International Journal of Management (IJM)
Volume 7, Issue 4, May–June 2016, pp.108–115, Article ID: IJM_07_04_008
Available online at
http://www.iaeme.com/ijm/issues.asp?JType=IJM&VType=7&IType=4
Journal Impact Factor (2016): 8.1920 (Calculated by GISI) www.jifactor.com
ISSN Print: 0976-6502 and ISSN Online: 0976-6510
© IAEME Publication

INFORMATION TECHNOLOGY ROLE IN HOSPITAL ADMINISTRATION PRACTICES

Prof. Rajbir Singh
Department of Management Studies,
Deenbandhu Chhotu Ram University of Science & Technology,
Murthal, India

Anand Chauhan
Assistant Professor,
Department of Management Studies,
Deenbandhu Chhotu Ram University of Science & Technology,
Murthal, India

ABSTRACT

Information Technology (IT) is very powerful in today's world and backbone of the Indian economy. Many healthcare sectors now have IT departments for managing the various departments of hospitals. The study was conducted in forty two hospitals of Delhi-NCR with Information Technology Professionals. The results obtained from the multiple regression analysis explain that factors for administration practices through information technology i.e. external participation, internal participation, supply chain management and Doctors' connectivity are having significant impact on information technology effectivity.

Key words: Information Technology, Hospital Administration, Effectivity

Cite this Article: Prof. Rajbir Singh and Anand Chauhan, Information Technology Role in Hospital Administration practices. *International Journal of Management*, **7**(4), 2016, pp.108–115.
http://www.iaeme.com/ijm/issues.asp?JType=IJM&VType=7&IType=4

1. INTRODUCTION

Information Technology expels the many different technologies inherent in the field of information technology and their impact on information systems to the collection of tools that make it easier to use, create, manage and exchange information.

World Health Report (2003) states that timely and accurate health information is the essential foundation for policy-making, for the planning, implementation and evaluation of all health programme's. The system will require the introduction of new technologies for patient identification and a continuous medical record, from which

data can be extracted for the measurement of treatment outcomes. Smith *et al*., (2007) concluded that impact of IT has grown in organizations, IT strategy is finally getting the attention it deserves in business. Dubey, (2011) concluded that IT is integral to support, enhance and expand business strategy.

Mishra *et al*., (2011) found that ICT can improve the health care practices in developing countries. Bakshi, (2012) explored that information and communication technology has revolutionized the way medicine is practiced and how healthcare information is documented, archived and retrieved at the point of care. While information technology is facing challenges of adoption, communication technology is striving to create health information exchanges for connecting providers within multi-organization environments and across disparate geographical boundaries, using secure and fail-safe internet connectivity for high speed data, voice and video communication.

2. LITERATURE REVIEW

Southard *et al*., (2000) analyzed in his study the world is continuously changing and information technology is one of the main driving forces for change. Health sciences are not spared from the advancement of information technology. Health care organizations have been trying to capture medical information related to patients, providers, government policy, etc., As a result, the health care industry is becoming a more information-based community that is connected to hospitals, clinics, pharmacies, and customers for sharing information, reducing administrative costs and improving the quality of care. Taylor & Wright, (2004) Investigates knowledge sharing in one public service context and identifies factors that influence the readiness of an organization to share knowledge effectively. Goldschmidt, (2005) defines HIT as application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, health care information, data, and knowledge for communication and decision making. Also concluded that health information technology can transform the health care system which improving quality, productivity and reduce the cost of services.

Kaur & Gupta, (2006) explored that e-health provides immediate access to the information that is relevant to patients as well as health care providers. Also suggested that improvement in healthcare can be achieved by adopting internet, video conferencing, data warehousing and e-business transactions. Ray & Mukherjee, (2007) found out that India's healthcare infrastructure and its standing in e-governance initiatives. effective e-governance can enhance the quality of healthcare service even within limited resources. An e-governance framework is suggested based on the factors. Vahabi, (2007) examined that health communication is a major component of health care. Also suggested that clear communication should be a high priority for health care professionals to improving health quality.

Nawakda et al. (2008) in a study reported that it is difficult to create a knowledge sharing culture in an environment under pressure involving medical and administrative staff. IT systems need to be utilized as the backbone for exchanging information which is needed to be replaced to an open system. Ahmadi &Shirzade, (2008) summarizes the SWOT analysis of IT implementation in the healthcare industry. The healthcare industry faces multi-faceted challenges to improve patient safety and assure information security while containing costs and increasing productivity.

Smith *et al.,* (2007) suggests for IT strategy whereas Goldschmidt, (2005), Kaur & Gupta, (2006), Ray & Mukherjee, (2007), Ahmadi &Shirzade, (2008) favors for IT implementation and believe that information technology brings effectivity in health organizations.

Federici & Resca, (2009) explored that work is to reconstruct, by following a knowledge management approach, the steps that led to the introduction of e-procurement as a new operating practice, by redesigning supply purchasing, supply chain and logistic processes. Herrick et al., (2010) tells health information technology has potential to improve quality and increase access to Care. Bhaskar & Somu (2011) supports for using information system in healthcare has become one of the best solutions for hospital management i.e. billing, diagnostic, registration, admission and administration. Information system helps in decrease operating cost, increase patient satisfaction and improves hospital processes.

Lewis & Hodge, (2011) found that HIS refers to any system that captures, stores, manages or transmits information related to the health of individuals or the activities of organisations that work within the health sector. It describes such things as district level routine information disease systems, disease surveillance systems but also includes laboratory information systems, hospital patient administration systems (PAS) and human resource management information systems (HRMIS) for health workers.

Itumaala, (2012) proposed approach to apply IT in enhancing service quality in hospital is based on the principles of efficiency and effectiveness. The hospital could be achieved the patient satisfaction with the help of IT i.e. the use of wireless technologies, broadband communications, Radio Frequency Identification (RFID) tags and hand-held device must be properly Admission EMR, Nursing Care, Patient Satisfaction, Diagnosis, Pharmacy, Support Services Clinical Care, Billing, Discharge, Patient Support, IT-Efficiency & Effectiveness IT-Service. Bhattacharya, (2015) found that healthcare professionals are affected by their job satisfaction use of HIT as a strategy. Information technology was found to be one among the factors that can plausibly influence their job satisfaction and intention to stay.

Information technology is a vital resource for corporate competitiveness and there are number of information technology solutions that provide support to knowledge management. Information technology supports the categorization and collaboration of explicit forms of knowledge at low cost.

3. OBJECTIVES OF STUDIES

This paper focused on information technology role in hospital administration practices for the purpose identifying and exploring the factors related with hospital administration practices and to predict the impact of factors on information technology effectivity.

4. METHODOLOGY AND DATA COLLECTION

In order to decide the use of research design an exhaustive literature review was done on information technology role in hospital administration practices. On the basis of review it is decided to use descriptive research design as it will be appropriate in studying the objectives defined. A sample of 42 (19 Government hospitals and 23 Private hospitals) hospitals with minimum hundred beds has been taken by stratified random sampling. For primary data collection a structured questionnaire was designed and circulated and total of 42 information technology professionals was taken i.e.

(Male 90% and Female 10%) and their views formed basis for further analysis and interpretation. Descriptive analysis, reliability analysis, factor analysis and multiple regression analysis have been used in the study.

5. DATA ANALYSIS AND DISCUSSION

Table 1 Technology professionals view point regarding information technology

S. No.	Information Technology helps in:	Mean	SD	SE	Variance	Cronbach's Alpha if Item Deleted
1	Decision making process fast	3.81	.862	.133	.743	0.872
2	Proper utilization of resources	3.88	.803	.124	.644	0.886
3	Reduction of paper work	3.83	.908	.140	.825	0.889
4	Reduce cost of operations	3.50	.944	.146	.890	0.894
5	Improving health status	3.50	1.065	.164	1.134	0.884
6	Security of data and information	3.88	.968	.149	.937	0.894
7	Maintaining standards	3.71	.944	.146	.892	0.886
	Overall	3.73	.928	.143	.867	0.901

Reliability of items was assessed by computing coefficient of Cronbach alpha. Cronbach coefficient measures the inter consistency of the items. Value of coefficient alpha above 0.800, is considered to be reliable. This table 1, Cronbach alpha coefficient is 0.894 that indicates are more consistency within the items of a group. Mean scores of these items is also shown in this table is 3.88, i.e. proper utilization of resources and security of data and information which is best indication of effectivity of information technology perception for health organization.

Table 2 Correlation Matrix of variables of IT effectivity

Sr No	Spearman's rho		Proper utilization of resources	Decision making process fast	Reduction of paper work	Reduce cost of operations	Improving health status	Security of data	Maintaining standards
1	Proper utilization of resources	Correlation Coefficient	1.000						
		Sig. (2-tailed)							
2	Decision making process fast	Correlation Coefficient	.729**	1.000					
		Sig. (2-tailed)	.000						
3	Reduction of paper work	Correlation Coefficient	.630**	.765**	1.000				
		Sig. (2-tailed)	.000	.000					
4	Reduce cost of operations	Correlation Coefficient	.658**	.712**	.577**	1.000			
		Sig. (2-tailed)	.000	.000	.000				
5	Improving health status	Correlation Coefficient	.624**	.704**	.499**	.652**	1.000		
		Sig. (2-tailed)	.000	.000	.001	.000			
6	Security of data	Correlation Coefficient	.549**	.560**	.683**	.439**	.589**	1.000	
		Sig. (2-tailed)	.000	.000	.000	.004	.000		
7	Maintaining standards	Correlation Coefficient	.619**	.638**	.537**	.417**	.713**	.666**	1.000
		Sig. (2-tailed)	.000	.000	.000	.006	.000	.000	

The correlation matrix shows the pair-wise correlations and indicates highly significant relations. This can give us an indication of relationship between the dependent variables as shown in table 1. Variables, combinations can be treated as overall information technology effectivity.

Table 3 Technology professionals view point regarding information technology role in administration

S. No.	IT role in hospital administration	Mean	SD	SE	Variance	Cronbach's Alpha if Item Deleted
1	Health professionals associations	4.05	0.795	0.123	0.632	0.859
2	Implementing government policies	3.50	1.11	0.171	1.232	0.840
3	Educational institutions	3.64	0.932	0.144	0.869	0.849
4	Drug companies	3.33	1.203	0.186	1.447	0.844
5	Charity organizations	3.12	1.383	0.213	1.912	0.844
6	Insurance companies	3.88	0.803	0.124	0.644	0.863
7	Medical supply companies	4.02	0.517	0.080	0.268	0.861
8	Research facilities	3.86	0.843	0.130	0.711	0.849
9	Laboratories/Diagnostics	3.76	1.055	0.163	1.113	0.843
10	Physicians Offices	3.55	0.739	0.114	0.546	0.867
11	Communicating with departments.	4.17	0.660	0.102	0.435	0.865
12	Scheduling Activities/Work	3.83	1.102	0.170	1.215	0.845
13	Human resource management	4.26	0.767	0.118	0.588	0.873
14	Marketing of Hospitals	3.76	1.165	0.180	1.357	0.857
15	Financial and accounting procedures	4.33	0.687	0.106	0.472	0.868
16	Supply chain management	4.12	0.550	0.085	0.303	0.870
17	Purchasing and Inventory control	4.36	0.533	0.082	0.284	0.877
	Overall	3.86	0.873	0.135	0.825	0.866

Reliability of items was assessed by computing coefficient of Cronbach alpha. Cronbach coefficient measures the inter consistency of the items. Value of coefficient alpha above 0.800, is considered to be reliable. This table 1, Cronbach alpha coefficient is 0.877 that indicates more consistency within the items of a group. Mean scores of these items is also shown in this table is 4.36, i.e. purchasing and inventory control which is perceived that IT can play a role for hospital administration.

Table 4 Factors Labeling of IT role in hospital administration

Sr No.	Statements	External participation	Internal participation	Supply chain management	Doctor's connectivity	Communication
1	Laboratories/Diagnostics	.894				
2	Implementing government policies	.873				
3	Charity organizations	.873				
4	Scheduling Activities/Work	.861				
5	Drug companies	.817				
6	Research Facilities	.810				
7	Educational institutions	.732				
8	Marketing of Hospitals	.717				
9	Human resource management		.883			
10	Financial and accounting procedures		.823			

Sr No.	Statements	External participation	Internal participation	Supply chain management	Doctor's connectivity	Communication
11	Insurance companies		.605			
12	Medical supply companies		.517			
13	Health professionals associations		.491			
14	Supply chain management			.838		
15	Purchasing and inventory control			.816		
16	Physicians offices				.799	
17	Communicating with departments.					.660
	Eigen Values	6.049	2.721	1.834	1.363	1.204
	%of variance explained	35.580	16.004	10.788	8.016	7.082
	Cumulative %of variance explained	35.580	51.584	62.372	70.388	77.470

Principal components analysis is used to extract maximum variance from the data set with each component thus reducing a large number of variables into smaller number of components. The result of the analysis was a rotated component matrix consisting of 17 components that account for 77.47% of the variance. The eigen values are used to determine how many factors to retain. The 5 factors identified from the analysis have been named as external participation, internal participation, supply chain management, doctor's connectivity and communication indicates the hospital administration practices.

Table 5 Multiple Regression Results of Administration practices and IT effectivity

Independent Variables	Beta	t	Sig
(Constant)		-3.044	.004
External participation	.678	8.333	.000
Internal participation	.280	3.424	.002
Supply chain management	.181	2.295	.028
Doctors' connectivity	.165	2.043	.048
Communication	.112	1.333	.191

Dependent Variable: IT effectivity

Sample R^2 = .797

Adjusted R^2 = .769

Overall Degree of Freedom = 41

F = 28.308

Durbin-Watson = 2.185

Number of Cases = 42

Finally the multiple regression results for knowledge creation to quality improvement. Shows that R^2 = .797 F = 28.308 and Durbin-Watson = 2.185. Results shows that external participation, internal participation, supply chain management and doctor's connectivity impacts on IT effectivity with significant level of $P< 0.05$

Information technology effectivity is predicted from hospital administration factors at 79.7% which signifies that there are many other unexplained parameters that effect outcome of Information technology effectivity. However external participation perspective in predicting Information technology effectivity is very high.

5. CONCLUSION

The result highlights that the Information technology professionals are well conversant towards the role of IT for hospital administration. Proper utilization of resources and security of data and information is best indication of IT effectivity and purchasing and inventory control is perceived where IT can play a role for hospital administration. IT effectivity of hospitals administration can be improved by utilizing information technology applications. Role of information technology may be an effective initiative that enables decision making, cost reduction, reduced paper, proper utilization of resources. Also plays a significant role in hospital administration practices to make it much effective.

REFERENCES

[1] Ahmadi, F. & Shirzade, J. (2011). Identify factor that impact on develop of knowledge Management in Automobile Industry. *Interdisciplinary journal of Contemporary Research in Business* , 2(10), pp-327-340.

[2] Bakshi, S. M. H. (2012). Healthcare Information Technology Service Assessment: A Healthcare Leader Prospective. *International Journal of Advanced Research in Computer Engineering & Technology,* 1(4), pp-410–418.

[3] Bhaskar, R. K. & G, Somu. (2011). Adapting Information Technology (IT) in healthcare for quality patient care-study conducted in a hospital in South India. *Journal of Health Informatics in Developing Countries*, pp-209–218.

[4] Bhattacharya, I., & Ramachandran, A. (2015). A path analysis study of retention of healthcare professionals in urban India using health information technology. *Human Resources for Health*, 13 (65), pp 1–14.

[5] Dubey, S. S. (2011). *IT Strategy and Management* (2nd ed.). New Delhi: PHI Learning Pvt. Ltd.

[6] Federici, T.& Resca, A. (2009). Managing E-Procurement in Public Healthcare: A Knowledge Management Perspective . *International Journal of Healthcare Delivery Reform Initiatives*, Vol 1(1), pp 1–15.

[7] Goldschmidt, P. G. (2005). HIT and MIS:Implications of health information technology and medical information systems. *Communications of the ACM*, Vol. 48 (10), pp 69–74.

[8] Herrick, D.M., Gorman, L., & Goodman, J.C. (2010). Health Information Technology: Benefits and Problems. *National center for policy analysis*, Policy Report No. 327, pp 1–24.

[9] Itumalla, R. (2012). Information Technology and Service Quality in Health Care: An Empirical Study of Private Hospital in India. *International Journal of Innovation, Management and Technology*, 3 (4), pp 433–436.

[10] Kaur, G. & Gupta, N. (2006). E-health: A New Perspective on Global Health. *Journal of Evolution and Technology* , 15(1), pp 23–35.

[11] Lewis, D., Hodge, N., Gamage, D., & Whitakker, M. (2011). Understanding the role of technology in health information systems. *Health Information Systems Knowledge Hub,* pp 1–22.

[12] Mishra, S., Kalra, A., & Choudhary, K. (2013). Influence of Information and Communication Technology in Health Sectors. *International Journal of Soft Computing and Engineering*, 3(5), pp 66–68.