

**THE IMPACT OF INFORMATION SYSTEM ON ADMINISTRATIVE SERVICE
QUALITY IN HOSPITALS: THE CASE OF PRINCE HAMZAH HOSPITAL,
JORDAN 2015**

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Abstract

This research project is an initial investigation on the impact of information system in Administrative Services Quality (ASQ). Health care organizations provide services and use information system in administrative processes that have an impact on their customers. Many of its attributes relate to information system (IS) such as system and information quality. The aim of the system operation is to reduce resources used, to save time and efforts as well as to reduce cost and ensure that the information system provides high-quality information. The results show a significant effect of system quality and information quality on improving the level of service quality in prince Hamzah hospital in Jordan in 2015. The commitment of the management is vital to improve the system that is explicit and unmistakable in the implementation. The communication is also a key factor in the decision making as systematic data quality assessment can never be achieved without management commitment.

Kulcsszavak: information and communication technology, information system, Service Quality

JEL besorolás: M15, O32, O33

LCC: RA960-1000.5

Introduction

In Jordan a nationwide project has been initiated in 2009 to link all healthcare institutions with a shared database so it is possible to access the medical records from anywhere at any time by the social security number of the patient. In 2018 more than 120 healthcare institutions were linked to this nationwide information system. This project is called Hakeem. This project includes implementing nation-wide electronic medical records to both public and private hospital. So this costly project needs to be measured and how the success of this information system enhances the service quality in hospitals.

It was expected to reach USD 3.7 trillion of global spending on information technology and the development and construction of information systems by 2013, which means an average increase of 4.1 percent yearly. However, at the same time the proportion of IT projects and information systems failed about 70-80 per cent as a result of weakness in the development and analysis of the requirements of Information Systems.

Since the introduction of information systems, organizations want to ensure that their systems are effective or “successful”. In the last 60 years, during the evaluation of information systems they were continuously up-graded to support the successful operation. The role of information systems has changed dramatically in organizations.

Total worldwide information technology investment exceeded one trillion US dollars in 2001, and since it have been growing 10 per cent each year. The huge amount of expenditure brings the question if those systems provide enough advantages of competitiveness for firms.

The quality of the service provided by the information system is considered as the main indicator of the effectiveness of the information system being used and it is very important for satisfying the user of the information system . (Watson et al, 1993)

While expenditure on information technology (IT) increase in hospitals, only a few studies investigate the impacts of these investments on health care services. They present a positive relationship between the level of investments in IS and the productivity of health care services . There are difficulties in cost justification. Organizational impacts and benefits, on the other hand, are often intangible and their realization may take a long time. (Chang et al, 2012) Therefore, There are several studies addressed this issue from different sides .

Literature review

Raid (2009) Assessing the success of Information Systems (ISs) as one of most critical issues in IS field. Several conceptual and empirical studies have been conducted to explore this confusing yet important issue. A huge debate continues concerning the appropriate set of variables that can be used to determine the users' perception of ISs success. However, studies relating to this issue within the context of Arab countries are few and lack the ability to propose an appropriate evaluation criterion for Arab organizations. This study is one step ahead and aims to propose and empirically test an evaluation model for ISs success from the users' perspective. Accordingly, this study is of two folds including the theoretical fold which deals with the conceptual elements leading to the appropriate evaluation criterion and the empirical fold which deals with testing the proposed model. Among the five factors that were explored in this study, four factors were determined as influential factors including system's usefulness, user's technical capabilities, information quality and management support. System's ease of use was excluded from our proposed model. The findings of this study are expected to add value to ISs' investments as well as to increase the rate of success for costly ISs initiatives.

According to (Gordana & Neđo, 2009) The necessitate of Information System functionality performances evaluation has emerged from the importance of Information Technology in effectiveness and efficiency of work processes in an organization, causing rapid growth of demands in sense of resources performances in Information System. The main purpose of Information System functionality performances evaluation is upgrading and especially improvement in quality of maintenance.

Despite the large number of empirical studies in IS success, what exactly is meant by "IS success has never been clear nor researchers found much agreement about that. It appears that IS success is one of the controversial issues that has eluded IS researchers. The problem is compounded because success is a multidimensional concept that can be assessed at different levels (such as technical, individual, group, organizational) and using a number of not necessarily complementary criteria (such as economic, financial, behavioral and perceptual).

it can be seen that health care organizations are still lacking in IQM implementation and further research is needed for better improvement(the organization need to institutionalize the implementation of information quality management (Mohammed & Yusof, 2012).

Service quality and information systems

According to (Berhan & Kitaw, 2012) Service quality is “conceptualized using four different constructs (Knowles, 2011): assurance, reliability, responsiveness, and empathy. Tangibility is excluded, as it is included directly or indirectly in the IT infrastructure and business function.

from other hand Parasuraman et al. (1985) defined the quality of service as "the difference between consumer expectations for service and perceived service If the expectation is greater than the performance of the service the consumer is satisfied, but if the service is expected larger than the perceived consumer is dissatisfied," and other words is "the gap between consumers' expectations for service and their awareness of the service experience."

In first model it was ten factors or indicators that used to evaluate the service quality (SERVQUAL) . later in the subsequent work by the same authors they reduced them to five factors : tangible , reliability responsiveness , assurance and empathy.

Through the entrance of the user can define the quality in the field of Information Systems product's ability "information system" to satisfy customer expectations through performance included accuracy and efficiency, and the timing and quality of information (Saroja & Sujatha, 2002)

Information quality management practice: is “a set of quality activities performed by entire organizations to ensure that the quality of information produced in HIS fits the users’ requirements "(Mohammed & Yusof, 2012).

From the new study that integrate the three dimensions of study is the service, information, system quality so that this model called 3Q model consider actually integrated model. (Jingjun et al, 2013)

Also this model differentiate and distinct the beliefs and attitude of the system from those of using the system. (Jingjun et al, 2013)

A study conducted in Iran about the quality of Iranian health care services showed that according to the patients in Iran they are not fully satisfied with the quality of health services and Improvements were needed (Teshnizi et al.2018)

The model of the information system success(IS-success model)

In 1992, DeLone and McLean suggested that the dependent variable for information systems (IS) research is IS Success. Their research resulted in the widely cited according to (Delone & McLean, 2003) IS Success Model, in which System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact are distinct, but related dimensions of IS success. Since the original IS Success Model was published, research has developed a better understanding of IS success. , comprehensive and integrative research on the variables that influence IS success has been lacking.

The success of the information system model is the most famous models and applications that were classified dimensions measuring the success of information systems within the framework in which you can apply the theories for assessing the effectiveness and success of the Information Systems. (Seen, 2007)

The basic elements for the success of the information system model as following:

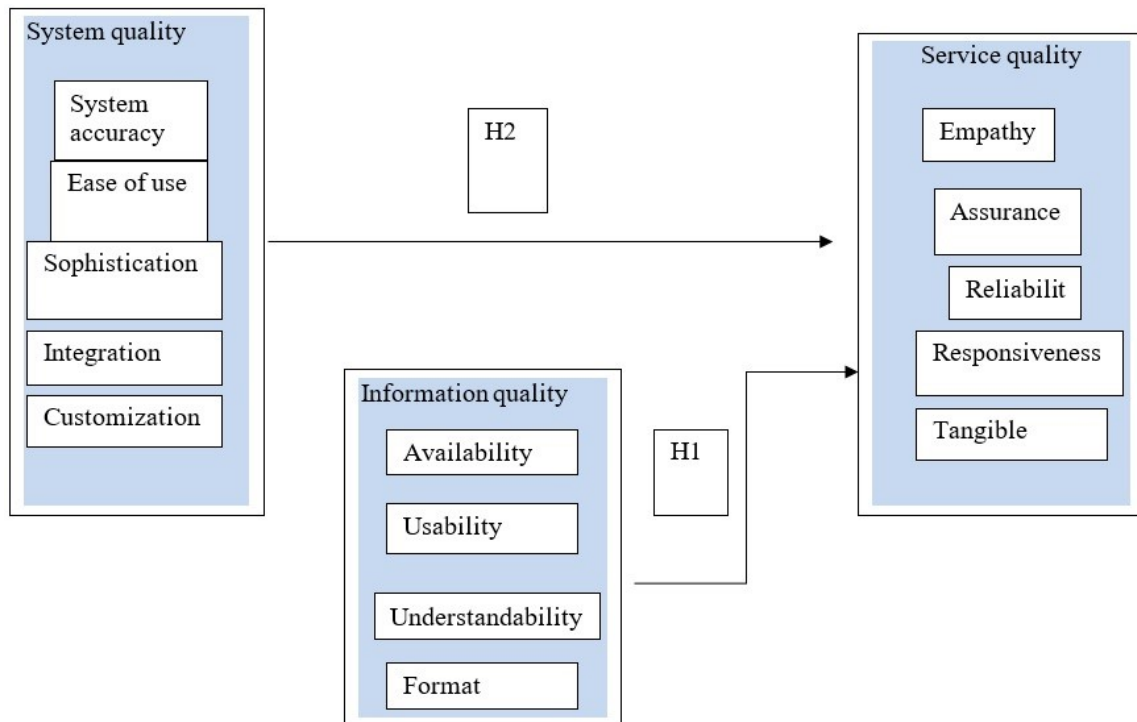
- Quality system means the value of usability of a user of it can be measured by the flexibility of the system and integration, as well as response time, as well as cognitive-expected user of the system and confidence in him, and ease of use, ease of learning and the benefits derived from the system.
- Quality Information: back to the quality and value of the information and data obtained by the user when using the system, it can be measured by the confidence and accuracy, and relevant, understanding, meaningful and modern, as well as to be comparable with a suitable form.
- Use: refers to the extent of use of the results provided by the information system for the end user.
- User satisfaction: refers to the responsiveness of the user for effective use of the information system.
- Impact on individuals: it is the impact of information on the behavior and performance of the user.
- Regulatory impact: refers to the impact of the information system on the performance of the organization in general.

After Do both of Delone & McLean reviewing previous studies, presented each updated model for the success of the information system contains many of the changes in the model of the success of the previous information system, which is as follows (Delone & McLean, 2003):

- Has been added a third dimension quality is the "quality of service.
- Was divided dimensions the" use "to the two-dimensional "Use " ,” intention to use " directly linked to the three dimensions of quality in order to solve the problem of ambiguity use.
- The "Net Benefits” presented as a measure of the impact to be a substitute for the effects of individual and organizational effects so that they are linked to positive or negative with all of the stakeholders, industries, economy, communities presence feedback received from the "ultimate benefit" to "use" and "user satisfaction"

Model of the study and the hypotheses

This study attempts to model linking the impact of Information Systems IS-Impact, which was developed by (Gable et al, 2008) depending on the model of the success of the information system IS-Success and instrument "quality of service".So we proposed the following model:



Based on the above model suggest the following hypotheses:

Hypothesis of Research:

H1: Information Quality will positively affect on service quality.

H2: System quality will positively affect on servile quality

The Methodology

In accordance with the purpose of our study, we chose quantitative research methods to meet objectives of this study. In particular questionnaire, based on IS success model and by using previously tested and validated instruments, was used to get the citizens' responses regarding the overall use of the system and the same data is also used for validation of the model using statistical analysis.

In line with the aim of this study, the main purpose of this questionnaire was to overall evaluate the information system quality based on two constructs of DeLone & McLean (1992)[] model and effect in service Quality, also to test this model using the data collected through this questionnaire. There is no comprehensive and standard instrument that can be used to evaluate information systems successes in the literature. Therefore each of the construct was measured by several items that have been tested and validated by other researchers in previous studies. The criteria that we used while choosing questionnaire items was the popularity of the instrument and the use of the instrument in the studies close to our study. Wordings and format of the items were changed to fit these items into our study's context. By using previously tested and validated measures.

When researchers design their studies, they have to ensure that their work will accurately reflect the population in which they are interested. A population is a collection of people, objects, countries, etc., that share a common characteristic of interest.

The target population for this study includes individuals who have using information systems in hospital.

Experiment and evaluation

The study sample consisted of (100) an employee of prince Hamzah hospital in Jordan; table (2) shows the distribution of the sample depending on the personal and functional variables.

Table (1): distribution of the sample according to the personal variables

Variable	Categories	Frequency	percent
Gender	Male	48	48.0
	Female	52	52.0
	Total	100	100.0
Age	less than 27 years	32	32.0
	27-32 years	45	45.0
	33-37 years	21	21.0
	more than 38 years	2	2.0
	Total	100	100.0
Experience	less than 5 years	58	58.0
	5-10 years	36	36.0
	More than 10 years	6	6.0
	Total	100	100.0

Reliability Analysis:

Table (2): the result of reliability (Cronbach Alpha)

No	Domain	Alpha	Item No
1	Quality of information	0.84	5
2	Quality of the system	0.89	6
3	Service's quality	0.82	6
Tool of study		0.97	17

Table (2) shows that:

The highest cronbach alpha value reached (0.89) for domain (2) "quality of the system", then for domain (1) "quality of information", (alpha value 0.84). And the lowest alpha value was (0.82) for domain (3) "service's quality". But the total alpha values reached (0.97) this indicates to accept reliability.

The results

Table (3): Means and standard deviation for each domain of study and total means of them (n= 100)

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Quality of information	3.91	0.67	3	High
2	Quality of the system	4.06	0.73	1	High
3	Service's quality	4.00	0.59	2	High
Total Means		4.00	0.61	-	High

Table (3) shows that the highest means reached (4.06) out of (5) for domain (2) "quality of the system" by high agreement degree, then for domain (3) "service's quality", by high agreement

degree (means 4.00), and the lowest means was (3.91) for domain (3) "quality of information" by high agreement degree.

The total means for tool of study reached (4.00) by high agreement degree.

- Means and standard deviation for "quality of information" domain.

Table (4): Means and standard deviation for "quality of information" domain items and total means of them (n= 100)

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Services offered by information systems can be perceived as unique and special	3.90	0.69	4	High
2	Data provided by the current system is sufficient and cover all work department	3.61	0.84	5	Medium
3	tasks can't be done without information provided by information system	4.09	0.89	1	High
4	Information provided by the current system is new and refreshed	3.98	0.99	2	High
5	Information provided by the system is clear and can be simply understood	3.95	0.86	3	High
Total Means		3.91	0.67	-	High

Table (4) shows that the highest means reached (4.09) out of (5) for item (3) "it can't be done without information provided by information system" by high agreement degree, then for item (4) "information provided by the current system is new and refreshed", by high agreement degree (means 3.98), then for item (5) "information provided by the system is clear and can be simply understood", by high agreement degree (means 3.95), And the lowest means was (3.61) for item (2) "data provided by the current system is sufficient and cover all work department" by medium agreement degree.

The total means for "quality of information" domain reached (3.91) by high agreement degree.

- Means and standard deviation for "quality of the system" domain.

Table (5): Means and standard deviation for "quality of the system" domain items and total means of them (n= 100)

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Information system is simple to use	4.21	0.94	2	High
2	Information system's screens are simple to use	4.29	0.83	1	High
3	I feel comfort when I use information system	4.07	0.84	4	High
4	I feel confidence toward information system	4.11	0.79	3	High
5	Information system provides accuracy in work	3.93	0.98	5	High
6	I don't feel there are mistakes or inconsistency in information system	3.77	1.02	6	High
Total Means		4.06	0.73	-	High

Table (5) shows that the highest means reached (4.29) out of (5) for item (2) "information system's screens are simple to use" by high agreement degree, then for item (1) "information system is simple to use", by high agreement degree (means 4.21), then for item (4) "I feel confidence toward information system", by high agreement degree (means 4.11), And the lowest means was (3.77) for item (6) "I don't feel there are mistakes or inconsistency in information system" by medium agreement degree.

The total means for "quality of the system" domain reached (4.06) by high agreement degree.

Table (6): Means and standard deviation for "service's quality" domain items and total means of them (n= 100)

No	Items	Mean	Standard. Deviation	Rank	Agreement Degree
1	Information systems unit offers service needed by employees quickly	3.89	0.82	4	High
2	Problem faced by employee is solved seriously by information system unit	4.01	0.96	3	High
3	There is a confidence between employee and information systems unit	4.10	0.83	2	High
4	Information system unit's cadre avoids mistakes	3.89	0.75	4	High
5	user feels comfort when dealing with employees in information system unit	4.13	0.81	1	High
Total Means		4.00	0.59	-	High

Table (6) shows that the highest means reached (4.13) out of (5) for item (5) "user feels comfort when dealing with employees in information system unit" by high agreement degree, then for item (3) "there is a confidence between employee and information systems unit", by high agreement degree (means 4.10), then for item (2) "problem faced by employee is solved seriously by information system unit", by high agreement degree (means 4.01), And the lowest means was (3.89) for tow items (1, 4) "information systems unit offers service needed by employees quickly" by high agreement degree.

The total means for "service's quality" domain reached (4.00) by high agreement degree.

Table (7): result of the (Linear Regressions) analysis of the effect t system quality on improving the level of service quality (n= 100)

Independent variable	"t" value	"t" sig	B	R	R ²	"f" value	"f" sig
system quality	10.791	0.00	0.595	0.737	0.543	116.791	0.00

* Dependent variable: service quality

Table (7) shows that a statistically significant effect at significant level ($\alpha \leq 0.05$) of system quality on improving the level of service quality in prince Hamzah hospital in Jordan, where "f" value reached (116.791) by statistically significant (0.00). (R) value reached (0.737), and (R²) value reached (0.543). **so we conclude that there is a statistically positive effect at significant level ($\alpha \leq 0.05$) of the system quality on the improving the level of the service quality in prince Hamzah hospital in Jordan**

Table (8): result of the (Linear Regressions) analysis of the effect information quality on improving the level of service quality (n= 100)

Independent variable	"t" value	"t" sig	B	R	R ²	"f" value	"f" sig
information quality	8.938	0.00	0.585	0.670	0.449	79.888	0.00

* Dependent variable: service quality

Table (8) shows that a statistically significant effect at significant level ($\alpha \leq 0.05$) of information quality on improving the level of service quality in prince Hamzah hospital in Jordan, where "f" value reached (79.888) by statistically significant (0.00). (R) Value reached (0.670), and (R²) value reached (0.449). **so we conclude that there is a statistically positive effect at significant level ($\alpha \leq 0.05$) of the information quality on the improving the level of the service quality in prince Hamzah hospital in Jordan**

Conclusions and future work

This research is one of the early researches that are interested in investigating information system Quality impact. Research model able to help Healths Care Organizations in improve service quality through provide better understandability how information system quality contribute to improve service quality.

The results show a significant effect of system quality and information quality on improving the level of service quality in prince Hamzah hospital in Jordan in 2015. The commitment of the management is vital to improve the system that is explicit and unmistakable in the implementation

The research team will be further refining the 'Quality' criterion and developing user interfaces which can be used to measure user acceptance and satisfaction with the quality information retrieval process from the web.

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