

# A Study of the Effect of Barriers in the Implementation of IT Based Services in the Management of Professional Educational Institutions

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## **Abstract**

Educational institutions need to use IT based solutions for improving academic performance and satisfy the growing expectations of students. However, there a number of problems in the implementation of IT based services in the educational institutions. In this paper we have identified various barriers or obstacles and studied their effect of in the implementation various IT based services in the professional education institutes of Indore.

## **Keywords:**

IT based Services, e-Learning, Student Support, Placement Teaching-Learning, Class Management

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## **Introduction**

Higher education is the major driver of economic competitiveness. Higher Educational Institutions which want to gain competitive edge need to begin searching for creative and efficient ways to attract, retain and foster stronger relationships with the students. Many institutions engaged in higher education are utilizing information technology services as an effective tool for monitoring and improving organization's academic and administrative performance (OECD, 2004). Information Technology services are required in a number of areas in management of higher educational institutions (Kanungo, 2011; Kanungo, 2010):

- Improved teaching-learning process
- Better classroom management:
- Examination and evaluation management
- Promoting research environment
- Support for extra-curricular activities and involvement of students.
- Assisting training and placement cell
- Improving resource utilization in the institute.
- Effective Management and Administration with e-Governance.
- Increasing effectiveness of leadership.
- Improving communication and coordination among stack-holders.

## Barriers to IT Based Services

Use of Information Technology (IT) in management of education has become essential part of educational processes. However, there are a number of problems in the implementation of IT based services in the educational institutions. Despite of feasibility of computers and networking infrastructure, there are a number of barriers which are necessary to solve for successful implementation of IT based services. Administrative staff is trained in traditional method. Literacy of computer staff, especially senior staff, is poor due to technological phobia and conservative attitude. Poor maintenance and update culture causes frequent computers and network breakdowns and failure. Also, there is a lack of IT skills and slow process of automation due to lack of technical support (Aggarwal & Kaur, 2011).

Management support and involvement is necessary for successful implementation of IT services for adequate funds and resources. This also ensures effective implementation changes required by new system like change in organizational realignments norms, rules and regulations, work habits etc. (Carnall, 1995). User at all the levels must be explained the understanding of the system (Sarwani, 2003). Ajayi & Omirin (2007) recommended that the MIS units should be adequately financed and maintained to ensure free flow of information and adequate use of MIS in decision making on long-term and short-term planning as well as budgeting. Proper orientation should be given to managers at all levels and in-service training should be imparted for secretaries to ensure proper and adequate use of MIS facilities in generating and disseminating information for better decisions.

The major barriers to ICT include lack of IT skills in teachers, lack of teachers' confidence, lack of pedagogical training, lack of suitable IT software, limited access to ICT, rigid structure of traditional education system, restrictive curricula etc. If teachers' attitude is positive towards use of educational technology adaption and integration of ICT, teaching-learning is facilitated (Albirini, 2006; Kanungo, 2011). Teachers should be assured that technology can make teaching interesting and easier and enjoyable to the students. Teachers' professional development is key factor to successful integration of computers in classroom teaching (Charles, 2012) and (Adams, 2002). The barriers in the implementation of IT services in Higher Education Institutions include (Alwani & Soomro, 2010):

- No specific budget for information technology
- No vision or Strategic plan for IT
- No instructional support for incorporating IT into teaching
- The lack of funds to get hardware

- Students don't have access to the Internet during the day
- The architecture of classrooms is not suitable for implementing IT

Adeyemi and Olaleye (2010) investigated the use of information communication and technology (ICT) for effective management of educational institutions in Ekiti State, Nigeria and detected various barriers in implementation of IT services. They found that the level of provision of ICT equipment to in the state was low. The level of Principals' management of educational institutions was also low. The intermittent disruption of electricity and inadequate funding (OECD, 2011) were found as major problem in the usage of ICT equipment for the management of educational institutions in the state. It was concluded that the state government was not fully ready to imbibe ICT for the effective management of educational institutions in the state. It was recommended that the state government should supply the necessary ICT equipment to all educational institutions. Government should also improve the training of Principals, teachers and computer personnel in the use of computers and other ICT equipment through seminar, workshop and in-service training.

Begg (2002) posted that critical barrier pertains to teachers' poor preparation and lack of confidence for use of IT. Even highly educated and competent teachers in their own area have fear of technology and have a fear of looking stupid in front of students by failing their use of IT. Thus, modest levels of IT skills in the teachers are barriers to implementation of IT services (Afshari, Bakar, Luan, Samah & Fooi, 2009). Corbin (2003) has identified five barriers and grouped them into three areas viz. lack of experience in pre-service training, lack of access to computers in the educational institutions and lack of on-site technical support. He also stated that the most important barrier is that most teachers have to deal with is lack of access to computers, either in a laboratory setting or in the classrooms.

Moreover, some of the Universities are reluctant to change their content and delivery and are hard pressed to demonstrate the superiority of traditional classroom processes for the knowledge transfer. But e-Learning is necessary to supplement the traditional classroom-examination centric model to create problem based learning environment (Romiszowski, 2004). Fundamental concepts can be explained in better way using web based interactive learning to move from cramming to understanding (Addo, 2003). E-learning can also prove to be effective in imparting education to masses in rural and remote areas. Education through e-Learning has to be duly recognized and accredited as equivalent to education through conventional means (Narayanan, 2005). Based on the literature survey, we have chosen following most common barriers in implementation

of IT based services in the higher education institutions:

- Resistance of staff members in using computers and IT techniques create problems in implementation of IT services.
- As the required IT facilities not accessible, teachers and students cannot make use of IT based service.
- Lack of maintenance and technical support is a major problem in upkeep of IT services.
- Due to intermittent disruption of electricity, IT based services are not reliable.

### Research Methodology

The data has been collected through structured questionnaire. An online questionnaire form was uploaded and link was e-mailed to students and faculty members of various Professional Educational Institutes of Indore city. The sampling procedure used for the study was probabilistic stratified random sampling for selecting respondents. The stratification has been done on the basis of management and engineering institutions and teachers and students within these institutions.

The samples were collected from various professional educational institutes in Indore. Indore is considered to be the education hub for engineering and management education in Central India. International level educational institutions like Indian Institute of Technology (IIT) and India Institute of Management (IIM) have also been established in this glorious city. A large number of professional courses like BE, MBA, M. Tech., M. E, MCA, BBA , BCA , MBBS and BDS etc. are conducted by a number of colleges. Most of the engineering colleges are also conducting MBA program.

The respondents are faculty, staff members and students of the engineering, management and Information Technology Institutes. Sample size was 700. Around 65% respondents from Engineering and Information Technology Institutions and 35 % respondents from Management Institutions were chosen. In each of these category, 40% teachers and 60% students were chosen. Three students and two teachers were selected from 50 management institutes and six students and four teachers were selected from 45 engineering institutions as a sample. Out of these around 60 % male and 40% female were selected.

All the students, faculty members and staff of higher educational institutes will constitute the population of the study. Indore city is considered to be education hub of central India. As nearly one third of the professional institutes of Central India are located in the Indore city, we had considered the entire professional Institutes of Indore city as the population of the study. There are 58 management

institutions and 45 engineering colleges in Indore. Number of students studying in engineering colleges is approximately 38000 and management courses are around 15000. Similarly, number of teachers in engineering courses is around 2000 and number of faculty members in management Institutions is around 800. The sample size for the study is 700 out of which 250 respondents were students and 450 respondents were faculty and staff members of Professional Education Institutes. The response rate was 71%. A total 500 response sheets were found suitable for the analysis.

Various IT Based Services being used in Professional Educational Institutions in Indore include:

- IT Services for Human Resource Development
- Web Enabled Services
- IT Based Services for Teachers
- IT Based Services for Learning
- IT Based Services for Student Support
- IT Based Services for Placement
- IT Based Services for Class Management
- IT Based Services for Research
- IT Based Services for Administration
- IT Services for Examinations and Results

Based on the uses of IT Based services in the professional education institutions in Indore, 12 variables were considered for the study, these variables include Human Resource Development for IT Services, Web enabled Services available in the Institute, Efficacy of IT services in Teaching, Efficacy of IT services in learning, Efficacy of IT Services for Student's Support, Efficacy of IT Services for Placement, Efficacy of IT Services in Class Management, Efficacy of IT Services in Research, Efficacy of IT Services in Administration of the Institute, Efficacy of IT Services on Examination and Results, User Friendliness of IT Based Services and Barriers in Implementation of IT Based Services.

Overall IT Management Service is the variable which measures the overall affect of IT services used in an Institute. This variable comprises of Human Resource Development for IT Services, Web enabled Services, IT services on Teaching, IT services for learning, IT Services for Student's Support, IT Services for Placement, IT Services in Class Management, IT Services in Research, IT Services in Administration of the Institute, and IT Services on Examination and Results. A mean score, of the mean of these 10 variables form the variable Overall IT Management Service was calculated. Then a standard score of the same is

calculated for further analysis.

In this paper, we have studied then effect of barriers in the implementation various IT based services in the professional education institutes of Indore. The effect of Barriers in Implementation of IT based services was measured by 4 questions. A mean score of mean of these variables was calculated and then this score was converted to standard score. The formula used was,  $Z = (x - \text{mean}) / \text{Standard Deviation}$ . The data was analyzed for mean and standard deviation for descriptive statistics. For inferential statistics, parametric tests such as correlation, independent t-test and regression analysis were employed. Regression analysis is used to evaluate the relation between the variables.

### **Analysis of the Barriers to the Implementation of IT Services in the Educational Institutions in Indore**

Although there are a number of barriers affecting the implementation of IT services, for this study four important barriers are considered viz. resistance from staff members in using computers and IT techniques, accessibility of the required IT facilities to students, teachers and staff to make use of IT based service, lack of maintenance and technical support in upkeep of IT services and intermittent disruption of electricity which can makes IT based services unreliable. Table 1 shows the mean and standard deviation of the barriers to the implementation of IT based services. From the table, it is evident that all the respondents agree with low degree on the barriers which are affecting the implementation of IT services.

Table 2 gives the percentage analysis of the barriers in implementation of IT based services. From the percentage analysis, it is obvious that nearly 55 percent of the respondents agree that resistance of the staff members creates problems in the implementation of IT services. More than 70 percent of the faculty members also agree that IT facilities are easily accessible to students, teachers and staff to make use of IT based services. More than 70 percent of the respondents agree that lack of maintenance and technical support is a major problem in up keeping of IT services. More than 50 percent of the respondents also agree that intermittent disruption of electricity makes IT based services unreliable.

It can be concluded that resistance of staff members is the problem in the implementation of IT services. However, the IT services are accessible to students, teachers and staff to make use of IT based services. It is also observed that lack of maintenance and technical support is a major problem in up keeping of IT services. The factor which makes IT based services unreliable is the disruption of electricity.

### **Relation between Overall IT Management Services and Barriers in Implementation of IT Based Services**

In order to find impact of Barriers in implementation of IT based services on Overall IT Management Service, first correlation between the two has to be found. Karl Pearson correlation gives the linear correlation between the two variables which is given in Table 3. From the table, it is evident that the correlation is positive and significant, which means there is positive correlation between the Overall IT Management Service and Barriers in implementation of IT based services.

In order to evaluate the relation between the two, a simple linear regression is estimated, where Barriers in implementation of IT based services is an independent variable and Overall IT Management Service is a dependent variable. Table 5.37 reveals the regression coefficient and R<sup>2</sup>. From the table, the relation explained between Overall IT Management Service and Barriers in implementation of IT based services is 12.5 percent and the relation is positive. The predicted regression equation is:

### **Overall IT Management Service = 3.057 + 0.236 Barriers in implementation of IT based services**

In order to test the effect of Barriers in implementation of IT based services on the Overall IT Management Service a Null hypothesis is developed and tested using t test.

H01: There is no significant impact of Barriers in Implementation of IT Based Services on the Overall IT Management Service i.e.  $\beta = 0$

From Table 4, it is clear that the t value is 8.447 with p value 0.000 which is significant. Hence, the null hypothesis is rejected, which means Barriers in Implementation of IT Based Services has impact on Overall IT Management Service. It can be concluded that the relation between Overall IT Management Service and Barriers in Implementation of IT Based Services is positive.

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The hypothesis is rejected, which means that the Barriers in implementation of IT based services have significant impact on Overall IT Management Service. Though there are many barriers which are affecting the implementation of IT services, for the study four more significant barriers are considered viz., resistance of staff members in using computers and IT techniques which; accessibility of the required IT facilities to students, teachers and staff to make use of IT based service; lack of maintenance and technical support in upkeep of IT services; and intermittent disruption of electricity which can makes IT based services unreliable.

From the responses of various stack-holders, it is clear that all the respondents agree with low degree on the barriers which are affecting the implementation of IT services.

A large number of faculty members agree that IT facilities are easily accessible to students, teachers and staff to make use of IT based services. Similarly, the respondents agree that lack of maintenance and technical support is a major problem in upkeep of IT services. However, nearly half of the respondents agree that resistance of the staff members creates problems in the implementation of IT services and intermittent disruption of electricity makes IT based services unreliable. A large number of faculty members agree that IT facilities are easily accessible to students, teachers and staff to make use of IT based services. Similarly, the respondents agree that lack of maintenance and technical support is a major problem in upkeep of IT services. However, nearly half of the respondents agree that resistance of the staff members creates problems in the implementation of IT services and intermittent disruption of electricity makes IT based services unreliable.

The relation between Overall IT Management Service and Barriers in implementation of IT based services has been predicted using following regression equation:

**Overall IT Management Service = 3.057 + 0.236 Barriers in Implementation of IT Based Services**

### Conclusion

In this paper, we have highlighted the dynamic role of higher education in the growing national economy and the complexities arising due to increased demand of trained graduates. Effect of various barriers or obstacles in the implementation of IT based services has been explored. The aim of this paper was to find the barriers to the implementation of IT based services in the Educational Institutions. The study shows that the barriers in implementation of IT based services have significant impact on Overall IT Management Service.

Barriers in the effective implementation of IT services in the educational institutions in Indore have been explored. It can be concluded that IT facilities are easily accessible to students, teachers and staff to make use of IT based services. It is found that the staff members' resistance is a problem in the implementation of IT services. It is also observed that lack of maintenance and technical support is a major problem in upkeep of IT services. The disruption of electricity makes IT based services unreliable.

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### APPENDIX I : Tables and Charts

**Table 1: Descriptive Statistics on Barriers to IT Services Implementation**

Barriers to the Implementation of IT Services	N	Minimum	Maximum	Mean	Std. Deviation
Whether the resistance of staff members in using computers and IT techniques creates problems in implementation of IT services?	500	1	5	3.50	1.002
Are the required IT facilities easily accessible to students, teachers and staff to make use of IT based service?	500	1	5	3.89	0.901
Whether lack of maintenance and technical support is a major problem in upkeep of IT services?	499	1	5	3.85	0.951
Is there an intermittent disruption of electricity which makes IT based services unreliable?	499	1	5	3.45	1.140

*Source: As per data collected by the researcher*

**Table 2: Analysis of Barriers to the Implementation of IT Services**

<b>Barriers to the Implementation of IT Services</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
Whether the resistance of staff members in using computers and IT techniques creates problems in implementation of IT services?	2.2%	15.6%	27.2%	39.6%	15.4%
Are the required IT facilities easily accessible to students, teachers and staff to make use of IT based service?	0.8%	7.8%	18.4%	47.6%	25.4%
Whether lack of maintenance and technical support is a major problem in upkeep of IT services?	2.0%	8.2%	17.2%	48.1%	24.4%
Is there an intermittent disruption of electricity which makes IT based services unreliable?	4.8%	18.8%	22.4%	34.7%	19.2%

*Source: As per data collected by the researcher*

**Table 3: Descriptive Statistics and Correlation for Barriers to the Implementation of IT Services**

<b>Variable</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>N</b>	<b>Pearson Correlation</b>	<b>p value of correlation</b>
Overall IT Management Service	3.9228	0.42374	500	0.354	0.000
Barriers in implementation of IT based services	3.6725	0.63654	500		

*Source: As per data collected by the researcher*

**Table 4: Coefficients and R<sup>2</sup> for Barriers to the Implementation of IT Services**

Model	Unstandardized Coefficients		t	Sig.	R <sup>2</sup>
	B	Std. Error			
(Constant)	3.057	0.104	29.402	0.000	0.125
Barriers in implementation of IT based services	0.236	0.028	8.447	0.000	

Dependent Variable: Overall IT Management Service

*Source: As per data collected by the researcher*