Review Article

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Shifting Paradigm of Digital Ecosystems for Modelling in-Science

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ABSTRACT

Health care system is the system or program by which health care is made available to the population and financed by government, private enterprise, or both. Health Information Technology can be introduced in many forms such as Electronic Health Record (EHR), Electronic Medical Record (EMR) and Clinical Decision Support System. In addition, Personal Health Record became more appealing as it kept patient health record in private. Any changes in health information technology play important roles in enhancing the quality of health system especially in terms of health care. With the availability of Information Technology in the health system, there is a strong opposition towards the adoption of e-health systems called Electronic Medical Records (EMR). Electrical Medical Records allows the patient data information system from a paper record to electronic format in the form of files which is easier and more effective management. The functions of EMR are to keep and gather the patients' past medical records, to inform any medical care and to publish any results they conduct in diagnostics testing. Electronic Health Record provide their patients information about a summary of their recent visits, medications, drug allergies, appointments, payments, and some medical forms which can be accessed through the internet. All of the patients' information will be kept secure in their data. Furthermore, health care professionals will have extra time and resources when making decision for their patients as the crucial information about them are available in the health information technology systems. Thus, these can be beneficial for the doctors and other medical experts as they can manage their patients with ease. Health care organization requires doctors, nurses, or hospital staffs to comprehend that their future in health information system such, that the need to construct supportable well-being framework is irrefutably attached to great execution administration. Then, the finalized information can be accessed through DVD, CD-ROM, or the internet. However, there is insufficient proof to replace written education or education by the health professionals with multimedia education. In addition, data must be recovered from paper-based records that frequently do not have the desires of electronics frameworks to have an inseparable tie to the patient's well-being, exchanging the substance of a paper record to an EPR framework will not suffice later increases to the framework if the framework is to be utilized for patient-driven purposes, since doctor driven framework do not gather all the information expected to look at patients.

INTRODUCTION

The American Recovery and Reinvestment Act of 2009 (ARRA) made a legislation that focus on health information technology (HIT) according to, The Brookings Institution [1], Hersh [2] & Blumenthal [3]. This law helps increase in findings for health care facilities and services as well as for health investigation and makes it easier for unemployed people to buy health insurance. There are three unique sorts of order individuals who worked in medicinal services focus on the organization flow system. The principal classification is medicinal specialists and restorative bolster staff, for example, specialists, attendants, rescue vehicle staff and phlebotomists, next classification is individuals who bolster the primary classification, for example, chairmen, cleaners, watchmen and personal computer specialists and the third class is patients [4].

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At the point when saying about data frameworks (ISs) in an association, a client is typically somebody who utilizes the framework for the benefit of the association, in other words, a supplier. Inside of social insurance focusing the initial two classes are the suppliers. For these people to work easily, they need information technology (IT) to support health services and as mentioned, ARRA made a legislation focus on this for the convenience of clinicians in America. Health information technology was presented in many forms and some of the well-known forms are electronic health records (EHR), electronic medical record (EMR), clinical decision support (CDSS), health information management (HIM), personal health record (PHR) and health information exchange (HIE). All of these forms interrelate between information technology and health system which therefore produces Health Information Technology (HIT). All these forms will be explained in more details about information technology that support health system under literature review and discussion. The details on information technology and health system will be explain in literature review and will be elaborated more under the discussion. In addition, aside from explaining or proving the relationship between information technology and health system, this report will also include the usage of IT in health systems, health facilities or commodities in IT, as well as the advantages and disadvantages of IT in health system usage.

LITERATURE REVIEW

Health care system is the system or program that is made available to the public and invested by government, private companies, or both. Information technology (IT) is the use of computer, networking, and other physical devices such as mobile phones, infrastructure and procedures to create, process, store, secure and exchange all forms of electronic data. Health information technology (HIT) is an area that involve with creation, design, development, and maintenance of information system for the healthcare industry. In addition, health information systems are predicted to improve efficiency, reduced error and lower cost, while also providing better consumer care and service. For instance, the management of patient care through secure and sharing of health information.

IT in Health System

According to Abd Rahman Ahlan and Barroon (2014), Health Information Technology (HIT) systems are not widely available and not properly utilized if available. However, HIT improves the quality, patient safety and reduce the cost of healthcare. HIT can be introduced in many forms such as Electronic Health Record (EHR), Electronic Medical Record (EMR) and Clinical Decision Support System (CDSS). In addition, Hersh (2009) have mentioned the relation of Health information management with IT in health system. Health information management (HIM) is the focus on managing medical records and since it became electronic, the overlaps between informatics grew [2]. Moreover, the most frequently used HIT is the electronic medical record (EMR) but, it has been replaced by electronic health record (EHR) that shows more extra information about the patient. In addition, Personal health record (PHR) became more appeal as it kept patient health record in private. Apart from that, health information exchange (HIE) also gained interest as health information of the patient can be exchanged with other HIE within a region.

Millery & Kukafka [6] believes that changes in health information technology play a major role in enhancing the quality of health system especially in terms of health care. There are many aspects where information technology can improve for example in documentation, ability in accessing any crucial information and increase the communication availability. With improvements in information technology, decision making can easily be made of each parties. In 2010, Sittig & Singh [7] introduced an eight-dimensional model that is successfully applied in real-world which includes hardware and software computing infrastructure, clinical contents, human-computer interface, the people, workflow communication, internal organizational features, external rules and regulations and measurement and monitoring that was created specifically to show the sociotechnical challenges included in designing, developing, implementing, as well as the usage and its evaluation associated with health information technology (HIT) with the complex adaptation of healthcare systems. It was adapted to improve and understand the applications of HIT during the development and implementation processes.

Usability in-Health

Disobedience is one of the problems among serious mental disorders patients, thus, it creates challenges for the mental health professionals. To overcome this problem, the use of information and communication technology (ICT) have increased in order to prompt the patients such as using text message and E-mail by stating the purpose of it being sent [8]. The usage of IT has increased in the health care organizations that is similar to what happened in other companies that rely in a well-developed IT infrastructure. IT infrastructures may include the use of web, databases and network infrastructures. Additionally, Health Information System (HIS) should ensure efficiency and security of information flows and, efficiency and proximity of health system. With available of IT in the health system, there is strong opposition towards the adoption of e-health systems called Electronic Medical Records (EMR). Electronic Medical Records (EMR) allows the patient data information system from a paper record to electronic format in the form of files which easier and more effective management [9]. To add on, Electronic Medical Record (EMR) is one type of the Health Information Technologies (HITs). The functions of EMR is to keep and gather the patient's past medical records, to inform any medical care and to publish any results they conduct in diagnostics testing [10]. EMR help to reduce cost, improve healthcare service quality and increase productivity among physicians [11].

Electronic Health Record (EHR) provide their patients information about a summary of their recent visit, medications, drug allergies, appointments, payments, and some medical forms through the internet. All of the patient's information is kept secure in their data [12] Electroencephalograph is a new health technology that will monitor an individual brain waves from home, this is to aid diagnosis a disease through telemedicine. This technology is hoped to be the next generation device for communication in the developments of brain science and medical area, as this only useful in investigating human mental condition and health diagnosis [13]. A clinical document consists of patient's records, notes, discharge summaries, doctor's referral letters. Natural Language Processing (NLP) is a successful device which helps to reduce cost in medical records, improve quality of the patient's health and the accuracy of the documents. This software is one of the successful programs to keep information, provide solution space for annotating and organising the documents into the database for the ease of health professionals to analyse. The first unsupervised approach was produced which is known as Prefix Span, this is use for medical concept extraction. Secondly, C-Value and its extraction, NC-Value was produced for statistics and linguistics information. Lastly, Text Rank algorithm which is use for the document summary task [14].

The technology use for dental implant is CAD/CAM technology in the process, as it is automatic and precise. Dental implant is helping to replace a damaged teeth with Titanium [15]. Healthcare professionals consumes extra time and resources when making decision for their patients as the decision made by Healthcare professionals will be put into HIT systems. Thus, with these capabilities, it helps doctors and other medical experts to manage their patients with ease. These systems are called Clinical Decision Support Systems (CDSS). CDSS is defined as "software applications that integrate patient data with a knowledge-base and an inference mechanism to produce patient specific output in the form of care recommendations, assessments, alerts and reminders to actively support practitioners in clinical decision making". Hence, CDSS can make decision based on the health situation. Additionally, a Decision Support Systems (DSS) will help surgeons and doctors to schedule their patients. The main components of DSS are database, user interface and DSS software system. To integrate DSS and HIS, an update service calls a web service in AIDA for a request to integrate data warehouse with data in HIS and shared the database to update the DSS database [5].

Health Facilities: Digital Transformation in IT

Health care organization requires doctors or nurse or hospital staffs to comprehend that their future in health information system, the need to construct supportable well-being frameworks, is irrefutably attached to great execution administration [16]. According to Ciciriello, et al. [17], detailed and useful information for medications need to be easily understood to enable consumers to use their medications safely and effectively since some studies show that multimedia education can be helpful than the usual care. In addition, the programs use different kinds of style to issue the information such as words, diagrams, pictures, together with audio, animation, and video. Then, the finalized information can be accessed through DVD, CD-ROM or the internet, and there is insufficient proof to replace written education or education by the health professionals with multimedia education. Therefore, it must be used together with usual care provided by health providers.

DISCUSSION

Lega & Vendramini [16] believed health care organization require doctors or nurse or hospital staffs to comprehend that their future in health information system, the need to construct supportable wellbeing frameworks, is irrefutably attached to great execution administration. The health care organization required scholastics and specialists to quit offering the most recent administration designs and to help the framework to contextualize its decisions over details and controllers to enhance their insight into such details, to take educated choices and to contribute to the advancement of those territories where there is an aggregate deficit in execution administration, for example, group administrations. Part of the expansions in general well-being consumption has been coordinated for the utilization of steady innovations, planning to upgrade social insurance procurement. The utilization of medicinal services has advanced with the fast improvement of information technology and advances in social insurance innovation in parallel with current concerns emerging over patients' security and obviously how to cure patients effectively [2]. Caceres [18] stated that the important thing in any information system is the accuracy of the data being provided. Data input is derived from the patients and other available sources which contain all the patient's medical record. The information will then be processed and the output which comprises all the patients' medical records.

As stated before, Sittig & Singh [7] have introduced the eight-dimensional model and the first dimension is the hardware and software computing infrastructure which refers to the items and software that are being used to control clinical appliances. Next is the clinical content which includes alphabetical as well as numerical data and graphics that represent the 'language' of clinical appliances. Human-computer interface is another dimension that comprises all characteristics of the computer those able users to interact easily. When mentioning people that are under the eight-dimensional model, it refers to everybody including the developer, users and patients who communicate through the system. Another dimension is the workflow and communication that define as the procedure that involves assuring that patients care tasks are done effectively. Next two dimensions are internal organisational features such as policies, processes, and culture and, external rules and regulations. Both of these dimensions provide many features of the preceding dimensions. Finally of the eight-dimensional model is the measurement and monitoring. These dimensions measure and evaluate both known and unknown effect of the usage and implemented HIT. Health Information Technology (HIT) is the combination of Information Systems, Computer Science and Healthcare. As a result of advancement in technology, it is gaining attention globally. With the available of HIT systems, patients can monitor either in clinical setting or from outside especially home. Patients monitoring systems applied sensor network technology for collecting physiological data of a patient that are suffering from different diseases such as diabetes. For instance, Jog Falls, a diabetes management system using sensor devices for collecting physiological and activity data that monitors patient's physical activities such as food intake. Furthermore, a system of monitoring such as Type 1 diabetic patient using mobile phone for a diet management system and web based medical diagnosis that use to predict patient's condition. Additionally, Health Information Technology is beneficial to the patients and the providers as it helps to improve the patient's health as well as cost saving as they can access the information easily. However, despite the benefits, the use of this system as well as Electronic Health Record (EHR) is still low [19].

The Brookings Institution [1] stated that American Recovery and Reinvestment Act of 2009 (ARRA) believed that if HIT is implemented and used effectively, it has the intense possibility in the improvement of patient's healthcare. The usage of electronic HIT is to stored health information such as EHRs, claims data, registries and payment system. Primary care providers in North Carolina have used health information to help better asthma care and look for their performance on a number of key metrics, decrease hospital admission rates and emergency room admissions. One of the evidence developments of HIT is that it can be used to organize investigation including comparing the success of observable studies. In addition, Cancer Care Outcomes Research and Surveillance Consortium (CanCORS) project use many information that requires IT such as demographic, contact and medical information to investigate information on lung and colorectal cancers in America. Another evidence development of HIT is the use of claims data shows that it enables to look for nearly 17,000 patients over a year to discover relative risk of heart attack among patients taking both drugs and started to warned physicians through the results. EVIDENT Program is the one of the theory-based intervention programs. This program is useful for giving information specifically under healthy nutrition and exercise activities about the patients that they record daily. They can access their information through their own mobile online applications

in the smart phones, and so some comparison on their everyday activities and food intake, which this can make an ease to the patients to take note what their progress. Secondly, Social-Cognitive Theory is produced to monitor obesity treatment by the research group in online or traditional face-to-face methods. This program will monitor their nutrition and exercise activities as they will be provided a counseling. Lastly, this mobile intervention programs help to prevent an unhealthy behaviour among the teenagers, such as smoking. These programs provide information which can aid to develop social strategies, provide useful activities for the adolescent. All of the above programs are introduced by Valdivieso-Lopez et al. and he believes that he will be supported by an individual who has stopped smoking (Gücina and Berka, 2015).

Patients with severe mental health problems are more likely to disobey their medical treatment such as forgetting their appointment and when to take the medicines. This can cause them not getting the medicines at the right time which can lead to poor health condition and being hospitalized. Several strategies have been introduced to help the patients with their medications. One of the strategies is prompting, where it helps to remind the patient to follow their treatments by using telephone calls, sending letters and personal visit by the hospital's staff. Recently, another type of prompting has been introduced which is Information and technology-based prompts [8]. Laboratory Information Systems (LIS) are a complicated machine that functioning in the information systems, integrated clinical information systems and Electronic Laboratory Records (EMRs) [20]. LIS is creating a link between analysing in the laboratory, medical technologies and clinical providers. This can help to monitor and improve the quality of healthcare; therefore, this reduce any human error has been made. In addition, LIS should provide computerized as it can support a high-performance laboratory and automatic laboratory results. However, designing a LIS is a challenge as LIS must have the ability to communicate across the technology platforms. This means that new laboratory IT systems will be incompatible with the present laboratory hardware. Furthermore, poor performance can be happened when the cost of administrative is high and the limitation of information technology.

Electronic Health Record (EHR) is accepted due to chronic conditions, as before it was rejected by most of the patients. This facility was introduced in other countries, as this facilities were proved to improve patients health and effective [12]. With this proved, there is an increasing shown in terms of investment. EHR is different from Electronic Medical Record or known as EMR, are the source of EHRs, where EMR provide each patient's information such as drug allergies, drug-to-drug interactions and past treatment of each patient in one hospital EMR also consist of sensitive personal information such as sexually transmitted disease, abortions, emotional problems and physically abused. Other than that, basic information of the patient also included, such as, height, weight and blood pressures. EMR only used within the hospital. However, EHRs provide a wide view for the patients' healthcare. Personal Health Record (PHRs) help EMR to keep the patient information data, and to help the patients by sharing the information which other hospitals may have a better cure for the patients [10]. Furthermore, EHR elaborated the usage of these systems by taking care and giving more safety to the patient's health. The patient's information privacy in EMRs still remains a concern to them and the hospital staff. Nurses have an important role for collecting the patient's information and keep them private, and they can secure the record-keeping in effectively and efficiently. However, some of the nurses only familiar in paper-based medical records and have no intentions to keep the information private and secure. These issues can be improved by giving an adequate training, which include about ethics, information security procedures and IT skills to all nurses. Nurses also have to know the importance of using EMRs and should know what information should be kept private.

In physicians' case, they have difficulty in using EMR, as most physicians have practice in paper-based medical and now they have to change into EMR environment. This difficulty occurs among the elder physicians which they have been years using paper-based medical records and who does not have any technical skills. In addition, EMR gives them a hard time to all the patient medical needs, and they hoped EMR help them to work effectively and efficiently, however that does not happened. NVivo9 was introduced to improve the ability to access informations and they can make a better decisions for the patient's care within short time and accurately. This will improve the patient's health and increase healthy population. Lastly, physicians can improve time with other staff through the EMR messaging capability [11]. As for EMR and EHR issues, Paul et al. [4] discussed that any composed note structure of numerous EPRs ought to bolster fantastic patient outlines attention for shared clinical consideration. Additionally, the point-by-point social insurance data in EPRs ought to make them critical wellsprings of data for clinical studies, examination and approach. The potential advantages of EPR (Electronic Patient Record) frameworks are guaranteed to be hierarchical issues, for example, enhancing the trading of data between social insurance offices furthermore the backing of institutionalized techniques that can build consistency between various administration suppliers. EPR ought to have the capacity to guarantee least principles over the direction of consideration when patients move between various specializations not just have these advantages not been conveyed yet, but rather significant issues have emerged with reference to how and whether these advantages will be conceivable.

Electroencephalograph is cheap, light with approximately 100g, easy to setup and have a rechargeable battery. However, the battery only gives 1-2 hours of consecutive measurements, and the electrodes is too small due to the electric potential. Other problems occur when it is easy to setup because only a few electrodes used in the central part of the head, and this can cause the life and right side are more advantageous. Second problem occur when they must use a simplified electroencephalograph. this simplified electroencephalograph is use for medical and brain science area research. It will give a person caution about their health conditions. One example of simplified electroencephalograph is the 3B Band which is produced by the B-Bridge International and this type of headband is known in the world. This is a headband which contain of NeuroSky chips. 3B Band use Bluetooth to connect to a computer, therefore, the usage of wire is not needed, and a person who use this headband will not feel bound. However, these headbands have an implication which the shape of earlobe and sweat status can lead to a wrong measurement of the brain wave (Motomura, Ohshima and Zhong, 2015).

Natural Language Processing (NLP) is an unsupervised approach to manage a clinical document, and there is three types have been introduced. Text Rank was the first unsupervised approached being familiarize by Mihalcea and Tarau, this is to aid staff to summarise text. Second types of unsupervised approach is the C-Value and NC-Value that introduced by Frantzi et al, this C-value helps to produce a unit-hood score depends on the length of the phrase were entered. NC-Value helps to enhance the accuracy

and quality of the term data entered. And lastly, frequent sequence mining or known as Prefix Span help to cooperate long text in little time needed, and to get use this data only a minimal training is needed [14]. CAD/CAM technology help the production of dental implants easy, and it can be done in-house if their resources are available to a collaborating partner. This technology needed a massive investment for Research and Development (R&D), as this step need a huge amount of money for the special kits and accessories to make a successful dental implant, however, this will give them a long-term benefit. The benefits are saving times and money and meets the international standards in terms of technology of producing dental implants [15]. As health consumers demand for exact and evidence-based information to be delivered in a way that is easy to understand about their health and its proper treatments, health professionals want to save consultation time and improve the medication compliance. Consultation is usually presented verbally alongside with written materials. Consequently, high chances that the patients will forget about the information that was delivered to them. Therefore, multimedia educational programs give more benefits as it is convenient because it can be accessed anywhere by the individuals and their families which is cost saving rather than having consultation with the doctor. Additionally, multimedia programs also allow individuals to alter the information according to their need.

In ICU, healthcare system is needed as it gives a relevant, accurate information on time. However, these high technologies give some limitations such as high cost of maintaining the machines, delayed products being sent, wrong delivery date. RFID is one of enforcement technology which monitored a manufacturing in a critical healthcare such as stents. The act of passing the duty of care for a patient to another nurses is called nursing handover. During this time, there is a possibility of getting error especially when the important medical information is not shared efficiently, accurately and in a timely manner thus may result in adverse events (AEs). Therefore, Information Technology is used to support the process in order to decrease the potential risk such as miscommunication, misunderstanding and the omission of crucial information. Furthermore, poor handover might cause delays for the patients' treatments. Consequently, an accurate handover of important information is crucial to continuity and safety of care for hospitalized patients [21]. In any field, particularly in the well-being framework field, one of the numerous focal points of data innovations is to offer the specialists, some assistance with nursing, healing facility staff and patients to pay in contact with one another inside and out structure the association. A standout amongst the most critical points of interest of data advances is the formation of one exhaustive asset, which are parallels upgraded and utilized by specialists, medical attendant or doctor's facility staff.

One of the challenges for retrieving the health information is the mismatch between a consumer's terms and professionals vocabularies used in medical literature. To overcome this, a system called Mesh Med has been introduced where it combined different functional search into one. It has two new search components known as term browser and tree browser which provide unique information about the search topic. In addition, Mesh vocabulary is downloaded from the National Library Of Medicine (NLM) in Extensible Markup Language (XML) format to support both browsers. Both browsers provide quick access to the information needed which make it more efficient and beneficial to find the definitions as well as synonyms for medical terms [22]. The advantage and disadvantage of any system in Health System can only be known when the users such as doctors, surgeons, and patients, accept and use it. Therefore, there are studies that facilitate the adoption of use of HIT system. Technology Acceptance Model (TAM) is one of the popular theories for studying the perception and factors to the acceptance of a new technology in this case the acceptance of technology in healthcare system. Davis (1986) designed TAM for modelling user acceptance of Information Systems. Moreover, by promoting its acceptance, it will increase the use of IT. TAM focuses on the users' behavioural intentions towards accepting a new technology specifically self-diagnosis system for reducing cost and improving the quality in healthcare system. Not only that, TAM was reengineer to TAM2 and TAM3. TAM2 focused on identifying sources of usefulness and moderating variables and TAM3 centred on interventions that can affect the acceptance and use of IT in a healthcare system. A new model developed from TAM2 called Information and Communication Technology Acceptance Model (ICTAM). ICTAM is for predicting and showing consumer's health information and services usage behaviour on the internet.

An intervention program has been introduced into the online applications and this has been beneficial to the patients. Moreover, interventions have the intention to provide a prevention or treatment to the patients who need them, which this is depending on the theory and model. This intervention programs have been introduced into the online applications and this has been beneficial to the patients. The Brookings Institution [1] shared an example that when researchers such as the clinicians uses electronic health information, they can easily look for patients health information anytime and anywhere, in other words, electronic health information is very convenient and they can observe their quality in terms of their health care services which may vary with the other healthcare centre. Different policies may give different outcomes like in designing formula and payment procedure. Therefore, health information technology such as Electronic Health Record (EHR) or Electronic Medical Record (EMR) enable efficient early investigations, and this may also be one of the advantages of health information technology.

Health care has invested a large amount of money for Information Technology (IT). The utilization of IT and Information System (IS) have taken different directions due to the demands and needs in various sectors of government and public organizations; cited by Kadiyala and Kleiner in 2005. The technological advancement in the form of electronic patient s records, clinical applications, and health management information system (HMIS) have encouraged many Health Care Organization to use it. However, this system can be hard to implement in both public organizations and health care organizations [23]. Gua [24] discussed and believed overseen care focuses on decreasing conveyance costs and enhancing medicinal services financing through strict use administration, money related impetuses to doctors and restricted access to suppliers. Right now, oversaw care exists as the overwhelming financing and conveyance framework; as anyone might expect, access, expense, and quality predicaments are imperative; procedures and arrangements, in this manner, must be received to address these issues. A methodical examination of these systems is valuable for administrators and experts endeavoring to enhance care quality under health care organization. To add on, according to Karsh, Weinger, Abbott and Wears (2010), researchers have argued that the acceptance of using HIT is low as some believe that it is not very useful and has less benefit. Health information technology needs to focus on changing the care services, improve patient results, created to support the needs the hospitals. In order for HIT to be successful is that its focal

point must be on the usage or assumption rather that the effect of the people's health. Therefore, if HIT is being applied in a right way, it may be successful in terms of supporting and expand clinician and patient efforts to intensify the population's health and welfare.

As Millery and Kukafka [6] have mentioned, new generation in information technology helps in improving the quality of health care services for example in handling the documentations especially the patient's information as well as their confidential prescription. Decision making in each organization also plays a major role in having the information technology where it can fasten the decision making amongst the end-user not only the administration management, but it also includes the medical expert. The function in IT involves interchange any content of information which leads continuation of health care management, between departments in the organizations, helps the end user to decode any scientific documentation into practice, treatment procedures and health care system's security. As Lega and Vendramini [16] discussed in their journal, administration control frameworks as an apparatus for top supervisors to control doctors and to distribute top-down assets. Few associations have grown more cooperative methodologies, in which the administration control framework gives a chance to encourage dialog in the middle of administration and doctors. Targets and assets are not just allotted top-down, but rather will be fairly arranged from the base up and considering a common "sharing of psyches", a typical comprehension of issues and a mutual need setting where showing clinics were and still are late movers, as colleges opposed the presentation of any execution estimation framework. Millery and Kukafka [6] discussed electronic health records (EHRs) can lead to dangerous matters due to internet access. Scammers can easily access any patient's record history as well as able to change any content or information within the records itself. Security in information technology department plays a crucial part to secure any confidential report. In addition, Cresswell, et al. [25] have also stated another disadvantage which is the Information Technology (IT) implementations in healthcare have been identified by various challenges such as technical problems, poor fit between systems and users, and limited acceptance by staff [26-50].

CONCLUSION

Patients monitoring systems or electronic health record utilized sensor network technology for collecting physiological data of a patient suffering from different diseases such as diabetes, cholesterol, coronary heart disease, high blood pressure and many more. Furthermore, a system of monitoring such as Type 1 diabetic patient using mobile phone for a diet management system and web based medical diagnosis that is used to predict patient's condition. The health care organization required scholastics and specialists to quit offering the most recent administration designs and to help the framework to contextualize its decisions over details and controllers to enhance their insight into such details, to take educated choices and to contribute in the advancement of those territories where there is an aggregate deficit in execution administration, for example, group administrations. Another dimension is the workflow and communication that define as the procedure that involves assuring that patients care tasks are done effectively. In addition, the dimensions could provide many features of the preceding dimensions. Another evidence development of HIT shows that the data claimed enables to look for nearly 17,000 patients over a year to discover relative risk of heart attack among patients taking both drugs and started to warned physicians through the results. One of the theory-based intervention programs is EVIDENT Program. The program is useful for giving information about healthy nutrition and exercise activities about the patients that they recorded daily. It also could monitor their nutrition and exercise activities as they will be provided a counseling session. Lastly, this mobile intervention programs helps to prevent an unhealthy behavior among the teenagers, such as smoking. The programs itself provide information which can aid to develop social strategies and useful activities for the adolescent included. As we discussed above, EHR is different from Electronic Medical Record or known as EMR. EMR are the source of EHRs, where it provides each patient's information such as drug allergies, drug-to-drug interactions, and past treatment of each patient in one hospital. EMR also consist of sensitive personal information such as sexually transmitted diseases, abortions, emotional problems and physically abused. Personal Health Record helps EMR to keep the patient information data and to help the patients by sharing the information which other departments or hospitals may have better cure for the patients.

The technological advancement in the term of electronic patient records, clinical applications and health management information system have encouraged many health care organizations to use it. In physician's case, they have difficulty in using EMR, as most physicians have practice in paper-based medical and now they have to change into EMR environment. In addition, EMR gives them difficulties to all the patient medical needs, and they hoped EMR gives them a hard time to all the patient medical needs and they expect EMR help them to work effectively and efficiently. However, by implementing this system, it can be hard to implement in both public organizations and health care organizations. A methodical examination of these systems is valuable for administrators and medical experts endeavor to enhance care quality under health care organization. The function in IT involves interchange with any content of information which leads continuation or communication of health care management between departments in the organizations, helps the end user to seek any scientific documentation into practice, treatment procedures and health care systems security.

RECOMMENDATION

In recommendation, to improve the usage of Electronic Health Record (EHR) among the elderly, by giving explanation of the importance and benefits of using these systems. This explanation has to be done by the experts of EHR, which may include about how efficient and effective these systems are. The expert also has to explain about how to use the portal, as some of the elderly may be unfamiliar with the patient portal they made. Furthermore, these experts have to examine by giving trial to the elderly to check whether they are comfortable with the systems or not, such that if they are not comfortable and satisfied, they can learn from the mistakes they did and improve their systems in order for the elderly to use the patient's portal with ease.

While to improve in Electronic Medical Record (EMR), since this system contain about patients' personal information, nurses have to know what kind of information they should keep private and secure in their database. However, the limitation of this EMR is some of the nurses have been trained in a traditional way on how to keep the patient's information privately, which they are using paper-based medical record. Paper-based medical record does have differences in terms of keeping information private with the digital-based medical record. To prevent some illegal acts being conducted, the hospital has to give a better training in terms of skills and ethics

of keeping patient's private information to the nurses and give a certificate when they have passed their training.

More than that, in order to improve Laboratory Information System (LIS), the system needs to provide some automatic technologies to support high performance laboratory processes. Also, LIS must be able to communicate and access information in short time disregarding the technology platforms as their key role for LIS is to improve healthcare quality. As a result, it will reduce the errors. Such as, technical errors and human errors. However, all this healthcare technologies are expensive to acquire them, and healthcare managers have to give some training to those who are going to use the system, which this can lead to increased cost in the organizations. On the other hand, with a sufficient training and skills given, the individuals who have been trained can gives a long-term benefit to the organizations, society and economy as this technology are effective and efficient to be used in this sector.

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