

Technology Acceptance variations on Demographic profile of Librarians

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Abstract

Increasing dominance of technology centric lifestyle gives scope for increased automation possibilities in the state run Libraries of Tamilnadu in near future. With 4575 state run libraries of various types in the state of Tamilnadu, the Libraries constitute an important component in the civil society. Despite having such importance, most of the state run libraries in the state of Tamilnadu are operated with manual procedures without major automation initiatives. Hence, considering the possibility of future Library automation, the present work attempts to identify the Technology Acceptance among the Librarians constituting those libraries. With sample size of 491 Librarians identified on stratified random sampling procedure, the present work identifies varied levels of Technology Acceptance among the Librarians on the basis of the demographic characteristics. Related findings and corresponding implications constitute the outcome associated with this work.

Key Words: *Library, Library automations, Technology Acceptance, Demographic Profile Librarians.*

1.1 Technology Adoption

Technology adoption is a process that begins with awareness of the technology and progresses through a series of steps that end in appropriate and effective usage of technology. Technology adoption is a 5 step process comprising:

1. Awareness Stage– Where, potential users learn enough about the technology and its benefits to decide whether they want to investigate further
2. Assessment Stage-Where, potential users evaluate the usefulness and usability of the technology, and the ease or difficulty of adopting
3. Acceptance Stage– Where, potential users decide to acquire and use the technology, or decide not to adopt
4. Learning Stage– Where, users develop the skills and knowledge required to use the technology effectively
5. Usage Stage– Where, users demonstrate appropriate and effective use of the technology

Research done on technology adoption shows that different people move through these 5 steps at different rates. Some people combine all the steps in one, while others never get past the assessment stage. People use widely differing acceptance criteria in deciding whether or not to use a technology, with early adopters being more willing to invest time and energy to figure out how to use it and later adopters requiring increasing simplicity, ease of use, and support. As far as the scenario of Technology adoption in most of the state run libraries in Tamilnadu are concerned, it can be observed that most of them have not even crossed the assessment stage of the adoption process. However, the rapid growth of technology dominated lifestyle is believed to cause turnaround on libraries in terms of technology adoption in near future. Hence, it becomes important to ascertain the acceptance levels of library technology among the potential users of such technology like librarians (Ramey, 2013).

1.2 Library Technology

Most of the automated libraries have adopted different technology for libraries use such as; LiMS, Nirmals, Koha, Vitrua, In-house, EasyLib, SmartCampus, Netlib, Libsys, Libsoft, Soul, E-Granthalaya, Lib-Manager, Libsuite, ie-Lib, SLIM++, Chancellor, Pal Pup, NewGenLib, YLAS and IOZEN. In addition to the above mentioned software based technology resources, automated libraries have certain hardware resources such as Fax Machines, Microfilm Readers, Photocopiers, Printers, Scanners (Digital), Television, UPS (Power Supply), USB Pen Drive, Wireless LAN (WiFi), Barcode Readers, Audio Players and Backup Drives. Some of the technology based apparatus and amenities deployed in automated libraries include: Computers, Online Public Access Catalog (OPAC), CD-ROM, Scanner, RFID based systems, Tele text, photocopying facilities, Printing technology, Barcode readers and generators (Das and Chatterjee, 2015).

2.0 Review of Literature

The initial reference position for the present work can be established through the various previous studies which are grouped under the following two categories such as studies on Library automation and Studies on Technology Acceptance Model.

2.1 Studies on Technology Acceptance Model

Several studies have examined TAM as a model to explain how people adopt and use e-learning. Selim (2003) stated that there was a need to investigate TAM with web-based learning. The above work put forward the course website acceptance model (CWAM) and tested the relationships among perceived usefulness, perceived ease of use and intention to use with university students using the structural equation modeling techniques of the LISREL program. Further, the above work concluded that the model fit of the collected data and that the usefulness and ease of use turned out to be good determinants of the acceptance and use of a course website as an effective and efficient learning technology.

Chau and Hu (2001) compared three models on Technology Acceptance; the Theory of Planned Behavior (TPB), and a decomposed TPB model that is potentially adequate in the targeted healthcare professional setting in Hong Kong. The results indicated that TAM was superior to TPB in explaining the physicians' intention to use telemedicine technology. The study conducted by Sun and Zhang (2003) found voluntariness can be factor in determining the behavioral intention to use. Pituch and Lee (2006) added system and learner characteristics as external variables that were hypothesized to impact perceived usefulness, perceived ease of use, and use of an e-learning system. After conducting a structural equation modeling technique with LISREL, the above work concluded that system characteristics were important determinants to perceived usefulness, perceived ease of use, and use of an e-learning system, and that the theoretical model based on TAM was well supported. Lee et al. (2005) did similar research with the LISREL program to investigate university students' adoption behavior towards an Internet-based learning medium (ILM) introducing TAM, but they integrated TAM with motivational theory. They included perceived enjoyment as an intrinsic motivator in addition to perceived usefulness and perceived ease of use into the TAM. The findings of the above study points that perceived usefulness and perceived enjoyment had an impact on both students' attitude toward and intention to use ILM. However, perceived ease of use was found to be unrelated to attitude.

2.2 Studies on Library Automation

Traditionally, Library automation is referred to the computerization of the entire library housekeeping operations like acquisition, cataloguing, circulation and serials control. But in the present context, it is also referred to handle the large quantity of data and information more efficiently and quickly with the help of computers and other modern Information Technologies. According to Bhardwaj and Sukla (2000) library automation is generic term used to denote the various activities with an improving quality of products and services of

library and information centers. It enhance the speed, productivity, adequacy and efficiency of the library professional staff and save the manpower to avoid some routine, repetitive and clerical tasks such as filing, sorting, typing, duplication checking etc. Vaishnav and Bapal (1995) in a feasibility Study with library automation programme of BAMUL Aurangabad identify that the problems in the existing system and gives reasons for automation. Also, the above study points out the requirement of library automation and discusses the technical, social and economic aspects of library automation in detail.

Anuradha (2000) in a study on Automated Circulating system using discusses salient features of automated circulation system, designed and developed to suit the requirements of a medium sized library using programming language visual basic. It also gives advantages of visual basic based circulation system and objectives of circulation control system and different types of files. Karisiddappa and Rajgoli (2008) report that the Libraries have long been involved in training their users in library use, its services and resources. Terms such as library instruction, library orientation, user education and bibliographic instruction have all been used at various times to indicate the process of helping users how to use the library, how to access information. Further, the above study observes that teaching various bibliographic tools and Information literacy has become an important concept since the arrival of the information age. Uwaifo (2007) investigated into the influence of age and exposure to computers as determinants of attitudes of librarians towards automation in the Nigerian setting. The study showed that majority of librarians welcomed the positive impact of library automation and that age of staff and prior exposure to the use of computers did not alter this established attitude towards library automation. This study challenges some perceived long-held notions that older library staff are technology averse.

3.0 Objectives and Methodology

3.1 Objectives

1. To measure the Technology Acceptance variations on Age, Income and Gender among the Librarians
2. To measure the Technology Acceptance variations on Educational and Experience of Librarians

3.2 Measurement scale details

Questionnaire was framed for the present study comprising the measurement schemes for measuring the factors (a) Demographic Profile of the respondents and (b) TAM factor Perceived ease of Use and the (c) TAM factor Perceived usefulness. Out of the above three factors, two TAM factors are measured with 5 point Likert scale. The data collected were analyzed with Statistical package for Social Science (SPSS) and one way ANOVA was used as the model.

3.3 Sampling details

The primary data for the present work is collected among the librarians working in Government libraries of Tamilnadu in 6 districts out of 32 identified on random basis. The districts constituting the sampling procedure include Madurai, Sivagangai, Cuddalore, Coimbatore, Erode, and Tirunelveli. In order to measure the accurate response, the questionnaire employed was translated in Tamil Language appropriately and was subsequently administered to 550 Librarians representing 550 libraries in the above listed sampling areas on random manner. The filled up response could be collected successfully from 491 respondents on random basis. Since, the filled up sample could be obtained successfully from 491 librarians out of 4575 total libraries in the state of Tamilnadu, the sampling sufficiency norms of more than 5 percent of the total population is ensured in the above survey and hence, the sufficiency of samples for the present study could be ensured. The primary data for the present study is collected between the period May 2016 and July 2016. Based on the sample identification procedure carried out and stated above, the

sampling procedure for the present study could be categorised as Stratified Random Sampling method.

4.0 Analysis and Interpretation

Table 1: One Way ANOVA on Age Category, Income and Gender for TAM and its Factors

Dependent variable	Age Category as source of Grouping	N	Mean	Std. Deviation	Std. Error Mean	t value	df	Sig.
Technology Acceptance	31-40 Years	191	113.3037	4.11185	0.29752	3.505	458.294	0.001
	41-50 Years	300	111.8500	5.00376	0.28889			
Dependent variable	Gender Grouping as variable	N	Mean	Std. Deviation	Std. Error Mean	t value	df	Sig.
Technology Acceptance	Male	459	112.353	4.78	0.223	1.349	38.0098	0.185
	Female	32	113.312	3.2822	0.6757			

Results of ANOVA

Dependent Variable	Income Levels as Source of Grouping	Sum of Squares	df	Mean Square	F	Sig.
Technology Acceptance	Between Groups	50.522	2	25.261	1.131	0.323
	Within Groups	10894.720	488	22.325		
	Total	10945.242	490			

4.1 Significant Variations on Technology Acceptance between Age group

The variations in Technology Acceptance between different categories of Age group such as 31-40Years and 41-50Years among the librarians are defined in the hypothesis x taken up and its result are shown in table1, as an outcome of ANOVA model conceptualized. From the results of this ANOVA models shown, it can be inferred that the t value of 3.505 corresponding to dependent variable Technology Acceptance on each different categories of Age group such as 31-40Years and 41-50Years are found to be significant at 5 percent level. Hence, the hypothesis x is rejected. This result clearly shows that there is significant variation in Technology Acceptance levels among the different Age group of librarians.

The details of the descriptive statistics on Technology Acceptance provided in table1, reveals that the Technology Acceptance is identified to be highest for the Age group of 31-40yrs with a highest mean value of 113.3037. The lowest Technology Acceptance levels are identified for the Age group of 41-50yrs with a lowest mean value of 111.8500. Further, this Age group is identified to be with maximum variations in Technology Acceptance having highest standard deviation value of 5.0037. Also, with a standard deviation value of 4.1118, Technology Acceptance variation is least for the Age group of 31-40yrs.

4.2 Insignificant variations on Technology Acceptance between gender groups

The variations in Technology Acceptance between different Gender groups such as Male and Female among the librarians are defined in the hypothesis x taken up and its result are shown in table1, as an outcome of ANOVA model conceptualized. From the results of this ANOVA models shown, it can be inferred that the t value of 1.349 corresponding to dependent variable Technology Acceptance on each different Gender groups such as Male and Female are found to be significant at 5 percent level. Hence, the hypothesis x is accepted. This result

clearly shows that there is significant variation in Technology Acceptance levels among the different Gender group of librarians.

The details of the descriptive statistics on Technology Acceptance provided in table1, reveals that the Technology Acceptance is identified to be highest for the Gender group of Female with a highest mean value of 113.312. The lowest Technology Acceptance levels are identified for the Gender group of Male with a lowest mean value of 112.353. Further, this Gender group is identified to be with maximum variations in Technology Acceptance having highest standard deviation value of 4.7800. Also, with a standard deviation value of 3.2822, Technology Acceptance variation is least for the Gender group of Female.

4.3 Insignificant variations on Technology Acceptance between income groups

The variations in Technology Acceptance between different levels of income group such as Rs.15000-25000, Rs.25000-35000 and above Rs.35000 among the librarians are defined in the hypothesis x taken up and its result are shown in table1, as an outcome of one way ANOVA model conceptualized. From the results of this one way ANOVA models shown, it can be inferred that the F value of 1.131 corresponding to dependent variables Technology Acceptance on each different levels of income group such as Rs.15000-25000, Rs.25000-35000 and above Rs.35000 are found to be insignificant. Hence, the hypothesis x is accepted. This result clearly shows that there is insignificant variation in Technology Acceptance levels among the different income group of librarians.

Table 2: One Way ANOVA on Technology Acceptance between Educational, Experience levels

Descriptive Details of Dependant Variables on the basis of Groupings						
Dependent Variable	Groupings on Educational Qualification	Mean	Std. Deviation	N		
Technology Acceptance	Diploma or technically certified	111.8992	3.84432	129		
	Graduate	110.8261	5.95279	46		
	Post-graduate	112.8576	4.79636	316		
Dependent Variable	Experience Levels	Mean	Std. Deviation	N		
Technology Acceptance	Below 5 yrs	112.3333	4.83588	192		
	5-15 yrs	112.9213	4.76892	216		
	15-25 yrs	111.2892	4.17171	83		
Results of ANOVA						
Dependent Variable	Educational Qualification as Source Grouping	Sum of Squares	Df	Mean Square	Partial Eta Squared	F
Technology Acceptance	Between Groups	212.352	2	106.176	0.019	4.828*
	Within Groups	10732.890	488	21.994		
	Total	10945.242	490			
Dependent Variable	Experience Levels as Source Grouping	Sum of Squares	Df	Mean Square	Partial Eta Squared	F
Technology Acceptance	Between Groups	161.853	2	80.927	0.026	3.662*
	Within Groups	10783.389	488	22.097		
	Total	10945.242	490			
Multiple Comparisons						
Dependent variable	(I) Educational Qualification	(J) Educational Qualification	Mean Difference (I-J)	Std. Error	Sig.	
Technology Acceptance	Diploma or technically certified	Graduate	1.07314	0.80537	0.183	
		Post-graduate	-.95837	0.48999	0.051	
	Graduate	Post-graduate	-2.03151*	0.74008	0.006	
Dependent variable	(I) Experience Level	(J) Experience Level	Mean Difference (I-J)	Std. Error	Sig.	
Technology Acceptance	Below 5 yrs	5-15 yrs	-0.58796	0.46625	0.208	
		15-25 yrs	1.04418	0.61751	0.091	
	5-15 yrs	Below 5 yrs	0.58796	0.46625	0.208	
		15-25 yrs	1.63214*	0.60707	0.007	
	15-25 yrs	Below 5 yrs	-1.04418	0.61751	0.091	
		5-15 yrs	-1.63214*	0.60707	0.007	

Independent Variable: Educational Qualifications and Experience; *Significant at 5percent level

Source: Computed from primary data

4.4 Significant Variations on Technology Acceptance between Educational groups

The variations in Technology Acceptance between different levels of Educational Qualifications such as Diploma or technically certified, Graduate and post Graduate among the librarians are defined in the hypothesis x taken up and its result are shown in table2, as an outcome of one way ANOVA model conceptualized. From the results of this one way ANOVA models shown, it can be inferred that the F value of 4.828 corresponding to dependent variable is Technology Acceptance on each different levels of Educational group such as Diploma or technically certified, Graduate and post Graduate are found to be significant at 5 percent level. Hence, the hypothesis x is rejected at 5 percent level of significance. This result clearly shows that there is significant variation in Technology Acceptance levels among the different Educational Qualifications of librarians. In order to identify the exact variations between different Educational groups, multiple comparisons were made with LSD method and its results are provided along with table2, in which the variations are noted as follows.

4.5 Significant variations on Technology Acceptance between Experience groups

The variations in Technology Acceptance between different levels of Experience group such as Below 5yrs, 5-15yrs and 15-25yrs among the librarians are defined in the hypothesis x taken up and its result are shown in table2, as an outcome of one way ANOVA model conceptualized. From the results of this one way ANOVA models shown, it can be inferred that the F value of 3.662 corresponding to dependent variables Technology Acceptance on each different levels of Experience group such as Below 5 yrs, 5-15 yrs and 15-25 yrs are found to be significant at 5 percent level. Hence, the hypothesis x is rejected at 5 percent level of significance. This result clearly shows that there is significant variation in Technology Acceptance levels among the different Experience group of librarians. In order to identify the exact variations between different Experience groups, multiple comparisons were made with LSD method and its results are provided along with table2, in which the variations are noted as follows.

4.6 Technology Acceptance Multiple Comparisons on Educational groups

From the details provided in table2, it can be noted that, the variations in the Technology Acceptance between the Educational groups of Graduate, and Post graduate is found to be significant at 5 percent level. However, the variations in the Technology Acceptance between the other combinations of Educational groups are not found to be significant at 5 percent level.

Further, the details of the descriptive statistics on Technology Acceptance provided in table2, reveals that the Technology Acceptance is identified to be highest for the Educational group of post Graduate with a highest mean value of 112.8576. The next higher level of Technology Acceptance is identified for the Educational group of Diploma or technically certified with a second higher mean value of 111.8992. The lowest Technology Acceptance levels are identified for the Educational group of Graduate with a lowest mean value of 110.8261. Further, this Educational group of Graduate is identified to be with maximum variations in Technology Acceptance having highest standard deviation value of 5.9527. This kind of variation is least for the Educational group of Diploma or technically certified with a standard deviation value of 3.8443. Also, with a standard deviation value of 4.7963, Technology Acceptance variation is second highest for the Educational group of post Graduate.

4.7 Technology Acceptance multiple comparisons on Experience groups

From the details provided in table2, it can be noted that the variations in the Technology Acceptance between the Experience groups of 5-15yrs, and 15-25yrs is found to be significant at 5 percent level. However, the variations in the Technology Acceptance between the other combinations of Experience groups are not found to be significant at 5 percent level.

Further, the details of the descriptive statistics on Technology Acceptance provided in table2, reveals that the Technology Acceptance is identified to be highest for the Experience group of 5-15yrs with a highest mean value of 112.9213. The next higher level of Technology Acceptance is identified for the Experience group of Below 5 yrs with a second higher mean value of 112.3333. The lowest Technology Acceptance levels are identified for the Experience group of 15-25 yrs with a lowest mean value of 111.2892. Further, this Experience group is identified to be with maximum variations in Technology Acceptance having highest standard deviation value of 4.8358. This kind of variation is least for the Experience group of 15-25yrs with a standard deviation value of 4.1717. Also, with a standard deviation value of 4.7689, Technology Acceptance variation is second highest for the Experience group of 5-15 yrs.

5.0 Findings

1. Technology Acceptance levels vary significantly between different age groups of librarian such as those who are below 40 years and those who are above 40 years. More specifically Technology Acceptance is higher for those who are below 40years than that of those who are above 40 years. However, Technology Acceptance levels do not vary significantly between different income groups and gender category among the librarians.

2. Technology Acceptance levels vary significantly between different Educational Qualifications of librarians. Technology Acceptance levels vary significantly between graduate and post graduate among librarians. Technology Acceptance is identified to be highest for the Educational group of post Graduate. The next higher level of Technology Acceptance is identified for the Educational group of Diploma or technically certified. The lowest Technology Acceptance levels are identified for the Educational group of Graduate among the librarians.

3. Technology Acceptance levels vary significantly between different Experiences levels of librarians. Technology Acceptance is identified to be highest for the Experience group of 5-15yrs. The next higher level of Technology Acceptance is identified for the Experience group of Below 5 yrs. The lowest Technology Acceptance levels are identified for the Experience group of 15-25 yrs is among the different Experience groups of librarians.

6.0 Implications and Conclusions

The findings that the technology acceptance is significantly higher for younger age group confirms the earlier reported finding that technology is resisted at higher age group. Further, the lowest technology acceptance is identified with higher experience levels. This kind of situation gives scope for improvising the new recruitments on the basis of IT orientation. Also, the educational qualifications of the Librarians are considered important towards devising appropriate technology adoption initiatives in libraries.

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APPENDIX

QUESTIONNAIRE

SECTION 1: DEMOGRAPHIC PROFILE

1. **Name (optional):** -----
2. **Designation:**-----
3. **Department:** -----
4. **Gender:**

(a) Male	(b) Female

5. **Age: (in Years)**

(a) Less than 21	(b) 21 – 30	(c) 31 – 40	(d) 40 – 50	(e) Above 50

6. **Educational Status:**

(a) School dropouts	(b) Up to 10 th or 12 th STD	(c) Diploma technically certified	or	(d) Graduate	(e) Post-graduate

7. **Total family Income per month:**

(a) Up to Rs.5000	(b) Rs.5000 to Rs.15000	(c) Rs.15000 to Rs.25000	(d) Rs.25000 to Rs.35000	(e) Above Rs.350000

8. Marital Status:

(a) Single	(b) Married

9. Income Earners:

(a) Dependent or single earning	(b) Married, one income	(c) Married, two income	(d) Married, three income	(e) Others

10. Occupational Status:

(a) Self employed	(b) Private employee	(c) Government employee	(d) Employed in MNC	(e) Others

11. Total Family Members:

(a) 1	(b) 2	(c) 2-4	(d) 5	(e) Above 5

12. Total work experience:

a) below 5 yrs	b) [] 5-15 yrs	c) [] 15-25 yrs	d) [] 25-30 yrs	e) [] 30 yrs & above

13. Experience in the present organization:

a) below 5 yrs	b) [] 5-15 yrs	c) [] 15-25 yrs	d) [] 25-30 yrs	e) [] 30 yrs & above

14. Distance between residence and workplace:

a) [] below 02 km	b) [] 02-10 km	c) [] 10-25 km	d) [] 25-30km	e) above 30 km

SECTION 2:

The Following Section captures your Perceived ease use of computing technology in work Place.

S.NO	TAM- PERCEIVED EASE OF USE ITEMS
15(A)	I do not get confused when I use the computers
15(B)	I do not make errors frequently when using computers
15(C)	Interacting with the computers is not frustrating
15(D)	I do not need to consult the user manual (or) others when using computers
15(E)	Interacting with the computers requires a minimal mental effort
15(F)	I find it easy to recover from errors encountered while using computers
15(G)	The computers is not rigid but flexible to interact with
15(H)	The computers do not behave in unexpected ways
15(I)	I do not find it cumbersome to use the computers
15(J)	My interacting with the computers is easy for me to understand
15(K)	It is easy for me to remember how to perform tasks using the computers
15(L)	The computers provides helpful guidance in performing tasks
15(M)	Overall, I find the computers easy to use
15(N)	Computers is easy to use or learn

SECTION 3:

The Following Section captures your Perceived usefulness of computing technology in work Place.

S.NO	TAM- PERCEIVED USEFULNESS ITEMS
16(A)	Computers can be used to manage library in efficient manner
16(B)	Computers will increase the profitability of libraries
16(C)	Using computer for managing library increases the transparency of library operations
16(D)	Computers are useful in adding deleting and finding books available in library stock
16(E)	Computers can be used to create used id for library users
16(F)	Recording the book details and date of issue of books through computers is reliable
16(G)	Computers can be efficiently used to manage large numbers of library users
16(H)	Identifying actual number of books issued for each library user through computers is fast and accurate
16(I)	Computers can be used for classifying the library resources easily
16(J)	Recording the date of return of a book through computers helps in calculating usage period of library resource very quickly
16(K)	Computers can efficiently help in generating report on the books rented by users