Computerized Information Systems in the Jordanian Banking Sector: An Empirical Study.

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Abstract

This study aims at evaluating the existence of the computerized information systems in the Jordanian banking sector, from different aspects.

To achieve these objectives, two techniques for gathering data are used: the questionnaire which represents the primary sources. Books, periodicals and various published studies, represent the secondary sources.

The researcher has distributed (164) questionnaires to the users (Accountants and Managers) of the Jordanian commercial banks listed in Amman stock exchange (ASE), (140) were received back and analyzed which represent (85.36%) from the Total population.

The results showed that the information technology, and the computer- based financial and accounting systems are highly common in all the Jordanian commercial banks.

Finally, the researcher summarized several recommendations according to the conclusions.

Key Words: information systems (IS), Information Technology (IT), The Financial and Accounting Computerized Information Systems (FACIS), Jordanian Banking Sector.

الملخص: تهدف هذه الدراسة إلى تبيان مدى تواجد نظم المعلومات المالية والمحاسبية المعتمدة على الحاسوب في قطاع المصارف الأردنية.

وقد اعتمدت الدراسة على أسلوبين لجمع البيانات: الأولية والثانوية، أما البيانات الأولية فقد تم جمعها من خلال الدراسة الميدانية التي تمت بواسطة استبانة وزّعت على مُستخدمي النُظم المالية والمحاسبية المعتمدة على الحاسوب (من محاسبين ومدراء ماليين) في كل البنوك التجارية الرئيسية الأردنية المدرجة في سوق عمان المالي والتي بلغت (15) بنكاً تجارياً. وقد بلغ عدد الاستبانات الموزعة على المستخدمين (من مدراء ماليين ومحاسبين) 164 استبانة استرد منها 140 استبانة مكتملة الإجابات أي بنسبة استرجاع (85.36%)، وقد تم تحليل البيانات المُجمعة باستخدام الأساليب الإحصائية الوصفية كمقاييس النزعة المركزية، ومقاييس التشتت، والتكرارات،. في حين أن البيانات الثانوية تم جمعها من خلال الاطلاع والمراجعة لأدبيات الموضوع من كتب وأبحاث ودوريات وغيرها.

وقد أظهرت نتائج هذه الدراسة بأن كل من انواع تكنولوجيا المعلومات، وأنواع نظم المعلومات المالية والمحاسبية المعتمدة على الحاسوب يتوفر بشكل واسع في البنوك التجارية الأردنية المدرجة في سوق عمان المالي.

الكلمات المفتاحية : نظم المعلومات,تكنولوجيا المعلومات, نظم المعلومات المالية و المحاسبية المعتمدة على الحاسوب, قطاع المصارف الاردنية .

1.General Framework

1.1Introduction:

Over the last years, organizations all over the world have invested significantly in information systems (IS). It is widely believed that investment in information systems will enable firms cut costs and compete strategically and effectively (Butler and Gray, 2006)

An information system (IS) is the application of computing and communication technology to face business in the emerging and strengthening global economy. Ultimately an IS exists to help an organization accomplish its objectives (Street and Meister, 2004). An IS takes raw facts, known as data, manipulates, compiles and integrates that data into something that has meaning for a manager or operator (planisamy, 2003). Information Systems should provide guidance to the organizations employees to better assist them in the accomplishment of their objectives. IS has great impact on all levels of organization (i.e. Operational, tactical, and strategic). They also impact on all functional areas: finance and accounting, Manufacturing and production, sales and marketing, and human resource.

The evaluation of the performance of information systems and its role in the Banking industry is a very important point for managers and employees of banks and customers. Especially in the finance and accounting functional areas of banks as these functions affects profit and returns. (Abu Musa, 2006)

1.2Research Objectives:

The present research conduct an intensive investigation of the computerized information systems in one industry , rather than spread the effort over a wide range of different types of information systems and industries .

The daily operations of a bank depend to a great extent on the reliability, accuracy, availability, and integrity of information, which are the main targets of the computerized information systems.

Therefore, this study seeks to achieve the following objectives:

- To uncover the types of computerized information systems, and information technology used in the banking sector in Jordan.

1. 3 Importance of the Study:

The overall purpose of this research is to investigate the role of information systems in Jordanian banks. The advent and development of information systems as well as globalization have forced organizations to use and employ information systems to survive, compete and excel. There is an undeniable need for information systems practices in the workplace to enable managers to promote the use of information systems and allow the organization to acquire and retain competitive advantage.

The importance of this study will be to identify how effective use of information systems in Jordanian banks can promote and shape the capabilities of employees and assist in achieving the organization goals and objectives.

2. Research Questions:

2.1 The First Question: To what extent employees' of Jordanian Banks industry use computerized information Systems?

A number of sub research questions have been developed:

1. To what extent employees of Jordanian Banks industry use Transaction processing system?
2. To what extent employees of Jordanian Banks industry use Office Automation system?
3. To what extent employees of Jordanian Banks industry use Communication systems?
4. To what extent employees of Jordanian Banks industry use experts systems?
5. To what extent employees of Jordanian Banks industry use Management information system?
6. To what extent employees of Jordanian Banks industry use Executive support systems?
7. To what extent employees of Jordanian Banks industry use Decision support information system?

2.2 The Second Question: What are the types of information technology that are used in the Jordanian commercial Banks?

3. Methodology:

There are two types of data collection:

1. **Primary data**: a questionnaire has been developed to measure information systems use and practices in Jordanian banks.
2. **Secondary data**: The researcher will review the relevant literature from different sources such as books, journals, essays, on line database to formulate the theoretical background of this research.

4 The Content of the Research

4. 1. Overview of Information Systems :

There are many kinds of information systems in the real world. All of them use hardware, software, and people resources to transform data resources into information products. Some are simple manual information systems, where people use simple tools such as pencils

and paper, or machines such as calculators and typewriters. Others are computer- based information systems that rely on a variety of computer systems to accomplish their information processing activities (O'Brien 1994, p.23)

4.2The Importance of Information Systems :

That's the same as asking why anyone should study accounting, Finance, operations management, marketing, human resource management, or any other major business function. Information systems have become a vital component of successful business firms and other organizations. They thus constitute an essential field of study in business administration and management, that's why most business majors must take a course in information systems. Since you probably intend to be a manager, entrepreneur, or business professional, it is just as important to have a basic understanding of information systems as it is to understand any other functional area in business. (O'Brien and Marakas 2008, p.5) .

4.3 Information System Concepts :

An information system uses the resources of hardware (machines and Media), software (programs and procedures), and people (specialists and users) to perform input, processing, output, storage and control activities that convert data resources into information products. Data is first collected and converted to a form that is suitable for processing (input). Then the data is manipulated and converted into information (processing), stored for future use (storage), or communicated to its ultimate user (output) according to correct processing procedures (control). (O'Brien and Marakas 2008, p.25) .

4.4 Major Types of Information Systems in Organizations:

4.4.1 Transaction Processing Systems: Transaction processing systems (TPS) are the basic business systems that serve the operational level of the organization. A transaction processing system are a computerized system that performs and records the daily routine transactions necessary to conduct business. Examples are sales order entry, hotel reservation systems, payroll, employee record keeping, and shipping system (which keeps track of the money paid to employees). Managers need (TPS) to monitor the status of internal operations and the firm's relations with the external environment. (TPS) are also major producers of information for the other types of systems. (for example, the payroll system supplies data to the company's general ledger system, which is responsible for maintaining records of the firm's income and expenses and for producing reports such as income statement and Balance sheets). (Hamilton and Anderson, 2003).

4.4.2 Management Information Systems: Management information systems (MIS) serve the management level of the organization, providing managers with reports and often online access to the organization's current performance and historical records. Typically, MIS are oriented almost exclusively to internal, not environmental or external, events. (MIS) are computer- based information systems, primarily serve the functions of planning, controlling, and decision making at the management level. Generally, they depend on underlying transaction processing systems for their data. (Tom et. al, 2005).

4.4.3 Decision- Support Systems: Decision support systems (DSS) are computerized systems that serve the management level of the organization and help managers make decisions .Although (DSS) use internal information from (TPS) and (MIS), They often bring information from external sources, such as current stock prices or product prices of competitors. (French, 2007).

4.4.4 Executive Support Systems: Executive support systems (ESS) are computer- based information systems which serve the strategic level of the organization, and help senior managers to make decisions. (ESS) are designed to incorporate data about external events, such as new tax laws or competitors, but they also draw summarized information from internal (MIS) and (DSS). Questions (ESS) assist in answering include the following: in what business should we be? What are the competitors doing? What new acquisitions would protect us from cyclical business swings? Which units should we sell to raise cash? (Vandenbosch and Higgins, 1995).

4.4.5: Knowledge-Based Information Systems: (Alavi and Leidner, 2006)

One of the most practical and widely implemented applications of artificial intelligence in business is the development of expert systems and other knowledge-based information systems. Expert systems (ES) are knowledge-based information system (KBIS) that uses its knowledge about a specific, complex application area to act an expert consultant to end users. These systems provide answers to questions in a very specific problem area by making humanlike inferences about explain their reasoning process and conclusions to a user**.**

4.4.6: Office Automation System: (Anderson and Segars, 2001)

Are computer-based information systems that collect, process, store, and transmit electronic messages, documents, and other forms of communications among individuals, work groups, and organizations. These systems can increased the productivity of managerial end users and other professional and staff personnel by

significantly reducing the time and effort needed to produce, and receive business communications.

Word processing: is the use of computer systems to create, edit, revise, and print text material. Word processing involves manipulating text data (Characters, words, sentences, and paragraphs) to produce information products in the form of documents (letters, memos, forms, and reports).

Computer graphics: Most people find it difficult to quickly and accurately comprehend numerical or statistical data that is presented in a purely numerical form (such as rows or columns of numbers).

4.4.7: Electronic Communications Systems: (Adams and Todd, 2003)

Electronic mail, voice mail, and facsimile allow organizations to send messages in text, video, or voice form or transmit copies of documents and do it in seconds, not hours or days. Such systems involve the transmission and distribution of text and images in electronic form over telecommunications networks, thus reducing the flow of paper messages, letters, memos, documents, and reports.

Teleconferencing: is an important form of electronic meeting systems which involve the use of video and audio communications to allow conferences and meetings to be held with participants who may be scattered across a room, a building, a country, or the globe. Reducing the need to travel to and from meetings should save employee time, increase productivity, and reduce travel expenses and energy consumption.

4.5. Description of the Banking Sector in Jordan

The table (1) shows a description of the banking sector in Jordan, there are 20 banks working in Jordan; 15 Jordanian banks and 5 foreign banks.

Table (1): Description of the Banking Sector in Jordan

Bank Name	Nationality[(a)]	Year of Establishment[(a)]	Number of Branches Working in Jordan[(a)]	Number of Branches Outside Jordan[(a)]	Paid- in Capital[(b*)]
Jordanian Banks					
Arab Bank	Jordanian	1930	31	89	88.000
Bank of Jordan	Jordanian	1960	39	5	20.219
Cairo- Amman Bank	Jordanian	1960	25	19	15.000
The Housing Bank	Jordanian	1974	106	4	100.000
Jordan Kuwait Bank	Jordanian	1977	26	1	20.000
Arab Banking Crop (ABC)	Jordanian	1989	16	-	20.000
Islamic Int'l Arab Bank	Jordanian	1997	7	-	40.000
Jordan Islamic Bank	Jordanian	1979	49	-	18.233
Arab Jordan Investment Bank	Jordanian	1978	7	1	20.000
Jordan Investment & Finance Bank	Jordanian	1989	6	-	15.133
Union Bank	Jordanian	1991	11	1	20.000
Societe General Bank (Jordan)	Jordanian	1993	6	-	16.015
Al Ahli Bank	Jordanian	1956	49	12	42.000
Capital Bank	Jordanian	1992	11	-	10.000
Jordan Commercial Bank	Jordanian	1978	24	3	20.000
Foreign Banks					
HSBC Bank	British	1949	5	-	10.000
Egyptian Arab Bank	Egyptian	1951	19	-	10.000
Rafidain Bank	Iraqi	1957	2	-	5.000
Chartered Grindlays Bank	Australian	1969	13	-	10.000
Citi Bank	American	1974	2	-	10.000

a: Source: Central Bank of Jordan 2007.

b: Source: Banks & finance Institutions Directory in Jordan. Nov. 2007

* Amounts in Thousands of Jordanian Dinar.

4.6.The Research Questions testing:

4.6.1 The first question: to what extent employees of Jordanian Banks industry practices computerized information systems?

Table (2) shows the types of computerized information systems used in the Jordanian commercial banks.

Table (2)
The type of computer- based information systems in the Jordanian commercial banks

The types of information systems	Yes		No	
	Frequency	The Percentage (%)	Frequency	The Percentage (%)
1. Office automation systems (OAS).	99	70.7%	41	29.3%
2. Decision support systems (DSS)	90	64.3%	50	35.7%
3. Executive support systems (ESS)	86	61.4%	54	38.6%
4. Expert Systems (ES).	57	40.7%	83	59.3%
5. Management information system (MIS)	124	88.6%	16	11.4%
6. Communication systems (CS): – E mail, Voice- mail, fax.	137	97.9%	03	2.1%
– Video- conference	27	19.3%	113	80.7%
– Video- Phone.	10	7.1%	130	92.9%
7. transaction Processing systems (TPS).	115	82.1%	25	17.9%

We can conclude from the answers of the sample that (88.6%) of the Jordanian commercial banks enjoy the management information systems (MIS) which are computer- based information systems serve the functions of planning, controlling, and decision making, and provide manager with reports to the organization's current performance and historical records. And (82.1%) of these banks have the transaction processing systems (TPS) Which is a computerized system that performs and records the daily routine transactions

necessary to conduct business, and help managers to monitor the status of internal operations and the firm's relations with the external environment. This indicates that the two systems (MIS) and (TPS) are used to a very high extent.

The above table also shows that (70.7%) of the Jordanian commercial banks have the office Automation system (OAS); which means that such systems available in banks in a high extent.

The decision support systems (DSS) are computerized information systems with support decisions through providing the information that help managers to solve the problems; and identify; evaluate and choose the best alternative solutions. Furthermore, such systems present managers with the ability of predicting the results of the alternatives that will be used in the solution. We have discovered from the answers, that (64.3%) of the Jordanian commercial banks have this type of computerized information systems in a high and large degree.

From the answers, we noticed that (61.4%) from the Jordanian commercial banks enjoy the executive support systems (ESS), which are computerized information systems that

provide different information about the internal and external environment of the bank; as well as the critical success factors, which is needed by the senior managers in the process of decision- making. Through the above percent, we conclude that the Jordanian commercial banks have (ESS) to a high extent.

Through the individuals answers, we conclude that (40.7%) from the Jordanian Commercial banks enjoy the expert systems which are computerized information systems, in which the experts nourish the computers with the knowledge required for conducting some conclusions and inferences; and presenting suggestion and solutions for the problems in a certain field because such solutions will be identical to the solutions provided by human experts. The percent shows that the expert systems (ES) is found moderately, that was expected; because the use of such systems even by developed countries has been only recently; and this can be explained by the fact that the expert systems (ES) are the most modern computer applications and they require a great amount of capital and experts.

Through the above table, we conclude also that (97.3%) of the Jordanian commercial banks acquire the communication systems (E-mail, voice mail, fax) which is a very great degree. While, they have a very low percent of (video- Conference; Video- Phone) which were (19.3%) and (7.1%) respectively; the reason for such percents goes to the fact that these systems found within the communication systems are highly developed, therefore they are costly.

4.6.2 The Second Question: what are the type of information technology that are used in the Jordanian commercial banks?

Table (3) shows the types of information technology used in the Jordanian commercial banks.

Table (3)
The Types of information technology in the Jordanian commercial banks

The types of information technology	Yes		No	
	Frequency	The Percentage (%)	Frequency	The Percentage (%)
Internet Banking	130	92.9%	10	7.1%
Self services Machines: (Automated Teller Machines, Foreign Exchange Machines).	119	85%	21	15%
Checks Reader.	135	96.4%	05	3.6%
Electronic Cards: (Master card, Visa card, Smart card).	138	98.6%	02	1.4%
Electronic archive systems.	108	77.1%	32	22.9%
communication control systems.	126	90%	14	10%
Data control systems	131	93.6%	09	6.4%
Antivirus programs	138	98.6%	02	1.4%
encryption	113	80.7%	27	19.3%
Passwords	138	98.6%	02	1.4%

First: we can conclude from the answers of the sample that (98.6%) of the Jordanian commercial banks provide the electronic

cards (Visa card, Master card, Visa card), and (96.4%) of these banks have the checks reader, (92.9%) of the commercial banks enjoy the internet banking, the self service machines (Automated teller machines, foreign exchange machines) are available at (85%) of the Jordanian commercial banks, while the electronic archive systems are used in (77.1%) of the commercial banks. This indicates that the types of information technology available in the Jordanian commercial banks used to a very large extent are: the electronic card, checks reader, internet, self service machines, electronic Archive systems.

We should noted that the Jordanian commercial banks have the internet banking in a great degree gives it ones of the most modern communication technology which plays a great role in the process of decision- making through the linking network it forms inside and outside the banks.

Second: the above table also shows that (98.6%) of the Jordanian commercial banks used the password and the antivirus programs, (93.6%) of these banks have the data control systems, (90%) of the commercial banks enjoy the communication control systems, the encryption as a security tools on the data is available at (80.7%) of the Jordanian commercial banks.

Therefore, we can judge that the Jordanian commercial banks as being developed comparing with the other commercial banks in the developing countries through the great usage of information technology as security and control tools in dealing with data.

5. Results:

This study aimed to evaluate the computerized systems used in the Jordanian commercial Banks that are listed in Amman stock exchange (ASE).

After the analysis of data collected through questionnaires distributed to the users of such systems we have reached to the following findings:

1- The difference in the percents of the types of computerized information systems was expected, because such systems differ according to the capital needed for their construction, and the

experiences and skills required for usage, which differ among the Jordanian commercial banks according to the size, the age and the capital of the bank.

2- We can conclude that information technologies used as control and security tools for information are found in a high and large degree in the Jordanian commercial banks, such information technologies are expected to guarantee security and control for the process of data transfer inside and outside the bank, through protecting data from spying and computer piracy for the benefit of bank's competitors. All that will lead to maintaining the feature of competition of banks.

3- It should be noted, that the use of the security and control tools (information technology) will be restricted only to some persons that they can get access to data or justify it, as well as protect it from viruses that can destroy it. All that will lead to affect the effectiveness of decisions made depending on it.

4- Based on the results, we conclude that the Jordanian commercial banks are developed in terms of computerized information systems and information technology comparing with banks in other developing countries. However, the Jordanian commercial banks are considered less developed comparing with banks in developed countries such as (the American and British banks), especially whose use the most modern computerized information systems which are the expert systems, and communication systems (Video- Conference, Video- Phone).

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