THE IMPACT OF SYSTEM QUALITY AND USER PARTICIPATION ON BUSINESS INTELLIGENCE SUCCESS

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ABSTRACT

Organizations seek to be more competitive and efficient by implementing various types of business intelligence (BI) systems. However, it seems common that user participation during the system development and design has been neglected and not considered as important, resulting in the poor quality of the system. This has eventually resulted in the BI system failure. This paper seeks to investigate the relationship between user participation and the quality of system and how the users can participate during the development and the design of BI system. Organizations therefore, need to improve the user participation and quality of system to achieve the objective of Business Intelligence. A quantitative approach by means of survey is adopted with questionnaire as technique to collect data. A total of 200 questionnaires were distributed to the headquarters bank employees in Jordan who use BI system. The returned and usable questionnaire were 52%. The data was analyzed using SPSS version 19. Finding revealed that, there is a positive and significant relationship between user participation and system quality on BI system success. This indicates that the high system quality and user participation would improve the effectiveness of BI system as well as avoid the system failure.

Keywords: Business Intelligence, System Quality, User Participation, Bank Employees, Jordan.

1. INTRODUCTION

The current context of economic environment is rapidly changing. Thus, the ability to use intelligent tools to turn the challenges into opportunities is of great importance. This indeed represents an essential condition for any company willing to not only stay ahead but also consolidate its position in the market. Intelligent tools are paramount for organizations to manage a large volume of data in possession so as to remain competitive and ensure survival.

Managers need to anticipate the changes that take place inside and outside the industry and act in a promptly manner toward making good decisions based on reliable information essential to
their companies. Both companies and managers need to implement proper instruments to immediately deal with the changes in the economic, social, legislative and administrative environments and analyze all aspects of changes in these environments if they wish to stay competent.

2. USER PARTICIPATION

Communications between users and system developers have recently been an interesting debate in User Participation area of study. Users are considered sources of knowledge and information for system developers. If users cannot competently communicate with the system developers, the important information for developing a system might be missing, which, in turn, can attenuate the quality of the information systems (Limpornpugdee, De Janz & Richardson, 2009).

In spite of extensive research to determine when and how user participation increased satisfaction, the researches emphasized the communication component of participation is important in information system context. Many researchers agreed that effective communication played an important role during user participation in predicting the success of the outcome (Guimaraes, Staples & McKeen, 2003) whilst the ineffective communication had a negative effect on the system success. It is evident that the user-developer communication has a direct positive impact on user satisfaction.

Briolat and Pogman (2000) suggest users should discover their need and point of view, validate specifications, and better IS for the organization. Participation reflects the performed specific behaviors, how many of these behaviors are performed and how often they are performed. User participation (formerly known as user involvement), has the potential to improve the quality of the system by providing a more complete assessment of user information requirements, as well as expertise about the organization.

User participation in information system development is considered as an important factor that influences implementation success or failure. A study uses ETHICS (Effective Technical and Human Implementation of Computer-based Systems) method was carried out by Wong & Tate (1994), with the aim to develop a guide for user involvement in system design. User participation in terms of activities engaged by users does not provide a complete and accurate picture, because there are many different ways in which users can play a part in system development (Lin & Shao, 2000). User participations vary in terms of type, degree, content, extent and formality.

Previous studies suggest the importance of user participation in the development process when developing an information system. Participation of users can improve the user’s attitude to the system. Likewise, participation of users has positive effects in the future usage of an information system. Bosman (2005) highlights three reasons why users should participate in the system development: improving the knowledge upon which system is built, enabling people to develop realistic expectations, reducing resistance to change, and increasing workplace democracy by giving the members of an organization the right to participate in decisions that are likely to affect at work.

3. SYSTEM QUALITY

System quality is recognized as an important factor in successful BI system implementation (Nelson et al. 2005). Previous researchers defined system quality as about whether there are errors in the system or the consistency of the user interface, ease of use, quality of documentation, and quality and maintenance of the program code. Seddon (1997) and DeLone & McLean (1992) believe that higher quality systems should be perceived as easier to use and ultimately have higher levels of usefulness and use.

Yi et al. (2006) agree with Seddon (1997) that system quality is one of the factors in IS success model. They investigate the effects of BI system on decision performance and found out the
evidence that support the basic concepts of the model that postulates positive impacts of system quality on decision performance through system use. In the context of BI system, Wixom and Watson (2001) showed the particular importance of system quality (system reliability and data quality) in securing benefits from the BI systems. Shin (2003) has identified system quality factors such as system throughput, ease of use, ability to locate data, access authorization, and data quality, which are regarded as crucial for the success of the BI.

Seddon (1997) notes that “system quality is concerned with bugs in the system, the consistency of user interface, ease of use, quality of documentation, and sometimes, quality and maintainability of program code. DeLone & McLean (2003) suggest additional dimensions such as ease of use, reliability, functionality, data quality, flexibility, and integration as a measurement of system quality.

System quality is referred to as system flexibility, ease of use, usefulness, reliability, and user friendliness Xiao & Dasgupta, 2002). Although some scholars equate system quality closely to service quality and ease of use, but Nelson et al. (2005) believe the constructs used are not the same. Researchers determine five dimensions to be associated with system quality, which are accessibility, reliability, response time, flexibility, and integration, which reflect the information processing system required to produce the output.

4. BUSINESS INTELLIGENCE SYSTEM

BI refers to an important class of systems that help an organization analyze and disseminate information from internal and external sources. Its process generated from business transforms is relatively meaningless. Yet, the data input realized into knowledge and useful executions have the potential to enhance the performance of business process. (Adela et al., 2009; Elbashir, Collier, & Davern, 2008; Hart, Esat, Rocha, & Khatieb, 2007).

The literature on BI system sees the system as important in organizations. This is due to the fact that the system has become one of the main data analyses that support decision-making, query and reporting. In addition, the system, which is completed by specialized IT infrastructure, disseminates information crucial for many organizations to make appropriate decisions, even under pressure, in a promptly manner; thus, ensuring to gain a competitive advantage in the global and digital economy (Filip, 2012).

Many studies indicate that BI system as one of the most important factors for sustaining organization and surviving the marketplace and e-marketplace. Indeed, the system helps an organization deal with intelligent exploration, integration, aggregation and a multidimensional analysis of data originating from various information resources. BI system is designed with a standard that combines data collected from internal information systems of an organization and integrates data coming from the environment and miscellaneous databases (Das & Thankachan, 2012). In spite of this, the important components that help the success of the BI system are user participation, and system quality (Aziz, Salleh & Mustafa, 2012).

Different types of people in an organization who participate in decision-making among others are stakeholders, customers and suppliers. The reach of a particular decision is in lots of cases of global nature. Regional and international interdependencies require wider exchange of information and knowledge sharing and better coordination in activities, and undertake the contrast of everything that took in the past (Olszak & Ziemba, 2006).

Within the last few years, the world has been experiencing a rapid development and changes in information and technology (IT). The advancement in the realm of IT has significantly impacted the global economy. Businesswise, current global economy has redefined the way that a business should be conducted. The presence of Internet as part of people’s daily life suggests that information technology is now an inseparable source especially in the business world. The utilization of
information technology, including BI system, enables business users to report, analyze and optimize business operations to reduce costs and increase revenues (Sandu, 2008).

5. PROBLEM STATEMENT

It is evidence for previous studies that user participation is essential in implementing, and taking into consideration the system quality to increase Information System effectiveness and achieving goals as well as to lead the success of the information system (Lorenzetti, 2010; Zaied, 2012).

The growing interest in BI area, the success of BI system implementation is still questionable. About 60 to 70% of BI applications fail due to the technology, organizational, cultural and infrastructure issues (Loshin, 2012). BI system initiatives are costly and difficult. A staggering 60% of all BI projects ultimately fail by curtailing the initial goals (Sacu & Spruit, 2010; Chuah & Wong, 2012).

6. OBJECTIVES

The objective of this study are as follows:

i. To identify the system quality impacts of the effectiveness of the BI system in Jordanian banks.
ii. To determine the users participation in BI system development in Jordanian banks.

7. RESEARCH QUESTIONS

i. Does user participation influence the BI system in Jordanian banks?
ii. What is the relationship between user participation and system quality in the BI System effectiveness in Jordanian banks?
iii. Do Jordanian banks realize the importance of user participation in the design and development of BI system, and with system quality utilized altogether in the system?

8. METHOD

According (Sekaran & Bougie, 2010), a theoretical framework is a conceptual model that includes theory and logical sense of the relationship among several factors identified as important to the problem. The framework allows for the development of testable hypotheses so as to examine whether the proposed formulated hypotheses are valid. To ensure the firmness of the research, the hypothesized relationship can thereafter be examined through appropriate statistical analysis. As the proposed framework is able to identify the relationship among the variables in the study, it is essential therefore to recognize variables involved in the study of conceptual model.

The proposed conceptual model in this paper is not new in its nature, but instead an extended version of DeLone and McLean success model (2003), which was based on information system success model. This paper adds a number of constructs, which have not been considered by the updated DeLone and McLean success model (2003). After taking into consideration, many previous studies have shown that the user participation has the potential to either directly or indirectly impact the information system effectiveness.

Figure 1 shows the proposed conceptual model for this study which includes the independent variables; user participation and system quality. The dependent variable is the BI system success.
The managers in the top, middle and operational level was utilized in this study as a key informant about the BI system. Managers and supervisor contribute and involved in the BI system as well as they are consider as a reliable source to get information about BI system, system quality and user participation.

The research questions are taken from the model (Figure 1) and are used in this study as a method for determining the extent and significance of system quality and user participation in business intelligence system success.

9. DATA ANALYSIS

9.1. Descriptive Analysis

Descriptive statistics has been conducted in order to provide mean value and standard deviation for all variables and items of this study as well as to presents a primary idea about the study from the raw data. A five-point Likert-type scale rating from 1 = strongly disagree to 5 = strongly agree was used for measuring all items of this study.

<table>
<thead>
<tr>
<th>No.</th>
<th>System quality items</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The business intelligence system provides up to date information</td>
<td>3.93</td>
<td>1.11</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>The business intelligent system gives timely information</td>
<td>3.92</td>
<td>1.04</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Business intelligence system is accurate</td>
<td>3.90</td>
<td>1.00</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>The business intelligence system usually fulfills the commitments it assumes</td>
<td>3.85</td>
<td>1.02</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>The business intelligence system performs the order right the first time</td>
<td>3.82</td>
<td>1.05</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>General Arithmetic mean and Standard deviation</td>
<td>3.88</td>
<td>.97</td>
<td></td>
</tr>
</tbody>
</table>
Table 1 shows that the arithmetic means for system quality items was between 3.93 and 3.82; it is observed that the highest item was “The business intelligence system provides up to date information” (M=3.93 and S = 1.11) while the lowest item was “The business intelligence system performs the order right the first time” (M=3.82 and S =1.05); the general arithmetic means and standard deviation was (M= 3.88 and S =0.97) that is mean the level of importance for system quality was high.

**Table 2: Descriptive statistics for user participation items**

<table>
<thead>
<tr>
<th>No.</th>
<th>User participation Items</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I was able to make changes to the formalized agreement of work to be done (during system definition, physical design and implementation)</td>
<td>3.61</td>
<td>1.20</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>Information system/data processing staff kept me informed concerning progress and/or problems (during system definition, physical design and implementation)</td>
<td>3.73</td>
<td>1.13</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>I formally approved work done by the information system/data processing staff (during system definition, physical design and implementation)</td>
<td>3.69</td>
<td>1.13</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>I was able to make changes to the formalized agreement of work to be done (during system definition, physical design and implementation).</td>
<td>3.66</td>
<td>1.11</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Information system/data processing staff kept me informed concerning progress and/or problems (during system definition, physical design and implementation).</td>
<td>3.72</td>
<td>1.03</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I formally approved work done by the information system/data processing staff (during system definition, physical design and implementation).</td>
<td>3.75</td>
<td>1.03</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>I approved an information requirement analysis developed by information system/data processing staff.</td>
<td>3.65</td>
<td>1.06</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>I formally reviewed worked done by information system/data processing staff (during system definition, physical design and implementation).</td>
<td>3.66</td>
<td>1.00</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>I evaluated an information requirement analysis developed by information system/data processing staff.</td>
<td>3.65</td>
<td>1.07</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>General arithmetic means and standard deviation</td>
<td>3.67</td>
<td>.95</td>
<td></td>
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</table>
Based on five point liker scale, the lowest possible mean score is one and the highest possible mean score is five, so the subtraction is four. To calculate the range, four is divided by three (low, moderate and high) the result is 1.33. Therefore, the lowest is one, while the highest for low level is 2.33. The moderate level is 2.34 to 3.66 and the high level is 3.67 to 5 (Dobbie & Fryer Jr; Kawachi, 2008).

Table 2 shows that the arithmetic means for user participation items was between 3.75 and 3.61. The general arithmetic means and standard deviation was M= 3.67 and S =.59. It is observed that the level of importance for user participation is high.

9.2. Correlation Analysis

In order to test the Pearson correlation between every two variables, the correlation analysis was conducted among all variables. Bivariate correlation was subjected to two-tailed test of significance from two levels namely, highly significant (p<.01), and significant (p<.05). In fact, preliminary analyses were conducted in order to ensure no violation of the underlying assumptions of normality, linearity, and homoscedasticity.

<table>
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<tr>
<th>Table 3: Correlation SQ and BI success</th>
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<tbody>
<tr>
<td>SQ</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>system quality</td>
</tr>
<tr>
<td>.40**</td>
</tr>
<tr>
<td>BI system success</td>
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<td>.000</td>
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</table>

The hypothesis stated that system quality is positively associated with business intelligence system success. This hypothesis was supported at the 0.01 level of significance. The correlation coefficient is 0.40 as shown in Table 3. The results supported the hypothesis that providing a good quality of system would contributes to the success of business intelligence system by improving decision making performance. This indicates that system quality could help in successful of business intelligence system.

Table 4: Correlation UP and BI success

<table>
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<th>Table 4: Correlation UP and BI success</th>
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<tbody>
<tr>
<td>UP</td>
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<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>User participation</td>
</tr>
<tr>
<td>.30**</td>
</tr>
<tr>
<td>.000</td>
</tr>
<tr>
<td>BI system success</td>
</tr>
<tr>
<td>.000</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

The second hypothesis stated that user participation is positively associated with business intelligence system success. This hypothesis was supported at the 0.01 level of significance. The correlation coefficient is 0.30 as shown in Table 4. The results supported the hypothesis that providing user participates would contribute to the success of business intelligence system. This indicates user participation could help in successful of business intelligence system.

10. CONCLUSION

The theoretical contribution of this paper to the existing body of knowledge in the literature is the identifying the association between user participation and system quality factor, as well as to identifying of quality factors specifically for the business intelligence system. Besides that, this
paper had combine between user participation and system quality factor to expand significantly the existing knowledge on the impact of business intelligence system.

Additional, this study contributes to the body of knowledge through focusing on factors that are related to increase BI system Effectiveness such as, user participation, system quality. The study investigated to what extend does the user participation, system quality effect on business intelligence system effectiveness, as well as to reduce the probability of business intelligence system failure.

This study recommended to Jordanian banks and business intelligence vendor allow to users in all managerial level (operational, tactical, and strategic) engage in the system development and implantation in order to increase the usage, benefits, performance, and value added of BI system; which led to increase the effectiveness of business intelligence system and avoid the system failure; and finally to help the manager to take a right decision in the right time under pressure.

REFERENCES


