

# Attitude of Staffs Towards the Information Technology Impact on Organizational Strategy of the Hospitals

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**Background:** Medical management, a main asset in strategic decision-making, must be based on the use of information and communication technology, till provides strategic services. However, it is not clear how much information technology is helpful in hospitals for their strategies; this is a gap in health care organizations.

**Objectives:** This study aimed to investigate the impact of information technology (IT) on organizational strategy in hospitals.

**Patients and Methods:** This study was performed on 325 administrative and medical staff in hospitals affiliated to Semnan university of medical sciences in Iran in 2014. Data were collected by anonymous self-administered, valid, and reliable questionnaires and analyzed by Mann-Whitney U and Kruskal-Wallis tests.

**Results:** About 44.4% of participants reported that IT has been somewhat effective in management decisions, 43.7% reported that information technology has somewhat improved provided services and efficiency of departments. Also, 24.5% of them reported that IT has been very much helpful in costs reduction of departments. Significant relationship was found between education level of the study subjects and their attitudes ( $P = 0.03$ ).

**Conclusions:** The results showed that the use of information technology in hospitals had several effects on some aspects of organizational strategy such as organizational knowledge, medical economics, and organizational decisions. In order to set up the governance of information technology in health system, it is necessary to involve managers and personnel alike in redesigning information systems and revising operational processes in hospitals.

**Keywords:** Health Information Technology; Organization; Strategy; Hospitals

## 1. Background

Information systems in organizations are not only used for the daily exchange of information, but also play a vital role in achieving competitive advantages in businesses (1, 2). However, lack of centralized control, proper prioritization of tasks, proper insight toward the needs of health care providers, and evaluating systems based on financial measures, all together have led organizations to adopt a strategic vision in this filed (3). To put it simply, Information Technology (IT) is consisted of knowledge, ability, and access to digital software and tools (hardware and software equipments) to produce, process, store, collect, save, protect, distribute, transfer, and retrieve information in a safe and secure manner so that to improve the organizational performance (4).

Moreover, a good strategic management approach tries to incorporate scientific analysis with intuitive judgments to take its advantages too (5, 6). As a main tool in strategic decision-making, medical management must be based on the use of information and communication technology in health centers, to provide strategic services, change

the technology, and increase its use (7). Currently that the management systems spend their largest investments on IT and information systems, hospitals have no choice but to use IT as a strategic resource to achieve their objectives; in such a condition, the concept of aligning IT and business strategy will come true (8, 9). Research in the field of strategic alignment indicates a positive and significant relationship among competitive strategies, IT, and organizational performance. Managers who succeeded to make an alignment between organizational strategy and IT in their business emphasize that such an alignment seems to be necessary for the survival and success of organizations (10, 11). In addition, IT can act both as a stimulus and aid for strategic management (12).

Although several studies have been conducted on information systems in hospitals, so far there has been no study to evaluate the impact of information systems (such as hospital information systems and office automation) on the organizational strategy. Internal customers of these information systems are typically called the us-

ers. These users use these systems every day and evaluate their quality. Users' understanding of these information systems is important for acceptance and evaluation of the information system. Their satisfaction of the practical aspects of these systems marks the IT alignment with organizational strategy.

## 2. Objectives

It is still unclear how much setting up of an IT system in hospitals is helpful for their strategies, which is an information gap in health care organizations. Because the main element of an information system is the user, his or her satisfaction affects the growth and survival of the IT and organization. Hence, this study aimed to investigate employees' attitudes towards the impact of IT on organizational strategy in hospitals.

## 3. Patients and Methods

### 3.1. Subjects and Settings

This descriptive study was performed on administrative and health care practitioners working in two hospitals (Amir Al Momenin and Kosar) affiliated to Semnan University of Medical Sciences, Iran. The hospitals were selected because they had clinical and administration information systems and their systems were connected to the Internet since 2008. The research was conducted from September 2014 to October 2014. All of the practitioners (n = 325) were included in this study.

### 3.2. Data Collection

For this study, an anonymous self-administered questionnaire was developed. First, a 17-item survey was developed after reviewing Health IT literature. The questionnaire was divided into two areas: 1) demographics section, including sex, age, education, work experience, and occupation, and 2) Impact of IT on the agenda of the hospital, as well as staff training, work requirements, the shift adjustment, data entering in information systems, employee performance, management decisions, efficiency of services provided, timely notification, time saving, costs reduction, and the career promotion of staff. The attitudes were graded as very low = 1, low = 2, somewhat = 3, high = 4, and very high = 5.

Then, the primary questionnaire was reviewed for content validity to evaluate the content validity index. In this regard, the questionnaire was given to 10 experts in management and health IT areas to offer their suggestions based on a 4-Likert scale regarding the aspects of simplicity of questions, relationship of questions, and clarity of questions. The ratio of the number of responses with scores of 3 and 4 to the total responses (10) was calculated for each question and each area. The questions with scores higher than 0.8, were regarded as suitable. The questions with the score less than 0.8

were removed or rewritten as recommended by the experts, and then they were reevaluated by them. In the next step, the mean scores for all three sections were calculated and were documented. Next, the questionnaire was rewritten focusing more on the experts' suggestions.

Then, we piloted the questionnaire on 30 administrative and health care practitioners randomly selected from the hospitals. Participants in the pilot study were later excluded from the study. Internal consistency was expressed as the Cronbach's alpha of 0.792 for the second section of the questionnaire. In the continuation, further revisions were made and some statements were rephrased. Lastly, the final version of the anonymous questionnaire was distributed among administrative and health care practitioners who were working in the hospitals and they were asked to complete the questionnaire. The questionnaires were returned to the researcher at most 72 hours later.

### 3.3. Data Analysis

SPSS was used to perform statistical analysis. In this regard, the mean and standard deviation for each variable was reported. Mann-Whitney U and Kruskal-Wallis tests were used to investigate significant differences among attitudes score in the study subjects. The significance level was set at P value < 0.05.

### 3.4. Ethical Considerations

First, we obtained ethical approval from the Semnan university of medical ethics committee. Then, we prepared a cover letter describing the purposes of the study. The letter explained that responding to the survey indicated the participants' consent to take part in the research. It also assured the participants that all responses would be kept confidential.

## 4. Results

The total response rate for the questionnaires was 61.5%. In total, 200 out of 325 questionnaires were returned. The results indicated that 162 (81%) participants were female, 113 (56.5%) were nurses, 159 (79.5%) of the participants had at least a bachelor's degree, 91 (47.4%) were less than 30 years old and 136 (74.3%) had work experience of less than 10 years (Table 1).

In this study, 38 (19.1%) participants reported that IT has had a significant impact on employee's training; 45 (22.6%) people reported that IT has had a significant impact on employees' performance; 87 (44.4%) people reported that IT has been somewhat effective on management decisions; 87 (43.7%) participants reported that IT has partially affected the improvement of services and efficiency of departments; 63 (31.5%) people reported that IT has been greatly saved employees' work time; 49 (24.5%) of them reported that IT has been very much help-

ful in costs reduction of departments; and 80 (40%) people reported that IT has been somewhat effective in staffs' job development (Table 2).

A Significant difference was found between education level of the study subjects and their attitudes ( $P = 0.03$ ; Table 3).

**Table 1.** Demographic Characteristics <sup>a</sup>

Characteristics	Values
<b>Gender</b>	
Female	162 (81)
Male	38 (19)
<b>Age, y</b>	
<30	91 (47.4)
30 - 40	64 (33.3)
40 - 50	35 (18.3)
> 50	2 (1)
<b>Education degree</b>	
Diploma	23 (11.5)
BA or BS	159 (79.5)
MA or MS	10 (5)
PhD	8 (4)
<b>Work experience, y</b>	
<10	136 (74.3)
10 - 20	30 (16.4)
> 20	17 (9.3)
<b>Occupation</b>	
Physician	8 (4)
Nurse	113 (56.5)
Employee	70 (35)
Other	9 (4.5)

<sup>a</sup> The values are presented as No. (%).

**Table 2.** Distribution of Staffs' Attitudes About the Impact of IT <sup>a</sup>

Attitudes Impact of Information Technology	Very High	High	Somewhat	Low	Very Low	Values
Hospital plans	5 (2.5)	64 (32.2)	105 (52.8)	20 (10)	5 (2.5)	2.77 ± 0.76
Staff training	8 (4)	38 (19.1)	91 (45.7)	52 (26.1)	10 (5)	2.91 ± 0.90
Business needs	14 (7)	66 (33.2)	95 (47.8)	14 (7)	10 (5)	3.30 ± 0.89
Set shift staff	4 (2.2)	20 (10.8)	60 (32.4)	51 (27.6)	50 (27)	2.34 ± 1.05
Data entry system	18 (9.3)	31 (16)	52 (26.8)	35 (19)	58 (29.9)	2.57 ± 1.31
Performance and working status staff	1 (0.5)	45 (22.6)	92 (46.2)	46 (23.2)	15 (7.5)	2.85 ± 0.87
Management decisions	18 (9.2)	36 (18.4)	87 (44.4)	39 (19.9)	16 (8.1)	3.01 ± 1.04
Provide services and improving performance	8 (4)	38 (19.1)	87 (43.7)	46 (23.1)	20 (10.1)	2.84 ± 0.98
Timely notification	8 (4)	17 (8.5)	104 (52)	47 (23.5)	24 (12)	2.69 ± 0.93
Save time employees	18 (9)	63 (31.5)	58 (29)	49 (24.5)	12 (6)	3.13 ± 1.07
Cost reduction	9 (4.5)	49 (24.5)	85 (42.5)	36 (18)	21 (10.5)	2.94 ± 1.01
Promotion and advancement of employees	2 (1)	52 (26)	80 (40)	47 (23.5)	19 (9.5)	2.86 ± 0.94

<sup>a</sup> Data are presented as No. (%) or mean ± SD.

**Table 3.** Differences Among Attitudes Score in the Study Subjects

Characteristics	Average <sup>a</sup>	P Value
<b>Gender</b>		0.71
Female	0.46 ± 2.88	
Male	0.39 ± 2.93	
<b>Age, y</b>		0.94
< 30	0.48 ± 2.87	
30 - 40	0.37 ± 2.95	
40 - 50	0.39 ± 2.95	
> 50	0.53 ± 2.87	
<b>Education degree</b>		0.03
Diploma	0.3 ± 2.8	
BA or BS	0.47 ± 2.91	
MA or MS	0.27 ± 3.01	
PhD	0.22 ± 2.69	
<b>Experience, y</b>		0.76
< 10	0.44 ± 2.91	
10 - 20	0.38 ± 2.92	
> 20	0.5 ± 2.85	
<b>Occupation</b>		0.05
Physician	0.22 ± 2.69	
Nurse	0.49 ± 2.85	
Employee	0.37 ± 3	
Other	0.44 ± 2.85	

<sup>a</sup> The values are presented as Mean ± SD.

## 5. Discussion

The present study examined the employees' attitudes toward the impact of IT on organizational strategy. The findings showed that half of the studied population believed that computer systems can save employees' time to a great extent. However, studies have indicated that the implementation of hospital information systems has been effective in reducing work hours of the clinical staffs (13, 14). Apparently, the use of IT by the studied population was partially effective in facilitating the processes and reducing staffs' referrals to other sectors and provided a better and broader access to information. Hopefully, the application of IT accelerates the operational processes and plays an invaluable role in optimizing time and increasing work efficiency of employees and finally increasing the productivity of the organization (15). Perhaps, redesigning work processes improves the effectiveness of IT, which is required for speeding up the organization.

According to the results of this study, half of the studied population reported that computer systems had a partial impact on better provision of services and improving the efficiency of different sectors. Several study results have

shown that IT could improve staffs' services (16, 17). The results of this study indicated that the use of computer systems by the studied population had been partially effective in accelerating the process of service delivery and timely response to the opportunities and threats using the collected data. As indicated by the previous studies, information systems can optimally collect, analyze, and transfer data and accordingly, support organizations to achieve their goals and perform their administrative duties. In this way, they can increase the efficiency and effectiveness of the organizations (18, 19). Evidently, redesigning existing information systems based on current processes and drawing out a logical pattern from the system can make IT more effective.

Our findings showed that less than half of the studied population reported the high impact of computer systems on the performance of different units and working conditions of employees. However, in a study by Moradi et al. which evaluated the role of hospital information system in improving the performance of Doctor Sheikh hospital in Mashhad, the results showed that the use of IT had a positive effect on hospital performance via reducing patients' waiting time, reducing costs, and accelerating as well as simplifying the tasks (14). The findings of this study suggest that the use of IT by the studied population, although had largely accelerated the calculation and transfer of data, had not been successful to fulfill the short-term, mid-term, and long-term goals and strategies, which had been designed to detect and eliminate the weaknesses and poor performance of the units and staff.

On the contrary, it was not able to improve the quality of decisions made by supervisors and managers to solve structured and non-structured problems. As a result, according to the findings of this study, less than half of the studied population reported that computer system was partially effective in management decisions. As indicated by other studies, IT can quickly process data and make management decisions more effective, and hence it can facilitate controlling and coordinating the operations in an organization which results in modification or improvement of organizational performance (19, 20). Evaluation of the quality of computer reports and comparing them with the real operations of different units may solve this problem. The results suggested that almost half of the studied population believed that the use of computer systems was somewhat effective in the promotion and advancement of employees. Other studies indicate that IT has a significant impact on the staffs' professional development and job satisfaction (21, 22). In addition, Hamidi and Yarahmadi showed that according to 92.3% of respondents, the impact of IT on professional and job development was moderate to high (16). This difference could imply that the use of IT by the studied population had somewhat been useful for career development, empowerment, and job planning, because there was a significant relationship between the use of IT and career development of employees.

Hence, employees can use technology to obtain information about their working environment and find some solutions to meet their needs and consequently develop and progress in their jobs (13). On the other hand, the results indicated that the use of IT by the studied population had been partially effective in increasing the organizational knowledge. According to the findings, half of the studied population reported the high impact of computer programs on training the staff. Nevertheless, it is expected that the use of IT leads to a rapid and uninterrupted access to vast amount of information and improves communication among experts, and increases their awareness; moreover, it can train the employees via providing them with the access to diverse sources of information and finally can lead to organizational learning (12).

The results showed that a quarter of individuals participating in this study believed that the use of computer networks had a large effect on reducing the cost of processes in their departments. The findings indicated that utilization of IT by the studied population did not avoid duplication of work, loss of capital, and improper use of equipments and facilities. Supposedly, IT should support financial, physical, and human resource management via facilitating and accelerating the collection of data, organizing data, accessing and exchanging information, which consequently results in the reduction of organizational costs (11). Our findings are in line with the results of a study by Safdary et al. 22.47% of participants in their study believed that the use of IT had a very trivial impact on reducing unnecessary admission of patients and duplication of works (4). The findings of this study should be interpreted with caution, because firstly this study was conducted using a researcher made questionnaire and consequently it might have its own potential problems such as ambiguity of the questions and likely bias, which weaken the results of the study. However, because of the high validity and reliability of the questionnaire such items have a little effect on the results. Secondly, as 40% of the target population did not participated in this study and the research was conducted only at one city, the results of the study cannot be generalized to all population. Hence, it is better to conduct further studies on larger scales. It may be necessary to carry out some other researches about the role of culture on the use of IT in hospitals.

The results showed the employees believed that the use of IT in hospitals had several effects on some aspects of organizational strategy such as organizational knowledge, medical economics, organizational decisions, and empowerment of the staff; in some of these aspects it partially succeeded while it failed in others. In order to set up the governance of IT in health system, it is necessary to encourage the managers and staffs to redesign information systems and revise operational processes in hospitals.

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## Authors' Contributions

Mehdi Kahouei prepared grant submissions for the project and was involved in the planning, preparation, and approval of the original questionnaire. Maede Khaste, Nahid Rezaeian conducted the questionnaire survey and data collection. All authors contributed to the writing of the article, read it, and approved the final manuscript.

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