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Organizational Success Factors of Data Warehouse and Their Relationship with IS Strategy: A Case Study of Bank Al Etihad - Jordan

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Abstract

This study aimed to investigate organizational success factors of Data Warehouse and their relationship with IS strategy as applied to Bank Al Etihad – Jordan. The sample of the study comprised all IT officials at Bank Al Etihad and all the branch's managers. A questionnaire was developed based upon previous studies to measure the study variables. The study concluded that (IS Innovator) was the most perceived IS strategy among the sample of the study. The sample of the study perceived that senior management support is the most considered Data Warehouse organizational success factor. Moreover, the study demonstrated that there is a statistically significant relationship between DW organizational success factors and IS strategy of Bank Al Etihad-Jordan, as perceived by branch managers or IT employees of Bank Al Etihad-Jordan. The study recommended enhancing the senior management support for using and developing IT/IS and Business Intelligence solutions in addition to other recommendations.

Keywords: Organizational success factors, Data warehousing, Information strategy, Management information systems in Banking.

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عوامل النجاح التنظيمي لمستودعات البيانات وعلاقتها باستراتيجية نظم المعلومات: دراسة حالة لبنك الاتحاد – الأردن

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ملخص

هدفت هذه الدراسة إلى التحقيق في عوامل النجاح التنظيمي لمستودعات البيانات وعلاقتها باستراتيجية نظم المعلومات متخذة بنك الاتحاد – الأردن كحالة دراسية. تضمنت عينة الدراسة جميع مسؤولي تكنولوجيا المعلومات في بنك الاتحاد وجميع مديري الفروع. تم تطوير استبانة بناءً على دراسات سابقة لقياس متغيرات الدراسة. وخلصت الدراسة إلى أن استراتيجية نظم المعلومات الإبداعية (IS Innovator) كانت استراتيجية نظم المعلومات الأكثر إدراكًا بين عينة الدراسة. وتوصلت الدراسة إلى أفراد عينة الدراسة يعتقدون أن دعم الإدارة العليا هو عامل النجاح التنظيمي الأكثر اعتبارًا لمستودعات البيانات (DW). علاوة على ذلك، أوضحت الدراسة أن هناك علاقة ذات دلالة إحصائية بين عوامل النجاح التنظيمي لمستودعات البيانات واستراتيجية استراتيجية نظم المعلومات (IS) لبنك الاتحاد – الأردن، كما يراها مديرو الفروع أو مسؤولو تكنولوجيا المعلومات في بنك الاتحاد – الأردن. أوصت الدراسة بتعزيز دعم الإدارة العليا لاستخدام وتطوير تكنولوجيا المعلومات / نظم المعلومات وحلول ذكاء الأعمال بالإضافة إلى توصيات أخرى.

الكلمات الدالة: عوامل النجاح التنظيمي ، تخزين البيانات ، إستراتيجية المعلومات ، نظم المعلومات الإدارية في البنوك.

Introduction

Banking industry plays a vital role in any national economy by improving stability and increasing economic growth. Banks are a main element in well-developed financial markets. The banking sector including insurance and investment services in Jordan contribute 24.3% of GDP for the first quarter of the fiscal year 2019 (Jordanian Department of Statistics, 2019). Jordanian Banks will be able to drive economic growth forward as banks have huge data on (customer behaviors) if used correctly, given the availability of predictive analytics and data-driven marketing that will significantly contribute to more accurate financial decisions (Qumsieh, 2019). Due to globalization, competition and fluctuations in business environments all over the world and Jordan is no exception, banks tend to adopt more strategic implementation of Information Systems (IS) (Al-Nsour, AlShobaki, & Alizoubidi, 2019).

Banks utilized financial innovation and IS strategy to cope with the changes in demand conditions, to respond to changes in supply conditions, and to avoid regulations (Mishkin & Seretis, 2011). Banks work in increasingly high economic pressure environments, data is multiplying every day and technology is developing continuously to deal effectively with it. Studies have demonstrated that banks' IS investments will be most prolific when there is an integration between IS Strategy and business strategy (Ackermann, Yeung, & Bommel, 2007), (Ho & Mallick, 2010) and (Beccalli, 2007). Banks in the world spend 6% on technology, whereas banks in Jordan over the past five years and before 2017 have spent less than 1%. Many of Jordan's major banks are investing heavily in developing their digital platforms, a move aimed at supporting the country's efforts to enhance its competitiveness (Ackermann et al., 2007 and Qumsiyeh, 2019).

This investment in IT/IS implies building and implementing large Data Warehouses as it amalgamates and normalizes information from different operational databases so that the information can be used across the bank for dealing with complex huge banking data, to better identify customers' needs, evaluate performance and measure success and keep data quality and security (Laudon & Laudon, 2013). Although successful data warehouses have high rates of return with moderate payback, data warehouses are expensive and time consuming development and implementation projects

also having high failure rates (Elson, 2001). Henceforth, it is essential to investigate factors that influence the success of data warehousing and their relationship with the IS strategy of the bank.

In this study, the researchers pursue to investigate the organizational factors affecting the success of Data Warehousing and their relationship to the IS strategy as perceived by the workers in Bank al Etihad as a case study of Jordanian commercial banks.

The Problem of the Study and its questions

In order to operate efficiently, a bank should manage ICT driving banks' core business; customer relationships and risks and financial crises (Paech, 2019). From that point of view, banks are forced to redesign every aspect of its operations to achieve these goals as well; banks have become under pressure to reconsider banks' IS strategies. The banks are in challenge to create digital capability as well as to modernize legacy systems plus managing security, identity, and privacy with building the modern workplace by adopting cloud services (Miner, 2019).

Data warehousing (DW) in banking is essential to simplify and standardize the way they gather data, take care of the difficult data management (digesting large quantities of data and ensuring accuracy) and make it easier for you to focus on the analysis (Jordan, 2017). As well as, to access and consolidate real-time and historical data across various systems and provide it to anyone who needs to report on it, process the data and make sure it can be trusted, keep data securely locked up and still provide useful information to those who need to report on it.

It is indispensable for banks to utilize Data Warehousing to execute the required IS strategy to obtain competitive advantage so that different technologies and solutions are seamlessly meshed to create maximum value (Cooper, Watson, Haley , & Goodhue, 2000). Banks' efforts to impel their digital transformation face many challenges such as synchronizing adopted technologies with the existing systems and the pace of the transformation process as well as the type of the transformation process itself. Accordingly, these challenges may be summarized by sustaining competitive advantage; aligning it with business objectives, and managing strategic transition (Laudon & Laudon, 2013).

Paech (2019) discusses the need for building adequate levels of IT governance and technological expertise at the appropriate management level. This imposes the need to identify what do the branch managers

perceive about DW implementation, usage and maintenance and its relationship with the IS strategy of the bank. At the same level, IT workers need to have awareness about the IS strategy of the bank, since they are demanded to encourage and support managers in developing appropriate internal understanding, at appropriate levels, of the use of technology in financial services and the potential associated risks and opportunities. Moreover, it is logical to investigate whether there is a gap in the perceptions of these two groups as their role is very significant in the success of the bank IS strategy.

The problem of the study is embodied by the following questions:

1. What are the perceptions of branch managers and IT employees of Bank al Etihad - Jordan about the organizational factors that influence the success of the bank DW?
2. What are the estimations of branch managers and IT employees of Bank al Etihad - Jordan of the IS strategy of their bank?
3. How do DW organizational success factors relate to the IS strategy of Bank al Etihad – Jordan according tobranch managers and IT employees of this bank?
4. Is there a difference in the perceptions of branch managers and IT employees according to DW organizational success factors?
5. Is there a difference in the perceptions of branch managers and IT employees of Bank al Etihad – Jordan according to the IS strategy of the Bank?

The Importance of the Study

The importance of the study emerges from the followings:

1) Data Warehouses are vital for helping organizations to generate new possibilities by automated prediction of trends and behaviors in a large database thereby improving the quality of decision-making process (Joseph, 2013).
2) Data Warehousing projects are complex, expensive, time-consuming and risky.
3) The existence of numerous factors affecting the success of implantation of Data Warehousing creates the need to focus on the organizational factors that attained but a little attention in the literature (Francis, 2010).

4) The alignment of IT & IS strategy with the business strategy is a key factor to gain an elusive competitive advantage. This could be interpreted by strategically managing information more effectively that imposed utilizing data warehouses (Clarke, 2001).

5) Banking industry is a key ingredient of the national economy and has a major role in encouraging investment and development in Jordan.

6) The scarcity of studies the relationship between DW organizational success factors and IS strategy in Arabic context especially in banking industry.

7) There is a need to clarify the relationship between DW organizational success factors and IS strategy from a theoretical point of view.

Objectives of the Study

This study aims to achieve the following objectives:

1. To identify whether perceptions of the DW organizational success factors differ according to Job Position (either branch managers or IT employees of Bank al Etihad – Jordan).
2. To identify whether perceptions of the IS strategy of Bank al Etihad – Jordan differ according toJob Position (either branch managers or IT employees of Bank al Etihad – Jordan).
3. To investigate how DW organizational success factors relate to the IS strategy of Bank al Etihad – Jordan according to Job Position (either branch managers or IT employees of Bank al Etihad – Jordan).

The Study Model

Figure (1) depicts the study model where organizational factors influencing DW success represents the independent variable and IS strategy represents the dependent variable.

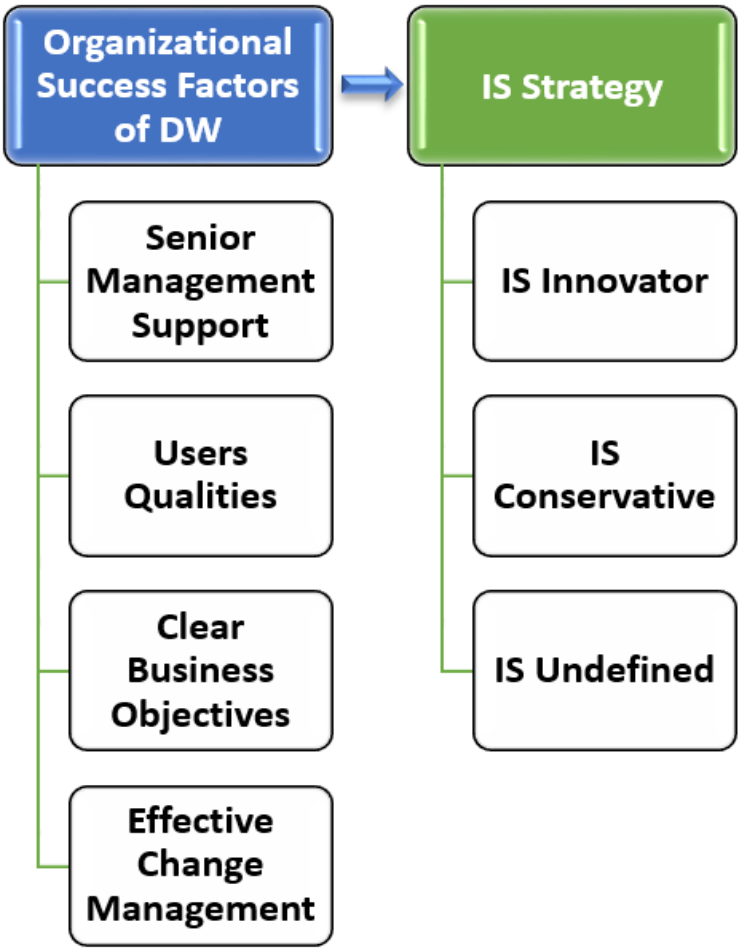

Figure (1) Study Model

The Hypotheses of the Study

The main hypotheses of the study could be formulated as follows:

H01: The perceptions of DW organizational success factors do not differ according to branch managers or IT employees of Bank al Etihad-Jordan.

This main hypothesis is divided to the following sub-hypotheses:

H01-1: The perceptions of senior management support do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan).

H01-2: The perceptions of user qualities do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan).

H01-3: The perceptions of clear business objectives do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan).

H01-4: The perceptions of effective change management do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan).

H02: The perceptions about the IS strategy of the bank do not differ according to branch managers or IT employees of Bank Al Etihad.

This main hypothesis is divided to the following sub-hypotheses:

H02-1: The perceptions about IS innovator do not differ according to Job Position (branch managers or IT employees of Bank Al Etihad-Jordan).

H02-2: The perceptions about IS conservative do not differ according to Job Position (branch managers or IT employees of Bank Al Etihad-Jordan).

H02-3: The perceptions about IS undefined do not differ according to Job Position (branch managers or IT employees of Bank Al Etihad-Jordan).

H03: There is a statistically significant correlation between DW organizational success factors and IS strategy of Bank Al Etihad-Jordan, as perceived by branch managers or IT employees of Bank Al Etihad-Jordan at $\propto \leq 0.05$.

The Limitation of the Study

The study is limited to branch managers and IT employees of Bank Al Etihad – Jordan during July 2019 to March 2020.

Theoretical Framework and Previous Studies

DW was presented by Inmon (2005) as a collection of data that supports decision-making processes. It is subject-oriented, integrated and consistent and shows its evolution over time and it is not volatile

DW isdefined by Golfarelli & Rizzi (2010) as a collection of methods, techniques, and tools used to support knowledge workers—senior managers, directors, managers, and analysts—to conduct data analyses that help with performing decision-making processes and improving information resources. While Rainardi (2008) demonstrated DW as a system that retrieves and consolidates data periodically from the source systems into a dimensional or normalized data store. It usually keeps years of history and is queried for business intelligence or other analytical activities.

There are certain requirements for a DW to be able transform operational data into decision-making support information, Golfarelli & Rizzi (2010) summarized these requirements in: accessibility; integration of data; query flexibility; information conciseness; multidimensional representation and correctness and completeness of integrated data.

Meeting these requirements imposes the question of what are the factors that make successful implementation of data warehouse. Plenty of researches were recently done in this field and due the numerous number of these factors; researchers categorized them in different ways. These factors were divided by Haley (1998) into 3 groups: (1) Project Factors, (2) Organizational Factors and (3) Infrastructure Factors. The three categories named by Van Rekom (2000) Information Technology Factors, (2) Data Factors and (3) Organizational Factors while Lee, Lee, & Suh, (2001) and Bhansali (2010) divided these factors into 4 categories: (1) organization factors, (2) user factors, (3) technology factors, and (4) data factors. Whereas AbuSaleem (2005) divide these factors into 5 categories: Organizational factors, Environmental factors, Project-related factors, Technical factors, and Educational factors but investigated only the first three groups in his thesis Some researchers expanded the results of (Mukherjee, 2003) but limited himself only to technical factors and organizational factors (Ganczarski, 2006). While others (Ojeda, Ramaswamy, Rivera , & Jumah, 2011) agree that these factors divided into two categories: technological and organizational as well as some who

followed the same categorization replaced the organizational factors with managerial factors (Sanger & Iahad, 2013). Moreover, Zaied, Grida, & Hussein (2018) proposed that these factors fall also into four categories namely: (1) organization, (2) process, (3) technology, and (4) environment. From the above review, it is obvious that organizational factors form a key ingredient of the success for design, implementing and operating a DW in an organization. Table 1 illustrates the organizational success factors of DW as presented in previous literature.

Table 1 Review of Organizational Success Factors of DW Success

Researcher (s)	Date	Factors
(El-Adaileh & Foster, 2019)	2019	Management Support, Organizational resources, Vision, Champions, Team Skills, Project Manager, User Participation and Change Management
(Zaied, et al.)	2018	Top management support, clear vision, adequate resource, organizational culture, BI strategic alignment
(García & Díaz Pinzón, 2017)	2017	Directives and Top Management, Business Linking, Project Leader or "Champion" set-up, Change Management, Project, People and Human Talent Teams, Learning and Skills, Environment, Resources
(Huebner, 2017)	2017	top management support, organizational size
(Lautenbach, Johnston, & Adeniran-Ogundipe, 2017)	2017	Top management support, Talent management challenges
(Kfouri& Skyrius , 2016)	2016	Vision & business case, management & championship
	2014	
(Shobha, 2014)	2014	Clearly defined business needs, Top management support, User Involvement/participation, project management, Practical implementation schedule
(Phiriyayotha & Rotchanakitumnuai, 2013)	2013	Management Support, User Involvement, Self-efficacy, Clear Objective, Scope and Goals, Organization Culture, Knowledge Sharing
(Sanger & Iahad, 2013)	2013	Top management Support, User education and training, stakeholders active involvement, Effective project management, change management
AlMabhouh, Saleh &	2012	Business Quality, User Quality, System Quality,

Researcher (s)	Date	Factors
Ahmad		Relationship Quality, Service Quality. Information Quality
(Olszak & Ziemba, 2012)	2012	Support from senior management, Skilled (qualified) sufficient staff/team/managers, Competent BI project manager (leadership), Past experience and cooperation With a BI supplier, Clear business vision and plan, Adequate budget
(Ojeda, Ramaswamy, Rivera , & Jumah, 2011)	2011	Scope, Management, Infrastructure, Availability of Specialists
(Bhansali, 2010)	2010	Size of the organization, Management support, team skills, champions, organizational support, organizational barriers
(Arnott, 2008)	2008	Committed and informed executive sponsor, Widespread management support, Appropriate team skills, Adequate resources, Clear link with business objectives, Management of project scope
(Yeoh, 2008)	2008	Committed management support & sponsorship, clear vision & well-established business case
(Hayen, Rutashobya, & Vetter, 2007)	2007	Management Support, Resources, User Participation
(Xu & Hwang, 2007)	2007	Clearly defined business needs, Top management support, User involvement/participation, Project management (teamwork), Practical implementation schedule, Adequate IS staff & consultants
(Ganczarski, 2006)	2006	Management, Goals, Users, Organization (Mukherjee, 2003)
(AbuSaleem, 2005)	2005	Existence of champion, Top management sponsorship and Business internal needs
(Mukherjee, 2003)	2003	Management, Goals, Users, Organization
(Lee, Lee, & Suh, 2001)	2001	right resources, championship, management support, management of user expectations, understanding of external environment
(Wixom & Watson, 2001)	2001	Management Support, Champion, Resources, User Participation

Researcher (s)	Date	Factors
(Van Rekom, 2000)	2000	Organizational environment, Management support, Accurate and documented business processes, Accurate and documented data sources, Job tasks and responsibilities, Work incentives, Training, Help desk support, Project team support
(Haley, 1998)	1997	Having the right resources, Champion, Management support

Gaardboe & Svarre (2018) made a review of business intelligence (BI) success factors as they investigated 43 studies; they discovered 34 CSFs related BI success. They claimed thatorganizational characteristics include: Management support, extrinsic motivation, management processes, organizational competence, IT infrastructure, IT investments, external environment, IS governance, and organizational size.

Heise (2006) states that "Without a strategic goal (specific and measurable), the data warehouse will be just money down the drain." This coincides with what Gaardboe & Svarre (2018) concluded that organizations should clearly identify their BI success factors to arrange the usage of their limited resources as well as to gain a more competitive edge. Implementing IS strategy in many organizations have faced difficulties in processing a significant amount of data and transforming it into valuable information, until the emergence of data warehouses. So, there is a solid connection between IS strategy and DW success (Alnassar, 2016).

Information system (IS) strategy is a vital mark in business and IT environments. Concisely, it assists organizations to allot,hoard, deal with data and transfer the data and information they develop and receive. Moreover, it empowers and replenishes various means and services for helping organizations to put on metrics and analytical tools in their informatics repository function and granting them to pinpoint the bright expanding opportunities and quiet ways to foster efficient operations and supply. Henceforth providing a more effective data management, presentation and analysis.

IS strategy is defined as "the formulation of approaches and planning needed to deploy information systems resources to support organizational strategy" (Chaffey & Wood, 2005). ISstrategy isdefined as the plan organization uses in providing information systems and services (Pearlson, Saunders, C, & Galletta, D., 2016). The role of IS strategy could be

summarized in: Defining what IS needed to meet the information needs of the organization to help achieve organization's mission; seeking to identify opportunities for leveraging the value of information to inform the organizational strategy; providing the information processes to manage information and respond to the opportunities and challenges posed by advances in IT (Cox, 2014).

Three conceptions of IS strategy could beidentified (Chen, Preston, Mocker, & Teubner, 2010) (1) IS strategy as the use of IS to support business strategy; (2) IS strategy as the master plan of the IS function; and (3) IS strategy as the shared view of the IS role within the organization. They defined IS strategy as "the organizational perspective on the investment in, deployment, use, and management of information systems."

The activities controlled through IS strategy according to (Chaffey & Wood, 2005) are: (1) Applications development services, (2) Information services, (3) Strategy and planning services, and (4) Technical user support services. In summary, Information systems (IS) strategy is a key concern for both IT managers and managers of other business functions within enterprises. IS strategy is about effective planning of the use and utilization of information systems resources and technologies to achieve organizational long-term objectives.

IS strategy is about creating a fit among information system activities. This implies that there should be a three way fit between business needs, current IT systems and new opportunities offered by technology (Porter, 2001). There should be an alignment between decisions of business strategy, information systems and organizational design. This alignment was known as the IS strategy triangle where the business strategy drives both Organizational and Information strategy. Four keys comprised IS strategy according to (Pearlson et al., 2016), some authors named them, as IS strategy matrix, they are Hardware, software, Networking and Data.

Hammouri, Shraideh, & Abu-Shanab (2015) concluded that developing IS strategy in certain organizations requires the integration of data within the different departments of the organization. Some researchers such as Duggal & Pylyayeva (2001) and Chaffey & Wood (2005) claimed that DWs are integrated within as an infrastructure or a foundation of IS strategy of the organization to improve the decision making process in organizations by providing timely, reliable information to decision makers.

Cooper et al. (2000) noticed that many organizations have implemented very good DWs for technical perspective but failed to influence the organizational performance. They suggested that there are certain success factors that lead to a change in organizations IS strategy as well as its business strategy. This is also what Bhansali (2010) and Watson et al. (2001) observed and argued that DW should be considered as a strategy enabler that means being dependent on organizational factors such top management concern.

Many studies have discussed the implementation of DW and IS strategy in banking industry such as (Sabharwal, 2014); (Al-Nsour et al., 2019); (Kanakriyah, 2017); (Chen W. , 2015); (Al- Saraireh, 2013); (Scott, 2018); (Joseph, 2013); (Bajaber, AlQulaity, & Zafar, 2016); (Copper et al., 2000); (Pilarczyk, 2016); and many other studies. These studies share that applying an IS strategy requires assessing the need for immediate investment, appraisal of IS/IT as it relates to the business and identifying required and potential future investment. This mandates a proper and effective implementation of DW and determination of critical factors of processes and activities in order to develop the required IS strategy.

Methodology

The IS strategy of the bank is measured using IS strategy typology developed by Chen et al. (2010). The questions 21 to 29 were utilized to give the identification of Is Strategy either: IS Innovator, IS Conservative, or Undefined. The organizational factors influencing DW success is assessed using a questionnaire developed based on the works of (Mukherjee, 2003; Bhansali, 2010; Wixom & Watson, 2001; Alnassar, 2016). Questions from 1 to 5 represent Senior Management Support, questions from 6 to 10 represent Users Qualities, questions from 11 to 15 represent Clear Business Objectives and questions 16 to 20represent Effective Change Management. The population of the study consisted of Branch's Managers and IT officials at Bank Al Etihad in Jordan. This bank invested heavily in technology to increase its operational efficiency, to expand flexibly and to provide a seamless multi-channel customer experience (Bank Al Etihad, 2018).

The population of the study consisted of all IT officials at Bank al Etihad and all the branch's managers (IT department comprised 68 officials and there are 48 branches.) The questionnaire was distributed to the sample's individuals using Google Forms to accelerate gathering data, the restored responses equals 98, which consists approximately 85% of the sample.

Table (2) illustrates that the items used to measure each variable is reliable since the values of Cronbach's Alpha is greater than 0.6.

Table (2) Reliability Test

Item	No. of Items	Cronbach's Alpha
Senior Management Support	5	0.736
Users Qualities	5	0.820
Clear Business Objectives	5	0.812
Effective Change Management	5	0.840
IS Innovator	3	0.675
IS Conservative	3	0.859
IS Undefined	3	0.761

From table 3, it is evident that all the variables of the study follow the normal distribution as the Sig value of Kolmogorov-Smirnov test is higher than 0.05. This indicates that data is suitable for performing regression analysis.

Table (3) Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Senior Management Support	.087	98	.064	.968	98	.018
Users Qualities	.075	98	.196	.973	98	.039
Clear Business	.051	98	.197	.991	98	.769

Objectives						
Effective Change Management	.087	98	.064	.966	98	.011
IS Innovator	.070	98	.196	.984	98	.291
IS Conservative	.086	98	.068	.985	98	.316
IS Undefined	.087	98	.068	.953	98	.002
a. Lilliefors Significance Correction						

Results & Conclusions

I. Descriptive Statistics

From Table 4, it is indicated that the branch Managers form 66.3% of the sample while IT Specialists form 33.7% of the sample.

Table (4) Distribution of the Individuals of the Sample according to their Function

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Branch Manager	65	66.3	66.3	66.3
	IT Specialist	33	33.7	33.7	100.0
	Total	98	100.0	100.0	

From Table (5), it indicated that Senior Management Support has the highest arithmetic average (3.47) among the DW CSFs, followed by Users Qualities with an arithmetic average of 3.28, then Clear Business Objectives (3.08) and in the last place Effective Change Management (2.72). According to the variable IS strategy, the Innovator Strategy has got the highest 3.36 followed by Undefined Strategy with 2.97 and at last Conservative Strategy with 2.86 arithmetic average.

Table (5) Descriptive Analysis

	Mean	S.D.	Skewness	Kurtosis

	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Senior Management Support	3.47	.729	-.559	.244	.592	.483
Users Qualities	3.28	.767	-.292	.244	-.369	.483
Clear Business Objectives	3.08	.676	.125	.244	-.258	.483
Effective Change Management	2.72	.645	.614	.244	-.043	.483
IS Innovator	3.36	.791	-.110	.244	-.577	.483
IS Conservative	2.86	.707	-.231	.244	-.367	.483
IS Undefined	2.97	.857	.244	.244	-.979	.483

Table 6 shows the perceived strategy types by the employees, it is indicated that 36.7% of the sample perceived that the bank strategy is an IS innovator but 8.2% think the bank is a IS conservative while the majority perceived the bank as IS undefined with 55.1.

Table (6) Perceived Strategy Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Innovative	36	36.7	36.7	36.7
	Conservative	8	8.2	8.2	44.9
	Undefined	54	55.1	55.1	100.0

	Total	98	100.0	100.0	

II. Hypothesis Testing

First main Hypothesis:

The independent samples T-test was applied to test the first hypotheses stating "The perceptions about DW organizational success factors do not differ according to Job Position (either branch managers or IT employees of Bank Al Etihad-Jordan)," the dependent (continuous) variables should be of normal distribution that is confirmed previously as shown in table 4.

Table 7 illustrates the importance degree of the means of the responses of the sample. As shown in Table 8 branch managers have higher means of responses than IT employees for the four dimensions of DW organizational success factors. As well as, the degree of importance of the perceptions of the sample of the study towardsDW organizational success factors are of moderate degree of importance as they all lie in the range (2.62-3.51).

Table (7) Importance Degree of the Means of the Responses

High	Moderate	Low
3.68 or more	2.34 – 3.67	2.33 or less

Levene's Test for Equality of Variances shown in Table 9 demonstrates that sig. value for all four dimensions of DW organizational success factors. Since Sig. value is greater than 0.05 then we consider "Equal variances assumed" value.

The first sub-hypothesis

The perceptions of both categories of the sample about "Senior Management Support" were of moderate degree where the Branch managers' perceptions have 3.51 arithmetic mean and 0.708 standard deviation in comparison 3.09 arithmetic mean and 0.709 standard deviation for the IT employees, as shown in Table 8. Table 9 demonstrates that t-value forsenior management support when "Equal variances assumed" equals 0.754 with 96 DF and 0.453 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions about senior

management support do not differ according to Job Position (branch managers or IT employees of Bank Al Etihad-Jordan)."

Table (8) Group Statistics for Testing the First Main Hypothesis

	Function	N	Mean	Std. Deviation	Std. Error Mean
Senior Management Support	Branch Manager	65	3.51	.708	.088
	IT Specialist	33	3.39	.775	.135
Users Qualities	Branch Manager	65	3.38	.783	.097
	IT Specialist	33	3.09	.709	.123
Clear Business Objectives	Branch Manager	65	3.16	.673	.083
	IT Specialist	33	2.91	.659	.115
Effective Change Management	Branch Manager	65	2.77	.664	.082
	IT Specialist	33	2.62	.603	.105

The second sub-hypothesis

The perceptions of both categories of the sample about "Users Qualities" were of moderate degree where the Branch managers' perceptions have 3.38 arithmetic mean and 0.783 standard deviation in comparison 3.39 arithmetic mean and 0.775 standard deviation for the IT employees, as shown in Table 8. Table 9 demonstrates that t-value for senior management support when "Equal variances assumed" equals 1.752 with 96 DF and .083 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions about user qualities do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

The third sub-hypothesis

The perceptions of both categories of the sample about "Clear Business Objectives" were of moderate degree where the Branch managers' perceptions have 3.16 arithmetic mean and 0.783 standard deviation in comparison 2.91 arithmetic mean and 0.659 standard deviation for the IT employees, as shown in Table 8. Table 9 demonstrates that t-value for senior management support when "Equal variances assumed" equals 1.770 with 96 DF and .080 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions about Clear Business Objectives do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

The fourth sub-hypothesis

The perceptions of both categories of the sample about "Effective Change Management" were of moderate degree where the Branch managers' perceptions have 2.77 arithmetic mean and 0.664 standard deviation in comparison 2.62 arithmetic mean and 0.603 standard deviation for the IT employees, as shown in Table 8. Table 9 demonstrates that t-value for senior management support when "Equal variances assumed" equals 1.127 with 96 DF and .263 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions about Effective Change Management do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

Table (9) Independent Samples Test for Testing the First Hypothesis

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Senior Management Support	Equal variances assumed	.790	.376	.754	96	.453	.118	.156	-.192	.428
	Equal variances not assumed			.732	59.528	.467	.118	.161	-.204	.440
Users Qualities	Equal variances assumed	.141	.708	1.752	96	.083	.284	.162	-.038	.606
	Equal variances not assumed			1.811	70.438	.074	.284	.157	-.029	.597
Clear Business Objectives	Equal variances assumed	.128	.721	1.770	96	.080	.253	.143	-.031	.537
	Equal variances not assumed			1.782	65.627	.079	.253	.142	-.030	.536
Effective Change Management	Equal variances assumed	1.076	.302	1.127	96	.263	.155	.138	-.118	.429
	Equal variances not assumed			1.163	70.156	.249	.155	.133	-.111	.421

From the above, we conclude that we fail to reject the first main null hypothesis stating, "The perceptions about DW organizational success factors do not differ according to Job Position (either branch managers or IT employees of Bank Al Etihad-Jordan)." Both categories of the sample of the study have but a little variance in their perceptions about DW organizational success factors, as well as, they consider DW organizational success factors of moderate importance degree. Based on the arithmetic means of their responses illustrated in Table 8, they consider Senior Management Support in the first rank that is in line with most of the previous studies such as (El-Adaileh & Foster, 2019); (Alnassar, 2016); (Almabhouh, Saleh, & Ahmad, 2012); (Sangar & Iahad, 2013); (Arnott, 2008); etc. Whereas, the study disagrees with (Kfouri & Skyrius, 2016) that emphasized the need of talented staff (i.e., user quality) is mostly from the IT department the most important in the Organization Dimension to achieve a successful BI implementation. Users Qualities comes in the second rank, followed by clear business objectives and in the last placeEffective Change Management.

The moderate degree of importance of these factors could be interpreted by the fact there are many other factors affecting the success of DW that will reduce their effect. As well as, the rapid change in DW technology, make it very difficult for organizational factors to have a stronger effect on DW success in comparison with the technical factors that could be considered in further studies. This conclusion agrees with (Mukherjee, 2003); (Alshubaily & Altameem, 2017) and (Huebner, 2017) .

- **Second Mean Hypothesis**

The independent samples T-test was applied to test the first hypotheses stating "The perceptions about IS strategy of the bank do not differ according to branch managers or IT employees of Bank Al Etihad."

According to the importance degree scale shown in Table 7, the group Statistics of for testing the second main hypothesis shown in Table 10 reveal that the degree of importance of the perceptions of the sample of the study towards IS strategy of the bank are of moderate degree of importance as they all lie in the range (2.85-3.43). From the same table, for all dimensions of IS strategy, Branch Managers have a higher degree of importance than IT Specialist employees.

Table (10) Group Statistics for Testing the Second Main Hypothesis

	Function	N	Mean	Std. Deviation	Std. Error Mean
IS Innovator	Branch Manager	65	3.43	.791	.098
	IT Specialist	33	3.23	.785	.137
IS Conservative	Branch Manager	65	2.91	.716	.089
	IT Specialist	33	2.75	.688	.120
IS Undefined	Branch Manager	65	3.04	.874	.108
	IT Specialist	33	2.85	.822	.143

Since the Sig. values in Levene's Test for Equality of Variances shown in Table 11 for the all three dimensions of IS strategy are greater than 0.05 then we will consider “Equal variances assumed” value.

Table (11) Independent Samples Test for Testing the Second Hypothesis

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
IS Innovator	Equal variances assumed	.414	.521	1.158	96	.250	.195	.169	-.140	.530
	Equal variances not assumed			1.161	64.891	.250	.195	.168	-.141	.531
IS Conservative	Equal variances assumed	.534	.467	1.101	96	.274	.166	.151	-.134	.466
	Equal variances not assumed			1.115	66.729	.269	.166	.149	-.131	.464
IS Undefined	Equal variances assumed	.679	.412	1.063	96	.290	.195	.183	-.169	.558
	Equal variances not assumed			1.085	68.032	.282	.195	.180	-.164	.553

The first sub-hypothesis

The perceptions of both categories of the sample about "IS Innovator" were of moderate degree where the branch managers' perceptions have 3.43 arithmetic mean and 0.791 standard deviation in comparison 3.23 arithmetic mean and 0.785 standard deviation for the IT employees, as shown in Table 10. Table 11 demonstrates that t-value for IS innovator when "Equal variances assumed" equals 1.101with 96 DF and 0.250 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions of the innovator do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

The second sub-hypothesis

The perceptions of both categories of the sample about "IS Conservative" were of moderate degree where the Branch managers' perceptions have 2.91 arithmetic mean and 0.716 standard deviation in comparison to 2.75 arithmetic mean and 0.688 standard deviation for the IT employees, as shown in Table 10. Table 11 demonstrates that t-value forIS conservative when "Equal variances assumed" equals 1.101 with 96 DF and 0.274 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions of IS conservative do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

The third sub-hypothesis

The perceptions of both categories of the sample about "IS Undefined" were of moderate degree where the Branch managers' perceptions have 3.04 arithmetic mean and 0.874 standard deviation in comparison 2.85 arithmetic mean and 0.822 standard deviation for the IT employees, as shown in Table 10. Table 11 demonstrates that t-value forIS undefined when "Equal variances assumed" equals 1.063 with 96 DF and 0.290 sig. value that is greater 0.05. Henceforth, we fail to reject the null hypothesis stating, "The perceptions of IS undefined do not differ according to Job Position (branch managers or IT employees of Bank al Etihad-Jordan)."

From the above discussion, we conclude that we fail to reject the second main null Hypothesis stating, "The perceptions about the IS strategy of the bank do not differ according to branch managers or IT employees of Bank al Etihad." Both categories of the sample of the study have but a little variance in their perceptions about IS strategy of the bank, as well as, they consider IS strategy of the bank of moderate importance degree. Based on the arithmetic means of their responses illustrated in Table 10, they consider

IS Innovator in the first rank that is in line with most of the previous studies such as (Ankrah, 2016) and (Bajaber et al., 2016).

Third Mean Hypothesis

There is no correlation between DW organizational success factors and the IS strategy of Bank al Etihad-Jordan, as perceived by branch managers or IT employees of Bank Al Etihad-Jordan.

In order to test this hypothesis, Pearson Correlation Coefficient test was used as shown in Table 12. It is indicated from Pearson's Correlation Coefficients Matrix that all dimensions of DW organizational success factors have statistically significant correlation with the dimensions of IS strategy of the bank (IS Innovator, IS Conservative, IS Undefined). Effective Change Management dimension has the highest correlation coefficients with the dimensions of IS strategy of the bank (0.978, 0.972, 0.978) while Clear Business Objectives occupied the second rank with coefficients (0.516, 0.515, 0.477). Users Qualities came in the third rank with coefficients (0.516, 0.515, and 0.477) followed in the last place by Senior Management Support with coefficients (0.262, 0.250, and 0.272).

Since all the coefficient in Pearson's Correlation Coefficient Matrix are statistically significant at $\propto \leq 0.05$, then we fail to accept the null hypothesis and accept the alternative hypothesis stating that, "There is a statistically significant correlation between DW organizational success factors and IS strategy of Bank Al Etihad-Jordan, as perceived by branch managers or IT employees of Bank al Etihad-Jordan at $\propto \leq 0.05$."

Pearson's Correlation Coefficient Matrix shown in Table 12 illustrates the strong relationship of Effective Change Management with the IS strategy of the bank as perceived by the individuals of the sample. While both Clear Business Objectives and Users Qualities have a moderate relationship with IS strategy. Senior Management Support has the least relationship with IS strategy of the bank that could be attributed to the fact that IS strategy is part of the whole strategy of the bank and senior managers have considered IS strategy within the completely competitive environment of the bank. Henceforth, their relationship with IS strategy alleviated by other environmental forces either financial or political ones.

Table (12) Pearson's Correlation Coefficient Matrix

		IS	IS	IS Undefined

		Innovator	**Conservative**	
Senior Management Support	Pearson Correlation	.262**	.250*	.272**
	Sig. (2-tailed)	.009	.013	.007
	N	98	98	98
Users Qualities	Pearson Correlation	.506**	.499**	.463**
	Sig. (2-tailed)	.000	.000	.000
	N	98	98	98
Clear Business Objectives	Pearson Correlation	.516**	.515**	.477**
	Sig. (2-tailed)	.000	.000	.000
	N	98	98	98
Effective Change Management	Pearson Correlation	.978**	.972**	.978**
	Sig. (2-tailed)	.000	.000	.000
	N	98	98	98

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

*. Correlation is significant at the 0.05 level (2-tailed).

This fits with the Chen (2010) who emphasized the need for effective management change (IS innovation) in turbulent environments as well as with (Saad, 2011) that recommends establishing goals and success objectives besides Soliciting top management support and user involvement at all levels plus implementing change management to determine strategy for adopting IS rather than adapting it. Moreover, the study confirms the finding of (Scott, 2018) regarding the strategic alignment between IS strategy and business strategy (clear business objectives). The study in line with (Lamberti & Büger, 2009) and (Ravasan & Savoji, 2014) highlights that IT (DW part of it) in banking industry is a matter of management rather than technology.

Recommendations

Based on the results and the conclusions of the study the researchers recommend the followings:

1. To enhance the senior management support for using and developing IT/IS and Business Intelligence solutions through training and updating systems and developing new innovative products to keep the competitive advantage of the bank since it demonstrated the lowest relationship (Senior Management Support/IS innovator).
2. To invest more in the user qualities by recruiting talented people in addition to in job training.
3. To foster the business objectives by encouraging the employees to adapt to the IS strategy of the bank to minimize the undefined effect.
4. To expand the population of the study to include all commercial banks in Jordan in order to generalize the results of the study.
5. It is desirable in the future to compare technical and organizational of DW or BI success factors in the context of the Banking industry.

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