Demir et al., 2021). As a result, understanding how KMC affect innovation capability is crucial.

In addition, Rafi (2021) asserted that the influence of KMC on innovation capability. "can be better understood through underlying mechanisms". In particular, in volatile environments, it is unlikely that KMC directly contribute to innovation capability (AlMulhim, 2021). In order for KMC to be understood precisely, an underlying mechanism must be provided to explain how they enhance business performance (Battistella et al., 2017). Therefore, To successfully adapt to ever-changing and uncertain environments, firms require a different set of capabilities. To stay abreast of the rapid rate of change and market opportunities imposed by Industry 4.0, they must develop key capabilities to deal with the dynamic environment of the market (Cho et al., 2022). An organization can become more agile by developing its organizational agility "responsiveness and adaptability to changes in the market" that relies heavily on its unique capabilities, one of the most important elements of sustained competitive advantage. In a turbulent and fast-changing business environment (Rafi et al., 2022). Shehzad et al (2022) indicated that firms that predict market volatility accurately are more likely to be able to use knowledge sources to reduce risks, and ambiguities, and pursue innovation. Therefore, it is imperative that organizational agility be identified and clarified as a potential moderating factor in the interaction between KMC and innovation capability.

Business intelligence has long been recognized as an important innovation driver (Chang et al., 2019; Fink et al., 2017), to achieve superior performance (Aydiner et al., 2019) Increasing innovation capability (Chang et al., 2019). Theoretically, little research has examined how Business intelligence impacts innovation capability in the context of knowledge management and agility. In the present study, we seek to fill this research gap in the setting of Jordanian industrial firms.

Following this introduction, Section 2 presents literature reviews and research hypotheses. Detailed information about the study sample, data collection, measurement of variables, and data analysis procedures are described in section 3. In section 4, we present the Discussion and conclusion. Implications for theories are discussed in section 5. Practical implication and limitation are discussed in Section 6.

## **Literature Review and Hypothesis Development**

### **Business Intelligence and Innovation Capability**

Nowadays, companies have access to a huge amount of multidimensional, variety, and structured and unstructured data that make information systems essential to understanding the business environment. With BI, organizations can achieve the desired outcomes (Jafari et al., 2021). However, even though there are many different definitions for business intelligence in the literature, BI is defined as a set of technologies, techniques, applications, and processes encompassing the acquisition, storage, analysis, and transformation of business and market information and data in order to improve business outcomes (Aydiner et al., 2019).

Božič and Dimovski (2019) claim that a deeper understanding of IS value requires an in-depth examination of value creation processes within the context of a particular IS technology. In order to understand how BI delivers organizational benefits, it is necessary to integrate what is known about IT value creation while taking into account the unique features of BI. BI assets can be transformed into value by embedding them in products and services, improving decision-making, and streamlining business processes, thereby generating business value (Aydiner et al., 2019). BI helps develop strategies for new markets, assess customer demand, and evaluate whether products or services are suitable for different market segments (Mariani et al., 2018).

According to Mariani et al (2018) the most effective business intelligence is derived from the combination of external data from customer markets and internal data from company sources. In this way, when combined, external and internal data provide a comprehensive picture and provide a form of "intelligence" not possible if one set of data were to be used alone. Over the past few years, business intelligence has seen a rise in its use since it offers great potential for business growth (Ashrafi et al., 2019). By combining both business intelligence and analytics, business firms can make effective and accurate business decisions (Qaffas et al., 2022) In order to enhance our understanding of IT resources and innovation capabilities, we should explore the relationship between BI and specific forms of innovation. It is impossible to underestimate the power of innovation. There is no doubt that innovation plays a key role in assisting firms to adapt to change and overcoming turbulent economic times (Alkhatib et al., 2022). Innovation is the ability of a firm to create new products, services, management procedures, and work processes to gain an advantage over the competition (Lei et al., 2020) Innovation has been classified into a number of categories in previous studies, such as process and product innovation (Abualoush et al., 2022), service innovation (Alkhatib, 2022) Alkhatib and ,Technology Innovation Chaoji and Martinsuo (2019), radical and

incremental innovation (Thi Mai Anh et al., 2019). Disruptive Innovation (Sundström et al., 2021).

BI is examined in this study in relation to radical and incremental innovation since they represent two distinct degrees of innovation originality (Nguyen et al., 2022). radical innovation refers to introducing completely different products or services for new markets or new customers. In terms of economic development, it represents a high degree of novelty that alters the entire order of things (Nguyen et al., 2022), in contrast to incremental innovations, which involve minor improvements to products and services that make them innovative (Al-Khatib et al., 2022). incremental innovation refers to the provision of service, products, or procedures of work that are improved or expanded within a firm and that enhance the technology currently available within the firm through these innovations (Thi Mai Anh et al., 2019).

In the literature, BI has been widely acknowledged as a tool that supports innovation within organizations (Božič and Dimovski, 2019). Business intelligence is essential for creating value for companies. It facilitates change in businesses and projects (Sundström et al., 2021) which improves the innovation capabilities of companies. BI improves the quality of decisions made by companies at all levels of the organization. Companies with data-management and information-processing capabilities will be better equipped to implement activities and processes within their organizations (Aydiner et al., 2019), strengthening performance and innovation within the organization. Bouaoula et al (2019) emphasized the importance of BI in enhancing company innovation capabilities, both radical and incremental. As an example, business intelligence can help assess latent preferences and new consumer patterns, providing an opportunity to develop new products as well as new markets.

***H1.a. business intelligence positively affects Radical innovation.***

***H1.b. business intelligence positively affects incremental innovation***

### **Business intelligence and knowledge management capability**

KMC refers to a firm's ability to create value and sustain competitive advantage by creating, sharing, and leveraging knowledge resources (Chaoji and Martinsuo, 2019). It refers to the process of building new knowledge within an organization by a continuous set of procedures incorporated into its physical and social structure (Sun et al., 2020). Through KMC, organizations can become more knowledgeable by analyzing, identifying, and controlling their existing knowledge (Naqshbandi and Jasimuddin, 2018). Therefore, KMC is a set of processes firms use to manage and deploy knowledge resources effectively together with other resources. The majority of scholars agree that KMC involves acquiring, sharing, and implementing knowledge (Rafi et al., 2022; Abualoush et al., 2022; Nguyen et al., 2022), with knowledge acquisition being the process by which firms acquire new information and knowledge based on their existing knowledge (Rafi et al., 2018), knowledge sharing is the exchange of skills and knowledge between individuals in order to complement and develop new skills (Al-Eisawi et al., 2021), Knowledge is disseminated across a company's different layers, functional areas, business networks, and members (Aydiner et al., 2019); The application of knowledge refers to the realization and implementation of the knowledge values in practice in order to achieve outcomes that are desired (Sun et al., 2020). By utilizing knowledge effectively, the organization can achieve its goals more efficiently and effectively (Abualoush et al., 2018). Most organizations rely on KMC to succeed (Naqshbandi and Jasimuddin, 2018). In this regard, BI is crucial for strengthening the ability of firms to identify,

collect, share, apply and convert knowledge capital into reality. An effective knowledge management system relies heavily on BI Arefin et al (2015), The purpose of BI is to provide knowledge Mikalef et al (2019), It has been argued that BI represents a large part of KM effort (Arefin et al., 2015). Mariani et al (2018) note that BI and KM have played an important role in increasing decision-makers access to quantitative and qualitative knowledge.

The make of BI is to collect relevant information from both internal and external sources (AlMulhim, 2021). Information has been captured and disseminated on a massive scale thanks to the exponential growth of ICTs While more data is available, finding the right information has become more challenging; therefore, knowledge management has become increasingly important. By utilizing different techniques like data mining, it is possible to screen vital information and identify trends ( Mikalef et al., 2019). In order to find interesting relationships among data collected by a company, BI must identify unknown relationships between the data. As a result, KM must be integrated with data mining in order to improve knowledge. Talaoui and Kohtamäki (2021) pointed out that BI plays an essential role in modern business operations. Data warehouses in KM systems were studied in terms of their significance and functional applications. As an additional benefit, data warehousing can be used to generate information, from which knowledge can be gained.

## ***H2. Business intelligence positively affects knowledge management capability***

### ***Knowledge management capability and radical and incremental innovation***

Several studies have demonstrated a significant correlation between KMC and innovation capability. Indeed, based on du Plesse (2007), KMC contributes to innovation in a number of ways, including how it facilitates collaboration, how it facilitates tacit knowledge conversion into explicit knowledge, Identifying knowledge gaps, and ensuring knowledge can be accessed and utilized, Similarly, Hislop et al (2018), noted that firms' innovation capability is largely determined by how well they transform and apply their knowledge. Shehzad et al (2021) concluded that knowledge management can enhance organizational innovation by continuously transforming administrative processes, information systems, and organizational structures into new innovations. Sun et al (2020) stressed that KMC considerably promotes innovation capability through its ability to convert tacit knowledge into explicit knowledge and make it accessible and available to innovators. Lei et al (2021) revealed that KMC boosts firms' innovation capability by speeding up and improving knowledge acquisition and application. Specifically, Naqshbandi and Jasimuddin (2020), showed that firms possessing a higher KMC are more effective at combining incremental and radical innovations. Chang et al (2019) argues that knowledge acquisition, diffusion, and application are the main antecedents to organizations improving collaboration and increasing innovation capabilities. Hence, these arguments suggest that KMC can positively impact a firm's innovation capability; therefore, we propose these hypotheses

***H3.a. knowledge management capability positively affects Radical innovation.***

***H3.b. knowledge management capability positively affects incremental innovation.***

### ***Mediating role of knowledge management capability***

Through its interaction with other tools and skills, BI can indirectly affect innovation and efficiency in the workplace (Turulja and Bajgoric, 2018). By exploiting business processes for strategic purposes, BI has also improved similar procedures within a company (Aydiner et al.,

2019). As an operating capability based on processes, KMC can also utilize business intelligence (Sun et al., 2020). BI resources and innovation capability are related through KMC, showing that KMC is a mediator of BI resources and innovation capability. With high-quality BI systems, organizations can expand their capacity to process business, especially when developing KMC. Conversely, strengthened KMCs lead to the efficient management of intellectual capital, thereby creating valuable and unique resources (Talaoui and Kohtamäki, 2021). Furthermore, BI investments would not return a positive return without KMC. We propose the following hypothesis

***H4a: knowledge management capability mediating between business intelligence and radical innovation***

***H4b: knowledge management capability mediating between business intelligence and incremental innovation***

### **The moderating role of agility organization**

Alongside the direct impact of KMC on innovation, it is also proposed that it indirectly impacts innovation through organizational agility. By facilitating knowledge activities and applications, KMC promotes organizational agility (Battistella et al., 2017). After gaining agility through KMC, organizations are better equipped to respond to market demands and environmental changes. Thus, this ability facilitates the development and provision of high-quality products and services which enhance innovation capabilities (Ahammad et al., 2019). A company without agility is less likely to succeed, since it is unable to respond quickly to external changes and environmental turbulence. From all these arguments, it can be deduced that business process-oriented organizational agility mediates the relationship between innovation and KMC in an organization (Ahammad et al., 2019). A company's knowledge capability strengthens its innovation capability. Business success is primarily determined by robustness, swiftness, and flexibility of processes, which are reflected in agility. In order to increase profitability and efficiency, organizations must embed agility in their processes (Asseraf et al., 2019). Conversely, an organization will be less likely to improve innovation and performance if it does not integrate agility into its processes (Christofi et al., 2021). Conventional, particularly outdated approaches and approaches do not adapt to external changes because they advocate "one size fits all". Simply put, organizational agility is achieved through KMC because it strengthens the ability and capacity of organizations to improve internal operations and external initiatives, thereby increasing innovation capability.

***H5.a: agility organization moderates between knowledge management capability and radical innovation***

***H5.b: agility organization moderates between knowledge management capability and incremental innovation***

### **Methodology**

We use a cross-sectional approach and a quantitative-deductive causal approach, in accordance with our study objectives and hypotheses. In this study, hypotheses are tested after they have been developed through a review of relevant literature (Aydiner et al., 2019; Abualoush et al., 2022; Fink et al., 2017). Due to this, the study has a quantitative focus rather than a theoretical focus, but rather tests theories and hypotheses. In order to understand the mechanisms supporting relationships between constructs, statistical tests are conducted

(Sekaran and Bougie, 2016). In this study, a oneshot sampling was used to measure the time horizon cross-sectionally.

### Sampling and Data Collection

Jordanian industrial firms were the subject of this study. In selecting these firms, we considered the lack of research on these firms, as well as the study of the relationship between BI, KMC, and agility in determining radical and incremental innovation. As for the distribution of the questionnaire, simple random sampling was chosen since it ensures equality and equivalence (Sekaran and Bougie, 2016), thereby reducing the probability of bias in the distribution process. Each of these firms' organizational and administrative units was included in the analysis unit. For statistical analysis, 420 questionnaires were distributed. We received 314 meaningful responses, representing a 55.3% response rate. The demographics and personal characteristics of participants are shown in table 1.

Table 1

#### *Demographics and personal characteristics*

Category	category	Frequency	%
Gender	Male	276	0.878
	Female	38	0.121
	Total	314	100
Level of education	Bachelor's degree or less	281	0.894
	A postgraduate degree	60	0.191
	Total	314	100
Years of experience	Five years or less	47	0.149
	5 - 10 years or less	154	0.490
	Ten to less than fifteen years	80	0.254
	More than 15 years	33	0.105
	Total		100

### Measure

In order to collect data about these constructs, a questionnaire was used. Researchers used items from previously published studies in the questionnaire to ensure higher reliability and validity, as well as to enhance generalizability (Duan et al., 2020). In order to accommodate Jordanian culture, some questionnaire items were modified. To guarantee the greatest possible amount of participants, the items were then translated into Arabic. Likert scales were used to measure responses to the questionnaire items. Here is a summary of the questionnaire items distributed to participants in Table 2.

### Measurement Model

evaluation and convergent validity verification were performed, as well as factor loadings, composite reliability (CR), Cronbach's alpha and average variance extracted (AVE) values. Cronbach's alpha, factor loadings, and factor CR values should be greater than 0.70, as well as AVE values above 0.50 (Hair et al., 2019). As all values were higher than the statistically acceptable values, all constructs passed the convergent validity and reliability tests. Convergent validity and reliability of the constructs are summarized in Table 2.



Table: 2

*Validity and Reliability Measures*

Construct	Item	Factor loading	AVE	CR	$\alpha$	References
BI	BI 1	0.762	0.654	0.862	0.831	Al-Khatib et al., 2022; Bouaoula et al.,2019, Abusweilem and Abualoush (2019). Jafari et al.,2021
	BI2	0.713				
	B3	0.745				
	BI4	0.823				
	BI5	0.743				
	BI6	0.743				
KMC	KMC	0.812	0.621	0.823	0.842	Abualoush et al.,2018; Rafi 2021;
	KMC2	0.789				
	KMC3	0.742				
	KMC4	0.765				
	KMC5	0.782				
	KMC6	0.812				
Agility	Agility1	0.723	0.632	0.832	0.792	Rafi, 2021
	Agility2	0.756				
	Agility3	0.735				
	Agility4	0.763				
	Agility5	0.762				
Radical innovation	RI1		0.654	0.821	0.824	
	RI2					
	RI3					
Incremental innovation	INI1		.592	0.802	0.835	
	INI2					
	IN3					

By comparing the construct's square root value to the correlation coefficient with other constructs, the discriminant validity of the construct was evaluated. For the square root of the AVE to be greater than the correlation coefficient between the construct and other constructs, the AVE must be larger than its square root (Fornell and Larcker, 1981). According to Table 3, the acceptable values are statistically valid, supporting the validity of the discriminant validity between all the components.

Table 3  
discriminant validity

Instruments	Mean	SD	BI	KMC	RI	INI	Agility	
BI	3.56	0.78	<b>0.827</b>					
KMC	3.51	0.71	0.572	<b>0.782</b>				
RI	3.67	0.72	0.581	0.634	<b>0.842</b>			
INI	3.50	0.73	0.573	0.793	0.752	<b>0.821</b>		
Agility	3.52	0.76	0.621	0.628	0.711	0.721	<b>0.734</b>	

### Structural Model

Based on a measurement model verification that confirmed all statistical tests were conducted as recommended, 5,000 bootstrapped samples were used to test relationships between constructs. With Smart-PLS, we are able to test the relationships between endogenous and exogenous constructs (Streukens and Leroi-Werelds, 2016). The findings from the testing of direct, moderating, and mediating hypotheses are presented in Table 3. To assess the significance of the endogenous and exogenous construct causal linkages, path coefficients, T-values, and P-values were used to calculate statistical significance.

Results of the direct impacts show that BI is considerably and favorably related to radical innovation ( $\beta = 0.305$ ,  $P < 0.000$ ), confirming hypothesis H1a. The direct effects indicate that BI influences incremental innovation positively and significantly ( $\beta = 0.331$ ,  $P < 0.000$ ), so hypothesis H1b is supported. Also, BI is positively and significantly related to KPC ( $\beta = 0.253$ ,  $P < 0.000$ ), so hypothesis H2 is also supported. In addition, KMC has a positive and significant impact on radical innovation ( $\beta = 0.263^{***}$ ,  $P < 0.000$ ), hence hypothesis H3.a is supported. KMC also directly affects incremental innovation ( $\beta = 0.321$ ,  $P < 0.000$ ), which supports hypothesis H3.b.

The bootstrapping analysis shows that BI has a 0.0211 indirect effect on radical innovation through KMC. As a result, hypothesis H4.a is supported. With respect to the mediating effect, bootstrapping results indicate that the standardized indirect effect of BI on incremental innovation through KMC ( $\beta = 0.231$  with a  $P < 0.05$ ). Thus, hypothesis H4.b is supported. Also, hypothesis H5.a is supported, since the estimated indirect effect of KMC on radical innovation through Agility ( $\beta = 0.205$  with  $P < 0.05$ ), and hypothesis H5.b by the estimated indirect effect of KMC on incremental innovation through Agility ( $\beta = 0.2017$  with  $P < 0.05$ ). Moreover, the coefficients of determination ( $R^2$ ) for KMC, the agility, radical innovation and incremental innovation, (0.56; 0.44 0.51; 0.53) respectively, According to the proposed model, the variation is moderately accounted for. The hypotheses tested are summarized in Table 4 below.

Table 4

*Result direct and indirect relationship*

Hypothesis	Path	Standardized effect	Result
H1.a	BI→RIN	0.305***	Supported
H1.b	BI→IIN	0.331***	Supported
H2	BI→KMC	0.253***	Supported
H3.a	KMC→RIN	0.263***	Supported
H3.b	KMC →RIN	0.321***	Supported
H4.a	BI – KMC - RIN	0.211**(indirect effect)	Supported
H4.b	BI – KMC - IIN	0.231**( indirect effect)	Supported
H5.a	KMP-agility- RIN	0.205(indirect effect)	Supported
H5.b	KMP-agility- IIN	0.217**(indirect effect)	Supported
<b>Notes:</b> ***p < 0.001; **p < 0.01.			

**Discussion and Conclusion**

The following are the theoretical and empirical contributions of this study. In the literature review, it is shown that there are a number of factors that influence radical and incremental innovation. In spite of the fact that researchers have studied the effects of BI, KMC, and agility independently on radical and incremental innovation. As far as the authors are aware, no research has examined the concurrent influence of BI, KMC, and agility organizations on radical and incremental innovation. In order to fill this gap, a new conceptual framework was developed, illustrating the impact of BI, KMC, and agility organizations on innovation capability. It offers a valuable theoretical contribution to innovation capability literature, particularly in terms of incremental and radical innovation. Additionally, the research provides empirical evidence about the impact of BI, KMC, and agility organizations on innovation in different industries using appropriate sample sizes. Research hypotheses were supported by acceptable levels of variance using the constructs used in this study. BI is also linked to radical and incremental innovation through an intermediate mechanism between KMC and organizations' agility. As a result, BI improves the KMC and agility of innovation capabilities.

**Theoretical Implication**

several theoretical implications emerge from the study. Importantly, first, this study is the only one to examine the components of Business Intelligence, KMC, and their relationship with Innovation Capability while taking agility into consideration as a moderator. The study also contributes to theory by offering fresh causal factors for variables influencing innovative capability, how Business intelligence analytics can be the key component in improving the of organisations' responses to environmental change show Business intelligence analytics can help organizations respond to environmental changes more effectively, and how Business intelligence can contribute to an improvement in the innovation landscape in organizations by improving the compatibility between customer demands and product specifications (AL-Khatib, 2019), thereby strengthening innovation capability. Consequently, the study has contributed to an explanation of the relationships between the constructs in the model that may be useful for researchers and specialists in innovation and knowledge

Second, According to knowledge-based view theory, the findings of this study contribute to a better understanding of the extent to which organizations are able to utilize external knowledge as a source of business intelligence by using predictive analytics and their

analytical capabilities. Through the use of these capabilities and methods, organizations can create models that can predict with high efficiency and improve their ability to learn and innovate. As a result, organizations can make better decisions and get a better grasp of customer wants and needs, as well as competitive market requirements, ultimately improving performance and innovation specifically.

Third, the study examines how KM capabilities influence specific aspects of innovation with organizational agility as a moderating factor. According to this study, KM capabilities facilitate organizations becoming agile, which in turn leads to innovation. As a strategic capability, agility enables organizations to identify and respond to market changes in a timely manner; as a result, organizations are more likely to be able to take advantage of new opportunities since time-to-market is reduced. According to existing literature, organizational agility did not receive much attention, especially in the context of KM capabilities. An integrated framework for KM capabilities and innovation capabilities was developed and empirically tested using organizational agility as a mediator. In light of increasing rivalry and product substitution in contemporary organizations, the proposed capability-capacity nexus provides the theoretical basis for strategic solutions, which complement each other and contribute to successful innovation.

### **Practical Implication and Limitation**

Several implications arise from this study for management professionals. First, BI capability facilitates innovation Božič and Dimovski (2019), thus, BI implementation strategies should be aligned with other strategies in order to improve their application. A sufficient amount of resources should be allocated to this system by top management. To achieve superior BI capabilities, firms must make crucial BI investment decisions. In order to achieve agility and enhanced innovation, firms should recruit and retain highly skilled and competent IT staff and managers who can develop IT skills. Furthermore, managers should upgrade IT infrastructure along with proactively integrating IT with the business to achieve greater BI capabilities to prepare for market uncertainty. It is also essential for firms to focus on proper business intelligence and aligning business processes in order to recognize, explore, and embrace various IT innovations.

Second, KMC was found to positively influence innovation capability and modify the relationship between business intelligence and innovation. Through the use of BI to understand customer preferences and analyze their needs and desires, Jordanian companies will be able to develop new ideas and transform them in real time into innovative products by harnessing the capabilities of KMC.

Innovation has been broadly recognized as a crucial factor enhancing a firm's competitive advantage (Than et al., 2022). A firm's ability to adapt to change depends on its innovation capability, which makes it more effective and flexible (Abualoush et al., 2022). The ability to innovate allows firms to better serve consumers, compete more effectively, identify market opportunities, align the strengths of the firm, and leverage market opportunities, particularly in light of rapid technological change, globalization, and intense competition (Le et al., 2020). Whether it is through the introduction of new products and services, the exploration of new market segments, the identification of new business opportunities, or the identification of new business models, innovation may provide organizations with a chance to survive and grow (Ali et al., 2022). Due to the crucial role innovation plays in overcoming volatile environments, a large number of companies have been looking for ways to enhance their innovation capabilities. As a result, practitioners and scholars have become increasingly

interested in how to improve innovation capabilities (and have endeavored to understand the antecedents or critical factors that influence and foster the innovation capability of a business, so that organizations can deliver business value and secure competitive advantages by improving performance and leading the implementation of new products, services, and procedures (Shehzad et al., 2022; Jafari et al., 2022). Due to the complex interrelationship between organizational agility and firm innovation, managers need to understand when being agile is advantageous for their business. Agile organizations do not automatically reap benefits. Businesses can benefit from KMC when they possess an appropriate level. According to the findings, firms are most likely to be agile when they possess high levels of KMC. Therefore, in order to enhance agility for innovation success, firms might need to develop and improve their KMC.

In this paper, some limitations are present. first, data were collected at one time via a self-administered questionnaire. As a result, a combination of data collection methods and longitudinal data will be helpful in understanding the relationships between constructs. second, the paper was designed to study the Jordanian industrial firms' sector, which makes the results inapplicable to other countries, cultures or contexts. Thus, in future studies, different cultures and contexts should be considered. Deductive quantitative approaches were preferred over qualitative or mixed approaches. Consequently, a method of data collection neglected in this paper, interviews, should be explored in future studies. Finally, Other constructs should be studied in future studies, such as knowledge management infrastructure, market tolerance.

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