The strategies and policies of IT systems implementation in Malaysian hospitals and its benefits and challenges

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ABSTRACT

Nowadays, among all the industries in Malaysia the healthcare industry is in rapid and great growth, and it can be considered as a very controversial and sensitive one among the different industries because it relates the economy, the technology and the health care. Thus, the challenge is to supply a high health care quality for patient using the best tools, process and to be on time in addition to the minimum cost possible. Thus, the aim of this research is to investigate the current situation of the health care sector in Malaysia regarding the strategies, policies and the implementation of the technology benefits and the challenges. The findings show an increase of the health information system implementation especially in public hospitals based on an outsourcing strategy and the follow of lean healthcare management and risk management for best implementation. This implementation of HIS has approve its efficiency and benefits by reducing costs and time, better safeguards of patient files and increase in the quality of healthcare in addition that it makes the work process more smooth, organized and accurate.

Key words: **Malaysian hospitals, HIS, strategy, privacy policy, hospitals performance**

1. Introduction

In fact, a new approach was adapted in the last years by many health care industries which is the introduction and integration of the new information technology, systems, methods and tools to improve the state of the hospital functions, services, security, data quality and health care quality provided to the patient (Ministry of health Malaysia, 2011; Safurah, Kamaliah, Khairiyah, Nour, and Judith, 2013).The reason behind the integration of this approaches was to minimize the issues that face the healthcare industries such as the reduction of the significant time spend to share a treatment in all the levels of the

organisation due to the difficult communication between patient, doctors and staff and to improve the quality of care provided to patients (Karen, Frances, and John, 2009). In fact, in the developing countries such as Malaysia this approach has been started to be adopted in the health care industries to keep up with the development and the rapid change in the health care industry worldwide and in the increasing suffering from the lack of sufficient places and the difficulty to save the patient files (Ministry of health Malaysia, 2011). Thereby, many healthcare industries in Malaysia start to make the organisation functions fully integrated with technology, which will make the processes automated and all the staff and patient data will be transformed into electronic records by the establishment of systems to manage and exchange all of data and functions in the organisation (K. Noraziani, A. Nurul, Sara, Bilal, Sharifa and A. Siti, 2013).

1. **Literature review**

1.1.   Malaysian Governmental strategy for IT implementation in healthcare sector

In fact, in the last Malaysian plan of 2016-2020 in one of the strategies regarding the health care sector enhancement the strategy focused in improving the system delivery for better health outcomes. Thus, the Malaysian government will formulate the legislations and increase implementation through enhancing the coordination between the private sector and government agencies. Moreover, there will be an adoption of the lean management in the healthcare services to simplify the work processes. Furthermore, there will be more integration between hospitals due to the implementation of hospital cluster concept in some selected places which mean that the hospitals in the same place will work as a unified unit and sharing resources. Additionally, there will be an implementation of the eHealth strategy which focus on integrating the existing ICT systems in one unified system, system-wide model to enhance health data management, and support research, development and commercialization initiatives. Moreover, The Malaysian government will help the private sector to raise the information sharing and enhancing the service delivery (Eleventh Malaysia Plan 2016-2020, 2015)

1.2.   Health information system (HIS) and electronic medical records (EMR) implementation in Malaysian hospitals

The planning for the implementation of health information systems has started since 1993 in Malaysia to improve and enhance dramatically the quality of healthcare treatment and services provided to patients. In fact, the health information system (HIS) is a system based on computer and information technology to manage all the hospital levels, sectors and departments efficiently. HIS comprise different categories of information systems to manage data in different departments such as clinical,

financial, laboratory, nursing, pharmacy and radiology systems. (Nurul Izzatty, Nor Hazana, Alina, and Nik Azliza, 2013). In fact, one of the main components of the HIS is the electronic medical record (EMR) which is a computerized and digital medical record. It provides the medical history of each patient by recording and saving all the data related to patient from all the departments and categories of the HIS which facilitate the access and share of patient records among all the hospital sectors in a confidential and secure manner. Moreover, through the discussion on the SWOT (strength, weaknesses, opportunities, and threats) analysis on the implementation of EMR in Malaysian hospitals. The result found is that firstly the strength of the implementation of EMR are safeguarding information confidentiality, reducing the probability of lost records, improving the quality of documentation and the communication among providers, cost saving by the decrease of workplace inefficiency, improving the data storage by saving records in an electronic way and transformation of old paper- based records by scanning it into EMR, improve service provided by saving the patient and staff time and it help in the emergency cases when the patient is not able to answer questions about his medical history thus it can be easily find in his EMR. Secondly, in the other hand some of the weaknesses in the implementation of EMR can be resumed by the high adoption cost, the lack of interoperability or exchange of data among different EMR due to the lack of standard, it lead to medical errors where studies has shown the increase of medical errors and mortality since the implementation of EMR because healthcare personal rely only on the EMR in the care management plan (K. Noraziani, A. Nurul, Sara, Bilal, Sharifa and A. Siti, 2013), the lack of a single software package to support the hospital needs (Haslina and Sharifah, 2005)., also it require an extensive personnel training (K. Noraziani, A. Nurul, Sara, Bilal, Sharifa and A. Siti, 2013). Indeed, the ground work of the EMR is the master patient index record (MPI) which is a part of the health information exchange system (HIE) that exchange the patient information and activity in the whole care organization. In effect, the MPIs are make and attainable from the EMR. Thus, the MPI can be considered as an electronic medical database that contain all the information about the patient such as the first and last name, the gender, the date of birth, the phone number and other information beside the medical history of the patient. The MPI help to ensure that each patient is uniquely identified in the whole hospital which will help to provide an efficient and accurate health care to patients. (Cynthia and David, 2014; Education Module for Health Record Practice, 2012).

1.3. Users acceptance and satisfaction

In a research conducted by Indah and Surya to examine the level of user satisfaction of using HIS in Malaysian hospitals. They have found that there are differences between the types of users for HIS in the quality of function, interface, and HIS performance. Thus, there should be and understand of the users'

requirements by the HIS managers and developers and make a customization of the HIS depending of the type of users to improve the quality of use and increase its benefits. Thence, cooperation with the users, training and support by the technical personnel may well be feasible for future HIS development methodology and implementation (Indah and Surya, 2011). Moreover, another research was done to investigate the system acceptance and user satisfaction which is influenced by the performance and capabilities of HIS in the Selayang hospital in Malaysia which is one of the first hospitals that have implement the HIS successfully in Malaysia. The study found that the usefulness is related to system capabilities, the ease of use related to system capability and nurses' satisfaction. Moreover, factors such as users' intention to use the system, attitude and their trust on the system should be taken into consideration (Noor'ain, Dilla, Zamzaliza and Siti Noorsuriani, 2013).

1.4. HIS implementation benefits and challenges

In fact, the health information systems implementation benefits and in some cases accompanied by some challenges and issues. Indeed, the implementation of healthcare information system should be well studied and there should be a customization of system to get better results for system users in the hospital as well as for patients. Thus, the benefits, challenges and problems of HIS implementation can be resumed in the points below (Don, Nicola, Duminda, and Maxine, 2011; Devon, Linda, and John, 2010; American hospital association, 2010; Office of the National Coordinator for Health Information Technology, 2011):

Benefits: Improve the quality and efficiency of health care in hospitals provided to patients, reduce money and waste, and Improve information sharing, data protection and exchange.

Challenges: The human and financial boundaries of hospitals, realistic implementation timeframes, and hospitals and policymakers must make a balance between rapid and careful adoption of health IT, protecting the privacy and security of health information, technical and logistical challenges involved in installing, maintaining and updating HIS, creating a national infrastructure by which business networks can connect to each other, the development of consistent standards to ensure interoperability and privacy, security protocols to ensure trust that the network will handle information adequately, HIS must address legal, organizational, and technical challenges that might disrupt its sustainability, No direct benefits to the health of the rural population were observed, and the technology needs to be suitable to the capabilities and maturity of the health system, and this comprise both human and technological maturity, as *"if you automate a mess, you'll get an automated mess"*

Problems: New errors caused by HIS, and over-reliance on the accuracy of EMRs, Physician order entry system errors, the problem of assured performance and data overload, and maintain the security and privacy of patients.

1.5. Strategies for the HIS Implementation in hospitals

In fact, IT can play a significant role to accomplish the vision of Malaysian government for the healthcare by helping in the integration of systems in each unit of a hospital to provide an effective care. As mentioned before the implementation of HIS in Malaysian hospitals where in 1998, this was in Selayang hospital where the implementation of HIS was successful and effective and represent a good pattern in public hospitals. Thus, to implement HIS in the hospital the strategy adopted by the ministry of healthcare was not to develop in-house systems but they have chosen to pursuit the strategy of outsourcing due to the velocity in the implementation (Indah and Surya, 2011). Moreover, initially the idea of outsourcing the public healthcare of Malaysian Ministry of Health (MoH) was raised in 1996 by the government in the Seventh Malaysia Plan in which to increase the efficiency of services and to retain its own qualified and experienced manpower. However, the outsourcing strategy had contribute in the raise of some issues such as the dramatic increase in the operational costs (Fara, Muzani Fuziah , and Kherun, 2006).

One of the research that address the complexities of IT outsourcing projects have mentioned that it requires a stress on effective project risk management strategies adopted by the service provider and receiver. Moreover, it present that an important number of big IT outsourcing deals fail due to bad planning, and bad management of the projects which make the huge projects and systems face more risks and issues. Indeed, risk management strategies are crucial to successful IT outsourcing projects in public sector (Abdrahman Ahlan, Yusri, Sharifah, and Syed, 2012).

1.6. Privacy Policies for the HIS Implementation in hospitals

In fact, the privacy of health information is one of the main and significant points that must be taken into consideration during the implementation of HIS and EMR. Furthermore, it should be supported by clear legislation and law from the government to protect the confidentiality of personal health information. Unfortunately, there were many cases of unauthorized breakthrough of personal health information happened but no legal action can be done due to the lack of a privacy act in Malaysia. The adoption of information privacy principles in hospitals' Health Information System (HIS) especially in managing personal health information must benefit both hospital management to mitigate any possible unethical

action; such as identity theft, patient information leakages and loss and unauthorized modification of information and the patients by improving their trust and confidence. Indeed, for Malaysia the privacy policy must include three principles the patient agreement, patient free accessibility and transparency in personal health information management. The authority and lawmakers also must carefully design the personal health information policy to correspond with Malaysia uniqueness in terms of multi-ethnicity, multi-religion, multi-cultures and values. (Suhaila, Rabiah and Zuraini, 2011).

1.7. The correlation of IT with the increase of hospitals performance

Currently with the rapid change in the healthcare sector environment and the increase of expectations on delivering high quality of healthcare services this make the Healthcare system faced many challenges. Thus, the lean healthcare practices can significantly contribute to improve healthcare performance that its measurement support to promote the achievement of health system objectives. For instance, for financial performance Most of the healthcare industries aim to reduce cost and improving patient satisfaction and outcomes when implementing lean in healthcare. (Nurul, Nurul Fadly, Naimah, Nur Afni, and Noor Hidayah, 2013).

2. LITERATURE FINDINGS

The last Governmental Malaysian plans show a clear strategy which focus in the enhancement of the health care sector by optimizing coordination with private hospitals, the integration of different hospitals to share resources, the application of lean management to simplify the work process and the focus on the implementation of eHealth strategy which concentrate on integrating the existing ICT systems in one unified system.

Moreover, the main goal of the implementation and application of HIS, EMR, MPI, HIE is to improve the situation of health care in general in the country and to enhance the quality of health care data and services provided to patients. In fact, the integration of this systems with the health care help to save time and money, make data accessible and exchangeable in a confidential way, reduce the loss of records, and improve the documentation of information, accurate identification of patient. Although many issues and challenges has been created after the implementation of the new systems such as the high adoption cost, the lack of interoperability, the increase of medical errors, it require an extensive personnel training, realistic implementation timeframes, Hospitals and policymakers have to make a balance between rapid and careful adoption of health IT, protecting the privacy and security of health information, technical and logistical challenges involved in installing, maintaining and updating HIS, creation of a national infrastructure by which business networks can connect to each other, no direct benefits to the

health of the rural population were observed, The technology needs to be adequate to the capabilities and maturity of the health system, and this includes both human and technological maturity, as "*if you automate a mess, you'll get an automated mess*". Thus, the lean healthcare practices can significantly contribute to improve healthcare performance that its measurement support to promote the achievement of health system objectives as planned by the government.

Furthermore, the implementation of HIS systems should be accompanied by an understanding of the users requirements by the HIS managers and developers and make a customization of the HIS depending of the type of users to improve the quality of use and increase its benefits. Moreover, factors such as users' intention to use the system, attitude and their trust on the system should be taken into consideration

The strategy followed to implement the HIS in Malaysian hospitals especially the public one is of outsourcing initiated by the government in the Seventh Malaysia Plan to increase the efficiency of services. However, the outsourcing strategy had contributed in the raise of some issues such as the dramatic increase in the operational costs. Thus, this require to use of risk management strategies to successful IT outsourcing projects in public sector.

Additionally, regarding the policies especially the privacy policies need to be adopted in hospitals' Health Information System (HIS) which will benefit both hospital and the patients'. Indeed, for Malaysia the privacy policy must include three principles the patient agreement, patient free accessibility and transparency in personal health information management and it should be carefully designed to correspond with Malaysia uniqueness in terms of multi-ethnicity, multi-religion, multi-cultures and values.

3. RESEARCH METHODOLOGY AND EMPIRICAL FINDINGS

3.1. Research design, sample, and data collection

The total number of Malaysian hospitals is 394 including 247 private hospitals and 147 public hospitals. The studies show that due to many barriers only 15.2 % of this especially public hospitals are implementing the HIS and EMR which can be a number of 22 public hospitals (Nurul Izzatty, Nor Hazana, and Alina, 2014). The study sample is from both genders from the age of 23 to 50. Furthermore, there position vary from managers, nurses and IT professionals with a good experience in work. In this study the data collection was by conducting interviews with the participant. These interviews are an in-depth conversation with the participants and an observation of their non-verbal behaviour (Jane Ritchie,

Jane Lewis, ….2013; David Silverman, 2010). In addition to use of the observation technique that help to see how things currently work in the real ground at the hospitals.

3.2. Empirical findings

After interviewing staff such as IT managers, officers, center of research officers, nurses, patient registration staff, Human resource managers, from various hospitals and making observations to observe and understand the work process in Public Malaysian hospitals and some of the private hospitals. We have found that firstly regarding the public hospitals the level of IT implementation and use vary in a large scale from one to another. For instance, some public hospitals do not use IT systems especially HIS and EMRs. While others use the technology partially meaning that for the patient registration can be done through system but his file and history will be all hard copy. Moreover, another level of implementation which show a successful implementation of IT systems especially HIS and EMR in some public hospitals where the patient files are registered and managed trough the systems.

Moreover, in the hospitals where there is no-implementation of IT the different hospital entities were not connected and there no interaction between it, moreover the number of hard copies stored physically which make it hard to manage it and reduce risks such as security risks. While in the other hand for the hospitals that implement IT systems the work process was well organized and patients were more satisfied.

Furthermore, Regarding the strategy followed by hospitals most of the public hospitals follow the strategy of outsourcing in the implementation of new HIS and EMR systems and selection of the third party depend on various criteria the quality, costs, and the customization of the services to be suitable for the hospital. Although, the development of small software's and application are developed insource by the IT department staff and IT professionals.

In fact, one significant and positive point is the high level of IT implementation and management success in many private hospitals in Malaysia which allow them to provide a high level of quality health care to patients. Thus, many private hospitals are fully integrating IT to provide better services and quality of healthcare and there is a leading private hospital that have start to use the cloud technology to store data by contracting with IBM.

4. CONCLUSION

Indeed, the main points that can be learned from the research review and empirical study regarding the heath care IT implementation strategies in Malaysia and the current situation of HIS in private and public hospitals is that:

- There is a strategy to make hospitals more integrated and increasing the coordination between private and public hospitals

- Promoting the health information exchange (HIE)

- Increase in the HIS implementation

- The use of lean healthcare practices and management to improve health care performance

- The implementation of privacy policies to protect patient info in HIS and laws must be developed to be reliable and appropriate with Malaysian society.

- The main strategy adopted to HIS implementation is outsourcing while for the development of small application and software id done in-source in the hospital by the IT department. And the use of risk management strategies for successful IT outsourcing projects in public sector.

- The level of HIS implementation varies from low, medium and high for public sector while in private sector it varies between medium, high and very high.

- The implementation of HIS has approve its efficiency and benefits by reducing costs and time, better safeguards of patient files and increase in the quality of healthcare in addition that it makes the work process more smooth, organised and accurate.

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