Review Article

KEY INDICATORS TO ANALYZING HEALTH IT IN HEALTHCARE SECTOR

[1], *John Sakhi and [2]Dr. Mohd Vaseem Ismail

[1]Department of Management, Jamia Hamdard, New Delhi
[2]Department of Community Medicine, HIMSR, Jamia Hamdard, New Delhi

ARTICLE INFO	ABSTRACT
	We can expect more hospitals adopting integrated information systems and, in turn, more such solutions being developed. The learning by doing' concept is sure to lead to better innovations and improvements in information systems. But that is one side of the picture the other side –and an equally improvement one – is the implementation and servicing that a vendor provides. One of the immediate major challenges today is to get doctors to overcome their reluctance and use IT regularly. The good news on this front is that things can only get better on this front as IT is fact becoming an integral part of the life of the common man. Interestingly the Revenue Management of the hospital / HCO is the thrust area in the industry. HR, Finance, Admin, Supply chain Management are the main area of focus in this healthcare industry due to profit margin view of the newly emerged corporate set up, other way we can say that, ERP (Enterprise Resource Planning) boosted up with the entry of corporate quality culture of the corporate hospitals, and give much lesser importance to the area like Clinical Information System (CIS) and PACS, RIS, EPMR, WARD Management etc were no income generates directly.

INTRODUCTION

Today's Information Technology in Healthcare

Interestingly the Revenue Management of the hospital / HCO is the thrust area in the industry. HR, Finance, Admin, Supply chain Management are the main area of focus in this healthcare industry due to profit margin view of the newly emerged corporate set up, other way we can say that, ERP (Enterprise Resource Planning) boosted up with the entry of corporate quality culture of the corporate hospitals, and give much lesser importance to the area like Clinical Information System (CIS) and PACS,RIS, EPMR,WARD Management etc were no income generates directly.

What patient Needs?

Personalized Healthcare/ Patient centric healthcare which is "health care that establishes a partnership among practitioners, patients, and their families (when appropriate) to ensure that decisions respect patients' wants, needs and preferences and solicit patients' input on the education and support they need to make decisions and participate in their own care., Faced with unsustainable costs and enormous amounts of under-utilized data, health care needs more efficient practices, research, and

tools to harness the full benefits of personal health and healthcare-related data. Imagine visiting your physician's office with a list of concerns and questions. What if you could walk out the office with a personalized assessment of your health? (DiGioia III, Anthony, Pamela K. Greenhouse, and Timothy J. Levison. "Patient and family-centered collaborative care: an orthopaedic model." Clinical orthopaedics and related research 463 (2007): 13-19.). The timing is right for such a research direction given the changes in health care, reimbursement, reform, meaningful use of electronic health care data, and patient-centered outcome mandate. We present the foundations of work that takes a Big Data driven approach towards personalized healthcare, and demonstrate its applicability to patient-centered outcomes, meaningful use, and reducing re-admission rates. Lifetime treatment, if patient provided with life long history of his treatment , prognosis, family history would be another significant role of Health IT in coming days. To access the all information from one point , availability of data from his childhood immunizations to current date would be boost healthcare data for data mining and other research activities, that would definiely help for Pre symptomatic treatment of the community. Speedy Diagnosis and less hospital stay is an another area were patient gets its advantages. High technology adaptation always helps to boom the sector in new horizon, but the same time, in health sector, it is not denying the fact that complexity of healthcare processes, operations will not allow function only with

*Corresponding author: John Sakhi,
Department of Management, Jamia Hamdard, New Delhi.

adaptation with high technology IT solution and equipment. As old say, we should not allow technology rule us'. Less investment on labour, is the another major significance of good IT solution in health as well as hospital sector. But at the same time, training of personnel in health IT is another unavoidable part. Training and development of front office desk, Para-medical, medical and nursing staff and making them proficient with the system not only difficult task but also it cost you money.

Driving forces of automation

Multiple factors are responsible for increasing automation in hospitals. It is true that most often, hospitals do not have a planned strategy for automation and implement a solution only when they find that the manual process has unacceptably high error rate or clinical and administrative processes need speeding up urgently. The significance of medical tourism appears to be increasing as a significant number of respondents cited it as a reason for automation in corporate hospital. However, there is a marked different in the perception of this as a driving force of automation when we look at private vs mission/trust/NGOn hospitals. Approximately half the latter hospitals view medical tourism as promoting automation whilst just over 8% of private hospitals think the same. In large hospitals (>300 beds), corporatization of health care delivery and medical tourism are more improvement causes of automation than in smaller facilities of less than 150 beds (Ehealth). In mission/trust/NGO Nearly majority of manager's think that demand from medical and nursing staff is leading to increasing automation of facilities a positive sign for the sector. Interestingly, health insurance has less importance being a factor responsible for increasing automation. The survey results indicate that the demand for automation is increasingly from the end user medical staff. It is hearting to see that the enthusiasm for the same is high in the mission/trust/NGO facilities. Increasing cut throat competition between hospitals and a desire to differentiate themselves from other facilities is bound to impact the level of automation in the near future with the development of IT solution and both availability and choice of software on the rise, we can hope for lower costs and more accurate data management in the years to come.

Advantages of IT in health and hospital sector

Its mainly focus on their business and management in better way. there is growing interdependence between business strategy , rules and regulation, procedures in one hand information system software , hardware , database and telecommunication on other. From the front desk to archive management, the scope of IT in the healthcare sector is on the rise. New and innovative applications of ICT and technology are being tested. Its useage however, depends significantly on the size of the institution and the resources available at its disposal as our survey reveals. Automation has both long term and short term advantages. Given this scenario, larger hospitals chains may be in a more advantageous position with respect to implementation of IT systems, due to their deeper pockets and ability to put up with longer gestation periods. Out of the hospitals surveyed, an overwhelming majority said that long term strategic planning is an advantage of implementing IT systems. This is irrespective of the size of the institutions is part of their long-term strategic plan and not just today's

requirement. Nearly two-thirds of the hospitals use IT to make day-to-day administrative processes easier. These are perhaps the most time consuming, but assume great importance especially in emergency/medico-legal cases. Speeding up clinical processes is another important benefits of automation as nearly 61% of hospitals agreed. The data indicates that mission/trust/NGO hospitals give automation of clinical process greater importance. Hospitals do not disagree too much about advantage of IT depending on their size. The larger facilities however, lay more stress on short term department processes. Those with <150 beds are more concered with flexible clinical operations and strategic, long term planning. The need to increase speed is a factor irrespective of size.

Kind of software in use

Like to look into the kind of information systems that were most commonly used. A hospital management System (HMS) or Hospital Information System (HIS) is the most widely used software. Some kind of HIS is used by over 95% of hospitals. The laboratory Information System (LIS) is also installed in majority of the Facilities for its advantages. One time data capture is sufficient, this makes repeat entries and duplication of information redundant and saves effort, time and expenses. It is also reduces the possibility of human error. Since the system is event driven, it can function independently and notify other departments needing the information automatically. Information resource is accurate and up-to-date. One common database makes a powerful information resource available to the entire hospital or health care system. Many places existing applications, forming islands of computerization of departments can be integrated into a unified system. The system offers information management for the entire hospital while allowing smooth functioning of department systems independently. It serves as a datamine for research, and various useful reports can be drawn from the common database facilitating efficient and informed management action. Instantaneous input and retrieval of clinical information from numerous remote sites.

And also its results , reduction of clerical work and printed forms. It also improves accountability and accuracy of information, cost accounting, reduction in patient average length of stay because of speedy diagnostic and therapeutic measures. Quick flow of information from data entry to data used is the another major advantages of Health IT implementation. Speedy retrieval of any information related to administrative, clinical as well as para clinical is much easier in digitized form of MIS. Freeing of highly trained medical and nursing professional from manual repetitive tasks such as paper work. And also it will improve the operational efficiency of the hospital and health sector. Ans also it improves in decision making by hospital administrator or health managers since up to date information becomes available. Adequate data protection since checks and codes are used to reveal the information only to those who are authorized to have information in more efficient and effective manner is the another major significant role of good health IT solution. The system offers information management for the entire hospital while allowing smooth functioning of department systems independently.

Qulaity Factor: when a patient is admitted to the hospital , we provides up to date and valid and timely information to the care

takers like doctors , nurses and clinical and para-clinical professionals for better and patient care delivery in more efficient and effective manner.

Cost factor: in an automated hospital information system used abroad, as estimated 3-5 of the costs of an enterprise are due to electronic data processing. This includes computer system, network, and application software and licensing.

The data shows that overall, there is not much of a difference between private and mission/trust/NGO hospitals as far as the use of software goes. All private hospitals and 90% of mission/trust/NGO ones have an HIS system in place. Laboratory Information Systems are the next most common software with an good implementation rate e. The biggest difference we see is in the implementation of pictures Archiving and communication System (PACS) and proper radiology information system in place because of huge investment. It is to be noted here that picture archiving and transfer is a capital-intensive technology which also requires high bandwidth.

Measuring the success of implementation

Once a hospital is partially or fully automated, administrators will look at the outcome of the new system. There is

Various criteria to select a vendor For automationMission/trust/NGOPrivate		
Cost/Pricing	1.00	1.00
Maintenance and support	1.43	1.90
Level of R&D Investment	2.50	2.67
Inbuilt tools to measure outcomes	3.00	-
Implementation assistance	4.00	3.33
User Training	5.25	3.89
Vendor/support/Organisation Reputation	5.00	4.50
Flexibility/Scalability	6.0	4.67
Provision of Managed/Hosted Services	7.75	7.00

(Source: Ehealth)

In the above table we see that the criterion to select a vendor differs signficanlty between mission/trust/NGO and private hospitals only when it comes to the user training provided and the flexibility /scalability of the solution (both)

Various criteria to select a vendor for automation	<150Beds	>300 Beds
Cost/Pricing	1.00	1.00
Maintenance and support	1.75	1.43
Level of R&D Investment	3.00	2.00
Inbuilt tools to measure outcomes	4.00	2.67
Implementation assistance	4.00	3.50
User Training	4.33	4.25
Vendor/support/Organisation Reputation	5.50	4.00
Flexibility/Scalability	6.50	4.33
Provision of Managed/Hosted Services	9.00	7.00

(Courtesy: Ehealth)

No doubt that the success of a particular implementation will be measured according to the intention behind the project. Many of respondents said that they measure the success of implementation by the corresponding increase in service levels and customer satisfaction. Hence, it is evident that public perception of services quality is a matter of concern to most hospitals. Better operational control was cited by both kinds of institution with an average of many agreeing. The third measurement is by cost savings. But how to measure the

success ? only customer satisfaction will reveal fact which realted to Health IT implement ?? Can customer satisfaction take it as main criteria for evaluate any IT solution.

The turnaround time per bed is more of a concern in private hospitals because Money matters for them. hospitals spend over 50 lacs per annum on IT whereas 12.5% of hospitals with less than 150 beds do the same.
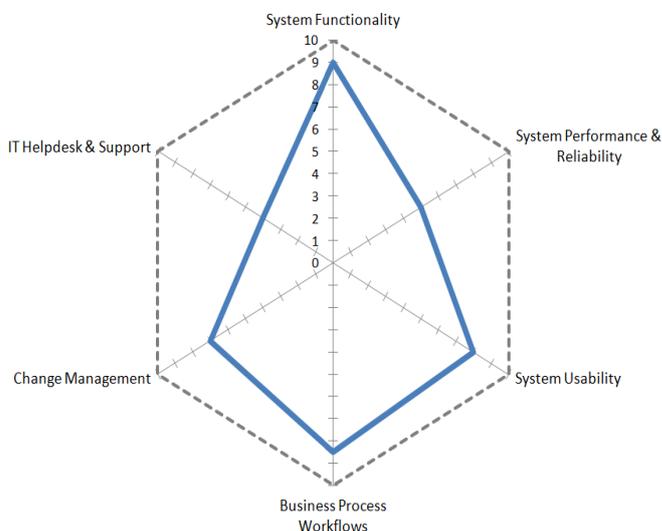
Six Dimensions of HMIS for Analysis

The IT Applications Assessment would be done across Ten Key Dimensions thus determining all Gaps holistically. System functionality the adequency of the features and functionality available in the system for all users. System performance and reliability the consistency of performance of the system, response time, uptime, reliability etc. System usability the key elements of system usability include effectiveness and user satisfaction. This covers navigation, keystrokes etc. The alignment of the business process workflows of the IT Application. Change Management transitioning individuals / teams to the desired usage. This include aspects like training, incentives, communication and governance model.
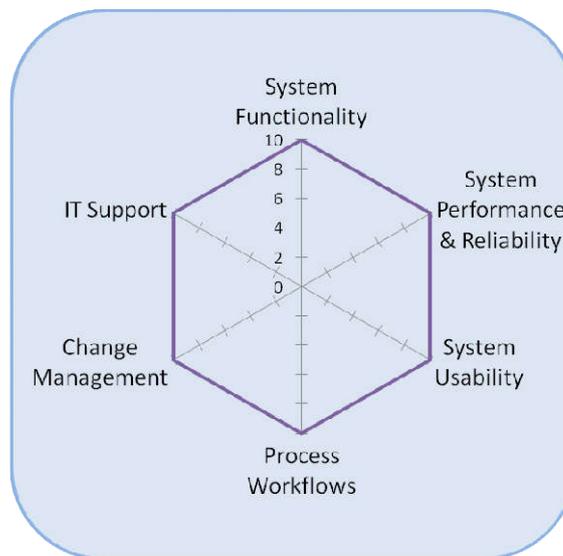
IT Helpdesk and Support, The processes and quality of support provides to be able to use the system effectively

Conclusion

While conducting the study realized that IT heads of hospitals are very often non-existent or technician s, and the hospitals IT system is overseen by one of the doctors. Often, a decision has to be taken about whether a facility should go in for a complete solution from one vendor or whether different information systems should be sourced from different services providers. This is indeed a tough decision due to the limited budgets in India and scale of such projects. We observe that the majority of hospitals have limited automation with a solution that covers only a particular clinical or administrative process. Implementing an automation solution can take anywhere from a couple of months to a few years. The bigger the project, the more important is the choice of vendor. Hospitals need to pick a solution provider who has a local presence and will provide after-implementation assistance with minimum fuss. Keeping in mind future plans of expansion, the software should be scable enough. They should also have complete knowledge of compliance regulations and standards as hospitals administrators have to keep in mind medico-legal issues.

Medical and information technology is constantly changing allowing for better diagnosis and greater accuracy. What is required to give the hospital IT business a boost is standardization, keeping in mind that India and the region are key destinations for medical tourism-touted to be a US$ 40 million industry by 2010. Strengthening of infrastructure is another issue that needs to be addressed higher bandwidth is required for heavy PACS transfers. Telephone and Internet connectivity in smaller towns and cities is a major issue. Software vendors have raised the issue of inadequate man-power and training in the use of systems.in order to extract the maximum benefits from an information system. The staff using it and those who will be affected by its implementation must be properly trained.

REFERENCES

Adler-Milstein, J. and D. W. Bates, ''Paperless health care: Progress and challenges of an IT- enabled health care system,'' business Horizons, vol.53, no 2,2010.

Collen, M. F. ''A vision of health care and informatics in 2008,'' *J Am Med Inform Assoc*. 1999 Jan-Feb, Vol.6, no. 1, pp. 1-5, 1999.

Haux, R., E. Ammenwerth, and A. Bunchier, (Ed). The Requirements Index for Information Processing in Hospitals. Version 1.0b.Germany: Inattitut fur Medizinische Biometrie und Informatik (imGi). Supported by the Deutschungsgemeinschaft (DFG), Adopted by the DFG's Computing Facilities, 2001.

Hayajneh, Y. A., W. A. Hayajneh, I. I. Matalka, H. Z. Jaradat, Z. Q. Bashabsheh, and M. S. Alyahya, (2006). [Online] Available: http: // hayajneh. Startlogic.com/ research/ Extnt _ of _Use_.pdf

James, A. G., ''Clearing the Way for Physicians ' Use of Clinical Information Systems '' *Communication of the ACM*, August, vol 40, no .8,pp.83-90,1997.

Joseph, T. K. H. Health Management Information System, *ASPEN Publisher*, Inc. 1995, ISBN: 0-8342-0613-7

Leyland, P., F. Watson Richard, T. Kavan, C. Brruce ''Service quality: A measure of information system effectiveness,'' – MIS Quarterely , June , vol. 19 ,no .2,pp.173-188, 1995.

Pearson Sammy, B. J. E. W. "Development of a tool for measuring and analyzing user satisfaction " Management Science, May, Vol.29 , no 5,p530-545,1983.

Roussel, L., R .C. Swansburg, and R. J. Swanburg ''Mangement and Leadership for Nurse Administrators, '' Contributor Russell C.Swansburg, *Richard J Swanburg. Jones and Bartlett Publisher*, 2005.

William, D. H. McLean Ephrain, R. ''Information System Success: The quest for the dependant variable,'' *Information System Research*, March, Vol. 3 , no. 1 ,1992.

Yusof, M.M., A. Papazafeiropoulou, R. J. Paul, and K Stergioulas, '' Investigating evaluation frameworks for health information systems'' *International Journal Of Medical Informatics*, vol. 77, pp. 377-385, 2008.

www.maxhealthcare.in

www.google.com

www.wikipedia.com

http://www.indmedica.com/journals.php?journalid=6&issueid= 23&articleid=205&action=article

http://www.indmedica.com/journals.php?journalid=6&issueid= 23&articleid=209&action=article

Journal of the Academy of Hospital Administration, - *A Study Benchmarking of Operation Theatre Processes in a Corporate Hospital* Author(s): B. Krishna Reddy*, G.V.R.K. Acharyulu**Vol. 17, No. 2 (2005-01 - 2005-12)

****