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The Adoption of Hospital Information System in Private Sector Hospitals: A Case Study of Hyderabad

Raja Naveed Sarwar[1,] Imdad Ali Bughio[2] Shakeel Ahmed Arain[3]
Muhammad Nawaz Tunio[4]

1,2 & 3, Mehran University Institute of Science, Technology and Development (MUISTD), Mehran University of Engineering and Technology Jamshoro, Pakistan.
[4]Beijing University of Posts and Telecommunication, P. R. China

Abstract: *The main focus of this study is to analyze the adoption of Hospital Information System, an integrated computer software system in the private sector hospitals of Hyderabad. There is a need to investigate that why Hospital Information System is not being adopted in the hospitals of Hyderabad and what are the requirements for the adoption and implementation of the said system, whilst this system is working well in the private sector.This research study explored and pointed out various hindrances and problems in the way of adoption of Hospital Information System and offers feasible and viable solutions for the adoption of Hospital Information System in the private sector hospitals of Hyderabad.*

I. Introduction

Background of the Study

A Hospital is a place, of first and last hope of survival, for any human being. The Private sector hospitals of Pakistan proffer the better health facilities as compare to the Public sector hospitals. Apropos to the electronic patient record and health services delivery system, most of the Private sector hospitals have developed an Hospital Information System in their hospitals. [2]

The purpose of the study is to analyze the adoption of the Hospital Information System in Public and Private sector hospitals of Hyderabad district.

Based on the literature review, patient referral system and online laboratory and medical services of Agha Khan Hospital, a private sector hospital urges the need for the establishment of such kind of similar services in Public sector hospitals of Hyderabad, where hundred of thousands of patients visit on daily basis.

There is a need to investigate that why Hospital Information System is not being adopted in the public sector hospitals of Hyderabad and what are the requirements for the adoption and implementation of the said system, whilst this system is working well in the private sector.

The Hospital Information System, an integrated system designed to manage the medical, administrative, financial and legal aspects of a hospital and its service processing. The Hospital Information System records patient information, patient laboratory test results, patient's visits and patient's doctor information. Hospital Information Systems provide a common source of information about a patient's health history. [3]

These systems enhance the ability of health care professionals to coordinate care by providing a patient's health information and visit history at the place and time when it is needed. Patient's laboratory test information also visual results such as X-ray may reachable from professionals along with the previous prescriptions.

The Hospital Information System, is therefore a complete integrated system that promises the security and reliability of the data, hence make the data informative for physicians and lab technicians. In fact, Hospital Information System is perhaps an innovative step in the field of medicines.

The Hospital Information System not only facilitates the physicians, lab technicians and ultimately the patients, but also makes the easier task for the administration to keep their HR and financial data secure and updated.

Research objectives

The overall objective of this study is to analyze the adoption of Hospital Information System in public sector hospitals of Hyderabad district. The specific sub objectives are as follows:

Identify the barriers in the adoption of Hospital Information System in private sector hospitals of Hyderabad.

To assess the performance/ impact of HIS in private sector hospitals of Hyderabad.

Suggest policy implications for the adoption of Hospital Information System in hospitals for the entire Sindh Province.

Organizational structure in HIS

The Hospital Information System is managed by a number of computer professionals, but utterly depends on the size of the hospital and applications or different modules. The in-charge for the IT department that is responsible for the maintenance and sustainability of the said system should be a Database Administrator or IT Manager. Whenever, any hospital goes for the implementation of the Hospital Information System, whether it is by the software vendor or by the independent effort of the Hospital by hiring few computer professionals, it however requires to build an IT department.

Technology Adoption Lifecycle in an Organization

According to Rogers' bell curve: The technology adoption lifecycle model describes the adoption or acceptance of a new product or innovation, according to the demographic and psychological characteristics of defined adopter groups. The process of adoption over time is typically illustrated as a classical normal distribution or "bell curve." The model indicates that the first group of people to use a new product is called "innovators," followed by "early adopters." Next come the early and late majority, and the last group to eventually adopt a product are called "laggards." [4]

Comparison between Paper-less and Paper-based records

Paper-based records require a significant amount of storage space compared to digital records. . When paper records are stored in different locations, collating them to a single location for review by a health care provider is time consuming and complicated, whereas the process can be simplified with electronic records. This is particularly true in the case of person-centered records, which are impractical to maintain if not electronic (thus difficult to centralize or federate). When paper-based records are required in multiple locations, copying, faxing, and transporting costs are significant compared to duplication and transfer of digital records.
Handwritten paper medical records can be associated with poor legibility, which can contribute to medical errors. [5]

Architecture of Hospital Information System

Architecture in based on a distributed approach and on the utilization of standard software products complying with the industrial and market standards must be utilized (such as: UNIX operating systems, MS-Windows, local area network based on Ethernet and TCP/IP protocols, relational database management systems based on SQL language or Oracle databases, C programming language). [6]
Results of Various Empirical Research

IT adoption of clinical information systems in Austrian and German hospitals: Results of a comparative survey with a focus on nursing

Hubner et al (2010), [7] compared the differences and services of Hospital Information Systems between Austria and Germany, the two developed European countries, which started the adoption of Hospital Information Systems in the same year. Their findings positioned Austria better than Germany in the nursing services. Smaller countries with greater health budget are more inclined towards the adoption of IT rather than bigger countries with less health budget. Austrian hospitals are governed at federal level, and hence they negotiate with software vendors communally, whilst this is not the case with German hospitals. Up-gradation of Hospital Information Systems software is also adopted equally countrywide in Austria that gives an edge over German hospitals.

Health Care Finance and the Early Adoption of Hospital Information Systems, Estimates of Current HIT Adoption and of HIT Diffusion

Borzekowski (2011), [12] evaluated the Hospital Information System apropos to the finance and cost expenditures in building and maintaining such a system. This study examines the adoption of hospital information systems (HIS), specially focusing on the connection between the financing of health care and the adoption of these new technologies. Public and private hospitals are differentiated into not-for-profit and for-profit hospitals. This study suggests that without a proper and incentive based intervention of the Government, the not-for-profit (public) sector hospitals can not adopt the Hospital Information System and bear the expenditures for hiring such a system, though it is cost effective but the incentives are needed by the Government to run the system effectively, that would ultimately benefit the public.

Challenges of setting up hospital management information system (HMIS) in Pakistan:
Pakistan Institute of Medical Sciences: A unique success story.

Khan (2010), [13] described the successful story of the installation of the Hospital Information System at Pakistan Institute of Medical Sciences (PIMS). The different procedures and requirements had been shown to establish an effective Hospital Information System. The study points out numerous steps for the inception of such a system that can be beneficial for the public and can facilitate the patients with appropriate medical services. Khan examined the technical specifications with cost effective prototype and strengthened the need to extend the Hospital Information System to the other public sector hospitals of Pakistan.

Situation analysis of health management information system in Pakistan

Ali et al (2002), [14] found the current status of the HMIS in Pakistan and its analysis. Their research added the flavor of Geographic Information Systems (GIS) and sought the room for its existence. Qualitative type method of research was chosen and key personnel were interviewed. Based on the research, it was proposed that role of HMIS in Pakistan do exists but it is not entirely structured. Hence response rate is very low due to the insufficient resources, maladministration, lack of capable technical workforce and the lack of vertical coordination. This paper also suggested that the better understanding of HMIS is needed to pursue a change in Health care System of Pakistan and it will not only save the money, but also save the time.

Information Management as a Corner Stone for Improving the Quality of Healthcare Services in Pakistan.

Wajid et al, [17] inscribed that accurate, reliable and timely information is of key importance for planning, management and decision-making. Hence, the role of HMIS cannot be neglected at all. But, the situation is very depressing throughout Pakistan especially in Public sector. According to Wajid et al these are the key defects in HMIS in Pakistan: Weak health management information infrastructure, poorly organized data collection facilities, lack of coherence between the information collected and information needed, limited use of the generated information and reliability issues of the collected information.

The Implementation of Hospital Information System (HIS) in Tertiary Hospitals in Malaysia: A Qualitative Study

Ismail et al (2010), [19] analyzed the implementation of Hospital Information System in the three big hospitals of Malaysia. Malaysia has been pursing progressive developments i.e. induction of Hospital Information System in the health sector since its seventh policy plan of 1996. It was proposed that thirty three hospitals would adopt a paperless Hospital environment. By the time, more hospitals were added to the policy plan. This study hypothetically analyzed the after effects of implementation of Hospital Information System. There are two types for the implementation of Hospital Information System, i.e. through software vendor and secondly through utilizing own local capabilities. This study found that one hospital which adopted Hospital Information System through its own local capabilities by employing IT professionals were running their Hospital Information System more successfully as compared to the other two hospitals which adopted Hospital Information System through a software vendor i.e. Oracle, SAP, IBM, HP etc. The reason was found that the locally implemented software was upto the exact requirement of the employees of the hospital, and it was also observed that locally implemented software was not only cost effective but also its maintenance charges were also minimal.

This study also showed that it doesn't matter how the system is upgraded or it should be, Hospital Information System can work well with low cost system of Pentium II. It is also mentioned that Hospital Information System was not implemented completely in one single step rather it was implemented in parts. Hospital Information System depends utterly on the skills of the technical workforce as how they deliver and maintain the error free system.

Critical factors of hospital adoption on CRM system: Organizational and information system perspectives

Hung et al (2010), [20] discussed the business perspective of the Hospital Information System in the light of Customer relationship management (CRM), which portraits an innovative technical approach to make business or organization or hospital, customer oriented and maintain the customer relationship efficiently. Here customers are meant by the patients of the hospitals. For this research study, five hospitals of Taiwan are selected and categories in for-profit (private) and not-for-profit (public) hospitals. The customer satisfaction was assessed through various key indicators that were employed in this research study. It was concluded based on research findings that Customer satisfaction i.e. patient care was much better in for-profit hospitals than not-for-profit hospitals. Reasons could be adequate financing and effective administration. For-profit hospitals run their

administration in the business organizational perspective and provide every best services to their customers i.e. the patients. Here the role of insurance companies can't be neglected as most of the patients come to for-profit hospitals are insured. Besides that, this was also observed that the adoption of Hospital Information System varies the size, organization and financial position of the hospitals apropos to the customer relationship management. Hospitals having good and strong financial position are more prone to customer relationship management and they are likely to adopt updated Hospital Information Systems in their hospitals. This study also emphasized on the innovation of senior executives of the hospitals as they are the key personnel who can play a major role in the adoption of Hospital Information System.

Research Approach

This research study was based on mixed methodology (quantitative as well as qualitative). A thorough questionnaire was served to the key stakeholders i.e. Doctors, Paramedical staff, Administration personnel of the hospital, and finally the patients who visit the hospitals.

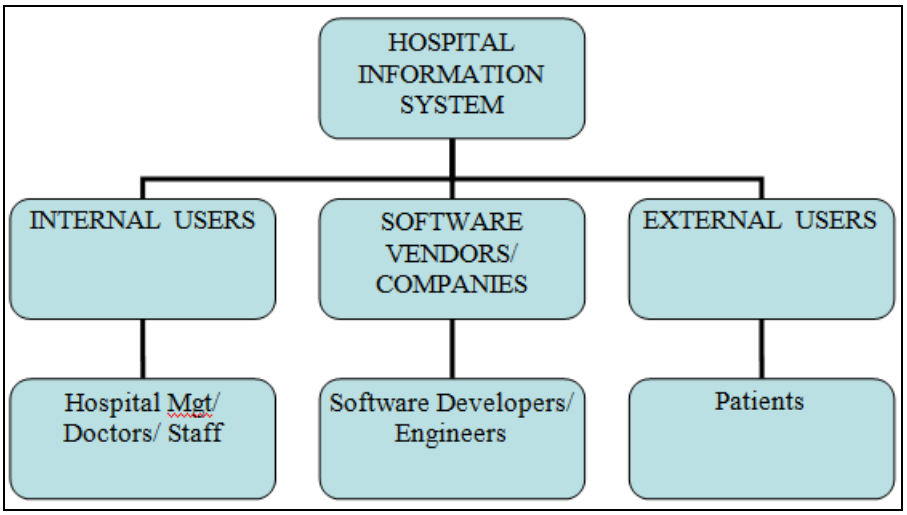
Based on the results of questionnaire and tentative findings, face to face interviews were also conducted with the mentioned stakeholders to make the research more viable, authentic and valuable.

Below is the list of visited hospitals:

Isra University Hospital
Agha Khan Hospital
Rajputana Hospital
St. Elizebeth Hospital
Shah Bhitai Hospital Latifabad

Participants:

The participants for that research process were internal users i.e. Doctors, paramedical staff and the administration personnel, since they are the people who have to utilize the Hospital Information System, if it is adopted at their hospital, and the external users i.e. the patients. The Software vendors were also consulted to see the technical and financial room for the adoption of HIS.



Research Design

Keeping in view the nature of this research study and possible outcomes, the exploratory research design is adopted, that is non-experimental or observational. Exploration begins with the review of literature, focus group and the interview technique.

The research design comprises the method for the data collection and the instrument that is to be used to collect the desired data. In principle, research design is the process of planning, collection of data through interview or questionnaire as an instrument of data gathering, and finally the analysis of that data to accumulate the knowledge into a valuable information.

Table: Distribution of questionnaire participants (Admn personnel, Doctors, Paramedical staff and the Patients)

S.No	Hospital Name	Distributed Questionnaire	Response Achieved
1.	Civil Hospital Hyderabad	22	17
2.	Isra University Hospital	6	6
3.	Agha Khan Hospital	5	4
4.	Rajputana Hospital	8	5
5.	St. Elizebeth Hospital	9	6
6.	Shah Bhitai Hospital Latifabad	13	10
7.	Taluka Hospital Tando Mohammad Khan	7	3

Total Questionnaires were served: 70
Total Respondents: 51
Response Ratio: 71.83%

Interviews

After the disappointing factor emerged with the unawareness of Hospital Information System, when the questionnaires were replied, the interview process was begun to explore the lack of knowledge among the participants. Interviews are one of the most important sources of case study information; it is an important data gathering technique which involves verbal communication between researcher and the participant. It helps researcher in gathering reliable and valid data (Saunders et al, 2007).

Table Interview with participants (Admn personnel, Doctors, Paramedical staff, E-Health Professionals and the IT personnel)

S.No	Hospital/ Company Name	No of Respondents
1.	Civil Hospital Hyderabad	7
2.	Isra University Hospital	4
3.	Agha Khan Hospital	3
4.	Rajputana Hospital	4
5.	St. Elizebeth Hospital	2
6.	Shah Bhitai Hospital Latifabad	5
7.	Taluka Hospital Tando Mohammad Khan	4
8.	Info Tech Software Company	2
9.	VergSystem Software Company	1
10.	E – Health Professionals	2

Secondary Data Collection

Secondary data is a kind of data that is already published in the print or electronic media. This is the basic source of knowledge prior to begin any research study, and off course on the basis of secondary data, the research gap is created and diagnosed for further research study. Secondary data, paves the way for the design of questionnaire and interview questions.

Data Analysis and Interpretation Procedures

Raw data or the hoard of knowledge that comes through the questionnaire survey and interview process is further shaped into useful information that is too time consuming and requires thorough knowledge of the subject. Once the data is accumulated, it would be finalized into a useful information and hence make a base for the formation of final research study and thesis also.

It is however, important to note that this research study is based on mixed methodology, i.e. quantitative as well as qualitative research methodology. Gathering and molding the whole data into useful information make it possible for the writer to analyze the outcomes and further investigate on his own personal understanding and opinion.

Data Analysis

This chapter is the soul of entire research study and hence this thesis. It discusses the data analysis and its findings, that were collected during the questionnaire survey and the face to face interviews conducted with Administration personnel of the hospitals, doctors and paramedical staff, and the E-health professionals and the

IT professionals belonging to different software vendor companies, which can be responsible for the installation of Hospital Information System. The whole paradigm for this research study is investigated and analyzed in this data analysis chapter, and the raw data collected, will be mold into useful information.

Phase I: Analysis of Secondary Data

Most of the research as described earlier, not only starts with the literature review as a source of secondary data, but it also depends on the already written literature throughout the research study.

Same kind of approach was taken into mind when this research study was initiated. Pakistan as an underdeveloped country lacks in the technology adoption, especially when we talk about the Hospital Information System. We have very little literature on the Hospital Information System. Suppose:

Malik et al (2009), [9] discussed the successful implementation story of Hospital Information System at Pakistan Institute of Medical Sciences (PIMS), the only Public sector hospital in Pakistan where Hospital Information System has been implemented.

Khan (2010), [13] described the successful story of the installation of the Hospital Information System at Pakistan Institute of Medical Sciences (PIMS). The different procedures and requirements had been shown to establish an effective Hospital Information System. The study points out numerous steps for the inception of such a system that can be beneficial for the public and can facilitate the patients with appropriate medical services.

Ali et al (2002), [14] found the current status of the HMIS in Pakistan and its analysis. Their research added the flavor of Geographic Information Systems (GIS) and sought the room for its existence.

Qazi et al (2009), [15] explored the perceptions of health managers regarding Health Management Information System (HMIS), within their organizational setting and in the context of decentralization process in Pakistan.

Chaudhry et al, [16] discussed the Health Care Management System hypothetically, and also proposed an international standards compliant healthcare information system including its architecture and technology specifications.

Wajid et al, [17] inscribed that accurate, reliable and timely information is of key importance for planning, management and decision-making in the delivery of better Health services.

Phase II: Analysis of Primary Data

Data was collected during the months of August and September, and various hospitals of Hyderabad district were physically visited and concerned stakeholders were interviewed to determine the current status of Hospital Information System at their hospital, whether it has been adopted or not. Based on the interview findings, questionnaires were utilized to get the opinion of maximum respondents.

Some of the key inquiries and their rejoinder are given below:

Awareness about Hospital Information System

By and large, people generally carry the wrong perception about the Hospital Information System, and in fact, there is an evident lack of knowledge. People are not aware and in reality they do not know what the Hospital Information System is.

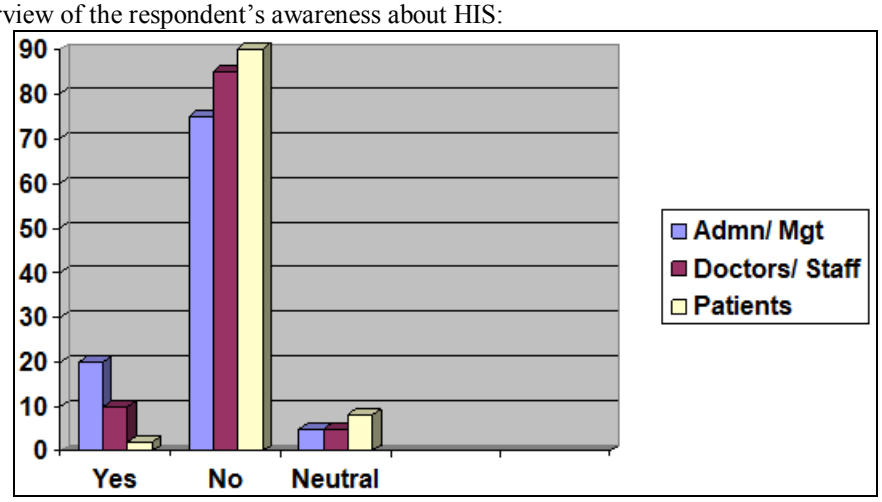
Apparently, most of the respondents negated the terminology of Hospital Information System but when they were apprised by the same kind of Electronic Medical Record that is successfully being run at Agha Khan Hospital and various other numerous private hospitals, they understood the terminology/ functioning of HIS and expressed their interest to adopt at the earliest stage.

In fact, people know that whenever, they undergo any medical laboratory test through the Agha Khan laboratories, located in different locations of every city of Pakistan, they get a registered slip or receipt, and they witness admission of their name into the record of Agha Khan laboratories. Even the other laboratories like Isra University Hospitals's laboratories and other independent laboratories e.g. Hassan Laboratory, Vital Laboratory,

Indus Lab and vice versa.

Keeping in mind the Agha Khan Laboratory functioning specifically, as we have made the Hospital Information System of Agha Khan Hospital as an example for our this research study, people understand the operation of Agha Khan Hospital. They know, whenever they undergo any Pathological/ medical test through Agha Khan Laboratory, the same test result is available not only online, but also on the computers of Physicians of Agha Khan Hospital whenever they visit any Physician. This is Hospital Information System, if we describe to people. On our description of the whole operation of Hospital Information System, keeping the Agha Khan Hospital as an example, people readily understand the Hospital Information System terminology.

Graphical overview of the respondent's awareness about HIS:



Administration / Management of Hospitals:

20% of respondents know Hospital Information System, especially at the private Hospitals, e.g. Isra University hospital and St. Elizebeth Hospital.

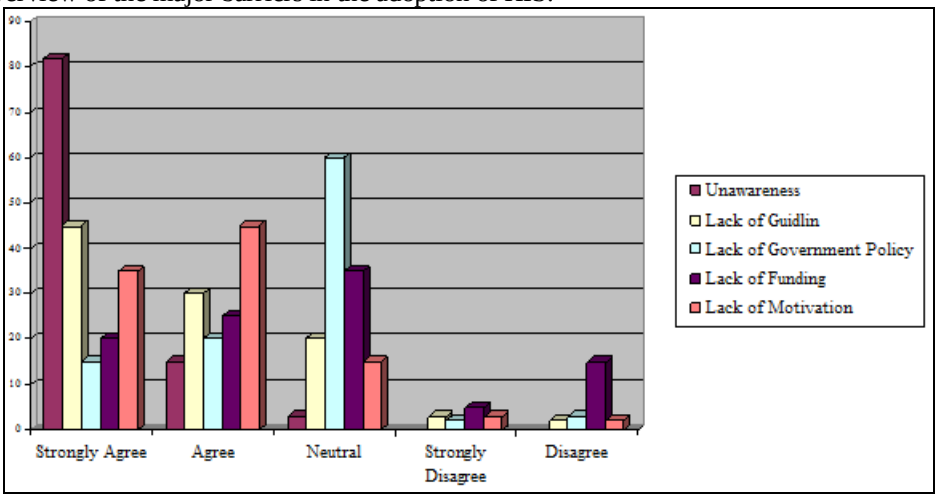
Doctors / Paramedical Staff of Hospitals:

10% of respondents have awareness about Hospital Information System and its terminology, but not in the depth. They think interconnected system of computers in the hospitals covering the laboratory and admission counter resembles the Hospital Information System, in fact, this is not true if we define the true essence of Hospital Information System.

Visiting Patients at Hospitals:

Just 3% of patients, in fact, who were educated, had awareness about the Hospital Information System's terminology. Rest of 97% respondents had no knowledge what the Hospital Information System is. But, interestingly, when they were apprised by the functioning of Agha Khan Laboratory and its Hospital interconnectivity through online portal, majority of respondents understand Hospital Information System.
Hence, the writer aimed to acquaint people by the terminology of Hospital Information System, besides fulfilling the research study objectives.

Graphical overview of the major barriers in the adoption of HIS:



Aspiration for the adoption of hospital Information System

When respondents were introduced by the benefits of HIS with detailed décor, they warmly welcome the inception of HIS at their hospital. This shows the reliable enthusiasm of the respondents, especially the doctors and paramedical staff.

Administration/ Management of Hospitals:

80% of respondents belonging to the Management showed deep aspiration for the adoption of Hospital Information System at their hospital. They believe it would create transparency within their overall administration and finance system, and they would be able to eradicate any lapse of non governance and maladministration. Their hospital's rank will go up, and it will automatically generate revenue for the hospitals, as more patients will visit their hospital.

5% of administration personnel endorsed the adoption of Hospital Information System at their hospital. But, 15% of Management personnel raised the question of funding as the main hurdle in the adoption of Hospital Information System, and they didn't favour the adoption of Hospital Information System at their hospital. While, it was also evident that they did not oppose the adoption of Hospital Information System.

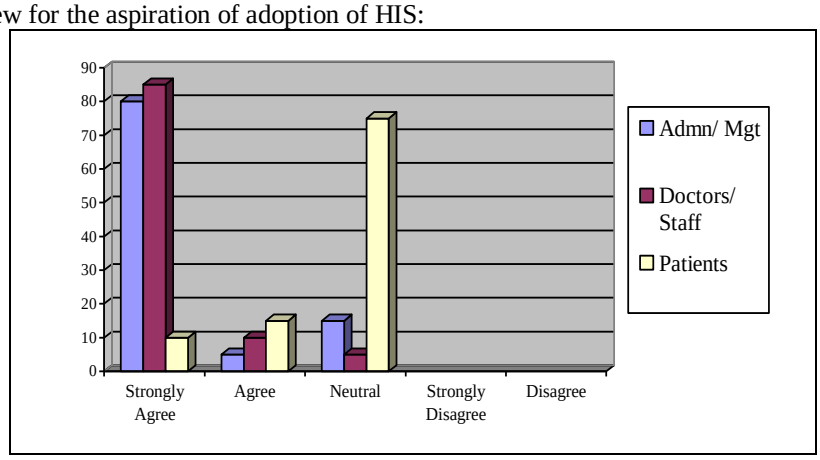
Doctors and Paramedical Staff:

Approximately 85% respondents who were doctors and paramedical staff showed strong will for the adoption of Hospital Information System. They think it would facilitate and swift their work process and they would be able to offer optimum medical services to their patients. 10% of respondents posed agreement over the adoption of Hospital Information System. 5% of respondents were not certain, whether the adoption of Hospital Information System will bring any change into the health delivery services.

Patients:

Patients, as external users need the adoption of Hospital Information System. But, as the lack of awareness about Hospital Information System, became the major hurdle in conducting this research study, just 10% of patients strongly endorsed the adoption of Hospital Information System. They do not know advantages or disadvantages of the Hospital Information System. And up-to 12% respondents explained their will for the adoption of Hospital Information System. It is notably important to mention here that majority of the respondents from this 22% figure, were educated. Around 78% respondents were totally unaware about Hospital Information System, and remain neutral in their stance because they do not know exactly what the Hospital Information System is.

Graphical overview for the aspiration of adoption of HIS:



An overview of Interview survey:

Below is the list of Hospitals where respondents were interviewed as well, besides the questionnaire survey:

Isra University Hospital
Agha Khan Hospital
Rajputana Hospital
St. Elizebeth Hospital
Shah Bhitai Hospital Latifabad
Below is the brief synopsis of each hospital visit.

St. Elizebeth Hospital Hyderabad

We visited St. Elizebeth Hospital, located in Latifabad unit no: 7. We met 3 doctors and 2 paramedical staff, and 1 administration personnel and enquired about Hospital Information System. Some of respondents knew this terminology, and shared their viewpoint. According to them, they tried to adopt Hospital Information System twice, in past. But it was failed due to the incompetence of the IT professionals. What they told it was

their own effort to initiate Hospital Information System in their hospital with the help of local workforce, rather than get implemented by any software vendor. Reason could be the small budget allocation for the Hospital Information System adoption at their hospital. However, their admission and laboratory departments are computerized and every patient gets entered onto the system, whenever he interacts with any said department. But, both admission and laboratory departments are not interconnected with each other.
We got the valuable suggestions from doctors and paramedical staff as well as the administration staff regarding the use and benefits of Hospital Information System.

Isra University Hospital Hyderabad

Isra University hospital is a largest private hospital of Hyderabad and connected/ affiliated with Isra University Hyderabad. Large pools of patients visit daily for all kind of medical treatment at the hospital.

We visited Isra University Hospital, the largest private hospital of Hyderabd and met 5 doctors, 3 paramedical staff people and 2 administration personnel. We enquired the Hospital Information System at their hospitals. But unfortunately many of the respondents were not familiar with the Hospital Information System. Although, the admission and laboratory departments were computerized and according to them, both departments store patient's information, history and laboratory test results store for minimum 20 days onto their computers. But, both admission and laboratory departments are not interconnected with each other, hence do not fulfill the basic essence of Hospital Information System. According to the respondents, regular Software Engineers and computer operators are hired to operate and look after the data entry. Computer systems are using visual basic as application programming for data assimilation, storage and print out of the data.
Although many of the respondents were not aware of the Hospital Information System, but when they were given information about Hospital Information System, they liked to adopt the said system at their hospital.

Rajputana Hospital Hyderabad

We visited Rajputana hospital, a 2nd largest private hospital of Hyderabad, and witnessed almost the same common response from the 4 doctors, 3 paramedical staff and 1 administration personnel that they are, in fact hearing the Hospital Information System first time. Rajputana hospital has also the usual computerized admission and laboratory departments, but these are not interconnected with each other.
Respondents were likely to adopt Hospital Information System at their hospital if they are given adequate facilities.

E-Health Professionals

E-Health professionals are basically IT professionals who are working for the promotion of Information Technology in the health sector. A small group of professionals, who belong to different companies and different walks of society, work as a Non-Governmental Organization (NGO) and conduct seminars, workshops and symposiums for the awareness of E-Health. In fact, Hospital Information System is also a part of E-Health, so it was necessary for the writer to meet the E-Health professionals and get their viewpoint regarding the non-adoption of Hospital Information System in the Public sector hospitals of Hyderabad district.
We interacted with 2 E-health professionals and shared our research study and its outcome, and sought their input to make our research more exhaustive and broadly valuable.
These professional raised almost the same issues, which our research study testified by going into the field and exploring the facts. Lack of awareness not only at doctors/ paramedical staff or patient's level, but it is also at the Management of hospitals level too, became the major hurdle in the adoption of Hospital Information System. In fact, there is no policy at the Government level. They also emphasis on the awareness of Hospital Information System and bestow valuable suggestions.

Software Vendor Companies

We visited two software houses in Hyderabad and meet the IT professionals. We visited Info Tech Software Company and met 2 Software developers and sought their opinion about the feasibility of Hospital Information System. Whether, is it possible to establish an in-house Hospital Information System with small budget? They endorsed, and said that if they would be given a chance, they will certainly establish a complete in-house Hospital Information System at Hospital with small budget and fewer resources.
We visited another software house, VergSystem Software Company and met 1 IT professional and sought his opinion regarding the inception of Hospital Information System in the public sector hospitals of Hyderabad. His technically testified that Hospital Information System can be installed with not only small budget but also with less effort.

Fulfilling the Research objectives

The overall objective of this study was to analyze the adoption of Hospital Information System in public sector hospitals of Hyderabad district. The specific sub objectives are as follows, and we try to put brief analytical description of each sub objective:

II. Conclusions

When the public sectors hospitals were visited it portrayed a horrible picture. Limited number of required doctors/ paramedical staff, shortage of basic common medicines (even life saving medicines/ drips), archaic building infrastructure which requires immediate repairing, lack of basic commodities of life i.e. clean drinking water/ electricity, insanitation and hoard of dirt in the rooms and corridors, no proper dustbin or facility for dust dumping after any surgery or medical treatment that is creating unhygienic atmosphere in the surroundings and can cause infections.

Adoption of Hospital Information System in that kind of atmosphere looks merely a golden dream that has no reality. But as the world is sustained on hope and believing in the concept of hope against hope, by the address the Adoption of Hospital Information Syste, above mentioned issues/ problems can be resolved easily and effectively. Lack of awareness about the Hospital Information System is also a major cause of non-adoption of Hospital Information System.

III. Recommendations For Future Study

Hospital Information System should be adopted first in the hospitals that are directly or indirectly connected to Medical Colleges/ Universities.

A health reform committee should be constituted at the Government level that should consist of both health and IT personnel. The task of this committee should be to see the room for Hospital Information System in the hospitals across the Sindh province, and facilitate the adoption of Hospital Information System technically and financially.

Medical curriculum should be updated and Hospital Information System should be included as a subject. IT education and technical hands on training should be given to doctors/ paramedical during their academic education at the College/ University.

Government as well as Non-Governmental organizations (NGO's) should organize awareness workshops and conferences on the adoption of Hospital Information System.

Donor and aid agencies e.g. US Aid should seriously take measures like funding for the adoption of Hospital Information System in the public sector hospitals of Sindh province.

It has been witnessed that admission and laboratory departments of many hospitals are computerized. If these departments are interconnected, along with administration department, the partial completion of Hospital Information System can be achieved.

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