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The Role of Information Systems in Decision Making: The case of Jordan Bank

Maha Alkhaffaf
Management Information Systems Dept, Applied Sciences University, PO box 166, Amman 11391, Jordan.
* E-mail of the corresponding author: maha_m_fares@yahoo.com

Abstract
This research aims to analyze the current state of computer information systems and its role in decision making in Jordan bank. It identifies the types of computer based information systems that is used in the Bank. However, the research relies on an empirical study and a structured questionnaire. Questionnaire numbered 252 have been distributed to the studied bank, 212 questionnaires have been retrieved. The study found a strong relationship between information systems and the process of decision making; on the other hand the results show that Jordan relies heavily on a number of technologies used by IS to implement their key activities.
Keywords: Information systems, decision making.

1. Introduction

The relationship between information system and decision making is a central concern in the field of information system (IS). The main objective of information systems is helping decision makers by providing accurate and time based information helping them in making the right decisions in turbulent environment. A successful organization nowadays relies heavily on information systems to improve its work in one hand, and on the other hand achieving its goals and benefits. Management Information Systems helps in solving both structured and unstructured problem environments. This system is consisted of computers, People, procedures, databases, interactive query facilities and… Information is considered as a most important ingredient for success decision making in now a days companies, Due to the importance of information in decision making a developed system has emerged to serve the appropriate information's to managers for good decision making process; called information system. Such systems as DSS, MIS, TPS were discussed in this paper to analyze its role in decision making process in the studied population; Jordan Bank.

1.1 Procedural Definitions

Decision Support Systems: Information system that supports organizational decision-making activities. It is a software-based system intended to help decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.
Information Systems: Professional discipline bridging the business field and the well-defined computer science field that is evolving toward a new scientific area of study. It includes people, procedures, data, software, and hardware that are used to gather and analyze digital information.

2. Background

Number of authors has discussed the role of information system in decision making, Kostetsky was one of the first authors who wrote about the relationship between information systems, system analyst and decision making in 1966. Management information system provides knowledge about the relative position of the organization and basic forces at work. It provides the right information needed in decision making process and help the organizations control, planning and operational functions to be carried out effectively (Reddy, 2090). Furthermore, Ajayi, I. A. and Omirin, Fadekem investigated the use of management information systems in decision-making on long-term planning, short-term planning and budgeting in the South-West Nigerian Universities. A stratified random sampling technique was used to collect data and conclude that that there was a significant difference in the use of MIS for decision making on budgeting between Federal and State universities in favor of the Federal universities. The authors recommend that the MIS units should be adequately financed and maintained to ensure a free flow of information and adequate use of MIS in decision-making on short-term and long-term planning as well as budgeting. Ali Safari and Asefeh Asemi have discussed two main information systems, namely, MIS and DSS, its characteristics, relations, and connections of each concept to decision-making process. Srinivas Nowduri has the same consumption about the relationship between MIS and decision making. Decision making process and its impact on top level management in a business organization was explained also with an emphasis on automated decision making. The study found that the dynamic nature of MIS makes it difficult for some organizations to keep up with the principles, strategies, propositions or

even ideas. Barry Chris, provide added a new conceptual framework for decision making and information systems development, same as another authors who analyzed the role of MIS in decision making. A framework was developed, combining an analysis of decision-making within the systems development life cycle, key models of decision-making and the actors involved in the process of systems development. Barry Chris concludes that a deeper understanding of differing viewpoints on systems development held by actors and other phenomena can be illustrated with the framework. George Huber also draws a theory of effects of advanced information technologies on organizational design, intelligent and decision making, the theory studied the effects that computer- assisted communication and decision aiding technologies have on organizational design and decision making. Humber focuses on technology that affects the quality and timelines of decision making from one side and from the other side has prompted changes in organizational design. On the other hand Felix Alvarado in his study " Complementary uses of Information Systems in Decision Making, Planning and Democracy: An Example in the Education Sector" describes the ongoing implementation of web intelligence tools in public education and other policy sectors in Guatemala. Software tools were developed for use in business was adopted for planning and decision making in public institutions. The study summarizes the salient aspects of the experience so far of implementing and expanding what has been called the "Platform for Integrated Social Information," It discusses the issues this Platform raises as a resource for improved public decision making, policy analysis and especially, as a promising but challenging tool for democracy in the education sector. However, the world health organization has introduced a report by who study group it was about the role of research and information systems in decision making for the development of human resource for health, the study identified a number of problems and noted causes of these problems such as inefficient data definition and, lack of relevant information and poor coordination of available information on the other hand the study identified a positive factors that prompt decision making such as problem awareness and easy availability of well presented information. The study group emphasized that strengthening decision making in the development of human resource of health, by linking information and research to decision making and prompting relevant information requires a coordinated approach.

3. Research hypothesis

Ho.1 there is no significant relationship between IS and the quality of the managerial decision

Ho.1.1 there is no significant relationship between IS and the degree of accuracy in the managerial decision.

Ho.1.2 there is no significant relationship between IS and the speed of the managerial decision.

Ho1.3 there is no significant relationship between IS and the degree of easiness in the decision making.

Ho.2 there is no significant relationship between IS and the managerial decision making depending on the standards of information quality.

Ho.3 there is no significant relationship between the information quality standards and the factors of the managerial decision quality.

4. Research methodology and analysis

- A survey research that is able to describe the situation of a company from information gathered through a questionnaire. It is also possible to form explanations based on statistical analysis of the data. Two main sources will be used in this research to collect required information: primary sources and secondary sources. Data gathered from magazines, books and previous published studies of related subjects to e-readiness, in addition to data gathered from the World Wide Web (Internet). A research methodology justifies the techniques adopted for collecting, analyzing and interpreting data. Multiple regression will be used to analyze the relationship between the dependent and independent variables in which the study has a number of independent variables. T Calculated and T tabulated will be used also to analyze the hypothesis acceptance or rejection.

4.1 Results and Discussion

The table bellows identify the types of used CBISs in order to answer the main research question; what are the types of CBIS used in the case study (Jordan Bank)?

The most information system that is used in the bank was identified in table is e-mail and voice mail since the percentage was 94.9 % and the second information was Information system management with percentage 90%. This high percentage means that; the studied bank relies heavily on these two types of information systems.

4.2 Hypotheses testing

Hypothesis .1 There is no significant relationship between IS and the quality of the managerial decision.
In this research the researcher has selected an analytical tool that can be used to analyze the relationship among the IS and the other factors -Accuracy, Speed, Easiness and Appropriate – and that's why the explanatory factor analysis have been to as a best way to collect the variable into groups depending on the links relationship among these factors.

1-Factor One: Accuracy

This factor consisted of four variables used to evaluate the concept of accuracy in decision making, The figure below shows that this factor has a high value of internal consistency (0.811) and is considered as an indication of the stability of this factor, where the load factor scores ranged between (0.60) and (0.70) which is considered as high values comparing to the accepted value (0.400).

2- Factor Two: This factor consisted of four variables used to evaluate the concept of speed in decision making, so that the bank can be adaptive by making a speed decisions. The figure below shows that this factor has a high value of internal consistency (0.885) and is considered as an indication of the stability of this factor, where the load factor scores ranged between (0.541) and (0.741) which is considered as high values comparing to the accepted value (0.400).

3-Factor Three: This factor consisted of four variables used to evaluate the concept of easiness in decision making. The figure below shows that this factor has a high value of internal consistency (0.886) and is considered as an indication of the stability of this factor, where the load factor scores ranged between (0.474) and (0.662) which is considered as high values comparing to the accepted value (0.400).

Ho.2 There is no significant relationship between IS and the managerial decision making depending on the standards of information quality.
In order to identify the efficiency of the decision making in the studied bank the researcher has analyzed three dimensions consisted of sub dimensions:

1- Time dimension
2- Formal dimension
3- Content dimension

1- Time Dimension

This dimension contains three variables concerned about the effect of time dimension of information that in order effect on the process of decision making
The table below shows that the factor 23 has the highest loading.

2- Formal dimension

Four variables was concerned about this dimension; Clarity, Arrangements and Inclusiveness. Clarity means that the information is easy to understand by the user, Arrangements means that the information is presented in a sequential way depending on the need for this information, Inclusiveness means that the information is complete and cover all the details.

3- content dimension

This dimension contains three variables accuracy, relatedness and completeness, Accuracy means that the information is correct and doesn't has any mistakes, relatedness means that the information is related to the subject of decision and help the user in making the decision, finally the completeness means that the information help the user in all the details needed in making the decision.

Ho.3 there is no significant relationship between the information quality standards and the factors of the managerial decision quality.
The table below shoes the multiple regressions, it shows that number of factors of information quality explained 39% of the variance in degree of risk in terms of the value of F statistically significant at the level of (0,001 > a) and shows the values of T calculated that the effect of the formal dimension and the content dimension was statistically significant at the level of (0,001 > a) while no significant effect of the time dimension in explaining the variation, the reason of this that the importance of the decision under the risk impose the decision maker to be careful and ell planed, and this mean that the management in the studied population focuses on the careful decision making in the risk events, on the other hand using technological tools and information systems to minimize the importance of time factor.
The Table also shows that the dimensions of the information quality explained 62% in the variance of the managerial

decision quality, and the value of T calculated shows that the effect of the three variables (factors of the managerial decision quality) was statistically significant in explaining the variance in the factors of managerial decision, the table also shows that the T values was important in level of (0,001> a).

And to explain that we found that the factors of the managerial decision identified with four factors (accuracy, speed, easiness and appropriate), and where the results explained the effect of the dimension of information quality on the factors of managerial decision, this results shows a strong relationship among the information systems and the managerial decisions.

The results shows that the two dimensions of the information quality (content and formal dimension) was explained 49% in the variance of degree of the participation in decision making, and this was statistically significant at the level(0,001>a). The F calculated also shows that the variables (content and formal dimension) was important in explaining the variance in the degree of participation and was statistically significant at the level (0,001 > a) while the other dimension (time dimension) was not significant in explaining the variance of the degree of participation.

5. Conclusion and study results

By reviewing the literature written in the subject of information system we can figure out that all the definitions of information systems focuses on the role of this systems in enhancing and improving the decision making process by providing the accurate related and time based information needed in making the decision, however; this study results shows the same strong relationship among information systems and decision making**.** The right use of information systems in the bank helps that bank achieving competitive advantage comparing with other bank in Jordanian environment , furthermore; the results shows that the factor (easiness) has the highest variance level in the relationship among the information systems and the decisions quality in the studied bank.

- the results shows that the easiness variable had the highest variance to measure the relationship among information systems and the quality of decision making, while the accuracy had the lowest variance. As for the risk and participation variables the variance of participation was higher that the risk variable. And as for the quality of information; time dimension was the highest variance and the lowest was the content dimension.
- The study found that the accuracy of information was the most usable variable in the bank, while the appropriateness was the lowest usable variable in the study population, however; the risk variable was more usable in the bank that the participation variable, as for the quality of the information; time dimension was the most variable used in the bank.
- The result show a great influence of risk in decision making, where the degree of risk increases when increasing the difficulties of using information systems, this difficulties is usually faces managers in the high organizational levels and needs intuition, prediction or guesswork.
- The results also shows a great importance of the participation in decisions making, Information systems such as group decision support system (GDSS), video conferencing, intranet and extranet may help in increasing participation in decision making, furthermore; the study found that the needed infrastructure for those information systems are available on the bank.

Depending on the study results number of recommendations is listed below:

- The studded bank needs a continuous developments and improvement of the used information, it also needs to use the latest technology used in the field of banking.
- The need of training course for staff in order to revive their abilities of using information systems. However; the bank needs to determine the competence of each employee in the information system department and what each employee needs from information systems.
- Field studies in group decision support systems are needed to be implemented in the bank which helps decision making in the workplace and in addition it helps in generating ideas. .

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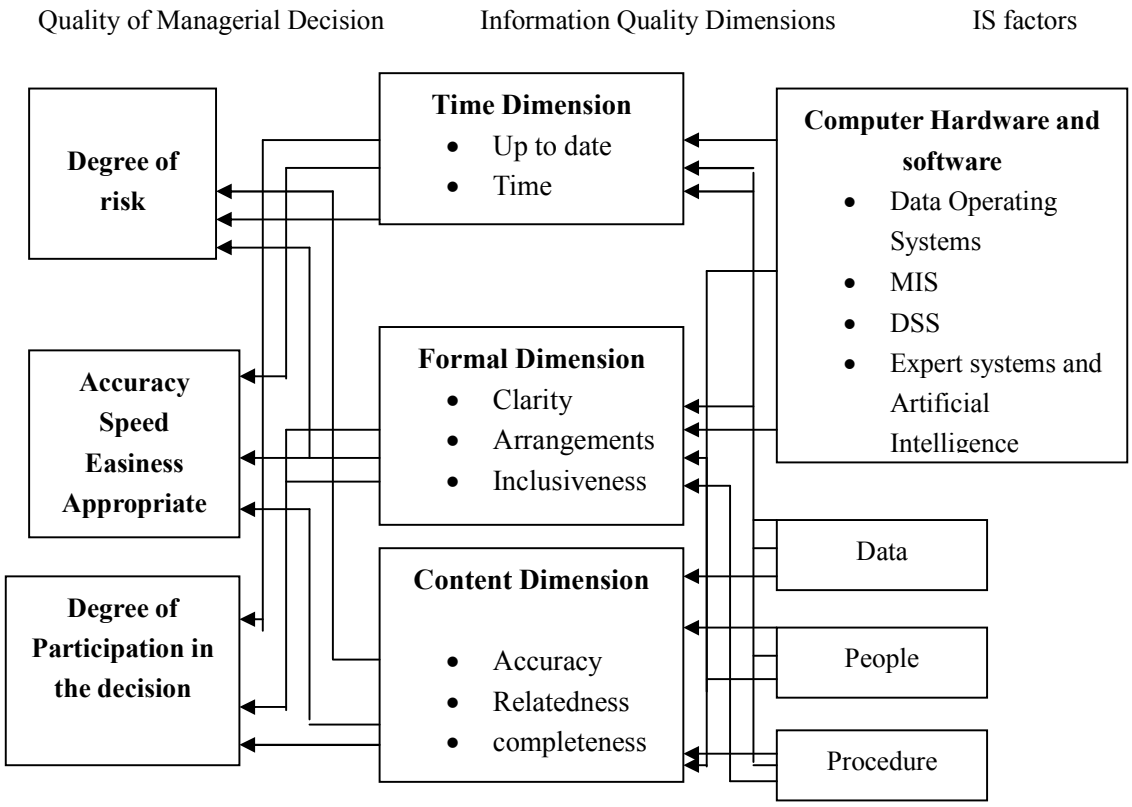

Figure 1. Research Mode

Table (1) Views of the sample on types of the used CBISs.

No	The used type	Yes		No	
		Repetition	Percentage	Repetition	Percentage
1	Data operating systems	181	86.2	29	13.8
2	Management information systems	189	90	21	10
3	Executive information systems	127	60.5	83	39.5
4	Expert systems and artificial intelligent	41	19.5	169	80.5
5	Decision support system	134	63.8	76	36.2
6	Office automation	181	86.2	29	13.8
7	E-mail and voice mail	198	94.3	12	5.7
8	Video conferencing	28	13.3	182	86.7
9	Reporting information system	184	87.6	26	12.4
10	Simulation system	39	18.6	171	81.4

Table (2) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.811		Coefficient of variation: 0.05		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
1	The Process of saving info on CDs keeps the security of Info needed for decision making.	3.21	0.71	0.600
2	I have deferent options to use information systems leads to more accurate decisions.	3.07	0.76	0.699
3	The continues improvement of IS helps in better decision making.	3.27	0.79	0.614
4	The use of different information systems helps in better accurate and speed decisions	3.28	0.63	0.651

Table (3) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.885		Coefficient of variation: 0.061		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
1	I can find the needed information for my decisions easily by entering the information systems used in the bank.	3.21	0.67	0.604
2	I use the automated information system to help me in automating the routine decisions	2.77	0.74	0.696
3	The information used in the information systems is clear, accurate time-based and related	2.89	0.69	0.700
4	The used information systems help in consulting experts easily	3.15	0.71	0.551

Table (4) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.886		Coefficient of variation: 0.088		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
1	I can easily use information system when I make my decisions.	3.11	0.60	0.404
2	I can use internet easily when I make my decisions.	3.20	0.74	0.686
3	The information introduced by the information systems is abstracted and easy to understand.	2.99	0.61	0.620
4	The used information systems helps in represent information in different ways text, audio…	2.80	0.66	0.500

Table (5) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.853		Coefficient of variation: 0.095		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
23	The delays in the time needed for providing information effect negatively in effectiveness of the decision making process	2,69	0.80	0.780
24	The process of updating the information saved in the systems is concerned as a critical step in decision making	3.18	0.78	0.678
25	It is possible to use the historical data saved in the systems in solving a future similar problems.	3,00	0.73	0.719

Table (6) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.887		Coefficient of variation: 0.075		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
26	I can use the manual IS when computers is not available or breakdowns.	2,71	0.80	0.532
29	I don't need a detailed or long CBIS when I make my decision.	2.43	0.85	0.624
28	Our IS can provide me with information in different forms; graphical, numeric, mathematical…	2,76	0.74	0.502

Table (7) Test results analysis of the factors, averages and standard deviations.

Reliability Coefficient: 0.887		Coefficient of variation: 0.075		
Paragraph No.	Paragraph	Mean	Standard deviation	Factor loading
16	Our information systems provide all the information needed in decision making	2,95	0.57	0.530
27	Our DSS help me in all the levels of decision making and all types of decision	2.76	0.69	0.580
30	The modeling tools help me in defining the problem to solve in decision making	2,79	0.79	0.745

Table (8) the result of the regression to the effect of the dimension of the information quality on the factors of managerial decision.

Independent variable	Dependent variable	Beta Partial Correlation	T	Sig of T	F	Sig of F	R2
Degree of risk	Time dimension	0,045	0.781	0,436	43,876	0.001	0,395
	Formal dimension	0,295	5,030	0.001			
	Content dimension	0,438	7,279	0.001			
Factors of the managerial decision quality	Time dimension	0,280	6,182	0.001	113,708	0,001	0,623
	Formal dimension	0,317	6,885	0,001			
	Content dimension	0,468	9,904	0,001			
Degree of participation in the decision	Time dimension	0,053	1,012	0,313	67,010	0,001	0,494
	Formal dimension	0,288	5,406	0,001			
	Content dimension	0,526	9,598	0,001			