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The Impact of Business Intelligence on Strategic Entrepreneurship: The Mediating Role of Organizational Agility

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ABSTRACT

The purpose of the study is to examine the impact of Business Intelligence (BI) on Strategic Entrepreneurship (SE) with the existence of Organizational Agility (OA) in Jordanian entrepreneurial companies. The researchers used the quantitative method, as it has an empirical nature. The questionnaire was adopted as a data collection tool. In total, 209 questionnaires were disturbed electronically among 16 entrepreneurial companies operating in King Hussein Business Park (KHBS) in Amman, Jordan. The analyzed results showed a high positive impact of BI on SE, which is seen evident in the results where BI dimensions (data warehousing, data mining, and On-Line Analytic Processing (OLAP)), have a statistically significant impact on SE and its dimensions (entrepreneurial mindset, applying creativity and developing innovation, opportunities identification, and acceptance of risk). Additionally, OA depicted a partial mediation between BI and SE. Furthermore, all main and sub hypotheses were significant and accepted, since the p-value of each analysis is <0.05. Finally, the researchers recommend applying BI in entrepreneurial companies that do not adopt it, and it should be given a high priority as it has been proven that BI increases the chances of identifying opportunities, accepting risks, and, moreover, developing innovative projects.

Keywords: Business Intelligence, Strategic Entrepreneurship, Organizational Agility, Entrepreneurial Companies
JEL Classifications: L26, M15

1. INTRODUCTION

Responding to the global challenges of rapidly changing markets is a necessary requirement for organizations' permanence, while developing innovative products and services is one of the most important ways to keep the permanence especially under dynamic environments.

Innovative and creative organizations ensure their survival and success, which leads to have the entrepreneurship. On achieving entrepreneurship organizations must identify opportunities, and respond rapidly toward them, they need to own the way to plan in entrepreneurial way, which leads to have the strategic entrepreneurship.

On the other hand, BI today has a significant role in enhancing organizations' business operations and making decisions. BI tools make it easy to complete functions, tasks, and communications between employees themselves, and different units in organization. BI helps in understanding customers' demands and managing the relation between customers and organizations that can control changes (Isik et al., 2013). It gives organizations the ability to run queries and conclude important data to make better decisions. This meaning is harmonious with OA.

Organizational agility provides the ability for organizations to detect opportunities and risks faster than competitors. That will allow them to react before others in seizing opportunities or

avoiding risks. OA makes organizations make decisions rapid and be flexible in acting.

As a result, there are three worthy topics to be discussed and studied the relationships between them to know their roles in helping organizations to keep their competitive advantage, and to maintain their positions in the market. So, does implementing BI help organizations in accomplishing SE? Can the advantage of applying agility in organizations help BI increase the chance of SE achievement?

Therefore, this paper examines the impact of BI on SE through OA in entrepreneurial companies in Jordan, to put forward relevant recommendations on how to improve the competitive advantage of organizations and maintain their permanence through information technology and agility. The importance of this study comes from that the relationship between BI and OA and their impact on SE has not been discussed yet in Arabic environments.

The rest of this paper is organized as follows: Section 2 provides the research framework and hypotheses development of the study. Section 3 discusses the theoretical background and literature review. Then, Section 4 describes the research method and measure tools, Section 5 lays out a discussion of the results. Finally, Section 6 provides the conclusion, with Limitations and future works.

2. RESEARCH FRAMEWORK AND HYPOTHESES

The research framework has been designed with the following variables: SE is considered as a dependent variable, BI is considered as an independent variable, and OA is considered as a mediating variable. This framework will help to understand how does BI impact SE and how does OA will add or modify the impact on SE while other factors remain the same. The following main and sub-hypotheses are formulated:

$H_0$1: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI with its dimensions on SE.

The following sub-hypotheses are derived from the first main hypothesis:

$H_0$1-1: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI on Entrepreneurial Mindset.

$H_0$1-2: There is no statistically significant impact at level ($\alpha \leq 0.05$) of on Applying Creativity and Developing Innovation.

$H_0$1-3: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI on Opportunities Identification

$H_0$1-4: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI on Acceptance of Risk.

While the rest main hypotheses are:

$H_0$2: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI with its dimensions on OA.

$H_0$3: There is no statistically significant impact at level ($\alpha \leq 0.05$) of OA on SE.

$H_0$4: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI with its dimensions on SE with the presence of OA as a mediating variable.

Based on the review of related works, the research framework can be represented in the current study as shown in Figure 1.

3. THEORETICAL BACKGROUND AND LITERATURE REVIEW

3.1. Strategic Entrepreneurship (SE)

Researchers' interest is nowadays increasing in approaches that make organizations agile, flexible, and entrepreneurial; as a requirement for the present dynamic environments. One of these approaches is SE. SE is a new field that is consolidated from the concepts of entrepreneurship and strategy, and it is based on the integration of entrepreneurship and strategic management (Genç, 2012). Entrepreneurship and strategic management create wealth when they are consolidated in a proper way.

Entrepreneurship refers to actions that create new ideas, develop innovative projects, identify opportunities, and accept risks. Entrepreneurship is defined as: "the process of creating value by pulling together a unique package of resources to exploit an opportunity" (Stevenson et al., 1985, 16). By Entrepreneurship, organizations can introduce new services or products, open new markets, and develop existing projects, as a result, add value and sustain competitive advantage.

Hitt et al. (2001) examined the relationship between entrepreneurship and strategy in detail. They associated entrepreneurship with creating new products, and strategic management with developing competitive advantage through those created products. And so, there is a need for the integration of entrepreneurial and strategic thinking. Morris et al. (2008) mentioned that SE combines the attributes of the entrepreneurial perspective and the strategic perspective, where the entrepreneurial perspective seeks opportunity, and the strategic perspective seeks advantage. SE interests in exploiting the innovations that result from the organizations' efforts in exploring opportunities (Ireland and Webb, 2007). SE emphasizes the importance of managing sources strategically in order to get the competition's advantages (Tantau, 2008).

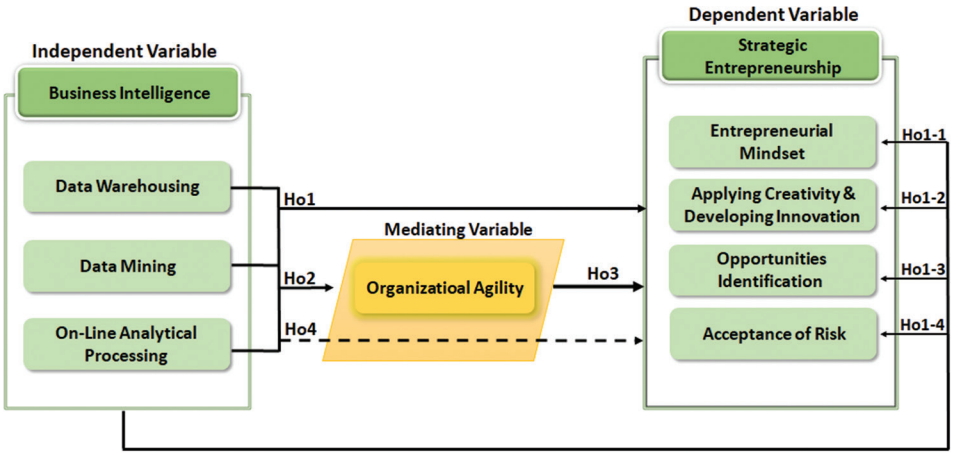
The researchers adopted four strategic entrepreneurship dimensions to examine the impact of the independent and mediating variables on SE which is the dependent variable and the core of the study. These dimensions are entrepreneurial mindset, applying creativity and developing innovation, opportunities identification, and acceptance of risk.

3.2. Business Intelligence (BI)

Business intelligence is one of the new business concepts used to express using technological tools to deal with data in business organizations. It is main task is to make sense of data. Isik et al. (2011) in their research provided a definition of BI, where they defined BI as a mix of business and technical tools that read historical data or raw materials from different sources and then transform it into clear information that helps managers to make decisions.

BI uses tools, applications, and techniques such as data warehousing, data mining, OLAP, and knowledge management to

Figure 1: Proposed research framework and hypotheses



provide an efficient way in dealing with business data by analyzing it and enhancing the execution of day-to-day operations and increase organizational awareness (Elbashir et al., 2008). Chang (2014) defined BI as a set of methods, processes, architectures, and technologies that have the ability to analyze, process, and transform data into clear and meaningful information to use in business activities. Ranjan (2008) mentioned additional technologies of BI such as reporting, ad hoc querying, and visualizing the data.

Petrini and Pozzebon (2009) proposed managerial and technical approaches to BI. The managerial approach considers BI as a process where data is collected and integrated, while the technical approach considers BI as tools used to execute the process of collecting and analyzing data, so it focuses on technologies, algorithms, and tools which provide the ability to collect, analyze, store, and explore data and information.

The large amounts of data (for example orders, customers, and financial information) that had been collected and analyzed by BI tools will help the organization to understand customers' behavior, suppliers, stakeholders, materials, orders, processes, and the total business conditions better. And as a result, BI enables the organization to choose the best action for their business enhancement (Balint and Toma, 2015).

In this paper, the researchers adopted technical dimensions of BI to specifically know the impact of technological tools of BI on the research variables, these dimensions are: data warehousing, data mining, and OLAP.

3.3. Organizational Agility (OA)

Agility is considered one of the important factors for organizations to achieve success, especially in dynamic environments with rapid changes. (Vagnoni and Khoddami, 2016).Organizational agility allows organizations to respond quickly to threats, explore opportunities before competitors, react flexibly to changes, and develop innovative products and services to result in superior organizational performance (Cegarra-Navarro et al., 2016).

Organizations must own Adaptability, which means the ability to learn quickly and having Flexibility in operations implementation and taking decisions. OA is a very important source of competitive strategy, to have a competitive advantage and sustain it as it enables the organization to react effectively to unpredictable changes. (Liuand Yang, 2019).

The researchers concluded that one of the most critical factors of OA is the ability to sense, respond, and act quickly. Nowadays, modern technologies provide this flexibility by applying BI tools in organizations. According to Negash (2004) research, business intelligence is the process of collecting, managing, and analyzing relevant data of an organization's business in combination with modern digital technologies and information technology. Its purpose is to help organizations improve competitiveness by making better decisions faster and easier. This leads to look for the impact of BI with the existence of OA on organization performance. That is, BI helps organizations to have sensing agility and acting agility in a sense that it helps in exploring opportunities and threats, and detecting strengths and weaknesses.

The researchers determined four dimensions for OA, these dimensions have been used mostly in previous research and proved their importance, these are sensing agility, responsiveness agility, acting agility, and workforce agility.

3.4. Literature Review

In recent years, there has been an increasing interest from researchers in studying SE and discovering its effects on organizations, and focusing on managerial attitudes that help in adopting SE in organizations which indeed increase the chance to create value and maximize wealth and sustain the organization's success in competitive environments. Lyver and Lu (2018) in their study attempted to examine the effects of IT capabilities on Product Innovation Performance with the existence of SE as a mediating variable. The study was conducted in small and medium size IT firms in Canada, and the results emphasized that IT capabilities boost Product Innovation Performance and thus create level value to the firm. Furthermore, the results showed that SE had a direct impact on Product Innovation Performance, and SE partially mediates IT capabilities effect on Product Innovation Performance.

One of the recent studies in SE, Omoshagba et al. (2021), examined the impact of strategic entrepreneurship on the performance of Nigerian banks. It showed that SE with its dimensions play a vital role in organizational performance. In addition, it emphasized that strategic renewal independently impacts organizational performance too. But sustained regeneration has the opposite impact on the performance.

Different authors have aimed to show the impact of BI on organizational performance, as it considered being one of the most effective factors today in the recent enormous growth in organizations and their processes. A study of Olszak (2014) aimed to discuss the dynamic capability of BI and to design a framework for BI. The survey showed that BI is considered as a tool, which used to gather and analyze data and it is not considered to be to be the only main factor in making decisions in organizations. The study showed also that BI improves organizational performance and helps in creating new ideas and establishing innovative business procedures for business operations.

Shanmugam et al. (2020) in their research aimed to find the impact of BI on business performance. They concluded that BI has a statistically significant impact on the business performance of the food delivery platform which is seen evident in the results by a survey used to collect data. The results showed that Strategic planning, Organizational Support, Knowledge management, Technological innovation are statistically significant for the business performance of the food delivery platform.

Many other researchers focus on OA and its relationship with BI and their impact on enhancing organizations' performance and achieving competitive advantage. Kuilboer et al. (2016) concluded that BI has a high potential to be one of the reasons for achieving organizational agility. BI provides real-time information that gives the organization the ability to react rapidly and to have more flexibility in analysis capabilities. They showed that BI can enhance responsiveness as it offers organizations many tools that help in anticipating changes and suggesting decisions based on analytic capabilities. They emphasized that an organization's structure needs to allow data-driven decision making, and so, the results extracted from BI system can have an action and make a difference.

GhalichKhani and Hakkak (2016) in their study aimed to examine the impact of business intelligence on organizational agility with the mediating role of Empowerment. 102 questionnaires have been distributed among managers in Tehran Construction Engineering Organization (TCEO) and ETKA Organization Industries co. which are analyzed and proved the hypothesis that there is positive impact of BI on OA through Empowerment.

Park et al. (2017) aimed to find the role of BI to achieve OA in different organizations; they provided a configurational analytic framework to examine the impact of IT on agility, and to explore how it is embedded in the organizational elements. They showed in detail how managers have various options of multiple configurations to choose from and to have their own configuration suitable to their contextual condition, to achieve high agility and reduce the probability of failure. At the same time, the results showed that organizations can use a few configurations to achieve high agility, and the effectiveness of each one is different from the others. In conclusion, managers can choose from a limited set of options which can reduce cognitive overload on them. The researchers emphasized that IT alone is not sufficient to produce OA but it is a vital element of the systemic configuration, where IT and organizational and environmental elements can together produce agility.

As concluded from previous studies, BI has a vital role in achieving OA and has its benefits of having flexible and wise responding to environment's rapid changes and competitors' actions. The added value of this research is to find the impact of BI with the existence of OA as a mediating variable on SE, as BI and OA -both of them- have their positive influences on organizations' performance, and SE is one of the newest managerial topics that has its importance in adding competitive advantage and reaching strategic sovereignty, which reflects on the overall organization's performance.

4. RESEARCH METHOD

4.1. Study Population and Sample

The study employed a questionnaire designed to examine the impact of BI on SE through OA of selected entrepreneurial companies in King Hussein Business Park KHBP in Jordan. The researchers adopted to choose these entrepreneurial companies based on their shared vision that is to be smart and innovative business companies in the region, and their interest in the entrepreneurial values; these values represent opportunities, taking risks, innovation, sharing knowledge, collaboration, dynamism, competition, and Integration.

The target population comprised of the top-level managers such as the board of directors, CEO, COO, CTO, and CFO, as well as middle/business level managers, directors, supervisors; and data analysts and employees that are responsible of data retrieval and making decisions within the selected companies who were believed to have required knowledge and experience on both company strategy, and business processes of the company, and able to provide accurate answers about the questionnaire items belonging to the main and sub variables of the study. A simple random sample and stratified proportionate sampling method was adopted for respondents' selection to ensure bias elimination (Bordens and Abbot, 2002). In addition, the Simple random sampling method increases sampling precision in that it gives each sampling unit an equal chance to be selected (Kumar, 2005).

The study population consists of (16) entrepreneurial companies located in Amman in KHBP, with a size equal to (455) managers/ data analysts working in top-level, business level, and data analysts, while the study sample as mentioned above is a stratified proportionate random sample consisting of (209) respondents according to (Sekaran and Bougie, 2010. p. 295).

4.2. Data Collection and Study Tool

The study adopts primary sources to collect the required data. The primary source of data collection is more accurate because it

provides the researcher the chance to gain a better understanding of behaviors, and present cases. The adopted primary source tool is an electronic questionnaire, created and designed using the Google Forms service.

The questionnaire was developed by the researchers carefully to find the effect of the most significant dimensions of each variable. The questionnaire comprises (41) questions, and divided into (4) sections as follows:

- Section 1: Demographic profile consists of 5 questions, are shown in Table 1.
- Section 2: Consists of items that measure the independent variable (BI) through 3 dimensions which are: data warehousing, data mining, and On-Line Analytic Processing.
- Section 3: Consists of items that measure the dependent variable (SE) through 4 dimensions: entrepreneurial mindset, applying innovation and developing creativity, opportunities identification, and acceptance of risk.
- Section 4: Consists of items that measure the mediating variable (OA) through 8 items cover 4 embedded dimensions which are: sensing agility, acting agility, decision making agility, and workforce agility.

Each dimension of independent and dependent variables has four-item scale. All items were assessed on five-point Likert scales ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The statistical sample showed that 62.68% of the respondents were males and 37.32% were females. 35.89% is the highest percentage of age which is in the range of 30-<40. In terms of educational level, 5.74% had a doctorate degree, 32.06% had a master's degree, 55.02% had B.A. which is the highest percentage, and 7.18% had a diploma. 44.98% is the highest percentage of years of experience which is in the range of 6-<11 and that is expected based on knowing that most of these companies are recent entrepreneurial companies in the region. And finally, 55.02% is the highest percentage of job positions which is the respondents work as data analysts or dealing with data entry in general.

Table 1: Demographic Characteristics of the Sample (n = 209)

No.	Demographic Profile	Frequency	Percentage
1.	Gender		
	Male	131	62.68
	Female	78	37.32
	Total	209	100
2.	Age		
	<30	57	27.27
	30-<40	75	35.89
	40-<50	53	25.36
	50 or more	24	11.48
	Total	209	100
3.	Educational level		
	Diploma	15	7.18
	B.A	115	55.02
	Master	67	32.06
	PhD	12	5.74
	Total	209	100
4.	Years of experience		
	<6	30	14.35
	6-<11	94	44.98
	11-<16	52	24.88
	16 or more	33	15.79
	Total	209	100
5.	Job position		
	Top level Management	32	15.31
	Middle level Management	62	29.67
	IT Department	115	55.02
	Total	209	100

4.3. Measures

Table 2 showed that the overall Cronbach's alpha coefficient for the questionnaire is 0.986, which is an indicator of internal consistency between the questionnaire's items, and the questionnaire itself is highly reliable, where Cronbach's α value should be above 0.70 (Bhattacherjee and Park, 2014).

Table 3 showed that all dimensions have correlation coefficients above 0.90. The values for all dimensions ranged between (0.913 and 0.967). And so, the variables' dimensions were all of reasonable satisfactory correlation.

The correlation matrix statistical method was used to analyze the significant relationships among variables by using the spearman matrix of correlation; the results are demonstrated in Table 4.

Table 2: Reliability Coefficients/Cronbach's Alpha

Variable	No. of Items	Measured Cronbach's Alpha	Approval
BI	12	0.971	Approved
Data warehousing	4	0.957	Approved
Data mining	4	0.960	Approved
OLAP	4	0.898	Approved
SE	16	0.972	Approved
Entrepreneurial mindset	4	0.919	Approved
Innovation and creativity	4	0937	Approved
Opportunities identification	4	0.917	Approved
Acceptance of risk	4	0.906	Approved
OA	8	0.940	Approved
The whole questionnaire items	36	0.986	Approved

Table 3: Correlation Coefficients for Each Dimension with Its Variable

Dimension	Variable	Correlation coefficient	p-value
Data warehousing	BI	0.967**	0.00
Data mining		0.954**	0.00
OLAP		0.913**	0.00
Entrepreneurial mindset	SE	0.950**	0.00
Innovation and creativity		0.931**	0.00
Opportunities identification		0.933**	0.00
Acceptance of risk		0.920**	0.00

**Correlation is significant at the 0.01 level (2-tailed)

Table 4: Correlation matrix

Item	SE	BI	OA
SE	1.000	0.889**	0.879**
BI	0.889**	1.000	0.848**
OA	0.879**	0.848**	1.000

**Correlation is significant at the 0.01 level (2-tailed)

It is shown in Table 4 that the value for every correlation relationship ranged between (0.848 and 0.889); these values are < 0.9 and acceptable. In a study by Chang et al. (2020), correlation coefficients should be greater than 0.7, particularly for regression analysis. This means that there is a statistically significant relationship between each pair of variables, with a alpha value < 0.05. It is concluded that there are strong positive relationships between study variables.

To check any signs of multicollinearity problems among the independent variable's dimensions, Variance Inflation Factor (VIF) and Tolerance were analyzed as shown in Table 5, and as shown all VIF values are <10 and tolerance values are greater than 0.1 (Lindner et al., 2019), which indicate that these dimensions are free of multicollinearity problem.

Table 6 presents the descriptive indicators of study variables and their dimensions/sub-variables, including the mean, standard deviation, and variance.

5. DISCUSSION

Based on previous results of measurements, it is emphasized that the data is fit and appropriate for analysis, so they can be used to test the study hypotheses. For that purpose, the data were transformed into numeric form and analyzed using appropriate statistical methods by SPSS Software.

- The first main hypothesis:

$H_0$1: There is no statistically significant impact at level ($\alpha \leq 0.05$) of BI with its dimensions (Data Warehousing, Data Mining, and OLAP) on SE.

To test this hypothesis, the standard multiple regression analysis is used to investigate the impact of BI dimensions on SE, as shown in Table 7.

The test using alpha=0.05, the overall regression model was significant:

Table 5: Multicollinearity results

Variable	Collinearity Statistics	
	Tolerance	VIF
Data Warehousing	0.152	6.577
Data Mining	0.187	5.350
OLAP	0.299	3.339

Table 6: Descriptive statistics

Variable	Mean	Standard deviation	Variance
BI	2.31	1.06	1.12
Data warehousing	2.36	1.19	1.42
Data mining	2.50	1.21	1.46
OLAP	2.06	0.95	0.92
SE	2.21	0.94	0.89
Entrepreneurial mindset	2.22	0.98	0.96
Innovation and creativity	1.94	0.98	0.96
Opportunities identification	2.27	1.04	1.09
Acceptance of risk	2.42	1.04	1.09
OA	2.27	0.91	0.83

$F(3, 205) = 599.393$, $p < 0.01$, $R^2 = 0.896$.

F value must be greater than (2.6049) based on F Table for alpha=0.05, so it is accepted.

For the first dimension (Data Warehousing), it is shown by Table 7 the following values of coefficients (B = 0.286, T = 4.996, sig = 0.000), for the second dimension (Data Mining) the values are: (B = 0.269, T = 5.196, sig = 0.000), and for the third dimension (OLAP) the values are: (B = 0.449, T = 10.996, sig = 0.000). T-coefficients above + 1.96 are significant at the 0.05 level.

The adjusted $R^2 = 0.896$ indicates that BI sub variables explained 89.6% of SE in Jordanian Entrepreneurial Companies which is a high percentage value. Finally, p-value (0.000) is < alpha level (0.05), and the results revealed that the all sub-variables (Data Warehousing, Data Mining, and OLAP) have significant impact on SE.

This further rejects the Null hypothesis and supports the first alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI with its dimensions (Data Warehousing, Data Mining, and OLAP) on SE.

- The sub-hypotheses $H_0$1-1, $H_0$1-2, $H_0$1-3, $H_0$1-4:

To test these hypotheses, the simple linear regression analysis is used to investigate the impact of BI on each dimension of SE, as shown in Table 8.

5.1. The First Sub Hypothesis $H_0$1-1

The test using alpha=0.05, the overall regression model was significant: $F(1, 207) = 852.622$, $P < 0.01$, $R^2 = 0.804$

F value must be greater than (3.8415) based on F Table for alpha = 0.05, so it is accepted. It is shown by Table 8 the following values of coefficients (B = 0.897, T = 29.20, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted $R^2 = 0.804$ indicates that BI explained 80.4% of entrepreneurial mindset in Jordanian Entrepreneurial Companies which is a high percent value. Finally, P-value (0.000) is less than alpha level (0.05), and the results revealed that BI has significant impact on entrepreneurial mindset.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on entrepreneurial mindset.

5.2. The Second Sub Hypothesis $H_0$1-2

The test using alpha = 0.05, the overall regress ion model was significant: $F(1, 207) = 594.638$, $P < 0.01$, $R^2 = 0.741$, so it is accepted. It is shown by Table 8 the following values of coefficients (B = 0.861, T = 24.385, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted $R^2 = 0.741$ indicates that BI explained 74.1% of creativity and innovation in Jordanian Entrepreneurial Companies which is a high percent value. Finally, P-value (0.000) is less than alpha level (0.05), and the results revealed that BI has significant impact on creativity and innovation.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on Applying Creativity and Developing Innovation.

5.3. The Third Sub Hypothesis $H_0$1-3

The test using alpha = 0.05, the overall regression model was significant: F(1, 207) = 679.254, P < 0.01, R^2= 0.765, so it is accepted. It is shown by Table 8 the following values of coefficients (B = 0.875, T = 26.062, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted R^2 = 0.765 indicates that BI explained 76.5% of Opportunities Identification in Jordanian Entrepreneurial Companies which is a high percent value. Finally, P-value (0.000) is < alpha level (0.05), and the results revealed that BI has significant impact on Opportunities Identification.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on Opportunities Identification.

5.4. The Fourth Sub Hypothesis $H_0$1-4

The test using alpha = 0.05, the overall regression model was significant: F(1, 207) = 754.511, P < 0.01, R^2 = 0.784, so it is accepted. It is shown by Table 8 the following values of coefficients (B = 0.886, T = 27.468, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted R^2 = 0.784 indicates that BI explained 78.4% of Acceptance of Risk in Jordanian Entrepreneurial Companies which is a high percent value. Finally, P-value (0.000) is < alpha level (0.05), and the results revealed that BI has significant impact on Acceptance of Risk.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on Acceptance of Risk.

5.5. The Second and Third Main Hypotheses $H_0$2, $H_0$3

To test these hypotheses, the simple linear regression analysis is used to investigate the impact of BI on mediating variable (OA) and impact of OA on dependent variable (SE) respectively, as shown in Table 9.

5.6. The Second Hypothesis $H_0$2

The test using alpha = 0.05, the overall regression model was significant: F(1, 207) = 552.883, P < 0.01, R^2= 0.726, so it is accepted. It is shown by Table 9 the following values of coefficients (B = 0.853, T = 23.513, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted R^2 = 0.726 indicates that BI explained 72.6% of OA in Jordanian Entrepreneurial Companies which is a high percent value. Finally, p-value (0.000) is less than alpha level (0.05), and the results revealed that BI has significant impact on OA.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on OA.

5.7. The Third Hypothesis $H_0$3

The test using alpha = 0.05, the overall regression model was significant: F(1, 207) = 702.369, P < 0.01, R^2 = 0.771, so it is accepted. It is shown by Table 9 the following values of coefficients (B = 0.879, T = 26.502, sig = 0.000). T-coefficients above +1.96 are significant at the 0.05 level. The adjusted R^2 = 0.771 indicates that OA explained 77.1% of SE in Jordanian Entrepreneurial Companies which is a high percent value. Finally, p-value (0.000) is less than alpha level (0.05), and the results revealed that OA has significant impact on SE.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of OA on SE.

5.8. The Fourth Hypothesis $H_0$4

According to baron and Kenny model (1986) there are three initial conditions to examine the impact of the mediating variable on the relationship between dependent and independent variables, and

Table 7: Standard multiple regression analysis for the first main hypothesis

Dependent variable	Adjusted R^2	ANOVA			Coefficients			Independent sub-variables
		F calculated	DF	P-value	B-Coefficient	T-Ratio	Sig.	
SE	0.896	599.393	3	0.000	0.286	4.996	0.000	Warehousing
					0.269	5.196	0.000	Data Mining
					0.449	10.996	0.000	OLAP

Table 8: Simple linear regression analysis for the sub hypotheses

Dependent variable	Independent variable	Adjusted R^2	ANOVA			Coefficients			Hypothesis
			F calculated	DF	P-value	B-Coefficient	T-Ratio	Sig.	
Entrepreneurial Mindset	**BI**	0.804	852.622	1	0.000	0.897	29.20	0.000	$H_0$1-1
Creativity and Innovation		0.741	594.638	1	0.000	0.861	24.385	0.000	$H_0$1-2
Opportunities Identification		0.765	679.254	1	0.000	0.875	26.062	0.000	$H_0$1-3
Acceptance of Risk		0.784	754.511	1	0.000	0.886	27.468	0.000	$H_0$1-4

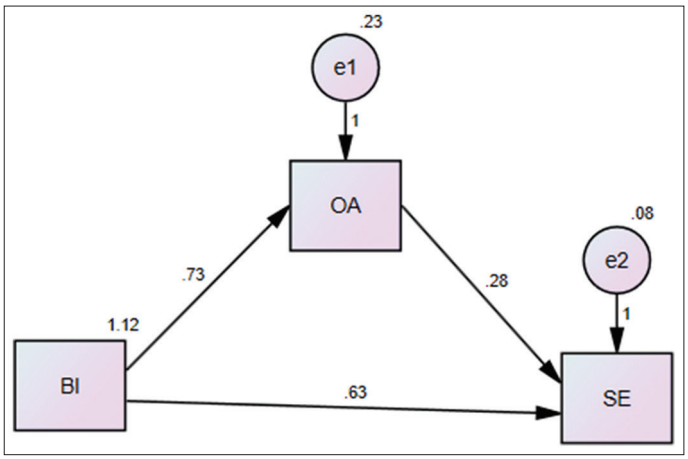
Table 9: Simple linear regression analysis for H02, H03 hypotheses

Dependent variable	Predictor	Adjusted R^2	ANOVA			Coefficients			hypothesis
			F calculated	DF	P-value	B-coefficient	T-Ratio	Sig.	
OA	BI	0.726	552.883	1	0.000	0.853	23.513	0.000	$H_0$2
SE	OA	0.771	702.369	1	0.000	0.879	26.502	0.000	$H_0$3

Table 10: Path analysis results of hypothesis H04

Variables			Estimate	S.E.	C.R.	p-value	Direct Effects	Indirect Effects	Total Effects
OA	<---	BI	0.732	0.031	23.570	***	0.732	-	0.732
SE	<---	OA	0.285	0.042	6.851	***	0.285	-	0.285
SE	<---	BI	0.632	0.036	17.720	***	0.632	0.209	0.841

Figure 2: Path analysis taken from AMOS



these conditions were met as illustrated above and it is accepted to examine the mediating effect. The next step is done through path analysis by AMOS Software which is embedded in SPSS, the results are shown in Table 10 and Figure 2.

The effect of BI on SE through OA (B value) is (0.632) which is nearer to zero and less than the direct effect of BI on SE (B = 0.841), this showed that OA plays a positive and significant mediating role between BI and SE and has a direct impact on SE. In addition, it is shown that this value is significant at the 0.001 level, and as a result, the mediation role of OA is partial mediation with a 28.5% added effect to BI on SE.

This further rejects the Null hypothesis and supports the alternate hypothesis: There is a statistically significant impact at level ($\alpha \leq 0.05$) of BI on SE with the presence of OA as a mediating variable.

6. CONCLUSIONS, AND LIMITATIONS AND FUTURE WORKS

6.1. Conclusions

The present study empirically investigates the impact of BI on SE in the presence of OA as a mediating variable in entrepreneurial companies in KHBP in Jordan. It is the first study - according to the researchers' knowledge - that is conducted in these start-up entrepreneurial companies, especially, examining recent managerial concepts such as entrepreneurship and its relationship to BI.

The study adopted the questionnaire as a study tool. The results of all hypotheses were accepted. It has been proven that SE is an important antecedent for improved organizational performance. This study emphasizes the role of agility in quickly responding to dynamic business environments, and flexible acting or making decisions towards actions by competitors and its role in the effect of BI on achieving SE to help in enhancing performance, maximizing wealth, and sustaining the competitive advantage of the company.

The findings validate that SE can be achieved confidently in companies that rely on BI tools in their operations. In contrast, companies that don't implement BI proved to have less SE than those implement BI. Similarly, OA significantly increases the chance to have SE while adopting BI with a partial mediation role.

The researchers recommend adopting BI tools and increasing interest in implementing OA in organizations, especially with the present rapid and continuous development of digital technologies. The organization's swiftness to adapt to market change is critically required. The researchers hope that the outcomes of this study add some contribution to the literature and provide a basis for future studies.

6.2. Limitations and Future Works

The limitations of this study are represented in the following points: lack of understanding of the purpose of BI and its tools for some employees so it might reflect inaccurate data about the use of BI in their companies. Some large companies have a reluctance to talk about their experiences in applying BI tools or other study variables in their units which may be reflected in data incompleteness or retrieving wrong data.

Future work can add benefits by increasing the number of managers to be surveyed which will be reflected in more accurate data. Also, by increasing the number of companies in the study sample with those companies located out of KHBP. In addition, it will be an added advantage to make a comparison of the results of such a study with results of similar studies examining the same variables in different regions and countries.

REFERENCES

Balint, A., Toma, M. (2015), How does business intelligence solutions can streamline and influence transport network. Procedia Economic and Finance, 20(5), 59-64.

Baron, R.M., Kenny, D.A. (1986), The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51(6), 1173-1182.

Bhattacherjee, A., Park, S.C. (2014), Why end-users move to the cloud: A migration theoretic analysis. European Journal of Information Systems, 23(3), 357-372.

Bordens, K.S., Abbot, B.B. (2002), Research Design and Methods: A Process Approach. 5th ed. New York: McGraw-Hill.

Cegarra-Navarro, J.G., Soto-Acosta, P.Y., Wensley, A.K. (2016), Structured knowledge processes and firm performance: The role

of organizational agility. Journal of Business Research, 69(5), 1544-1549.
Chang, V. (2014), The business intelligence as a service in the cloud. Future Generation Computer Systems, 41, 512-534.
Chang, Y., Kim, J., Oh, D., Choi, S. (2020), Data for: Factors associated with partitioning behavior of persistent organic pollutants in a feto-maternal system: A multiple linear regression approach. Mendeley Data, 1, 128-247.
Chin, W.W., Marcolin, B.L., Newsted, P.N. (2003), A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. Information Systems Research, 14(2), 189-217.
Elbashir, M., Collier, P., Davern, M. (2008), Measuring the effect of business intelligence system: The relationship between business process and organizational performance. International Journal of Accounting Information Systems, 9(3), 135-153.
Fornell, C., Larcker, D.F. (1981), Structural equation model with unobservable variables and measurement error: Algebra and statistics. Journal of Marketing Research, 18(3), 382-389.
Genç, K.Y. (2012), The response of the entrepreneurship to the changing business environment: Strategic entrepreneurship. International Journal of Economics and Administrative Studies, 5(9), 71-84.
GhalichKhani, R.D., Hakkak, M. (2016), A model for measuring the direct and indirect impact of business intelligence on organizational agility with partial mediatory role of empowerment (Case Study: Tehran Construction Engineering Organization (TCEO) and ETKA Organization Industries.co). Procedia Social and Behavioral Sciences, 230, 413-421.
Hitt, M.A., Ireland, R.D., Camp, S.M., Sexton, D.L. (2001), Guest editors' introduction to the special issue strategic entrepreneurship: Entrepreneurial strategies for wealth creation. Strategic Management Journal, 22(6/7), 479-491.
Ireland, D.R., Webb, J.W. (2007), Strategic entrepreneurship: Creating competitive advantage through streams of innovation. Business Horizons, 50(1), 49-59.
Isik, O., Jones, M., Sidorova, A. (2011), Business intelligence (BI) success and the role of BI capabilities. Intelligent Systems in Accounting, Finance and Management Journal, 18(4), 161-176.
Isik, O., Jones, M., Sidorova, A. (2013), Business Intelligence Success: The role of BI capabilities and decision environment. Information and Management, 50(1), 13-23.
Kraus, S., Samhoud, S. (2009), Strategic Corporate Entrepreneurship a Case Study on the Basis of the Configuration Approach. Utrecht.
Kuilboer, J., Ashrafi, N., Lee, O. (2016), Business Intelligence Capabilities as Facilitators to Achieve Organizational Agility. 22nd Americas Conference on Information Systems, San Diego, CA, United States. Available from: https://aisel.aisnet.org/amcis2016/ITAgil/Presentations/2
Kumar, R. (2005), Research Methodology: A Step-by-Step Guide for Beginners. Thousand Oaks, California: SAGE.
Lindner, T., Puck, J., Verbeke, A. (2019), Misconceptions about multicollinearity in international business research: Identification, consequences, and remedies. Journal of International Business Studies, 51(3), 283-298.
Liu, H.M., Yang, H.F. (2019), Network resource meet organizational agility: Creating an idiosyncratic competitive advantage for SMEs. Management Decision, 58(1), 58-75.
Lyver, M.J., Lu, T.J. (2018), Sustaining innovation performance in SMEs: Exploring the roles of strategic entrepreneurship and IT capabilities. Sustainability, 10(2), 1-27.
Morris, M.H., Kuratko, D.F., Covin, J.G. (2008), Corporate Entrepreneurship and Innovation. 2nd ed. Boston, MA: Thomson Higher Education.
Negash, S. (2004), Business Intelligence. Vol. 13. Communications of the Association for Information Systems. p177-195.
Olszak, M. (2014), Towards an Understanding Business Intelligence. A Dynamic Capability-Based Framework for Business Intelligence. Vol. 2. Federated Conference on Computer Science and Information Systems. p1103-1110.
Omoshagba, P.O., Adeyeye, M.M., Sajuyigbe, A.S. (2021), Strategic entrepreneurship and performance of Nigerian banks: A quantitative approach. International Entrepreneurship Review, 7(2), 21-30.
Park, Y., El Sawy, O., Fiss, P.C. (2017), The role of business intelligence and communication technologies in organizational agility: A configurational approach. Journal of the Association for Information Systems, 18(9), 648-686.
Petrini, M., Pozzebon, M. (2009), Managing sustainability with the support business intelligence: Integration socio environmental indicators and organizational context. The Journal of Strategic Information Systems, 18(4), 178-191.
Ranjan, J. (2008), Business justification with business intelligence. Vine, 38(4), 461-475.
Sekaran, U., Bougie, R. (2010), Research Methods for Business: A Skill-building Approach. 5th ed. New York: John Wiley and Sons.
Shanmugam, K., Jeganathan, K., Basheer, M.S., Firthows, M.A., Jayakody, A. (2020), Impact of business intelligence on business performance of food delivery platforms in Sri Lanka. Global Journal of Management and Business Research: G Interdisciplinary. 20(6), 39-51.
Stevenson, H.H., Gumpert, D.E. (1985), The Heart of Entrepreneurship. Harvard Business Review. p1-11.
Tantau, A.D. (2008), Common dimensions for entrepreneurship and strategy: The need for strategic entrepreneurship. Management and Marketing Journal, 3(1), 73-80.
Trkman, P., McCormack, K., Oliveira, M.P.V., Ladeira, M.B. (2010), The impact of business analytics on supply chain performance. Decision Support Systems, 49, 318-327.
Vagnoni, E., Khoddami, S. (2016), Designing competitivity activity model through the strategic agility approach in a turbulent environment. Foresight, 18(6), 625-648.