An Assessment of End User Computing Satisfaction at a Hospital

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ABSTRACT

The purpose of the study is to assess the degree of EUCS (end user computing satisfaction) at European Gaza Hospital. The study explores the main domains of EUCS. A model for EUCS is proposed and a questionnaire related to the model was distributed to officials at European Gaza Hospital (EGH) in order to understand the attitudes and opinions of hospital staff related to end user computing satisfaction with a new computer system that has been implemented. Results of the study are reported based on the dimensions laid out in the end user computing model that was constructed for the study. Recommendations for future research are also discussed to better understand the issue of end user satisfaction.

Keywords: Information Systems Development, end-user computing satisfaction, Human Computer Interaction, Hospital, implementation

1. INTRODUCTION

The information system development literature suggests that end users’ perception of successful final system is often addressed through end user satisfaction, which serves as a substitute measure of system effectiveness. Satisfaction is the most commonly used success measure in the literature (Armstrong, 2005; Baroudi, 1988; Ives, 1983; Jiang 2002). In particular, end user information satisfaction is the “extent to which users believe the information system meets their information requirements. (Ives, 1983).

Within the computing world, the proliferation of the use of information systems has brought about the desire to understand end user computing satisfaction (EUCS) and the way in which the views of a computer user can affect how he or she perceives the usefulness of the system (Gao, 2004). On an annual basis, companies around the world spend upwards of $1 trillion a year on for information technology. While this amount may seem unbelievable, it is actually estimated to increase at a rate of 10% per year (Seddon, Patnayakuni, & Bowtell, 1999). According to Forrester Research (2010), companies and government agencies are expected to spend $1.6 trillion on information technology throughout 2010. With so much in financial resources being spent every year on information technology, it is important to understand the specific characteristics that are associated with high levels of end user computing satisfaction.

The purpose of this research paper is to examine end user computing satisfaction among a sample of professionals working at a hospital in Gaza. This research will begin with a statement of the problem to be addressed, as well as the research questions that are presented to guide the current study. Next, a brief overview of some of the theories and models of end user computing satisfaction will be examined. Based on these models and the information that is reviewed, a model of end user computing satisfaction will be presented as the theoretical basis of the current research. Then, the methodology of how the data for this study was collected will be reviewed. Finally, the results of the study and the
conclusions drawn from those results will be presented.

In the end, the importance of this research is that it can provide a means for other medical facilities to understand how to improve the level of satisfaction among their employees and professions in relation to the computer and information systems that are introduced. Even more, for those facilities that have situations where employees do not have a high degree of satisfaction, these findings might allow them to take steps to improve the level of satisfaction, or lack thereof that currently exists.

2. PROBLEM STATEMENT

The Palestinian Ministry of Health has spent a great deal of money to implement a new computer system at the European Gaza Hospital. In the future, the Ministry has plans to implement the same system across its other medical facilities. The problem, however, is that they system has been implemented at European Gaza Hospital without input from medical personnel, and will be implemented at other facilities without personnel input. However, hospital personnel can provide feedback, and the Ministry is interesting in understanding whether moving forward with the implementation of the computer system across all of its medical facilities and determining how it can increase the level of satisfaction and overall usefulness of the system for its personnel.

3. RESEARCH QUESTIONS

The following four research questions will guide the current study, and will be addressed based on the research that is conducted.

1) What is the level of EUCS with the computer system within the hospital?
2) What is the status of the computer system at the hospital in terms of its strengths and weaknesses in the opinion of hospital personnel?
3) Is the information contained in the computer system easy to obtain on the part of personnel, as well as having enough equipment to gain access to the information and support when assistance is needed?
4) Do significant differences exist in EUCS based on demographic and organizational variables?

4. THEORETICAL FRAMEWORK

In the literature concerning the characteristics associated with higher levels of end user computing satisfaction, one of the issues that is discussed as being important is the level of training that employees are provided by their organizations (Kendall, 1999; Khosrowpour, 2002; Information Resources Management Association, 1997). The reason that this characteristic is given so much attention is based on the idea that people will be more motivated to use a computer system and see the value that it can provide in terms of improving their own productivity if they feel comfortable using the system and know how it functions. Doll & Torkzadeh (1988) actually explain the meaning of end user computing satisfaction by stating that it is based on the user having an appropriate attitude toward the system that is being used. If employees are not educated on how to use a computer system, especially in relation to their specific tasks, then they will simply view the system as getting in the way of completing tasks and as not being useful for their needs. However, if they are given training and know how to use the system efficiently and effectively in relation to their jobs, then they are more likely to have a positive attitude toward the system.

Davis (2003), however, explains that the information obtained from a computer system is also important in relation to the level of end user computing satisfaction. He states that the information must be able to be obtained in a format that is easy to read and understand. In addition, the information must be reliable and complete. Otherwise, users will simply feel that a computer system contains information that is incorrect and not reliable enough to use in their daily jobs.

Levy (2006) explains that researchers in the area of end user computing satisfaction have developed models that largely contain the same five basic characteristics related to the information contained in computer and information systems. These characteristics are content, accuracy, format, ease of use, and timeliness. In order for users to have a high level of satisfaction in relation to the computer system, they must feel that they information contained in the system meets the criteria of including content useful to them, that the information is accurate, that it is in a format...
appropriate to their jobs, as well as being easy to use, and the information must be timely.

It is important to understand, however, that there are many different models related to end user computing satisfaction which take into account issues other than the information contained in an information system or its perceived ease of use on the part of organization members. For example, DeLone & McLean (2003) have put forth a model of end user satisfaction that begins with the quality of the information in the system, but adds the issue of service quality, which includes the ability to receive technical support when problems arise with the system or when questions arise that need to be answered immediately. The authors explain that the combination of information quality, system quality, and service quality work together to influence how users actually utilize a computer system, which in turns affects how they view the usefulness of the system.

Pitt, Watson, and Kavan (1995) also put forth the idea of service quality being an important factor in the level of end user computing satisfaction. The authors explain in their model that service quality is an important part not only in the level of use and user satisfaction of a computer information system, but also in the way in which the system is able to impact how individuals work within the organization. Seddon (1997) also includes the issue of service quality in his model of end user computing satisfaction. Again, the idea is that users have to be able to receive the technical support that they need and feel comfortable receiving help. This is in addition to a system that is considered to be of quality in terms of allowing users to retrieve information quickly and efficiently.

It should be noted that there has been debate among some researchers (Van Dyke, Prybutok, and Kappelman, 1999) about the validity of the concept of service quality in terms of how it is measured. It would seem appropriate to assume that service quality can mean many different things to different people. Some might view service quality simply as a system that is running appropriately all of the time, while others might view service quality as a system that has the latest equipment, as well as technical support personnel that can be contacted at any moment to provide assistance when problems do arise.

In the end, this brief of the theoretical framework behind the concept of end user computing satisfaction does reveal that there are similarities in the characteristics that are presented across many of these separate models. Concepts such as ease of use, training, accuracy of information, format of information, and the quality of the system are raised in most models. However, there is also the issue of service quality and the individuals characteristics that might be included in service quality, such as the quality of the equipment and access to technical support. Based on the information gathered from the review of the theoretical framework, a model of end user computing satisfaction is proposed for this research. Figure 1 shows the characteristics included in the proposed model.

![Figure 1: Proposed Model of End User Computing Satisfaction](image)

5. MATERIALS AND METHODS

The research for this study was conducted using a quantitative methodology. Standardized structure questionnaires were used to obtain information from the sample of professionals from European Gaza Hospital. Approval to conduct the research at European Gaza Hospital was obtained from the Hospital’s General Director. In addition, explanation letters were included with each questionnaire. Even more, each participant was informed that complete confidentiality and anonymity would occur regarding the information that they provided. This was ensured not only to protect the privacy of each participant, but also to
obtain the maximum level of participation possible.

The distribution of the questionnaire involved each participant being given the instrument along with an envelope. The participants were involved of the objectives of the research, as well as to complete the questionnaire and place it in the envelopes without writing their names or any other identifying information on them. The completed questionnaires were then collected in a way to ensure as much confidentiality and anonymity as possible.

6. SAMPLING

The sample for this study was taken from the personnel working for European Gaza Hospital. All professional employees at the hospital that wished to participate were included in the sample. This was done as a means of attracting the largest number of participants possible. In addition, the desire was to have as many participants from as many different professional areas of the hospital as possible in order to be able to examine the characteristics of end user computing satisfaction across as many professional areas as possible.

7. INSTRUMENT

The questionnaire used in the current study was constructed in order to ask questions related to each of the areas examined regarding the theoretical background of end user computing satisfaction. The questionnaire contained two parts. The first part consisted of 22 questions asking the participants about demographic information about themselves and their professional experience. The questions relating to professional experience included asking for information about their current positions within the hospital, as well as questions about their experience using computers and information technology. The second part of the questionnaire consisted of 84 questions related to the different characteristics of end user computing satisfaction. These questions were scored on a five-point Likert scale ranging from 1=strongly dissatisfied to 5=strongly satisfied.

8. RESULTS

The final sample of participants consisted of 241 people. Table 1 presents the demographic information for the participants included in the study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>160</td>
<td>66.4%</td>
</tr>
<tr>
<td>Female</td>
<td>81</td>
<td>33.6%</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>100%</td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than or equal 29</td>
<td>84</td>
<td>38.2%</td>
</tr>
<tr>
<td>30 – 40</td>
<td>116</td>
<td>44.8%</td>
</tr>
<tr>
<td>More than 40</td>
<td>41</td>
<td>17%</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>100%</td>
</tr>
<tr>
<td>Residency place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rafah governorate</td>
<td>90</td>
<td>37.3%</td>
</tr>
<tr>
<td>Khanyounis governorate</td>
<td>100</td>
<td>41.5%</td>
</tr>
<tr>
<td>Middle governorate</td>
<td>33</td>
<td>13.7%</td>
</tr>
<tr>
<td>Gaza governorate</td>
<td>14</td>
<td>5.8%</td>
</tr>
<tr>
<td>South governorate</td>
<td>4</td>
<td>1.7%</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>100%</td>
</tr>
</tbody>
</table>

In terms of the results of the study related to the first research question of the level of EUCS and the dimensions of EUCS as perceived by hospital personnel, Figure 2 shows that overall, most hospital personnel were satisfied with the computer system. Only a small percentage of participants stated that they were extremely dissatisfied with the hospital’s computer system.
The second research question presented for this study was the status of the computing system at the hospital in terms of its strengths and weaknesses. Figure 3 presents the level of satisfaction among the dimensions included in the EUCS model for this study. The figure shows that training appears to be a point of weakness from the standpoint of hospital personnel.

![Figure 3: User Satisfaction Scores](image)

Next, the desire was to understand the feelings of hospital personnel in terms of the information contained in the computer system and how they felt about the ability to extract information and use it. Figure 3 shows that hospital personnel felt that the system was generally easy to use, and that the content and system speed were good. In addition, they felt that the system was fast and the information could be extracted in a useful format.

Finally, the research question was raised regarding whether significant differences in EUCS exists based on demographic variables. The analysis of the data showed that there were significant differences in EUCS based on demographic variables. A series of one-way ANOVAs were performed and the results showed that significant differences existed in terms of age. Interestingly, the data suggest that those participants over the age of 40 actually had higher levels of EUCS as compared to those participants under the age of 40. In addition, the one-way ANOVAs also showed significant differences in EUCS based on other demographic variables, such as the department in which the participants worked. Finally, those participants that had taken three or more computer classes on their own reported a higher level of EUCS satisfaction as compared to those that had taken fewer than three computer training courses.

### 9. DISCUSSION

The results of this study seem to concur with the issues presented as part of the discussion of the theoretical framework regarding end user computing satisfaction. What seems to stand out as a major issue related to end user computing satisfaction among the participants at European Gaza Hospital is the level of training that they received on how to use the hospital’s computer system, as well as the general knowledge of computers from other courses they had taken on their own. Those participants with higher levels of computer training had a greater level of end user computing satisfaction than those that had less computer training. In addition, the data showed that demographic variables, such as the age of the participants, as well as the department in which they worked and the type of job performed indicated significant differences in end user computing satisfaction.

Interestingly, the users generally seemed to have a high level of end user satisfaction in terms of the actual system and the equipment associated with the system. This finding is important because it would suggest that users are not unhappy with the hospital’s information technology. Instead, the area where improvements need to be made are associated with the level of training that is received. It would appear that with specialized training on how to use the system in relation to specific job functions and specific departmental needs, the level of satisfaction among many of the users could be easily increased.

For the Palistian Health Ministry, this finding may be most important because it indicates that the money spent on the computer system was indeed worthwhile. The area that has been overlooked, however, is in ensuring that all hospital personnel have the training that they need to feel comfortable using the system in relation to their specific functions. With more emphasis on providing training, the Palistian Health Ministry could do more to ensure that the money spent on implementing the computer system that is currently in place at European Gaza Hospital is truly being utilized in the best means possible. The additional training would likely result in a greater level of satisfaction and ultimately a
10. CONCLUSION

The purpose of this study was to examine the dimensions of end user computing satisfaction among personnel at European Gaza Hospital. The results of the study showed that while users were generally satisfied with the various dimensions related to computing satisfaction in relation to the hospital’s computer system, there were important differences that existed based on computer training and the different departments and job functions of personnel within the organization. The importance of these findings on a practical level is that they provide further evidence for European Gaza Hospital specifically, and organizations in general, that providing specific training to personnel based on their departments and job tasks is an important factor in relation to obtaining higher levels of end user computing satisfaction.

The results in this study also reinforced the idea that training is an important dimension of end user computing satisfaction. While there are many dimensions to the larger concept of end user computing satisfaction, it appears that the level of training that a person has received in how to use an organization’s computer technology plays a vital role in how comfortable they feel in using the system in order to perform job tasks and to become more productive. This is a key finding if organizations around the world are spending in excess of $1 trillion a year on computer technology in order to improve employee productivity. Without taking the time to provide proper training, companies may not be receiving the largest benefit from the financial resources that they are allocating to computer technology.

11. REFERENCES