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Institutional pressures and business intelligence uses: antecedents and consequences

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Abstract: This study aimed to analyze the relationship between institutional pressures and business intelligence uses. Data were collected from 223 participants in Jordanian manufacturing companies and analyzed using Smart PLS software. The results revealed a positive effect of institutional pressures, including coercive, mimetic, and normative pressures, on business intelligence Use. They also indicated a positive impact of business intelligence use on competitive agility and competitive intelligence. This study makes important contributions to institutional theory and the theory of adoption and use of innovative information technology by linking institutional pressures to the use of business intelligence. It also provides practical insights that serve industrial firms, decision-makers, and policy-makers in several ways.

Keywords: institutional pressures; coercive pressures, mimetic pressures, normative pressures, business intelligence; competitive agility, competitive intelligence

1 Introduction

Unstable business environments, high levels of uncertainty, and increased competition have become dominant in today's business world as there is no longer a permanent competitive advantage (Sołoducho-Pelc, & Sulich, 2020; Balog, 2020). These challenges have motivated organizations to develop competitive strategies characterized by intelligence and agility to act quickly in various ways in response to changes in the business environment (Akkaya, B., & Tabak, A. 2020). Such strategies have required mechanisms for tracking the external environment and gathering and analyzing big, unstructured, and diverse data from different open sources to support organizations in improving strategic decisions and remaining competitive (Ranjan & Foropon, 2021).

One of the main characteristics of modern organizations is the data revolution that has been steadily taking place over the last two decades (Jiménez-Partearroyo & Medina-López, 2024). This huge amount of digital data has changed the companies' competitive environment. Many practitioners and scholars even see organizational and management decision-making to be in the middle of a gradual transformation from an instinct-driven "art" to a progressively data-driven approach (Hurbean, 2005; Solano & Cruz, 2024). Organizations today have access to almost unlimited amounts of data – sales, demographics, economic trends, competitive data, consumer behavior, efficiency measures, financial calculations, and more (Solano, & Cruz, 2024). There has been a significant increase in business analytics technology demands in recent years, with an increase in the amount of data and information stored in various business systems. Business Intelligence (BI) is now widely used and implemented in many organizations, particularly those that place a premium on digital transformation (Zaki, 2019).

BI technology has played a critical role in digital transformation through the development of methods, systems, and tools that have enabled the collection, storage,

and analysis of this vast quantity of data (Garzoni et al., 2020). The literature confirms that BI systems are resource-intensive applications that allow decision-makers to derive appropriate insights and develop strategies to improve their business (El Ghalbzouri & El Bouhdidi, 2022). According to Chen and Lin (2021), BI uses have become a prevalent technological direction in today's dynamic environment, where organizations can become more scalable, intelligent, and flexible.

The drivers and value of using BI tools have interested researchers since their inception. Despite of recent rich body of literature on BI, the existing studies have largely remained silent on external drivers of BI adoption across industries and organizations. However, such external factors have been highlighted in institutional theory (Scott, 2005; Berrone et al., 2013). According to the institutional viewpoint, organizations seek approval from their surroundings and are thus vulnerable to social influence (Pedersen & Gwozdz, 2014; Xie et al., 2022). Institutional pressures generally include social, cultural, legal, technological, or collaborative forces that influence and shape the organizational structure, behavior, and strategic actions of firms seeking legitimacy (Pedersen & Gwozdz, 2014). They, in general, include social, legal, technological, and collaborative forces that influence and shape the organizational structure, behavior, and strategic actions of firms seeking legitimacy through meeting social and environmental demands as well as the needs of other stakeholders (Pedersen & Gwozdz, 2014; Li et al., 2019). The literature, however, agrees that even firms operating in the same environment may respond differently to institutional pressures (Rao & Tilt, 2016; Xie et al., 2022).

The use of Large-scale data for decision-making in fuzzy environments has garnered much attention from both researchers and practitioners in the field (Isik et al., 2011). Firms today, in order to remain relevant in the market, need to compete not only strategically but also from operational and tactical angles (Dubey et al., 2020). Industry practitioners have shown much interest in the role BI tools enable the creation of competitive products and services geared towards improved managerial practices and business operations (Trieu, 2017). These technologies have emerged as primary technologies necessary for modern business organizations to analyze and obtain useful information from data and provide adequate decision-making for all functions, processes, and relationships with partners (Ramakrishnan et al., 2012; Farayola, 2024). BI in comparison to other fields of study is new and relatively unexplored which presents a void especially on the effects and reasons of both its adoption and the constant development of its tools as well as the vastness of its applications. A literature review underscores the need for analysis on the impact of institutional pressures in developing countries like Jordan with regards to the organization's applications of BI tools. In addition, the literature shows the gap in empirical research regarding the use of BI at an organization for the purpose of competing with intelligence and agility. This research evaluates the effect of organizational influences on the utilization of BI. It further investigates the contribution of BI toward forming competitive agility and competitive intelligence.

Given the gap in the previous literature and the need to understand and enhance knowledge about the antecedents and consequences of using BI from a practical perspective, this study seeks to answer the following questions: Q1: Do institutional pressures impact BI use? Q2: Does BI use impact competitive intelligence and competitive agility? Answering these questions will contribute to expanding the scope of institutional theory and its ability to explain the use of modern technology, particularly smart applications, whose adoption and spread are expanding. This study will also enhance companies' and managers' awareness and knowledge of the BI environment and its performance.

2 Literature review

BI is defined in various ways from different perspectives. For example, Isik et al. (2011) described BI as the proactive process by which a company scans and absorbs information from a volatile environment to identify opportunities and mitigate risks. According to Hurbean (2005), it is a diverse set of software platforms, applications, and technologies designed to assist decision-makers in performing more effectively and efficiently. Furthermore, Niu et al. (2021) defined BI as a management approach that enables an organization to define what information is useful and relevant to corporate decision-making. Although many studies have addressed the factors influencing the adoption of BI applications, studying the impact of institutional pressures on their use is still a topic that requires further study and research.

In the last 20 years, institutional theory has become popular as an explanation for the impact of external organizatons on an organization's decision-making processes and outcomes (Krell et al., 2016). Institutional pressures arise from social frameworks that set certain expectations and boundaries for business procedures (DiMaggio & Powell, 1983). There are interest groups and public opinions, and within this wide scope of institutions comes regulatory frameworks, government bodies, laws, courts, and other professions. Studies validate that in order to remain viable, firms need to pivot towards the direction of their external environment's needs and expectations (Dubey et al., 2015; Chen et al., 2018). As Silva and Avrichir (2024) describe, institutional theory aids in comprehending how institutional contexts shape organizational choices and results. Still, the field of information systems has drawn on institutional theory to explain the remarkable acceptance of different IS innovations (Krell et al., 2016; Bennich, 2024).

The literature established 3 categories of institutional factors which profoundly impact the organizational practices regarding creativity and its institutionalization (DiMaggio & Powell, 1983; Aharonson & Bort, 2015; Ain et al., 2019). Coercive forces are those which utilize institutional pressure as a way to enforce compliance to certain rules or regulations by external parties such as government agencies, professional associations, or other regulatory bodies (DiMaggio & Powell, 1983). Non-compliance of these rules or regulations will bring about penalties or sanctions the external party imposes. (Latif et al., 2020). As a result of uncertainty and change in the environment, firms may be coerced to emulate their rival4s who are successful in implementing certain strategies, technologies, practices and organizational structures (Berrone et al., 2013). The phenomenon by which a firm adopts the actions and innovations of market leaders and other successful businesses is termed as "mimetic pressure" (DiMaggio & Powell, 1983). Normative pressures are also known as the third form of institutional pressure. Considering the social networks, forces of integration and advancement emphasize that organizations should comply with the prevailing authority within the field, and instead of company policies on how work should be done, focus on competencies (Dubey et al. 2015). A business enterprise, including its environment, has its own culture, including its values, expectations, standards, and society that defines the level of stress it is (Aharonson & Bort 2015). Bharathi Sorour and Atkins (2024) cite new research which advocates that many companies can benefit from BI in better decision-making and increased productivity because they understand their customers better.

BI analyzes data discovering trends, patterns, and outliers for enhanced decision-making in business (Szukits & Móricz 2024). Aharonson & Bort (2015) add that it is also useful in monitoring operational efficiency or conducting marketing research aimed at studying changes in customer sentiment. Al-Okaily and Al-Okaily (2025) contended that a business is more likely to experience enhanced productivity, increased profit, and diminished expense due to BI benefits. New market opportunities can be discovered and exploited with the help of BI, which enables firms to outperform other

competitors as noted by the authors. Chen and Lin (2021) also studied the relationship between BI and CRM to identify the scope of integration between the two systems. The researchers pointed out that BI allows companies to identify and comprehend the behaviors and preferences of their target audience, which leads to better marketing, heightened customer satisfaction, and improved company performance.

While a considerable amount of literature exists on the function of BI including its numerous advantages, some thorough studies on its effect on global competitiveness leave much to be desired. It is, indeed, rather surprising that there is insufficient coverage of the impact of BI on competitiveness. For example, not much attention has been paid to the role of BI to the development of competitive intelligence. Bose 2008 defined competitive intelligence as the process of scanning the environment, gathering and analyzing data and information from a particular and strategic viewpoint, and assisting the organization to gain and sustain a competitive advantage over rival organizations. Chukwuka and Imide 2024 similarly posited that suf-ficient competitive intelligence is required for basic business analy-sis to stimulate forward looking decisions. Other scholars have concentrated on the effect of BI on competitive agility of the firms. Competitive agility' addresses how a firm's capacity to identify and react to competition can be an edge for the firm (Nkuda, 2017). This is achieved by incrementally developing capabilities made up of mobilizable tangible and intangible resources (Reddy & Reddy, 2002).

3 Research Model and Hypotheses

To answer the research questions, the research model (Fig.1) of this study proposes that institutional pressures, including coercive pressures, mimetic pressures, and normative pressures significantly impact BI uses. The research model also posits that BI has a significant impact on competitive intelligence and competitive agility.

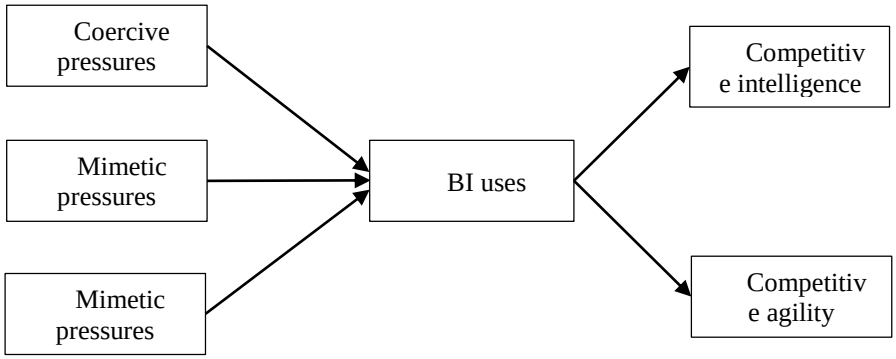

Figure 1. Research model

Details of the justification of these relationships and their hypotheses are provided in the following sections.

3.1 Coercive pressure and BI uses

There is existing research that establishes a relationship between coercive pressures and the use of innovative, data-driven technologies (Bennich, 2024; Singh & Joshi, 2024). BI solutions may need to be put in place to satisfy governmental regulations, industry

norms, or even policies from the legislature (Arranz et al., 2022). Companies tend to invest more in BI systems because they wish to comply with the laws, avoiding legal penalties as well as negative publicity (Chaubey & Sahoo, 2021). Customers and suppliers, who are important stakeholders, can exert coercion on the organization to implement BI that will enhance accountability and transparency in the processes of the organization (Ahmed, 2021). Such pressure qualifies to be labeled as coercive. Furthermore, the way BI technologies are deployed in an organization may be altered as a result of coercive power. A company facing the prospect of adverse publicity or regulatory action because of data breaches may choose to enhance the use of BI in security and risk management (Chaubey, & Sahoo, 2021). Subsequently, there will likely be changes to the organization's BI strategy, increasing focus on governance and security of data. To sum up, we argue that coercive pressure is vital in the adoption and use of BI within an organization, as organizations are motivated to adopt BI uses compliantly and retain their legitimacy and reputation for stakeholders. Hence, this research posits:

H1: Coercive pressure has a significant impact on BI system uses.

3.2 Normative and pressure and BI uses

Normative pressures seem to be associated with an organization's culture and values. In cases where there is an organizational or sector culture that embraces BI as a standard within the strategic decision-making processes, it is likely that there the BI tools are embraced within the organization (Trieu, 2017). Such pressures may compel firms to keep pace with the prevailing business intelligence technology adoption in the market (Singh & Joshi, 2024; Taranu & Cioranu, 2024). This is important because these factors define the degree of support and commitment to BI initiatives (Arranz et al., 2022). Firms that have dominant cultures of change and learning are most likely to utilize BI tools to monitor and benchmark performance in order not to be marginalized or ridiculed (Chen & Lin, 2021; Alsaad et al., 2022). In Trieu's (2017) view, firms that have deeply embedded ethical culture within the organization are more likely to adopt BI tools in order to detect fraud and other unethical acts. Moreover, outside constituents are looking forward to the organizations implementing BI technologies to enhance the level of accountability and transparency in their processes (El Ghalbzouri & El Bouhdidi, 2022). According to Jiménez-Partearroyo and Medina-López (2024), companies implement BI for the preservation of their image and credibility in the eyes of the stakeholders. Therefore, this research posits:

H2: Normative pressures have a significant impact on BI uses.

3.3 Mimetic pressure and BI

It is understood that Aharonson and Bort (2015) argue that institutional theory holds that firms try to gain legitimacy and stability by copying the practices of other already established firms and even other competing firms. Adithi (2017) explains this by stating that firms attempt to gain legitimacy and stability by imitating the operations of firms that have already succeeded. There are numerous sources of industry standards, professional bodies, and even the press, to name a few, from which these mimetic pressures can come (Arranz et al., 2022). Trieu (2017) followed by Niu et al. (2021) argued that the use of BI technologies can become a norm or standard for competitive and successful firms within an industry. For this reason, firms are predisposed to adopting BI strategies to gain legitimacy in a market where they will be viewed as non-competitive. Chaubey and Sahoo (2021) observes suggest that perceived competition comes with the pressure of adopting BI strategies that are assumed to be in fashion among competitive and successful firms in the industry. Through BIs, it is possible to

enhance firm performance and competitiveness (Bharathi et al., 2024; Farayola, 2024). While doing so, these businesses are more likely to satisfy the expectations of professional bodies and other stakeholders (Sorour & Atkins, 2024). This may empower them to reinforce their legitimacy while achieving balance in the industry. Hence, the present study hypothesizes the following:

H3: There is a significant impact of mimetic pressures on BI uses.

3.4 BI and competitive intelligence

These concepts, BI, and competitive intelligence, are distinct yet integrated concepts in relation to business strategy and decision making. Competitive intelligence involves gathering and interpreting information about competitors along with market developments to secure a competitive edge, albeit modest (Bose, 2008). On the other hand, BI looks at the data and offers findings about how a business functions and its relative success (Ranjan & Foropon, 2021; Taranu & Cioranu, 2024). BI has become more automated, and analytics tools are designed to gather enormous quantities of information, analyze them, and detect factors and patterns that would lend toward favorable business decisions (Al-Omoush & Alghusin, 2024). As in the case for BI, competitive intelligence analytics tools are developed to gather and analyze competitor information to identify market risks and opportunities (Kazemi & Soltani, 2024; Tanev, 2024). The use of both BI and competitive intelligence enables the firms to get a comprehensive perception of the internal and external environment which impacts their business (Ahmed, 2021; Ranjan & Foropon, 2021). Data visualization is another bridge which BI and competitive intelligence can cross (Ranjan & Foropon, 2021). Likewise, competitive intelligence professionals use data visualization tools to present competitive intelligence information in a way that is easy to understand and use (Ranjan, J., & Foropon, 2021; Alsaad et al., 2022). Therefore, this research offers:

H4: The use of BI has a significant impact on competitive intelligence.

3.5 BI and Competitive Agility

The agility of an organization can be improved by using BI systems that provide valuable information regarding the market, social media, and other external sources (Hurbean, 2005; Chaubey & Sahoo, 2021). BI is also able to provide insight for an organization in understanding its own market as well as the competitor's market. Ranjan and Foropon (2021) reported that BI tools usage enables firms to control competition by monitoring competitors' activities, spending in the market, and other opportunities. This enables firms to make informed decisions and adapt more quickly to the competitive environment (Dubey et al., 2020). Al-Omoush (2022) demonstrated that big data analytics could facilitate competitive agility in a firm by providing precise information within set timeframes. There is proof now that BI assists firms in identifying new directions as well as in responding in a timely manner when the market shifts (Solano \& Cruz, 2024; Al-Okaily \& Al-Okaily, 2025). BI arms firms with tools to assess changes in the market, identify potential opportunities, and analyze rival activity (Szukits & Móricz, 2024). These capabilities empower organizations in not only making more informed decisions but also in being more responsive to the dynamic competitive environment. Therefore, this study proposes a hypothesis:

H5: There is a significant impact of BI uses on competitive agility.

4 Research methodology

4.1 Design and Development of the Instrument

To test its research model, this study seeks to collect data using a questionnaire tool. Table 1 presents the items used in measuring study constructs and the sources used in adapting the items.

Table 1. Questionnaire items

Construct	Code	Item	Reference
BI uses	BIU1	BI tools provide senior management with a detailed picture of the company's history and identify trends and chances for growth.	Trieu, 2017; Chaubey & Sahoo, 2021; Chen & Lin, 2021; Bharathi et al., 2024.
	BIU2	My company uses BI as a tool for monitoring performance.	
	BIU3	BI tools improve the company's function and processes.	
	BIU4	The BI applications lower risk and limit losses.	
	BIU5	BI and analysis programs are designed to handle administrative and financial events and processes in the company.	
	BIU6	BI and analysis programs are used to improve the decision-making process in the company through the information stored in databases	
	BIU7	BI tools help in acquiring knowledge from the reality of the databases stored in the systems.	
	BIU8	BI allows for fast and adequate storage of knowledge	
	BIU9	BI tools provide all the company's needs for information and data on its operations.	
Coercive pressures	CP1	Using BI applications is consistent with the practices of other organizations.	DiMaggio & Powell, 1983; Aharonson & Bort, 2015; Adithi, 2017.
	CP2	Our main competitors in our industry who have adopted BI applications are more competitive.	
	CP3	Using BI applications to conduct business is an important part of our business operations.	
	CP4	BI satisfies the requirements of government laws and regulations.	

	CP5	BI tools have become critical components of our strategy.	
Mimetic pressures	MP1	Our primary business partners make extensive use of BI applications.	DiMaggio & Powell, 1983; Berrone et al., 2013; Adithi, 2017.
	MP2	Our competitors make extensive use of BI applications.	
	MP3	Early adopters have reaped significant benefits from using BI applications.	
	MP4	Business partners are widely adopting BI practices.	
	MP5	Adopters of BI have gained a competitive advantage.	
Normative pressures	NP1	If we implement BI, our business partners may regard us as forward-thinking.	DiMaggio & Powell, 1983; Aharonson & Bort, 2015; Singh & Joshi, 2024.
	NP2	Adopting BI applications meets professional expectations for how work should be done.	
	NP3	It is critical that we are perceived as a forward-thinking company that uses cutting-edge BI applications.	
	NP4	Stakeholders believe that adopting BI propels our company forward.	
	NP5	Professionals' expectations about how CSR should be undertaken and communicated are met by BI practices.	
Competitive intelligence	CI1	Our organization regularly monitors competitors to stay ahead in the market.	Al-Omoush & Alghusin, 2024; Taranu & Cioranu, 2024.
	CI2	We systematically collect and analyze information about market trends and competitors.	
	CI3	Competitive intelligence is a key input in our strategic decision-making process.	
	CI4	The company frequently assesses competitor strategies to improve its own position.	
	CI5	We regularly analyze environmental changes in order to adapt its strategies.	
Competitive agility	CA1	The company detects changes in the business environment and industry and forecasts what will happen in the future.	Kovacikova & Zemková, 2021: Reddy & Reddy, 2002.
	CA2	Our company is constantly on the lookout for new opportunities and threats in its environment.	

	CA3	The company is devoted to tracking changes in competitor movements.
	CA4	We have a strong capacity for change.
	CA5	The company considers its ability to change to be a strength.

In order to determine the level of respondents' agreements with items in an accurate manner, the five-point scale was relied upon.

4.2 Sample and data collection

The study population included manufacturing companies operating in Jordan, as this sector is considered one of the most important sectors in promoting economic growth in Jordan. The convenience sampling method was used to collect cross-sectional data, as this method is considered a non-probability sampling method (Wilson, 2014), which is used when targeting a specific group of participants with certain characteristics or experiences (Sekaran & Bougie, 2016) or when methods are not available randomness in data collection. For the purposes of achieving the objectives of the current study, 223 questionnaires were distributed through the manual method, i.e. handling by hand, and according to the recommendations of (Hair et al., 2014), when using structural equation modeling SEM through partial least squares PLS methodology, it is possible to use a relatively small sample size, i.e. less from 200 responses, therefore, the current sample size is suitable for conducting and implementing hypothesis tests. Preliminary sorting of the collected responses was carried out in order to ensure the appropriateness of the data and responses for statistical analysis, in addition to verifying the reasonableness of the responses and the absence of missing or extreme values, as all 223 responses were reasonable and could be used to achieve the goals. Table 2 summarizes the characteristics of the participants.

Table 2. Demographic profile of the study participants

Variable		Frequency	%
Gender	Males	179	80%
	Females	44	20%
Age	< 25 years	28	13%
	25-34 years	90	40%
	35-44 years	72	32%
	45-54 years	27	12%
	> 55 years	6	3%
Education	Diploma	33	15%
	Bachelor	109	49%
	Higher diploma	30	13%
	Master	45	20%
	Ph.D.	6	3%
Experience	< 5 years	33	15%
	5-10 years	49	22%
	11-15 years	83	37%
	16-20 years	40	18%
	> 20 years	18	8%
Occupation	Chief executive officer (CEO) /President	25	11%
	Chief information officer (CIO)	79	35%

	Head of the technology department	44	20%
	Vice president of technology	59	26%
	Director of IT	15	6.6%
	Manager of IT	1	0.4%
Total		223	100%

5 Data analysis

The current study aims to explore the direct effects of institutional pressures (CP, MP and NP) on BI uses in Jordanian manufacturing companies. The study also aims to know the direct effects of BI uses on both competitive intelligence and competitive agility. In order to test these relationships, SPSS software was used in addition to the PLS-SEM methodology through the Smart PLS software, where the SPSS software was used to encode the data and extract the different descriptive statistical measures, while the Smart PLS software was used to evaluate the measurement model, which provides convergent tests validity, reliability, discriminant validity and predictive power, and the structural model was also used to test hypotheses (Hair et al., 2019). Also, before testing the hypotheses, some tests were conducted in order to see the suitability of the data for testing the hypotheses by examining the multicollinearity in addition to the normal distribution of the data.

5.1 The Measurement Model

Before testing hypotheses through the structural model, convergent validity and discriminant validity should be confirmed, in addition to the reliability of its various types (Hair et al., 2019). The measurement model provides the ability to evaluate convergent validity, as this assumption is one of the main assumptions to ensure that there are correlations between the items that can explain the variation in the construct (Hair et al., 2019). The results of convergent validity reveal that all values were greater than (0.70) for Factor loadings and (0.50) for AVE values, and this confirms the acceptance of convergent validity. For the purposes of improving the values of the convergent validity tests, the items whose factor loadings were less than (0.70) were deleted, which could negatively affect the results.

The reliability was also verified by calculating the Cronbach alpha values in addition to the composite reliability CR. According to the recommendation of (Hair et al., 2019), the vertebrae and latent constructs used in the study can be judged as reliable if the Cronbach alpha and CR values are higher than (0.70). Based on the results presented in Table (3-3), all values were higher than (0.70), and this confirms that the constructs and their items are reliable.

Table 3. Reliability and validity

Construct	Item	Factor loading	AVE	CR	Cronbach alpha
BIU	BIU1	0.824	0.672	0.942	0.930
	BIU2	0.822			
	BIU3	0.837			
	BIU4	0.823			
	BIU5	0.852			
	BIU6	0.838			
	BIU7	0.818			

	BIU8	0.740			
	BIU9	-			
CP	CP1	0.813	0.739	0.934	0.911
	CP2	0.872			
	CP3	0.870			
	CP4	0.872			
	CP5	0.869			
MP	MP1	0.872	0.727	0.930	0.906
	MP2	0.884			
	MP3	0.787			
	MP4	0.860			
	MP5	0.857			
NP	NP1	0.813	0.725	0.929	0.905
	NP2	0.831			
	NP3	0.826			
	NP4	0.899			
	NP5	0.885			
CI	CI1	0.894	0.842	0.955	0.937
	CI2	0.927			
	CI3	0.939			
	CI4	0.910			
	CI5	-			
CA	CA1	0.816	0.721	0.928	0.903
	CA2	0.849			
	CA3	0.861			
	CA4	0.885			
	CA5	0.832			

To evaluate discriminant validity, the method of Fornell and Larcker (1981) was used, which is one of the most common methods for evaluating discriminant validity. As it is clear from Table (4), the discriminant validity assumption was fulfilled, as all the square root values of the AVE values were higher than the other correlation coefficients, and this statistically supports the divergence and differentiation of these constructs from each other.

Table 4. Discriminant validity

Constructs	BIU	CA	CI	MP	NP	CP
BIU	**0.820**					
CA	0.685	**0.849**				
CI	0.699	0.636	**0.918**			
MP	0.793	0.639	0.800	**0.853**		
NP	0.806	0.679	0.705	0.821	**0.851**	
CP	0.816	0.723	0.701	0.805	0.812	**0.859**

5.2 Hypothesis testing

Figure 2 shows the results of the Smart PLS analysis, including factor loadings, path coefficients, and R2 values for the study relationships.

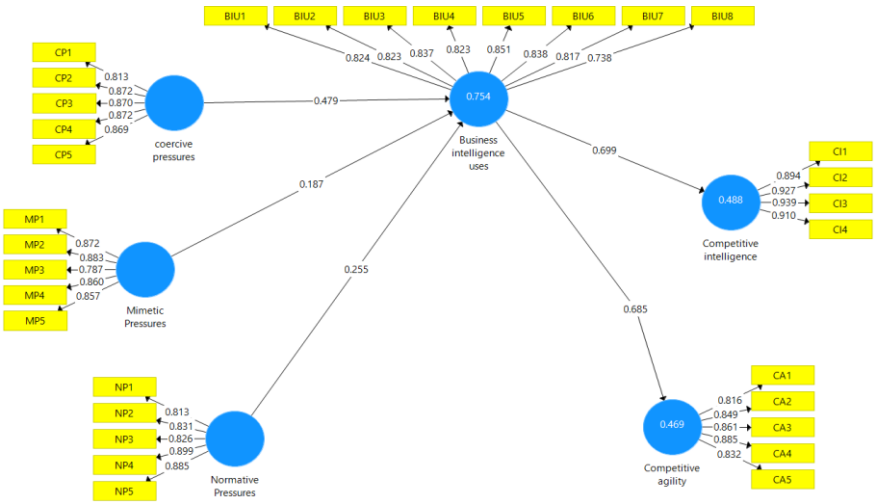

Fig 2. The measurement model results

Table 5 shows the results of hypothesis testing through the bootstrapping procedure, which is mainly used in the PLS-SEM methodology (Hair et al., 2019). The results of the study provided empirical evidence to accept all hypotheses, as the effect of CP, MP, and NP on BIU was positive and statistically significant, as the results were (β = 0.479, t = 7.396, p = 0.000; β = 0.187, t = 2.257, p = 0.024; β = 0.255, t = 3.419, p = 0.001) and thus H1, H2, and H3 were supported. H4 and H5 were also accepted as BIU had a positive effect on both CA and CI (β = 0.685, t = 17.268, p = 0.000; β = 0.699, t = 15.341, p = 0.000).

Table 5. Results of the hypothesis testing

Hypotheses	Path	Beta value	Std. Error	t-Statistic	P-Value	Result
H1	CP⇒BIU	0.479	0.065	7.396	0.000	Significant
H2	MP⇒ BIU	0.187	0.083	2.257	0.024	Significant
H3	NP⇒ BIU	0.255	0.075	3.419	0.001	Significant
H4	BIU⇒ CA	0.685	0.040	17.268	0.000	Significant
H5	BIU⇒ CI	0.699	0.046	15.341	0.000	Significant

6 Discussion

The current study reached a set of results that support the hypotheses that were assumed in the literature section, where the empirical results that were reached through hypothesis testing and data analysis confirmed the acceptance of all hypotheses. The results confirmed the presence of a positive effect of institutional pressures in their dimensions (coercive, mimetic, and normative) on BI uses in Jordanian manufacturing companies, and this confirms the importance of institutional pressures in adopting the use of in the activities of these companies, where coercive pressures play a major and positive role in promoting the practices and uses of BI through the support of these practices by government agencies and the development of procedures, laws, and regulations that ensure the application of these uses (Al-omoush, 2022), as this result was consistent with a group of results in previous literature (Chaubey & Sahoo, 2021;

Bennich, 2024; Singh & Joshi, 2024), which emphasizes the importance of coercive pressures in promoting the adoption of new technology.

Mimetic pressures also had a positive role in enhancing the level of BI uses, as the results of the current study emphasized the importance of the strategy of imitation and work on imitating leading companies to reduce risk pressures (Singh & Joshi, 2024; Taranu & Cioranu, 2024) and this leads to increased support for senior management to use BI technology. Also, companies realize the importance of BI technology when competitors adopt such applications, which prompts companies to increase the adoption of these practices in a positive way. Furthermore, the results revealed that normative pressures play an important and positive role in enhancing BI. This result was consistent with previous studies (Bharathi et al., 2024; Farayola, 2024), which emphasized the organizations' attitudes to monitor the performance of partners and competitors and benchmarking to avoid exclusion or criticism (Chen & Lin, 2021; Alsaad et al., 2022).

The findings suggested that the application of BI tools had a beneficial impact on competitiveness. This is because BI technology has the potential to enhance the capabilities of firms in the organizational environment, allowing them to achieve higher levels of performance relative to their competitors (Kazemi & Soltani, 2024; Tanev, 2024). This phenomenon was also reported in other publications, like the study (Botos et al., 2018). Earlier studies indicated that the use of integrated BI and competitive intelligence analytics systems enables firms to grasp comprehensively the internal and external determinants of their activities and standing in the market and the industry. (Ahmed, 2021; Ranjan & Foropon, 2021). Other research findings also substantiated the positive influence of BI usage on the competitive agility of a firm. This result is consistent with prior studies that validated the importance of BI analytics tools in gathering and analyzing vast amounts of information to identify patterns and trends useful for supporting business decisions (Al-Omoush & Alghusin, 2024). This also corroborates studies on the usability of competitive data through visualization for effective interpretation and application (Ranjan, J., & Foropon, 2021; Alsaad et al., 2022).

7 Implications

This study has both practical and theoretical importance that is unmatched. Understanding the role of institutional pressures, such as coercive, mimetic, and normative, as they relate to BI usage helps to understand the role of these pressures in organizational behavior and decision-making globally. This study contributes to the artificial intelligence and BI literature by offering comprehensive insights into how the institutional context affects technology choices. Moreover, the research shows the need to analyze these pressures from the scope of not only institutional adaptation, but also strategic decision-making regarding data and information analysis. This forms a scientific justification for an explication of the effects of institutional pressures on the use of information technology and information intelligence in relations with organizations.

Studies examining the interplay between BI applications and competitive intelligence aid in analyzing how businesses monitor rivals and industry changes with the help of information intelligence. The information from this research indicates how several data sets can strategically be integrated and employed in an organization for its competitive edge. Competitive intelligence has the potential to direct business strategy in a way that mitigates the adverse effects of competition, allowing for greater analysis and interpretation of data. BI enables companies to analyze current and emerging markets, thus improving the ability for organizations to anticipate and respond to challenges from competitors.

Understanding BI use has been expanded through the examination of organizational constraints which assists in changing the methods of data collection and analysis. More active forms of BI enable proactive responses to strategic problems related to business operations, product innovation, and service delivery. The negative effects of the information are reduced and the positive effects are increased. The possibility of improving the use of BI increases organizational competitiveness and enables quicker and more accurate detection of new opportunities. Finally, the quality of information available to decision-makers improves, resulting in more informed decisions within the organization.

Researching the impact of BI in boosting competitive agility offers a better understanding of how organizations can swiftly respond to alterations in competition. Organizations are able to foresee trends and adapt their plans accordingly with the use of BI tools. Being able to respond swiftly to external obstacles greatly helps in increasing an organization's agility. Rapid response to competition and changes in the market improves the organization's competitive position as a result of optimally utilizing information intelligence. Moreover, it helps in making timely and precise decisions which assists the organization remain in a fiercely competitive environment.

8 Conclusion

BI technology plays a critical role in digital transformation through the development of methods, systems, and tools that have enabled the collection, storage, and analysis of this vast quantity of data. Even though researchers have become more interested in analyzing the BI uses in different contexts, there still remains a gap in research. Therefore, this study was conducted to determine how institutional pressure affects BI usage. In addition, it aimed to assess the effect of BI dependencies on competitive intelligence and competitive agility. The findings underscored institutional pressures, which are coercive, mimetic, and normative, have a positive influence on BI adoption. They also showed that BI adoption positively influences competitive agility and competitive intelligence.

The study of the effects of institutional pressures (coercive, mimetic, normative) on the implementation of BI helps in understanding the impact of such factors on an organization's behavior and decision processes. It also shows the scope of the relationship between business intelligence and competitive intelligence, as intelligence information aids in enhancing the capacity of firms to monitor competitors and make strategic decisions. Practically, BI empowers organizations to monitor the organization's performance in terms of strategy decision-making and risk management, which enhances performance. Furthermore, BI enables firms' agile competition because they can easily respond to changes in the business environment, which enables them to sustain their competitive edge in a fast-changing and challenging market.

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