

The Relationship between System Quality, Information Quality, and Organizational Performance

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Abstract : The system that used modern technologies can present information to users in an easy-to-understand format enabling them to use information systems effectively and improve the performance , high quality of the system leads to high quality of the information .The high quality of information helps organizations in managing their business processes , making decisions , and improve organizational performance. The aim of this study is to clarify the concept of system quality, information quality ,and organizational performance. In addition explain the relationship between system quality , information quality and organizational performance. This paper reviews other researches. Synthesizing from the literature , We hypothesize a positive relationship between system quality , information quality and organizational performance.

Keywords : Information Systems, System Quality, Information Quality, Organizational Performance.

1. INTRODUCTION

There is no doubt that a good system in the organizations will produce good information and this information will effect on the organization as a whole. According to Gorla [1] system quality and information quality are measures of information systems quality . For example, system quality represents the quality of information processing itself, which is characterized by employment of state-of-the-art technology, a system offering key functions and features , and software that is user friendly, easy to learn, and easily maintainable .Information quality, a concept that is related to the quality of information system outputs, can be described in terms of outputs that are useful for business users, relevant for decision making, and easy-to-understand (representing IS quality as value) as well as outputs that meet users' information specifications (representing IS quality as conformance to specification) . According to Lee ,et al.[2] Information quality has become a critical concern of organizations and an active area of information systems research. Therefore, it is important to any organization to attention on the system quality to the improve the quality of information produced as well as the improvement of the organizational performance of the organization.

2. THEORETICAL BACKGROUND

The theoretical background is organized into three sections. The first section describes IS success models.

The second section describe system quality, and the third section describes the information quality.

2.1 IS SUCCESS MODELS

Delone and Mclean [3] performed a review of the research published during the period 1981–1987, and created taxonomy of IS success based upon this review. In their 1992 paper, they identified six variables or components of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact Petter et al [4]. System quality is one of the most studied dimensions of IS success is system quality. It refers to measures of the information processing system itself, basically how well the hardware and the software work together. Meanwhile Information quality is measures of information system output rather than measure the quality of the system performance, other IS researchers have preferred to focus on the quality of the information system output, namely, the quality of the information that the system produces, primarily in the form of reports [3].

In addition Delone and Mclean [3] state that system use has been proposed as a success measure in many IS conceptual models and empirical studies. System use is the degree and manner in which staff and customers utilize the capabilities of an information system. For example: amount of use, frequency of use, nature of use, appropriateness of use, extent of use, and purpose of use [4]. Meanwhile User satisfaction is considered one of the most important measures when investigating overall IS success [5]. Petter and Mclean [6] defined user satisfaction as Approval or likeability of an IS and its output .According to Delone & Mclean [3] user satisfaction is recipient response to the use of the output of an information system.

In addition Delone and Mclean [3] define individual impact as the effect of information on the behavior of a recipient and indicate that it is closely related to an individual's performance. Moreover organizational impact is the effect of information system on organizational performance. There are a lot of items for measure the organizational impact such as staff reduction, overall productivity gains, increased revenues, increased sales, increased profits, increased work volume, product quality, and contribution to achieving goals etc [3] .Moreover organizational performance is accumulated end results of all the organization's work processes and activities [7].

2.2 SYSTEM QUALITY

2.2.1 System

According to Ramachandra and Srinivas [8] a system is set of elements joined together to achieve common objectives i.e. group of elements organized with a purpose. The systems often have multiple goals. The system utilizes computer hardware and software, manual procedures, management and decision models and database. A system is made up of sub-system, which may be composed to further sub-system. Sub-systems send and receive data from each other. According to O'Brien and Marakas [9] a system is a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives by accepting inputs and producing outputs in an organized transformation process. Many examples of systems can be found in the physical and biological sciences, in modern technology, and in human society. Thus, we can talk of the physical system of the sun and its planets, the biological system of the human body, the technological system of an oil refinery, and the socioeconomic system of a business organization. According to Belle, et al. [10] a system is an organized assembly of components with special relationships between the components. According to Hardcastle [11] a system can be defined as a collection of components that work together towards a common goal. The objective of a system is to receive inputs and transform these into outputs.

2.2.2 System Quality

System quality is the desirable characteristics of an information system. For example ease of use, system flexibility ,system reliability ,ease of learning, intuitiveness , sophistication , response time [4]. Ease of use is the degree to which the users perceived that by using IS they need less effort to use the system. In addition a quality of IS needs to be flexible enough in order for the user to use the system .Flexible IS means the ability to customize the system based on the conditions and the internal and external changes .The lower the flexibility of the system, the lower the user's satisfaction which later impacts the user's engagement to the system. Moreover reliability is important indicators of quality IS .Reliability is defined as the degree of which the users can trust the IS. in addition ease to learn is important indicators of quality IS . Ease to learning is the degree to which users perceived that the system easy to learn. as well as system features of intuitiveness, sophistication, and response times are important indicators of quality IS. Response time is the length of time taken by a system to response to an instruction. Longer system response times may cause lower satisfaction of users.

2.3 INFORMATION QUALITY

2.3.1 Data and Information

The word data is the plural of datum, though data commonly represents both singular and plural forms. Data are raw facts or observations, typically about physical phenomena or business transactions. Data is raw unprocessed facts and figures that have no context or purposeful meaning and information is processed data that has meaning and is presented in a context [12]. Data can take many forms, including traditional alphanumeric data, composed of numbers and alphabetical and other characters that describe business transactions and other events and entities. Text data, consisting of sentences and paragraphs used in written communications; image data, such as graphic shapes and figures; and audio data, the human voice and other sounds, are also important forms of data. According to Shim [13] Data are usually the input of a management information system (MIS). After data are processed by the MIS, information will be generated. Users can then use information for decision making. Data are normally organized into files' tables, and files are organized into database. Users can retrieve data as input of application software and produce information as output. Information is a collection of facts organized or processed in such a way that they have additional value for further use. Information is valuable and useful because it can help decision makers. According to Hardcastle [11] Data is a raw fact and can take the form of a number or statement such as a date or a measurement .information is generated through the transformation of data. According to O'Brien and Marakas [9] Information as data that have been converted into a meaningful and useful context for specific end users. According to Ramachandra and Srinivas [8] information is the data that is processed in a form which helps the management to take decisions i.e. it is the data that have been put into a meaningful and useful context and communicated to a recipient who uses it to make decisions. The relation of data to information is that of raw material to finished product. The word information is a processed data, useful or relevant data, data with surprise value, data which is useful in the decision making process. Figure 1 explain how to transforming Data into Information [14].

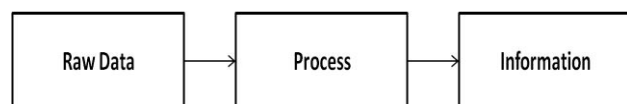


Figure 1: Transforming Data into Information

2.3.2 Information Systems

For the last twenty years, different kinds of information systems are developed for different purposes, depending on the need of the business. Each plays a different role in organizational hierarchy and management operations [15]. According to O'Brien, & Marakas, [9] information

system (IS) can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization.

2.3.3 Information quality

Information quality is the desirable characteristics of the system outputs. For example relevance, understandability, accuracy, conciseness, completeness, currency, timeliness, usability [4]. The output of the information systems should be relevant to the purpose for which it is required, easy to understand, accurate or less error, concise, complete or contains all the required information, currency, quick availability and timely to support information needs, and usability. According to Al-Mamary et al [16] A number of researchers consider information quality as important factor to MIS success in organization.

2.3.4 Characteristics of Information Quality

- **Accuracy**

Accuracy means how accurate is the information or how much error does it contain? [10]. Information needs to be accurate enough for the use to which it is going to be put [12]. MIS information should be accurate and avoid any inclusions of estimates or probable costs .

- **Relevance**

Information should be relevant to the purpose for which it is required. It must be suitable. What is relevant for one manager may not be relevant for another [12]. According to Belle, et al. (2001). Relevance means how pertinent is the information to the question? According to Lee ,et al. [2] measures of relevance are this information is useful to our work, this information is relevant to our work, this information appropriate for our work, and this information is applicable to our work .

- **Completeness**

Information should contain all the details required by the user [12]. Completeness means Does it contain all the important facts? [10]. According to Lee ,et al. [2] measures of completeness is this information includes all necessary values .This information is complete .This information is sufficiently complete for our needs. This information covers the needs of our tasks. This information has sufficient breadth and depth for our task. According to Kahn, et al. [17] completeness is the extent to which information is not missing and is of sufficient breadth and depth for the task at hand .

- **Timeliness**

Information must be on time for the purpose for which it is required. Information received too late will be irrelevant [12]. Data must be available for the intended use within a reasonable time period. According to Lee ,et al.[2].measures of timeliness are This information is sufficiently timely, This information is sufficiently current for our work, this information sufficiently up-to-date for our work. According to Kahn, et al. [17]. Timeliness is the extent to which the information is sufficiently up-to-date for the task at hand.

- **Conciseness**

According to Kahn, et al. [17] concise representation is the extent to which information is compactly represented. According to Patterson [12] information should be in a form that is short enough to allow for its examination and use. There should be no extraneous information. According to Lee ,et al. [2] measures of concise representation are this information is formatted compactly, this information is presented concisely, this information is presented in a compact form, and the representation of this information is compact and concise .

- **Appropriate Amount of Information**

According to Kahn, et al. [17] appropriate amount of information is the extent to which the volume of information is appropriate for the task at hand. According to Lee ,et al.[2] measures of appropriate Amount are the amount of information sufficient for our needs; the amount of information is neither too much nor too little .

- **Consistency**

According to Lee ,et al. [2] measures of consistent representation are this information is consistently presented in the same format, this information is presented consistently. This information is represented in a consistent format. According to Kahn, et al. [17] consistent representation is the extent to which information is presented in the same format .

- **Understandability**

According to Lee ,et al. [2] measures of understandability are this information is easy to understand, the meaning of this information is to understand, this information is easy to comprehend. According to Kahn, et al. [17] understandability is the extent to which information is easily comprehended .

- **Accessibility**

According to Kahn, et al. [17] accessibility is the extent to which information is available, or easily and quickly retrievable. According to Patterson [12] information should be easy to obtain or access. According to Lee ,et

al. [2] measures of accessibility are easily retrievable, easily accessible, easily obtainable and quickly accessible when needed.

3. ORGANIZATIONAL PERFORMANCE

Organizational performance is accumulated end results of all the organization's work processes and activities. The common measures for organizational performance are organizational productivity and organizational effectiveness. Organizational productivity is a measure of how efficiently employees do their work. Organizational effectiveness is measure of how appropriate organizational goals are and how well an organization is achieving those goals [7]. There are a lot of measures for the organizational impact and these measures differ from one researcher to another.

4. THE RELATIONSHIP BETWEEN INFORMATION QUALITY , SYSTEM QUALITY , AND ORGANIZATIONAL PERFORMANCE

Gorla et al. [1] assume that system quality is positively associated with information quality and organizational impact, and information quality is positively associated with organizational impact. Raymond and Bergeron [18] confirms that the quality of information output by a PMIS is strongly associated to the technical and service aspects of the system, that is, to system quality. According to Hasan et al. [19] there is significant relationship between system quality and information quality.

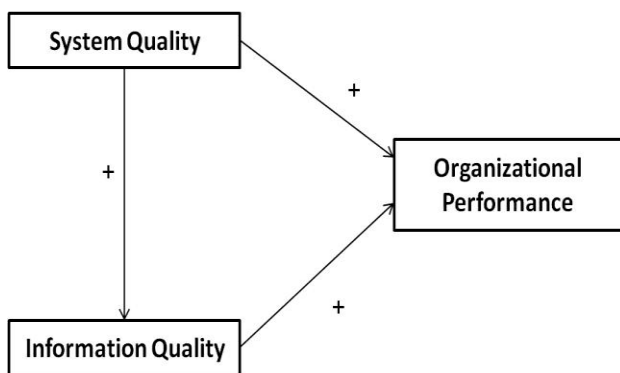


Figure 2: The relationship between system quality, information quality , and organizational performance

5. CONCLUSION

The quality of the system have a significant impact on the acceptance of the system. In addition its effect on the efficiency and effectiveness of the organizational performance in organizations. That's where the system that is ease of use and easy of learn will produce good quality of information. Moreover information quality will have a significant impact on the acceptance of the

information systems and improve the organizational performance. The quality of the system and quality of the information are considered as a key factors affecting IS acceptance and improve the organizational performance.

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