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Effect of Organizational Characters on ICT adoption in University Libraries in West Bengal, India



Dr. Sambit Kumar Hazra

Abstract:

This study tries to investigate the effect of organizational characteristics on ICT adoption in the University libraries in west Bengal. Organizational character based on resource based theory. A survey method is applied to gather data and came to the conclusion that organizational location has no effect on ICT adoption in the university libraries in west Bengal. Study also support the fact that large organization in terms of their access to different resources stand in a better chance to adopt and use ICT successfully and top management support, head of the organizations or the higher authority support can encourage or discourage adoption of such innovations due to the mandate of the authority vested on them.

Keywords: E- Resources, Resource based Theory, Organizational Characters, University Libraries, Information and communication technology

1 Introduction

Adoption of ICT in the University libraries depends upon its organizational characters in different perspectives like availability of resources, location of the university, top management support etc. An organizational character includes Location of the organization, availability of e-resources and Top management supports. Effects of these characters are better explained by the Resource based theory(RBT), this theory was developed by Penrose (1959), and in recent year it gains popularity in ICT research. The theory was developed to give explanation of growth mechanism and dynamics of the organization. Penrose defined an organization is made up of various resources. This theory assume that each and every organization has the positive relationship of unique resources and capabilities (Barney,2001). RBT stated that organization can take competitive advantage by logical utilization of its available resources.

Location of the organization is the important factor, it has been suggested that location of the organization should be among the organisational characteristics that may affect innovation decision. Storey (1994) opined that organizations located in urban areas or accessible areas are observed more rapid growth rate than those in rural areas. Causes of such growth difference may be the effect of the diverse access of external resource.

The availability of e- resources or size of the organization perhaps the mostly studied organisational characteristics that influencing adoption of ICT and its usage. It is conventional that the size of the organization is positively related to innovation adoption (Frambach et al, 1998; Rogers,2003). Most of the previous studied identified the fact that large organization in terms of their access to different resources (for example: sahadev and Islam, 2005; Thong,1999) stand in a better chance to adopt and use ICT successfully.

Almost all organizations, individual employees have no freedom about technology adoption and use in their service places. Head of the organizations or the higher authority support can encourage or discourage adoption of such innovations due to the mandate of the authority vested on them. Rogers (2003) suggest three types of organizational innovation decision these are authority, collective and optional innovation decisions.

2. Literature Review

In recent years, there has been an increasing amount of literature on study like effects of various factors on ICT adoption. Such as Study on financial Factors explained why Fund is essential for successful implementation of modern technology in the library, modern ICT facilities such as Computer, server, scanner, RFID system need big fund for installation. To subscribe or purchase online books, journals, and offline source such as e-books, e-journals needs fund. Amutabi(2009) opined that inadequate fund leads to unsuccessful ICT adoption. Kamba (2011) conclude that sustainable of funding very much essential to updated the existing technology.

Technological factors are very much important for successful ICT adoption, inadequate infrastructure of ICT causes unsuccessful ICT adoption. Many past researcher conclude that inadequate infrastructure is major challenge for ICT adoption. Kamba (2011) observed that ICT is not widely adopted in African country because of that problem of poor communication network and inadequate of hardware and software infrastructure. Minshi-Majanja,(2005) opined that poor number of computer and low internet connectivity, poor telecommunication

service, inadequate electric supply, low bandwidth causes unsuccessful ICT adoption. Rosenberg showed in his study, less number of computer is the root causes of poor ICT adoption.

Human Factors is the very important factor for ICT adoption, leadership of the librarian and trained and skill staff are the key player of the ICT adoption. Many researcher like Sife; Minshi-Majanja; Odero-Musakali and Mutual identified that lack of skilled staff and negative attitude of the university management hinder the successful adoption of ICT

Cultural Factors: There are some social and cultural factors which hinder the ICT adoption, Socio-cultural facets like cultural values, regional priorities, institutional relations and political dynamics and educational background influence the potential users groups.

Amutabi(2009) opined that the absence of computer culture in public universities hampers rapid circulation of the new technologies. He adds that many university officials began their careers in the age of typewriter, before the extensive introduction of computer technology at universities and therefore find it very tough to comprehend many things in ICT. Gould and Gomez (2010) found that people of many countries still not aware about the information available in the library there are problem in mind set; they believe that library is the storing place of books; they are unaware about the service provided by the libraries

Eze, Awa, Okoye, Emecheta & Anazodol(2013) Conducted a study to investigate effects of 13 factors on ICT adoption in Nigerian Universities. They applied a theoretical framework of technology organisation and environment (T-O-E). For this purpose a survey is conducted by questionnaire and interview methods. The result of the investigation shows that irrespective of the consciousness about the benefit of ICT adoption government aided institute are not utilizing its full potential. several factors are responsible for that, these are shortage of financial fund, constant corrupt practice, inadequate power supply. This study raised some challenges that will be a guidance to future research and provide guide line for ICT adoption.

Kahu (192-199) Identified some socio-psychological factors in his study, that can affect the ICT adoption. These are Student behaviour, Institutional practice,

Jantz(2013) found in his study that leadership quality of the librarian is the important factor for the successful adoption of ICT in the libraries. The management style and managerial skill always influenced the decision of the technology adoption. Many researchers opined that leadership of the librarian is very important factors for taking decision about technology

application. The study also shows along with leadership quality some other factors can determine the ability of adoption these are organizational characteristics (size, management support, complexity and environmental factors)

The focuses of the study is effect of organizational characters on ICT adoption among the university libraries. to achieves this aim following objective can be formulated.

2. Objective of the study:

2.1 To identify the implication of geographical location on ICTs adoption in the University libraries

2.2 To identify effect of e-resources availability on the ICT adoption

2.3 To identify the role of Top management support for ICTs adoption in the University Libraries

3 Hypothesis

To achieve the above mentioned objectives there are several approaches however the present study approaches the objectives based on the following hypothesis

H1. Organization located in urban areas are rapidly adopted ICTs than the organization located in rural areas.

H2. Organizational e-resource availability is related to ICT adoption in positive direction

H3. Higher authority support is related to ICT adoption in positive direction

4 Methodology

For this study survey method is administered with structure questionnaire, conducted among the professional staff of the university libraries as well as face to face interview were conducted for gathering data. From collected data the research has analyzed the potential influences on the adoption of ICT. To obtained primary data from library professionals survey, 206 questionnaire was distributed among the librarian and library professionals and 167(81%) filled- in questionnaire are received back.

Questionnaire was prepared on the basis of research objective like environmental characteristics, external and institutional interventional characteristics to asses ICT adoption. Individual asked to tick mark against the statement which is made on the basis of objective, each statements consisted of Likert 5 point scale 'Strongly- agree'(SA), Agree.(A),

neutral/nocomment(N), Disagree(D), Strongly Disagree.(SD). each response given a numerical score [Strongly agree'(SA) =2, Agree(A) =1, neutral/nocomment(N) =0, Disagree(D) =-1, Strongly Disagree(SD) = -2] indicating its positivity and negativity and score totalled to measure the respondents attitude.

STATEMENTS	S.A (2)	.A (1)	N (0)	D. (-1)	S.D (-2)	Frequenc y	Score	Mean
ICT helps access information easily and quickly	120	27	11	4	5	167	253	1.51

4.1 Population

The population for this study comprised of the University library (Central library) of West Bengal , the library which was established at least ten years ago ,name of the library and number of respondent are as follows:1. University of Calcutta central library,(36) 2. Jadavpur university library, (49) 3. Rabindrabharati university library, (16) 4. presidency university library, (11) 5.Bidhan Chandra Krishi Viswavidyalaya, (12) 6. Kalyani University library, (11)7. North Bengal University library,(7) 8. Burdwan University library (17) 9. Viswabharati University Library (36)10.Vidyasagar University Library ,(9)) all the professional staff of the library is considered for study.

4.2 Sample Design

In order to achieve desired representation, stratified random sampling have been used. This is because the accessible population is not homogenous in terms of the role they play in fostering ICT adoption. The two strata namely the librarians and library assistants will be formed from the accessible population. This is almost a census study all the librarian and professional staff has been considered from selected universities. And total 206 numbers of staff are considered

4.3 Data Collection Tools

The questionnaire method was adopted for collection of data for this study, supplemented by interviews of Librarians to gather additional information. A draft questionnaire was designed based on discussions with professional colleagues and related research studies.

Two sets of structured questionnaires were prepared; one questionnaire to the University Librarian or Librarian in Charge and another to the library professionals in the central and departmental libraries in the universities selected for the study.

5 Analysis of the problem

The research findings are summarised after the analysis of data which is collected from questionnaire related to the objective of the study, and interview method

5.1 Organizational characteristics

Organizational Characteristics comprises its location, size, and Top management support

5.1.1 Location: Location of the library is established by the address of the university. According to table 1, 2 and 3 Location of the organization does not affect the ICT adoption in the university libraries in West Bengal. According to theory, organization located in the metropolitan area adopted ICT better than the rural area. But this study reveals that institute like RBU is located in metropolitan area, still adoption of ICT is not better than the institutes like VU, BU, and VBU which are located in rural area. Hence the Hypothesis **H.1** That “Organizational location is positively related to ICT adoption”. This hypothesis is not supported by the study.

5.1.2 Size: It is generally found that large institutions are more innovative than the small institutions. Generalization 10-1 states: larger organizations are more innovative [14].

Table 1 Containing Information Resources available in the Library

Documents	CU	JU	BU	VU	NBU	PU	BCKV	KU	VBU	RBU
Books	12L	6.5L	1.7L	1.2L	1.9L	1L	0.76L	2l	7.5L	1.5l
e-Books	10T	15T	7T	12T	5T	2T	2T	4T	8T	2T
Bound vol. journals	1L	.90L	.16L	.15L	.25L	.20L	.24L	.10L	1.7L	.12L
Foreign Journals	45	64	14	21	07	15	35	7	125	20
Indian Journals	275	321	145	178	128	180	120	165	265	135
e-Journals	10500	12243	10100	11000	9500	9800	9600	9700	11000	9500
Thesis	12000	8917	6500	2200	2700	1200	2000	2884	9000	3400
Dissertation /Proj.	12456	8631	4500	4300	3500	2400	1200	8400	7300	8200
Reports	42000	37000	11000	4000	2500	17000	700	12000	35000	15000
Standards	1400	3000	150	78	45	245	24	350	2400	120
Patents	-	-	-	-	-	-	-	-	-	-
Online	12	24	07	22	07	05	06	8	09	-

Table 3 Containing data about characteristics of the libraries

Rank	Statements	SDA -2	DA -1	N 0	A +1	SA +2	Score	Mean
1	Employees are aware about the benefits of ICT application	5	11	3	24	124	251	1.50
2	The Library has adequate staff for ICT operation	11	25	6	15	110	188	1.12
3	Library had in-house IT expertise and skill to support ICT adoption.	12	27	3	21	104	178	1.06
4	The institutes have enough financial resources to support ICT adoption	20	32	15	12	88	116	0.69
	Total							4.37

The statements about organizational characteristics are arranged in descending order according to their mean value. Employees are aware about the benefits of ICT application has scored 1.50 and ranked 1st. The Library has adequate staff for ICT operation, it has scored 1.12 and ranked 2nd. Library had in-house IT expertise and skills to support ICT adoption has scored 1.06 and ranked 3rd. The institutes have enough financial resources to support ICT adoption has scored 0.69 and ranked 4th.

Present study shows university like JU, CU, VU, VBU have more e- resources.

Table 4 Containing University wise distribution of mean value on size and top management support

Factors	CUL	JUL	BUL	VUL	NBUL	VBUL	RBUL	PUL	BCKVL	KUL	All
Size	5.34	5.65	4.10	4.21	4.44	5.21	4.00	4.96	4.85	4.40	4.37
Top management support	7.85	8.35	7.68	8.21	7.80	7.92	7.20	8.10	8.25	7.75	8.01

Table shows the mean value of each university on size and top management and 'All' column shows mean value of all university calculated before. A comparison of each factors in all the universities is shown in the bar diagram for better understanding.

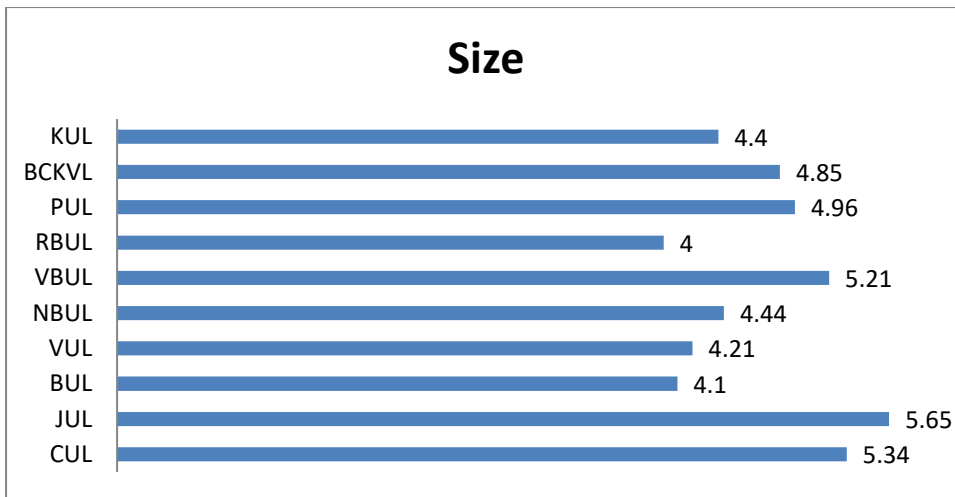
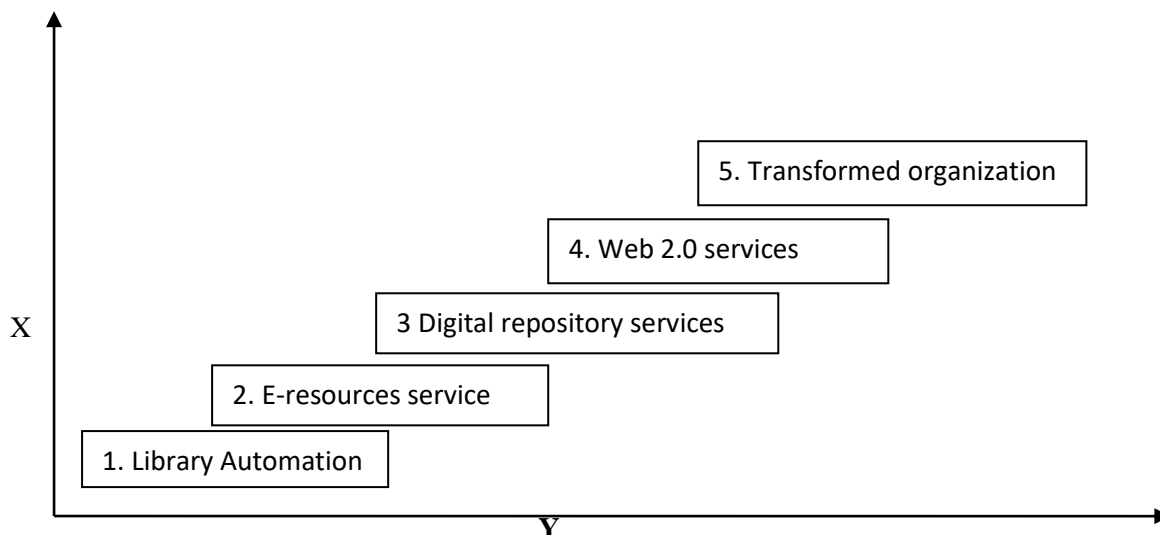


Fig-1 Bar diagram showing the size that means availability of infrastructure, trained staff and e-resources.

Mean value on Size scored by each university libraries are arranged in descending order. JUL scored 5.65, CUL scored 5.34, VBUL scored 5.21, PUL scored 4.96, BCKVL scored 4.85, NBUL scored 4.44, KUL scored 4.4, VUL scored 4.21, BUL scored 4.1, RBUL scored 4.

Measuring the ICTs adoption in the University libraries

It is very difficult to measure the ICT adoption in the libraries quantitatively. Adoption of ICT may be defined to its usage. Marten & Matalay (2001) designed a framework for ICT adoption in five different levels of ICT indication. Each level of adoption within ladder has different degree of business benefits; in this study this scale is applied to measure the different levels of ICT adoption. In case of libraries, each level of adoption within ladder has different degrees of service benefits. In the figure, X axis represents service benefits and Y axis represents the extent of organizational changes and sophistication, when Y axis increases then Service benefits also increases.



Y= Extent of organizational change and sophistication

X= Services benefits

Fig-6 Ladder scale

By applying this scale we can measure the level of ICT adoption in the university libraries.

Table 5 containing the level of ICT adoption by the different libraries in West Bengal

Ladder No.	ICT adoption level	CUL	JUL	BUL	VBUL	NBUL	KUL	VUL	PUL	RBUL	BCKVL	Total
1	Library Automation	Y	Y	Y	Y	Y	Y-	Y	Y	Y	Y-	10
2	e-resources service	Y-	Y-	Y	Y	Y-	Y	Y-	Y	Y-	Y	10
3	Digital repository	Y-	Y-	-	Y-	-	-	Y-	-	-	-	4
4	Web 2.0 service	-	-	-	-	-	-	-	-	-	-	0
5	Transformed organization	-	-	-	-	-	-	-	-	-	-	0

It is shown in the table 4 that all the university libraries in West Bengal are achieved the ladder 2 levels, four university libraries go to level 3. No libraries have entered the ladder 4 & 5, i.e. web 2.0 services and transformed organization which means fully automated, fully digitized and enabled to provide facilities of web tools for resource discovery and self

operational library. Present study shows university like JU, CU, VU, VBU are in the third level of ladder but tend to go 4th level, these universities have more e- resources.

From the above analysis it is found that organizational infrastructure and data represented in the Table 1, 2, 3 and 4 regarding availability of resources supported the Hypothesis ***H.2 “Organizational e-resource availability is positively related to ICT adoption”***. Data represented in table 1 and table 2 reflects the resource availability of the university like CU, JU where availability of e- resources are more and ICT adoption are better. So, this fact supports the hypothesis positively.

5.1.3. Top management support

Table 6 containing data on top management support

Rank.	Statements	SDA -2	DA -1	N 0	A +1	SA +2	Score	Mean
3	Top management considers ICT as important for our library	6	11	15	23	112	224	1.34
4	Top management allocated resources for ICT adoption	8	17	6	27	110	214	1.28
2	Top management discusses with employees regarding the support of ICT adoption	7	12	9	15	124	237	1.41
6	Higher authorities are actively supports the adoption of ICT	12	5	21	35	94	194	1.16
1	Top management is aware of the benefits of ICT adoption	0	0	12	42	113	268	1.60
5	Higher authority enthusiastically support the staff to use ICT	7	17	14	22	107	205	1.22
	Total							8.01

Statements about top management are arranged in descending order according to their mean value and ranked accordingly. Top management is aware of the benefits of ICT adoption has scored 1.60 and ranked 1st. Top management discusses with employees regarding the support of ICT adoption has scored 1.41 and ranked 2nd. Top management considers ICT as important for our library has scored 1.34 and ranked 3rd. Top management allocated resources for ICT adoption has scored 1.28 and ranked 4th. Higher authority energetically supports the staff to use ICT has scored 1.22 and ranked 5th. Higher authority actively supports the adoption of ICT has scored 1.16 and ranked 6th.

According to table 4, for better understanding results shows in bar diagram

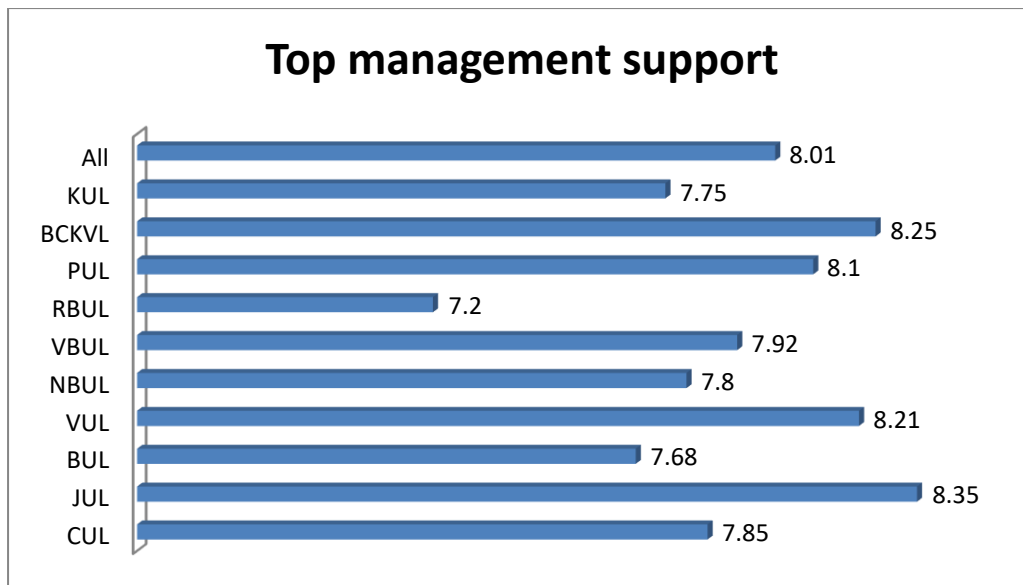


Fig-2 Showing Top management support on ICT adoption by the different libraries.

Mean value on Top Management Support scored by each university libraries are arranged by descending order. JUL scored 8.35, BCKVL scored 8.25, VUL scored 8.21, PUL scored 8.1, VBUL scored 7.92, CUL scored 7.85, NBUL scored 7.8, KUL scored 7.75, BUL scored 7.68, RBUL scored 7.2.

From the above analysis it is found that all the statements on Top management support show high mean value. Hence the Hypothesis **H. 3-** “Higher authority *support is positively related to ICT adoption*”- stands as valid. This hypothesis is also supported by the data in the table 6.

6 Conclusion:

From the result of the investigation we may come to the conclusion that in this study location of the universities has no effect on ICT adoption. According to resource based theory organization located in urban area adopted ICT more rapidly than the rural areas. But this study reveals that institute like RBU is located in metropolitan area, still adoption of ICT is not better than the institutes like VU, BU, and VBU which are located in rural area. Study also support the fact that large organization in terms of their access to different resources stand in a better chance to adopt and use ICT successfully and top management support, head

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