

# Usage of ICT for Information Administration in Higher education Institutions – A study

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**Abstract—** A good higher education system is required for overall prosperity of a nation. A tremendous growth in the higher education sector had made the administration of higher education institutions complex. Many researches reveal that the integration of ICT helps to reduce the complexity and enhance the overall administration of higher education. This study has been undertaken to identify the various functional areas to which ICT is deployed for information administration in higher education institutions and to find the current extent of usage of ICT in all these functional areas pertaining to Information administration. The various factors that contribute to these functional areas were identified. A theoretical model was derived and validated.

**Index Terms—**General administration, Information administration, Information and Communication Technology (ICT), Student administration, Staff administration, Path Model.

## I. INTRODUCTION

Change has been happening at an uneven pace in any growth-oriented industry, and the education sector is no exception. Rapid growth in the field of education has made governance in academic sector a very complex task. The 21<sup>st</sup> century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. Cost-effective technology combined with the flexibility in learning and administrative activities is essential to enhance efficiency.

Computers can be used extensively for educational administration. The following are some of the areas where computers can be used for effective educational administration (Ben-Zion Barta et. al. 1995):

- General Administration
- Pay Roll and Financial Accounting
- Administration of Student Data
- Inventory Management
- Personnel Records Maintenance
- Library System

Information and Communication Technology (ICT) plays a vital role in supporting powerful, efficient management and administration in education sector. It is specified that technology can be used right from student administration to various resource administration in an education institution (Christiana Maki 2008).

Sharad Sinha (2008) mentioned the various administrative challenges for Indian education system of the 21<sup>st</sup> century as given below:

- Global and local challenges

- Universal and individual challenges
- Balancing between traditional and modern approaches
- Long term and short term considerations
- Competition and equity challenges
- Extraordinary expansion of knowledge

As a part of strategy, the author mentioned that these challenges could be overcome with the proper usage of technology. Moreover many studies revealed the need for ICT integration into administrative activities of higher education institutions. The various ways of introducing technology in education institution administration are the following (Caroline Salerno 2009):

- Sending e-mail notices and agendas to staff, rather than printing and distributing them
- Submission of lesson plans through e-mail
- Foster technology growth by asking parents to write e-mail addresses on medical forms.
- Insist that all teachers create a class Web page
- Attend technology conferences to see what other schools are doing, what other teachers are doing to integrate technology, and what principals are doing to encourage the use of technology in their schools and classrooms.
- Admissions through web-enabled services.
- All day-to-day activities of the institution (General Administration)
- Staff administration

## II. THEORETICAL MODEL

Rajeev Singh (2008) has specified that ICT has played a major role in reducing operational inefficiency and improving decision-making in many areas of governance. An integrated Higher Education Service System is one such concept that can empower the governing bodies to administer the progress of the education plan in the whole country and serve various stakeholders in a much better manner.

According to (Christiana Maki 2008), administrative subsystems include Personnel administration, student administration, resources administration, financial administration and general administration.

Ulf Fredriksson and Elzbieta Gajek (2009) mentioned that Communication and general administration are the two main areas in which ICT is used in the management of education institutions. It is evident from the above that administrative activities in a higher education institution consists of student administration, staff and resources administration, communication and general administration

According to Hossein Zainally (2008), "Information and Communication technology provides several facilities and possibilities for educational administrators to do their tasks". There is a mention that communication and information systems have changed the very nature of higher education, allowing information to be transferred, stored, retrieved, and processed by almost all who work, study or interact with a given institution. The author has also quoted from other research work that there is an increase in managerial effectiveness and efficiency through usage of Information and Communication technologies

The various research studies conducted to evaluate the extent of usage of Information and Communication technologies in multiple aspects of higher education revealed that heads of faculties utilized technology in planning, and to a large extent in the supervision and evaluation of academic affairs, student affairs, financial affairs and administrative affairs. It was concluded that information and communication technologies have an impact on increase of the scientific level of faculty members, students, and staff.

Ashish Kumar and Arun Kumar (2005) highlighted the importance of Information Technology (IT) as a modern day techno-management tool that would benefit institutions of higher education in India. Gumala Suri (2005) reported that Spanish and Indian universities have been changing fast due to the development of new Information and Communication Technologies (ICT). The author has mentioned that user satisfaction is a widely used measure of ICT success. The author has concluded by providing a conceptual model for implementing a good technical system. It is mentioned that ICT is used in administration to support the business strategies and processes of higher education institutions, and a "dynamic new shift occurred in higher education" due to the application of ICT in University administration. This facilitated creation of large and complex institutions that could function with increased efficiency and user-friendliness. It is also mentioned that usage of ICT in higher education administration involves "harnessing technology for better planning, setting standards, effecting change and monitoring results of the core functions of universities. One of the key conclusions arrived at is that the integration of ICTs in higher education is inevitable (UNESCO, 2009)

Olive Mugenda (2006) said ICT fosters the dissemination of information and knowledge by separating content from its physical location. This flow of information is largely impervious to geographic boundaries allowing remote communities to become integrated into global networks and making information, knowledge and culture accessible, in theory, to anyone. It is also mentioned that ICT enhances day-to-day management of institutions and the various functional areas in which it could be used are specified below:

- Timetabling
- Student admission and Tracking
- Financial Management
- Medical services
- Procurement and Store management
- Data distribution and management

ICT is used in maintenance of student and staff records and for communication and document management (OECS 2001). Ashish Kumar and Arun Kumar (2005) have mentioned about the positive perception towards the use of ICT in education. It is mentioned in the study that students of different universities reported the usage of ICT for communication and for on-line discussion forums. ICT facilitated contact and information exchange and also promoted access to higher education. ICTs included systems for student admission and records, examination results and transcripts, finance database, human resources database, and management information.

Various literature reviews reveal that Information administration is one part of overall administration of education institutions which mainly covers general and day-to-day operational activities. Hence, it could be concluded that Information administration cycle includes four major components namely, Student administration, Staff administration, and General administration. A theoretical model for Information administration has been formulated, and is depicted below:

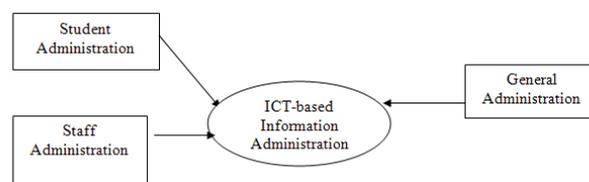


Figure 1: Theoretical model for Information administration

Information administration in this context refers to activities relating to the management of higher education institutions which is often mentioned in other studies as managerial activities in higher education institutions. The administrative systems include Personnel administration, student administration, resources administration, financial administration and general administration (Christiana Maki, 2008). Based on the literature review the three main functional areas of information administration that are of great significance for day-to-day management of higher education institutions was identified as follows:

- Student administration
- Staff administration
- General administration

Student administration is an important and integral part of information administration. This involves various activities commencing from the admission process to learning activities till processing of results and performance analysis. The integration of ICT into this process enhances the overall admission activities of higher education institutions by making it more accessible to many (Thomas Kwaku Obeng 2004). Based on the literature review, the important items identified under this category relates to the automation of admission process through e-media. This includes admission enquiry by students, applying for admissions through electronic media, registration / enrolment using computers, course allotment, and availability of information like timetable / class schedule in electronic form and attendance monitoring / maintenance through e-media. Further it includes the various communications relating to transport, hostel accommodation and other communication to

guardians/parents. The integration also helps in expansion of the geographical boundaries for student intake, thus facilitating cross-border higher education.

Staff administration includes recruitment and work allotment of faculty and staff in the institution, their attendance and leave management, and performance appraisal. This also includes relevant communication to and from the institutions and among peers. Staff administration done through Information and communication technology (ICT) helps in processing of voluminous records in a quick, meticulous, and impeccable manner thereby making data retrieval easier (Thomas Kwaku Obeng 2004).

In general, a good communication system should also be in place for the overall effectiveness of administration. ICT helps in providing a good communication system in higher education system (Magni 2009). ICT helps in providing timely information to all concerned. Communication could be for internal and external information acquisition and dissemination. It includes communication between the important stakeholders of the system such as sending e-circulars to students, faculty and staff. The dissemination of information about the institution using e-kiosks is also a very important item to be considered. The relevant aspects of communication have been clubbed with Student administration and Staff administration for this research study.

A very important part of Information administration is general administration of higher education institutions which includes the various day-to-day activities of the entire system. Through literature reviews, it is evident that the integration of

ICT into general administration has brought increased efficiency and optimal resource utilization (Hasan et al. 2007). The various items classified under this category include usage of electronic media for scheduling of halls and other resources, fee payment, and handling internal and external examination activities in coordination with the faculty members, all day to-day activities, intra and inter communication etc.,.

### III. METHODOLOGY

Information administration was identified as one of the important functional area in higher education institutions. It is often mentioned in various studies as managerial. Usage of appropriate information technologies could improve the overall environment and operational efficiency of higher education institution and it helps to improve the following functional areas and not limited to inventory control, allocation of resources, fiscal management, communications, pupil/personnel services, student records, employee productivity etc. (MD Roblyer et. al 2005).

The Methodology adopted involved the following:

- Item generation
- Content Validity
- Reliability test
- Criterion Validity
- Path Validity

The item categories derived from the literature review for information administration are summarized in Table-1

TABLE1 ITEM CATEGORIES GENERATED FOR INFORMATION ADMINISTRATION

Sl. No.	Construct	Content categories
1	Student Administration	Usage of electronic media by students to apply for admissions
		Usage of computers for student registration / enrolment
		Availability of timetable / class schedule in electronic form
		Usage of computers for maintenance of attendance of students
		Communication of academic details of students to their parents / guardians through e-media
		Usage of e-media for notifications regarding hostel accommodation
2	Staff Administration	Usage of e-media for notifications regarding transportation
		Usage of computers for recruitment and work allotment of staff in the institution
		Automation of attendance and leave management of staff members in the institution
		Usage of electronic media for performance appraisal
		Communication with staff using e-media
		e-circulars from the institution regarding official matters
		e-kiosks are available in the institution
3	General Administration	Usage of e-media for scheduling / allocation of halls for examinations
		Dissemination of information in the institution through e-kiosks
		Usage of e-media by students to apply for university examinations
		Usage of e-media for the processing and display of results of students
		Facility for students to make fee payments electronically

Information administration consists of three main components namely Student administration, Staff Administration and General administration with Communication as an integral part of these three components.

The items that contribute towards all the three functional

areas were carefully identified through extensive literature review and discussions with educational practitioners and experts. A formal questionnaire was prepared. The responses for the questionnaire received from administrative personnel were grouped according to the functional areas. For every item, the responses given in a five-point Likert scale by the

respondents were classified into two categories namely 'Yes' and 'No' for the usage of technology in Information administration.

Reliability test was done using SPSS software. The overall reliability of the instrument was 0.884. The final alpha scores for Student, Staff, and General Administration were found to be .693, .802, and .580 respectively. Criterion validity is the extent to which a measurement instrument can predict a variable that is designated as a criterion. It is concerned with detecting presence or absence of one or more criterion considered to represent constructs of interest. Criterion validity for Information administration was tested by examining the  $R^2$  value obtained for the construct whose value depicts the extent of representation by the independent variables. The reliability and AVE were found as depicted in Table-2.

TABLE2 RELIABILITY AND AVERAGE VARIANCE EXTRACTED

Construct	Composite Reliability	AVE
Student Administration	0.87	0.49
Staff Administration	0.71	0.37
General Administration	0.57	0.29
Information Administration	0.63	0.41

#### IV. ANALYSIS AND INFERENCES

The overall mean score for the functional areas of Information administration was 3.54 which reveal that all the functional areas contribute well towards Information administration. Analysis was done to see whether the indicators for Information administration had a statistically significant relationship with each other. Pearson correlation test was done to examine the association between the indicators. All the constructs correlate positively with each other either at 0.01 or at 0.05 level of significance.

The demographic factors were analyzed for their impact on the functional areas of Information administration. Most of the demographic factors did not have any statistically significant difference in the functional areas of Information administration. These include the demographic factors relating to respondents such as gender, age, department, designation and the factors relating to institutions such as years of existence, affiliated university, and region.

It can be observed that the mean score for Student and staff administration are well above 3.02 and that of General administration was little less with the score of 2.82. This clearly indicates that the integration of ICT into general administration has large scope. Every item of all the respondents was analyzed based on the above and the items contributing to Student, Staff, and General administration were grouped to find the extent to which technology is currently in use. This was done to identify the extent of usage

of technology for overall Information administration construct (ia). It was inferred from the analysis that 66% of the respondents utilized technology for Student administration, 46% for Staff administration, and 37.6% for General administration. It was identified that 58.5% of the respondents made use of technology for overall information administration.

Coefficient of determination ( $R^2$ ) is the percentage of the total variation in the dependent variable explained by the independent variable. The R-square value of Information administration was 0.448 which describes that path model has good criterion validity. The validated theoretical model using PLS is depicted as shown below in Fig-2.

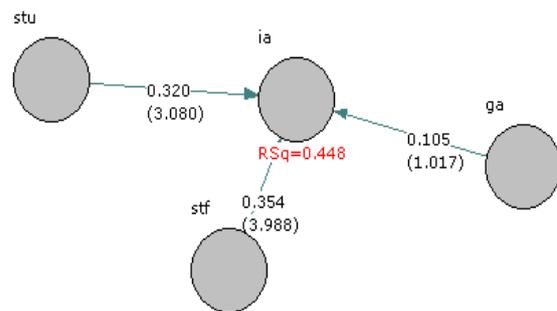


Figure-2 Validated Path Model for Information Administration

This clearly shows that ICT has become a necessary tool for accomplishing the administrative tasks with ease. Through this study it is evident that transformation in accordance with technological advancements is happening in the education sector. It is mainly used in the areas of student administration and staff administration. The extent of usage for general administrative activities is comparatively less.

#### V. CONCLUSION

This study has identified a comprehensive set of functional areas of Information administration. It was found that current level of usage indicates a clear integration of ICT for managerial or information-based administration in higher education institutions.

This study reveals that demographic factors do not have major impact on Information administration in higher education institutions

It was also evident from the validation of the path model that all the functional areas identified have an influence on Information administration. This reveals that enhancing the usage of ICT on these functional areas and especially for general administration will enable enhancement of overall information administration in higher education institutions in the realm of global competitive environment. This study could serve as a base for education planners to deploy Technology based administration in higher education institutions

#### REFERENCES

- [1] Ashish Kumar and Arun Kumar (2005), "IT based KM for Institutions of Higher Education A Need", Paper published in A weekly Journal of Higher Education in India from Association of Indian Universities, New Delhi India Vol. 43, No. 30, July 25-31, 2005, pp. 4 – 9

- [2] Ben-Zion Barta., et.al. (1995),” Information Technology in Educational Management”, Chapman and Hall, London.
- [3] Caroline Salerno (2009),”Administrator’s Role in Technology Integration”, EducationWorld 2009.
- [4] Christiana Maki (2008),”Information and Communication Technology for Administration and Management for secondary schools in Cyprus”, Journal of Online Learning and Teaching Vol. 4 No. 3.
- [5] Hossein Zainally (2008),” Administration of Faculties by Information and Communication Technology and Its Obstacles”, International Journal of Education and Information Technologies , Vol. 2,issue1 2008
- [6] Magni (2009),”ICT usage in Higher education”, International Technology and Education and Development Conference, Spain March 9-11 2009.
- [7] Sharad Sinha(2008), National Policy on ICT in School Education, Ministry of Human Resource Development Government of India
- [8] Ulf Fredriksson et.al(2009),”Ways to use ICT in schools to optimize the impact on teaching and learning”, Paper presented at ECER, September 28 – 30 in Vienna, Austria
- [9] Gunmala Suri (2005),” “Organizational culture in ICT implementation and knowledge management in Spanish and Indian Universities: A conceptual Model”, published in A Special Interest Groups of CSI.
- [10] Hasan et. al. (2007), CIT reflections ,Annual Magazine of the FTK-Centre for Information Technology ,Jamia Millia Islamia , New Delhi, Issue-1 April 2007.
- [11] Thomas Kwaku Obeng (2004), “Practical Application Of ICT To Enhance University Education In Ghana”, Feature Article, Ghana Web 2004.
- [12] Roblyer M.D. (2005),”Educational Technology Research That makes a Difference: Series Introduction, Contemporary issues in Technology and Teacher Education Vol.5, Issue 2(2005).

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