UCT JOURNAL OF MANAGEMENT AND ACCOUNTING STUDIES 2018(04)

Available online at http://journals.researchub.org

The Relationship Between the Quality of Hospital Information Systems and User Trust

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ARTICLE INFO

Article history:
Received 21 May 2018
Received in revised form 20 May 2018
Accepted 18 Sept 2018

Keywords:
System Quality,
Information Quality,
Hospital Information Systems,
Trust.

ABSTRACT

Objective: In the much complex and dynamic system of health, the smallest difference in services leads to increase in customer demand. Medical centers and hospitals need to expand internet and Application Service Providing (ASP) and to convert that in to a competitive, long-lasting choice. The present study was carried out with the aim of determining the relationship between the quality of service providing software systems and customer Trust in selected hospitals of Tehran University of Medical Sciences using similar hospital information systems. **Methodology**: This research is a correlation, descriptive analysis. The statistical group includes employees in the hospital revenue and clearance unit and the study was carried out through census and using questionnaire. To analyze the data, SPSS software was used and in addition to descriptive statistics of: frequency distribution and mean tables, inferential statistics like KS and Pearson tests were used. **Results**: With a 95% trust level one can conclude from this study that there is a meaningful relationship between the quality of service providing software programs with customer trust in the selected hospitals of Tehran University of Medical Sciences. Also, the results showed that the intensity of the relationship between trust and other variables of service quality, system quality and information quality is 0.835, 0.732 and 0.703 respectively (P<.05). **Conclusion**: Although all variables have positive and meaningful relationship with customer trust, their average is less than moderate limit so with regard to the meaningful relationship but less than average of the research variables, the managers in the field of health are advised to consider these issues in their management methods.

1. Introduction

Medical centres need an information technology that responds to patients' medical needs. They are aware that although development and maintenance of software programs is expensive, they are necessary for providing suitable service, remaining competitive and attracting customer, so medical centres and hospitals need to expand internet and Application Service Providing (ASP) and to convert that in to a competitive, long-lasting choice. Users engaged with information systems are effective arms of service provision in medical centres and their level of trust with such software are very important in providing suitable service. Software programs play an important role in marketing programs of many organizations and service excellence is part of the requested value package by the customers. Therefore, in open and competitive markets, procedures like qualitative service provision and advanced systems have attracted most of the attention (Kettinger & Lee, 1994). There is a meaningful relationship between customer involvement and their trust and reliance. There is also a certain concern regarding the importance of customer perceptions from service encounter, since from the customer's view the sign of service quality becomes evident at the time of service encounter i.e. the crucial moment when the customer contacts the organization (Pitt et al., 1995). That is why the quality of service software programs is mentioned as a key competitive weapon which leads to superiority of companies and the services provided by them from the customer's point of view (Yang et al., 2005). In design and development of information systems we must note that the employees are key elements that manage these systems. Often, admission of system user or consumer becomes a fundamental and decisive factor in an

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DOI: https://doi.org/10.24200/jmas.vol6iss04pp24-28

information projects' success or failure (Limam & Boutaba, 2010). In our country, universities of medical sciences and the private sector have spent a lot on launch, maintenance and support of hospital information systems under their care. Therefore, the government and investors must ensure this technology's effective use and its benefits. While (Gorla et al., 2010) concluded through a study that in many cases, the employees of health and medical institutes are not inclined to using information systems and so stop using them with the decrease in supervision and pressure of seniors. Understanding user behaviour with regard to new technology has changed to one of the most challenging issues in information systems' research (Chakrabarty et al., 2008). If hospital information systems do not respond to user needs (internal customers), they will be ignored or be even considered as a nuisance. Since hospitals, as any other business activity, require user trust for success and user trust also leads to decrease in expenses and increase in hospital income, in this study we have investigated the relationship between the quality of hospital information systems and user trust in selected hospitals of Tehran University of Medical Sciences.

1.1 Trust

Trust is the facilitating factor in human communications; trust enables people to perform business transactions and aids a more fluent economy. In another description trust is relied on as a belief or expectation of the salesman's word or commitment and the salesman will not misuse the customer's vulnerability (Aggelidis & Chatzoglou, 2002). Trust and risk are completely related and in other words risk is the nucleus of trust. According to a more accurate definition, trusting a commercial brand means customer tendency and his confidence in the commercial brand's capabilities and abilities in performing the determined responsibilities. Establishing the spirit of trust and honesty in the work place is very important and we must believe that the economic life of any organization as well as external customer trust, depends on the confidence the users have on the system (Hsiao et al., 2011). When we build trust in a person and make them believe they can meet the high-ranking managers of the service providing company and discuss their issues when necessary, we have certainly stabilized his presence in our company. Transformations and variations in service provision with regard to employee suggestions will encourage them to cooperation and so the employees consider themselves to be part of the company. Managers that pursue and study all users' views, even the unsatisfied users, and try to implement them are among successful managers (Ismail et al., 2010).

1.2 System Quality

One of the main techniques used by a service firm in order to signalize itself from other competitors is regular and qualitative service provision to customers. Many organizations and companies are aware of the vital fact that providing qualitative service can present them with a powerful competitive advantage; an advantage which leads to higher profit and to reach this aim it is simply enough to respond suitably to customer expectations of services provided or even surpass them (Kettinger & Lee, 1994).

1.3 Service Quality

Many organizations claim that "the employees are their main asset" but a small number of great managers actually believe in that (Ma et al., 2005). Hal Rosenbert states in his book "Customer is in Second Place" that organizations must initially focus and emphasize their employees. He notes that: "only when people feel superior in another person's view, they can honestly share this feeling with others" (Vaccarelli & Von Bergman, 2010). In services which require high contact, we tend to remember the roles played by behind the counter employees more than other aspects of the act; often the employees are part of the service. Due to inseparability of services, we tend to not dissociate the service from the person providing it. A unit employee may play several roles; for example, as part of the service received, part of the distribution system acts as counselling and guidance and marketing. In fact, employees in contact with the customers must simultaneously observe operational goals and marketing and on one hand the employees must produce and provide the service and actually be producers and on the other hand accept the responsibility of marketing. In summary it can be said that the employees play a threefold role in service provision. They act as operational experts, marketer and part of the service. This plurality or multiplicity may lead to role opposition among employees. As a result, organizations that possess widespread service encounter are inclined towards a more rigid and strict management than those who are not so and as the human element complicates stability in service provision, their responsibility for quality improvement and profit is also complicated (Xu et al., 2013). Front desk employees are considered "border spreaders" because they work at the borders of the organization. Border spreaders are the factor connecting external customer and the environment with internal activities of the organization. So, the first step is selecting suitable employees for service provision. Also, lack or underutilization of tangible factors in service provision increases the value and importance of employees engaged in providing service. In fact, due to their engagement with the customers, front desk employees have a major share in determining the quality level of the service provided. So, part of the effort towards improving service quality must focus on front desk employees. According to the concept of internal marketing, front desk employees are the aim of internal marketing strategy in order to improve the quality of service provision (Chang et al., 2012).

Hospital Information System (HIS) consists of an integrated system of producing information necessary for managing all activities related to health such as programming, supervision, coordination and decision making. Supporting hospital activities takes place at operational, tactical and strategic levels. The responsibility of the HIS is to utilize the computer and means of communication for gathering, reserving, processing, reviving and relating patient care and official information for all activities related to hospital. Human work labour as the most important and valuable asset of the organization can create a powerful and dynamic organization through optimal use of other resources. Clearly all software and hardware and advanced technologies are tools which requires educated, interested and committed work force for optimal use. Providing employee trust has undeniable effect on organization efficiency (Horan et al., 2006). In design and development of information systems one must consider that the employees are key elements managing such systems. If hospital information systems do not fulfil user expectations (internal customers) they will be ignored or even be viewed as a nuisance (Benlian et al., 2011).

1.4 Research Hypotheses:

Main hypothesis: there is a meaningful relationship between the quality of service providing software systems with customer trust

Secondary hypotheses:

1- There is a meaningful relationship between system quality and user trust.
2- There is a meaningful relationship between information quality and user trust.
3- There is a meaningful relationship between service quality and user trust.

2. Materials and methods

This research is a descriptive analysis carried out in 2015 in hospitals selected by Tehran University of Medical Sciences. The statistical group included all users working in revenue and clearance unit, estimated to be 102 at the time of research. "user" in this context means those hospital employees in the research participating in one way or another in entering, processing and retrieval of information and using this system is part of their work activity or responsibility. Due to limitations of the statistical group, no sampling was carried out and the study was performed through census and 102 questionnaires were distributed out of which 90 completed, documented questionnaires were obtained. The hospitals under study were Shari′ati, Moheb Yas, Razi and Roozbeh. In this study correlation method was used and to investigate factors field and library study were carried out. The tool used for gathering information was questionnaire. In this research the standard questionnaire of Kim et al was used to investigate the factors related to trust. This questionnaire consisted of two demographic parts of 4 questions and the specialized part of 12 questions in four aspects as explained in table 1. The questionnaire was based on Likert scale (1: completely disagree, 2: disagree, 3: no comment, 4: agree, 5: completely agree). Regarding the validity of this research, the questions are described according to theoretical principles and other similar research and with regard to details of each variable. The questions have also been discussed with scholars in the field and management professors and the original questionnaire was distributed after being edited. Therefore, the validity of the questions is confirmed with respect to contents. To estimate the constancy of the questionnaire Alpha Chronbach was used. In this study alpha Chronbach coefficient varied from 0.72 to 0.87 with regard to dimension separation.

To analyse the data in addition to descriptive statistics of: tables, frequency distribution percentage and average, inferential statistics like KS and Pearson tests were used.

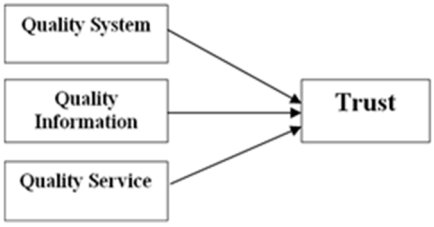

Figure 1. Conceptual Model

2.1 Demographic findings

Descriptive findings show that the participants in the research were mostly women (56%) mostly married (64%) between the ages of 31-40 (32%) and had a bachelor's degree (48%).

Research variables' distribution

To investigate customer trust distribution and the effecting factors KS test was used.

As the data in table 1 show the results of the KS test reveal that user trust and the effective factors (system quality, information quality, service quality and trust) are distributed normally among users ($p > 0.05$). Therefore, to describe the above variables, mean and standard deviation and to respond to research hypotheses, parametric tests are used.

Table 1. Evaluation of user Trust and factors affecting it

User Trust and factors affecting it	KS test	P value
Quality System	1.305	**.066**
Quality Information	1.091	**.185**
Quality of service	1.185	**.121**
Trust	**1.195**	**.115**

3. Discussion and results

The results state that the mean of factors effecting user trust in educational hospitals selected by Tehran University of Medical Sciences was between 2.97 and 2.62. so as is shown in table 2 the mean of factors affecting the quality of service providing software systems in educational hospitals of Tehran University of Medical Sciences was less than the average limit.

Also, investigations showed that the average user trust in educational hospitals selected by Tehran University of Medical Sciences was between 2.84 and so the average user trust from service providing software systems in educational hospitals of Tehran University of Medical Sciences was less than the average limit.

Table 2. Mean and standard deviation factors affecting user trust

Factors of affecting user trust	Average	Standard deviation	min	max
Quality System	2.97	.80	1.00	**5**
Information	2.62	.80	1.00	**5**
Quality of service	2.63	.80	1.00	**5**

Evaluating Research Hypotheses

Since variable are quantitative and no violation of normality is witnessed in data, to respond Pearson correlation coefficient was used.

Hypothesis 1 – meaningful relationship between system quality and user trust

The results of Pearson correlation coefficient in table 3 show that: there is a meaningful relationship between the quality of information systems and user trust ($P< 0.05$, $r = 0.734$). Positive correlation indicates that the higher the quality of service providing software systems, the higher the trust of users. This finding illustrates that null hypothesis is rejected and research hypothesis is approved. So, it can be said that there is positive and meaningful relationship between system quality and user trust in educational hospitals selected by Tehran University of Medical Sciences.

Hypothesis 2 – meaningful relationship between information quality and user trust

The results of Pearson correlation coefficient in table 3 show that: there is a meaningful relationship between the quality of information systems and user trust ($P< 0.05$, $r = 0.703$). Positive correlation indicates that the higher the information quality, the higher the trust of users. This finding illustrates that null hypothesis is rejected and research hypothesis is approved. So, it can be said that there is positive and meaningful relationship between information quality and user trust in educational hospitals selected by Tehran University of Medical Sciences.

Hypothesis 3 – meaningful relationship between service quality and user trust

The results of Pearson correlation coefficient in table 3 show that: there is a meaningful relationship between the quality of service providing systems and user trust ($P< 0.05$, $r = 0.721$). Positive correlation indicates that the higher the service quality, the higher the trust of users. This finding illustrates that null hypothesis is rejected and research hypothesis is approved. So, it can be said that there is positive and meaningful relationship between service quality and user trust in educational hospitals selected by Tehran University of Medical Sciences

Table 3. Pearson correlation test

Factors affecting the ASP	Trust	
	Pearson correlation coefficient	**P value**
Quality System	0.734	**.001**
Information	0.521	**.001**
Quality of service	0.721	**.001**

4. Conclusion

This research aimed at determining the relationship between the quality of service providing software systems with user trust in selected hospitals of Tehran University of Medical Sciences. The research carried out by Chou & Chiang (2013) in small and medium companies of South Korea showed that the quality of the system in information systems do not lead to trust while the results of the present study revealed that the main factor related to user trust is the quality of service providing software systems. The more these systems are operationally powerful, simple and equipped with smart systems based on recognition, trust increases. The reason for this unconformity can be the nature of the services provided by service companies with hospitals' users.

Also, in findings of Chou & Chiang (2013) it was shown that the quality of information systems' information leads to trust which is parallel to the findings of this research. In addition, the study performed by Bevan (1999) titled "Investigating the Effect of Organizational Citizen Behaviour on the Success of Information Systems" also confirms this fact. In the end the results indicated that there is positive and meaningful relationship between the quality of service providing software systems and customer trust. Also, in Chou & Chiang (2013) it was stated that the quality of the information systems' services leads to trust which conforms to the results obtained from the present study.

Finally, with 95% confidence level from the present study one can conclude that there is meaningful relationship between the quality of service providing software systems with user trust in selected hospitals of Tehran University of Medical Sciences and there is higher correlation in the relationship between system quality and user trust. Investigating the variables of this research showed that although all variables have a positive and meaningful relationship with user trust, their mean is less than the average limit so it is proposed that hospitals look for ways of producing ideas and values and higher quality information systems so that the users believe better service provision through this system is impossible in other similar centres (competitors). Also, the hospitals can provide services which respond to welfare, security, superiority and uniqueness and special requirements of the users. In order to improve

information quality, hospitals can equip systems to video conferencing between medical experts and make the information available through the internet and telephone communication (mobiles) and utilize multimedia technologies for recording all kinds of audio-visual information. Constant face-to-face communication of organization managers and software users and analysing their complaints is also a common and suitable method for promoting the quality of information systems.

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How to Cite this Article:

MaeboodMojdehi Z., Nasiripour A., Raeissi P., The Relationship Between the Quality of Hospital Information Systems and User Trust, Uct Journal of Management and Accounting Studies 6(4) (2018) 24–28.