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CRM Software Implementation Factors in Hospital

Software & Patient Perspectives

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***Abstract*— Customer Relationship Management (CRM) related issues, during three consecutive years, were in the top nine lists of most concern for the hospitals' chief executive officers in the USA and furthermore, Information Technology (IT) projects' failure rate in the organizations were quite high. To deal with such problems Success Factors (CSF) from different perspectives such as management, staff, patient and software were reviewed in previous healthcare's literatures. In this paper, software and patient factors deeply were focused and added to the Egg model and a five perspective map was created. Implementation success factors map depicts inadequate study on patient's trust and perception and software's customization, complexity, usability, privacy and usefulness. Chief Information Officers (CIO) and Chief Executive Officers (CEO) of hospitals and hospital's CRM system vendors can use proposed factors' map for more successful implementations. It should be noted that this result is part of a PhD research and further investigation is required to test these factors in term of practical usage in heath care environment.**

Keywords-CRM; Implemention success model;Success factors; Hospital; UTAUT; D&M IS success model

I. INTRODUCTION

In the modern environment of business, the central critical point of all marketing activities is customer and Customer Relationship Management (CRM) has high priority for companies [1, 2]. Organizations, companies and all enterprise need the customer to continue their business. Without customer any goal is meaningless to achieve by organizations. If the word "Customer" removes from organizations then all business will be closed immediately.

All organizational activities, directly or indirectly are ended to customer related services. This is why customer has vital role in business' activities. Among different type of organizations, hospitals have played critical role for their customers. In the hospital patients have played customer's role, but with different behaviors and attitudes. Patient's expectations in contrast of regular customers are quite high and deferent.

In 2008 Healthcare Information and Management Systems Society reported within two next year improving quality of care and customer satisfaction will be two critical business promoters. These two factors have had the most influenced on the healthcare for the predicted period[3]. Consumer's considerations were the second most important subject that had impact on the healthcare in 2009 [4]. In 2007 an investigation was conducted by American College of Healthcare Executives. In this study 1080 hospitals were questioned about top issues that confronting hospitals. According to the investigation CRM related issues during three consecutive years were in the top nine most-concerned lists of the hospital's chief executive officers [4].

II. CURRENT STATUS OF CRM SYSTEMS IN THE HOSPITAL

Patients dissatisfaction have been moderated by using CRM system in healthcare environments[5]. Healthcare providers have used CRM as an approach to take most information about their customers, make relevant communication, deliver just-in-time information to them and mining results to create necessary program adjustment [6].

Some of the studies had focused on investigating the factors have influenced the CRM system implementation and adoption in different industries. However positive relationship between CRM and organization performance have been approved by some academic researchers[7-9] and billions of dollars are spent each year by business firms on CRM application [10, 11] unfortunately many disappointed results were shown by many business reports, academic experts and research groups [11-14]. Payne and Frow expressed that "Despite an increasing amount of published material, most of which is practitioner oriented, there remains a lack of agreement about what CRM is and how CRM strategy should be developed" [15].

III. CRM DEFINITIONS

Customer Relationship Management is an outcome of marketing issue. In short description CRM gives ability to organization administrators to manage and make efficient and productive relationship with customers. CRM is an information industry term for methodologies, software, and usually internet capabilities that help an enterprise to manage customer relationships in an organized and efficient manner[16].

According to the previous literatures, some CRM definitions are:

- "CRM is a term for methodologies, technologies, and ecommerce capabilities used by companies to manage customer relationships" [17].
- "CRM is an enterprise wide initiative that belongs in all areas of an organization" [18].
- "CRM is a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer" [19].

IV. HOSPITAL CRM ARCHITECTURE

CRM processes have been considered as the most important part of the CRM architecture. Various processes have been introduced by different researchers. Swift considered CRM process in four steps. 1. *Knowledge Discovery* (KD) process analysis the detail information of customer to find more knowledge of customer's requirements.
2. *Market Planning* (MP) process supports activities such as product development, preferences of channel and the development of strategic communication plans.
3. *Customer Interaction* (CI) process consists of the use of relevant and real time information through communication channels and front office applications, including customer contact applications, sales applications, and customer service applications.4. *Analysis and Refinement* (AR) process represents communicating with customers and ongoing learning from customers' attitudes and behavior in choosing and buying. Organization with the analysis of the customers' behavior can adjust product price, communication model, and quantity. CRM is an ongoing cycle of these four processes. [20]

V. HOSPITAL CRM APPLICATION

Three types of CRM application were introduced. [21] Each one is crucial for customer management. *Operational CRM* enables effective interaction with customers. Website, email, fax, call centers, etc. are examples of this type. *Analytical CRM* analyzing the data are collected in operational CRM to segment customers and as the result valuable information will be obtained to satisfy customers [22]. *Collaborative CRM* enables The various departments of company such as the sales, technical support, and marketing, share the information that was collected about customers. Collaboration allows the companies to synchronize and manage efficient and productive interactions with customers, prospects, partners, and internal associates across all communication channels.

VI. HOSPITAL CRM FUNCTIONALITY

Each CRM application should be equipped by various technical abilities. Each one of the abilities influences the implementation of CRM in the organization. Following brief discussion represent of these functionalities [23]:

- *Multiple communication channels* - enables business to be responsive to the needs and desires of its customers. Web, Fax, Interactive TV, IVR (Integrated Voice Response), E-mail, and direct field sales force are examples of communication channels.
- *Database* - database of customers is created by collecting information through semi-structured interviews, document analysis of annual reports, organizational charts, and system charts.
- *Workflow and assignment* - CRM solutions enhance the customer service by clearly defining the tasks, assigning the tasks to the various departments. CRM solutions also monitor the smooth flow of information to support the task and keep track to being completed.
- *Scalability* - CRM applications can be used on a large scale, in terms of number of participants it can handle and can be expanded to any desired scale.
- *Privacy concerns* - is one of the major factors in the selection criteria of CRM applications. Those organizations implementing CRM facing operational applications and customer intelligence must give priority to customer privacy issue in deciding the business strategy.

VII. CRM SYSTEM FEATURES IN HOSPITAL

Depending on the mission of organization CRM should have various characteristics and features. Hung et al. [5] discussed about critical characteristics which should be considered for healthcare CRM operations. Three characteristics are as follows:

- *Little power of patients*: Regular customers have lots of information about what they needed. In contrast patients have little knowledge to decide what kind of service or treatment they needed. There is a great medical information asymmetry between medical service providers and patients. Patients rely totally on the service providers to supply medical information because of only medical staffs know what particular treatments should be precisely performed for what kind of diseases.
- *Information Technology*: The use of information technology (IT) is essential for implementing CRM. An effective CRM requires a synergistic integration of the strategy, people and technology of an organization [24].

- *Customer Loyalty and Lifelong Value*: The CRM in the healthcare industry seeks to obtain patients' loyalty and provide lifelong value. The more loyal the customers are in each transaction, the less investment is needed by the organization. [25].

VIII. CRM CONSIDERATION IN IMPLEMENTATION

According to the tutorial-report.com some issues should be considered when CRM systems are going to implementation. The following list is represented critical considerations[26]:

- With rapid response to the customer request easy interaction between organization and customer is created by.
- Customers' information and perceptions should be updated during period of time.
- Various types of channels of customer interaction have accumulated abundant supply of customer.
- Personalized information such as tailoring the company's product and services has segmented customers' information to provide support for customization.
- Targeting the same customer segment by having cordial relationship with other companies. Thus giving relevant solution to customers' need and increasing acknowledgement to customers
- Customer should have high access to company's information of advantages and content of customization to achieve the benefits. Based on mutual trust and respect a profit stable relationship will be created.

IX. A CRM FIVE PERSPECTIVE MAP

More than 120 articles were reviewed and 31 articles that were closer to the CRM issue were chosen. Gap analysis had been done on five different perspectives which influenced CRM implementation in hospital. Management, employee and resource points of view (see figure 1, Egg Model) were discussed in the related conference paper and software and patient perspectives are discussed in this paper. Due to close roles of employee's factors beside of patients and software perspectives in CRM successful implementation, these factors are shown again in this paper accompany of the other perspectives. Table 1 and 2 represent the software and patient factors as the most important factors that directly influence CRM implementation.

Software perspective consists of data quality, complexity, integrity, usability, usefulness, relative advantages, customization, flexibility and privacy policy. These factors are shown in the table 1. This table also presents the number of investigations that were conducted on software features that influence CRM implementation. Due to inadequate study on this factors, usability, privacy, usefulness, complexity, customization and relative advantages are considered in the proposed implementation success factors map (figure 2) in application factors section.

Table 1: Software Factors

Software Factors	Author / Year
Data Quality	[27], [28], [29], [30], [31], [32], [33], [34], [35], [36], [37]
Relative advantages	[5], [38]
Customization	[39]
Complexity	[5]
Integration	[27], [28], [40], [41]
Flexibility	[42], [30], [43]
Usability	----
Privacy	----
Usefulness	[43]

The brief description of the mentioned software factors in the table 1 is as the follows:

Data Quality: is an evaluating of data's fitness to serve its purpose in a given context. Data quality is included of checking:[44]

- Accuracy
- Completeness
- Update status
- Relevance
- Consistency across data sources
- Reliability
- Appropriate presentation
- Accessibility

Relative advantages: the degree to which new software is superior to an existing one.[45]

Customization: To make or change to organizational software specifications.

Complexity: is a number of exiting various paths for achieving to the special parts of an application.

Integration: CRM integration refers to the integration of a range of software with a company's customer relationship management.

Flexibility: The ability of software to act and change easily in reply to different user and system request.

Usability: is a scale of interface quality which refers to the effectiveness, efficiency and satisfaction with which users can perform tasks with software.

Privacy: the ability to preserve the security of users and patients information.

Usefulness: the ability of having utility and especially practical worth or applicability for end users.

The success factors that patients should have, are shown in table 2. Without these factors CRM implementation in the hospitals will be failed, because patients are one of the critical users of CRM applications in each organization. As it shown in the following table just Da Silva and Rahimi (2007) [41] and Mendoza and et al. (2006) [42] were done study on the customer involvement factors as a success factor in CRM implementation. Other factors such as trust and perception of the patient were missed in previous investigation. This is why; these factors are considered in proposed map (figure 2) for future studies.

Table 2: Patient Factors

Patient Factors	Author / Year
Customer Involvement	[41], [42]
Trust	---
Perception	---

Patients' trust; mention to the situation that patient believes and accept the hospital's CRM application. Perception of the patients is a basic step in order to achieve to the patients' trust. More perception of the patient lead to more patient's trust. This hypothesis would be checked in the future works.

Figure 1 is called Egg model, this model was contribution of the CRM implementation success factors from employee, resource and management perspectives[46]. In the central point of Egg model CRM implementation grows successfully during the time and the rest of the Egg feeds the kernel by preparing infrastructures, manager support, awareness and readiness of managers and creating special characteristics and staff' perception. Without contributing the factors CRM implementation will not be matured. This model is just mentioned to clarify the other factors that influenced CRM implementation in a hospital.

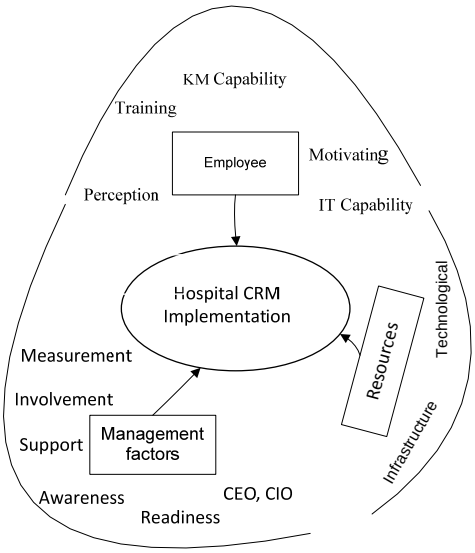

Figure 1: Implementation success factors map (Egg Model) [46]

Figure 2 is generated by adding patient and software factors to the Egg model. Holistic map for successful CRM implementation is consisting of five deferent perspectives that were concluded from literature review and presented in a single and novel aspect. Chief Information Officers (CIO) and Chief Executive Officers (CEO) of hospitals and hospital's CRM system vendors can use proposed factors' map for more successful implementations.

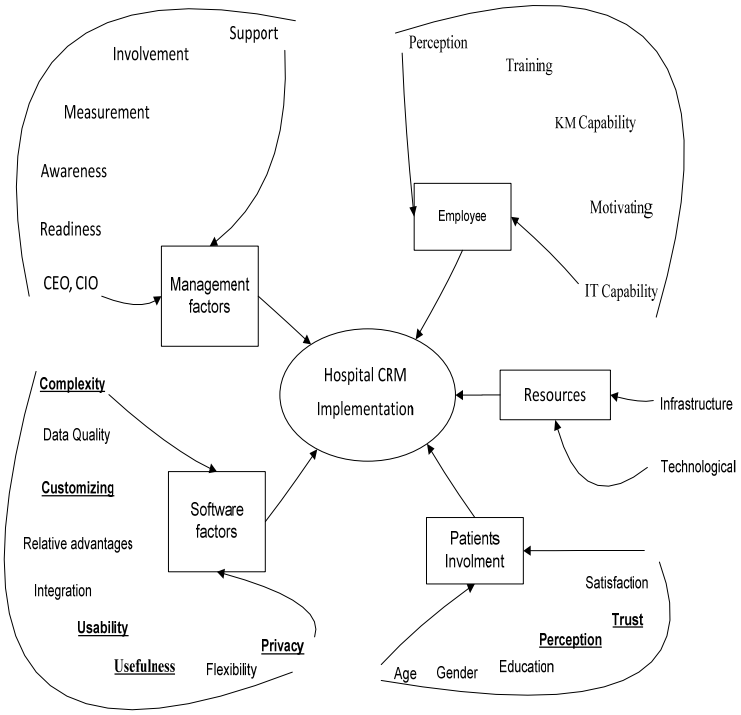

Figure 2: Holistic implementation success factors map

X. FURTHER WORKS

However holistic implementation success factors map (figure 2) depicts to the comprehensive perspectives, but more studies are needed to map these factors on DeLone and McLean IS success model. D&M IS success model that generally discussed on organizational component to achieve success but the role of mediators were not focused. Further works are needed to zoom on the mediators as a series of accelerator which are influenced CRM implementation in hospital over DeLone and McLean IS success model. The more intention of use of hospital CRM applications by patients and employees lead to more successful implementation. This is why next study should investigate the roles of mediators and correlation between them.

CONCLUSION

To prevent of high risk of failure in IT project in the hospital, CIO and CEO and vendors need to know more about CRM implementation success factors. Software and patient factors are two critical perspectives that influence CRM implementation in a hospital. Holistic implementation success factors map (figure 2) is created by adding these two perspectives to the Egg model implementation success factors map (figure 1). Comprehensiveness is one of the strength points of proposed map. Among of software and patient factors some of them were not totally investigated in previous literatures and have potential ability for more study in future works. Mapping influenced factors over DeLone and McLean IS success model and zoom on the mediators and correlation between them are proposed for further study. It should be noted that this paper is part of the PhD research and more investigations are needed in term of practical usage in hospital.

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