

NO. 35 \$36



**NIGERIAN LIBRARY ASSOCIATION**

*Proceedings of*

**2021 CONFERENCE OF  
NIGERIAN LIBRARY ASSOCIATION,  
KADUNA STATE CHAPTER**

THEME

**TOWARDS ATTAINING SUSTAINABLE  
DEVELOPMENT GOALS THROUGH LIBRARY  
AND INFORMATION SERVICES DELIVERY IN NIGERIA.**



*Held At:*

*National Research Institute for Chemical  
Technology (NARICT), Zaria.*

*August 4<sup>th</sup>, 2021*

**DESIGN AND IMPLEMENTATION OF EXPECTANCY DISCONFIRMATION THEORY  
SOFTWARE FOR QUALITY SERVICE DELIVERY IN FEDERAL UNIVERSITY  
LIBRARIES IN NIGERIA**

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**Abstract**

*The university library being an integral part of an academic institution is saddled with the responsibility of providing print and electronic information resources to facilitate the attainment of the university's vision and mission. In view of the importance of the library service quality assessment and lack of existing software for library services quality evaluated as identified in the literature review, the researchers conducted a survey to determine the extent of users' satisfaction with the library electronic resources and services provision; designed a prototype for Expectancy Disconfirmation Theory (EDT) using the five dimensions of the SERVQUAL instrument to evaluate users' perception and expectations of library services quality. The research method used was descriptive survey design, 722 postgraduate students participated in the survey while only 50 library users were tested during the usability evaluation exercise. Data collected were analyzed with frequency counts, percentage checklist, charts using SEM, SPSS and STATA. The study discusses the Actor and use case, obtained a domain to fast track the empirical usability testing process. It was statistically proven that the usability of library electronic resources has negative relationship with users' satisfaction and service quality has a positive influence on the level of library users' satisfaction with electronic resources in federal university libraries in Nigeria and users preferred text messaging to other channels of communication. The study discussed the procedures involved in designing the disconfirmation software and purchased a domain to fast track the process of usability testing process. Service quality has a significant influence on the level of library users' satisfaction with electronic resources in federal university libraries in Nigeria and concluded by encouraging libraries to adopt the software designed for this study to measure library service quality for effective service delivery. The paper recommends that libraries should improve security measures, regular evaluation of library resources and users' satisfaction, subscription to community based resources, reviewing of library policies and regular sensitization of the users*

**Keywords:** Prototype, library services, SERVQUAL, EDT Model, satisfaction, usability evaluation.

**Introduction**

Over the years user's service sector including information service organisations of which university libraries are not exempted have been vested with the responsibilities of providing effective service delivery to its ever-increasing user communities and to discharge their duties as the nerve centre of



academic excellence, users' satisfaction is crucial. Users' satisfaction has been reported to have influenced users' intention to use library resources and switching behaviour (seeking for information resources elsewhere or not using library services at all) (Schiebler, 2019). To this end, users' satisfaction assessment should be a regular exercise in the university libraries because it is possible to make resources available but it is not possible to coerce users to use the provided resources. In other words, users are expected to be treated like kings and queens, if the huge investment made on library and information resources would not amount to a waste. University library resources and services are rendered to support teaching, learning and research activities of their parent institutions. The university library is an integral part of an academic institution is saddled with the responsibility of providing print and electronic information resources to support the vision and mission of the parent institution. Nigerian academic institutions, particularly the universities, were broadly categorised by the Nigerian Universities Commission (2019) into three clusters in terms of ownership namely; federal, state and private universities.

The motive behind the establishment of these universities is no doubt connected with the needs for high-level manpower development. An important need for human development is to seek for information irrespective of the format it is presented. University libraries have, therefore, go beyond mere storehouses of books but are now seen as the technology-driven users' information literacy skills acquisition centres where users' information needs are turned into reality. The need for information cannot be over-emphasised, in corroboration with the view of the authors, Udensi and Akor (2014) posited that information is "life" – that is, information has become an essential part of everyone's daily activities because nothing happens without information.

Information provision in federal universities in Nigeria has taken a new dimension as the librarians now move from manual ways of discharging library services to digitalised methods of acquiring, processing and disseminating library resources and services. In other words, the task of university librarians has transformed from being a caretaker of information to being an information professional, who manages a system of information in multiple formats. This information is disseminated through specifically designed services as per the users' request and library's perception of users' information needs to justify the aim and objectives of establishing a library in any institution of higher learning. Thus, the librarians must be able to acquire relevant information resources, process, preserve, store, and disseminate these resources at the right time and to the right user using different Information and Communication Technology (ICT) tools.

Advancement in research has brought about the application of Information and Communication Technology (ICT) in our day to day activities which has also change the library's traditional method of service delivery to a modern system of handling information right from the acquisition stage, up to the dissemination and feedback stages, meaning that libraries and information centres use computers and telecommunication devices to carry out their day to day operations.

Accordingly, universities and libraries are operating in a rapidly changing information environment (Feret, 2011). Hence, libraries have been retooled to serve as facilitators to wealth of information far beyond the physical collection, providing regular and instantaneous access to global information through online resources and systems, and they also create their own digital contents for local and global access. In the process of creating their own local contents, libraries subscribe to electronic databases as well as developing database of open access resources to complement the available subscribed electronic resources to satisfy the information needs of the library users.

Considering the state of Nigeria economy, the post covid adverse effect characterised with recession, inability to fund education section and lots more. This problem has been reported to have had negative impact on the availability of electronic resources in Nigerian federal university libraries. This has equally hampered some university libraries from subscribing to important



databases or electronic resources which makes regular checking of the availability of library resources availability.

### **Statement of Research Problem**

In view of the importance of users' satisfaction assessment in providing effective service delivery in the federal university libraries, the preliminary study has observed a communication gap between the university libraries and the user communities in the utilisation of electronic resources provided by university libraries covered by the study, which has drastically affected the use of library electronic resources in the federal university libraries.

It is against this backdrop that the researchers have deemed it fit to investigate the cause(s) of low utilisation of the library electronic resources and services using different statistical methods to test the influence of usability and quality of library services on users' satisfaction with electronic resources as well as using the ServQual questions to determine the users' expected service delivery as against the perceived service delivery in order to gather the required information for the design and implementation of the expectancy disconfirmation theory (EDT) software.

### **Objective of the Study**

Objectives of the study are to:

- i. determine the usability of electronic resources in federal university libraries in Nigeria.
- ii. determine the quality of library services rendered by the federal university libraries in Nigeria.
- iii. design a prototype for assessing users' satisfaction with an embedded Really Simple Syndication (RSS) feeds for current awareness services using short message services (SMS).

### **Hypotheses on the influence of usability and quality of library services on users' satisfaction with electronic resources' provision in federal university libraries in Nigeria**

The following null hypotheses will be tested at 0.05 level of significance.

- Usability will have no significant influence on the level of library users' satisfaction with electronic resources in federal university libraries in Nigeria.
- There is no significant relationship between the quality of library service and users' satisfaction with electronic resources in federal university libraries in Nigeria.

### **Review of Related Literature**

Usability is how easy it is for library users to access, navigate, download, save or print from the library electronic resources website or portal to satisfy their information needs? Possibly if users get lost on the library website or database home page without any library staff to put them through, they may leave the site, or if they find it difficult to navigate from one document to another they may feel unfulfilled.

Similarly, Manandhar (2019) viewed usability assessment encourages service providers to know their products or resources better. The inquiries such as how is the item worked by the users? Are the users judiciously utilising the resources provided? Is the item viable to arrive at their ideal objectives? At last the inquiry is the item justified, despite any trouble? Therefore, the usability of library electronic resources is an important factor towards effective utilisation of electronic resources.

Availability of electronic resources in the university library does not necessitate utilisation but rather the ease of use; ease of access; users' opinion and relevance to users' area of study can aid the level of utilisation. In corroboration, International Standard Organisation, ISO 9241-1 has quoted by Hassan (2014) described usability as the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of

use. In a similar view, Speicher, as quoted by Adepoju, Oyefolahan, Abdullahi and Mohammed (2018), defined usability as the "effectiveness, efficiency, and satisfaction that the users achieved in using electronic information resources.

This can be evaluated through response time, ease of use and ease of navigating the information. In corroboration with Speicher's view Ward, Freeman and Nixon (2015) said that "library collections which library user can view, read, download or use library electronic resources. Libraries can subscribe to electronic resources but may not know when the link to the resources will become inactive, if not properly monitored and used as it is possible to see an active link today becoming inactive tomorrow due to system maintenance or upgrade.

Usability means more than just "ease of use". The five 'Es'— efficient, effective, engaging, error was tolerant and easy to learn – describe the multi-faceted characteristics of usability. Interfaces are evaluated against the combination of these characteristics which best describe the user's requirements for success and satisfaction (Quesenbery, 2001). In corroboration, Nielsen (2012), Joo, Lin and Lu (2011), and Matera, Rizzo and Carughi (2006) "modelled usability with five qualify constructs which are learnability, effectiveness, efficiency, memorability, error rates and satisfaction". That means that usability is about performing a great task within a short time using a particular electronic resource to carry out a given task successfully". Matusiak (2012) reported in a study of "perceptions of usability and usefulness of digital libraries among faculty and undergraduate students of Midwestern University, United State of America. The study revealed that staff and two hundred level geography students of Midwestern University use academic full-text resources from digital libraries but later changed to open Internet sources to access visual and multimedia resources through search engines.

The idea of using open Internet sources by the respondents was as a result of their negative perception towards digital libraries as most of them viewed digital images. The respondents indicated that low usage of digital libraries was connected with the following perceptions: digital library systems were not user-friendly thereby discourages them from utilizing them judiciously, academic libraries were perceived as places where textual resources are provided and used by the faculty staff and students, perception of usefulness to the respondents especially in terms of the relevance of contents, coverage, and currency, has been viewed as negative towards the use of digital libraries especially when searching for visual materials. No doubt, the review on the usability of library portals/website/ electronic resources were not judiciously utilised since most of the interfaces provided to users were not friendly".

Service quality has been described by Udensi and Akor (2014) that "the standard in the library can best be determined by looking at library resources capability and utilisation, meaning that the effectiveness of the library services can only be judged by its collections, facilities and staff performance". The authors were of the "opinion that the services which satisfy high degree information and research needs of faculty, students and other users can contribute to the success of educational and developmental goals of the institution in an effective manner".

The duo further concluded that since the Nigerian Library Association is yet to design a common standard that will be used to judge the library service especially in tertiary institutions, quality of service delivery should be based on users' satisfaction and if users are dissatisfied then, the standard is perceived to below.

Lovelock and Wirtz (2011) opined that "service can be viewed from 5 dimensions, namely; 1) Tangibles: refers to physical attractiveness, equipment and materials used by the library, as well as employee performance". Tangibility in library service has to do with the conduciveness of



the library spaces such as e-library space, reading areas, collection centres. The library must be able to provide adequate facilities to enhance teaching, learning and research activities of the users.

Library building must be located at a strategic place possibly at the centre of the university since it is regarded as the heart of the university, but when planning the library necessary measures must be put in place to ensure that users interest is considered in whatever facility the library will provide, it must be far away from the market areas or lecture halls to avoid noise pollution and pandemonium from distracting library users, sanitation and general neatness of the environment must be ascertained. Information and communication facilities must be adequately deployed to avoid wasting the time of users, and for effective service delivery. Toilet facilities for normal and physically challenged people must be available and keep clean at all times. Recreation facilities such as television, satellite receivers, computer games and constant Internet facilities must also be put in place for the retention of users. Other important facilities should be made available to the user”.

- 2) Reliability: This refers to the library's “ability to provide adequate service repeatedly without making any mistakes and deliver services at the right time”. Users will be coming to use the library to come back to re-use the information resources, the library staff should keep a proper record of the resources consulted by users”.
- 3) Responsiveness: concerning the willingness and ability of the employees to help users and respond to their requests, and informs when services will be provided” and then provide such services quickly without wasting users’ time.
- 4) Assurance: The behaviour of the library staff that fosters customer’s trust towards the library and the library can create a sense of security for the user. Assurance also means that library staff is always being polite and master every knowledge and skills needed to handle any questions or concerns from the users.
- 5) Empathy: It is defined as the caring, individualized attention provided to the users by the library staff. This dimension tries to explain empathy through personalized or individualized services that users are unique and special to the library. The focus of this dimension is on a variety of services that satisfies different needs of users, individualized or personalized services etc. In this case, the service providers need to know users’ personal needs or wants and preferences. It implies that the library staff understands users’ problem and act in the interest of users, and provides personalized attention to, and has convenient hours of operation for maximum satisfaction.

The above 5 dimensions were the highlights of what the users expect as the qualities of service that can lead to effective service delivery. Thus, the 5 dimensions are vital to libraries services except for the fifth dimension that needs a little modification for it to be appropriate for measuring library services. In the context of this study, the dimensions 1 – 4 will be slightly modified to reflect the new dimension named “effectiveness” which is the fifth dimension will totally be replaced with a (Responsiveness) can take care of the “Empathy” in a library setting.

Therefore, it is considered unnecessary in the context of this study. The idea of effectiveness in this study is to ensure that the aim and objectives of providing library services are not being neglected. Every library tries to provide good quality services to its users and if the services are not effectively delivered then the users will not feel the impact of the library in their teaching, learning and research.

The dimension effectiveness includes ease of access to library resources, availability of library portal, ease of use, ease of navigating the In and Outside links on library portal, regular updating of the library portal, adequate bandwidth to access the electronic resources, regular checking of the library electronic resources links, regular information literacy training for library staff and users, uninterrupted power supply, regular subscription to most used electronic resources and adequate Information and Communication Technology (ICT) infrastructural facilities to maximize the use of electronic resources.

The quality of resources provided by university libraries is very important to the effective utilisation of the resources. an electronic resource is said to be of high quality when the credentials of the author are well known, its content covers what it is expected to cover when it is current and when it has been peer-reviewed and when the content is not overlapping and has been accessed from a reputable or high impact database or website.

All these contributed to the quality of a good electronic resource and will be measured by using the modified "ServQual" dimensions. Users' expectations and perception will be measured with 4-point Likert scale to rate their level of agreement or disagreement (1-strongly disagree and 4 - strongly agree), in which the higher number will indicate a higher level of expectation or perceptions.

Perceptions will be based on the actual service they receive in the federal university libraries in Nigeria while expectations will also be based on past experiences and information received about library services. Service quality scores will be the differences between the users' perception and expectation scores which can be mathematically represented as  $ServQual = P - E$ .

#### **Theoretical Framework**

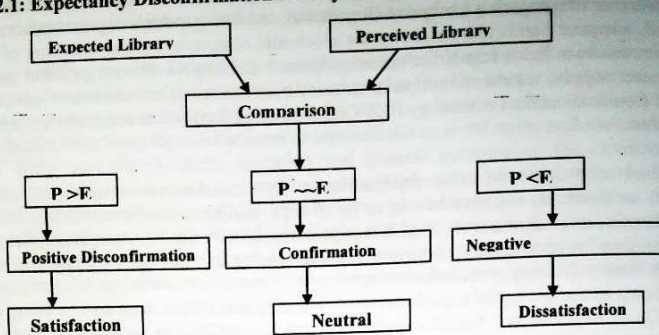
##### **Expectancy Disconfirmation Theory (EDT)**

Expectancy disconfirmation theory is a theory that has been used significantly in measuring consumer's satisfaction especially in banking and different client related sectors of which library isn't always an exemption. The principle is one of the prominent theories used for measuring how true or bad an agency is doing. The study identified the theory more appropriate for describing the difference between users' expectation and perception of the library. In corroboration with the authors' decision to use the theory, Elkhani and Bakri (2013) viewed Expectancy Disconfirmation Theory (EDT) as a result of the difference in disconfirmation of expectation or users' advantageous or terrible preference, because of this fact each time a person's perception of the performance of the quality of library service is higher than the expectations, it is assumed that high-quality disconfirmation has happened.

The duo pronounced that the Expectancy Disconfirmation Theory (EDT) turned into constructed upon the idea of Cognitive Dissonance Theory (CDT) that's viewed as a dissonance between cognition of something and its truth. Similarly, while a person's notion of the performance of library service quality is decrease than what's predicted or preferred approximately the quality of library offerings, it indicates that negative disconfirmation has come about. Positive disconfirmation leads to users' satisfaction and disconfirmation cause the consumer's dissatisfaction. Figure 2.1 shows the connection between the components of the expectancy disconfirmation theory (EDT).



**Fig.2.1: Expectancy Disconfirmation Theory Model**



**Figure 1: Expectancy Disconfirmation Theory Model**  
Source: Adapted from Oliver (1977)

## Methodology

### Research Design

A mixed approach methods (that is, qualitative and quantitative) were used to describe the situation under study. Descriptive survey, observation and interview designs were used for this study. Mixed approach is appropriate for this study because it will investigate the influence of usability, quality of library service delivery and users' satisfaction by giving a clearer understanding of the variables.

This study used focus group to conduct a direct observation of the demonstrable skills of a number of library users. Focus group is found suitable to observe the user's effectiveness, efficiency and satisfaction with the library electronic resources. The researchers see mixed approach as the design suitable for measuring a wide variety of unobservable data on usability and quality of service delivery as well as users' satisfaction and its ability to collect data remotely from a large population that is too large to be observed directly.

### Sample and Sampling Technique

The sample size for this study was 772 while 50 postgraduate users. This study applied multistage sampling technique to arrive at the sample size that will represent the registered postgraduate users for the selected federal university libraries from the six geo-political zones of Nigeria. Purposive sampling techniques were used to select federal universities running postgraduate programmes from the 43 federal universities in Nigeria. In selecting the 6 universities that will represent the 6 geo-political zones of Nigeria, stratified sampling technique was adopted and simple ballot system of random selection was used to select one Federal University from each zone.

The following university libraries were randomly selected to represent the entire six geo-political zones of Nigeria: University of Technology Library, Owerri, (south-east), Abdullahi Fodiyo Library Complex, Usmanu Danfodiyo University, Sokoto (north-west), Ibrahim Badamosi Babangida Library, Federal University of Technology, Minna (north-central), Hezekiah Oluwasanmi Library, Obafemi Awolowo University, Ile-Ife (south-west), Ramat Library, University of Maiduguri (north-east) and John Harris Library, University of Benin, Benin City, Edo State (south-south geo-political zone) respectively. The sample was drawn from the total population of all registered postgraduate library users for 2017/2018 academic session.

This study used 2 sets of questionnaire and usability evaluation tools as instruments for data collection. Two sets of structured questionnaires were designed for this study; two were designed



for the postgraduate students of the selected universities. Interview guide and observation checklist were used to gather more data from the participants.

The researchers embarked on field trips to the six geo-political zones of Nigeria to administer the research instruments for data collection, two research assistants were employed in each university library to help in the collection of the instruments while the usability tests were coordinated by the researcher to observe the demonstrable skills of the ten postgraduate users of the university libraries under study.

The data collection exercise lasted for eight weeks (2 Months) and the data collected was analysed. For usability testing, the study used Think Aloud technique for evaluation of university library electronic resources (databases) in order to prepare the participants for the test, a pretest was conducted in each of the six libraries under study to enable users identify important tasks and the required time for the completion of the 4 tasks. Interview, the study engaged the participants in a face-to-face formal interaction to further extract the dormant information from them.

Based on the design of the research instrument, the data collected were analysed by frequency counts, simple percentage, mean and standard deviation using SPSS version 21 and STATA. Structural Equation Model to determine the relationships between the usability and users satisfaction.

### Discussions

Data were collected from two different sets of questionnaire to determine the user's level of agreement with the statements usability of electronic resources in the federal university libraries in Nigeria. Findings from data analysed were discussed.

### Availability of Electronic Resources in Federal University Libraries in Nigeria

- The study found that electronic information resources such as Open Access Journals/ Books, OPAC, Open Educational Resources (OERS) were available in the libraries, while Oxford University Press, EduDonor, Hepseu, Oakleaf Books, Baobab, eGranary, AJOL, West Law, IEEE, Emerald and Educational Module Contents (eLearning Platform) were not available in the libraries. Similarly, Elsevier ScienceDirect, CABDirect, JSTOR, Law Pavilion, ProQuest, EbscoHost, TEEAL, ARDI, OARE, AGORA, Lexis Nexis, Hein Online, Ebrary, Scopus, Legalpedia, IMF ELibrary, Springer, Others: EIFL.net were not available in federal University Libraries in Nigeria. Participants were asked to log on to any of the available databases for usability tasks.

### Channels of Communication used by the Libraries

- The channels of communication used for dissemination of information about the availability of electronic resources to the users. These responses ranged from  $M = 2.14$  ("University of electronic resources to the users. These responses ranged from  $M = 2.14$  ("University mailing list/email alert") to  $M = 2.89$  ("General study course-use of library"). The result shows that out of the fourteen items listed for respondents to indicate the way show federal university library disseminate information to post-graduate students; seven items have high mean scores above 2.5 bench mark. These items include internal memo, Fresher's orientation, and general study course-use of library, University website/portal, Notice board, and library social platform and University News bulletins.

On the other hand, seven items produced low mean scores below the bench mark of 2.50 because they were not used to disseminate information to the post-graduate students as expected. Consequently, those items were signifies that majority of the respondents responded that their libraries do not use university mailing list/email alert, notice board and

electronic bill board and mobile short message services (SMS) alert for disseminating information and they have never attended any sensitization workshop or training on the use of electronic resources in their libraries.

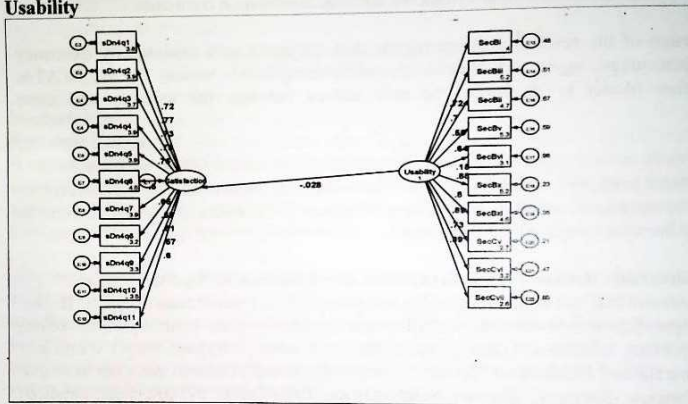
• **Usability Test Report**

Among the fifty participants for the usability testing only 10 were able to complete the three tasks given to them after pre-tasks while other fifty could not complete within the time frame. Majority of the participants disagree with the questions asked about the effectiveness, efficiency, and satisfaction with the library electronic resources and services provision.

• **Interview/ Focus Group Report**

A total number of 7 questions were prepared to guide the interview. Data collected from the interview has been presented using thematic approach to validate the findings gathered from the questionnaire.

**Fig.4.1: Structural Equation Model of the relationship between user's satisfaction and Usability**



The findings of the test of hypothesis of relationship between usability and users' satisfaction with electronic resources in federal university libraries in Nigeria shows that the standardized path coefficient ( $\beta = -.028$ ) has negative relationship between usability and user's satisfaction, and having a p-value of ( $p > 0.493$ ) means that the null hypothesis is accepted. Conclusively, usability had no significant influence on the level of library users' satisfaction with electronic resources in federal university libraries in Nigeria.

**Hypothesis Two**

**H<sub>03</sub>:** There is no significant relationship between the quality of library service and users' satisfaction with electronic resources in federal university libraries in Nigeria.

**Test of Hypothesis**

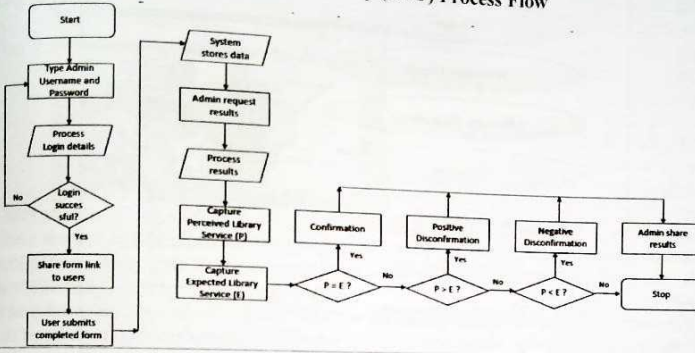
The finding of the test of hypothesis of relationship between service quality and users' satisfaction with electronic resources in federal university libraries in Nigeria depicts that the standardized path quality on users' research work and user's satisfaction, with a p-value ( $p < 0.001$ ) which connotes library users' satisfaction with electronic resources in federal university libraries in Nigeria.

**Flow Chart of the Expectancy Disconfirmation Model**



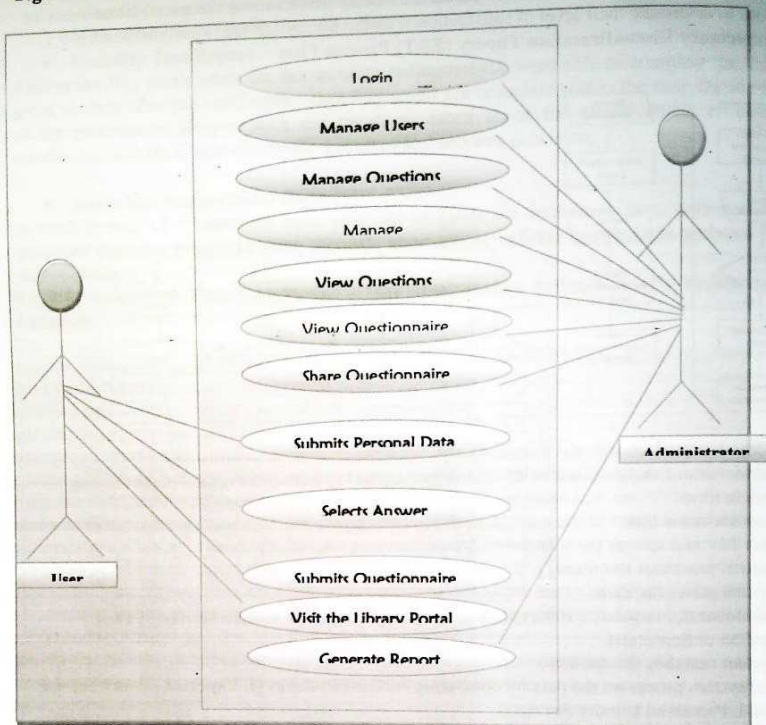
The flow chart shows the sequence of tasks to be performed by the expectancy disconfirmation theory model by comparing the scores of perceived library services and the users' library service expectations to determine their level of satisfaction with the library service provision. See fig. 5.1.

Fig5.1: Expectancy Disconfirmation Theory (EDT) Process Flow



1. Administrator logs into the system
2. Administrator shares a link to the online data capturing instrument (questionnaire) using google form
3. User visits the link
4. User fills and submit the form\*
5. System processes the form
6. System stores the data
7. Administrator requests a report summary, search filters (i.e. Gender, Age range, Date, Session or Semester)
8. System searches the database
9. The system processes the data by comparing the 2 mean scores (1. Expected Library Service and 2. Perceived Library Service)
10. If Perceived Service is **Greater Than** Expected Library Service then the decision is Positive Disconfirmation (i.e the user is satisfied meaning **Satisfaction** has occurred)
11. If the result of Perceived Service is **Equal or Equivalent to Expected Library Service** it means **Confirmation** has occurred that is **Neutral** (Neither Satisfied nor Dissatisfied, that can also be referred to as **zone of Tolerance**).
12. If **Perception** is **Less Than Expectation** it means **Negative Disconfirmation** (**Dissatisfaction**)
13. Administrator saves or print the results
14. Administrator navigates to share the results
15. Administrator inputs contacts of receivers
16. Administrator can share the results with other staff

Fig. 5.2: Actors and Use Case



This prototype is designed to measure library service quality through an adapted SERVQUAL instrument (25 Survey Questions). The questions were formed based on the peculiarities of the library operations and services. The SERVQUAL 5 dimensions are Tangible, Reliability, Responsive, Assurance and Effectiveness instrument and Expectancy-Disconfirmation Theory (EDT).

#### Designing the Prototype

In the process of developing this prototype a paper model was first used to come up with the ideas about how features and functionalities of the system should look like so as to enable more updates and upgrades to be made in order to add more value and make an efficient tool for data collection based on the two defined services peculiarities (the Expected and Perceived services).

#### How the prototype works

This prototype provides features and functionalities with which a user can be created to access the prototype. This user can login and perform series of tasks. These include creating more users within his/her domain. Such users created are also administrators. An administrator can create streams of questions based on their service categories (Expected and Perceived services). With these questions created, there is a provision for creating a questionnaire title after which questions can be picked



from the pre-defined questions and finally a questionnaire generated. Users, Questions and questionnaires can be viewed and managed. After creating a questionnaire, an option has been made for sharing the questionnaire link via email or text message. Users then follow this link and fill in their demographic information and submit.

### Log in Page



### Users process

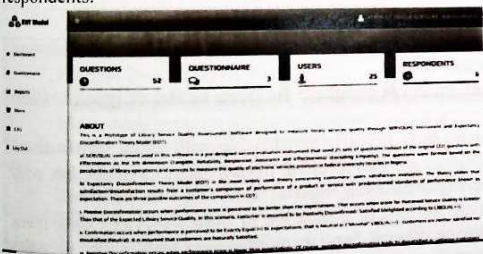
There are two major types of user recognised by this prototype: these are administrative user and public user. They are however called the actors of the system and the tasks they perform authoritatively are referred to the use cases.

**Administrator:** An authorized user who creates public users and share questionnaire to users. This can be a Librarian, administrative officer or lecturer who wants to evaluate his/her course(s).

- Administrator logs in to the system with a pre-defined username and password created by super administrator
- Administrator will land on dashboard and menu options and their sub-menus as follows:

### Dashboard

This provides a summary report at a glance as per the system activities. Information on the dashboard includes a total number of Questions, Questionnaires, Administrative users and list of respondents.



### User

This is a menu that enables admin to manage users.

**Create User View:** Used for creating and view other administrators who are users on the system.

### Process of Creating User

1. Administrator logs in to the prototype
2. Admin goes to 'users' main menu and goes to 'create user'
3. Administrator fills the form with the new user information and click process

### User Information

- Full name, Gender, Email address, Role (Librarian, Lecturer, Sales manager)

**View User:** Displays the list of available users on the system. The administrator can update or delete users' record as well.

### Questionnaire View

This is where questions and questionnaires are created, listed and shared.

**Create question:** Allows administrator to create, questions.

**View Questions:** Lists all questions created by the administrator. This page also permits the administrator to edit or delete question.

**Create Questionnaire:** Allows the creation of a new questionnaire. See figure 5.6

**List questionnaire:** Lists all existing questionnaires created by the administrator. Through this menu, a questionnaire record can be updated or deleted.

**Share Questionnaire:** Enables administrator to share questionnaire link to public users through email or text messages.

### **Link Sharing Preview**

This administrator can send voice, video or text message to all registered user using text message.

### **Report**

There is a provision for an administrator to generate report from the user responses so as to gather the scores obtained for a particular questionnaire shared on a particular date. To generate this report, the admin need to select the questionnaire title, the date it was shared, service category and users' gender. This prototype provides a comprehensive report in tabular form and allow for the results to be exported in CSV or MS-Excel formats.

### **Current Awareness Services View**

The current awareness services platform enables the administrators to share current news, events, resources and services of the library with the registered users for effective utilisation of library resources.

### **Findings of the Study**

Based on the data collected and analysed, the study found out that:

- Postgraduate users were naturally disconfirmed with the library electronic resources provision.
- Most participants hardly use library fee-based electronic resources.
- All participants preferred text message as the best channel of communication.
- Participants were not happy with most of their university library management software (LMS) performance during the usability testing.
- Many participants got frustrated and could not complete the three tasks assigned to them due to slow Internet connectivity.
- Usability of library electronic resources show negative relationship with users' satisfaction.
- Service quality has significant influence on the level of library users' satisfaction with electronic resources in federal university libraries in Nigeria.
- The study recommended the prototype for regular evaluation of library services since there is no standard software for measuring library service quality that uses short message services for disseminating information to users.

### **Conclusion**

In view of the review of the related literature and the findings of the study, it is obvious that previous studies conducted on users' satisfaction have failed to identify the factors responsible for low utilisation of electronic resources in federal university libraries in Nigeria which this study had unveiled among others that the low utilisation of the library electronic resources is connected to such as lack of remote access, ineffective communication/ information dissemination of the library had contributed to users dissatisfaction over the years, these have been tagged as bad resources in Federal university libraries in Nigeria. Thus, the study has recommended the following as measures to increase users' satisfaction with library services delivery.



## Recommendations

- Libraries should improve on the service delivery by adjusting their rules and regulations and embark on regular sensitization of the users' community through SMS.
- Library should increase their band width to facilitate easy access to electronic resources
- Library should advice all database owners to make the home page friendly and easy to use for users.
- Library should adopt EDT software for measuring library service quality and users satisfaction.
- Libraries should be conducting usability test for all selected electronic resources before subscription to avoid low utilisation of the aggregator databases.

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