

Management Information Systems in Health Sector: Evidence of Mandatory Use

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Abstract — The purpose of this study is to investigate the factors that negatively impact the development of health information systems and the documentation of the theoretical model for the Mandatory Use of Software Engineering. The factors were investigated through a structured questionnaire on 120 users of the system of the General Hospital of Lamia in Greece, who had recent experience in the introduction of an integrated information technology system. The results of the analysis shows that targeted interventions of the administration of the Hospitals to inform, about expected net benefit of users, contribute to the acceptance and therefore to the functional and comprehensive introduction of information systems in health, highlighting the actual substance as tools in modern decision making.

Keywords-management information systems; health care; hospital; Greece.

I. INTRODUCTION

The rapid increase in health expenditure creates problems of sustainability in National Health Systems worldwide. Decision making in health aims to search and select the best solutions that define the best use of limited resources, the most efficient and qualitative confrontation of the health needs of the population and the maximization of the social benefit. Management Information Systems (MIS) in health sector is the critical tool for rational decision making and integral documentation in any effort of planning / programming implementation. The success of the implementation of management information systems depends on the attitude of users towards them especially under an environment that its used is mandatory, such as in hospital services that its use is imposed. Understanding the reasons why people accept or reject the information and communication technologies has proven decisive factor for their survival.

The best known bibliographic models-theories that have been developed to better understand the factors that contribute most to the user acceptance of the new technology are: the theory of reasoned action proposed by Ajzen and Fishbein [1], the model of acceptance of technology [2-3], the unified theory of acceptance and use of technology [4] and the integrated research model of Wixom and Todd [5].

We apply the above theories in hospital sector to show that the lack of user acceptance is the key barrier to the success of new information systems. We address the factors that explain why users accept or reject information systems and how their acceptance is affected by the mandatory use.

The rest of this paper is organized as follows. Section II describes the theoretical model and the research questions. Section III describes the statistical inference analysis and presents the results. Section IV addresses the conclusions.

II. PRESENTATION OF THE RESEARCH TOOL

The introduction of the Information System in the General Hospital of Lamia in Greece was implemented in a coordinated way and replaced the majority of previous procedures. It involved employees of all specialties (administrative, nursing, medical and paramedical staff) who are Integrated Information System users.

Therefore, we can consider the environment of the hospital as a mandatory environment and thus useful to investigate it through the model discussed above for mandatory environments (Model for Mandatory Use of Software Technologies - MMUST) of Koh, Prybutok, Ryan and Wu [6].

Based on the above theoretical model, the research hypotheses are as follows:

- H1: Higher quality information is associated with a higher level of satisfaction on the information.
- H2: Higher level of satisfaction on the information is associated with a higher level of expected performance.
- H3: Higher level of expected performance is associated with more positive attitude while using the system.
- H4: The social influence has a positive direct impact on the expected performance.
- H5: The positive attitude is associated with extensive use of the system.
- H6: The attitude of the user of the system is positively correlated with the user satisfaction by the system.
- H7: The use of the system is positively correlated with net benefits.
- H8: The overall satisfaction on the system is positively correlated with the net benefits.

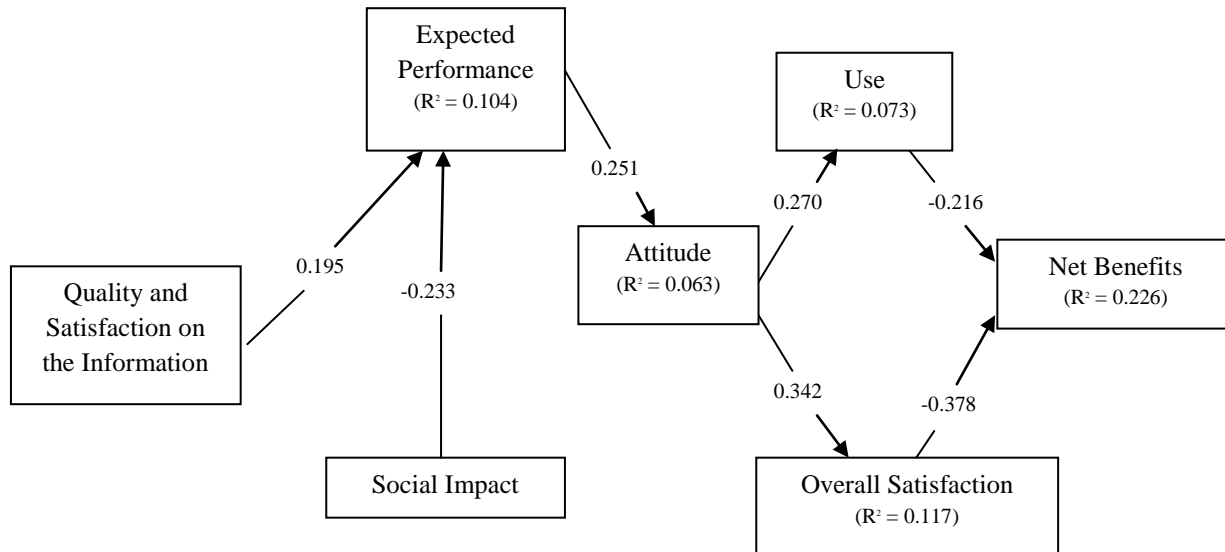


Figure 1. MIS acceptance model correlation and R^2 results

Based on the MMUST model, we use a structured questionnaire with the following dimensions: Information Quality; Satisfaction on the Information; Attitude; Expected Performance; Social Influence; Use; Overall Satisfaction; and Net Benefits. The responses were measured according to a 5-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The statistical analysis carried out was a series of controls to determine whether our sample match the proposed model that investigates the acceptance of information systems for mandatory environments.

III. RESULTS

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS 18). Exploratory factor analysis using principal axis factoring with oblique rotation was conducted to explore the factor structure of the MMUST.

Therefore, in terms of the factors-variables created are:

- Factor 1 - Expected Performance (PE).
- Factor 2 - Quality and Satisfaction on the Information (IQIS).
- Factor 3 - Net Benefits (NB).
- Factor 4 - Use (US).
- Factor 5 - Overall Satisfaction (OS).
- Factor 6 - Social Impact (SI).
- Factor 7 - Attitude (AT)

Considering the above, significant correlations exist between factors in the MMUST model. For example factor 1 "Expected Performance (PE)" has positive correlation coefficient (0.195) with Factor 2 "Quality and Satisfaction on the Information (IQIS)". On the other hand factor 1 has a coefficient of determination $R^2=0.104$ (ie, explained variance), when regression with factors 1 and 6 is performed. Figure 1 shows the analytic results.

The results showed that the MMUST model is partially confirmed, for the interpretation of user acceptance. It was found that the level of customization that shows the sample

of user responses is quite low. Regarding the factors "Information Quality" and "Meeting on the Information", the factorial analysis revealed the existence of a single factor, which we called "Quality and Satisfaction on the Information" instead of the two separate factors that appeared in the original model. This indicates a match and absolute relevance of these two concepts in the minds of users.

IV. CONCLUSIONS

Exploring the model proved that the determinants of acceptance is the "attitude" (as the central key variable) and "the view of the Net Benefits" (as the ultimate objective). The strengthening of these points should be therefore the focus and the interest of Administrations. Also, 'the contribution of social influence' is important, which importance increases in mandatory environments and is a factor that can greatly be enhanced by management.

These findings provide a useful tool to extract certain conclusions concerning the operations of the hospital administration to increase acceptance and therefore the use and performance of Information Systems.

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REFERENCES

- [1] I. Ajzen, and M. Fishbein, "Understanding attitudes and predicting social behavior," Prentice-Hall, 1980.
- [2] F. Davis, "Perceived usefulness, perceived ease of use and user acceptance of information technology," MIS Quarterly, vol. 13, no. 3, pp. 319-340, 1989.
- [3] S. Y. Yousafzai, G. R. Foxall, and J. G. Pallister, "Technology acceptance: A meta-analysis of the TAM: Part

- 1," *Journal of Modelling in Management*, vol. 2, no. 3, pp. 251-280, 2007.
- [4] V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, vol. 27, no. 3, pp. 425-478, 2003.
- [5] B. H. Wixom, and P. A. Todd, "A theoretical integration of user satisfaction and technology acceptance," *Information Systems Research*, vol 16, no.1, pp. 85-102, 2005.
- [6] E. C. Koh, R. V. Prybutok, D. R. Ryan, and Y. Wu "A Model for Mandatory Use of Software Technologies: An Integrative Approach by Applying Multiple Levels of Abstraction of Informing Science," *Informing Science: the International Journal of an Emerging Transdiscipline*, vol. 13, pp. 177-203 2010.