SERVICE QUALITY OF SPECIAL LIBRARIES IN KERALA

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by

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Declaration

I hereby declare that the thesis entitled **Service Quality of Special Libraries in Kerala** is the authentic record of research work carried out by me, for my Doctoral Degree under the supervision and guidance of Dr Mohamed Haneefa K., Associate Professor & Head, Department of Library and Information Science, University of Calicut, and that no part thereof has previously formed the basis for the award of any degree or diploma or any other similar titles or recognition.

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Certificate

I, Dr. Mohamed Haneefa K., do hereby certify that the PhD thesis entitled **Service Quality of Special Libraries in Kerala** is a record of bonafide study and research carried out by Ms. Sajna K.P. under my supervision and guidance.

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Dedicated to

Beloved Parents
(Muhammed K. P. & Ayishabi. U. P.)

For giving me the wings to soar

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List of Abbreviations / Acronyms

AGFI	Adjusted Goodness of Fit Index
APA	American Psychological Association
CDB	Coconut Development Board
CDS	Centre for Development Studies
CFA	Confirmatory Factor analysis
CFI	Comparative Fit Index
CIFT	Central Institute of Fisheries Technology
CMFRI	Central Marine Fisheries Research Institute
CPCRI	Central Plantation Crops Research Institute
CSIR	Council of Scientific and Industrial Research
CTCRI	Central Tuber Crops Research Institute
CWRDM	Centre for Water Resource Development and Management
DRDO	Defense Research and Development Organization
EFA	Exploratory factor Analysis
FCRI	Fluid Control Research Institute
GRA	Grey Relational Analysis
HoQ	House of Quality
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
ICT	Information and Communication Technology
JNTBGRI	Jawaharlal Nehru Tropical Botanic Garden and Research Institute
KFRI	Kerala Forest Research Institute
KSCSTE	Kerala State Council for Science, Technology and Environment
KSPB	Kerala State Planning Board
MPEDA	Marine Products Export Development Authority
NCESS	National Centre for Earth Science Studies
NFI	Normed Fit Index
NIIST	National Institute for Interdisciplinary Science and Technology
NIO	National Institute of Oceanography
OPAC	Online Public Access Catalogue
QFD	Quality Function Deployment

R&D	Research and Development
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
RRI	Rubber Research Institute of India
SEM	Structural Equation Modeling
SPSS	Statistical Package for Social Science
TQM	Total Quality Management
VSSC	Vikram Sarabhai Space Centre

Abstract

The success, sustenance and demand of libraries in the future depend upon their capability to be more dynamic, technologically advanced and continue to prove their worth in academic and research endeavors. The only alternative left for libraries is to adopt quality enhancement practices in all the library activities and services and thus contribute to the productivity and accomplishments of the user expectations.

Libraries are service organizations and the quality of their service is a substantial factor in the development and dissemination of knowledge. Due to the scientific and technological revolution, there is a burgeoning need for information and knowledge. As a resource centre for learning, libraries should provide accurate and reliable information for the users. In the present era, factors like hike in knowledge production, increase in the number of resources of information and their necessity in research and development, widespread use of Information Technology in information generation and knowledge sharing have made the role of libraries more competent than ever before. It is very important to measure the efficiency and service quality of libraries. The study was conducted to measure the service quality of special libraries in Kerala. Both qualitative and quantitative techniques were applied in this study. In order to attain a sound theoretical background, an intensive survey of literature was carried out. In light of it, a modified SERVQUAL instrument was developed for conducting the study.

SERVQUAL is a service quality measurement tool developed by Parasuraman, Zeithaml and Berry in 1985. It has 22 statements under five dimensions: they are tangibility, reliability, responsiveness, assurance and empathy. As the study used modified

SERVQUAL, the dimensions were changed in to physical facility, library collection, library staff, technical process and library service. All these dimensions were meant to contribute to the total quality of library services.

The sample of the study consisted of 19 special libraries in Kerala belonging to the Central and State Government institutes, which were selected by random sampling method. Of the 800 questionnaires distributed, 620 questionnaires were returned with a response rate of 77.5percent. Factor analysis was conducted to assess the adequacy of the measurement model and it confirmed that the model is fit for further measurement.

Service quality is measured based on the analysis of the expectations and perceptions of the users. The study evaluated the expectations of the users and found that they have high expectations in all dimensions. Physical facility dimension is observed as the most crucial dimension and library service dimension as the least important. While analyzing the perceptions of the users, it was found that users have high perception on library staff dimension and least perception on library service dimension. The institute wise analysis shows that the Central Marine Fisheries Institute (CMFRI) library and Vikram Sarabhai Space Centre (VSSC) library have high perception and low service quality gap. The libraries of Kerala Forest Research Institute (KFRI), Central Plantation Crops Research Institute (CPCRI), Centre for Development Studies (CDS), Central Institute of Fisheries Technology (CIFT) and National Institute of Interdisciplinary Science and Technology (NIIST) also provide almost good services to its users. But the National Institute of Oceanography (NIO) library has the lowest perception and highest service quality gap. The study observed that there are no gender differences in the quality perception of users. Meanwhile, the differences exist in the

service quality of Central Government institute libraries and State Government institute libraries, even though there were no significant differences in the physical facilities of these libraries.

Through an item wise analysis, it can be observed that the items such as 'adequate lighting and ventilation', and 'clean, tidy and hygienic environment' are the highly expected and perceived items by the users. Therefore, they had the lowest service quality gap whereas the items like 'Physical facilities for differently abled users' and 'Provide of special services to differently abled users' are well expected but least perceived by the users and are hence regarded as the items having highest service quality gap. Unfortunately none of the libraries provide separate physical facilities and specific services to differently abled users. The items 'Indexing and Abstracting Services', 'Video Library Service' and 'Access to Audio Visual Materials' also have low perceptions.

The analysis revealed that special libraries in Kerala have failed to fully meet the quality expectations of their users. The services did not rise up to the expectations of their users. Therefore libraries should find alternate ways to improve the service quality and thereby cater to the rest of the needs and expectations of the users. In addition to the SERVQUAL questionnaire, interviews with the librarians were also conducted as part of the study and majority of the librarians raised the issue of lack of adequate staff and financial constraints as the basic barrier to provide quality services. Proper financial allocation, adequate physical facilities and knowledgeable staff are pre-requisites of a library for providing quality services. The study also provides suggestions for improvement and recommendations for further research.

Chapter 1
INTRODUCTION

1.1. Service Quality

Quality is the most critical element for any products and services. Defining quality is quite difficult as it is a subjective phenomenon. It means different things to different people. According to Webb (1995) "Quality is seen as something which is made up of processes, procedures, standards and the resultant performance which these bring about". Quality is assessed with the competence of a service or product to its proposed need or usage, being subject to the expectations of the user. Therefore, quality has to be in accordance with the customer's requirements and demands. The ISO 9000 (2005) standard describe quality as "the consistent conformance of a product or service to a given set of standards or expectations". As quality assurance is a continuous process of assessment and reassessment of the necessities of users, expectation has to be met or satisfied through providing necessary means. It is primarily concerned with providing customer requirements than meeting standards or specifications.

In today's world, service quality is one of the significant criteria that influence every business, including the service sectors. Since customers are regarded as the greatest asset of any organization, quality has to be measured from a customer's point of view. The whole idea of quality management is based on customer focus, which can be interpreted as either simply meeting or exceeding the customer requirements and expectations. A service is said to be a quality service only if it can meet the needs and expectations of the users. Needs and expectations are evolved on the basis of people's culture, their standard of living, education, age, etc. Emerging

technologies provide new means to satisfy human need for knowledge. Satisfying the growing needs of users is recognized as an indicator of quality. Thapisa and Gamini (1999) viewed quality of service as the realization of what is good and bad, acceptable and non-acceptable service. Services, in general, can be exchanged for value and it is a characteristic feature that sets it apart from goods. The application of knowledge on goods-management to enhance service quality management and maintaining consistency is really hard due to the diverse nature of service. According to Kotler (2000) "Service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may not be tied to a physical product". The intangible nature of service makes quality measurement very arduous, unlike goods. There is no consistency in the provision of services and it changes with time, person, nature etc. In service, the production and consumption takes place at the same time and is inseparable. The ways in which services differ from goods make assessment of service quality an onerous task. As goods are most often produced by meeting certain standards or guidelines, they tend to have great consistency when it comes to quality. While services, even of the same type are subjected to prominent variations as they are dependent on the interactions between the client and the service provider. With goods, production and consumption are separate and therefore, the customer is only present in the final stage. In the case of services, production and consumption are usually inseparable, thereby resulting in the client's presence throughout the life. Parasuraman et al. (1985), observed intangibility, heterogeneity and inseparability of production and consumption as the features of service. Therefore service quality can't be measured as an abstract and elusive construct, like goods. Hence service quality measurement focuses on customers perceptions of quality.

Quality service has its focus on helping customers in characterizing their needs, elucidating customer benefits, establishing confidence, observing and evaluating the organisation and keeping track of the impact generated by its products and services. The emphasis is on finding opportunities for service accomplishment and improvement and taking remedial measures during diversion. As a matter of fact, service quality is achieved when customer expectations exceed. Despite the fact that initial quality models focused basically on products, after the Second World War, the western economies faced an immense growth in the service sector which brought a growing body of literature on service quality. It is generally recognized that the intangible nature of services had made it more difficult for defining and modeling service quality than modeling the quality of goods (Jayasundara, 2009).

Jayasundara, Ngulbe and Majanaja (2009) discussed about the 'disconfirmation paradigm' based on the Expectancy Confirmation Theory of Richard L Oliver. According to the theory, "the satisfaction of a customer is determined by customer expectation prior to using the service and the (dis)confirmation of that expectation" (Oliver, 1980). Disconfirmation paradigm is the discrepancy between the expected and actual performance. It has three outcomes: confirmation, positive disconfirmation and negative disconfirmation of expectations. Confirmation happens when the performance meets the expectation, negative disconfirmation is when the performance is below the expectation and positive disconfirmation is when the service exceeds the expectation. On the basis of this disconfirmation paradigm, Parasuraman et al. (1985) developed the gap model of service quality. According to them service quality is "the degree of discrepancy between customers' expectations for the service, and their perceptions of the service performance". Disconfirmation theory

as applied in service quality posits that, before using a service, a client has certain expectations about it. After the service encounter, he compares those expectations with actual performance and his perception is either confirmed (if they match), negatively disconfirmed (if the perception is lower than the expectation), or positively disconfirmed (if the perception is higher than expectations). The essence of the theory is a comparison between expectations and performance (Zeithaml, Parasuraman & Berry, 1990).

There is a set of key discrepancies or gaps in the executive perceptions of service quality and the tasks connected with service delivery to consumers. These gaps can be major hurdles in attempting to deliver a service which consumers perceive to possess high quality. Through an exploratory investigation on service quality concept, Parasuraman, Zeithaml and Berry (1985) identified that there are 5 service quality gaps. They are;

Gap 1: The gap between customers expectations and management perceptions regarding customer expectations.

Parallel to human nature, the service firm executives may not always be able to comprehend the features promising higher quality to the consumers ahead, the features that are crucial to meet customer needs, the performance level required for delivering high quality service from those features. Service marketers won't always be able to perceive the consumer expectations from a service.

For exceeding customer expectations and to subsequently assure customer satisfaction, it's imperative for the service company management to have precise and proper understanding of customer expectation. The absence of such understanding generates a gap which can act as a major hindrance to customer satisfaction.

Gap 2: The gap between management perceptions and service specifications.

Even if the management is able to cognize the customer expectation, they may fail in meeting it in the form of service specifications. This gap emerges when the management perceives actual customer expectation and subsequently fails in interpreting the expectation to accurate service specification.

Various factors such as resource constraints, market conditions and management indifference can lead to incongruity between management perceptions of consumer expectations and the actual specification prescribed for a service.

Gap 3: The gap between service quality specifications and actual service delivery

This emerges when the employees fail to deliver services according to the quality specifications. It can happen either due to the lack of awareness of employees regarding service quality specifications or their inability and inefficiency to perform successfully.

Gap 4: The gap between actual service delivered and the external communications regarding the service

Consumer expectations can also be influenced by the firm's advertisement campaigns and other means of reaching out into the public. The promise of more than what can be delivered marginally increases initial expectations. However the perception of quality is brought down when promises are not satisfied. On the other hand, dissimilarities between service delivery and external communications through exaggerated promises or the unavailability of information regarding service delivery aspect to serve consumers effectively can influence the consumer perceptions of service quality.

Gap 5: The gap between customer expectations and perceptions.

This is the entire aggregate of all other gaps. The high and low service quality is determined depending on the consumer's perception of actual service performance with regard to their anticipation.

Hence Gap 5=f(Gap1+Gap2+Gap3+Gap4) (Parasuraman, Zeithaml and Berry, 1985).
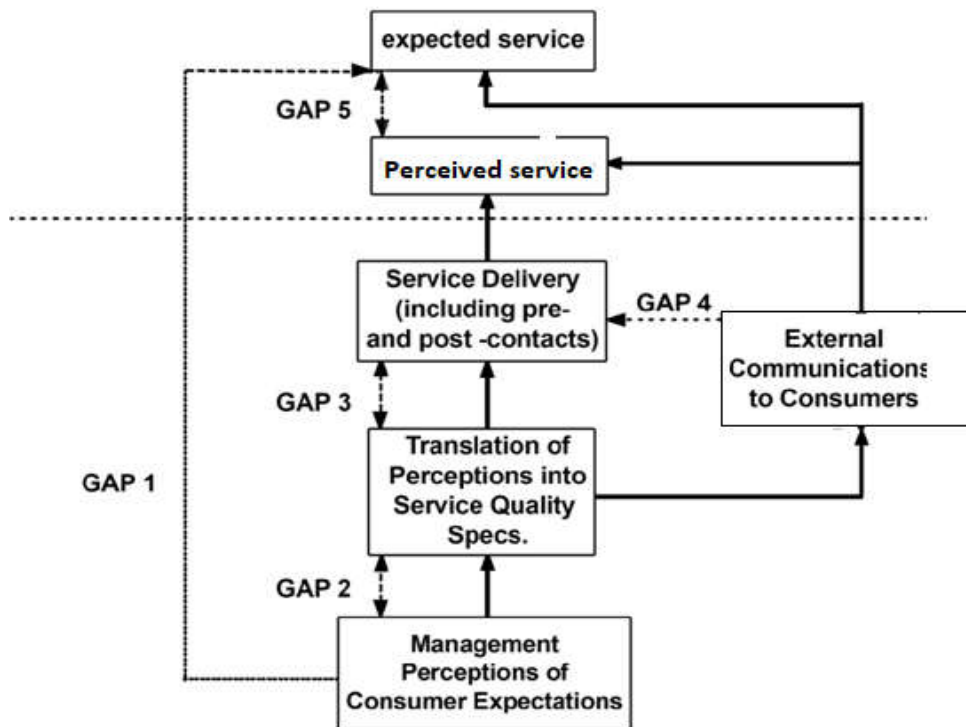
Figure 1.1
Service Quality Model
(Parasuraman, Zeeithaml and Berry,1988)

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1.2. Service Quality of Libraries

By providing quality information and services, libraries are contributing to the educational and cultural progress of the society. The different types of libraries like public library, academic library, special library and national library provides various types of services required for their users. Libraries support both formal and informal education by acting as the knowledge hub of the society. It acquires, organize, distribute and retrieve information for the purpose of disseminating knowledge. Library services include reference service, referral service reprographic service, digital library services, extension services etc. With the limited budget and high cost, libraries can purchase only limited copies of particular books. In such cases, libraries keep them as reference books and users can only read and take photocopy of the required part. The union catalogue service of a library maintains a database of the collections of two or more libraries. It enables them to avail inter-library loan service.

Ever since the Implementation of IT in the library and information services, digital library services have witnessed a drastic evolution. The characteristic features of information services generated in libraries was greatly influenced and successfully altered by information technology. Technological advancements revolutionized every aspect of library work in academic, school, public, and special libraries. The significant changes included the increased database access via CD-ROMs, local mainframes or dial-up services. The library instruction saw a directional change towards skill for utilizing information systems based on computers; and accessibility of local collections to remote users, and remote collections for local users. World Wide Web acted as a major instrument in disseminating information. Information technology transpired to become the most

powerful tool to gather, organize and distribute information to people on a wider scale along the communication network. The internet brought about a shift in the library services in the 1990s, with the rapid growth of access to the computer availability. A comprehensive change was initiated with the introduction of Information and Communication Technologies (ICT) in handling, delivering and storage of information. When the conventional library collections were progressively converted into digital collections, librarians were benefited with new possibilities and challenges.

The internet, particularly the WWW, assigned the librarians a dynamic role to perform in the society by improving the means of dispersing information. As the potent characteristics of the web such as distributed, heterogeneous, collaborative, multimedia, standards and protocols and architecture transformed the methods of information access and generated various possibilities in the fields of digital libraries and virtual libraries ineffective communication retrieval and distribution. Many libraries evolved in to "Virtual Libraries" due to the online access to information (Rasul & Sahu, 2011).

The technological innovation enabled libraries to provide access to all the information requirements of users within a mouse click. Through this new advancement, users are able to access e-resources like e-journals, e-books, e-theses etc. The application of web 2.0 technologies enabled the library to provide more interactive services to users. By the 'ask a librarian' service, users can interact with the librarian any time they wish and it also provide Institutional repository service for preserving the intellectual output of the organization. Library provides OPAC (Online Public Access Catalogue) and Web OPAC services. It helps the user to search the exact location of the required material in the library collections.

Through Web OPAC, the books or other materials in a particular library can be searched from anywhere in the world.

Libraries have been introducing web scale discovery services, by which users can search quickly and seamlessly across a vast range of local and remote resources and retrieve the results based on relevance ranking. With this technological hand of help, a user gets results from all the relevant sources. Vu find, Open Bib, Black light etc. are the examples of open source discovery products. EBSCO discovery service and Serial Solution Summon are the examples of commercial discovery products. As the libraries introduce new and sophisticated services on a daily basis, it conducts user orientation programs to circulate knowledge regarding its functions.

Besides these, libraries make their services accessible to differently abled users with the help of latest technologies and provide them with specific services too. In addition, many extension services are offered by libraries such as book talks, book reviews, book exhibitions, public talks and debates on topic of social relevance, recreational programmes, quiz competitions, reading and writing competitions, etc.

During 1950's, 'quality' has evolved as a subject of study on account of the studies made by Deming, Juran, Crosby, Taylor, Feigenbaum, and Peters. By 1980's, with the emergence of consumerism, service quality also gained attention as a subject of study and in 1990's service quality studies were started in service organizations like libraries (Manjunatha & Shivalingaiah, 2004).

Libraries are the repositories of various kinds of information and knowledge. It is a place where people quench their thirst for knowledge. A knowledgeable citizen can perform integral functions in the socio - economic development of the nation. Thus, libraries play

an important role in a democracy. Therefore, they have to provide quality information and services to its users to equip them with right information and knowledge. In the initial stage, libraries are merely concerned about the issue, circulation and return of books and were not bothered about the quality of information and services they offer and whether the information provided met the requirements of users. The social and economic changes insisted libraries to develop more services that can satisfy the needs and expectations of the users. The success and survival of libraries in future depends upon their efficiency to amend and reform themselves, be more dynamic, and continuously prove their worth in academic endeavors and offer better research assistance. The only way out for the libraries is to adopt practices to enhance and ensure quality in all the activities and services associated with and organized by the libraries thus contributing to the productivity and accomplishments and meeting the customer expectations. Libraries have a variety of reasons in order to improve their quality. Due to increasing customer demands for quality service, impacts of the boom of information technology and price hikes, outcomes of inflation were becoming the standard for today's library systems. Greater efficiency, better service and optimum utilization of resources are the means by which quality enhancement is carried out in such systems. The most crucial factor of strategic importance when it comes to librarianship is quality. To satisfy the customers by achieving highest quality is the ultimate goal of every library and this is the reason why digitization and updation of the resources is being done on a regular basis. Maintenance of quality is an integral part of library services.

Quality management has a vital role in both academic and special libraries. Although these libraries have adequate customers, they need to convince them regarding the quality of library services. In the

case of academic libraries, service quality is evaluated by the academic community itself whereas in special libraries, they are responsible to the budget-providing authority, like parent organisation that they are providing quality service with their limited budget and resources (Tan & Foo, 1999). Libraries exist as service centres which provide required services to its users. Certain fundamental principles that are common to service quality measurements are also applicable to libraries and information services.

Quality assessment of libraries is not possible without the involvement of its users. Library users are the ultimate judges in determining the quality of library services. Quite as different from traditional methods, the service quality is measured on the basis of satisfaction of user's needs other than the quantity of its collections. Having large collection of books never meant that the library is providing quality services. The success of libraries depends on customers' perceptions or judgment on the quality of products/services provided by the service personnel. Therefore, service quality is the measure of how well the products/ services delivered meet customer expectations (Manjunatha & Shivalingaiah, 2004). Service quality of a library is based on its efficiency in providing the required service within a reasonable time and whether it will satisfy the user's needs and expectations. The satisfied users are the strong pillars of a library. Thapisa and Gamini (1999) also observed that, the conventional method of service quality measurement of an academic library is based on the annual statistic report submitted to the university administration, which includes; funds spent on collection development, number of professional librarians employed, number of clients (external and internal) utilising the service and the queries answered by reference

librarians. Now the focus has changed on evaluating the quality and significance of the services.

The position of libraries is precariously placed in the competitive global environment. In an age of internet boom, they have been facing severe competition from other information providers. In order to compete with these challenges, libraries should provide quality information and services. Service quality and user satisfaction are very important concepts that libraries must cater to in order to survive the competition. Libraries undergo constant changes in subscription packages, formats, and technological advancements. The changing information landscape and users' demand force libraries to provide quality services. The advent of digital era has created a trend towards accessing digital resources than actually owning books. Severe challenges are faced by libraries from various sources that try to provide similar services like bookstores and information from publishers and vendors. Since the competitors are providing more efficient and faster services, libraries need to focus on offering better services. Besides physically accessible libraries that are quite competitive, virtual libraries accessible from anywhere through the internet also raise challenges for the existence of libraries. Nitecki (1996) stated that "Identifying new ways to conceive of quality and to monitor its attainment are current challenges for libraries".

Lack of adequate physical and financial resources is one of the major problems faced by the libraries today. Therefore the available resources should be employed effectively for providing quality library services. Hence quality evaluation and ensuring efficient utilization of such resources is of utmost importance. If libraries cannot provide what user's need, then they cannot hope to survive in a competitive world where the customer picks and chooses the best service.

Quality service is an interdependent relationship where the service provider is liable to fulfill the user requirements within its accessible capacity and resources. Vinod Kumar (2009) describes quality service as "the ability or capability of library services, products and consultation to meet the requirements of the users". Being service organizations, libraries and information centers can also employ strategies and models developed, utilized and proved to be successful by service industries and reap its benefits.

1.3. Quality Measurement in Libraries

Quality measurement is vital among libraries for evaluating the adequacy of the provided services and recognizing potential areas for quality improvement. A prime focus on customer service works as an effective instrument in fulfilling the library's mission to serve customers in a better fashion. Development of a standardized tool is necessary for the measurement of service quality. Various techniques and methods from industrial and commercial sectors are modified and applied by libraries for measuring quality of their services. Since the quality and performance evaluation generates information which influences decision making and improvement of services, it is significant for the management of libraries and information services. Several attempts were carried out to develop a standardized tool for the effective measurement of service quality. The following are the various important quality measurement tools and methods that are widely applied in libraries.

1.3.1. SERVQUAL

For measuring service quality in commercial environment, Parasuraman, Zeithaml and Berry had developed a tool named SERVQAUL in 1985. The tool is used to measure service quality on the basis of 10 quality dimensions. They are; tangibles, reliability, responsiveness, communication, credibility, security, competence,

courtesy and understanding/ knowing the customer and access. Later it was reduced to five dimensions, namely reliability, tangibles, responsiveness, assurance and empathy. It contained 22 pairs of statements under the five dimensions. Service quality is identified on the basis of measuring the gap between users' expectations of a particular service and their actual perceptions regarding the service.

The SERVQUAL formula for measuring service quality is

Q = P-E where

Q = Quality

P = Perceptions of customers about services

E = Customers' expectations about services

According to the formula, when the perception of the user is equivalent to the expectations of the user, it is said that there exist quality. When the perception is higher than the expectations of the users, the service quality is high and if the perception is lower than the expectations, the service quality is low.

Dimensions of SERVQUAL
The following are the five dimensions of SERVQUAL

Tangibles: It measures those things which are tangible in nature such as physical facilities, resources, physical appearance of the personnel etc.

Reliability: Measures the ability of the service provider to provide services dependably and accurately

Responsiveness: It shows the willingness of the employee to help users and provide adequate services.

Assurance: Shows knowledge and courtesy of employees and their confidence.

Empathy: Caring and individualised attention that the firm provides to its customers (Parasuraman, Zeithaml & Berry, 1988).

1.3.2. SERVPREF

SERVPREF was developed as an instrument which measured service quality and customer satisfaction by Cronin and Taylor in 1992. Even though it contained similar domains as SERVQUAL model, its development intended to focus on the study of four service sectors: banking, pest control, dry cleaning, and fast food.

Since SERVPERF is formed upon performance theory, it is utilized for a performance-based evaluation of service quality. Though being a modification of SERVQUAL model, customer expectations are not considered in SERVPREF unlike SERVQUAL. Only customer perceptions of service performance is taken in to account and therefore, it does not contain disconfirmation scale which denotes the gap between expectations and perceived performance of service. While having a single part, that is perceived performance of service, the users have to rate their perceptions of performance using similar attributes in the SERVQUAL model. The various domains identified by SERVQUAL model such as tangibles, reliability, responsiveness, assurance and empathy are equally relevant to SERVPREF. Questions required to evaluate the significance of the item's dimension and questions regarding overall service quality and satisfaction can be included. Similar to SERVQUAL, modification and addition of questions is possible. SERVPREF is less complex, brief yet comprehensive, precise and easier to manage than SERVQUAL. As SERVPERF is shorter, different scores for analysis are not required. Researchers and subject specialists find SERVQUAL model

more attractive because of its comprehensiveness and better ability in providing diagnostic information. The variation in customer perceptions of service quality is further explained in SERVPREF. As SERVQUAL has wide application in service industries, it is mostly preferred by researchers and libraries instead of SERVPERF (Cronin & Taylor, 1994; White, Abels & Nitecki, 1994).

1.3.3. LibQUAL

LibQUAL is a modified version of SERVQUAL, developed by researchers in Library and Information Science, based upon the fundamental methodology of SERVQUAL, as an attempt to evolve a model that is specific to the measurement of service quality in libraries. It is a web based library service quality assessment protocol and is being widely used among libraries throughout the world. LibQUAL was developed by collaboration of Texas A& M University and the Association for Research Libraries in the United States to empower institutions to undertake service quality gaps while enhancing responses to user requirements.

The LibQUAL model contains 22 statements with a three column rating format comprising of minimum service expectations, desired service expectations, and the perception of service performance of the library reviewed. According to researchers, the attributes of LibQUAL portrays the service quality domains of research libraries better than the SERVQUAL's set of factors and domains which was developed across service industries. Three customer perceptions are recognized by LibQUAL such as minimal, optimal, and current service levels. The service quality analysis is based upon the constructed gap with the relative ranking of the current perceived levels to the minimal and optimal levels. A user defined zone of tolerance can be found in between the minimal and optimal expectations. The difference in between the customer's adequate service level and expected service

level is the zone of tolerance. Along with the questionnaire, a remarks box is also additionally provided for the collection of suggestions from the respondents. The responses are measured utilizing a 9 point Likert Scale. Based upon the evaluation provided by the users and staff regarding their library, required actions are taken with a view to improve the quality of library services. This enables the recognition of the most suitable practices for providing quality services and in maintaining pleasant relationships among the users and the staff of the library.

Dimensions of LibQual

In due course, the original five dimensions of LibQUAL were changed in to three. Service quality started to be measured based on these dimensions.

They are;

- Affect of Service

- Library as a Place

- Information Control

Affect of Service

This dimension contains 9 items which evaluates the efficiency and capability of the library staff while attending the users.

Information Control

It contains 8 items assessing the sufficiency of library collection and also measuring the effectiveness in providing the users access to its collection.

Library as a Place

It incorporates 5 items measuring the ease and convenience and physical qualities of library as a place (www.LibQual.Org).

1.3.4.DigiQUAL

DigiQUAL was created as a measurement of the service quality of a digital library with the support of the Association of Research Libraries and financial aid from the National Science Foundation. From the focus group interviews conducted with staff at DLESE (Digital Library for Earth System Education) and MERLOT (Multimedia Educational Resources for Learning and Online Teaching), DigiQUAL was able to recognize 180+ Items in the twelve themes related to digital service quality. During the primary phase of DigiQUAL, various subsets of these elements were tested from users at five pilot locations: DLESE, Math Forum, MERLOT, NSDL.org, and NEEDS (National Engineering Education Delivery System).In the wake of testing and investigation in the spring and summer of 2005, documentation of protocol was done in literature. DigiQUAL protocol is not in operation as an online service.

The DigiQUAL helps in understanding users through its various evaluation services, their interaction with digital libraries and their methods of generating novel knowledge. The web over view interface was made through cooperation between ARL, Texas A& M University Libraries, and the University of Texas – assessing digital libraries from users' point of view while concentrating on various issues regarding reliability and dependability of a website. Since digital library services are accessible to vast communities of users, they necessitate periodical and methodical assessment by those users. Digital libraries are in search of productive and efficient methods so that they can cater outstanding service using electronic resources. The capacity to evaluate service quality of DLs enables them to

enhance the retrieval of significant information, encouraging users to prepare for an information-rich society and encouraging scholarships and ever last learning.

The part of the project that was funded by NSF/NSDL had this comprehensive goal of creating a digital library service quality assessment process that strengthens student learning by allowing timely allocation of resources according to the user-identified need. The project goal was to build a complete market survey suitable for the digital library environment. In order to attain that goal, the project seeks to accomplish the following objectives and outcomes within the NSF/NSDL community:

(a)   Defining various dimensions of digital library service quality from the user's point of view,

(b)   Developing a tool for the measurement of user perception and expectation regarding digital library service quality across NSDL digital library contexts,

(c)   Distinguishing digital library "best practices" that allows generalizations over operations and development platforms,

(d)   Improving student learning through effectual management of user perceptions and expectations of digital library services,

(e)   Establishing a digital library service quality assessment program as an essential part of the library service quality assessment program at ARL, and

(f)   Institutionalizing consistent product and process assessment efforts coordinated towards positive and timely management of outcomes (http://www.digiqual.org/about).

1.3.5. WebQual

WebQual is a tool which enables measurement of website quality and can be used in libraries to assess the quality of library websites. The quality measurement is based on customer perceptions and additional changes are made so that it becomes more user-friendly. Even though WebQual was initially used only for measuring the quality of e- commerce websites, its applicability was later stretched out to other websites too.

WebQual as an instrument evaluates the usability, information and service interaction quality of websites, especially those handling e-commerce. The WebQual tool was developed by the Managements Schools affiliated to University of Bath and the University of East Anglia by Stuart Barnes and Richard Vidgen (www.webqual.co.uk). Since various dimensions were utilized for measuring quality of websites, Loiacono, Watson and Goodhue (2002) discussed about the 12 dimensions of WebQual. They are:

- Ease of understanding: it measures the effectiveness of websites so that users can read and understand properly.

- Intuitive operations: it describes the operational facilities of websites such as simple to work in and navigate through the website.

- Information quality: It considers the information quality of the website, their accuracy and relevance.

- Functional fit to task: It measures the ability of the website in meeting users' needs and expectations.

- Interactivity: measures the interactivity of the site, whether users can include their own ideas to the website.

- Trust: it measures the effectiveness of the site in maintaining user privacy and level of information security.

- Response time: measures the time taken for actions and responses.

- Visual appeal: It measures the visual appearance of the website, layout and design etc.

- Innovativeness: The capability in providing innovative ideas, creativity and uniqueness of the site.

- Emotional Appeal: measures emotional impact on the user while using the website and the magnitude of involvement.

- Online completeness: measures the website's ability in completing a specific transaction.

- Consistent image: the website ought to have a consistent image in the user's mind set while being accordant to the image outlined by the firm.

These 12 dimensions are groped in to 5 categories as

1. Ease of use

2. Usefulness

3. Entertainment

4. Complementary relationship

5. Customer service

The WebQual instrument was made accessible in the internet with an instruction page which opens a different browser window containing the qualities that needed to be assessed. In order to rate

the performance of a specific website, the user has to rate it on a five point scale based on his perceptions.

Progressively, various versions of WebQual were developed. Though WebQual 1.0 was an effective tool in assessing information quality, it lacked elements of interaction quality. Interaction quality is inevitable as the quality of websites is dependent upon its effectiveness in interaction with the users. Hence, WebQual 2.0 was developed including the feature of interaction quality. Further advancements necessitated the development of WebQual 3.0 and 4.0 etc. These versions specifically concentrated on the following three quality dimensions. They are:

(1)   Information quality;

(2)   Interaction quality; and

(3)   Site design quality

WebQual was formed on the basis of method called Quality Function Deployment (QFD). This management tool can be used for evaluation of quality of a product, process or service according to the voice of the customers. Since appropriate quality judgment can only be provided by users, WebQual utilizes user responses for website evaluation. Its development intended to shape the customer perceptions about website quality (www.webqual.co.uk).

1.3.6.Total Quality Management

Total Quality Management (TQM) focuses on providing quality services as understood from customer's perspective and not that of management. Even though TQM is excessively utilized in Japan, the last twenty years has witnessed it being embraced and adopted by manufacturing and service industries of the United States. Contemplation of quality had always been a constraint for

information professionals, and TQM is yet to be widely implemented in libraries. The absence of an appropriate and transferable instrument for evaluating service quality from the user perspective has been the major hindrance in implementing TQM in libraries.

Since TQM is an emerging management technique, it is widely used in most of the disciplines and the Library and Information Science is no exception. In the late 1980's, TQM started to be applied in the service sector such as Library and Information Services (LIS) as an American reaction towards customer satisfaction by fulfilling requirements and expectations of users. The usage of TQM in library and information centres started recently in India. TQM is a customer-centric management system with its focus on constant increase in customer satisfaction at constantly lower costs. Although it is not a tool by itself, the tools and techniques of Statistical Process Control constitute an integral part of TQM exercises. TQM is a method of management that helps in improving the effectiveness, efficiency, flexibility and competitiveness by associatively urging everyone in the organization towards enhancing various ways through which things are done (Sherikar & Jange, 2006).

1.3.7. Benchmarking

Besides quality measurement in one's own institution, Benchmarking between academic libraries enables to assess performance. According to Roberts and Rowley (2004) Benchmarking constitutes the following:

• Frequent comparison of current performance with the standards;

• Identification of performance shortcomings with comparison to standards and competitors;

- Seeking out various methods that can accomplish performance improvements;

- Implementation of improvements;

- Observation of progress achieved through improvements and assessing the benefits. While comparing with others, one can appropriately perceive their operations and implement practices on one's own.

The opinions of certain experts were collected using research questionnaire in which some equivocal questions were rectified before utilizing factor analysis for general validity test.

1.4. Service Quality of Special Libraries

Special libraries are intended to serve particular kinds of users and focuses on a particular subject. Libraries of research and development institutes, government departments, directorates, bureaus, industrial and business undertakings, learned societies and professional associations, trade and business associations, hospitals and health services, social and welfare organisations, museums, national gallery of arts, medias, etc. can be categorized as special libraries. The collections and services of special libraries are devised in a way to facilitate the objective of the parent organization. The term "special libraries" covers library and information functions in a variety of settings, each of which indicates the type of service required and, increasingly, the mode of operation to conform to organizational standards and procedures (Webb, 1995).

According to J.E. Wright, the "Special Library" means a library which is concerned almost exclusively with the literature of a particular subject or group of subjects. Dr. S.R. Ranaganathan observed that "the difference between general library and special library lay only in

the nature of the clientele and the materials or the documents served". With the increase in the size and number of business and industrial organizations and government departments, special libraries also began to develop along with it. As a result of World Wars I and II, industrial, scientific and technological research and development activities are highly institutionalized and led to the development of special libraries (Pankaj Kumar Singh, 2015).

As these are libraries of specific nature, the term "special library" came in to existence in 1909, coined by John Cotton Dana, librarian of Newark Free Public Library. He discussed with 26 other librarians about a specific kind of library that had emerged in America and called it as "special library". The characteristics of special libraries are:

a. Parent Organization

Special libraries normally function under a parent organization. All the functions and services of special libraries are directed towards the achievement of the objectives of parent organization. Libraries of Government departments like ministries of labour, commerce, food and agriculture, law, parliament, libraries of Govt. research laboratories; national libraries with special materials, libraries of private business and industrial organizations, etc. are special libraries in nature.

b. Subject Scope

The subject coverage of special libraries depends on the nature of the parent organization. Thus special libraries have limited subject coverage. The collection includes those materials related to the objectives of the parent organization, which meet the current and prospective needs of the users. It supports the research and development activities of the institute. Therefore libraries strive to

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collect all the resources available in the respective areas of interest. The collections of special libraries may contain reports, reprints, patents, standards, official publications, photographs, trade literature, treatises, etc.

c. Reference/ Information Service

Special libraries are entrusted with the responsibility of providing particular and specialized information services to the users. As special libraries are specific in nature, the needs and expectations of the users are also specific. Therefore, libraries attempt to satisfy them by providing the required information precisely. Services like user based alert program, selective dissemination of information, newspaper clipping service etc will enable libraries to provide information on the specific areas. According to J K Khanna (1987) "the distinguished characteristics of the special library is to provide the right information to the right reader, at the right time, in the right amount and in the right form".

d. Clientele of Specialist

Special libraries provide services only to the clients who are engaged in the achievement of common objective of the parent organization. As they are busy with their work, they might lack time to hunt for the required information. They spend their whole time for the regular business of the parent organization. Therefore the special librarian is entrusted with the duty of finding out the required information to facilitate their work and present it to the concerned client. Whenever a query is raised before the special librarian, he conducts an extensive literature search and presents it in the form of an article, abstract, translation or whatever format required.

e. Small in Size

Compared to other libraries like university libraries, special libraries are small in size and its collections are meager. It contains only those

resources that support the objectives of the parent organization. Hence the collections are limited to specific subject only (Khanna 1987).

The main functions of the special libraries such as acquisition, cataloguing, classification, circulation, etc. and services like reference service, OPAC service, Xerox service, etc. are all similar to other libraries. Besides these, they also provide some specific services, such as indexing and abstracting services, bibliographical services, state of the art reports, newspaper clipping services, Current Awareness Service, Selective Dissemination of Information, etc.

Gosh and Wesley (2002) observed that the transition from library as a storehouse of books to an information centre changed their focus upon the information needs of the users in a multidisciplinary information environment that constantly provides value added and customized information services. Both the technological revolution and information revolution has increased the information demands of users.

The major function of special libraries is to assess the information needs of the users. Collection developments are done on the basis of such needs. Library identifies and acquires all relevant resources which are necessary to meet the information requirements of the users. In addition, it analyzes, evaluates and organizes contents of diverse information sources. By assessing the information needs of the users in different departments, special libraries frame policies to improve the resources and services, which in turn enhance the knowledge base of the organization. Special libraries develop collections covering all major areas of the parent institute's concerns, programmes and activities. According to Pankaj Kumar Singh (2015),

the collections of special library include three major components such as (1) published information (2) internally generated information (3) information available from sources, outside the organization. Published information includes the periodicals, textbooks, information collected through newspaper clippings, pamphlets, statistical compilations, sales literature, trade catalogues, financial statements, government documents, etc. The information generated within the organization consists of research reports, technical memoranda, laboratory notebooks, working papers, correspondence, house organs, newsletters, etc. Information acquired from external sources contains collections in public, academic and special libraries through inter-library loan and other procedures. Library bulletins are published by libraries at regular intervals for internal circulation. It contained details regarding newly added materials, journals, indexing of articles, bibliography on a specific subject, library circular, etc.

In order to provide quality services, a special library should have specialist librarians possessing the following qualities.

- Approachable and welcoming attitude

- Knowledge and skill to answer user's queries

- Competent enough to anticipate the changing needs of the users

- Emotional intelligence to deal with the specific problems of the users

- Impart proper training to the users for using various information products and services

- Knowledge regarding policy of digital resource access, licensing and implementation in order to negotiate with other information providers (Singh, 2006).

- Provide individual attention to user if needed

- Subject expertise

- Professionalism

Based on the profile of the user, special libraries provide customized information services to them, in their respective areas of interest. Personalised information services can be provided through information consolidation and repackaging. The current awareness service and selective dissemination of information service provides the user information about recent developments and current trends in their respective areas. SDI prepares separate user profile for this purpose.

Indexing and abstracting service is an important service provided by special libraries. The functions of special libraries also include literature search and translation services. They provide bibliographic information, statistical data, and source of information and referral service. It also includes creation of information products and promotion of the publications of parent organization. Special libraries serve as research assistant. It assists the researcher in search of information for the research activities. When the researcher is unable to find the required information, then the librarian can guide the user by providing details regarding the exact sources where the researcher can get the required information. The assistance is provided through telephone, email, by manuals or face to face.

In the context of rapid developments in Information and Communication Technology and increasing awareness among the

users regarding quality, libraries need to improve quality in its information and services. Lack of adequate financial resources and the rising cost of materials hinder libraries from providing quality services. As the libraries are forced to provide quality service within a limited budget, they have to provide more focus on customers' needs, performance measurement and develop strategies for regular improvements. The functions of special libraries vary on the basis of nature of the parent organization that fosters it. As there is an ongoing information explosion, it became important to evaluate the information available, which necessitated the librarian to have the skill to evaluate the relevance of the information. The librarian has to perform the most crucial role of making the resources accessible to the users as and when they are in need of it. Advancement in ICT has made the role of libraries more customer-centered and provides 24x7 access from anywhere in the world. Special library services are designed in such a way so as to become customer- sensitive and customer centered.

The services can be evaluated primarily on the basis of statistical data which makes the comparison with other libraries easier. Special libraries are providing highly individualized services tailored to the unique requirements of the users. Singh (2006) discussed about three paradigm shift in special libraries. They are; (1) transition from print to electronic media (2) lack of financial resources and rising demands for information. It resulted in emphasis on performance measurement, user's needs and requirements and continuous improvement (3) change in the working environment.

The emergence and growth of research institutions paved the way for the development of special libraries in India. Institutes like, Council of Scientific and Industrial Research (CSIR), Defence Research and Development Organization (DRDO), Indian Council of Agricultural

Research (ICAR), Indian Council of Medical Research (ICMR), R& D laboratories and other such organizations resulted in the development of special libraries in association with them for satisfying the highly specialized information needs of the clients (Singh 2006). New methods and practices are being applied for its development and improvement. As the information resources became costlier, special libraries started purchasing in groups, which extended their purchasing capacity and spread its access to a wide range of resources. Library networks and consortia also enable libraries to get huge amount of resources at reduced rates through collective bargaining with publishers. In addition, the subject gateway service helps special libraries to provide the required information regarding the concerned subject. It includes high quality resources on the specific subject. Digital technology is being applied in special library for preservation of rare and valuable documents such as the cultural heritage resources of the country, that can't be preserved in traditional methods. Digitization enabled wide access to such rare and limited resources. Besides these, through digitization, resources can be shared economically among the other libraries. Special libraries need to practice marketing techniques for giving adequate publicity for information products and services. As the information is scattered, consolidation and repackaging of information is essential to satisfy the specific needs of the users. The library professional has to analyse, evaluate and synthesize the available information and then repackage it in required format to meet the information needs of the users. Outsourcing is another trend followed in special libraries. Libraries are outsourcing some of their work such as cataloging, classification, stock taking, bibliography compilation, library automation, etc. to other external agencies on contract basis. It helps in saving manpower and valuable time. Knowledge management practices are maintained by special

libraries by developing a database of expertise, as it contains biographical and subject based information of employees. Through which the tacit and explicit knowledge of the organization can make use of the benefit of the organization. It helps in building up the intellectual capital of the organization. Special library follows a participative management approach, in which all employees have a chance to participate in all of its activities. It enhances their experiences and enables them to learn lessons from the mistakes and amend themselves. Better performances of the employee will better the services provided (Singh, 2006).

1.5. Need and Significance of the Study

The technological breakthrough in information and communication has resulted in a shape-shifting and transformation of libraries. The information demands became greatly specialized along with the increase in research and development activities, ever since the introduction of Information and Communication Technology (ICT). Special libraries fulfill all the knowledge requirements of the parent institution and acts as a centre for its research and development activities. The availability of resources and quality of the provided services determines the success of such libraries. To provide quality services, the ever changing needs of the customers have to be identified initially. The quality of services and collections of libraries has a direct effect on the reputation of the parent institution and its research and developmental activities; therefore the institution has to ensure that the information and services provided are of great quality. To provide quality services, appropriate allocation and usage of the physical, financial and human resources of libraries are necessary. The study of service quality of special libraries has a great significance as it offers insight to the parent organization regarding

the service quality of libraries and the level of improvement needed to attain the institutional targets.

The services provided by libraries should serve as a guide to its customers. The five laws of Library Science by S R Ranganathan, especially the fourth law, "Save the time of the user" entail the importance of service quality in libraries (Manjunatha and Shivalingaiah, 2004; Ranganathan, 1988). The law emphasize that library should provide the required service to the user without any delay. In order to ensure quality services to the users the staffs should be adequately and appropriately trained according to the recent trends and changes. Libraries should conduct training programmes, workshops, seminars and other human resource development activities, so that the staffs can keep track of the advancements in technology and services in library and information science. The analysis of customer perspectives, that is the things they need, how they need and when they need is the key in providing quality services. Frequently enquiring the users regarding the resources and services of libraries and obtaining a feedback are the easiest way to measure quality of libraries. Frequent quality evaluation with the use of standardized tools of measurement and evaluation directs attention to the problems faced by libraries that hinders quality services. The service quality assessment identifies problems within various sections of special libraries. Thus, the study gains importance as it helps to identify and improve the quality of services provided by special libraries in Kerala.

Service quality measurement enables assessment of service quality gap in libraries and helps to improve the existing service while introducing new and innovative services based on the needs and expectations of the users. It dispenses reviews and feedback of each services provided by the libraries. Service quality evaluation

identifies the problems faced by users while utilizing a service and provides them with immediate solution. It assesses whether the services provided by the library meet the expectations of the users or not.

The librarian should have a reasonable learning of the present and future needs of the users, so that the special libraries can capacitate to support the goals and objectives of the organization. This requires understanding the structure of the organization, its purpose and connections between each individual unit. With a specific end goal to achieve the target, there must be an appraisal of quality of the services offered by such libraries. Standardized tool and techniques has to be developed, in order to measure quality of services.

Service quality assessment establishes a quality culture in libraries and thereby ensures quality in every section and service of the libraries. The study is an attempt to assess the quality of physical facilities, library collection, library staff, technical process and library services from the user's perspective and thereby identifying the best practices to enhance quality. Therefore, the study can helps to improve the quality of special libraries in Kerala. Even though there have been numerous studies carried out regarding the service quality of academic libraries, only few focused on the service quality of special libraries as a niche user group. The study attempts to address the service quality of special libraries in Kerala and to examine the current state of library assessment as well as to provide an initiative for quality enhancement of all libraries.

1.6. Special Libraries in Kerala

Special libraries in Kerala are witnessing a gradual growth. Since being the most literate state in India, Kerala has a vast number of special libraries connected to numerous research institutions,

industries and departments. The libraries have their own role in the accelerated progression of the research and development activities of Scientific and Technical institutes, Social Science institutes, industrial and commercial establishments in Kerala. While comparing with other libraries, special libraries are adopting advanced technologies and providing number of services to its users.

The implementation of library automation, development of digital libraries and application of innovative Information and Communication Technologies have seen a monumental increase since it rendered an improved user satisfaction, cost effectiveness, rapid responses, and easier operational procedures. The ICT and electronic information resources and services are being utilized by special libraries for fulfilling the various information requirements of users. E-journals, databases, e-books, web-based resources, and the divergent online services provided by the libraries have resulted in the paradigm shift of libraries.

In a study about the application of ICT in special libraries in Kerala, Haneefa (2007) reported that even though the libraries had hardware, software and communication facilities to an extent, the services provided never reached up to the user expectations. The study indicated that majority of the libraries were obstructed by budgetary constraints, lack of infrastructure and shortage of skilled professionals to set about on complete automation of library management activities and application of ICT. The automation process has gradually gained traction among the special libraries and most of them were able to partially automate their house keeping operations.

The preceding, concise description summarizing the existing diversity among special libraries has been furnished so as to provide a bird-

eye-view of the following representation regarding different references and information's that special libraries might provide to its collective clients in its service. Such services are classified under the subsequent topical headings: Information Services, Bibliographic Services, Online Search Services, Document Delivery Services, Indexing Services, Abstracting Services, Publishing and Alerting Services, Translation Services, Clipping Services, and Records Management and Archival Functions

There are 66 special libraries functioning under central and state government institutes in Kerala, of which the selected 19 special libraries are discussed below.

1.6.1. Centre for Development Studies (CDS) Library

CDS is a pioneer self-governing institution known for its advanced research in applied economics and topics related to socio-economic development, pedagogy and its rigorous training programmes. The library was set up by legendary economist late Professor K.N. Raj in 1971. The CDS library is elaborate and serves as one of the biggest sources of knowledge in India as it contains over 150000 titles in economics and related disciplines. The faculty strength of the library comes to about 20. Since its formation, CDS has given great priority in establishing an extensive library in Social Science and it enabled it to become a paramount Social Science research and reference library in the country with an abundant collection of books, journals, publications of other research institutes (national and international) and government publications. The library has over one hundred and fifty thousand titles in various fields such as Development Studies, Economics, Sociology, Demography, Statistics, History, Political Science and other allied subjects. The library also subscribes to around 230 journals currently. The library receives about 120 journals as gifts and compliments. The exchange programme

practiced by the library enables it to receive various publications from a number of national and international organisations, and also helps in receiving working papers of over 60 organisations.

The CDS library was renamed as K N Raj Library with effect from July 9, 2010 in remembrance of its founder Professor K.N. Raj. (http://www.cds.edu/).

1.6.2. Central Marine Fisheries Research Institute (CMFRI) Library

The CMFRI is one of the foremost tropical marine fisheries research institute in the world. It was established under the Ministry of Agriculture and Farmers Welfare of the Government of India in 1947. Later in 1967, CMFRI joined the ICAR family.

At the headquarters in Kochi is one among the vast libraries in the field of fisheries and marine science. The athenaeum in the headquarters has over 60,000 books and periodicals and over 400 scientific journals. The library subscribes to over 70 national and international print journals along with 82 online journals which can be accessed through internet from the headquarters and regional research centers. The digital library contains considerably huge resources including videos and data. The users can easily access the contents of the digital library from their desktops as they are all connected to the database in headquarters and research centers through intranet. The library provides computerised search alongside the electronic check in and checkout facility. CMFRI also has rare and old publications in marine science and fisheries preserved at Mandapam Regional Centre Library (http://www.cmfri.org.in/).

1.6.3.Central Tuber Crops Research Institute (CTCRI) Library

CTCRI was established in 1963 with its headquarters situated in Thiruvananthapuram. This integral institute comes under the ICAR family. CTCRI is the only research institute in the world which is completely focused on the research of tuber crops. The international acclaim it has received over the years has shaped CTCRI in to a premiere institute.

CTCRI library has the duty of providing information support for the Institute's research programs. The library contains about 17400 volumes of books and a vast collection of over 3500 reprints (hard copy) and 2000 e-reprints with a majority of them covering tuber crops. It also has technical publications and annual reports from other universities and agricultural institutions along with many theses submitted to various universities. The library currently has a subscription of about 42 journals. The library collection is mainly focused on agriculture and allied areas with its primary attention on tuber crops. It also covers various other areas including Agriculture, Agricultural extension, Computer Science, Field Crops, Genetics, Plant Breeding, Tissue culture, Soils and fertilizers, Plant physiology, Plant pathology, Entomology, Pest control, Crop production, Biotechnology and crop utilization etc. Apart from all the general library services the CTCRI library also provides digital services and the entire library catalogue can be accessed online (http://www.ctcri.org/).

1.6.4.Centre for Water Resource Development and Management (CWRDM) Library

The Centre for Water Resources Development and Management was established in 1978 as a self-governing research organisation by the Government of Kerala, under its Science and Technology policy soon after identifying the necessity for R& D in water management.

Through the years CWRDM has shaped itself in to a premier R& D institution in the field of water sector. In its Silver Jubilee Year of 2003, the centre was merged with the Kerala State Council for Science, Technology and Environment (KSCSTE). Its contribution to scientific hydrologic studies and water management is unparallel.

CWRDM library consists of a commendable collection of publications that concentrates on water resources and its allied disciplines. It houses around 10500 books and 60 periodicals currently. It also has various CWRDM publications and reports along with 4200 back volumes and 3400 reprints. The general services provided by the library include lending, reference, bibliographic news clipping and photocopying services. The trainees, researchers and students from other institutions are also offered services such as reference and photocopying. The library brings out topical bibliographies, and until now around 25 such bibliographies have been prepared. It also has the practice of annually publishing news clipping index (http://www.cwrdm.org/).

1.6.5. Kerala Forest Research Institute (KFRI) Library

KFRI was founded in 1975 and since existence it has considerably contributed to research in tropical forestry and conservation of biodiversity. In 2002 Kerala State Council for Science, Technology and Environment was constituted and KFRI became an integral part of it. The institute consists of a group of experts from several academic disciplines carrying out research on tropical forests and forestry. This institute provides scientific support for decision making on all matters related to forestry with prime importance given to conservation, sustainable utilization and scientific management of natural resources.

KFRI library serves as a comprehensive resource centre on tropical forestry and has special repository of literature on teak, bamboo and rattan. The library also functions as the national level Bamboo Information Centre. The published documents and information on bamboo species are amalgamated and presented in diverse forms to the public. KFRI library caters to the knowledge requirements of scientists and research scholars of the Institute and also to all those who are interested with its collection of about 17,000 books and 10,000 back volumes of journals on forestry and allied subjects. The library archives dated from 1939 is available to access for the scientists and research scholars. An extensive collection of national and international journals on forestry and allied subjects can also be accessed online. The digital collection also contains research reports, scientific papers and other documents published by KFRI scientists. The library has access to CAB's (Centre for Agricultural and Bioscience International) bibliographic database and CAB Abstracts. The Bibliographic database looks through various important subjects such as agriculture, environment and forestry. Now CAB Full Text is provided with CAB Abstracts and it directly hands out access to more than 400,000 journal articles, conference papers and reports. The majority of information provided by CAB Abstracts cannot be found elsewhere. The EBSCO database of Environment Complete is available for online access. It consists of about 4 million records from more than 2,200 national and international titles with some dating back to more than 100 years as well as about 190 monographs. The open source integrated library management software KOHA was used to aid in online cataloguing of book and back volume collections. It is also possible to search and download the collection of libraries e-books, e-prints, Indian Forest Records, bulletins and literatures on bamboo teak and cane. DSpace is used to organize and maintain the digital resources of the library and it can be accessed through

desktops by the scientists and research scholars. The library also maintains a treasured collection of valuable reference books, doctoral theses and publications of various national and international bodies like Forest Research Institute (FRI), APAFRI, IRGWP, IUCN and IUFRO (http://www.kfri.res.in/).

1.6.6. Kerala State Council for Science, Technology and Environment (KSCSTE) Library

KSCSTE was formed in accordance with the Science Policy of Government of India by reconstituting the former State Committee for Science, Technology and Environment. It was constituted in November 2002 as a self-governing body with its headquarters in Thiruvananthapuram. The primary purpose of the institute is to promote and develop all activities related to Science and Technology. The council prepares various strategies of development through scientific research and innovations.

The KSCSTE library acts as a branch of the Information Systems Division and is sufficiently equipped to satisfy all the professional research and reference needs of the institution. A good collection of books and journals on subjects related to Science, Technology and Environment are readily available in the library. The library has a collection of 5000 books. It also houses various project reports, study reports and project proposals from various departments collected through the years. The publications of the council and other R& D Centres are also stored in the library. It has a subscription to about 56 scientific journals, 11 newspapers and 17 magazines for general reading. The support for documentation of reports and other publications of KSCSTE is provided by the in-house documentation centre with reprographic facilities. The programmes and activities of KSCSTE are supported by the library by providing much needed information and documentation support. The entire digital collection

of the library is made available to the academic community free of cost. The library is not just limited to the staff members of KSCSTE but is also open to scientists and researchers of other institutions and universities and to all lay people for reference.

KSCSTE has started a library named **Sasthra Vigyan Kendra** limited to undergraduate level students with a modest collection of about 250 books (http://www.kscste.kerala.gov.in/).

1.6.7.Kerala State Planning Board (KSPB) Library

The Government of Kerala formed KSPB as an advisory board. The KSPB was initially formulated with Chief Minister as Chairman in the year 1967. The Board came in to existence with a perspective to empower the State Government to frame developmental plans scientifically while considering together the resources of the state and its growth priorities. The board also has the duty of annually preparing a comprehensive economic review report of the state. The term of the board is five years as per the term of the ruling government and since its inception; the Board has been reconstituted 15 times. The prowess of the board ensures good planning and better implementation of developmental schemes in the state.

The KSPB library is one among the significant research and reference library in the areas of development studies, gender studies, industry and general economics. The library aims to ease the process of creating new knowledge through acquisition, organization and dispersion of knowledge resources and providing value added services. It houses more than 20000 books and 3000 government publications. The library subscribes to about 45 journals and has 500 bound volumes in its collection. The function of the library is to collect, develop, organise and preserve books, journals, reports and

e-resources on all subject areas related to planning and development. From the computerised database the library also prepares bibliographies on specific subjects. The library is well equipped with modern amenities and efficiently serves its users (http://spb.kerala.gov.in).

1.6.8.Rubber Research Institute of India (RRI) Library

RRI was constituted under the Rubber Act of 1947 by the Government of India. This statutory body was formulated for the overall development of the rubber industry in the nation. RRI aims to boost the rubber industry by aiding and encouraging the scientific and technological research. Various studies are being carried out by the institute for the effective marketing of rubber by collecting information from estate owners, dealers and manufacturers. It also regulates the import and export of rubber and controls the prices and availability by advising the Government. The institute also provides technical advice to the rubber planters. It is also responsible of preparing and submitting reports regarding rubber industry whenever required by the Government.

The institute's library is a leading research and reference library. The library aims to facilitate creation of new knowledge through acquisition, organization and dissemination of knowledge resources and providing value added services. It houses more than 23000 books and 23795 in bound volumes. The library subscribes to more than 156 journals both national and international. General services provided by the library include Press-clipping service, SDI service, CD-ROM literature search service, Reprographic service and many other specialized services. (http://rubberboard.org.in/rubberresearchinstitute.asp).

1.6.9. National Institute of Oceanography (NIO) Library

CSIR-NIO was established in 1966 with its headquarters in Goa soon after the International Indian Ocean Expedition (IIOE) conducted in 1960s. The institute is a premier multidisciplinary oceanographic research institute of international acclaim and reputation. The research conducted had its major focus on assimilating the unusual characteristics of the Indian Ocean and the results were published in more than 5000 research articles.

From the mid 90's the NIO library has been accepted as the National Information Centre for Marine Sciences (NICMAS). Apart from serving the needs of the users from the institute, it is also dedicated to serve the seekers of marine information within and outside India. The library contains 7000 books and also has a collection of 50 theses and dissertations. The operations and activities of the library have been mostly computerised with the help of ISIS based software at the backend. The institutional staff can access the digital library repository through the Intranet library server. Every year the database of abstracts on Indian Ocean literature is compiled and updated. The database contains over 34000 records and all information listed in the database is available in the library. The information and facilities that can be accessed in the library are primarily meant for the users outside the institute (http://www.nio.org/index/option/com_subcategory/task/show/titl e/NIO%20at%20a%20Glance/tid/1/sid/117/thid/118).

1.6.10. National Institute for Interdisciplinary Science and Technology (NIIST) Library

NIIST was established in 1975 as a part of CSIR and was named as the Regional Research Laboratory in 1978 and was later renamed as NIIST in 2007. The aim of the Institute is to conduct world class research and development activities in areas related to effective

utilization of resources of the region and this service is of utmost relevance to the country. The institute has established an advanced facility which is currently being used for R& D programmes in various areas related to Agro-processing, Chemical Sciences, Materials Science and Technology, Biotechnology, Process Engineering and Environmental Technology. Over 252 Ph.D. degrees have been awarded to students based on the research conducted in the institute and the institute thereby plays a major role in Human Resource Development through training.

The NIIST library is known as Knowledge Resource Centre. It fuels and powers the research and development activities of NIIST through its various services. The library has a significant amount of collection of books, journals and back volumes. Specialised collection of documents is maintained in the library. KRC facilitates the access to electronic journals and databases of major publishers and offers value added information services. It also provides IT backup and support to the scientific community. KRC provides the essential IT services to the institute by handling planning, installation, operation, enhancement and maintenance of IT infrastructure of the laboratory (http://www.niist.res.in/english/).

1.6.11. National Centre for Earth Science Studies (NCESS) Library

NCESS was formed as a self-governing research centre in 1978 with its headquarters in Thiruvananthapuram. It is one among the earliest institutes in India to accept Earth System Science concept and studies problems related to land, sea and atmosphere. NCESS was constituted with a view to initiate and promote modern scientific and technological R& D studies in the field of Earth Sciences. Since inception it has contributed significantly in improving the knowledge about the geological origin and evolution of the region and thereby

helping the prediction and assessment of natural hazards and suggesting precautionary measures. Research courses that lead to doctoral degree are conducted by the institute along with field surveys and laboratory researches of academic and economic importance to the discipline of earth science. Studies conducted by the institute in other fields include river basin evaluation, ground water management, coastal erosion, natural disaster management and mitigations and other special problems.

The NCESS library plays a major role in the R& D programmes of the centre with its systematic and organised collection. The library has about 5663 books and 1833 back volumes. It also subscribes to more than 40 national and international journals. The library is also receiving few journals free of charge. It also maintains a healthy collection of various technical reports prepared by the scientific fraternity. The collection includes reprints of articles published by CESS scientists. The library receives bulletins and newsletters in related fields and from various Government bodies. Full text articles of e- journals can be accessed from the library. The digitization process of the entire library collection is still under progress (http://www.ncess.gov.in/).

1.6.12. Marine Products Export Development Authority (MPEDA) Library

The MPEDA was formulated by a Parliament act in 1972 by amalgamating the former Marine Products Export Promotion Council established by the Government of India. The headquarters of MPEDA is located in Kochi. MPEDA is given the directive by the government to promote the marine products industry with special consideration to exports from the country. The Act entitles MPEDA to regulate exports and take needed steps to ensure continuous quality seafood exports from the country. MPEDA has all the authority to make

decisions in every matter regarding the protection of seafood export in the country. It also has the power to carry out inspection of marine products and its raw materials and to fix standards. The trade information details are collected and circulated for the growth of the sector. The library brings out a monthly journal named *Indian Sea foods* which is mailed as a compliment to seafood buyers engaged in overseas trade missions. The centre also has published directories of exporters and importers. A fortnightly seafood newsletter is prepared and circulated only among the persons and organisations in the country. The library has a collection of about 8000 books and 272 periodicals. The reports and back volumes in the library would number around 300 each. The library also has a vast collection of market study reports, seminar proceedings and extension literature (http://mpeda.gov.in/MPEDA/#).

1.6.13. Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) Library

JNTBGRI was established as an autonomous R& D institution in the year 1979. It was formed with the objective of setting up a Conservatory Botanical Garden of tropical plant resources in Kerala. JNTBGRI also conducts surveys of the economic plant wealth of Kerala in-order to conserve and preserve the tropical plants of Kerala and for the sustained utilization of plant wealth. The institute library is one among the best specialised libraries in botany and allied science and it plays a significant role in assisting research by providing accurate and timely information. The mission of the library is to build a vast collection of necessary information materials and disperse it in time. With its wide collection, the library serves the needs of researchers from other institutions as well as students from other universities. The library has a collection of about 6561 books and 3546 bound volumes. It has a subscription of about 95 journals

both national and international. It also has 899 scientific reports and a collection of 1048 reprints.

The entire operation and services of the library is automated. The services can be accessed through LAN in the desktops. The library's digital collection contains scientific papers, annual reports, index to journal articles and various classic books in botany. The library database is updated every day with details of recently acquired books and journals. A desktop is provided in the library for its members to browse the internet. (http://www.jntbgri.res.in/).

1.6.14. Fluid Control Research Institute (FCRI) Library

FCRI is an independent organisation which is registered under the societies act and comes under the category of Heavy Industries & Public Enterprises. The institute was established in 1989 with techno commercial inputs from United Nations Development programme (UNDP). FCRI has grown in to a premier centre of excellence with international repute in flow measurement and control with one of the best Research and Calibration laboratory that rivals similar international establishments. The institute provides the flow products industry a basic structure for their technological development. It also serves as a national certifying authority and a high quality calibration laboratory. FCRI library also serves as a documentation centre and is updated and upgraded regularly in order to cater to the reference requirements of the scientists and researchers of the institute. The library houses a substantial amount of books and journals from the flow products industry. It houses more than 12000 books and has a huge collection of 2000 conference proceedings. The centre also has a collection of videos which provides deep insight on areas of flow measurement, its control and flow products manufactured by various industries. The

centre also has all relevant national and international standards for reference. The library has about 8000 standards for reference purposes. A large number of industries access the available literature in flow measurement for their reference requirements. FCRI has been publishing flow meter/valve abstracts journals thrice in a year since 1992. The library also prepares a periodically maintained directory of flow meter manufacturing organisations detailing the type, range and their relative accuracy. The directory is accessed by many as a useful tool for selecting suppliers of particular flow meter. The documentation centre provides photocopies of all the available documents to its users (http://www.fcriindia.com/about-fcri/).

1.6.15.   Coconut Development Board (CDB) Library

The CDB came in to existence in 1981 as a statutory body under the Ministry of Agriculture, Government of India. The institution, with its headquarters in Kochi aims in boosting coconut production and its utilization in the country with its focus on increasing productivity and product diversification. The CDB also has the function recommending the government about regulating the import and export of coconut and its products. The role of marketing coconut and its products is efficiently carried out by CDB with effective intervention in the market. The grades, specifications and standards of the coconut are fixed by the CDB. The CDB is responsible in providing technical advice to those engaged in coconut cultivation and its industry. The CDB library has a collection of wide variety of books and journals which helps in the scientific research requirements of the institute. It contains 6602 books and 220 current periodicals. The collection also includes a good number of videos in CDs and DVDs. The statistics of coconut and its products are collected periodically and published. The general services provided by the library include lending services, inter-library loan,

reference services, current awareness service and reprographic services (http://coconutboard.nic.in/).

1.6.16.   Central Institute of Fisheries Technology (CIFT) Library

CIFT was setup in 1957 as a self-governing body that concentrates in research related to fishing and fish processing, with its headquarters situated in Kochi. CIFT is considered to be the only national center that facilitates research in all disciplines related to fishing and fish processing. CIFT is capable of handling the entire range of harvest and post-harvest technology. The institute also helps in Human Resource Development through training, education, and extension.

The institute library has a good collection of books and bound volumes of scientific journals. It contains a vast collection of books that comes around 12558 in number. The institutional repository of CIFT collects and preserves institutional publications such as journal articles, conference proceedings, research papers, technical reports and theses. The library has access to more than 2500 journals and 1174 e-books. The library portal also provides links to e-resources including open access resources and e-repository that was developed in house. The digitized CIFT publications can also be accessed from the National Digital Library of India. Digital library resources are restricted to the CIFT community only. The library also prepares newsletter in every quarter (http://www.cift.res.in/).

1.6.17.   Spices Board Library

The spices board was formed for the development and worldwide promotion of Indian spices. It was constituted in 1987 under the Spices Board Act by merging former Cardamom Board and Spices Export Promotion Council. The Spices Board is responsible for the

export promotion of spices and cardamom. The Board considers hygiene and quality as a mandate for the development and promotional strategies.

The library is well equipped with a good collection of books and periodicals along with bibliographic database. The library maintains a collection of books around 5000 including periodicals and documents. New books and publications are regularly added to the library and information center. Reference facilities and guidelines are offered to students and research scholars of various universities. The library documents can be easily accessed through the Online Public Access Catalogue (OPAC) facility. Koha library management software has been installed with barcode scanning facility (http://www.indianspices.com/).

1.6.18.   Central Plantation Crops Research Institute (CPCRI) Library

The institute was initially formed as Coconut Research station in 1916 by the Madras government and later in 1948 the Indian central committee assumed control over it. In1970 it was transformed in to Central Plantation Crops Research Institute under the ICAR family as an agricultural research institute in the National Agricultural Research System (NARS). It was established for the research of coconut, areca nut and cocoa. Upon establishment, the Institute also conducted research on cashew, oil palm and spices until they were constituted as separate institutes. The research programmes are organized under five divisions, which are crop improvement, crop production, physiology, Bio chemistry and post-harvest technology. It also functions as a national forum for plantation crops by performing research on the various properties of these crops in order to produce genetically superior crops.

CPCRI has started creating databases on biotechnological aspects of coconut, cocoa and areca nut. The library of CPCRI always had a significant number of books and journals so that it can deliver to the reference requirements of its users. It houses 10000 books and more than 13000 back volume journals in its collection. The library has a rich collection of literature regarding the plantation crops. A librarian was posted in charge in 1958 soon after transferring the books and publications available in Quilon during the project investigating different diseases of coconut. The CPCRI library have also received books from former CCRS. From the year 1960 the institute library grew substantially (http://www.cpcri.gov.in/).

1.6.19. Vikram Sarabhai Space Centre (VSSC) Library

VSSC comes under the Indian Space Research Organization functioning under the Department of Space. It was formed in 1963 and is located in Thiruvananthapuram. VSSC is one of the main research and development establishments of ISRO. The center was named in the fond memory of Dr. Vikram Sarabhai who is the father of Indian space mission. VSSC heads the rocket research and launch vehicles project of the ISRO.

The VSSC library had a modest beginning with just 1000 documents and a small reading room. Now it is one among the advanced technical libraries in India with resources covering all areas of space science and technology. It provides information and reference to the scientific and technical personals of various institutions under ISRO. The library maintains a well-balanced collection with its thrust on quality. The library has an enormous collection of about 71000 books and 56000 back volume journals. It also has more than 3000 CD'S and DVD's containing videos and data for detailed reference. The VSSC library has one of the largest collections of standards as it

houses more than 15000 of them. The progressive segregation policy adopted enables in keeping the collection current and updated. The library collection has been steadily increasing in the recent years. The OPAC facility in the library even enables online access to the library resources from other ISRO centers. The library also has supporting facilities such as reprography, binding, audio-visual and conference facilities (http://vssc.gov.in/VSSC_V4/index.php/about-isro/genesis).

1.7. Statement of the Problem

Since the primary objective of every library is quality service, libraries endeavor in providing its services and products at the highest quality based on the needs and expectation of the users. In order to achieve the highest quality, a service has to meet all expectations of the users. Since special libraries mainly focus on research and development activities, it requires timely provision of accurate and reliable information. Due to the specific nature of special libraries, such as specialized collection, special users and specific objective, service quality measurement in special libraries need distinctive attention. The libraries should be able to provide up-to-date and authoritative information and its failure can negatively affect the objectives of the parent organization. The service quality measurement ensures reliability and accuracy of the information and thereby enables the libraries to avoid incomplete and inaccurate information which can mislead the parent institution and the researches altogether.

The service quality measurement of libraries is not confined to circulation of books, but it certainly takes into consideration other aspects of library such as staff, technical process, physical facilities, collections and services. The failure of any of these aspect would

adversely affect the overall service quality of the library. As the libraries exist in a physical form, its building, location and all other infrastructural facilities are very crucial in determining the service quality of a library. Inadequate physical facilities like furniture, lighting and space will create an uncomfortable environment for the users.

Since special libraries need definitive collections to meet the requirements of the parent organization, failure to maintain such an adequate collection, will obstruct the service quality of the library. The behavior and attitude of library staff also has an imperative role in the service quality of the libraries. The library staff has to attend to the queries politely and in a timely fashion so that the users will not have to face any unnecessary delays in getting their requirements served. One of the major constraints to quality service is the shortage of knowledgeable staff. The technical process is also an important aspect that can have a positive or negative impact on the quality of library system. Inappropriate cataloging and classification of books will make it strenuous for the users to find the required data. A methodical and organized approach towards the library services will bring an outlay towards the point of convergence of academics and focus on comprehensive development of users. Being qualitatively weak in providing certain services can generate negative perceptions among the users regarding other services provided by the same library. This probability of being branded poor in service necessitates quality service to be absolute.

Since huge amounts are spent by the parent organization, quality services are expected and thereby it has to fulfill the needful organizational objectives. The fund allocation for libraries is often questioned by the authorities regarding its worthiness. Instead of using it for developmental activities, the librarians are asked for its

effective utilization on libraries. Along these lines, it is necessary to assess whether the services are adequate to meet the expectations of users.

Ever since the introduction of internet, visit and use of libraries and dependency upon libraries for information witness a gradual decline. Despite of providing diversified services, most of the users neglect them. The reason for this hesitation of individuals towards libraries has to be analyzed in detail. The users are generally unaware of their resources of interest, amenities and services provided to them. Even though the frequency of library visits has seen a decline, interest for information over particular topics has increased.

If special libraries are inefficient in understanding user expectations, they will be incapable of providing information and services according to user expectations. In order to determine the service quality of libraries, the gap between expectations and perceptions of various service quality aspects has to be assessed. Hence it is essential to evaluate if the services will be able to meet user expectations. The study aims upon measuring the service quality of special libraries of Central Government and State Government institutes and providing suggestive measures for enhancing their quality. The assessment of service quality delivers an imperative input to libraries so as to evaluate and enhance the services given to the customers. Thus, service quality of special libraries in Kerala and how the quality assessment is being implemented or developed becomes an important question as pointed out above. A good overview of service quality measurement of special libraries in Kerala is yet to be produced. Hence, the study is entitled as **Service Quality of Special Libraries in Kerala.**

1.8.   Definition of Key Terms

The key terms in the title of the study are defined and detailed in the following subsections.

1.8.1. Service Quality

Service quality is delivering the service according to user expectations. It is a comparison of expectations regarding a service with their actual perceptions. Business Dictionary defines service quality as "an assessment of how well a delivered service conforms to the client's expectations. Service business operators often assess the service quality provided to their customers in order to improve their service, to quickly identify problems, and to better assess client satisfaction" (Service quality, 2017).

Parasuraman et al. (1988) defined service quality as "the global evaluation or attitude of overall excellence of services". Nitecki (1996) defined service quality in terms of "meeting or exceeding customer expectations, or as the difference between customer perceptions and expectations of service". Lewis and Booms (1983) defined it as "a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis". According to Calvert and Hernon (1997) service quality is defined in terms of reducing the gap between user expectations and actual service provided.

In the study concerned, service quality is the quality of library services provided by the special libraries in Kerala. It is the gap between user's expectations and their actual perceptions about library services. Users always have higher expectations and libraries strive to provide maximum quality services to users. The study attempts to examine whether special libraries are able to meet user

expectations and also to find out the discrepancies between users expectations and perceptions of library services.

1.8.2. Special Libraries

According to Singh (2006) "libraries may be "special" on account of a specific subject (e.g. Law, Medicine and Agriculture), form of collection (maps, pictures and digital documents), function (e.g. R& D related), institutional affiliation (e.g. government, business houses and hospital) and class of users (e.g. the blind, children and lawyers)".

"Special libraries are libraries that have one or more of the following attributes: a focus on specialized information resources, usually of a limited subject scope; a focus on a specialized and limited clientele; and the delivery of specialized services to that clientele" (Mount, 1983). The International Federation of Library Associations and Institutions (IFLA) (2007) states that "the division of special libraries is characterized by libraries with specific kinds of service functions and subject specialties. These libraries vary in size but all provide specialized services to their clientele". According to Encyclopedia of Library and Information Science (2010), "special libraries include medical libraries, law libraries, corporate libraries, libraries in legislative and executive agencies of government, music libraries, art libraries, engineering libraries and libraries of trade and professional associations, to name a few. Many specialized libraries in institutions of higher education are also considered special libraries" (Special Library, 2010). Special library is defined as "Libraries consisting of materials on a specialized topic (e.g., music libraries) or in a non-print form (e.g., film libraries), or serving a specialized clientele (e.g., corporate, non-profit, or government-agency libraries)"(Special library, 2017).

Being different from other libraries, special libraries address a specialized group of users, their needs and expectations are also different. Therefore, special library services should be channelized in such a way that it caters to the achievement of parent organization objectives. Special libraries in Kerala under Central and State Government institutes are specifically chosen for study. It includes Libraries under ICAR, CSIR, ISRO, Ministry of Commerce and Industry, public Sector Organisations, Research Institute, KSCSTE and government departments.

1.9.   Objectives of the Study

The main aim of the study is to investigate the quality of services offered by the special libraries in Kerala. The variety of needs and requirements of users are satisfied only through quality services. The following are the specific objectives of the study.

1.   To assess the user expectations of the services of special libraries

2.   To assess the user perceptions of the services provided by the special libraries

3.   To measure the service quality of the special libraries

4.   To analyse the gender differences in the perceived service quality of the special libraries

5.   To compare the service quality of the special libraries

1.10. Hypotheses

On the basis of the above objectives the following hypotheses are formulated.

1. The special libraries in Kerala meet the quality expectations of their users.

2. There is no significant gender difference in the perceived service quality of the special libraries in Kerala.

3. There is no significant difference in the perceived service quality of the special libraries belonging to State Government and Central Government institutes.

4. There is a significant institute wise difference in the perceived service quality of the special libraries in Kerala.

1.11. Scope and Limitations of the Study

The study focuses on service quality of special libraries in Kerala. There are about one hundred special libraries in Kerala but the study confined to 22 special libraries which come under the central and state government institutes. But three libraries have not granted permission for data collection. Hence data was collected from 19 libraries. Though abundant studies were conducted on the service quality of libraries, there have been no studies that specifically focus on service quality of special libraries in Kerala. Hence the study aids the special libraries in assessing the quality of the services, in analysing the expectations and perceptions of users and improving the services.

The study used modified SERVQUAL questionnaire for measuring the quality of services. The investigator attempts to assess service quality of libraries against five quality dimensions namely, physical facility, library collection, library staff, technical process and library service. As the instrument contains expectation and perception part, the questionnaire tends to be lengthy, and may have chances for some of the respondents to hesitate to fill it or carelessly fill it with

inaccurate and incomplete information. As the study primarily focused on the expectations and perceptions of the users of the special libraries, it is necessary for the respondents to give an exact picture of their expectations and perceptions by providing correct answers to the questions raised by the investigator.

The study selects three variables as independent. They are; special libraries of Kerala, gender and type of management. Dependent variables used in the study are user's expectation on library services, perceptions of users on library services, quality of physical facility, quality of library collection, quality of library staff, quality of technical process and quality of library service. Users of the special libraries are limited but highly specialized. Therefore they are always indifferent to such surveys. Special libraries provide membership to external users also, who conduct research in the same area. The study has taken into account only the active internal users of the special libraries during the period of investigation as the sample. The views of the librarian regarding the service quality of the libraries are also taken in to account but it did not include the perceptions and thoughts of other library staff. The study measures only the service quality and does not make any effort to evaluate the user satisfaction.

1.12. Organization of the Thesis

The thesis is organized into five chapters. It includes introduction, review of literature, research methodology, analysis and interpretations, findings, suggestions and conclusions. Appendices and bibliography are given at the end of the thesis.

Chapter I. Introduction

It contains brief introduction of the study, library as a service institution, service quality in the context of libraries, special libraries, features, functions and services, need and significance of the study, statement of the problem, definition of key terms, objectives of the study, hypotheses, scope and limitation of the study and organization of the thesis.

Chapter II. Review of Literature

This chapter deals with literature survey carried out for conducting the study. It includes both Indian and foreign studies and is presented under four headings such as measuring library service quality with SERVQUAL, service quality measurement with LibQual, e-service quality and quality assessment studies.

Chapter III. Research Design

It explains methodology for conducting the research, variables used for the study, universe and sample of the study, data collection procedure and tools and techniques used for data analysis.

Chapter IV. Data Analysis and Interpretations

This chapter contains data analysis and interpretations of the result. It includes tables, diagrams, etc. for better presentation of the data.

Chapter V. Findings, Suggestions and Conclusions

This chapter includes major findings of the study, testing the tenability of hypotheses, suggestions and recommendation for further research and conclusions.

Citation Style used

The style manual of American Psychological Association (APA) 6th edition is used for preparing the citations, references and bibliography. For more readability, citations with more than three authors are abbreviated to the first author name plus et al. in the in text citations. (American Psychological Association, 2010).

1.13. Conclusion

The study depicts a structure for assessing the service quality of special libraries in Kerala. Quality is a requirement in each aspect of the functioning of libraries. Every staff of the libraries bears the responsibility of improving the quality and furthermore to satisfy the objective of the parent organization. Continuous training is necessary to cope with the ever changing user demands. It is important to focus on service quality in order to enable the library as a productive working environment. Practical and effective plans are needed for enhancing the working atmosphere to produce the desired quality. The library management has a pivotal role in understanding the users' needs and executing changes in process and procedures. Libraries ought to implement innovative ideas for service quality enhancement and consistently review it in order to assess its impact on library service quality.

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Chapter 2
REVIEW OF LITERATURE

2.1. Introduction

In the current scenario, quality information and services are of high significance. Various studies had been conducted in service quality area which explored the issues related to quality measurement, management, and practices in libraries. A literature survey paved the way for the collection of data. An analysis of the theories, frameworks and research findings was carried out in the literature survey for the identification of the relevant quality attributes which were utilized in research studies of past from the field of service quality measurement in library and information services.

These studies discussed various aspects of service quality, service quality dimensions, service quality in special libraries, different tools available for measuring service quality such as SERVQUAL, LIBQUAL, etc. The reviews include studies from international journals, national journal, textbooks, dissertations, theses etc. The study makes intensive use of online information sources such as databases, e-journals, e-books, etc. The reviews divided into 4 sections; (I) Measuring library service quality with SERVQUAL (II) Quality measurement of libraries with LibQual (III) E-service quality measurement studies (IV) Quality assessment studies. All these studies help to explore 'service quality' in detail.

2.2 Measuring Library Service Quality with SERVQUAL

The review of literature associated with the discipline of Library and Information Science tracks back the empirical and analytical data collected by LIS professionals with the aid of SERVQUAL in order to

measure the quality functioning of a library. The review revealed SERVQUAL to be a promising and effective instrument to aid the measuring and evaluation of the service quality of the service industries, into which falls the libraries.

There had been ample research conducted in the application of SERVQUAL in libraries, difficulties that issue out of it, development of SERVQUAL dimensions, modification of SERVQUAL instrument etc. Some of the prominent studies were discussed below.

Hassanzadeh, Sharifabadi, and Derakhshan (2010) surveyed the service quality of the central library of Management and Planning Organization (MPO) at Iran. The objectives of the study were to examine whether the library met the NLI (National Library of Iran) standards for special libraries and also to identify the difference between the expected and actual level of service at the MPO central library. For this purpose, the current situation of the library was compared with NLI standards and found that the library confirmed to 63.7 percent of the standards. In which, library conformed most closely to the 'budget' standard (85.5%) and least to the standard for 'building and facilities' (44.5%). Being different from other libraries, MPO library did not have the problem of budget constraints, but it lacks some features in the building due to space limitations.

The difference between the actual and expected service was identified by using a modified SERVQUAL instrument among randomly selected respondent. A paired t-test was also conducted for this. The result showed that the mean difference between the two levels of service was 0.8 which meant that there was a significant difference between actual and expected service, and the library has not met the user's expectations. For more detailed analysis, the Wilcoxon test was conducted and the result indicated that 75 percent of users

rated the actual level of services lower than or equal to 6.23 and only 25 percent of users ranked the expected service lower than or equal to 6.26. Meanwhile, the analysis of the quality of each dimension in SERVQUAL revealed that there was a significant difference between expected and actual levels in each dimension. The dimension assurance has the largest gap and the dimension empathy has the smallest gap. Descriptive statistics were used to identify the percentage of user perceptions which has been met and it showed that 'responsiveness' (42.8%) has the highest frequency. By ANOVA test, it was identified that there was no significant difference between the expected and actual service levels among the organizational and non-organizational users and the one and only difference being attributed to the statement "Easy to understand materials such as handouts and statements". On the basis of the Friedman test, 'reliability' was considered as the most important dimension and empathy as the least. Factors affecting service quality was identified by factor analysis.

The study addressed the problem of service quality in MPO library, Iran. On the basis of all these tests, it was observed that there was a significant difference between actual service and expected service. One of the prominent problems of MPO library is the lack of adequate collection and efficient staffs. Therefore the library has to update the collection and implement new ideas to make the staff more efficient and friendly with the latest technologies.

Haneefa, Seenath and Sajna (2016) investigated the service quality of UGC-Infonet digital library consortium of Calicut University library. A modified SERVQUAL instrument having five dimensions and twenty items were used for data collection. The dimensions are; physical facility, staff, services, technology, and e-resources. The questionnaire was distributed among 225 users and 180 were

returned back. The study conducted both item wise analysis and dimension wise analysis. The item wise analysis identified the most expected item as "Library professionals in the Infonet center should have the competency and skill to serve their users" and the least expected item as "there should be proper ventilation and lighting in the Infonet center". The most expected dimension was "Technology' and the least expected was "Staff". The most perceived item was "the Infonet center provides facility to download and copy the e-resources whereas the least perceived item was "the Infonet center performs the services to the right user at the right time". The most perceived dimension was "e-resources" and the least perceived dimension was "staff". The item having the highest service quality gap was "acquiring new e-resources on time" and the lowest gap was "providing access to e-resources that will meet user's information needs". The dimension "physical facility" is the only one that has a positive gap value which conveyed that the physical facilities of Infonet have met the expectations of the users whereas the dimension "services" have the highest negative gap score. Therefore the library should improve the services of the Infonet by providing the right information to the right users.

Tan and Foo (1999) conducted a study on service quality of Singapore statutory board library. The main objectives of the study were to assess the level of services provided by the library on the basis of expectations and perceptions of users about the services along with the relative importance of each dimension of the services and benchmark the SERVQUAL scores against the local libraries and compare their performance. The study followed a survey method by an adapted SERVQUAL. A pilot study was conducted and necessary changes were made in the instrument. The convenience sampling method was used for selecting the respondents, which included only

those who had borrowed an item from the library during a period of 15 days. Of the 129 questionnaires distributed, 69 were returned and only 66 were used for further analysis.

For the purpose of identifying the relative importance of each of the service dimensions to the users, the respondents were asked to divide 100 points among the service dimensions and the result showed that the dimension 'reliability' was ranked as the most important dimension, responsiveness was the second and empathy the least important. The overall SERVQUAL score was noted to be - 0.53. The negative value indicates that the library has not met the expectations of the users. While analyzing the gap score in each dimension, it can be shown that the dimension 'empathy' has the largest gap followed by dimension 'assurance' and the smallest gap is attributed to the dimension 'tangibles'.

The SERVQUAL score does not measure the relative importance of service quality dimensions, the weighted SERVQUAL score was calculated by multiplying the SERVQUAL scores of the dimension by the weight assigned and dividing the sum by 22. Both the SERVQUAL and weighted SERVQUAL have negative scores, but the gap was comparatively less in weighted SERVQUAL. Besides these, the respondent's comments prove that the major problem faced by users was the lack of adequate collection and knowledgeable staff. An expectation chart was also prepared to identify the service shortfalls. For better understanding, the chart was converted to a grid, in which there were 4 quadrants. Quadrant 1 denote high expectation & high service gap, quadrant 2 denote high expectation and low service gap, quadrant 3 denote low expectation and low service gap and quadrant 4 denote low expectation and high service gap. The quadrant 1 include items relating to collection, location of the documents, knowledge, and approach of the staff and quadrant 4

include items like an online catalogue, modern facilities, signage, library working hours and user-specific needs. Both the quadrant show highest service gap, therefore, more attention should be given to items in quadrant 1 and 4.

The study employed a new method to measure service quality of Singapore statutory board library. The expectation chart and the grid method clearly depict the exact picture of the service gap in the library.

Nagata et al. (2004) identified the dimensions that construct the evaluation of service quality in academic libraries. Being the library services differ from all other services, there is a need to develop service quality attributes unique to university libraries. The SERVQUAL instrument measured only the functional quality, therefore some items associated with the measurement of technical quality also got incorporated into the instrument. The study was conducted at two universities in Japan, one university in England and Finland. Both national and private universities were included. In order to avoid the cumbersomeness, few items were deleted from the questionnaire and 9 items were added by referring the LibQual instrument. The final questionnaire contained 29 items and the items were arranged in a three column format bearing the user's minimum expectation, desired expectation, and perception. A seven-point Likert scale measured the responses. Some open-ended questions regarding education level, the frequency of library visit etc. were added towards the end.

A complete survey of faculties of each university and European students was conducted and a random sampling of Japanese students was performed. The study stressed the need to identify to what extent the factors inherent in each library affect the user's

expectations. The analysis revealed the most expected three items in all universities to be 'availability of required information', 'providing services as promised' and 'library staff with the knowledge to answer user's query'. Four dimensions of service quality were extracted by exploratory factor analysis. They are; effect of service (personnel), library as a place, collection and access, and effect of service (organizational). The reliability of all these dimensions was calculated by an alpha coefficient and was found to be reliable. The dimension library as a place meet the technical quality and collection and access was more concerned with functional quality.

Satoh et al. (2005) discussed university library service quality through focus group interviews. The study attempted to identify the indicators and measures corresponding to the dimensions of the user's evaluation of service quality. For this purpose 9 focus group interviews with 65 interviewees were conducted at four university libraries spread across three countries. The universities were; Tohoku University, Kumamoto University, Royal Holloway and Bedford New College, the University of London and the University of Oulu.

While analyzing the data, a KWIC index was prepared to check the correspondence between unique wording and usage context. On the basis of the KWIC index, each statement was coded and mapped to 17 subcategories with 337 items according to four dimensions of service quality. Along with this, a software application 'idea tree' was also used. The result indicated that students emphasized the dimension 'library as a place' as very important because they felt it as a comfortable space for study and discussions, while graduate students stressed the dimension 'collection and access' as important. The faculty member, however, perceived that the library as an organization that supports information acquisition and education.

On the basis of mapping of focus group interview statements, some items were added and deleted from the SERVQUAL instrument by comparing with the 29 questionnaire items. Items like OPAC outside the library and electronic journals were added. The dimension 'effect of service (organizational) and the dimension 'collection and access' were also considered as very important. More attention is necessary for matters such as inappropriateness of hours, overdue penalties and service uniformity. While delivering services, courtesy, politeness, readiness, and promptness are inevitable.

Hossain and Islam (2012) carried out a study on perceived service quality and satisfaction at Dhaka University Library, Bangladesh. The objectives of the study were to identify the current service performance and perceived service quality of Dhaka University Library and also to determine the extent to which the service delivered met the user expectation and measure their satisfaction. The study pointed out that service quality and customer satisfaction are two distinct constructs and are closely related to each other. Therefore it can be treated as separate entities.

A modified SERVQUAL instrument with 16 variables was used for data collection. The responses were collected in a three column format such as; desired service level, adequate service level, and perceived service performance. The respondents were selected by random sampling method and the data was collected from undergraduate students of the different department of the University of Dhaka. Out of 600 questionnaires distributed, 400 were returned back, of which 340 were selected for further analysis.

The perceived service quality was calculated by deducting the current performance from the minimum expected service. The positive result indicated quality and the negative value indicated

service shortfall. If the gap value is in between 0-30, the service is problematic; 31-60 showed critically and above 60 is most critical. The satisfaction is measured by comparing minimum expectation with perception. If ME > P indicates "need is not met," and result is "dissatisfaction"; If ME = P indicates "need met," and result is "satisfaction"; and If ME< P indicates "need exceeded," and result is "improved satisfaction."

The result revealed that the overall score of the perceived service was 3.41. Among the 16 items, 'convenient library hours' have the highest perceived mean (5) and the item 'having sufficient modern technological equipment and facilities' have the lowest perceived mean (2.86). In the dimension wise analysis, 'tangible' dimension occupies the highest score (3.62) and the dimension 'competence' occupies the lowest score (3.26). The gap analysis indicated the overall gap value as 0.29, only an item 'convenient library hours' has a positive gap and provides quality service, all other items have a negative gap. Majority of the services like 'having sufficient modern technological equipment', 'one can make a complaint or suggestion easily about the existing condition and facilities' lies in the critical and most critical service category.

The overall analysis revealed the users of the Dhaka University Library to be unsatisfied with the current service performance of the library. Majority of the user's needs were not fully met by the library. Therefore the authority should take necessary action to improve the service quality and user satisfaction of the library. The major limitation of the study is that the relationship between service quality and customer satisfaction was not studied.

Hossain (2014) conducted a study on the causes of user dissatisfaction in academic libraries in university libraries in

Bangladesh. The main objectives of the study were to identify the causes of triggering user dissatisfaction and provide measures to improve user satisfaction. The samples were selected from the graduate and undergraduate students of 10 public and private universities in Bangladesh. The public universities were; Dhaka University (DU), Jahangir nagar University (JU), Rajshahi University (RU), Chittagong University (CU) and Jagannath University (JNU); and the private universities were; North South University (NSU), Independent University Bangladesh (IUB), East West University (EWU), BRAC University (BRACU) and Premier University (PU). A modified SERVQUAL instrument was used for data collection and the data was collected by three column format such as desired expectation, minimum expectation, and perception. Besides these, the user's real expectation was also calculated by the average score of desired expectation and minimum expectation. The satisfaction was measured by applying Patterson's disconfirmation of expectations paradigm.

Out of 900 questionnaires distributed, 623 were returned. Wilcoxon test was applied to compare student's perception and expectation at different levels. The result indicated that the services provided by all the university libraries did not exceed the expectation of users. The services provided by IUB library satisfied the real expectation of users but did not meet the marks of the desired expectation whereas the DUL and RUL libraries provided poor services and CU, JNU and PU libraries were also in the defective zone. The study observed that DUL have a higher expectation when compared to other libraries. The unrealistic higher expectation was treated as a major cause of user's dissatisfaction, because, due to lack of finance, the university failed to satisfy the higher expectation. Besides these, lack of proper responses to the users' needs and demands from the side of

employees and managers, lack of employee-user relationship, lack of proper complaint mechanism, communication gap, lack of efficient management and proper monitoring etc. are the other major causes of user dissatisfaction.

The study concluded that the university libraries failed to satisfy the minimum expectation of users and public university libraries were providing poor services to users. In order to improve service and user satisfaction, more investment in terms of resources, equipment and manpower were required. Staff performance has to be improved. The chief limitation of the study was that it focused only the students, excluding the faculty, staff, and researchers. Another limitation is that the satisfaction was measured purely on the basis of quantitative data.

Ismail et al. (2011) investigated the performance of academic libraries in the research universities in Malaysia. The four research universities selected as samples are the University of Malaya (UM), the University of Kebangsaan Malaysia (UKM), the University Sains Malaysia (USM) and the University Putra Malaysia (UPM). The study measured the five SERVQUAL dimensions such as the library as a place, its collection and its access to information, reliability and empathy in providing quality service performance in the academic libraries. On the basis of stratified random sampling, 385 respondents were selected and the SERVQAUL questionnaire was distributed among them. But only 246 were completed and returned. The questionnaire contained 48 questions along with a set of demographic questions. For the purpose of hypothesis testing, various statistical analyses such as descriptive analysis, cross-tabulation and correlation were applied. The analysis of gender distribution showed that the majority of the respondents were female. By correlation analysis, the Pearson correlation coefficient of

all the dimensions against the dependent variable service quality was calculated. The value of empathy dimension is non-zero (0.724) which means that there is a positive relationship between dependent variable and independent variable. As the value of each dimension is positive, the relationship between the independent and dependent variable is positive. The study concludes that the empathy dimension has the most influence and all the other dimensions are important and should be incorporated in the routine of the academic libraries.

Sahu (2007) conducted a study on service quality measurement of Jawaharlal Nehru University library, Delhi. The objectives of the study were to examine the service quality perceptions of JNU library users and measure to what extend JNU library has succeeded in providing quality services to its users. The sample of the study included 70 students and 30 faculty member selected randomly. For the purpose of data collection, a questionnaire was prepared on the basis of SERVQUAL tool. The questionnaire contained statements relating to three main aspects of the library; physical facilities, technical facilities and the attitude and competence of the staff. There were 47 statements along with an open-ended question at each section, which allowed the respondent to indicate the overall rating of the particular aspect. In the end, two additional statements were also provided for assessing the overall performance of the library. A five-point Likert Scale was used to mark the responses. The result showed that the users of the JNU library were satisfied with the service quality of the library except on responsiveness and communication. Due to lack of proper communication, many of the users were unaware of various services available in the library. The problem associated with responsiveness was the unavailability of the latest publications. While analyzing the responses of faculty and students regarding service quality, it was found that there was

discrimination in providing information quickly. The staff has given more importance to faculty request than the user's request for information. The study suggested conducting a quality management improvement program for the empowerment of employees.

White (1998) conducted a survey on service quality at two units of the University of Virginia Library; they are Alderman's Reference and Information Services and Fiske Kimball Fine Arts Library. The survey was carried out by a modified SERVQUAL instrument. 682 surveys returned included 421 from Alderman Library and 261 from Fiske Kimball Fine Arts Library. The survey has 3 parts, the first part contained 25 questions relating to the five service quality dimensions in which the respondents were asked to indicate their perceptions also. The second part included questions relating to the overall services of the library and it required to mark the importance of each dimension. In this part, the respondent could provide their written comments about the services of the library. The third part was intended to collect the demographic information about the respondents, their frequency of library visit and the department they belong to. The importance of each service was indicated by a five-point scale.

While analyzing the data of Alderman library, it was found that 84 percent of the respondents were students and 70 percent were visiting the library daily or weekly. The overall service quality of Alderman library was 4.24, which mean that 88 percent were in favour of the service quality of Alderman library which was extremely good or good. Reliability and responsiveness were marked as the most important dimension and empathy and tangibles as the least important. Through written comments, the respondents invited attention on matters like working hours of the library, the accuracy

of circulation records, re-shelving of books, good working equipment etc.

The data analysis of Fiske Kimball Fine Arts Library showed that 90.8 percent of the respondents were students. The overall rating of service quality was 4.31 out of 5. As in the case of Alderman library, the Fiske Kimball Fine Arts Library also ranked the reliability and responsiveness as the most important and empathy and tangibles as the least important. The respondents of the fine arts library also recommended long working hours of the library, more computer, photocopier etc. through written comments.

The result of the study in both the units of the Virginia University Library was almost the same. The service quality of these two libraries was good. The area which required more attention in both the libraries according to the respondents were the working hours of the library, the circulation records that should be kept accurate and up to date and enough computers, photocopiers etc. and their smooth functioning. The respondents were satisfied with the behavior of the library staff.

Johnson and Sophia (2014) conducted a study in the business and management program institute in seven emirates, UAE. A modified SERVQUAL along with RATER analysis was applied for collecting the data. A five-point Likert scale marked the responses. The respondents included student, staff and faculty. The mean value and standard deviation of each response were calculated and ranked on the basis of importance provided by the respondent. The ranking indicated that a score of less than 3.0 was dissatisfaction, a score between 3.0 – 3.5 was the average level of satisfaction, 3.5 – 4 was above the average level of satisfaction and a score greater than 4.0 indicated a high level of satisfaction. The analysis part shows that in

the case of the reliability dimension, the statement 'Library adheres to its mission and goals' has the highest mean value (4.21) and ranked as 1. The statement 'staff are prompt in finding information' was ranked second with a mean value of 4.16 and the statement 'OPAC provides accurate information about all resources' attributed the lowest mean score of 3.79 and was ranked as 10. While measuring the assurance dimension, 'behavior of staff instills confidence' has the highest mean (4.20) and 'library conducts orientation/workshops to accomplish confidence' has the lowest mean score (3.76).

Tangible dimension contained a statement relating to physical facilities and equipment. The respondents were not satisfied with this dimension. The highest mean score was attributed to the appropriate lighting system and the lowest to 'library has a special collection'(3.39). In the empathy dimension, the statement 'staff are efficient in the delivery of service' was ranked as 1 with a mean score of 4.07. In the case of the responsiveness dimension, willingness to help users was ranked as 1. As the mean value of all the statements in this dimension was more than 4 and it can be concluded that the users were highly satisfied with the behavior and attitude of the staff.

In order to test the reliability of RATER analysis, Cronbach's alpha was calculated. The coefficient value of all the dimensions was above 0.70, which meant high reliability. The responsiveness dimension was treated as a highly reliable dimension.

The study also assessed service quality on the basis of the quality of learning resources, service quality, quality of physical facilities and staff assistance. The mean value of quality of learning resources (3.79), quality of services (3.90) and quality of physical facilities(3.85) etc. that lie above 3.5 showed above average level of satisfaction and

the mean value of quality of staff (4.26) above 4 indicated high level of satisfaction.

Both the RATER analysis and application of modified SERVQUAL instrument showed that the service quality of academic libraries in UAE was satisfactory. The respondents are highly satisfied with the quality of the staff.

Waqar, Soroya, and Malik (2015) discussed on service quality of library front desk staff in medical colleges in Lahore. The sample of the study included student library users of the medical college affiliated with University health science, Lahore, selected by random sampling. A structured SERVQUAL questionnaire was used to collect data; responses were marked by Likert scale. Out of 240 questionnaires distributed, 202 were returned and used for analysis. The analysis of the collected data showed that the mean value of perception was lower than that of expectation. The dimensions 'assurance' and 'empathy' have the maximum and minimum difference respectively. As the mean value of assurance dimension was comparatively less, there is a need to improve the politeness, communication skill and welcoming behavior of the front desk staff, whereas the mean value of responsiveness dimension indicated that the staff were highly responsive and immediately attend the user queries. The 't' test was applied to find out the gender differences in expectations and perceptions of service quality. The result showed that female library users perceive quality services than male library users. There was a significant difference in the perception of 'reliability' dimension by female users than male users. Female library users perceive more reliable services from the front desk staff than male users. While analyzing the expectations, male users have a higher expectation than female users. They have high expectations on dimensions like reliability, responsiveness, and empathy. Even

though the expectations of male users were high, they were not satisfied with the services, their perceptions of quality services were less as compared to female users. Therefore the front desk staffs of the library have to improve their services to the male users. In short, the overall service quality was found to be good. The study also pointed out some of the complaints made by library users regarding noisy study room, security of personal belongings, prayer place, library timing etc. The suggestions included, provision of a generator, improvement of hygiene and air-condition, improvement of communication, discussion room variety of books etc.

As the quality of the library largely depends on the behavior and knowledge of the library staff, the study, service quality of front desk staff is of great importance. The study measured service quality by assessing the five dimensions, not assessing the statements individually. The study was useful to other libraries also for assessing the expectation and satisfaction of users.

Iberahim and Nadzar (2011) discussed on service quality and user satisfaction of Readers Advisory Desk Service at University Putra Malaysia Library. Readers Advisory Desk Service is a service in which the staff helps the users for searching, downloading, saving and answering the reference questions by face to face or by telephone or email etc. The main objective of the study was to identify the effectiveness of the Readers Advisory Desk Service. On the basis of purposive sampling, the frequent users of the library, who regularly asked questions to the Readers Advisory Desk Service were selected as a sample and surveyed. The questionnaire contained 30 questions in 4 sections. Section A designed to collect demographic information of the respondent, section B included questions relating to Readers Advisory Desk Service, section C covered SERVQUAL statements and

section D intended to gather information on the overall response of the service.

While measuring the reliability of Readers Advisory Desk Service, it can be found that reliability has a positive relationship with the quality of the service. The result showed that 57.5 percent of respondents were able to find reliable information every time they raised inquiries, 60 percent of reader advisors were always able to answer respondents' queries correctly, 37.5 percent were often and only 2.5 percent were not very often able to answer respondents' queries correctly. The responses showed that 55 percent were of the opinion that the reader advisor advised the students accurately on how to get started with their research, how to access, evaluate and use information. In the case of responsiveness, 62.5 percent of respondent opined that reader advisors were willing to help users and 60 percent strongly agreed that the reader advisors have the ability to answer all queries. While assessing the assurance dimension, 60 percent of the respondents indicated that the reader advisors were efficient and 40 percent indicated that they were very efficient in providing relevant materials from the library collection. The result made it clear that the respondents were satisfied with the knowledge and ability of reader advisors to answer user queries. In the empathy dimension, 50 percent of the opinion that reader advisors were often available at the Readers Advisory Desk Service preventing the users from standing in a long queue, they felt convenient in the opening and closing hours of the library. The reader advisors were always available to respond to user queries. In the tangible dimension, 52.5 percent respondent strongly agreed and 47.5 percent agreed that the library has modern facilities and equipment. The overall responses showed that 65 percent of

respondent were very satisfied, 35 percent were satisfied and none of them were dissatisfied.

The study revealed that the users of the Readers Advisory Desk Services are satisfied with the services. The service quality dimensions such as reliability, tangibles, responsiveness, assurance and empathy has a positive effect on user satisfaction. Users were satisfied in all these dimensions. University Putra Malaysia library provided quality service to its users. The study stressed the need for a user education program to make the user aware of the library services like online databases, OPAC etc and enable them to use it individually.

Filiz (2007) conducted a study on service quality of university libraries among students at Osmangazi University and Anadolu University, Turkey. The study attempted to develop an instrument for measuring service quality and user satisfaction by assessing and comparing the perceptions of library users and thereby identifying the service shortfalls. A modified SERVQUAL questionnaire having 4 parts were used for the survey. Part 1 of the questionnaire assessed students' expectation and quality of library environment, quality of library service, information quality and system quality, part 2 measured 'usefulness', part 3 was students' observation about the library and part 4 is about students' use of the library. A seven-point Likert scale was used for part1, part2 and part 3 of the questionnaire. The sample of the study was selected randomly. Out of 450 questionnaires distributed, 400 were used for analysis.

ANOVA test was used for assessing the similarities and differences in the response of users. It showed that there was a significant difference in the importance and perception of master students than grade students but no differences were shown in the case of faculty.

By gender wise analysis it can be found that female students have more importance of library service quality than male students whereas there was no difference in the perceptions of male and female students. The differences can be shown in the perceptions of students from different universities. Osmangazi students were more satisfied than Anadolu students but it was not reflected in their importance. Paired t-test was conducted to identify the significant difference between the means of importance and perceptions of services. It showed that the highest performance score of 5.92 was attributed to ' currency of information received' and the lowest score of 4.13 for the online catalogue. The highest importance score of 6.65 belongs to 'accuracy of information received' and the lowest score of 5.54 to 'users' best interest at heart'. There were no service shortfalls, users were generally satisfied with the service. The construct validity of measures is tested by exploratory factor analysis. On the basis of factor analysis, five service quality dimensions are identified. They are; (1) quality of library service provided (2) quality of information and library environment (3) Reliability (4) quality of online catalogue system (5) confidence. Besides these, regression analysis was conducted to check the ability of the score to predict library service quality. All the variables selected have a great impact on student library satisfaction.

Asogwa et al. (2014) discussed on SERVQAUL application in the evaluation of academic libraries in developing countries. The objectives of the study included the measure of the service quality of academic libraries, identify the service dimensions that meet desires of library users, compare the results with developed countries, suggest factors that affect users' perception of service quality and also identify the areas that needed to be strengthened. The study used both primary and secondary data. Primary data were collected

from five Nigerian university libraries by the SERVQAUL instrument with a five-point Likert scale. The secondary data included the results of previous studies conducted in three universities, they are; University of Dhaka, Bangladesh; Islamic Azad University Mazandaran, Iran and the University of Pakistan, Pakistan. They had collected from the websites and research article in the International Journal of Library and Information Science.

In order to measure the two aspects of service quality, such as expectation and perception, two sets of SERVQUAL questionnaire were designed and distributed. The population of the study consists of 3,832 users from four developing countries which included 314 users from the University of Dhaka, 371 users from six universities in Iran, 876 users from 13 universities in Pakistan and 2,269 users randomly selected from five universities in Nigeria, which represents 59.21 percent of the working population. For identifying the service quality gap, the differences between the expected and perceived services were calculated. The results of academic libraries in developing countries showed that all the gaps were negatively marked, that meant users expectations of services exceeded users' perceptions of services. The expectations are not fully satisfied. As the gap is less, the service quality will be high. Therefore items like 'users have confidence in librarians' ability in handling their problems (-1.23)', 'library opens to readers at the appropriate time (1.43)', 'librarians are consistently courteous (-1.55)', 'Librarians are always willing to help users (1.71)', 'Users' records are appropriately kept and maintained (-1.76)' etc. have the least gap value and were treated as fairly satisfied by users. When the gap is high, the service quality will be less, hence items like 'library has modern and functional equipment (-2.56)', 'library has most e-resources I need for my studies (-2.17)', 'library has access tools for users (-2.15)',

'electronic resources in my library are accessible from t home/office (-2.13)' 'readers obtained e-services without much delayed (-2.06)' etc. showed the highest gap and users were not satisfied with these services. The most problematic dimension of service quality in developing countries is reliability and empathy. The services of academic libraries in developing countries are not user oriented. The SERVQUAL studies of developed countries are compared with those in developing countries by deducting the results of different studies. The findings revealed that the SERVQUAL studies were obsolete in developed countries and in developing countries it is an emerging trend. Reliability was the highest and tangible and empathy was the least service quality dimension in the academic libraries of developed countries whereas in developing countries there was an inconsistency in this matter. Lack of funds, inadequate infrastructure, and misappropriation of funds are the main reason for this.

Academic libraries in the developing countries are on the way to provide quality services to its users. The study observed that the physical facilities and ICT infrastructure of the libraries need to be improved. The users of the library should be treated with more attention and care and there should not be any delay for providing the service. Adequate human resources should be made available and proper training must be provided to them.

Somaratna, Peiris, and Jayasundara (2010) conducted a study on user expectation versus user perceptions of service quality in university libraries at the University of Colombo library system, Sri Lanka. A survey was carried out by distributing questionnaires to 855 randomly selected users. With a response rate of 74 percent, 634 were returned. On the basis of the literature search, a panel of

experts selected 35 most relevant attributes of service quality for quality assessment of academic libraries.

The SERVQUAL instrument with all these modifications along with a seven-point Likert scale was used for the purpose. In order to ensure the reliability of the attribute, wording, length, and sequencing of questions, a pilot study was conducted. The reliability coefficient Cronbach's alpha for user expectation was 0.921 and for the user, perception was 0.865, thus it ensures internal consistency. The result revealed that the most expected items by the users were; relevance of information received, access to electronic journals, adequate lighting, convenient opening hours, giving users individual attention, etc. and the least expected were; feel safe and secure in the library, user education programmes, library guides, brochures and alert services, visually appealing facilities, understanding the needs of users, etc. The highest perceived items include accuracy of information received, feeling of safety and security in the library, relevance of information received, courteous, polite and friendly staff and willingness to help users, etc. and the lowest perceived items were access to electronic journals, visually appealing facilities, well-organized webpage, easy to use online catalogue, modern equipment (photocopiers, scanners, printers, etc.) in good condition etc. The gap analysis showed that the largest gap areas were; access to electronic journals, online catalogue is easy to use, visually appealing facilities, modern equipment (photocopiers, scanners, printers, etc.) in good condition, well-organized web page etc. and the smallest gap was shown in the items like feeling safe and secure in the library, accuracy of information received, clear directional signs for collection, making users feel secure about transactions, willingness to help users etc. It was found that the users of the University of

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Colombo library system were fairly satisfied with the service quality of the libraries.

The study pointed out that the users were satisfied with the accuracy and relevancy of information obtained from the University of Colombo library system. They felt safety and security in using library services. The staffs in the library were knowledgeable, courteous, polite and friendly. They provided services at the promised time whereas the library catalogue and webpage were in poor condition. 'Access to e-journals' was one of the most problematic areas, as a solution, the study suggested a financially strong and sustainable national level consortium. Insufficient copies of books, the inadequacy of the latest books, not enough journal titles, etc. were the other major problems of the library. Proper orientation should be provided for the efficient use of online catalogue and other services of the library.

Vinod Kumar (2009) studied on service quality management in agricultural university libraries. The study pointed out that the effectiveness and quality of services are complementary to each other. The objective of the study was to identify the views of Librarians/Heads of the agricultural university libraries on quality management of libraries. The study was conducted at agricultural university libraries of four states in Northern India, namely; Punjab Agricultural University Library, CCS Haryana Agricultural University Library, Y S Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh and Gobind Ballabh Pant University of Agriculture and Technology, Pant Nagar, Uttarakhand.

A SERVQUAL model questionnaire was used for the purpose. In order to collect the views of Librarian or Head of the Department, they were asked 9 questions in each of the following management

attributes such as; leadership, strategy and policy, staff management, process management, and resource management. The responses regarding leadership indicated that the statements 'I prefer to work as facilitator and motivator rather as authoritarian', 'I consider the importance of different teams for the improvement of processes, procedures, and practices', and 'I can easily categories my subordinates as good and bad' were agreed by all the librarians and had the highest mean score of 5. The statement 'I praise orally in public for outstanding performance and condemn privately for poor performance' had the least mean score of 3.75. All other statements have above average mean score. Therefore it was assumed that leadership plays an important role in providing quality library service. In the case of strategy and policy, the responses showed that the highest mean score of 5 attributed to the statements 'all the services, processes and practices are planned to keep in view of the needs and expectations of the users', 'library policies, mission, values, and strategies are made clear to the staff', 'I explain my expectations to the subordinates and learn their expectations' and 'It is planned to make optimum use of ICT in providing library services' and the lowest mean score of 3.75 belongs to the statement 'the decisions are taken on the basis of the information supplied to me from various sections of the library' which makes it clear that librarians were implementing plans and policies on the basis of the needs and expectations of the users and there is active participation of staff on such matters.

While considering the 'staff management' the statements 'the staff is motivated on regular basis for being quality consciousness', 'I want to use workers heads and hearts in addition to their hands' and 'I help my subordinates in career planning' have the highest mean score of 4.75 and the statements 'suggestions are always welcomed

from library staff' and 'I have faith in my subordinates ability, potential, knowledge and skills' have the lowest mean score of 4.25. It is obvious from the response that, for providing quality services, proper training and motivation are provided to the staff, maintaining a healthy relationship with them and helping them for their career enhancement. In process management, the majority of the librarians agreed the statements such as 'library membership is given within a week after application', 'books are issued within 5 minutes to members' and 'OPAC/Catalogue is updated' and have a mean score of 4.75. The statements 'rules and regulations are followed and reports against those who violate' and 'I give chance to every employee to improve' were agreed only by a few of them and have a mean score of 4.25. Resource management also has a vital role in providing quality services. The statements 'librarian is involved in the process of planning the annual budget of the library and 'all equipment and instruments are kept functional' were highly agreed by all the librarians with a mean value of 4.75 and the statements 'Optimum use of the library resources', 'proper allocation of library budget for optimum utilization', 'budget for books and journals are allocated in the meeting of library committee' were the least agreed statements with a mean value of 4. The overall analysis showed that the attributes leadership, staff management, and process management have the highest mean value of 4.59, 4.53 and 4.53 respectively. The four agricultural libraries were providing almost quality services and have quality management. Among them, the highest quality service is provided by Punjab Agricultural University Library, Ludhiana and CCS Haryana Agricultural University Library, Hisar.

The study depicted the importance of quality attributes like leadership, strategy and policy, staff management, process

management, and resource management in providing quality services in libraries. The library management has to be very much cautious about these attributes and must be considered for quality management and provision of quality services.

Arshad and Ameen (2010) measured service quality of academic libraries in the University of Punjab. The objectives of the study included assessing the service quality of the academic libraries, determine the strength, weakness, and threats of providing quality library service and identify the students' preferences of service quality dimension. The population of the study consisted of regular students of affiliated colleges under the University of Punjab. The stratified random sampling method was applied for selecting the sample. The total population was divided into 12 strata of different faculties on the basis of a stratified variable 'Type of Faculty' and the required sample was selected from the strata. Modified SERVQUAL questionnaire with a seven-point Likert scale was employed for collecting data. The respondents were asked to indicate their preferences on each service quality dimensions by allocating 100 points to five service quality dimensions. Out of 390 questionnaires distributed, 338 were returned with a response rate of 87 percent. The analysis of the collected data showed that there was a female predominance in respondents, 61.4 percent of the respondents were female. The majority of the respondents were in the range of 18-27 years. Most of the respondents were bachelors (45.5 percent) and masters (42.5 percent) and only a few were doing MPhil (9.9 percent) and Ph.D. (1.2 percent). The faculty of science (24 percent) and faculty of commerce (20.4 percent) comprise the major part of the sample. Only 34 percent of the respondents were daily visitors of the library.

While measuring the service quality of the libraries, it can be seen that there was a wide gap between the users' perception (mean 4.6) and expectation (mean 5.9). The service quality statements 'library staff who are consistently courteous' (gap Score 0.7), 'library staff give users personal attention' (gap Score 0.76), 'providing services at the promised time' (gap Score 0.78), and 'performing services right the first time' (gap Score 0.79) have comparatively low gap score, which indicate that users were almost satisfied with these features and services of the library whereas the statements 'modern looking equipment' (gap score -1.5), 'assuring customers of the secrecy of their transactions' (gap score -1.29), 'library staff have the knowledge to answer customer's questions' (gap score -1.28), 'library staff who instill confidence in their users' (gap score -1.21) showed a high gap score and low perception of library service quality, therefore it was assumed that users were not satisfied with these services of the libraries.

The study observed that 'library staff's courteous behavior', 'caring attitude towards users', 'ability to provide services at the promised time' and 'understanding of users' needs' were the strength and 'lack of modern equipment', 'lack of assuring customers of the accuracy and confidentiality of their transactions', 'library staff who have not enough knowledge to answer customers' questions', 'library staff's inability to instill confidence in their users' and 'lack of visually attractive facilities' were the threats to the library. The quality perception of the students indicated that M.Phil and Ph.D. students have high service quality expectation and have the highest gap. They were not satisfied with library service quality. The 'tangible' dimension was the most preferred service quality dimension and the 'empathy' was the least. The study made it clear that the service

quality of the academic libraries of Punjab University was not up to the expectations of the users.

The study pointed out that physical facilities along with library collection play a vital role in library service quality. Better financial and managerial resources were needed to improve the quality of library services.

Ahmed and Shoeb (2009) measured the service quality of Dhaka University Library, Bangladesh by using SERVQUAL. As the SERVQUAL questionnaire lacks items measuring the technical quality of services, the other quality measurement tools LibQual and SERVPERF were also considered and framed a modified SERVQUAL tool applicable to libraries. A pilot study was conducted to assess the validity of added items. Twenty-five students of Dhaka University were participated in the pilot study and evaluated the instrument individually. On the basis of their responses, some items were simplified and restructured.

The final study was conducted among the faculty, graduate and undergraduate students of Dhaka University. They were selected randomly. Out of 350 questionnaires distributed, 314 were completed and returned.

The respondent evaluated the minimum, desired and actual service levels. The gap differences between these three levels were identified by applying Wilcoxon matched pairs test. The zone of tolerance concept was applied to identify the range between perceived and minimum service levels. The differences in service quality expectations of the various group were tested by Kruskal-Wallis test and exploratory factor analysis was used to identify the service quality dimensions. The gap differences between expected and perceived services showed that all gaps were negatively marked

which reflected that DUL did not meet the quality expectations of the users. This is mainly because of library resources and staff related problems. While analyzing the gap differences in the individual group, faculty group have the largest gap and the top five gaps are related to library resources and facilities. The graduate and undergraduate group have the largest gap in the library collection, equipment, and staff related problems.

The calculation of zone of tolerance showed that only those items ' Required resources are available, Convenient opening hours, A comfortable and inviting location, Space that enables quiet and calm study and Dependability in handling user's service problems' were within the zone of tolerance. For individual user group, items 'convenient opening hours' and 'comfortable and inviting location' were lying within the zone of tolerance of faculty group and items 'required resources are available', 'convenient opening hours', 'space that enables quiet and calm study' and 'comfortable and inviting location' is in the zone of tolerance of graduate group. The items 'assuring user of the accuracy and confidentiality of personal information', 'easy to make compliment', 'complaint or suggestion about condition', 'physical condition of resources', 'required resources are available', 'resources are delivered timely', 'convenient opening hours', 'comfortable and inviting location', 'space that enables calm and quiet study', 'library staff who keep users informed when the services will be performed", 'readiness to respond to user's questions', 'dependability in handling user's service problems', 'equipments are modern and in good condition' and 'library staff who provide services accurately with minimum interruption' were attributed to the zone of tolerance of undergraduate students. The analysis of desired expectations of various user group showed that 'space that enables quiet and calm study', 'equipment is modern and

in good condition', 'a comfortable and inviting location' 'convenient opening hours' and 'library website contains necessary information' were the highly expected items. Faculties have a higher expectation than other user groups. Through exploratory factor analysis, 'effect of service (organizational)', 'collection and access', 'library as a place' and 'effect of service (personal)' were identified as the dimensions of service quality.

The study of service quality measurement in Dhaka University Library developed new dimensions of service quality. Three levels of services such as minimum, desired and actual services as well as the zone of tolerance were calculated by the study. Majority of the items were outside the zone of tolerance. The study found that Dhaka University Library has not provided quality services to its users.

Sharma, Anand, and Sharma (2010) conducted a study about the quality of services rendered by university libraries in Punjab. The main objective was to identify the user satisfaction on each of the service quality dimension and to what extent the library meets the expectations of the users. To assess the quality of services, SERVQUAL questionnaire was administered in two universities of Punjab. Along with the questionnaire a five-point Likert scale was used to measure the responses. Questionnaire obtained included 100 from students and 20 from staff. The statistical test like Independent sample t-test, ANOVA, Pearson Correlation and Linear regression analysis were used for further analysis. Validity and reliability of the data were assessed by conducting a KMO (Kaiser-Meyer-Olkin) test, Bartlett's test and Cronbach's alpha test.

The findings showed that the significant difference on age group exists only on four variables, they were; clean environment, sufficient numbers of computers, library staff tries best to answer the question

and library staff answers accurately. There was no gender difference in any of the service quality parameters. It was also found that only one dimension 'adequate provisions for the display of new books' showed a significant difference in the perception of service quality by different educational qualifications. On the basis of ANOVA test, it can be proved that the respondents in the age group of 25-29 were not satisfied with the cleanliness of the library and respondents in the age group of below 20 years were not satisfied with numbers of computers in the libraries as well as handling of queries by the staff. The users of the library dissatisfied with the smaller reading area and lesser numbers of newspapers, magazines, etc. Correlation analysis found that there is a strong relationship between service quality dimensions and overall satisfaction. Through linear regression, it is observed that the dimension empathy, tangibles and assurance are the major predictors of service quality. Library staff has high perception regarding library services than a library user's expectation.

The study throws light on those areas where the library need to provide more priority on the basis of users requirements. Library should focus on the dimension 'empathy, 'tangibles' and' assurance' as they serve as the predictors of service quality.

Bahrainizadeh (2013) attempted to measure the service quality of the university library in Persian Gulf University. The main objectives of the study were to measure the service quality of Persian Gulf University library and identify the important service quality dimensions. For acquiring the required data, the study applied a tool of modified SERVQUAL and LIBQUAL model. Exploratory factor analysis was conducted to extract the service quality factors and identify the service quality gap. Sample size of the study was decided as 450 by using Cocheran formula. A total of 400 questionnaires

were filled and returned back. Reliability of the questionnaire was measured by using Cronbach's alpha and validity was tested by expert opinions. The suitability of the data for factor analysis was assessed by KMO and Bartlett's test. Through factor analysis, five factors were obtained and found that the factor "electronic access to resources and sets" was the most influencing factor on the service quality of the library while comparing with other factors. All other factors rated as second, third, fourth and fifth were, "personal service", "library as a place", "specific attention and user understanding and recognition" and "conditions and internal access to resources" respectively. A gap analysis was conducted on these five factors. The items 'access to online references through PC', 'appropriate use of signs and symbols in the library for a visual demonstration of service', 'on-time provision of references as demanded', 'special attention of employees to each of users, easy access to printed journals', and 'attention to users' preferences' have found the highest gaps and therefore more attention is needed. Through the study, it can be inferred that the library has failed to provide quality service as expected by the users. The study was concluded with some recommendations such as the inclusion of user's opinion, awareness to employees regarding user's expectations, provide wide access to electronic references etc.

The study helps to identify the strong and weak areas of the library and formulate strategies for providing quality services to the users.

Edwards and Browne (1995) conducted a study in Australian universities about quality in information services and assessed the differences in user's expectations and librarians perceptions about user's expectation. The objectives of the study were to identify the dimensions by which users assess the quality of information services and develop a user based questionnaire to be applied in evaluating

university library information services. On the basis of 10 dimensions of service quality, a list of expectations on information services by the users was developed by a senior librarian. The face validity of all the items were assessed. The items were restructured into the SERVQUAL model measurable by a 7 point Likert scale. Through a random method, 61 items were developed from the first section of the questionnaire.

The second part of the questionnaire allocated a total of 100 points to all the five dimensions. Besides these, three focus group discussions with academic staff and senior information service staff at three universities in Sydney have also been done. It resulted in an addition of 32 items. A group of 300 academics at four Australian universities were selected randomly and had sent them a version 2 of the questionnaire. In addition, the same was sent to the chief librarian and senior librarian of these universities and asked them to respond like as the users would.

The result indicated that both academics and librarians have moreover similar views. Of the five dimensions, they ranked the three dimensions; tangibles, responsiveness, and empathy as almost the same. The 'reliability' dimension showed the highest difference but it was not statistically significant, even though it was ranked as the most important dimension. Librarians ranked 'assurance' as important than academics. The librarians underestimated the importance of 'reliability' and overestimate 'assurance' dimensions. The study provided some suggestions also. It included the need for providing emphasis on 'responsiveness' dimensions, provision of electronic information services and also suggested that there is no need to provide over emphasis on library staff and user relationship and tangibles in the library because users are always concerned about the satisfaction of their information requirement.

Thompson and Cook (2000) discussed the reliability and validity of SERVQUAL scores while measuring service quality in libraries. The study emphasized the importance of measuring service quality. Association of Research Libraries (ARL) conducted a pilot study at 12 institutions to measure the integrity and validity of SERVQUAL. In the study, an attempt was made to assess the reliability of SERVQUAL score at different points of time on the different type of users. It also observed whether the factor analysis results in the structure of SERVQUAL as reliability, tangibles, responsiveness, assurance and empathy and thereby ensure its validity.

The participants included in the study were students, faculty and staff of the research library at Texas and A & M University selected randomly during 1995, 1997 and 1999. They were asked to rate the library performance as minimum acceptable, desired performance and perceived or actual performance. A 9 point Likert scale was used to measure the responses. Reliability of the SERVQUAL score was measured using the Cronbach Alpha method. KMO test was conducted to determine the sample adequacy and found it as 0.94. The factor analysis resulted in "service efficacy" and "effect of service experience" as minimum acceptable factors and "staff service orientation" and "service efficiency" as desired factors. The perceived factors include "effect of service experience" and "service reliability". The study observed that the reliability of the SERVQUAL score was consistent in all three years.

The study was a critique of the universal application of SERVQUAL. It pointed out the limitations as well as its applications. It suggests further refinement of the tool for universal application.

Coleman et al. (1997) assessed library service quality based on a TQM paradigm utilizing SERVQUAL questionnaire in Sterling C.

Evans Library at Texas A&M University. The study measured service quality by comparing the provider's performance with the customer's expectations. The purpose of the survey was: (1) "to define library service quality", (2) "to determine how to improve it", and (3) to "assess the dimensions of quality as most important to library customers". The survey contains two parts. Part 1 constitutes three sets of twenty- two questions each, in which the customer record their minimum, perceived, and desired service acceptance levels on a scale ranging from a low of 1 to a high of 9. The twenty-two questions can be classified into five sets, depicting each dimension of quality (reliability, responsiveness, assurance, empathy, and tangibles). Part 2 enables the customers to provide an overall rating about the library service quality with a view to measure the five different dimensions of quality relating to the services provided in academic libraries.

The faculty, staff, graduates and undergraduate students were given with 125 questionnaires each and 25 to the community users. Questionnaires were distributed according to the size of the schools. Computer generated random selection was used to determine the survey recipients. The results were evaluated by figuring out the position of perceived data points in accordance with the zone of tolerance. The data points that are within the zone denotes that the service was tolerable for the customers, those coming below the zone denotes that even the customers minimum requirements have not been met; and those coming above the zone denotes that the service quality surpasses the customers expected level. Every question was treated individually with its own zone of tolerance.

The importance of each dimension was denoted in the second part, in which reliability ranked first, closely followed by responsiveness and empathy being the least important. Majority of the survey

participants communicated areas of discontent with the library such as "difficulty in finding resources, circulation policies, unpleasant library staff, expenses associated with duplication services, outdated resources, building accessibility hours, and missing/lost materials". Attitude and work ethics of the staff received the most positive feedbacks.

Manjunatha and Shivalingaiah (2004) investigated about customer perception of service quality in libraries. The study discussed the emergence of service quality as a subject of study and the development of SERVQUAL tool for service quality measurement. It also measured the service quality of library and information services of eight academic libraries in Karnataka on the customer perspective. A modified SERVQUAL was used for data collection and 1252 responses were received. The study assessed the relative importance of five service quality dimensions and found that reliability was the most important dimension and empathy was the least important one. To ensure the significance of the differences in ranking pattern, ANOVA and t-test were conducted. It indicated that the differences were not significant. When the study was compared with other previous studies, it indicated that the importance of reliability remains the same but tangibles got varied.

While calculating the perception, it was noticed that "Reliability" has the highest gap score in both weighted and un-weighted scores whereas assurance has the lowest gap in un-weighted score and empathy has the lowest in the weighted score. Statistical test ANOVA and Regression were conducted to identify the factors influencing service quality perceptions of users. It was found that, service quality dimension, overall satisfaction level and word of mouth recommendation have a great impact on the service quality of libraries. Besides these, the quality of tangibles and demographic

characteristics like age, status, the frequency of library visit, past experience etc. also have an effect on it.

Nitecki and Hernon (2000) measured the service quality of Yale university libraries. On the basis of previous studies, they also assessed the applicability of five SERVQUAL dimensions to library settings. The main objectives of the study were to develop a SERVQUAL instrument for assessing user expectations and perceptions, examining its applications in a library setting and also observe further applications of its findings. For developing a customized SERVQUAL instrument, a list of service attributes was prepared. Then the list was discussed with readers, students and university librarian for suggestions and recommendations. After modifications, the final questionnaire was prepared. The questionnaire contained three sections; the first section deals with expectations and perceptions of library users, the second section evaluates the relative importance of five dimensions and the final section is about overall evaluation of Yale University library.

A random sample of 500 participants was selected for the survey and the printed questionnaires were mailed to them, out of which, 226 responded. The respondents included faculty, staff, and students. Both quadrant analysis and gap scores were used to indicate expectations and perceptions of users. The result showed that 'easy access to library materials, library website, library staff, OPAC etc. maintain high performance. More attention should be needed in the comprehensiveness of collection, library hour, return of the book, fine policy, photocopier, computers, re-shelving etc. The 'reliability' dimension was identified as the most important dimension and 'empathy' the least. It was also opined that none of the dimension addressed the breadth, depth, and content of the collection. The major problems faced by library users are regarding the overdue fine,

missing of important books, the high cost of photocopying etc. The overall evaluation showed that Yale university libraries was meeting but not surpassing all the expectations of the users.

The study explored the actual service elements for improvement, evaluated the service elements on the basis of importance by customers and encourages allocation of resources for meeting customer expectations.

Abdul Majeed (2002) conducted a quality assessment of college libraries in Kerala. The sample of the study consisted of students, teachers and librarians of 14 postgraduate colleges. The survey method was carried out for conducting the study. A questionnaire based on the SERVQUAL instrument was prepared for the students and teachers. It contained 85 statements in three parts. Part A included general information about the users, Part B was meant for collecting information regarding the expectations and Part C comprises the perceptions of users on service quality of libraries. Service quality was measured on the basis of the quality assessment of five dimensions, such as physical facilities, library collection, library staff, technical process and library services. Data were collected from 14 librarians, 1994 students, and 491 teachers. The collected data was analyzed by using the Mean and Standard deviation method. General analysis, dimension wise analysis, and item wise analysis of the data was conducted. It was found that the service quality of college libraries was low. All the dimensions and items reflected low service quality.

Nitecki (1996) discussed changing the concept and measure of service quality in academic libraries. The traditional concept of evaluating library quality based on the size of its collection has been changed. Nowadays, libraries are striving to identify new ways to

conceive of quality. As a part of it, SERVQUAL has evolved as an instrument for measuring service quality. The study attempted to explore the applicability of the instrument in academic libraries.

The evaluation of service quality in libraries requires incorporating the customer perspective. The users were considered as important during the mid-1980s. There are many reasons for incorporating library users for judging the quality, such as to gain insight into quality, for political benefit, to establish demand, to assess how needs are met by demand etc. though in the library field the concept of service quality has not been well developed.

The study selected interlibrary loan, reference and graduate reserve services of the main library of a large academic research library for testing the applicability of SERVQUAL in order to identify the user based criteria for measuring quality among academic library services. Three modified SERVQUAL instrument was used to assess each of the three services. The questionnaire contained an additional section in which the user was asked to allocate 100 points among the description of the five dimensions to indicate how important each feature is. The questionnaire was sent to the 564 randomly selected users of the service and 351 were returned. The result showed that all the SERVQUAL statements and dimensions were inevitable in evaluating service quality. The study suggests a three-factor structure rather than a five-factor structure as there was some overlapping between these dimensions. Reliability was perceived as the most important dimension and tangibility the least. Another observation was that the staff should improve their knowledge of answering user's questions and enhance their willingness.

The application of SERVQUAL instrument in libraries helps to develop normative measures and quality benchmark for comparing

the quality of services among libraries and also helps in identifying discrepancies.

2.3. Measuring Library Service Quality with LibQual

In addition to SERVQUAL, there are number of studies regarding service quality measurement of libraries by using LibQual. Unlike SERVQUAL, LibQual is purely designed for library quality measurement. The Association of Research Libraries has conducted numerous studies for assessing the feasibility of LibQual application in libraries and to find out few dimensions required to measure users' perceptions of library service quality. LibQUAL has experimented in the US, Australia, Canada, Egypt, England, France, Ireland, The Netherlands, Scotland, Sweden, and the United Arab Emirates (Ladhari and Morales, 2008). The following are some of the important studies that discuss the application of LibQual in libraries, its dimensions, modifications, and results.

Jankowska, Hertel, and Young (2006) carried out a LibQUAL[+TM] survey for measuring user satisfaction and expectations concerning library service quality. The study was aimed to apply customer benchmarking and assessment of survey comments so that the graduate students can be informed regarding library improvement plans. The study employed three methodologies that focused on graduate students for evaluating the survey results. The initial method, internal benchmarking, drew a comparison between UI graduate students and the UI faculty, staff, and undergraduates. Secondly, external benchmarking compared score norms of the UI student results with the whole graduate students at the 147 non-ARL libraries who took part their peers from other non-ARL libraries participating in the 2004 LibQUAL[+TM] survey. Finally, in addition to

quantitative methods, a qualitative method was also used for interpreting the survey comments.

The survey was conducted in 202 libraries from The United States, Canada and Europe including UI library. A representative sample of 2700 users, composed of 600 faculties, 900 undergraduates, 600 graduate students, and 600 staff were selected randomly according to the recommendation of the LibQUAL+™ survey team. From the selected sample, only 571 surveys returned with a response rate of 21 percent. A Likert scale was used to gather responses from the participants regarding 22 LibQUAL+™ questions of library service quality under the three survey dimensions of information control (IC), the effect of service (AS), and library as a place (LP) alongside library usage frequency, general satisfaction and information literacy. It also provides space for users' comments on library resources and services. The estimated mean of the following measures of service-the perceived level of service, adequacy gap, and superiority gap was measured making use of the results obtained from the survey.

The results of the survey enabled the UI library to understand its strengths and limitations. The 'Information Control' dimension was observed as the least satisfied dimension. The external benchmarking revealed that the services provided by UI Library marginally exceed the minimum levels of acceptable service. The study also pointed out the limitations of the library such as unreliable lower order technology, inadequate journals, outdated books, lack of proper physical facilities, non-availability of interlibrary loan and budgetary constraints. The financial problems were understood as the major issue that restricted the functionality of the library by the students. The requirements of modern technologies for accessing information, a library website with handy

navigation and electronic resources which can be accessed from anywhere were also suggested to be of great priority. The result of the study provided vital information in the strategic planning process for the library of the University of Idaho.

Thompson, Cook & Heath (2001) attempted a study to analyze the results of a web-based survey of library service quality at eleven ARL member institutions. The study examined the minimum dimensions that are needed to measure users' perceptions of library service quality. LibQUAL+, one of the new measures initiatives of ARL, was used for the study. LibQUAL+ contains twenty-two questions from SERVQUAL which assesses five dimensions of service quality such as empathy, assurance, responsiveness, reliability and tangibles and nineteen questions derived from qualitative interviews. Altogether, forty-one items were used. A total of 3987 participants from eleven ARL institutions consisting of graduate students, undergraduate students, faculty, and staff and ancillary professional personnel of which half were males and half females. The participants rated their perception of services on 1 to 9 Likert scales. Results showed that a single set of scores was one of the favorite ways to characterize customers' perception of library service quality. A range from .51 to .75 was the variation of the corrected discrimination coefficient. The alpha coefficient for the forty-one items was 0.965. Four items that correlated most with single service factor was respectively prompt service to users, employees understand needs of their users, employees who interact with users in caring fashion and having the users' best interest at heart. These results show that users' perception of library service quality can be achieved by a single dimension; i.e., service quality. Results do indicate service quality perceptions are necessary for describing the dimension of users' view of libraries.

Ladhari and Morales (2007) made a study to propose a conceptual model and empirically test the relationships between perceived service quality, perceived value, and recommendation in the public library settings. Data was collected from 439 Canadian public library users through the LibQUAL +TM 2004 instrument. A seven-point Likert scale was used to elicit responses. This model was tested Using EQS 6.1. As represented in LibQual + TM, library service quality is represented by three dimensions which are library as a place, the effect of service and information control. A high level of perceived service quality leading to a perceived service value is the suggestion given in the model proposed by the study. The study proposes that the three dimensions of library service quality such as library as a place, the effect of service and information control have a significant positive impact on perceived service value. The study also examined the relationship between perceived service value and word-of-mouth intentions. The proposed model in the study suggests that when the users' perceived service value is high, they recommend the library to others. Results showed that the item, 'library as a place that inspire study and learning' have highest correlation with perceived service value. Correlation between the effect of service and information control was positive and significant. Correlation between library as a place and information control was also significant and positive. Also, the correlation between library as place and effect of service was positive and significant and perceived service value has a positive impact on positive word-of-mouth intentions. Results show that information control, the effect of service and library as a place significantly explain the perceived value. There was a strong relationship between perceived service value and recommendation. It also supports the validity of the LibQual+TM measure and its relevance in the public library context. The study gives valuable

results concerning the perceived service value of library from the users' perspective.

Hiller (2001) evaluated the performance of the University of Washington Libraries on the basis of needs and satisfaction of users. A random sample of graduate and undergraduate students and all faculties were the participants of the survey. LibQual+ was the tool used for the survey. The evaluation contained a total of forty-one questions that used SERVQUAL plus and fourteen behavioral questions. Core questions include questions about satisfaction, service availability, library unit use, instructional needs and effectiveness, use of electronic resources, connectivity of the campus computer network, reasons and frequency of library use and information sources needed for research, teaching, and learning.

Survey results showed continuing importance of libraries as a place for students, a shift towards remote use and importance of electronic resources, high satisfaction levels and increased complexity of finding and using information for teaching, learning and research. Results have revealed significant variation within and between user groups concerning library satisfaction, use, priorities and importance. Standardized survey tool cannot effectively address the local issues of each institution. The University of Washington Libraries continue its participation in LIBQUAL+ as well as utilizing a variety of methods to assess user needs and library performance, including the conduct of large-scale user surveys.

Asemi, Kazempour, and Rizi (2010) conducted a study focused on improving library services on the basis of academic libraries in Iran. The study used the LIBQUAL questionnaire. Its objective was collection, data analysis, and assessment of library service quality from the user's viewpoint according to the LibQUAL model. Based on

the user's comments, the weaknesses and strengths were observed so that the defects can be eliminated and proposals can be provided. The printed questionnaire was translated into the Persian language and a group of specialist researchers and linguists verified its face-validity, content-validity, and reliability. The central libraries of the technical and engineering governmental universities in Teheran, including the City of Tehran University such as the Sharif University of Technology, Amirkabir University of Technology, and University of Science & Technology were used for the study. As the research community was of diverse components, cluster random sampling method was used.

From 20,600 users of the library, a sample group of 200 were randomly selected. After data collection, Gap scores were measured at the proposition level and dimension level. The analysis evaluated that "Easy-to-use access tools that allow me to find things on my own" is highest (6.32), and the lowest mean (4.64) was related to "Community space for group learning and group study". The users with access to information tools, including the library catalog, computerized lists, and databases were more satisfied. But library space with respect to the point of mass and working group has less satisfied users. The lowest user expectation is on "Employees who instill confidence in users" with a mean of 4.16. It was mostly expected that 'employees be consistently courteous' and users' expectation in this proposition was 8.57. The study observed that users are demanding well-mannered staff and a polite way of treating employees.

Creaser (2006) employed LIBQUAL organized user surveys in academic libraries. The study aimed to analyze and remark on the results of a variety of user surveys and draw comparisons from some of that work. The evaluation additionally considers the involvement

of various response rates and sample sizes on the validity of results, and problems related to benchmarking with user survey data. The analysis of responses gathered from five major user groups such as undergraduates, postgraduates, academic staff, library staff, and other staff was carried out separately. Individual libraries could decide which group of users should be included in the sampling. The responses of the library staffs were not included in the overall analysis of ARL. Nonetheless, LISU examinations demonstrate that library staffs have some response patterns which are significantly not the same as the users, especially with respect to the physical environment and the nature of the given resources. Undergraduate students had a lower response rate to the study in general, yet were more probable than other groups to utilize resources inside the library.

Their key needs were skilled staff with the capacity to acquire the texts and readings required for work. Postgraduates will probably utilize electronic assets, and their key needs were the collection, both of books and journals and having an easy to use website. The investigation found that there were fewer consistencies between libraries in the satisfaction ratings. After analyzing the data from seven libraries 'staff competence' and 'helpfulness' had the highest satisfaction. Both men and women, undergraduate and postgraduates students have distinct needs and use patterns. Students and staff in various disciplines also have distinctive needs. A good library service should have the flexibility to meet all the changing requirements and ensure high levels of satisfaction among all users.

Brito and Vergueiro (2013) measured quality evaluation of academic libraries in Brazil. The investigation discussed LIBQUAL tool developed based on SERVQUAL instrument. The survey contained 22

questions; five additional question regarding information literacy, three questions for general satisfaction and another three questions for the use of libraries and search portals. The five SERVQUAL dimensions were reduced into three dimensions namely; Affect of service; Information Control, and Library as a place. A standard methodology for data collection and evaluation based on the theory of gaps was utilized by LibQUAL+® instrument, where respondents must attribute the 22 issues a score on a nine-point scale from three viewpoints: the minimum level of service; the desired level of service; the observed or perceived level of service. The LibQUAL+® has two service gap scores. The perception score has to be somewhere between the minimum level of service at the lowest end of the scale and the desired level of service at the higher end for quality service. A radar chart was used to compute the results of the three scores (minimum, maximum, and perceived) of 22 questions of the instrument. The utilization of LibQUAL+® brought the library closer to the users developing an opportunity to move up and upgrade the status of the library in the community besides helping it in getting more economic resources for the library. The procedure permits performance evaluation, empowering the identification of best methods, including the foundation of library positioning and in addition the formation of a national library statistical database, making it conceivable to analyze factual information on local, national and institutional levels.

Pedramnia, Modiramani, and Ghavami (2011) studied about service quality in Mashhad University of Medical science Library. The investigation intended to assess the quality of services provided by the medical university libraries and analyze the expectations and satisfaction of library members about the library services in LibQual dimensions. The survey method used two different types of LibQual

questionnaire for collecting data. A sample of 402 individuals was selected from the population of internal users of 13 libraries of MUMS. The study observed that the expected rate of the users was higher than the satisfaction rate. Therefore the quality of libraries was still lower than the expected rate. The investigation points out that the greatest satisfaction was related to "service effect" and the lowest rate was given to the dimension "library as a place". The study concluded that the librarian's skill in presenting suitable services in circulation and reference area ought to be enhanced.

Rehman (2012) evaluated the service quality of public and private sector university libraries of Pakistan. The study focused on comparing four aspects of public and private university libraries: zone of tolerance for overall and individual user groups, dimension wise zone of tolerance for an overall and individual user group, gaps between desires and perceptions and significant differences in the service quality. The study utilized the LIBQUAL instrument for the measurement of service quality. The tool comprised of 22 core questions coming under the three dimensions which were the effect of service, information control, and library as a place. LIBQUAL questionnaire was used to collect data under the cross-sectional design and survey method. Sampling was conducted in two phases. During the first phase, 43 universities having central library were selected randomly. The second phase suitably selected 13 public and nine private universities and then 25 each undergraduate students, graduate students and teachers of different age, experience, department, gender and qualification.

Due to the unavailability of a complete list of the population, the convenient sampling method was utilized. Exploratory and confirmatory factor analysis was conducted to establish psychometric attributes. The users were asked to identify minimum,

expected and perceived level of services and a total of 1473 cases were finally selected for further study. If the perception scores fall above or equal to minimum scores then the services are within the ZOT.

The services which received perception scores below the minimum service level are way outside the zone of tolerance. The assessment of the result revealed that quality of services tends to be better in private sector libraries. Public sector libraries had 15 items outside ZOT and those items were related to collection, access and staff services. The highest negative gap scores were common for every user groups such as "modern equipment for easy access to information", "remote access of electronic resources", "adequacy of needed electronic resources", "printed materials" and "library web site to find information independently". The private sector had only six items outside ZOT and they were "modern equipment for easy access to information," "adequacy of needed electronic resources," "printed materials" and "library web site to find independent information." While considering overall library service variation, private sector had a wide zone of tolerance (1.77) as compared to the public sector (1.76). The study points out that the users were dissatisfied with library collection and access, the demeanor of library staff and library space for group learning. The analysis of comments provided by 309 private sector users conveyed that users were highly concerned regarding collection and access services even though they were slightly satisfied with the staff, physical facilities, and study space. The public sector faculty user group strongly communicated disappointment with electronic resources and their remote access. The study also shows that public sector users wanted proper space for individual and group learning. Likewise, they expressed worry about knowledge and behavior of library staff.

The suggestions in the study indicate that whatever point they experienced in service issue, they required qualified, well-mannered and polite staff. The remarks about physical facilities demonstrated that users of the two divisions were by and large satisfied with the library environment and physical facilities, yet a few areas like space for group discussion require prompt consideration.

Einasto (2009) conducted an investigation of service quality monitoring to support library management decisions. The study aimed at substantiating the role of service quality monitoring for service development planning in an academic library. The case study approach was carried out under the investigation of the Tartu University Library, Estonia by implementing an elective service quality instrument 'UTLibQual' for tracking the service quality. The other imperative objectives were to assess the UTLibQual instrument and attempting to discover the user's quality perceptions about the services of the library, the relative significance of the library services and enhancing improvement. A discussion conducted with two focus groups developed the UTLibQual instrument. The first group contained 12 library users including students and faculties. The second group contained 12 TUL managers or specialists from various library departments. This group was formed on the basis of service quality dimensions and indicators that was an outcome of the first focus group survey. Four dimensions of service quality were decided by the focus groups: (1) quality of information resources (2) Quality of library environment (3) quality of service access (4) quality of library staff. The measurement was done using a four-point Likert scale from the randomly selected sample of 500 users. The result demonstrated that the evaluation of the quality of TUL services limited to the zone of tolerance. Staff quality and the quality of access were rated the highest whereas the evaluation of information

and environment qualities were appraised the lowest. The study observed that the library should provide importance to those areas that are below the zone of tolerance. The study generated important information facilitating strategic planning and efficient allocation of resources.

Mcneil and Giesecke (2002) studied on improving services to library constituents at the University of Nebraska –Lincoln, USA. Around 2100 faculty, graduate and undergraduate students were selected and invited by the UNL Director of libraries through email for the data collection with LibQual+TM. From the 1850 participants who received the email, only 295 participants responded and completed the survey with a meager response rate of 15.94 percent. The emerged results from the survey pointed out the areas which met user requirements and those areas where perceptions came lower than expectations. The study also observed that from the areas that the study concentrated, five of them exceeded the expectations of the respondents such as assurance, empathy, library as a place, self-reliance, and responsiveness. From these areas such as assurance, empathy and responsiveness were found as the core strength of the libraries. The study also revealed that a negative gap prevailed among the minimum and perceived levels of service in the three areas, such as collections, reliability, and tangibles. Certain locally obtained questions used in the data collection represented that the faculty would encourage extensive technical assistance and reference support while utilizing online resources. With regard to the derived results of the LibQual[+TM], university libraries committed its efforts in significantly improving the discovered areas of concern.

Voorbij (2012) investigated the use of LibQual[+] by European research libraries with a purpose to measure the success of such an initiative. The survey was distributed through the mailing list of LIBER

(Association of European Research Libraries) by loading on Survey Monkey. The invitation to complete the survey was only given to the 385 individual libraries. The survey gathered a total of 129 responses in which only 96 responses were useful with a response rate of 25 percent. From the received useful responses, 34 respondents have been using LibQUAL as a survey instrument for the past five years, while 49 libraries utilized another survey instrument and the remaining 13 libraries even did not conduct a survey. The responses of 33 libraries were initially avoided as they failed to report whether they have conducted a user survey or whether they have used LibQUAL. The lack of proper translation in their language and lack of awareness about LibQUAL was the major reason for not using LibQUAL earlier. Efficiency and perceived opportunity for benchmarking is considered as the areas of strength for LibQUAL. From the users of LibQUAL, only 21 percent thought that the questions were relevant. The libraries that used survey instruments other than LibQUAL ranked unfriendly user experience as their third reason for avoiding LibQUAL due to the unavailability of translations and unawareness. The results of the study were reported by the libraries to their respective funders in order to display their commitment towards self-evaluation.

Moon (2007) studied LibQual+™ by conducting the survey in Rhodes University library, South Africa in the year 2005 since it was the first library in South Africa to successfully administer this web based survey. The survey was distributed to the whole university community via a link through email. The academics, administrative and support staff of the university had higher satisfaction scores for all the three questions than that of undergraduate and postgraduate students. The minimum and perceived levels of service had a negative gap between them, which clearly denotes that the library as

a place came outside the zone of tolerance. The library received a lower rating from every user group while comparing to various LibQUAL[+] counterparts from other South African libraries. The information control dimension of the Rhodes library performed exceptionally well with an overall score of 6.87, which is much higher than that of the national average for the same dimension. The effect of service was rated marginally higher than its counterparts by the academics, administrative and service staff of the library, however, this same dimension was rated much lower by undergraduates and postgraduate students. Around 5.7 percent of comments received from the survey were regarding the unavailability of space for group works. The library building received the major portion of the negative comments. Even comments were received regarding access for people with disabilities.

2.4. Quality Assessment of Libraries

There are number of ways and means to assess the service quality of libraries. Umpteen volumes of research were conducted in this field for exploring more quality dimensions and developing a standardized instrument for service quality measurement. Gap analysis by SERVQUAL, LibQual analysis, SERVPERF evaluation, Total Quality Management in libraries, Six Sigma analysis etc. were some of the important methods for assessing the performance of libraries. The studies discussed below provide an overview of the earlier attempt in quality assessment of libraries.

Suresh Kumar (2012) studied user satisfaction and service quality of university libraries in Kerala. RATER analysis based on the SERVQUAL instrument was applied for the study. On the basis of multistage stratified random sampling, the study selected student, teachers, research scholars, non-teaching staff and public as sample

from four university libraries such as Kerala University Library (KUL), Mahatma Gandhi University Library (MGUL), Cochin University of Science and Technology Library (CUSATL) and CH Mohammed Koya Library of University of Calicut (CHMKL). A total of 1000 questionnaires were distributed, 842 were used for analysis. The responses were marked by a five-point Likert Scale. The analysis of the reliability dimension showed that the statement 'Library services are provided in the promised time' is agreed by 53.9 percent and strongly agreed by 16.6 per cent, provision of information at the right time is agreed by 44.8 percent, strongly agreed by 15.6 percent and 41.3 percent agreed that the working hours of the library is convenient and 32.1 percent strongly agreed with it. In assurance dimension, the statement ' behavior of the staff members of the library instills confidence in user' is agreed by 36.2 percent, strongly agreed by 22.9 percent, courtesy of staff are agreed by 44.1 percent and strongly agreed by 15.9 percent and 41.3 percent agreed and 20.4 percent strongly agreed that staff members are knowledgeable to answer user queries. Regarding tangible dimension, the statement 'library has modern equipment' is agreed by 41.2 per cent and strongly agreed by 15.7 per cent, visually appealing physical facilities agreed by 36.3 per cent and strongly agreed by 10.7 per cent, neat appearance of library staff is agreed by 44.5 percent and strongly agreed by 23.2 percent and 41.1 percent agreed and 16.4 strongly agreed with the statement 'materials associated with library services are visually appealing'. The empathy dimension showed that the statement 'staff members of the library tell exactly when library services will be performed' agreed by 47.5 percent and strongly agreed by 21.4 percent, prompt delivery of service is agreed by 46 percent and strongly agreed by 22.6 percent, the statement 'staff members of the library are never too busy to respond the user's requests' agreed by 43.1 percent and strongly agreed by 16.2

percent, 33.8 percent agreed and 14.3 percent strongly agreed on individual attention to users and 29.3 percent agreed and 23.3 percent strongly agreed with the statement 'staff members of the library understand the specific needs of the users'. Regarding responsiveness, only 29.3 percent agreed and 23.3 percent strongly agreed that 'when the library user has a problem, library shows a sincere interest in solving it' and only 33.3 percent agreed and 15.1 strongly agreed on the willingness of staff to help the users.

The assessment of user satisfaction showed that majority of the respondents was neither satisfied nor dissatisfied with the library services and resources. The respondents have high satisfaction with the behavior of the staff and are moderately satisfied with collection, electronic resources, cleanliness, lighting and ventilation, computer and networking facility, marketing orientation of the library etc. The library wise analysis of quality and user satisfaction showed that CUSATL has high mean value (66.4) for quality and user satisfaction (30.6) which mean that the service quality and user satisfaction of CUSATL is high as compared to the other three university libraries. The lowest mean value for quality (59.9) and user satisfaction (26.8) is attributed to CHMKL, which meant that the service quality and user satisfaction of CHMKL was comparatively low. The category wise analysis of users showed that public and nonteaching staff have high mean value and the student has the least mean value, which makes it clear that the users other than the academic community have great satisfaction with the service quality of the university libraries.

The study pointed out that the users of university libraries in Kerala are moderately satisfied with the library quality and services. Besides these, there are some suggestions such as modernization, air-conditioning, digitization of rare materials, 24/7 access, virtual reference, e-mail, and chat reference systems, format the information

content for the mobile devices and provide access to catalogue, databases, information products, in-service training for the staff etc. The major limitation of the study is that there is nothing provided in the study to satisfy the objective 'problem faced by users while assessing library services'. The study doesn't address the problem faced by users of the university library.

Wang and Sheih (2006) studied the relationship between service quality and customer satisfaction at Chang Jung Christian University (CJCU) library, Taiwan. Besides this, the study attempt to find out the readers importance on each service attributes and compare it on the basis of different colleges and identities. By reviewing both SERVQUAL and SERVPERF, a questionnaire was prepared for data collection. Out of 60 samples selected only 55 were used for analysis. The sample of the study included faculty, students and school fellows of CJCU library. A five-point Likert scale was used to measure both the importance and satisfaction as well. For reliability measurement, the study applied Cronbach's alpha method and thereby reducing the number of statements from 49 to 42. In the analysis part, the respondent profile showed that 69.1 percent were male and 30.9 percent were female. Majority of the respondents are from the Institute of engineering and some are from the Institute of administration. The respondents visit the library twice a week, and the purpose of the visit is mainly for data consulting or loan collections. The analysis of the importance of service attribute of all users indicated that the top three attributes were "sufficient number of books", "providing loans and returning services" and "the overall reading atmosphere". The attributes such as "providing microcopies of data", "providing music listening areas" and "providing training courses for resource utilization" were the least important attributes. In the case of students, the top five attributes included "fine lighting

quality", "providing loans and returning services", "overall reading atmosphere", "database in good condition" and "sufficient number of books" whereas for faculty members, the attributes, "staff's willingness to provide services"" clear directional signs", " the collection meeting course needs", "the classification fitting in with all subjects" and a sufficient number of books" were top five important attributes. On the basis of regression analysis, it can be found that there was a significant positive relationship between overall service quality and user satisfaction. By dimension wise, all dimensions except 'responsiveness' have a significantly positive impact on user satisfaction. The ANOVA test was applied to identify the difference of importance on the basis of user characteristics and found that there is no significant difference between users from different institutes while there is a significant difference between users having different identities.

The study made it clear that service quality has a significant impact on customer satisfaction. There is a direct and positive relationship between service quality and customer satisfaction. With the improvement in service quality, the user is satisfied accordingly. The study recommended the improvement of lighting, computer facilities, seating, reading environment, collections, databases etc. in the library. The limitation of the study is that the responses of the staff of CJCU library are not included.

Crossno et al. (2001) assessed customer service in academic health care libraries. The objective of the study was to compare the results of a quality assessment by using the SERVQUAL instrument with other medical libraries as well as with the results of the survey using ACSAHL instrument. First of all, a pilot study was conducted by SERVQUAL for measuring customer satisfaction in the document delivery service at the University of Texas, southwestern medical

center at Dallas library. The result revealed a high perception score and high expectation score. Therefore the result was not useful for identifying areas which required the most and least attention. Besides these, the SERVQUAL instrument was criticized for its length and redundancy of information. Hence, a new instrument named ACSAHL (Assessment of Customer Service in Academic Health Care Libraries) was developed. It contained 12 statements and both the expectation and perceptions are grouped into the same page by using 5 points Likert scale. Two other academic libraries were also selected for the survey. A list of clients who used the document delivery service was prepared. Postcard alerts were sent to the survey participants to prepare them for the survey. The survey result showed that ACSAHL instrument has a high response rate (58 percent) than SERVQUAL instrument (48 percent). Out of the three libraries which participated in the survey, 'tangible' dimension as the lowest perception score and 'reliability' dimension as the highest gap was shown in library A. In-library C,' responsiveness' has the lowest perception and 'reliability' has the largest gap, while in library B, both SERVQUAL and ACSAHL showed low perception in the 'tangible' dimension, but the greatest gap is attributed to 'reliability' dimension by SERVQUAL instrument and to 'responsiveness' dimension by ACSAHL instrument. One of the limitations carried in ACSAHL instrument is its measurement scale. The five-point Likert scale used in it was not enough to differentiate between importance and expectation.

The study reflected that the respondents preferred to respond to a shortened survey instrument. Both the instruments SERVQUAL and ASCAHL produced almost similar results. The ACSAHL instrument with a seven-point Likert Scale can be applied for further research.

Awan and Mahmood (2013) discussed the development of a service quality model for academic libraries and a study was conducted at academic libraries in Lahore, Pakistan. The main objective of the study was to develop a valid and reliable service quality model for the measurement of service quality in academic libraries. The questionnaire developed by Thomas Seay, Sheila Seaman, and David Cohen was refined on the basis of focus group discussion and survey data used as the basis of the new service quality model. In the focus group discussion, librarians from 11 universities and degree awarding institutions participated and formulated a service quality measurement scale with 6 dimensions and 30 items. Due to lack of relevance and inability to conceive the content of the items by practitioners and replication of items, 4 items were deleted and 4 new items which were treated as important by the focus group participants were introduced. Seven points Likert scale was used to measure the responses. The questionnaires were sent to the librarians of 11 universities and degree awarding institutions. Out of 2000 questionnaires, 1629 questionnaires were returned with a response rate of 81.5 percent. All the items in the questionnaire were grouped into 6 service quality dimensions. The Confirmatory Factor Analysis was conducted to ensure the scale uni-dimensionality, scale reliability and construct validity. The Comparative Fit Index (CFI) value of Confirmatory Factor Analysis indicated that the model is acceptable. The RMSEA index and Cronbach's alpha value also showed that the model is good to fit. The content validity of the model is ensured by the extensive literature survey and focus group discussion. The convergent validity can be measured by the value of Confirmatory Factor analysis (CFA). The value of all the factory loadings in the CFA model lie above 0.60 and indicated that all the items have strong convergent validity. The discriminant validity of the model can be ensured by comparing the Cronbach's alpha of a

construct to its correlations with other model variables. The value of alpha is sufficiently larger than the average of its correlations with other variables, which showed that there is discriminant validity. Thus the service quality model developed through these stages is proved as good to fit by statistical measures and can be applied for service quality measurement in academic libraries.

The study provided a clear picture of how well a valid and reliable service quality measurement scale applicable in academic libraries can be developed. Various statistical measures such as Confirmatory Factor Analysis, Cronbach's alpha etc. are applied to ensure the content validity, convergent validity and discriminant validity. The scale can be applied for further service quality research.

Kulkarni and Despande (2012) studied the empowerment of library users and the establishment of the channel of communication for service quality expectations of trainers in Government Administrative Training Institute (ATI) libraries in India. The study emphasized the need for user participation in management and thereby empowering the user. The main objective of the study was to evaluate the service quality of ATI on the basis of service quality expectation, infrastructure, human resources, and financial resources. The study also attempted to develop criteria for assessing service quality and to rank the service quality attributes. The universe of the study included 29 state ATI libraries and the questionnaire is distributed to 307 faculty members of the institute. The service quality attributes were divided into five categories such as resources, staff, services, guidance, and environment. By using a four-point scale, the respondent marked the statement as most important, important, less important and unimportant to them.

In the environment part, 'silence in the study area' was indicated as the most important by the respondent. The items like, 'working condition of the equipment', 'proper lighting and ventilation', 'suitable software' etc. were also marked as important. A good library should provide proper guidance to its users to reach the required resources. Therefore 'guidance' is an important indicator of service quality in which, 'proper catalogue', 'helpful directional signs' and 'convenient working hours' were attributed as most important. The items which were marked as most important in the service part are 'updated collection', 'proper shelving', 'display of new arrivals', 'accuracy of borrower's record and support for training activities'. The proper allocation of limited resources is required for the effective functioning of a library. Therefore 'resources' is as important as any other attributes. The items like 'collection meeting the course requirement', 'collection should include census volume, economic census, NSS reports, CMIE reports, annual reports and administrative reports, proper collection development plan, documents of central and state government', 'CD and VCD collection', 'newspaper covering local national and international' etc. were marked as the most important in the resource part. The staffs in the library play an important role in providing quality services in a library. The accurate and timely delivery of information is much important when evaluating the service quality of the library. The knowledgeable staff, polite, and positive attitude etc. were ranked as the most important in this part. While ranking the five service quality attributes, the 'environment' was ranked as the most important attribute and 'services' were ranked second followed by 'resources'. The 'staff' and 'guidance' were ranked as fourth and fifth respectively.

The study made a great impact on the service quality aspects of the library. On the basis of these expectations, some recommendations

were formulated and implemented immediately. As a result, the government of Maharashtra declared its ATI library 'YASHADA' as a repository of government publications. YASHADA library Pune organized exhibition and sale of government publications. In addition to these, infrastructural development, guidance for use of library resources, proper training to staff, book clubs etc. were also done.

Wang (2007) conducted a study on evaluating e – CRM service quality in the library context. e-CRM can be defined as customer relationship management using internet technology and a database. In 2004 a pilot scheme was kick-started in an academic library at Taiwan for assimilating the impact of e-CRM in the library. The e-CRM prototype system was developed with the intention of cordial customer relations and service quality according to the group discussion conducted with the library staff, vendor etc. by system engineering methodology. The methodology utilized both the case study method and survey method. Various functions like access to the online knowledge base, interactive question and answer forms, discussion group and dynamically generated FAQs were included in the prototype. The SERVQUAL and SERVPERF were also considered as tools for measuring library service quality in the study. Of the total 21 questions, five dimensions with four questions each and one regarding the satisfaction rating of e-CRM prototype system were used. The questionnaire survey used a five-point Likert scale and was conducted online. Purposive sampling was used on the target population of undergraduate students in the Library and Information Science. Out of 43 questionnaires distributed only 37 were returned. The outcome of the study pointed out that respondents have generally highest perception scores related to 'library's trying to improve their service quality' and the relatively lowest perception scores for the 'system capable of keeping a promise'. The e-CRM

prototype system was found satisfactory only to 34 percent respondents, while 53 percent showed a neutral attitude and 13 percent providing negative views. Hence the respondent's perception was either neutral or positive. The major limitation of the study was that the size of the sample was small and bound to a particular user group.

The study excluded the responses of the staff regarding the system. It is another limitation of the study. The investigation recommends additional research for learning about user satisfaction by including staff responses and formulating a tool that can tune in to the customer needs so as to enhance the quality of information service.

Jamali and Tooranloo (2009) focused their investigation in prioritizing academic library service quality indicators using fuzzy approach at Ferdowsi University, Iran. For identifying the most relevant indicators for the user, various models were developed for prioritizing. TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution) is one of the main models used for that purpose. The research utilized fuzzy TOPSIS in order to achieve accurate ranking from the user perspective. The fundamental principle is that the chosen alternative should have the shortest distance from the ideal solution and the farthest distance from the negative-ideal solution. A questionnaire containing 56 questions regarding the significance of each indicator was distributed to 400 students who used library service at least once in a month of which 389 were returned as completed. The required data was collected from the respondents by asking them to select the importance of the indicators based on a (1-7) scale, with a ranking of 1 very low, 2 low, 3 relatively low, 4 fair, 5 relatively high, 6 high, and 7 very high. Since fuzzy set theory can represent vague expressions such as (usually, fair and satisfied), it is used to understand the vagueness of

human thought. A fuzzy set can be said as a class of objects with a continuum of membership degrees distinguished by a membership function which allows a membership grade ranging between zero and one to each object. The outcome showed that the measurement of dimensions and components of SERVQUAL inside the deterministic and non-fuzzy are limited for two reasons. One is that these methods neglect the vagueness of the individual judgments and their value changes when changed over to numbers and the other is that the evaluators' subjectivity, judgment, determination, and priority would greatly affect the results of the methods.

The fuzzy approach was used to gain more precise selection since customers' perceptions of service quality are for the most part communicated subjectively in vague linguistic terms. The study indicated that indicators that are relative to inner quality nature, for example; (enabling me to discover information myself 24 hours a day) have more significance for students. The indicators that are relative to external quality nature like (employee and place) have lower importance in improving user's satisfaction.

As per these results, a great deal of expenditures that are spent for visible and tangible indicators have minimum performance and decision makers should focus their attention to variables that are more significant. These results can be used by libraries so that they can design future strategies for improving their services.

Jayasundara, Ngulube, and Minishi-Majanja (2009) conducted research on developing a theoretical model for predicting customer satisfaction in relation to service quality at University libraries in Sri Lanka. This study also questions the effectiveness of current service quality models such as LibQUAL, SERVQUAL, and SERVPREF. Even though there are adequate resources, staffs and facilities at the

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university libraries in Sri Lanka, the delivery of quality service are still lacking. The study investigated the dis-conformation paradigm and performance only paradigm and their formulas in relation to service quality. As the intention of the research was to collect data regarding the customer outlook about service quality and customer satisfaction, focus groups and survey research method was implemented. Literature survey was used to collect most of the data.

A questionnaire was designed thereupon, on the basis of attributes identified by the focus groups. After receiving and analyzing the responses, Delphi technique (DT) was used to refine the attributes in the survey. The study focused on four universities out of the fifteen universities in Sri Lanka such as the University of Ruhuna, Rajarata University of Sri Lanka, Universities of Colombo and Sri Jayewardenepura. The study was limited to the faculties of Arts and the target population was chosen from the postgraduate and undergraduate students and permanent academic staff members from the selected universities. Four focus groups were established consisting of 10 members from each university. Discussions were conducted for each focus group with the purpose of obtaining the most important attributes that may contribute to customer satisfaction. From the quality statements gathered from focus group discussions, a list of 50 attributes was developed. Subsequently, an exploratory survey was carried out to refine the 50 quality attributes formulated by the focus groups and to recognize the quality domains so that the theoretical model can be developed for predicting customer satisfaction. This survey utilized a structured questionnaire formed upon multidimensional scaling, which is an amalgamation of Likert, numerical and categorical scales. Factor analysis was employed in this study to statistically confirm the domain structure of service quality that was distinguished by the

customers as a result of the Delphi technique. The review of the literature and the factor analysis justified the theoretical model that portrays the domains that are probably going to impact customer satisfaction. The domains described according to the theoretical model do not follow the three-domain structure of the LibQUAL and five domain structures of the SERVQUAL and SERVPERF models. The study points out that the model obtained by this investigation provides a guiding framework for understanding customer satisfaction in connection with service quality in university libraries. This theoretical model is constructed on literature and the findings from the focus group discussions and the exploratory survey and it was not verified by testing.

It can also be understood that the expectations of most of the library customers were very high regarding the quality of service of their libraries. Based on the expectations of the customers, this model provided a reference for university libraries to evaluate their performance against the eight quality domains and thirty-six related attributes related to customer satisfaction.

These quality domains and attributes must be considered by service providers and policymakers in university libraries with a specific end goal to tackle the process of improving customer satisfaction.

Dash and Padhi (2010) explored the concept of quality assessment of libraries. The article provides insight to the various tools like SERVQUAL, LIBQUAL+, ISO 11620, ISO 2789, a performance indicator, benchmarking, balanced scorecard and RODSKI etc. that are used for quality measurement in the libraries and also describe the evolution of the quality concept, changing quality concept in libraries, parameters of quality etc. The study observed that library qualities like 'performance', 'features', 'reliability', 'conformance',

'durability', 'currency', 'serviceability, 'aesthetics', 'usability/ accessibility', 'assurance/ competence/ credibility', 'courtesy/ responsiveness/ empathy', 'communication', 'speed', 'variety of services offered and 'perceived quality' are used as the criteria for measuring library quality. The study showed that the quality assessment in libraries covers the users (actual and potential), funding institutions (a university, a community), policymakers and library staff. As per the gap theory model for service quality, there are 5 gaps that result in service failures. By studying this model the service providers can understand the major issues that influence the satisfaction of customers. The article concluded by pointing out the importance of new evaluation programme along with implementing the current programme as management tools for distinguishing the services that need enhancement. Discussions have to be conducted by library staffs regarding user's needs and expectations, comprehending the service quality data utilizing their experience and recommending how the deficiencies can be attended.

Sivesan and Velnamby (2013) investigated on factor analysis of service quality in University libraries in Sri Lanka. Primary and secondary data were used for the study in which the primary data was acquired by a questionnaire. The questionnaire contained twenty-three statements for assessing the service quality and was dispensed to users (students, academic staff, and non- academic staffs) of the university library. The samples were selected from the library users of the University of Jaffna, University of Kelaniya and Vavuniya Campus. Only 232 respondents returned the questionnaire out of the 300 library users selected using the random sampling technique. The factor structure of the variable was analyzed using an Exploratory Factor Analysis (EFA). The result points out that the convenient opening hours include seven factors such as "convenient

opening hours", "promptness of the staff", "e-Journal access", "good functional furniture", "good ventilation", "need-oriented resources" and "good lighting facility" with loading ranging from 0.8 to 0.459. The eight factors such as current information, customer educational programme, personal attention, courtesy of the staff, access to computers, staff approachability, supportive atmosphere, and reflective and creative ranging from 0.677 to 0429 are available as current information. Collection comprehensiveness incorporates collection comprehensiveness, helpful directional signs and error-free record in the system with loading ranging from 0.833 to 0647. The factors like convenient access to the collection, complaint responsiveness, air condition, knowledge of the staff and audiovisual equipment are included in the convenient access to the collection with loading ranging from 0.648 to 0427. The investigation is concluded by pointing out that the quality will be for the most part characterized by the speed and exactness of reference and information services, open access to both physical collection and online retrieval systems.

The help and support from library staff are the most critical needs in a library. The effectiveness of background processes, the tradition of workshop, seminar, in-service training of newly introduced innovations and refreshment course conducted by library professional community are the most basic features for the library to adapt to globalization. The efficiency and effectiveness in delivering services of a library can be understood with performance measurement and user surveys.

Snoj and Petermanec (2001) explored the concept of users' judgment about the quality of library services on the basis of a study carried out in the faculty library in Slovenia. The study focused on the role that the librarian should perform in the wake of new information

technologies, globalization of supply, new competitors and the changing needs and expectations of users. It also pointed out the need for marketing library services. The main objectives were; assessment of the importance level and perceived level of service quality of faculty library and their differences and also assess the overall service quality and develop proposals for the improvement of library services. In order to judge the quality of faculty library services, a questionnaire with 45 items was used. A five-point Likert scale was used for measurement. The data was collected from 393 respondents including students, professors, and assistant and external visitors. The supplementary data were collected by interview also. The 45 service quality components were allocated to five groups. They are; (1) physical surroundings, ambiance; (2) equipment and information technology (3) collection (4) Information and library services (5) staff. In which, the staff group was identified as the most important service quality group and physical surroundings and ambiance, information and library services were treated as the least important group.

While assessing the items, availability of an adequate number of titles for those who demanded, ease of access to books and journals, staff professionalism, use of Internet and Ultranet, timely and updated collections, and the facility to make reservations, were of high importance. The analysis of the level of perceived service quality also observed that the group staff was the most perceived service quality group and equipment and information technology was the least. In the item wise analysis, items like the informational link with other libraries, personal appearance, and computer search for items were the highly perceived items and items like a number of study places, a number of computers and ventilation in the library were the least perceived items. The analysis of differences showed that in the

individual items, the highest difference is found in ' the adequate number of copies of titles' and in 'the impact of users on the forming of the collection'. This is mainly because of the librarian's absence of knowledge and lack of communication between librarian and users. In the group-wise category, the highest difference exists in equipment and staff.

Through the study, the respondents recommended for a new enlarged library capacity, better ambient conditions, more efficient equipment and information technology, more computer units and books, longer opening hours etc. The major limitation of the study is that it was confined to the sample users of faculty library in Slovenia and purely depended on quantitative methods.

Grieves and Halpin (2014) discussed developing a quality model at Sunderland University, UK. The model focused on offering solutions and differences rather than offering services and products. It was purely customer-centric and emphasized on quality improvement through the customer himself. The customers were treated as active agents instead of passive recipients. All staffs have personal responsibility for improving the quality and impact of their work. They must have a proper understanding of what are the services offered, to whom and why.

The quality model required the maintenance of a collection of impact evidence as part of performance management, in which the contribution made or the impact of the service provided should be highlighted. The model was based on the seven-step strategic marketing toolkit developed in 2007, which included; focus on the customer perspective; to aligning service planning with strategic priorities; identifying customer segments, their needs and expectations of us; meeting these expectations with benefit-based

service offers and managing customer relationships in order to capture and articulate contribution. Besides these, the 9 quality premise launched in 2008 restructured and was included in the quality model. They are; customer care, customer support, skills for learning, resources, learning spaces, equity, knowing your customers, feedback and communication. This model functions mainly on outcome rather than output, intangible things, transparent feedback mechanism, etc.

The new quality model employed the principle of enabling the customers for articulating and demonstrating the contribution made for them among the peers and stakeholders. Proper coordination and leadership is essential in carrying out the quality model. A quality promise timeline for the academic year is very important, which represent the core themes such as timings, articulated benefits, specific service promotions, and delivery methods, impact capture mechanisms and staff development. A quality promise brand is also equally important.

The study attempted to develop a new quality model which made the customers as advocates of the service benefits to all others. The model has made a great impact on cultural change and developed customer relationship.

Kaur (2006) explored the concept of quality management service at University of Malaya library. In response to the criticism regarding the quality of graduates produced and poor management and services offered, University of Malaya, decided to implement Quality Management System (QMS), including the university library also to be part of it. The University of Malaya library attempted to satisfy the ISO 9001-2000 quality management system requirement by providing quality services and customer satisfaction. The successful

implementation of QMS depended on factors like (1) management commitment, (2) communication (3) library quality committee, (4) resource allocation etc. Proper human resource management and finance were also essential. After the implementation, the library mainly focused on the stability of the system and surveillance and continual improvement. Work manuals were prepared for giving proper instruction.

The two main objectives listed in the quality manual were; acquisition of 80 percent of the resources listed in the reading list and providing user education to undergraduate and postgraduate students in the field of information skills. These objectives are reviewed and currently modified to include service-oriented objectives in order to improve customer satisfaction. The university library identified the following major areas through which the quality objectives can be identified, they were; (1) Management responsibility; (2) Resource management; (3) Product (service) realization; and (4) Measurement, analysis and improvement. Customer satisfaction is ensured at regular intervals. A suggestion box and a customer satisfaction form were accessible at the library. Each complaint or suggestion was discussed and resolved and is then communicated to the concerned person. An internal audit was conducted to ensure conformity and effectiveness, to check whether the planned activities were carried out and the result was achieved.

Continual improvement project has been carried out for maintaining quality management. In order to promote the usage of electronic resources, a project for 'promoting the usage of online databases' was initiated. Another project for supervising staff and efficient shelving was also launched. The project won a bronze medal in a competition.

The study depicted the procedures and activities carried out by the University of Malaya Library for implementing QMS and thereby attaining ISO 9001-2000 quality management system accreditation. It pointed out that management's commitment, conducive environment and good relations with customers etc. were inevitable in quality assurance.

Konappa and Chandran (1998) investigated about service quality in district central library at Kadapa. The study focused on measuring the quality of services at the central library and to determine the perceptions and importance of service quality attributes of the users. The SERVPERF model was used for the measurement of service quality. Only 94 questionnaires were completely filled and returned out of the distributed 100 questionnaires which contained around 20 closed-end questions. A five-point Likert scale was utilized for calculating the satisfaction and importance of every aspect of service quality as per the users. The complete evaluation of the gathered data revealed that "availability of computer terminals without excessive waiting" and "waiting time at circulation desk" were regarded as the most important aspect of service quality, however, it is also the least perceived aspect of service quality. Further, the study also revealed that the inability to recognizing the most significant aspect of quality service in the library resulted in poor customer satisfaction. As an outcome, every effort to provide satisfactory service failed.

The study acts as a framework for enhancing the service quality of the district central library, Kadapa according to user expectations. An inadequate financial resource is a major hindrance in offering and fulfilling quality services. As the knowledge regarding library user expectations has become more important, user satisfaction has

turned to be the key performance indicator which is extensively used for quality measurement.

Pinto, Fernández-Marcial, and Gómez-Camarero (2010) studied the impact of information behavior in academic library service quality at the Spanish University of Science and Technology libraries. The study aimed at discovering viewpoints of faculty and researchers in the area of science and technology services provided by university libraries and recognize new trends. The investigation also analyze the relationship between information behavior and the prerequisite for quality library services. The research was conducted in various stages with the implementing phase containing both qualitative and quantitative methods. It consisted of individual interviews, 6 focus groups, and 400 questionnaires with the participation of faculty and students. The analysis of the first survey conducted among the students of science and technology revealed that their information behavior is very poor. The students hardly use the books, journals or databases. Considering the direct relation between experience and evaluation, students were not included in the second stage. The BiQual instrument used for the study constituted of 44 items divided into five sections. BiQual was formulated as a specific library quality service tool for science and technology. It was designed on the basis of five quality service dimensions like service accessibility, functionality, communications, use, and value-added services and trends.

The last section of the questionnaire invited ideas and feedbacks in the areas that needed improvement. The results were presented for the three fundamental questionnaire blocks. First, the two variables, importance, and satisfaction were analyzed. Second, the level of utilization of the service is depicted. Finally, the trends characterized by the users are explained. The dimension having the highest

importance is collection accessibility. According to the analysis of the satisfaction variable, the mean level of satisfaction is lower than importance. The two aspects valued as the most important were the ease in consulting the Website and accessing journals. The parameter "scope and existence of the audiovisual collection" has the lowest satisfaction and importance rate. As per the reference value, 3.85 for satisfaction and 4.35 for importance, the nine most exceptionally valued parameters are those that lie above the mean for satisfaction. Even though a great level of significance is credited to journals, the level of satisfaction expressed with them seems to be low. 'Ease of obtaining documents not found in the library', and 'efforts to improve OPAC user friendliness' has a low level of quality. The highest number of responses directly points out to the need for raising the libraries printed collection. The use of electronic information is the second most desired aspect as the majority of the users communicated a high enthusiasm for accessing a greater volume of digital information. Some respondents also raised the issues regarding training of the librarians. The conclusion of the study states that the significance of university libraries becoming resource centers for learning and research in the future and a full-fledged library model that develops online materials and provides personalized assistance as per request.

Chen and Chou (2011) studied on applying GRA and QFD to improve library service quality. Quality Function Deployment (QFD) empowers in comprehending customers' requirements for products and thereby relating them to formulate specifications through House of Quality (HoQ). It can be utilized to enable organizations in understanding and fulfilling the requirements of their clients' with their own capacity and resources. Grey relational analysis (GRA) is commonly used in Asia and is used to effectively handle certainty,

multi-input, and discrete data. The study aims to amalgamate concepts of QFD and GRA for creating a model that increases library service quality. Therefore the first needs of the reader and their importance and satisfaction degrees were examined via questionnaires. The questionnaire consists of a first part that concentrates on respondent's background and the other one on readers' needs. Based on SERVQUAL, 20 services were selected that constitutes readers' needs. Firstly, a five-point Likert scale is employed to present the level of importance in the questionnaire that evaluates readers' perceptions towards each attribute. Second, service betterment strategies for fulfilling the reader needs were created by interviewing experts. The study identifies top 5 reader needs and service improvement techniques separately and some viable recommendations for library managers regarding knowledge management, staff education and training, operating standards and prevention mechanisms. The suggestions incorporated that conducting review meeting on a regular basis as one of the techniques of knowledge management to fortify the capacity for organizations to progress, prevent and react. The complaints and service failures can be evaluated and understood through review meetings thereby educating staffs regarding the issues.

The study observes the importance of implementing a total service improvement plan with staff education and training being an integral part of it. Selection of staff members by considering qualification and competence can make sure high service quality. Quality models fill in as the overall estimations for internal assessment or from readers' points of view. Management has to observe the reader activities and conduct random interviews for investigating their needs. Proper formal procedures should be carried out while processing reader

complaints or recommendations and the result must be provided as feedback to them.

Mulimani and Jange (2013) assessed the service quality of public libraries in Maharashtra. The study attempts to identify the mentality of local people towards the dimensions of service quality. The main objective of the study was to examine the relationship between the service quality dimensions and service quality of public libraries of Maharashtra. Other objectives included assessment of visiting and behavior pattern of public library users, customer expectation and perception of academic libraries, the gap between expectations and perceptions, the variations in expectation and perception on the basis of their subject and user categories, the nature of complaints of the users etc. The study also discussed different tools such as SERVQUAL, LIBQUAL, TQM etc. and explored the concept of service quality and its dimensions like reliability, tangibles, responsiveness, assurance, and empathy. By factor analysis, the factors influencing service quality were identified and divided into three groups such as the factors related to the library environment, factors related to information dissemination and factors related to library personnel. The study suggested the proper utilization of services and their reach to the target group brings in good results and leads to development.

The study is more relevant because there are not many studies on the service quality of public libraries in India and which is also useful for providing information to the government for further development of the public library. The major limitation of the study is that it doesn't cite anything satisfying the objectives.

Carvalho and Dominguez (2012) researched about new challenges in the library service delivery in Portugal. The study enabled to

distinguish those areas in UTAD library which needs to be improved for providing quality services. A survey containing 20 questions including 15 closed and 5 open was carried out for evaluating the perceived quality of library services and indicating relevant factors with respect to user satisfaction. The collected sample contained 820 users of UTAD's archival service libraries which represent nearly 10 percent of the total number of student. The questionnaire was divided into three sections with the first section intended to collect information about the profile of the user, the second part evaluates the type of services that satisfy the needs of users and the third part evaluates the satisfaction of users as well as the quality of service delivery based on SERVQUAL, LIBQUAL and BIQUAL studies.

The result of the survey points out that the majority of the users do not make proper use of the library. Fifty percent of the researchers do not use any library services because of the failure in updating the library collection due to lack of investment. The key library services such as the provision of general information services, the bibliography, interlibrary loan etc. have only average satisfaction. When the overall satisfaction level is considered, 58.2 percent of respondents agreed that the majority of services are great and 38.2 percent reviewed it as satisfactory. The quality of general information provided by staff, the responsiveness of available bibliographic collection, quality in a personal consultation, bibliographic scarcity, opening hours, gender etc. has great impact on the quality of services provided by the library. The main challenge faced by UTAD library is the lack of support for innovations and creativity.

The study observes the need for redefining the functions and services of UTAD library thereby enhancing user independence. There should be a proper investment so that the collections of the library can be updated accordingly.

Ghosh (2003) studied service evaluation in a special library at the Institute of Social Science Library, New Delhi. The study intended to provide a useful model for another special library so that they can deliver quality library services. For performance evaluation and assessment of library services like issues and inquiries, general computer and technology and so forth was identified and subjected to numeric measurement. The measurement of quality of service was done using performance indicators. The number of services provided was compared with other libraries. The case study describes every functions and service provided by the library including the core library functions such as electronic catalogue, computerized circulation, reference and information service, access to internet etc. and various specialist services like periodicals indexing, documentation services, CAS, SDI, interlibrary loans, newspaper clipping, photocopying and document delivery etc. The evaluation also explains about the special features of the library like nature and type of resources, nature of library users, nature of information processing and management activities, nature of queries, nature, and type of services provided etc.

The ISS library has a significant role in supporting all the research activities of the institute. The study observed the quality of such services and the effectiveness of such an approach to special library assessment. The excellent service quality provided by this library is a useful model for other libraries. The special libraries are concentrating more on electronic services than normal libraries.

Simmonds and Andaleeb (2001) assessed service quality, resources and user characteristics in academic libraries in Erie at Pennsylvania. It examined whether and the extent to which service quality factors alongside resources and user attributes impact library

usage. The research was conducted on the basis of an earlier study, where they investigated the relationship between library service quality factors and user satisfaction. Two items were considered for evaluating the data using a seven-point Likert scale namely: "I use my library a great deal" and "I spend a lot of time at the library." Secondary literature was referred by the researchers to understand library service quality and user satisfaction. Data was accumulated from the users of the library during the study period by using interviews for knowing their perception.

Systematic sampling was used to dispense questionnaires of around 210, out of which only 188 were returned. Multiple regression analysis was utilized for evaluating the data. According to the study, only one among the service factor tangibles has an important impact on library usage while responsiveness, competence, and demeanor of the staff hardly have any major effect. It was also found that in general, females use the library more than males.

The study observed that familiarity with the library and its resources greatly influences the users in a positive way. Those who are more acquainted with the library will probably utilize academic libraries. The study suggested that those academic librarians must observe the necessities of the academic environment by focusing on academic institution's educational modules, resource necessities of teachers, student's preferences for information packaging and related general use of information like career planning and development.

Nzivo (2012) conducted a study on user perception in library services and information resources in Kenyan public libraries. The Kenyan public libraries had a great role in empowering the Kenyans irrespective of their age, gender, education etc. The study assessed the use, familiarity with, favorability and perception of libraries and

also the barriers encountered by adult users. The methodology used was survey method. The samples selected were 150 adult users from Nairobi Area Library and the questionnaires distributed to them. With a response rate of 75 percent, 112 questionnaires were returned back.

The collected data revealed that the majority of the users of the public library were in the age group of 15-25 years old. The respondents also included lawyers, administrators, businessmen, accountant, medical professional, IT professional, researchers etc. The result made it clear that the majority of the users of Kenyan public libraries, when they started searching for information on any topic mainly depended on traditional library documents like books rather than electronic resources of the library.

As the respondents spent more time to search the resources, the study identified the need to introduce varied search sources to enhance their information needs. The result regarding library usage indicated that 84 percent was visiting the library for reading newspaper and periodicals, 81.8 percent visited for study purpose, 77.2 were for socializing with friends and classmates and 75.2 were for general reading. The user responses showed the need for developing a service relationship with customers. The internet usage was indicated by 63.3 percent and was mainly used for research purpose. The Kenyan library users were not familiar with databases like Emerald, EBSCOHost, etc.

The location, reading environment, staff, seating and meeting area, reference service, etc. of the Kenyan public libraries are positively perceived by the users except for special programs. The major barrier faced by the respondent was that most of them lack internet usage skills.

The services and resources of Kenyan public libraries were positively perceived by its users even though the study implied the need for providing a proper user education program for developing internet usage skills of the users and also stressed the importance of online tools in marketing library services, programmes, and special initiatives. Although the collections meet the requirement of the majority of the users, it has to be improved to satisfy others also. The major limitation of the study was that it is confined to adult users.

Quinn (1997) explored the concept of adapting service quality to academic libraries. The study emphasized the significance of assessing service quality in libraries and discussed various methods used for measuring customer expectations and perceptions like conducting customer surveys, needs analysis and information audit. It was also observed that, since the customers define the quality, the services should be in the customer's point of view and should meet their expectations. The article suggested the methods by which quality of services can be enhanced (1)measuring customers service expectations along with the customer's perception of service, (2) improving service and lowering costs, (3) showing customers respect, and (4) paying more attention to the overall atmosphere or ambiance in which the service is provided. The article pointed out some of the assumptions and limitations of service quality model such as the losing relevance of academic libraries, severe competition with huge bookstore chains and commercial document delivery services also being a threat to academic libraries. The service quality model was originally designed for a commercial environment. Though being a limitation it does not define that the model is not suitable for an academic library.

As the satisfaction of customer needs is primary in quality service it does not seem to fit readily with the academic library environment.

Even though the librarians can learn many things from the business sector the goals and methods of academic libraries are much more complicated than that in business. Numerous organizations devote substantial time and exertion in training their employees that will be involved with the general public and such programs could act as models for libraries and library schools intrigued by enhancing client relations and, eventually, customer satisfaction. The study also observed that other areas of the library aside from reference services can be utilized by accommodating service concept.

The library collection can be made more receptive by reasonable utilization of user studies that bolster collection in highly used areas and not avoiding less popular areas. The study also says that the service environment of the libraries can be improved to an extent by implementing various effective marketing and promotion methods used by bookstores, thereby grabbing the attention of users. The investigation reached a conclusion that the many limitations possessed by the existing model in its original form can be overcome by implementing service quality concepts to the academic library system.

Jayasundara (2015) conducted research on customer satisfaction in academic libraries in Sri Lanka. Different quality domains were evaluated in the study so that further quality improvements can be done to the Sri Lankan university library sector. A questionnaire was prepared considering the previous study which recognized 52 quality attributes in order to identify the degree of perception/significance of the service quality attributes that were applicable to university libraries in Sri Lanka. The total number of subjects for the sample survey was decided upon the method of five subjects for one attribute. Considering the contingency rate of 5per cent, 263 subjects were used instead of 250 as the sample. Only 242

questionnaires were returned out of the 263 after completion with ample responses and a 92.01per cent response rate. Delphi technique was applied in the study.

The quality attributes were grouped and evaluated by a panel of experts and further categorized the attributes into relevant conceptual domains based on their expertise. These generated seven conceptual domains such as the effect of service personnel, building environment, collection and access, furniture and facilities, technology, service delivery, and web services. The conceptual domains were tested using factor analysis technique applied to PCA and Varimax rotation in order to identify the statistical correctness.

The result of this study reveals that customer satisfaction from a service quality aspect is rather more complex than the idea provided by current tools like LibQUAL, SERVPERF, and SERVQUAL. The university libraries can evaluate their performance using these domains as a reference framework. The domain structure of the model is exclusive and it cannot be observed in other generic models. The research concluded that there is no universal hypothetical model in order to measure customer satisfaction related to service quality as there are numerous limitations and problems with SERVQUAL, SERVPREF and LibQUAL models.

Martensen and Gronholdt (2003) studied on library users' perceived quality and satisfaction. The study endeavor to determine the level of users' perception of library value, individual satisfaction and loyalty, the degree of interactions among these perceptions, and the degree to which nine basic elements of library services, collections, and environment contributed to these perceptions. Based on the literature studies, focus group discussion and experiences from the European Customer Satisfaction Index (ECSI), the model for user

satisfaction and loyalty was formulated. The model concept of the study can be specified as a structural equation model having nine latent variables. Measurement of the nine latent variables was done by a set of variables observed according to the survey questions. The latent variable 'user satisfaction' was estimated by three indicators experimentally observed by the three questions that have dominated theory and practice inside customer satisfaction measurement. Each question was intended on capturing various aspects of an underlying satisfaction perception. The study was conducted on five Danish libraries out of which four were university libraries and one public library. The questionnaire consisted 60-70 questions for each library with twenty three of these questions being common for all libraries. The remaining questions were library specific, capturing specific dimensions of the six determinants. A 7-point scale was utilized to assess the users' degree of agreement with the statements representing the nine latent variables. Around 1900 users participated in the study and data was gathered from both students as well as faculties. The gathered data from the questionnaire was examined with statistical technique Partial Least Squares (PLS). The investigation observed that three relationships stay unconfirmed such as the direct impact of 'electronic resources' and 'collections of printed publications' on user faithfulness and 'other library services' on 'user satisfaction.'

The result points out that 'collection of printed publications' has an immense effect on 'user satisfaction'. Therefore, user satisfaction is primarily based on 'collection of printed publications' and 'library environment. The impact of staffs' service only comes to about half of the size of 'collection of printed publications' and 'other library services. 'Electronic resources' and 'technical facilities' also has a major role in creating customer satisfaction. Loyalty can only be

improved if the management is skilled enough to motivate the employees in providing professional guidance to the users, available when the user needs help, avoid delay at the lending counter etc. The study concluded that the results were used by the participating libraries for preparing future planning directives regarding collection and services and to determine the areas where more emphasis is needed.

The Danish National Library Authority plans to execute the presented methodology as a cornerstone for national library measurement and management system which enables other libraries to implement and to present data for enhancing the continuous improvements of library resources and services.

Raza and Sohail (2012) measured the service quality of Dr.Zakir Husain Library, in New Delhi. The study aimed to decide the perceptions of the library's clients as they relate to quality service and to determine how far they have succeeded in delivering such service to its clients. The questionnaire-based survey method was used as the methodology. The investigator personally distributed 150 questionnaires to a scattered population consisting of students of various universities and received 120 completed questionnaires with a response rate of 80 percent.

Simple statistical methods such as table and percentage were used to analyze, classify and tabulate. The questionnaire indicated six determinants of quality service with each section consisting of an open-ended question, which enabled the respondents to evaluate the overall impact of the given criterion/criteria of quality service. The closed-ended questions were prepared in such a manner that it solicits responses on a five-point Likert scale to assess respondent satisfaction and perception of service quality. The result of the

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investigation uncovered that the college library has not been effective in its plans for providing quality services. The respondents expressed that they received an average quality of services. The positive response of service quality dimension in library showed that 'tangible was the highest (70.62%), followed by access, (61%), reliability, (59.50%), assurance (56.50%), responsiveness, (52.91%), communication, (52%)' and the negative response for service quality dimension in the library is 'maximum access factor, (37.20%), followed by both reliability and communication, (32%), responsiveness (28.33%), followed by tangible, (27.50%), assurance, (26.50%)'. Those responses unsure about service quality dimension in library 'responsiveness dimension with the highest percentage (18.75%), followed by communication, (16%), assurance, (15%), reliability, (8.50%), tangible, (1.87%), access, (1.50%). The conclusion of the study revealed that Dr.Zakir Husain Library has organized several programs for improving its services, failing to identify major aspects of service quality in their customers' ideas. The endeavor for providing customer satisfaction has been a failure to a great extent.

The investigation was aimed at helping the planning staff of JMI Central Library for formulating the improvement programs so that it enhances users' perception in the services offered.

Hallberg and Zackrisson (2010) examined the improvements of public library service quality. A study was conducted at the library and study centers in Sweden and England. The study focused on changing the role of the librarian in a way that contributed to the improvement of the public library and enhanced the interaction between the customer and the librarian. There were two studies conducted complimentary to each other. Study A covered libraries and study centers whereas study B covered library and adult education setting. Study A selected three libraries in the country of

Ostergotland, three study centers in England compared to two integrated libraries and study centers in England, namely Idea store in London and Dover Discovery center in Dover. Study B focused on interviews with Swedish library at public libraries and pedagogues in adult education in the countries Ostergotland and Smaland.

In study A, the interviews were analyzed by clustering. In study B, the analysis was done by a qualitative approach which is based on information retrieval process. Result revealed that the librarian lack insight regarding customer expectation. There was a great difference in Swedish librarian's an English librarian's roles. While comparing with English librarian, Swedish librarian lacked knowledge of customer interaction. Both the studies identified the role of the librarian as contact creator, inspirer, and process-oriented librarian. The study also reflected that the Swedish library lack knowledge of the market. The overall functions of English library were excellent which provide a suggestion for improvement of the Swedish library.

Thapisa and Gamini (1999) studied about service quality perceptions of University of Botswana library. The objectives of the study were to identify the students and staff perceptions of quality service of the library, to assess whether the library met the quality expectations of the users, to observe the differences in perceptions of graduate and undergraduate students regarding quality library service and also provide some recommendations to improve the quality of service. The sample selected for the study included 300 students and 100 faculty staff by stratified random sampling method. The questionnaire was distributed to 60 students and 20 teaching staff in each faculty. Besides these, another questionnaire was distributed to all 22 professional librarians working in the library to collect data about their perception towards quality service provision.

The result showed that there were significant differences in the quality perceptions of graduate and undergraduate students and also among various faculties. This made it clear that the status of the respondent also affects the information seeking behavior and quality perceptions. It also showed a significant relationship between user friendliness of OPAC and reliability of information, accessibility of information and user-friendliness of OPAC, CD ROM manuals and user-friendliness of CD ROM.

The users of Botswana University library have positive views about the services provided by the library except for the OPAC service. Users were not familiar with OPAC functionalities. Therefore a user education program should have to be provided to avoid such intricacies. The study stressed the importance of user-driven services by evaluating all its approaches to service, set performance goals, solve and prevent problems and communicate feedback to both its internal and external customers. The communication system should be improved to give publicity to the services available in the library. The study suggested that there should be a comprehensive information program focused on the needs, activities of the user's curricula requirement and research.

Albu, Cristian, and Pistol (2012) discussed some important aspects regarding the application of quality principles in the university library. Quality of service depends on the extent to which the service delivered meets the user's needs and expectations. The paper emphasized that total quality is the need for the effective functioning of a university library. It can be represented as a set of methods organized under a global strategy with an aim at satisfying the users' need for information. The total quality can be achieved through the combination of three important factors such as user's demand for information, user's need for information, and other library offers. The

article lists out some important methods for applying quality principles in libraries such as Total Quality Management, The WWWWHW method, and SWOT analysis. Total Quality Management is a method to achieve total quality in which the central focus is given to the user. It is a long-term strategy for quality enhancement. TQM in university library aims at meeting users' needs, attaining competitive market position, participative management, and long term quality improvement. The WWWWHW method involved a number of questions and the answers to the question provided a framework for quality improvement in the library. The questions included; 'what do we want to accomplish? What types of users are there? What is their educational background? What is their social status? What do we intend to offer our users? What is the role of the library? To inform?, To influence?, To train?, To convince?, Who is in charge of the tasks?, Who monitors the task implementation? Who are the users of the library services?, Where does the action mainly take place?, When do we act? When should we act? How is the library organized?' etc. The article provided some suggestions for quality improvement of university library like improvement and diversification of services provided, user-oriented collection, stocking, processing and organization of collections, collection preservation, improvement of existing technical–material equipment, acquisition of modern means of information on a national and international plane; continuous development of staff professional training; participation in internal and international events etc. All these are necessary for the effective functioning of a university library.

The article explained the quality principles of a university library. Quality principles and policies are required for the smooth functioning of every library. The paper stressed the importance of long-term quality enhancement through the application of such

principles. Proper quality monitoring and efficient feedback are necessary for continuous quality improvement.

Hernon and Calvert (1996) attempted to develop methods for measuring service quality in University libraries in New Zealand. Main objectives of the study were to produce a set of statements which better represent user's expectations, suggest new ways to review the library's present situation and also identify a multi-method approach for measuring service quality. The study developed a survey instrument based on the components identified in Hernon and Altman's service quality in academic libraries. A pretest with 15 students at the department of library and information studies at Victoria University was conducted. Focus group interviews with seven university libraries in New Zealand were also part of it and 69 librarians participated. After that, the instrument was revised with further changes. Another pretest with 500 library users at two universities in New Zealand was again conducted.

On the basis of the findings of the final survey, a focus group interview was conducted with selected customers that reflected their reaction on customer's expectation. They responded reluctantly towards expectations like a particular time frame for providing services like interlibrary loan, other materials etc. It's recommended that the time taken to find a particular material or interlibrary loan should be checked and thereby try to avoid such problems.

The instrument did not include any demographic variables that can be adapted on the basis of the nature of the library. The new instrument helps the librarian to be aware of what customer regards as the most important and which areas need to be improved.

Pitt, Watson, and Kavan (1995) analyzed the viability of Information System (IS) effectiveness based on service quality. As the IS

effectiveness is a multidimensional construct, multiple measures are required for observing IS success. These measures were grouped into six categories after ascertaining that they define the IS success model, specifically system quality, information quality, use, user satisfaction, individual impact, and organizational impact. User perception of the quality of the IS department's success points out the IS success. The IS department and a particular information system are the two conceivable units for analyzing IS service quality. This study stressed the importance of including service quality while measuring information system effectiveness. User conversations and stories regarding their experience with the IS department contribute to shaping their expectations about IS service.

The study indicates that the Vendor advertisements, presentations, and sales pitches can in many instances impact users' expectations. The measurement of Information System effectiveness was done using the modified SERVQUAL instrument. Before utilizing SERVQUAL, it is important to evaluate its validity in an IS setting. A modified SERVQUAL instrument was issued among three organizations- "a large South African financial institution (n=237)" "a large British accounting information management consulting firm (n=181)"," and a U.S. information services business (n=267)" for gathering data for validity assessment. Based on validity assessment, "content validity", "reliability", "convergent validity", and "nomological" and "discriminant validity" etc. were observed upon. On the basis of three studies, the collected data was evaluated separately in order to decide the number of factors to extract. The study shows that SERVQUAL has content, reliability and convergent validity. Even though there is some variability with "nomological" and "discriminant validity" it is still an acceptable measure of IS service quality.

2.5. E-Service Quality Measurement in Libraries

When ICT became a significant part of a library, many of the library services were transformed into e-services. Due to the accelerated development in ICT, e-resources and e-services play an imperative role in providing quality services in libraries. Radical metamorphoses in the discipline of information and technology in the two decades of the 21st century have revolutionized the idea of a library all over the world, altering the very concept, organization, functioning, and management of library information systems. Recent technological advancements aided the management of this explosive abundance of information. Libraries all over the world resorted to the aid of innovative technologies to offer better and quicker access to the reservoir of information effectively and efficiently to the users. The use of information technology in library management has helped in effectively resolving the crisis libraries face, resulting in a boost in the efficiency and productivity of the libraries, transforming them into places of excellent service. Quality evaluation of libraries cannot be accomplished without proper evaluation of e-services. But there has been no published instrument focusing exclusively on e-service quality of libraries. The below-given studies analyze e-service quality of the libraries, measuring its efficiency and evaluating the obstacles it faces, its dimensions, the impact of the use of information technology in libraries, and the effectiveness of the library websites in providing quality services.

Ladhari (2010) conducted a review with the concept of developing e-service quality scales. The literature analysis discussed the various issues associated with the development of e-service quality scales such as issues of adequacy of dimensions of e-service quality and methodological issues in developing e-service quality scales. The study revealed the incompetency of traditional SERVQUAL model as

a comprehensive instrument for the evaluation of e-service quality. The databases such as "Science Direct", "ABI/INFORM" and "EBSCOhost" were used to retrieve the studies selected for analysis. Only those studies that focused on the development of an instrument for the measurement e-service quality were included and were put through a complete in-depth content analysis of the major methodological aspects for the development of different e-service quality scales and their proposed dimensions. This revealed various relevant observations with regard to the dimensionality of e-service quality construct while including the recognition of many common dimensions of several e-service quality scales and some limitations related to the development of e-service quality scales. The identified methodological issues were issues associated with research methods, sampling methods, service industries, survey administration, generation of items, analysis of dimensionality, scale reliability and validity. The study clearly recommends the use of qualitative research during the preliminary stages of various methods like critical incident method by the researcher while developing electronic service quality management scale.

Si, Wanigasooriya, and Ranaweera (2017) investigated the service quality of university libraries of Sri Lanka. The study focused on identifying the important aspects of current e-services and the assessment of dimensions of e-service quality under various dimensions. The web-based method was used for evaluating the quality of provided e-services. Purposive sampling method was implemented in order to select 15 university libraries and their contents were scanned and analyzed by utilizing the survey developed on the basis of various studies from the year 2000. The e-services were analyzed using a 62 item checklist, out of which 47 items were utilized to assess accessibility, currency, accuracy and

the speed of websites, whereas the remaining 15 items assessed website features. According to the study, neither the libraries had the surveyed 62 items nor did they adopt an effective approach for the marketing and promotion of e-services. It was also observed that, even though library websites gave importance to general information of the library, they lacked the attention on user education and information literacy programmes. The result of the study showed that 73.33% of university libraries provided its users with web OPAC search facility and 46.7% of libraries had updated the website information at least by 6 months. The study also revealed that the users only had scanty chances to provide feedback and suggestions and therefore the study suggests the adoption of appropriate measures for receiving proper user feedback.

Aharony (2012) assessed the websites of American academic libraries through the period of 2000 to 2010. The research was focused on finding the differences in the content of academic libraries during the period and to understand the current shifts and tendencies of LIS communicated through websites. In the first phase of study 31 academic libraries were selected which had a current homepage that appeared in the Internet Archive during the year 2000. The second phase constituted of a content analysis of the academic library websites during both periods.

The study points out the drastic change occurred over ten years regarding the content of academic libraries. Another revelation was the limited use of date updation in 2010, which was even less in 2000. The investigation also signifies that the libraries were able to understand the importance of site search in assisting the users with the navigation and usage of the site in both periods. The websites are used as a tool by libraries in marketing services and sources to prospective users. The academic libraries offered a wide variety of

resources in 2010, whereas in 2000 the libraries focused mainly on bibliographic databases and had limited resources. This proves the growth of library resources over the years. When the usage of e-journals has become a trend in 2010, it was not common in 2000. In 2010, academic libraries have started focusing more on value-added services. In order to sustain and survive the fierce competition from other internet resources, libraries have begun implementing new technological application and platforms.

The emergence of new tendencies can be clearly seen while observing the current shifts and tendencies of LIS communicated through academic library websites. The e-journals and Web 2.0 application has witnessed increased usage. The study also suggests the need for further research with public library websites and academic libraries from other countries with a period of 10 years for accomplishing an extensive range of changes in library websites.

Halub (1999) discussed the value of Web-based library services at Cedars-Sinai Health System. Web-based services such as Web-based MEDLINE interface and OPAC was started in 1995 and full text online journals and textbooks were added in 1998. Initial pages of the website were created with the help of Hot Dog Web authoring software produced by Sausage Software. An annual user satisfaction survey was conducted and results showed that users value web-based services very effective as it saves their time and made it convenient to access the services whenever they needed.Ovid MEDLINE and other databases are available twenty-four hours a day and a link to Duke University's interactive Ovid MEDLINE tutorial is provided on the website and a total of 120 full-text journals are available online and staff members can be reached via e-mail link seven after the library hours. Web-based service has increased the value of the library and librarians can save time which in turn can be

used to provide other beneficial services to the users. Web-based service has increased the reputation of the library by providing innovative and progressive services to the medical center's commitment to excellence in patient care, education, and research. Increased usage of the library website made authorities to sanction additional funding to purchase user licenses and full-text journals. The design of the website was kept simple by avoiding graphics, sound, or motion that would make the page to load slowly. Most demanded MEDLINE is displayed at the top of the page. The library staffs were provided more time to maintain the highly used web-based services and they removed the less-used services. Another drawback of the website was that it mainly used Ovid MEDLINE and online full-text books and journals can be accessed only from within the campus through an intranet. Due to increased demand for off-campus access, discussions are undertaken to enable new technologies to facilitate the access of resources from outside the campus as well in the near future. Marketing of the website is done in all possible ways as very useful resources need promotion to be used effectively. Library staff has a good positive connection with all other departments in Cedars-Sinai Health System and friendly relationship with these web developers in these departments help to maintain the library website effectively by sharing tips and exchanging ideas. Increased funding, new recognition, and satisfied customers are the results of the effective maintenance of the website of the Cedars-Sinai Medical Library.

Rasul and Sahu (2011) conducted their study on the use and impact of information technology. Data collection was carried out using SERVQUAL from the students and faculty members of the IIMT library. Various statistical tools were implemented during data analysis such as frequency distribution, compare means, factor

analysis, and GAP analysis. Data analysis was performed with SPSS software. For the assessment of user expectations, the respondents were asked to mark the level of various items selected for the current research are required for a good library. The IT supported resources and facilities recorded the highest gap, which shows that the library staff has to provide concentration on the least perceived items like the electronic resources and IT equipment and services. The low gap features denote the need for improvement and suggestions for further development, whereas high gap features denote the necessity for rapid attention by the library staff. From a total of 80 respondents, 71(88.75%) respondents were satisfied with the overall library facilities and its services. The various features that had high gaps were available library resources through the website, online renewal and reservation facilities, networking, electronic security system, remote access of library, the speed of the Internet, latest computer facilities, subscription of more statistical and article online databases.

According to the study, the service quality and user satisfaction is average, which leaves a broad spectrum for improvement. The features which were rated especially lower and required special attention by the library staff were 1.Adequacy of print resources, 2.Electronic resources, and 3.IT Services.

Davidson and Kyrillidou (2010) evaluated the results of MINES for Libraries (Measuring the Impact of Networked Electronic Services) an online transaction based survey conducted among Ontario Council of University Libraries(OCUL) which had 21 member libraries in 2004-05 and 2010-11. The survey accessed patron demographics such as status and discipline affiliation and the purpose of use (non-funded research or funded teaching, coursework, patient care and other) and location of the point of use of users whether remote, in the

library or on campus. Scholars Portal developed in 2001 is the platform for OCUL's information infrastructure for giving digital services and content to support the teaching, research and learning process. Key objectives of MINES for Libraries conducted in 2004-05 were measuring of remote and in-library web usage of student portal in a representative sample and finding the demographic differences between remote patrons and in library patrons by assessing the status of the patron, finding the purpose of using Scholars Portal and also developing an OCUL infrastructure to make studies of users' usage of electronic resources routine and integrate it into decision making. In 2004-05, only consortia products were studied and in 2010-11, both consortia and individually licensed content were studied. Results of the 2004-05 survey show that half of the use of the scholars portal resources were by undergraduate students (46%), half of the use of portal (45%) was from off-campus locations and use of scholar portal was mainly for course work. Results of 2010-11 were almost the same; half the use by undergraduate students (50%), access from off-campus locations (68%) sharply increasing from 2004-05 and the main purpose of using for course work (55%) with sponsored research (18%) being a second-highest category of use. The MINES for libraries data gives an important link between electronic resources and value derived by users. The data helps authorities to support particular resources that are highly valued by users in tight financial conditions. The data also shows that users who gain the most value from e-resources are those who are attracting grants and producing more research output. MINES for Libraries helps to compare data across libraries, making implementation of consortia useful and helps in decision making within and across institutions.

Haneefa and Aswani (2017) assessed the quality of e-services of university libraries in Kerala. The study selected three universities as the sample of the study, University of Kerala, Mahatma Gandhi University Kottayam, and University of Calicut. A modified SERVQUAL questionnaire was used for data collection. Out of 450 questionnaires distributed, returned for further analysis. The analysis showed that users have high expectation and low perception on all the quality dimensions such as physical facility, library staff, e-resources, e-services, and Information technology. The items "library professionals/staff should be approachable" and "library should have high-speed internet connection" were the most expected items by the users whereas the item "library has proper ventilation and lighting" has the highest perception and the item "library gives orientation or training to users" has the lowest perception by the users. The item "library" should have error-free computer network" has the highest service quality gap and the item "library should provide a user-friendly interface (portal) which are convenient to users" has the lowest service quality gap. The study concluded that all the SERVQUAL statements had negative gap score which implies service quality of e-resources of the university libraries in Kerala was not up to the user's expectation and therefore library should focus on all these dimensions to improve the service quality of e-services.

Ahmad and Abawajy (2014) studied about digital library service quality. Digitization of activities has been greatly influenced by the advancements in ICT. The study recommends a new model for assessing digital library service quality. The recommended model contains the following features. '(1) Service quality features (i.e. environment quality, delivery quality, and outcome quality) as a dependent variable, independent variables (2) internal-focus (digital library) perspective, and (3) external-focus (end-user) perspective.

The sufficient variables for the relationship between service quality and digital library will be (4) third-Party Sourced services features, which include utilization, capability access quality and indicator and also utilized experts' opinion to filter the selected features and defined all of them to compete with the current digital library services'. Environment Quality includes to what extent user interface is present in digital services. Delivery quality can be defined as providing quality services through digital media. To address the prerequisites of a user's service delivery quality it requires strong and dependable technology. What the user is missing after the service delivery is considered as the service outcome quality. The external factor is the second factor that impacts the assessment of the quality of service for digital library environments. Two components can be categorized, according to this component: measurement based on the users view on the services and measurement based on the usage experience. While considering an interface effectiveness perspective, usability is the ease of use and user-friendliness. Several aspects like interface design, functional design, data, metadata, and computer systems and networks come under usability. These components have to work concurrently to create an efficient and user-friendly digital library services. The Internal factors of quality of service include procedures and standards. Digital library is a mutual customer for third-party service provider thus third-party service provider must be active with the digital library need so that it would not create any contradiction in standard and procedures related with the digital library. Hence procedures and standards need to be considered in this model.

The purpose of the study was to build up a conceptual structure on assessing the service quality of the digital library. The proposed model should be appealing to both library practitioners and the

academic community. This model enables the library practitioners to strengthen their comprehension of the features that contribute towards the quality of services in the digital library.

Einasto (2014) conducted a focus group study about e-service quality criteria in the university library. For being effective, there is a requirement for better assimilation of what forms library e-benefit quality, how users identify and assess library services, and which factors impact this. The study observed that while adopting a 5 gaps model in the context of the research library, an additional gap ought to be included, the gap between the information requirements of the users and the accessibility of monetary resources of the research library to address these needs. The price hike of the scientific e-journals was the main cause of the gap. The study employed two focus groups to identify the most significant criteria of e-SQ. The recruited participants were grouped into two on the basis of the increased productivity of members. All participants in the study were active users of e-library services. The discussion of the focus group covered major problems of online library users based on four topics the library and technology, the ways to use the library, the needs and expectations related to the library e-services, the criteria for successful e-service. The participants of the study recognized critical criteria and specified the reason for choosing and finally ranked the criteria according to significance. The final analysis revealed seven attributes like words, context, internal consistency, frequency and extensiveness of comments, specificity of comments, the intensity of comments, big ideas. The ranking was given to 15 criteria's with regard to their importance. Some of the important criteria were user-friendliness, reliability, assurance, speed, and security. The research findings indicated that dependable feedback and viable communication provides confidence to e-service clients. The

feasibility to communicate through the library website with other users is equally imperative to the library users. The study observed that the user's experience, information competence, and aptitude, combined with their willingness to communicate and participate in the service process, also influence the user-perceived quality. The research is showing the possibility to plan e-services on the basis of user expectations, with quality being important to them.

Kiran and Diljit (2012) studied about web-based library service quality. The study was conducted in two phases. The first phase gave preference to the investigation on the service quality in connection to online library services. Starting with the qualitative data collection through focus group interviews, the study proceeded to quantitative data collection and factor analysis in order to ascertain the factor structure from the dimensions of service quality. The second phase was focused on various quantitative methods incorporating confirmatory factor analysis using structural equation modeling to support and clarify the findings of the first phase. Postgraduate students and academic staff from four research universities in Malaysia were the participants of the study. The scale was validated by experts initially. This proceeded to an instrument of 95 items covering 14 constructs. The evidence suggested that web-based service quality could be viewed as a multidimensional construct. The 14 attributes identified were; 'site design/links, site accessibility/ technical/security, an organization of information, personalization, flexibility, content quality, communication, customer relationship, customer service, customer feedback, reliability, self-reliance, functional benefit, and emotional benefits'. Based on the initial scale, the design of the questionnaire was done in a way that respondents can specify the important items to them in evaluating the quality of web-based library services. Out of the 1000 preliminary

questionnaires dispensed only 535 responses were received, showing a return rate of 26.75 percent. Research assistants were utilized for the distribution of questionnaires to postgraduate students. The first survey using the 95 multi-item instruments was subjected to an internal consistency test using Cronbach's alpha. Exploratory Factor Analysis (EFA) was conducted to interpret the factor structures. The result obtained from the Survey 1 was an instrument consisting of 31 service-quality measures with seven first-order dimensions. Later a second survey was conducted on all four universities using the reduced scale with 31 items. The cost-efficient and time saving nonrandom convenience sampling was employed. Only 441 questionnaires were returned with a response rate of 22 percent. The measurement model of web-based library-service quality consisted of three dimensions and eight sub-dimensions. They are reliability, functional benefits, and emotional benefits.

The findings of the study observed that in addition to the focus on the advancements of new services, libraries should not disregard the essential library services like reference and bibliographic instruction in the online environment. The study also points out that the basic role of the professional librarian is to encourage intellectual development of the library user towards independence which is still relevant in the Web environment.

Hernon and Calvert (2005) evaluated e-service quality in libraries in New Zealand. The study was the first one to exclusively focus on the convenience of such an instrument to e-service quality in libraries. An –SERVQUAL instrument based on SERVQUAL was developed for the study. The previous adaptations of SERVQUAL in the LIS literature were studied for relevant dimensions and statements to incorporate to an e-SERVQUAL instrument. The 25 library staffs from four of the eight universities in New Zealand handling digital

services were used to conduct four-hour long focus group interviews. They selected a sample of library customers and were asked to recognize their expectations about library e-services. After a comparison of their comments,, no changes were needed.

The significance of attributes was identified using quadrant analysis. This technique classifies the service attributes into four quadrants defined by two dimensions. The first dimension is plotted along the horizontal axis as the ideal expectation for excellent service quality and the second dimension is plotted along the vertical axis as the perceived library's performance. Those attributes coming under quadrant one are the most significant to the users and they consider the library as performing well in their delivery. Attributes falling into quadrant two are also significant to the respondents but they are not observed as important features of a library's service. Any attributes present in quadrant three are generally insignificant. Quadrant four contains attributes that have no value for the customers and that they do not consider the library as performing as needed. After evaluating the related literature and the focus group interviews the researchers deduced 10 dimensions related to the electronic services such as ease of use, Web site aesthetics, linkage, collections, reliability, support, security, ease of access, flexibility and customization. While evaluating the library quality service, respondents were asked to identify the significance of each dimension. The study points out that it is fundamental for librarians to comprehend service quality delivered in a digital environment so as to oversee and keep up a custom of continuous quality improvement.

2.6. Conclusion

The studies discussed in this chapter provide an exact picture of the term service quality and its dimensions. The various viewpoints of the concept of quality are continually mentioned in different forms in the Library Science literature which helps in providing more focus on the areas that required to be explored. For the development of the concept of service quality and to distinguish trends in the evaluation of library users' expectations, a systematic review of literature is vital. The study points out the significance of measuring service quality and designing a standardized tool for that purpose. The development of different indicators for the assessment of library performance and for providing quality service leads to the creation of various international standards. The reviews in the study are categorized into various subsections on the basis of the tool applied and with respect to the objective also. The studies considered were mostly of foreign origin and even Indian studies were included. Since quality management is crucial for sustaining in a competitive world, the quality of library services has to be evaluated.

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Chapter 3
RESEARCH DESIGN

3.1 Introduction

Every library endeavors to provide quality services to its users by satisfying their needs and expectations. As the users belong to different categories, their needs are also different. Service quality is the assessment of gap between user's expectations and perceptions. Prompt and fast delivery of user requirements and services are the basic criteria of library service quality. This study measures the service quality of special libraries under the state government and central government institutions. The expectations and perceptions of users are collected through questionnaires and interviews were conducted with Chief Librarians for collecting detailed information regarding the facilities, collection, services, and users. This section discuss about the data collection tools used and the analysis procedures that were followed for the study. Data was collected and analyzed for the purpose of exploring the potential relationships posed in the research objectives.

3.2. Variables Used for the Study

The independent variables and dependent variables used for the study are;

3.2.1 Independent Variables

Independent variables of the study are;

- ❖ Special Libraries in Kerala

- ❖ Type of Management

- ❖ Gender

3.2.1.1. Special Libraries in Kerala

Special libraries are the integral part of the research and development activities of the institutes where they exist. The needs and expectations of the users of special libraries are oriented to the objectives of the parent organization. Therefore, their expectations and perceptions may change on the basis of these objectives. As there are a number of special libraries functioning in Kerala, the study explores the expectations and perceptions of the users of those special libraries under the central and state government institutes and measures the service quality perception of each of these libraries separately. It includes libraries of ICAR, CSIR, ISRO, KSCSTE, Ministry of Commerce and Industry, and Research Institutes. The users may include scientists, research scholars and other staff, etc.

3.2.1.2. Type of Management

The service quality of special libraries under the central government and state government are unlike in nature. Type of management also affects the quality of special libraries. There may be differences in the provision of services by different managements. The study attempts to assess the changes in the quality perception of the users of central government institutes libraries and state government institutes libraries.

3.2.1.3. Gender

As the gender differences affect human's character, their quality perceptions also get affected. The needs and expectations of special library users may be different based on their gender. Therefore the study examined expectations and perceptions of male and female separately.

3.2.2. Dependent Variables

Following are the dependent variables used in the study.

- Expectations of the users about the services of the libraries

- Perceptions of the users about the services of the library

- Quality of physical facilities of the libraries

- Quality of library collections

- Quality of library Staff

- Quality of technical Process

- Quality of library services

3.2.2.1. Expectations of the users about the services of the libraries

The users expect variable measures from the special libraries. The user's needs and expectations may vary from user to user and from institution to institution. Assessment of user's expectations provides opportunities for planning and implementation of new services in libraries. Therefore libraries strive to identify the changing needs of users. Here, expectations of the users about the five dimensions such as physical facility, library collection, library staff, technical processes and library services are collected. Each user's expectations on these dimensions are assessed.

3.2.2.2. Perceptions of the users about the services of the libraries

Perceptions of users measures what users actually received or experienced from the libraries. Sometimes users may or may not get services up-to the level of their expectations. Service quality is measured by comparing the perceptions and expectations. The gap

between the perceptions and expectations is used as an indicator of service quality. It is also calculated under the five service quality dimensions.

3.2.2.3. Quality of Physical Facilities of the Libraries

The physical facilities of a library have great influence on its service quality. The assessment of physical facilities depicts how a user perceives the library based on the quality of its physical facilities and measures the actual experience of the physical facilities compared with the expected facilities to be delivered by the library. Better physical facilities of the libraries inspire others to visit library. The variable measures to what extend the physical facilities of the library meet the expectations of the users. It includes the assessment of whether the libraries have;

- Comfortable and inviting location

- Sufficient space for readers / users

- Adequate lighting and ventilation

- Clean, tidy and hygienic

- Adequate and comfortable furniture

- Drinking water facility

- Lavatory facility

- Physical facilities for differently abled users

3.2.2.4. Quality of Library Collection

A good library needs to have good collections also. Good collection implies those collections which meet the needs and expectations of the users. The size of the collection does not imply that the service quality of library is good. Library should provide access to all of its

collections. As the special library deals with specific subject, it should have a collection of wide variety of resources on the subject the institute specializes. Therefore it is very important to evaluate whether the collections of the libraries are capable of supporting the institutes to achieve its objectives. The variable measures whether the library has;

- Resources meet the requirements of library users

- Access to collections of wide variety of books and journals on the subject the institute specializes

- Access to a wide range of e-resources on the subject the institute specializes (e-journals, e-books, databases, etc.)

- Access to collections include technical reports, patents and annual reports

- Efficiently maintain back volumes of journals

- Efficiently maintains project reports, dissertations and theses

- Provide access to audio visual materials

3.2.2.5. Quality of Library Staff

Library staff plays a vital role in maintaining and improving the service quality of a library. It is essential to have sufficient number of staff to deliver prompt services to users. There should be regular interaction with the users, which enables the staff to assess the expectations of users, develop collection on the basis of their requirement and provide services as expected from them. The behavior and attitude of library staff while providing service also affect user's perception regarding the service. It will enhance the confidence of the users. The staff must have good knowledge and expertise to provide the required information and answer the queries

raised by the users. In order to measure the service quality of a library, the quality of library staff should have to be evaluated. The variable measures include whether the library staff are;

- Approachable and welcoming

- Have good knowledge and expertise to provide value added library services

- Competent enough to anticipate library users needs and work accordingly

- Quick response to library users queries and requests

- Gives personal attention to library users

- Willingness to help library users all the time

- Emotional intelligence to deal with the library users

- Help library users when they fail to locate a document needed

- Re-shelving documents quickly in proper order

- Good knowledge and expertise in Information Technology

3.2.2.6. Quality of Technical Process

The effective functioning of a library mainly depended on the quality of technical process. It includes all the functions carried out in the processing and maintenance of library collections. An efficient cataloguing and classification system is essential in the library for effective searching and retrieval of information resources. Therefore, the service quality evaluation includes assessment of the technical process of the libraries. The dimension measures whether the libraries:

- Provide access to well organized library catalogue either in card or online catalogue/Web catalogue

- Functions and operations are automated/computerized

- Conduct continuous library users' need assessment

- ICT infrastructure of the library are always in good working condition

- Well designed and managed library website/ portal

- Provide full fledged Internet access

- Provide wireless network access (Wi-Fi, Wi-MAX, Wireless LAN)

- Classification and arrangement of documents are systematic and logical

- Protect library resources from damage and dust

- Frequently updated with latest technologies

3.2.2.7. Quality of Library Service

The service quality of a library can be assessed by evaluating the quality of services provided by the libraries. Libraries are introducing new and updated services for improving the service quality. The study assesses whether these services are needed by the users or not and to what extent the provided services were adequate. It also ensures that whether the services provided by the special libraries support the research and development activities of the parent organization. The variable measures whether the libraries;

- Keep library users informed about new facilities, collections and services provided by the library

- Provides Xerox service to library users during library hours

- Convenient library timing

- Provides user based alert service in a personal way

- Provides digital library services

- Provides institutional repository services (e-thesis repository)

- Provides indexing and abstracting services

- Provides content page service

- Provides newspaper clipping service

- Provides bibliographic databases

- Provides video library service

- Provides user education/orientation

- Provide services to differently abled users

- Display of directional signs to reach different sections of the library

- Provide user feedback facility

3.3. Universe and Sample of the Study

Universe of the study comprises special libraries in Kerala. Special libraries include libraries of Science and Technology institutes, Social Science institutes, industrial and commercial institutes, government departments, medias, etc. By referring Directory of Scientific Research Institutions in Kerala (Beegum Sarjoon and Humayoon Kabir, 2017), Directory of Libraries in India (Guptha, 1989) and Directory of Scientific and Technical Libraries in India (Kalia and Kumar, 1988), it can be found that there are 66 special libraries in Kerala under the Central and State Government institutes. Out of

these, 43 libraries function under the Central Government institutes and 23 libraries function under the State Government institutes.

A representative sample of 22 libraries (33 percent) were randomly selected for the study. Out of these 22 libraries, 15 libraries were functioning under Central Govt. institutes and 7 libraries were under State Govt. institutes. The two libraries under State Government institutes, such as Regional Cancer Centre Library and the Secretariat Library, and one library under Central Government institute, i.e., Naval Physical and Oceanographic Laboratory, did not grant permission to collect data. So they were excluded from the study. Therefore, the data was collected from 19 special libraries (Appendix III). As a special library is concerned, all the staff of the parent institute are the members of the library by default, but most of them not use many of the services offered by the library, thereby making it difficult to calculate the actual users of the library. Hence, instead of collecting data from all the users of the library, only the active users of the library during the period of investigation July 2017, who can provide valuable information regarding the quality of the library were selected. The total population of the study was 13319 library members.

The sample size was determined by US National Education Association statistical table as expressed by Krejcie and Morgan (1970). According to the table, the formula for determining sample size as follows:

s= X2 NP (1-P) ÷ d2 (N-1) +X2 P (1-P)

s   =   required Sample Size

X^2 =   the table value of chi square for 1 degree of

freedom at the desired confidence level (3.841)

N = the population size

P = the population proportion

(assumed to be .50 since this \would provide the

maximum sample size)

d = the degree of accuracy expressed as a proportion (.05)

= the degree of accuracy expressed as a proportion (.05).

According to the sample size table developed by Krejcie & Morgan (1970), minimum sample size needed for the population is 375. However, in order to get a representative sample of the users of the libraries belonging to state government and central government institutes, a sample of 800 users was selected for this study. The questionnaires were distributed to the 800 users of the 19 libraries and 620 questionnaires were returned back with a response rate of 77.5 per cent.

3.4. Data Collection Tools

The study was carried out by survey method. It included both qualitative and quantitative data. A modified version of SERVQUAL questionnaire, interview and observation techniques were used for data collection.

3.4.1. SERVQUAL

The SERVQUAL scale was conceptualized and crafted out from the works of a bunch of researchers who have essentially analyzed the definition of service quality through an overarching qualitative research study which characterized service quality and clarified the dimensions which consumers perceive and assess service quality. A conceptual model of service quality was developed by Parasuraman, Zeithaml and Berry in 1985 by conducting an exploratory

investigation which includes both executive interviews and focus group discussions. Initially, it identifies the 10 dimensions of service quality such as; tangibles, reliability, responsiveness, communication, credibility, security, competence, courtesy and understanding/knowing the customer and access.

As the exploratory research uncovered 10 evaluative dimensions that overshadow an assortment of services, there lies a necessity and opportunity for building a standard instrument which measured consumer's service quality perceptions. So research is required to produce items that substantiate the 10 dimensions, to conceive suitable rating scales for measuring consumer perceptions while considering each statement, and to consolidate the set of statements to generate a dependable and thorough, yet compact instrument. The generated statements has to be in such a way that with suitable changes in expression it can be utilized for measuring perceived quality of a wide variety of services.

These dimensions produced 97 items and that instrument was subjected to two stages of data collection and refinement. The initial stage concentrated on (1) consolidating the instrument by maintaining the only items capable of discerning through respondents having varied perceptions about firms in various categories (2) analyzing the dimensionality of the scale and exhibiting the reliabilities of its components. The refining of the 97 item instrument is carried out by evaluating the accumulated data from all service categories as a whole.

In order to enhance the refinement of the items, data gathering was done from a sample of 200 customers scrambled across banking, appliance repair and maintenance, long distance telephone,

securities brokerage and credit card. The responses were gathered using a 7 point Likert scale along with the perceptions and expectations of the respondents. After that calculation of coefficient alpha and item to total correlations for each of the dimension was carried out. According to the results, items with low correlation were removed for enhancing the alpha value. Factor analysis was conducted on the remaining 54 items for ensuring dimensionality. Oblique rotation was implemented to overcome the overlap of some dimensions. Because many items had high loading for more than one factor, it required reallocation by deletion of certain items and restructuring. The coefficient alpha and item to total correlation was calculated again. This process was repeated until 34 items with 7 dimensions remained. Then this 34 items scale was utilized for data collection from the sample of 200 customers of four organizations; a bank, a credit card company, appliance repair and maintenance firm and a long distance telephone company. Since overlap between dimensions was nonexistent, furthermore purification was carried out by deleting certain items and by amalgamating 4 dimensions to form two from the seven dimensions, which resulted in a 22 item scale having 5 dimensions and they were tangibles, reliability, responsiveness, assurance and empathy. The items from the original communication, credibility, security competence, and courtesy dimensions were also included in the new broad dimension assurance. The new broad dimension empathy incorporated various items from the original understanding/knowing the customer and access dimensions (Parasuraman, Zeithaml and Berry, 1985;1988).
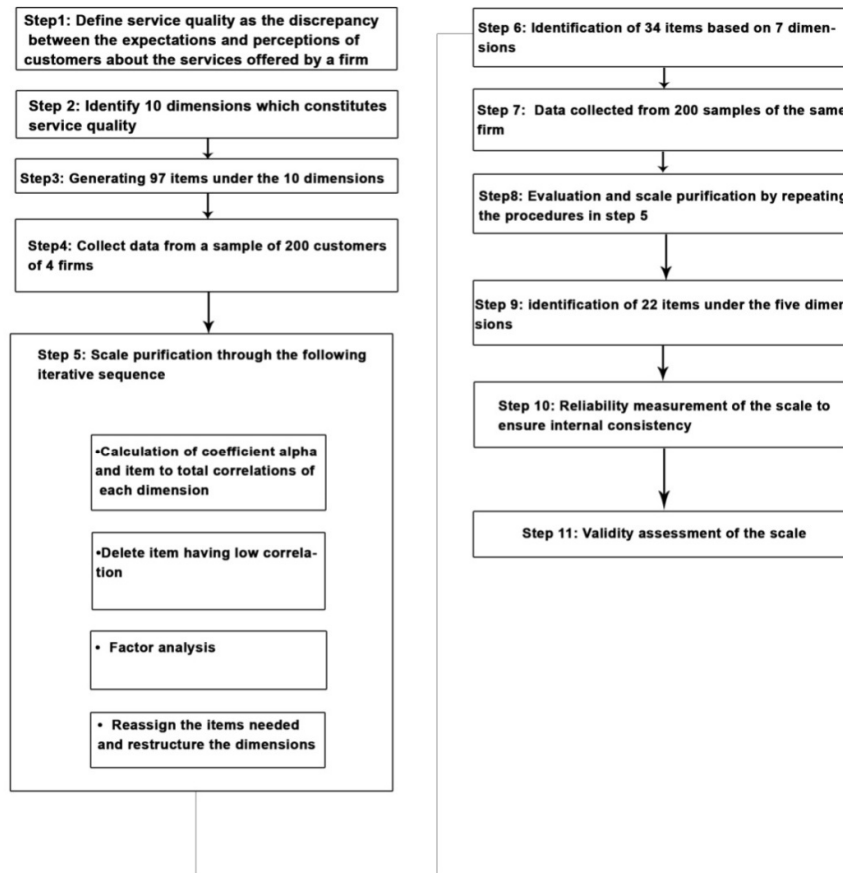
Figure 3.1
Steps in Developing a SERVQUAL Scale
(Parasuraman, Zeithaml and Berry,1988)

Awan and Mahmood (2013) discussed in his study about two service quality perspectives such as "Nordic perspective" proposed by Gronroos(1984) and the "American perspective" proposed by Parasuraman et al. (1985, 1988). In the Nordic Perspective, Gronroos (1984) identified two dimensions of service quality namely, technical quality and functional quality. Technical quality comprises employees' technical ability, employees' knowledge, technical solutions, computerized systems and machine quality as its attribute. Functional quality consists of behavior, attitude, accessibility, appearance, customer contact, internal relationships, service-mindedness as its attributes. The American perspective

consist of service quality measurement scale (SERVQUAL) developed by Parasuraman et al. They claimed that the scale and its dimensions and items are applicable to all service organizations. Even though "Nordic perspective" was the first one to get reported in scholarly literature, the initial dedicated program of service quality was of Parasuraman et al. (1985, 1988).

3.4.2 Application of SERVQUAL

SERVQUAL is a comprehensive multiple item scale employed by retailers for understanding the service expectations and perceptions of users as it has good reliability and validity, thereby improving services. The design of the instrument enables it to be applicable over a wide range of system of services. The SERVQUAL gives a basic skeleton by incorporating statements from the five service quality dimensions along with the expectation/ perception format. As per the need, the skeleton can be adapted or suited according to the attributes or necessities of the research of a specific organization.

SERVQUAL is of high value while utilized occasionally to track service quality trends and when used in concurrence with various forms of service quality measurement. It can be used to evaluate a firm's quality as per every five service dimensions by averaging the distinction of scores of things that shape the dimension thereby providing a whole measurement of service quality as average score over each of the five dimensions. Meaningful and significant reactions to the perception statements expect respondents to have some information or involvement with the firm being researched. Even though SERVQUAL has a limited application to current or past customers of the firm, it has a wide variety of prospective applications.

One of such potential application is finding the impact created on customers over every quality perception by the relative significance of five dimensions.

The instrument is also used in categorizing a firm's customers in to various perceived- quality segments (eg: high, medium and low) based on their individual SERVQUAL scores. Evaluation of these segments can be followed using (1) demographic, psychographic and/ or other profiles (2) the relative importance of the five dimensions in influencing service quality perceptions and (3) the reasons behind the perceptions reported.

Multi-unit retail chains have the possibility of tracking their service level of each individual store with the application of SERVQUAL. The respondents can be asked about the most familiar stores and their perception regarding that, the received responses enable the researcher to compare average SERVQUAL scores of each store with the others.

Utilizing SERVQUAL a retailer can measure its service performance relative to its principal competitors. It also points out areas that need improvement and attentiveness of management for enhancing service quality (Parasuraman, Zeithaml and Berry, 1988).

3.4.3. Adoption of SERVQUAL in Libraries
After the introduction of SERVQUAL model, many studies applied this model for measuring service quality. These studies were conducted in measuring service quality in hotels, hospitals, educational institutes, IT centers, supply chain service, hygiene sector service and service quality measurement in banking industry. As a service institution, libraries share some commonalities with other service organization.

As the SERVQUAL was designed to be applied in commercial environment, it needs to be revised and modified to be applicable in libraries. During 1990's SERVQUAL began to be applied in Library and Information Science. Nitecki (1996) used the modified SERVQUAL for the first time in academic libraries for measuring service quality. Many of the researchers have applied modified SERVQUAL instrument in LIS research and replaced the existing dimensions with new ones. Simmonds and Andaleeb (2001), in their study on service quality of academic libraries included 'resources' as an additional dimension and merged the 'assurance' and 'empathy' dimensions in to 'demeanor'. Martensen and Gronholdt (2003) pointed that "electronic resources, collections of printed publications, other library services, technical facilities, library environment and human side of user service" as service quality determinants. While measuring the quality of college library services in Kerala, Abdul Majeed (2005) identified "physical facility", "library collection", "library staff", "technical process" and "library services" as the dimensions of service quality. The same dimension was followed by Haneefa et al. (2016) for measuring the service quality of UGC-Infonet Digital Library Consortium of Calicut university library. In a study about service quality in academic libraries, Sahu (2007) applied modified SERVQUAL instrument which covered three main section of the library, i.e. the aspect relating to physical facilities, technical facilities, such as computer facilities, and the attitude and competence of staff.

Filiz (2007) identified "Quality of library service provided", "Quality of information and library environment", "Reliability", and "Confidence" as service quality factors for measuring service quality of a university library. A study conducted by Jayasundara, Ngulube and Minishi-Majanja (2009) identified the following service quality domains in relation to the customer satisfaction of selected university libraries in Sri Lanka. They are; responsiveness, supportiveness, building

environment, collection and access, furniture and facilities, technology, web services and service delivery. Similarly in their study, Ahmed and Shoeb (2009) identified ''Affect of service (Organisational), Collection and Access, Library as a Place and Affect of Service (Personal)'' as service quality dimensions. Vinod Kumar (2009) measured the service quality of Agricultural university libraries by assessing the views of librarians regarding Leadership, Strategy and Policy, Staff Management, Process Management and Resource Management. While assessing the service quality expectations of trainers of the Government Administrative Training Institute libraries, Kulkarni and Deshpande (2012) distinguish resources, staff, services, guidance and environment as service quality dimensions.

In the study on service quality measurement of academic libraries in Lahore, Pakisthan, Awan and Mahmood (2013) identified "access, reliability, responsiveness, assurance, communication and empathy" as the determinants of service quality. Being different from SERVQUAL's original dimensions, Baharainizadeh (2013) identified in their study, "electronic access to resources and sets", "personnel service", "library as a place", "specific attention and user understanding and recognition", and "conditions and internal access to resources" as service quality dimensions. In a study of factor analysis of service quality of university libraries in Sri Lanka, Sivesan and Velnamby (2013) identified convenient opening hours, current information, collection comprehensiveness and convenient access to collection as the service quality factors.

3.5. Data Collection Procedure

With the view to elicit information on the quality of the special libraries in terms of infrastructure, human resources, information resources and services available, the study makes use of the instrument only after some modifications. Intensive literature survey was conducted to identify the quality attributes relating to the

service quality of the special library. Existing theories and past research findings were analyzed through literature survey. Thus the modified SERVQUAL instrument initially contains 75 statements under 5 dimensions. The dimensions are; physical facility, library collection, library staff, technical process and library service. The questionnaire was designed in a way that requires the respondent to assess the SERVQUAL items on expectation and perception at the same time. Thus, respondents need not have to go through the 22 items twice as in the case of the original SERVQUAL. Tan and Foo (1999) in their study also followed this method. A pilot study was carried out to finalize the statements. On the basis of the results, Cronbach alpha test was applied to measure the reliability. As a result, all the statements having a value of less than 0.06 were excluded to increase the reliability. In addition, overlapping statements and statements having missing values were also eliminated. Then 50 statements are formulated on the basis of reliability and validity testing. Expert opinions are consulted to assess the validity of the instrument. A 5 point Likert Scale is used to measure the responses. Where 1 denotes "Strongly Disagree", 2 for "Agree", 3 for "Neither Agree nor Disagree", 4 for "Agree" and 5 denotes "Strongly agree".

The questionnaire contained two sections. Section A contains personal information about the users and section B contained queries related to expectations and perceptions about the library services by the users. Besides the SERVQUAL questionnaire, interview with librarian was also conducted for collecting information about the library's quality. Along with it, information collected from national and international journals, books and online materials, data collected from various subjects experts in the field of Library and Information Science and from other disciplines are also used for conducting the study.

For the purpose of collecting data, the investigator personally visited all of the 19 special libraries in Kerala and sought permission from the concerned authority for distributing the questionnaire. The modified SERVQUAL questionnaire was distributed among the active users of the libraries and additional data was collected from the librarian and other library staff by interviewing them individually. The table 3.1 depicts the questionnaire distribution and the responses received. The table 3.2 and figure 3.2 shows the frequency of central government and state government library users. Table 3.3 and figure 3.3 shows the frequency of male and female library users of the study.

Table 3.1

Questionnaire Distribution

Sl. No.	Name of the Institute	Questionnaires Distributed	Questionnaires Collected
1	CWRDM	50	45
2	KFRI	50	40
3	FCRI	30	21
4	CIFT	50	44
5	CMFRI	50	41
6	NIO	30	26
7	MPEDA	30	29
8	CDB	50	41
9	CTCRI	30	27
10	CDS	30	27
11	NCESS	30	29
12	KSPB	30	25
13	NIIST	50	44
14	TBGRI	40	38
15	VSSC	100	30
16	CPCRI	30	17
17	SPICES BOARD	40	39
18	RRI	50	40
19	KSCSTE	30	17
Total		**800**	**620**

It can be seen in the table 3.1 that a total of 800 questionnaires were distributed among the users of 19 special libraries in Kerala and 620 returned back with a response rate of 77.5 percent.

The table 3.2 and figure 3.2 shows the management wise representation of the sample. The respondents included 455 users from the libraries under central government and 165 users from the state government institutes. The reason for the variation is that majority of the special libraries belongs to central government institutions.

Table 3.2

Management wise Distribution of the Respondents

Type of management	Frequency (Percentage)
Central Government Institutes	455 (73.4 %)
State Government Institutes	165 (26.6%)
Total	620 (100)
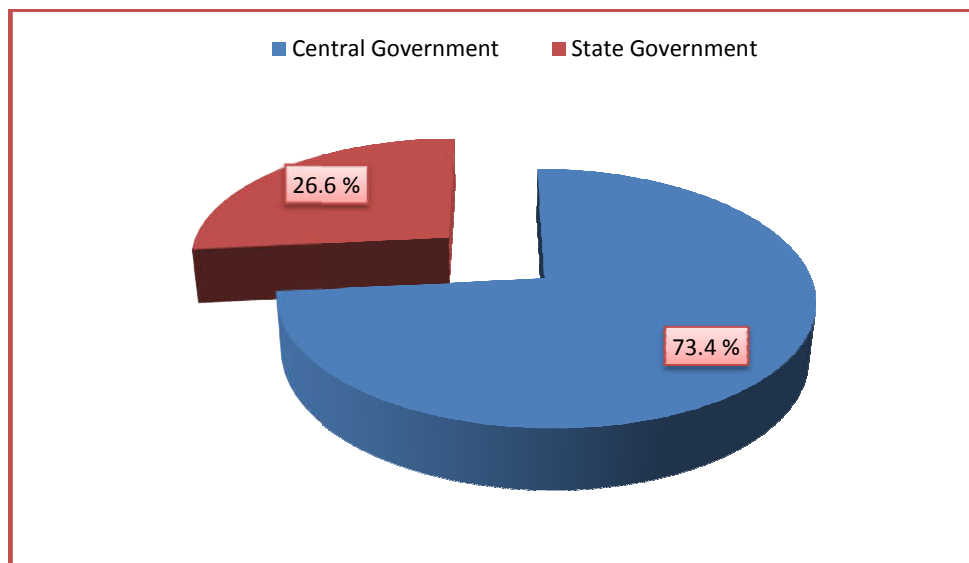
Figure 3.2

Management wise Distribution of the Respondents

The table 3.3 and figure 3.3 depicts the gender wise representation of the sample. It included 363 (58.5%) male users and 257 (41.5%) female users of the special libraries.

Table 3.3

Gender wise Distribution of the Respondents

Gender	Frequency
Male	363 (58.5%)
Female	257(41.5%)
Total	620(100%)
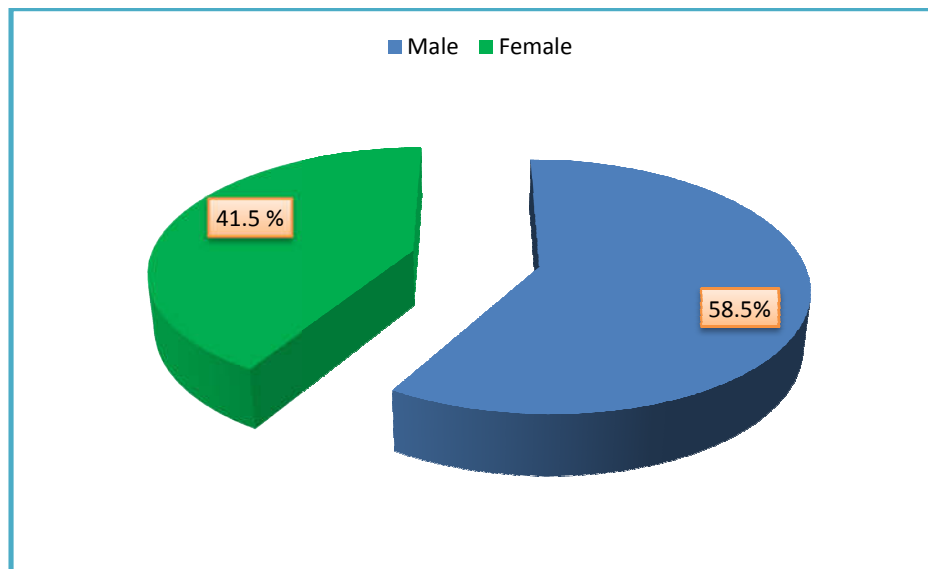
Figure 3.3

Gender wise Distribution of the Respondents

3.6. Data Analysis Techniques

The method used in the study was exploratory as it utilized scoring of the variables. The collected data contains both qualitative and quantitative data. Accordingly, the study used both qualitative and quantitative techniques for the analysis of data. The statistical analysis comprised of two stages. The first stage examined the

descriptive statistics of the measurement items and assessed the reliability and validity of the measure applied in this study. The second stage tested the proposed research model and this involved assessing the contributions and significance of the manifest variables path coefficients. The data were analyzed via SPSS 20.0. Descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. Gap analysis was used to identify the gap between user's expectation and perception of library services.

Structural Equation Modeling: The study used the structural equations to evaluate the regression equation for each of the variables which eliminates the measurement bias and random variations. That is using these regression equation helps to find out the values of each of the variables which are free of personal prejudices, measurement bias and doubts over the appropriate placement of crosshairs to determine whether perception and expectation is high or low. As this being an opinion converted into a score, the answer may be subjected to random variation and is influenced by psychological factors. So it is better to use psychometric scale development approaches to evaluate the relationship. The best model for testing the convergent validity and for modeling is Structural Equation Model or confirmatory factor analysis. The related gap analysis is carried out using these estimated values.

Confirmatory Factor Analysis (CFA): Confirmatory Factor Analysis through Structural Equation Modeling was done to finalize the variables used for the study and to validate the same. It is one type of analysis that falls under the SEM. CFA focuses on the relationships between the indicators and latent variables.

Regression Coefficient: Regression coefficient represents the change in the value of dependent variable corresponding to the unit change in the independent variable.

Arithmetic Mean: Mean is the simplest measurement of central tendency and is a widely used measure. Its primary use consists in summarizing the essential features of a series and in enabling data to be compared (Kothari, 2004). It is the average of a set of numerical values, as calculated by adding them together and dividing it by the number of terms in the set.

Standard Deviation (SD): Standard Deviation measures the amount of variation or dispersion of a set of values from the mean value of a group. It indicates the scattering of the values around the central value.

KruskalWalli's Test: It is a nonparametric test that can be used to determine the statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. It is considered the nonparametric alternative to the one-way ANOVA.

Mann-Whitney U-Test: It is used to compare differences between two independent samples that came from the same population.

Friedman's Two Way Analysis of Variance: It is a method to compare matched samples in multiple groups. It is the nonparametric equivalent of the Two Way Analysis of Variance. **Wilcoxon Signed Rank Test**: It is a nonparametric test that compares two paired groups. The test essentially calculates the difference between each set of pairs and analyzes these differences. The Wilcoxon Signed Rank test assumes that there is information in the magnitudes and signs of the differences between paired observations. It investigates any change in scores from one time point to another.

Kolmogorov –Smirnov Test: It is used to decide if a sample comes from a population with a specific distribution. It decides if two samples are significantly different from each other.

Cronbach Alpha: It is a measure of internal consistency or reliability of the variables. The reliability of any given measurement refers to the extent to which it is a consistent measure of a concept, and Cronbach's alpha is one way of measuring the strength of that consistency.

3.7. Normality and Reliability of the Data

An assessment of the normality and statistical reliability is necessary before any further validation analysis. The table 3.4 shows the normality of the data.

Table 3.4

K-S Test for Normality

Dimensions	Normal Parameters		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	Mean	Std. Deviation		
Physical facility-Expectation	4.62	0.392	1.019	0.250
Physical facility-Perception	3.78	0.575	1.103	0.175
Library collection-Expectation	4.60	0.428	0.871	0.434
Library collection-Perception	3.81	0.742	0.853	0.461
Library staff-Expectation	4.50	0.462	1.058	0.213
Library staff-Perception	4.00	0.721	1.207	0.109
Technical process-Expectation	4.56	0.458	1.300	0.068
Technical process-Perception	3.55	0.738	0.809	0.529
Library Service-Expectation	4.46	0.492	1.058	0.213
Library service-Perception	3.21	0.673	0.809	0.529

It is very essential to test the normality of the data before conducting any statistical analysis as the statistical procedures and tests differs for normal data and non-normal data. Parametric test procedures are used for normal and distribution free methods used for non-normal data. To test normality the study used Kolmogorov-Smirnov test. If p value is less than 0.05, the data is non-normal and if p value is greater than 0.05, the data is normal. The test indicates that the data is normal because the p value is above 0.05 for all variables. The table 3.5 shows the reliability of the data.

Table 3.5

Cronbach's Alpha Test for Reliability

Variable	Cronbach's Alpha	Number of Items
Physical facility-Expectation	0.858	8
Physical facility-Perception	0.811	8
Library collection-Expectation	0.849	7
Library collection-Perception	0.854	7
Library staff-Expectation	0.886	10
Library staff-Perception	0.936	10
Technical process-Expectation	0.902	10
Technical process-Perception	0.855	10
Library Service-Expectation	0.940	15
Library service-Perception	0.877	15

Reliability refers to degree of dependability or consistency of a scale. Internal consistency is estimated by using Cronbach's alpha. An alpha value of 0.70 or above is considered to be criterion for demonstrating strong internal consistency, alpha value of 0.60 or above is considered to be significant. The reliability of the questionnaire is also evaluated using Cronbach's alpha. The table 3.5 gives the initial and final Cronbach's alpha for each of the construct considered. Result shows that all of the constructs has

reliability greater than 0.6, hence can be proceeded for further analysis.

3.8. Conclusion

Quality evaluation of libraries is essential for providing quality services to the library users. The varying needs of users cannot be predicted. Therefore a systematic methodological framework was developed to assess users' expectation about library services. Important statistical test are conducted to ensure the validity and reliability of the data. The accuracy of research data depends upon the quality of the research design. It was purely based on the objective of the research and the nature of the problem studied. The SERVQUAL questionnaire yields maximum information and considered many different aspects of library service quality.

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Chapter 4
ANALYSIS AND INTERPRETATIONS

4.1. Introduction

The data collected through SERVQUAL survey were further analyzed and interpreted for drawing conclusions. The service quality of the libraries is calculated by measuring the gap difference between users' expected service and the actual service. Factor analysis, normality and reliability test were conducted for assessing the internal consistency of collected data. Data analysis was carried out by using SPSS software. Important statistical test such as Arithmetic Mean, Standard Deviation, Regression Coefficient, Cronbach's alpha method, KruskalWalli's test, Kolmogrov Smirnov test, Mann Whitney U test, and Fried-Man test were conducted to derive the result and the results are presented by using appropriate tables, diagrams and graphs.

This chapter deals with Structural Equation Modeling (SEM) analysis and service quality analysis. SEM includes Confirmatory Factor Analysis (CFA) and assesses the goodness of fit of the model. Service quality analysis includes dimension wise analysis, item wise analysis, institute wise analysis, management wise analysis and gender wise analysis of users' expectations and perceptions. Then gap analysis was conducted to assess the service quality of the libraries.

4.2. Structural Equation Modeling

Structural equation modeling is a statistical technique that takes a confirmatory approach to the analysis of a structural theory bearing on some phenomenon. SEM conveys two important aspects of the procedures: a) causal process under study is represented by a series

of structural (regression) equations, and b) these structural relationships can be modelled to facilitate a clearer conceptualization of the theory under study. The hypothesized model is statistically tested simultaneously to examine its consistency with the data through goodness of fit measures.

It allows the examination of a series of dependence relationships between *exogenous (independent)* and *endogenous (dependent)* variables simultaneously. An *exogenous* variable is one whose variability is assumed to be determined by causes outside causal model and an *endogenous* variable, is the one whose variation is explained by exogenous and other endogenous variables in the causal model.

Another classification of variables is *latent variables* and *manifest variables (observed).* Latent is a hypothesized and unobserved concept that can only be approximated by observable or measurable variables which are called manifest variables.

SEM consists of two parts: *measurement model* and the *structural equation model. Measurement model* specifies how the latent variables are represented through observed variables and its measurement properties. The *structural equation model* is a comprehensive model that depicts the pattern of relationships among independent and dependent variables. It incorporates the strengths of multiple regression analysis, factor analysis and multivariate ANOVA.

The structural equation modelling is done using the two-stage analysis in which the measurement model is first estimated and then the measurement model is kept fixed in the next step in which the structural model is estimated. The rationale for this approach is that

accurate representation of the reliability of the indicators is best accomplished in two steps to avoid interaction of structural and measurement models.

4.3. Confirmatory Factor Analysis

Confirmatory factor analysis is a type of Structural Equation Modelling, which deals specifically with measurement models, that is relationship between observed measures or indicators (eg. Test items, test scores etc.) and the latent variables or factors. A fundamental feature of CFA is its hypothesis –driven nature. In CFA, the researcher specifies the number of factors and the pattern of indicator factor loading in advance, thus the researcher must have a firm prior sense, based on past evidence and theory of the factors that exist in the data. CFA is used for four major purposes 1) psychometric evaluation of measures (questionnaires) 2) construct validation 3) testing method effects and 4) testing measurement in variance (across groups or population).

In social research works, researchers need to have measures with good reliability and validity that are appropriate for use across diverse populations. Development of psychometrically sound measures is an expensive and time consuming process, and CFA is one step in the development of process, because researchers often do not have the time or resources to develop a new measure, they may need to use existing measures. In addition to savings in time and costs, using existing measures also helps to make research findings comparable across studies when the same measure is used in more than one study. However, when using existing measure, it is important to examine whether the measure is appropriate for the population included in the current study. In these circumstances, CFA can be used to examine whether the original structure of the measure works well in the new population.

4.4. Goodness of Fit Indices

By using SEM, it is a common practice to use a variety of indices to measure the model fit. In addition to the ratio of the X^2 statistic to its degree of freedom, with a value less than 5 indicating acceptable fit, researchers recommended a handful of fit indices to assess model fit. These are the Goodness of Fit Index (GFI), Adjusted goodness of fit (AGFI), Normed Fit Index (NFI), Standardized Root Mean Residual (SRMR) and the Comparative Fit Index (CFI). According to the usual procedures, the goodness of fit is assessed by checking the statistical and substantive validity of estimates (i.e. that no estimates lie out of the admissible range, as the case is for negative variances or correlations larger than one, and that no estimates lack a theoretical interpretation, as the case is for estimates of unexpected sign), the convergence of the estimation procedure, the empirical identification of the model, the statistical significance of the parameters, and the goodness of fit to the covariance matrix. Since complex models are inevitably specified mistakenly to a certain extent, the standard $\chi 2$ test of the hypothesis of perfect fit to the population covariance matrix is given less importance than measures of the degree of approximation between the model and the population covariance matrix. The *root mean squared error of approximation* (RMSEA) is selected as such a measure.

GFI: Absolute fit indices, such as the Goodness of Fit Index (GFI) effectively compare the hypothesized model with null model and measure the relative level of variance and co variance. A GFI of above 0.90 is generally accepted as indicative of a good fit.

AGFI: The Adjusted Goodness of Fit Index (AGFI) is similar to the GFI but addresses the issue of parsimony by adjusting the degrees of freedom.

RMR: The Root Mean Square Residual (RMR) represents the average residual value resulting from a comparison of variance-covariance matrix of the hypothesized model with that of the data. The range of values for the RMR, range from zero to one with lower values reflecting better fit. Values below 0.08 are indicative of a good fit.

RMSEA: The RMSEA (Root Mean Square Error of Approximation) is recognized as "one of the most informative criteria in covariance structure modeling". The RMSEA reports the discrepancy, or misfit, in the fit of the model to the population covariance matrix and is adjusted for the degree of freedom. Values range from zero to one with lower values indicating better fits. Values between 0.05 and 0.08 are seen as representing well fitted models, values between 0.08 and 0.10 mediocre fits and above 0.10 poor fit.

NFI: The Normed Fit Index (NFI) is recognized as the principal incremental fit index but has been criticized for underestimating fit with small sample sizes. The results for the NFI range from zero to one with larger results indicating better fit. A result of above 0.90 is indicative of a good fit.

CFI: The Comparative Fit index (CFI) was developed by Bentler (1990) to reflect the criticisms associated with the NFI. As with NFI the results for the CFI range from zero to one with larger results indicating better fit. A result of above 0.90 is indicative of a good fit.

In the following section the study applied the SEM model to fit the regression equation for the variables Physical facilities, Library collection, Library staff, Technical process and Library Service one after the other separately for expectation and perception.

4.4.1. Physical Facility-Expectation

As the physical facilities of a library have its own impact in its service quality, it is inevitable to assess the quality of physical facilities of libraries while measuring the service quality. The model fit indices measures whether the model is fit for measuring the users expectation on physical facilities of the libraries and regression coefficient measures to what extend each item in the 'physical facility' dimension is important for assessing the expectations of users. The following tables and diagrams showing the model fit indices and regression coefficient of the expectations of users on physical facility dimension.

Table 4.1

Model Fit Indices for CFA-Physical Facility-Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Recommended Fit				< 5	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	< .05	<.05
Physical facility-Expectation	3.249	12	.994	.271	.999	.996	.998	1.010	1.000	.002	.000

The table 4.1 shows the model fit indices for Confirmatory Factor Analysis of the expectations of physical facilities. In which the Goodness of Fit Index obtained is 0.999 as against the recommended value of above 0.90, The Adjusted Goodness of Fit Index is 0.996 as against the recommended value of above 0.90 as well. The Normed fit Index, Comparative Fit index, Tucker Lewis Index are 0.998, 1.00, 1.010 respectively as against the recommended level of above 0.90. Root Mean Square Error of Approximation is 0.00 and is well below the recommended limit of 0.05, and Root Mean Square Residual is also well below the recommended limit of 0.05 at 0.002. This can be interpreted that the model explains the correlation to within an average error of 0.001 all the attributes loaded significantly on the

latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data (Hu and Bentler, 1990). Hence the model shows an overall acceptable fit. The confirmatory factor analysis shows an acceptable overall model fit and hence, the theorized model fit well with the observed data. It can be concluded that the hypothesized factor CFA model fits the sample data very well.

Table 4.2

The Regression Coefficients -Physical Facility-Expectation

Path	Regression Estimate	Variance explained	CR	P	Rank
PF1E→ Physical facility	0.581	33.8	16.493	<0.001	5
PF2E→ Physical facility	0.757	57.3	24.570	<0.001	3
PF3E→ Physical facility	0.76	57.7	24.745	<0.001	2
PF4E→ Physical facility	0.795	63.2	26.948	<0.001	1
PF5E→ Physical facility	0.742	55.1	23.720	<0.001	4
PF6E→ Physical facility	0.506	25.6	13.844	<0.001	8
PF7E→ Physical facility	0.524	27.5	14.453	<0.001	7
PF8E → Physical facility	0.532	28.3	14.728	<0.001	6

On the basis of table 4.2 the regression equation for Physical facility-Expectation can be write as

Physical facility-Expectation= 0.581 PF1E + 0.757 PF2E + 0.760 PF3E + 0.795 PF4E + 0.742 PF5E + 0.506 PF6E +0.524 PF7E+ 0.532 PF8E

The table 4.2 shows that, to what extend each item in the physical facility dimensions are related to the service quality of a library. All the 8 statements indicate a significant relationship with the physical

facility dimension because the p value is <0.001 for all the statements. It is evident from the table that the item PF4E "clean, tidy and hygienic (0.795)" have the highest value than all other items in the dimension. Therefore, it is the most important factor in determining service quality in the physical facility dimension. As far the user is concerned, primarily they need a better platform for doing library activities. The least value belongs to PF6E "drinking water facility (0.506)". According to user's expectations, for improving the service quality of physical facilities, drinking water facility is not as important as all other items in the dimension.
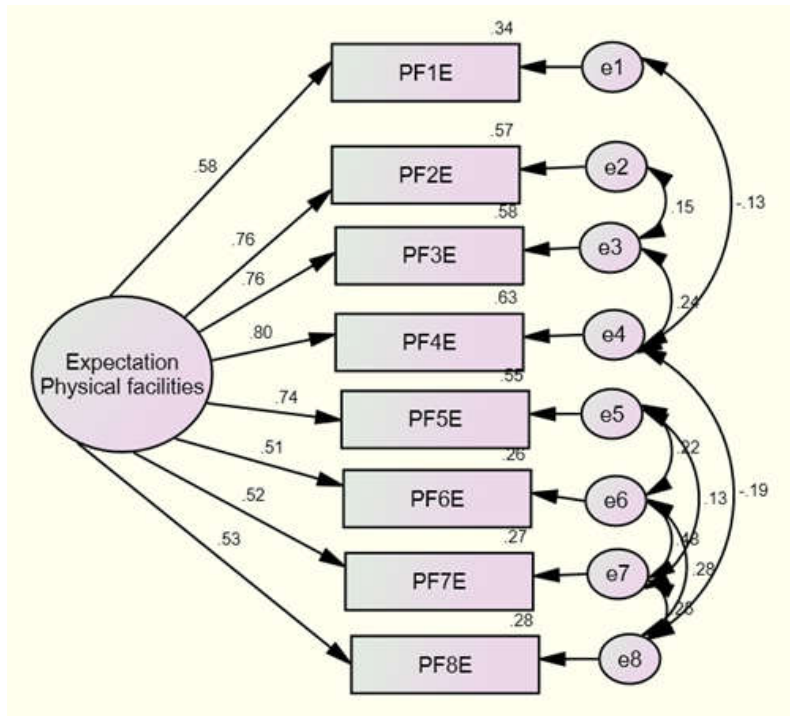
Figure 4.1

The regression Coefficients -Physical facility-Expectation

For the analysis initially an input model was developed by using AMOS-18 graphics. The rectangle represents observed factors, Ovals drawn in the diagram represents unobserved variable. The curved

double headed arrows represent correlations or co-variances among the unobserved variables and the straight headed arrow represents the factor loadings of the observed variables. The small circles with arrows pointing from the circles to the observed variables represent errors /unique factors, which are also known as squared multiple correlation of the standard error. This initial model is refined to arrive at the final model.

In the figure 4.1, the observed variables are in the rectangles, in which term PF1E denotes the statement "Comfortable and Inviting Location", PF2E for "sufficient space for readers/users", PF3E for "adequate lighting and ventilation", PF4E for "clean, tidy and hygienic", PF5E for "adequate and comfortable furniture", PF6E for "drinking water facility", PF7E for "lavatory facility" and PF8E denotes "physical facilities for differently-abled users". The relationship between latent variable and observed variables are indicated by arrows going from the latent variable to the observed variable. The loadings for the eight variables on users expectation on physical facilities range from 0.51 (PF6E) to 0.80 (PF4E).It is evident that all items are related to expectation to physical facilities with their standardised regression weights which are more than 0.50. The PF2E, PF3E, PF4E and PF5E variables appear to be the best indicators of expectation to physical facilities. Their standardised regression weights are, respectively, 0.76, 0.76, 0.80 and 0.74. Additionally expectation to physical facilities explains about 57percent of the variance in PF2E, 58 percent of the variance in PF3E, 63 percent of the variance in PF4E and 55 percent of the variance in PF5E. The other indicators such as PF1E, PF6E, PF7E and PF8E with standardised regression weights around 0.51 to 0.58 are so taken as weak indicators of Expectation to physical facilities. Also expectation to physical facilities explains about 26 percent to 34

percent of the variance in those respective weak indicators which means that expectation to physical facilities explains practically very small variance in these items. All loadings are significant ($p < 0.05$). The numbers at the upper right hand corner of each observed variable are the squared multiple correlations for each observed variable. The squared multiple correlation for PF1E is 0.34, which indicates that 34 percent of the variance in PF1E is accounted for by users expectation on 'Physical Facility' dimension. The remaining 66 percent of the variance in PF1E is accounted for by the unique factor e1, which represents the unique aspects of the item or measurement error. The squared multiple correlations for the Physical Facility items range from 0.26 for PF6E to 0.63 for PF4E.

4.4.2. Physical Facility-Perception

The perceptions of physical facilities depict how a user perceives the libraries based on the quality of its physical facilities compared with the expected level the library can deliver. On the basis of model fit indices, the study assesses whether the model is fit for measuring the perceptions of the users of the special libraries in Kerala regarding physical facilities. The regression coefficient measures the importance of each statement in the physical facility dimension while measuring the users perception. The following tables and diagrams showing the model fit indices and regression coefficient of the perceptions of users on physical facility dimension.

Table 4.3

Model Fit Indices for CFA-Physical Facility-Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Physical facility-Perception	21.736	17	.195	1.279	.991	.981	.988	.996	.997	.018	.021

The table 4.3 shows the model fit indices for CFA of perceptions of the physical facility dimension. It indicates the Goodness of Fit Index as 0.991 and the Adjusted Goodness of Fit Index as 0.981. The Normed fit Index found as 0.988, Comparative Fit Index is 0.997 and Tucker Lewis Index is 0.996. Root Mean Square Error of Approximation is 0.001 and Root Mean Square Residual is 0.02. Hence it proved as an overall acceptable model fit.

Table 4.4

The Regression Coefficients -Physical Facility-Perception

| Path	Estimate	Variance explained	CR	P	Rank
PF1P → Physical facility	0.604	36.5	17.373	<0.001	5
PF2P → Physical facility	0.692	47.9	21.158	<0.001	4
PF3P → Physical facility	0.764	58.3	24.982	<0.001	2
PF4P → Physical facility	0.756	57.1	24.512	<0.001	3
PF5P → Physical facility	0.812	65.9	28.140	<0.001	1
PF6P → Physical facility	0.481	23.1	13.023	<0.001	6
PF7P → Physical facility	0.459	21.1	12.321	<0.001	7
PF8P → Physical facility	0.114	1.3	2.844	0.005	8

On the basis of the table 4.4, the regression equation for Physical facility- Perception can be written as;

Physical facility- Perception= 0.604 PF1P + 0.692 PF2P + 0.764 PF3P + 0.756 PF4P + 0.812 PF5P + 0.481 PF6P +0.459 PF7P+ 0.114 PF8P

The table 4.4 shows the regression coefficient value of physical facility perception. The item PF5P "adequate and comfortable furniture (0.812)" has the highest value and the item PF8P "physical facilities for differently abled users (0.114)" has the least value. All other items lie in the range between 0.114 to 0.812.
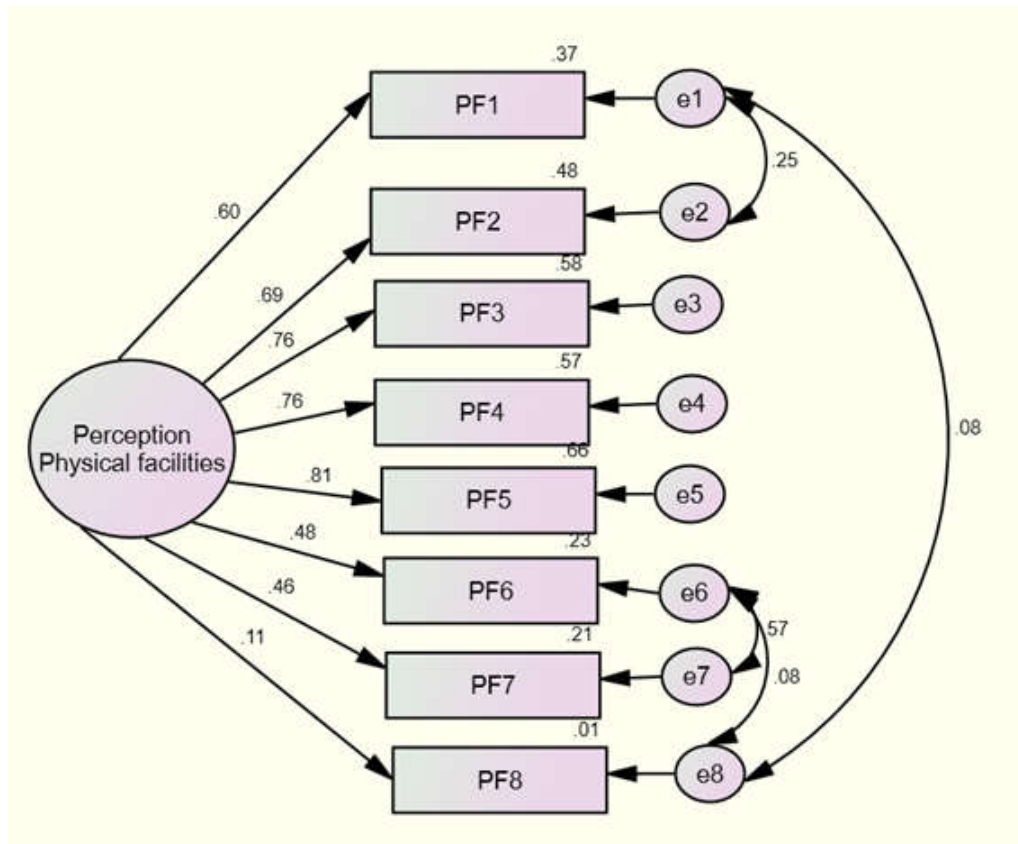
Figure4.2

The Regression Coefficients -Physical Facility-Perception

In the figure 4.2, the observed variables are in the rectangles, in which term PF1 denotes the statement "comfortable and inviting location", PF2 for "sufficient space for readers/users", PF3 for "adequate lighting and ventilation", PF4 for "clean, tidy and hygienic", PF5 for "adequate and comfortable furniture", PF6 for "drinking water facility", PF7 for "lavatory facility" and PF8 denotes "physical facilities for differently-abled users".

The loadings for the eight variables on users perception on physical facilities range from 0.11 (PF8) to 0.81 (PF4E). The squared multiple correlations for the Physical Facility Perception items range from

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0.21 for PF8 to 0.66 for PF5. It is evident that all items are related to Perception to physical facilities with their standardised regression weights which are more than and around 0.50 except for the variable PF8 which has a standardised regression weight 0.11. The PF1E, PF2E, PF3E, PF4E and PF5E variables appear to be the best indicators of Perception to physical facilities. Their standardised regression weights are, respectively, 0.60, 0.69, 0.76, 0.76 and 0.81. Additionally, perception to physical facilities explains about 37 percent of the variance in PF1E, 48 percent of the variance in PF2E, 58 percent of the variance in PF3E, 57 percent of the variance in PF4E and 66 percent of the variance in PF5E. The other indicators such as PF6E, PF7E, and PF8E with standardised regression weights respectively 0.48, 0.46 and 0.11 are taken as weak indicators of perception to physical facilities. Also perception to physical facilities explains about 23 percent, 21 percent and 1 percent of the variance in those respective weak indicators which means that Perception to physical facilities explains practically very small variance in these items.

4.4.3. Library Collection-Expectation

As a special library is concerned, specialized collection to meet the specific needs of users is the primary factor to be considered. Through the 7 statements, the dimension attempt to measure the quality of library collection by assessing the expectations and perceptions of users. The model fit indices measures whether the model is acceptable or not by observing that all fit indices reach the recommended fit. The regression coefficient observes which statement in the dimension has more variability and which has least variability while measuring the expectations of library collection dimension. The following table and diagrams shows the model fit

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indices and regression coefficient of the users expectations on library collection dimensions

Table 4.5

Model Fit Indices for CFA-Library Collection-Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library Collection-Expectation	18.085	9	.034	2.009	.992	.975	.990	.988	.995	.007	.040

The table 4.5 shows the model fit indices for users expectations on library collection dimension. The table depicts the GFI as 0.992, AGFI as 0.975. NFI as 0.990, TLI as 0.988, CFI as0.995, RMR as 0.007 and RMSEA as 0.040. All the values lie within the recommended fit, therefore the model is considered as fit.

Table4.6

The Regression Coefficients -Library Collection-Expectation

Path			Estimate	Variance explained	CR	P	Rank
LCE1	→	Library collection	0.660	43.5	19.693	<0.001	5
LCE2	→	Library collection	0.642	41.3	18.917	<0.001	6
LCE3	→	Library collection	0.669	44.8	20.093	<0.001	4
LCE4	→	Library collection	0.775	60.0	25.652	<0.001	1
LCE5	→	Library collection	0.723	52.3	22.701	<0.001	3
LCE6	→	Library collection	0.730	53.3	23.069	<0.001	2
LCE7	→	Library collection	0.457	20.9	12.259	<0.001	7

The regression equation for Library collection- Expectation as

Library collection- Expection= 0.660 LCE1+ 0.642 LCE2 + 0.669 LCE3+0.775 LCE4+ 0.723 LCE5+ 0.730 LCE6 + 0.457 LCE7.

The table 4.6 shows the weightage of each item in the library collection dimension. It indicates to what extent each item contributes to establish the dimension. The item LC4E "access to collections include technical reports, patents and annual reports" (0.775) has the highest value. The item LC7E "access to audio visual materials" (0.457) has the least value. All other items in the dimension lie in between the values 0.457 to 0.775.
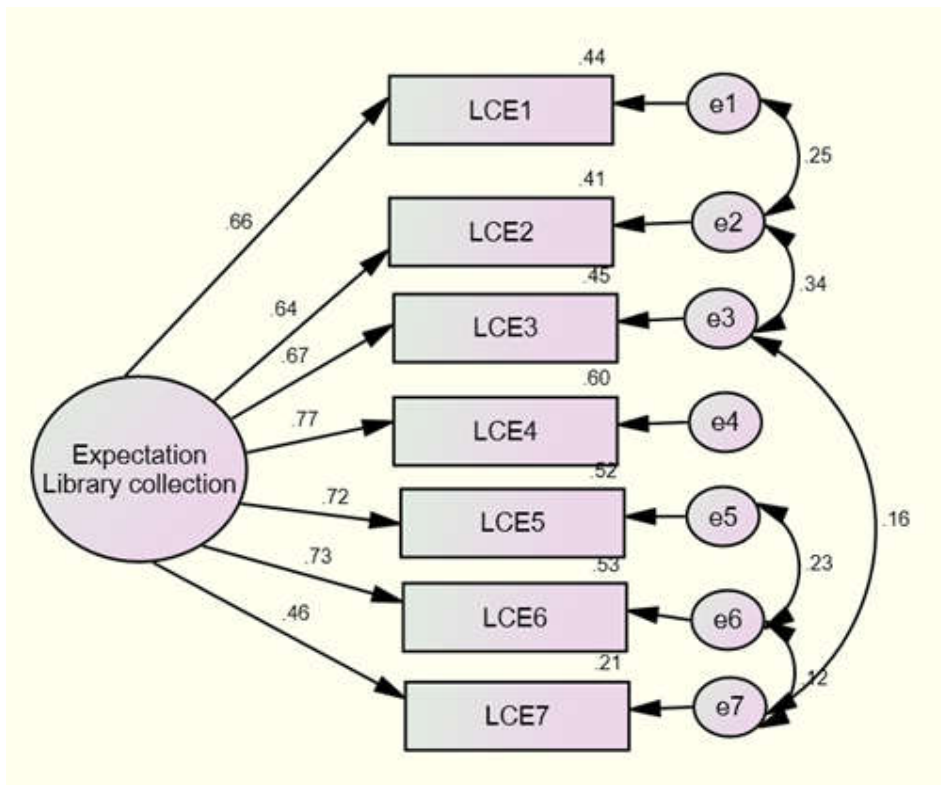
Figure 4.3

The Regression Coefficients -Library Collection-Expectation

The observed variables are represented by LCE1 to LCE7. In which LCE1 denote the statement "resources meet the requirements of library users", LCE2 for "access to collections of wide variety of books and journals on the subject the institute specializes", LCE3 for

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"access to wide variety of e-journals on the subject the institute specializes", LCE4 for "access to collections include technical reports, patent and annual report", LCE5 for "efficiently maintain back volumes of journals", LCE6 for "efficiently maintains project report, dissertations and theses", LCE7 for " access to audio visual materials".

The loadings for the seven variables on users expectation on Library Collection range from 0.46 (LCE7) to 0.77 (LCE4). The squared multiple correlations for the Library Collection Expectation items range from 0.21 for LCE7 to 0.60 for LCE4. From the regression coefficient path diagram it is evident that all items are related to expectation library collections with their standardised regression weights which are more than and around 0.50. All the variables LCE1, LCE2, LCE3, LCE4, LCE5, LCE6 and LCE7 considered being the best indicators of Expectation library collections. Their standardised regression weights are, respectively, 0.66,0.64,0.67, 0.77,0.72,0.73 and 0.46. Additionally expectation library collections explains about 44% of the variance in LCE1, 41 percent of the variance in LCE2, 45 percent of the variance in LCE3, 60 percent of the variance in LCE4 , 52 percent of the variance in LCE5, 53 percent of the variance in LCE6 and 21percent of the variance in LCE7.

4.4.4. Library Collection-Perception

As in the case of expectation, the model fit indices and regression coefficient of users perceptions on library collection also calculated for assessing the model fit and observing the importance of each statement in the library collection dimension for measuring the perceptions of the users. The following table and diagrams shows the model fit indices and regression coefficient of the users perceptions on library collection dimensions

Table 4.7

Model Fit Indices for CFA-Library Collection-Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library Collection-Perception	8.188	7	.316	1.170	.996	.985	.996	.998	.999	.012	.017

The table 4.7 shows the model fit indices of user's perception on library collection. It can be seen that all the attributes loaded significantly on the latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data.

Table4.8

The Regression Coefficients -Library Collection-Perception

Path	Estimate	Variance explained	CR	P	Rank
LC1 → Library collection	0.836	69.8	30.000	<0.001	2
LC2 → Library collection	0.732	53.6	23.176	<0.001	3
LC3 → Library collection	0.603	36.4	17.334	<0.001	6
LC4 → Library collection	0.865	74.8	32.611	<0.001	1
LC5 → Library collection	0.655	42.9	19.474	<0.001	4
LC6 → Library collection	0.605	36.6	17.412	<0.001	5
LC7 → Library collection	0.394	15.6	30.000	<0.001	7

The regression equation for Library collection - Perception

Library collection - Perception= 0.836 LC1+ 0.732 LC2+ 0.603 LC3+ 0.865 LC4 + 0.655 LC5+ 0.605 LC6+ 0.394 LC7

The table 4.8 reflects how each item in the Library Collection dimension is perceived by the users. The item LC4P "access to collections includes technical reports, patents and annual reports" (0.865) has high perception value and LC7P "access to audio visual materials" (0.394) has low perception value. All other items in the dimension lie in the range of 0.39 to 0.86.
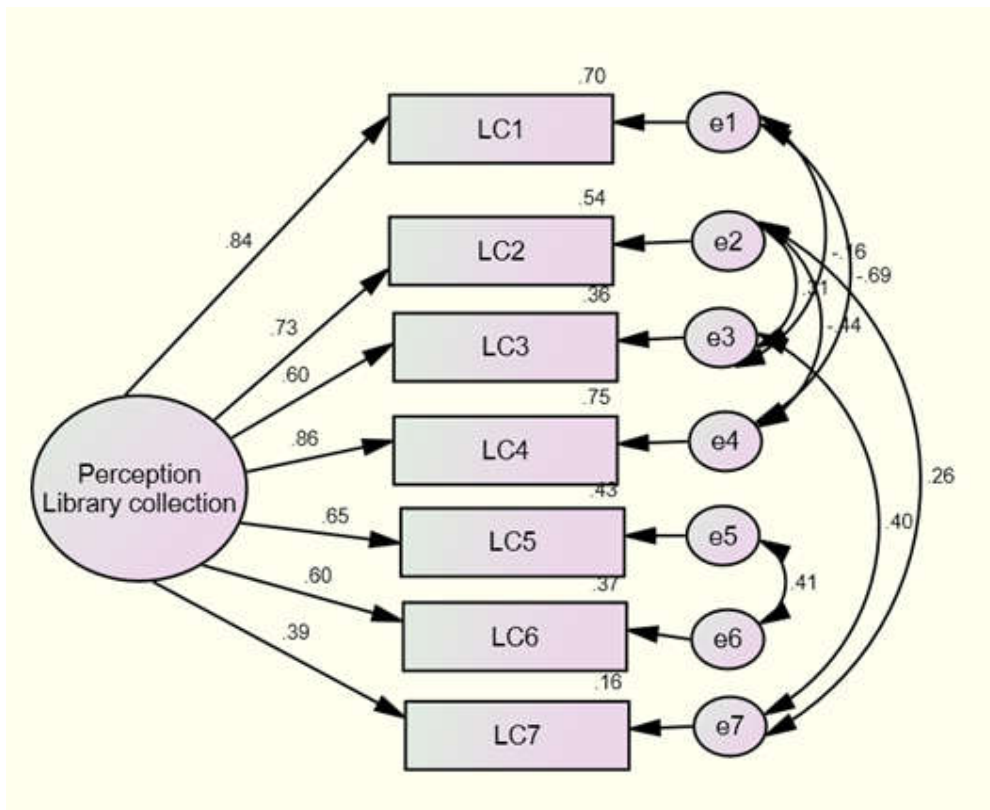
Figure 4.4

The Regression Coefficients-Library Collection-Perception

The observed variables are represented by LC1 to LC7. In which LC1 denote the statement "Resources meet the requirements of library users", LC2 for "Access to collections of wide variety of books and journals on the subject the institute specializes", LC3 for "access to wide variety of e-journals on the subject the institute specializes", LC4 for "access to collections include technical reports, patent and

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annual report", LC5 for "efficiently maintaining back volumes of journals", LC6 for "efficiently maintaining project report, dissertations and theses", LC7 for " access to audio visual materials".

The loadings for the seven variables on users perception on Library Collection range from 0.39 (LC7) to 0.84 (LC1). The squared multiple correlations for the Library Collection perception items range from 0.16 for LC7 to 0.75 for LCE4. The better way to communicate an SEM model is making the regression coefficient path diagrams which draw pictures to show the relationship among observed variables. We can conclude the following results- It is evident that all items are related to perception of library collections with their standardised regression weights which are more than and around 0.50 Except for the Variable LC7. All the variables LC1, LC2, LC3, LC4, LC5 and LC6 considered being the best indicators of perception of library collections. Their standardised regression weights are, respectively, 0.84,0.73,0.60,0.86,0.65 and 0.60.Additionally Perception library collections explains about 70 percent of the variance in LC1, 54 percent of the variance in LC2, 36 percent of the variance in LC3, 75 percent of the variance in LC4 , 43 percent of the variance in LC5 and 37 percent of the variance in LC6.For the variable LC7 which is comparatively considered as a poor indicator of Perception library collections since regression weight is 0.39 and also Perception library collections 16 percent of the variance in LC7.

4.4.5. Library staff-Expectation

The service quality of libraries also gets affected by the performance of library staff. Only an efficient and knowledgeable staff can provide quality services to its users. Therefore, it has to be assessed upon while measuring the service quality of libraries. The quality of library staff is measured on the basis of 10 statements. The model fit indices and regression coefficients are calculated to find out the model fit and variability of each statement. The following tables and diagram

shows the model fit indices and regression coefficient of the expectations of library staff dimension.

Table 4.9

Model Fit Indices for CFA-Library Staff-Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library Staff-Expectation	21.416	16	.163	1.338	.993	.976	.993	.995	.998	.008	.023

The table 4.9 shows the model fit indices of user's expectation on library staff dimension. In which the GFI is 0.993 and AGFI is 0.976, as the values lies within the recommended limit it shows a reasonable fit. The NFI, CFI, TLI are 0.993, 0.998, 0.995 respectively. RMSEA is 0.023 and RMR is 0.008. Hence the model shows an overall acceptable fit.

Table4.10

The Regression Coefficients -Library Staff-Expectation

Path	Estimate	Variance explained	CR	P	Rank
LSE1 → Library staff	0.605	36.5	17.412	<0.001	8
LSE2 → Library staff	0.671	45.1	20.184	<0.001	5
LSE3 → Library staff	0.810	65.7	27.995	<0.001	1
LSE 4 → Library staff	0.725	52.5	22.805	<0.001	3
LSE 5 → Library staff	0.588	34.5	16.757	<0.001	9
LSE 6 → Library staff	0.686	47.1	20.874	<0.001	4
LSE 7 → Library staff	0.556	31.0	15.575	<0.001	10
LSE 8 → Library staff	0.666	44.4	19.959	<0.001	6
LSE 9 → Library staff	0.640	40.9	18.833	<0.001	7
LSE10 → Library staff	0.749	56.1	24.111	<0.001	2

The regression equation for Library staff -Expectation

Library staff -Expectation= 0.605 LSE 1+ 0.671 LSE 2+ 0.810 LSE 3+ 0.725 LSE 4+ 0.588 LSE 5+ 0.686 LSE 6+ 0.556 LSE 7+ 0.666 LSE8 + 0.640 LSE 9 + 0.749 LSE10

The table 4.10 shows the regression coefficient of user's expectation on library staff dimension. It indicates that the item LSE3 "competent enough to anticipate library users' needs and work accordingly" (0.810) ranked as first; therefore it is regarded as the highly expected item by the users. Library users' needs and expectations are changing on time, in order to provide quality services, library staff should have the ability to provide information and services as and when in accordance to the changes. Meanwhile, the item LSE 7 "emotional intelligence to deal with the library users" (0.556) ranked as the last. This is because the users may not consider emotional intelligence of the staff as important as any other items in the dimensions.
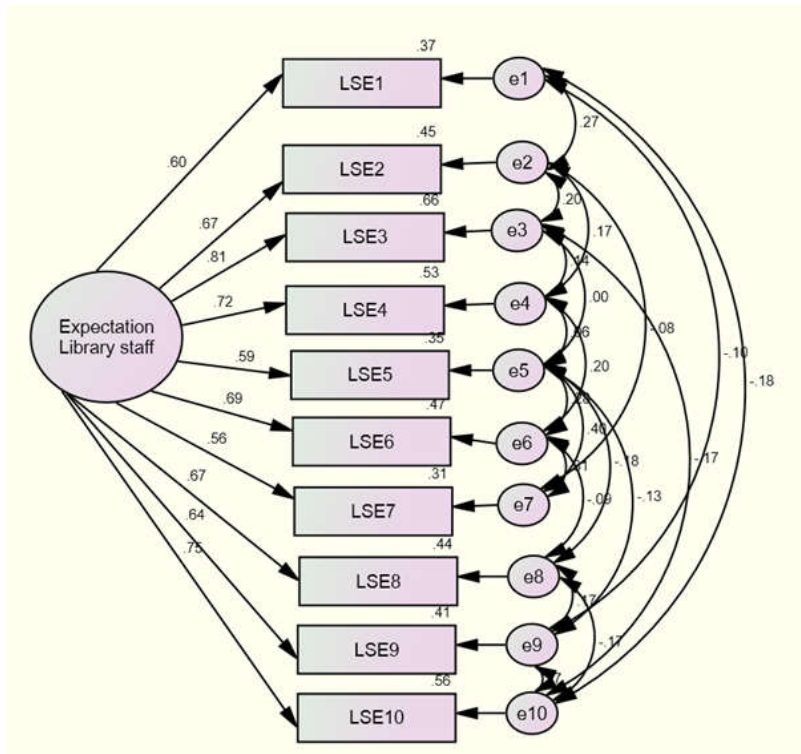
Figure 4.5

The Regression Coefficients -Library Staff-Expectation

The figure 4.5 shows the diagrammatic representation of regression coefficient of users' expectation on library staff. The observed variable in the dimensions are indicated as LSE1 to LSE10, of which LSE 1 for the statement "approachable and welcoming", LSE2 for "good knowledge and expertise to provide value added library services", LSE3 for "competent enough to anticipate library users needs and work accordingly", LSE4 for "quick response to library users query and request", LSE5 for "giving personal attention to library users", LSE6 for "willingness to help the library users all the time", LSE7 "emotional intelligence to deal with the library users", LSE8 "help library users when they fail to locate a document needed", LSE9 "re-shelving documents quickly in proper order", LSE10 for "good knowledge and expertise in Information Technology".

The loadings for the ten variables on users expectation on Library Staff range from 0.56 (LSE7) to 0.81 (LSE3). The squared multiple correlations for the Library Staff Expectation items range from 0.31 for LSE7 to 0.66 for LSE3. So it can say that from the path diagram those observed variables with standard regression weights around and more than 0.50 are the best describers of the Main variable Expectation library staff. Out of these 3 variables LSE3, LSE4 and LSE10 have regression weights more than 0.70 which can be treated separately. The squared multiple correlations show that most of the variance in the observed variables is explained by expectation library staff since their percentage of variability ranging from 31% to 66%.

4.4.6. Library Staff-Perception

By applying model fit indices and regression coefficient, confirmatory factor analysis of the perceptions of library staff dimension was also conducted. It identifies the major components in the dimension which constitutes the service quality of libraries. The following tables

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and diagram shows the model fit indices and regression coefficient of the perceptions of library staff dimension.

Table 4.11

Model Fit Indices for CFA-Library Staff-Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library staff-Perception	22.748	22	.416	1.034	.993	.982	.995	1.000	1.000	.009	.007

The table 4.11 presents the model fit indices of user's perceptions on library staff dimension. Through the table it can be seen that all values lie within the recommended fit, therefore the model exhibits an overall acceptable fit.

Table 4.12

The Regression Coefficients -Library Staff-Perception

Path	Estimate	Variance explained	CR	P	Rank
LS1 → Library staff	0.755	57.0	24.454	<0.001	5
LS2 → Library staff	0.774	60.0	25.59	<0.001	4
LS3 → Library staff	0.840	70.5	30.333	<0.001	1
LS 4 → Library staff	0.835	69.8	29.917	<0.001	2
LS 5 → Library staff	0.723	52.3	22.701	<0.001	8
LS 6 → Library staff	0.829	68.7	29.433	<0.001	3
LS 7 → Library staff	0.728	52.9	22.963	<0.001	7
LS 8 → Library staff	0.718	51.5	22.443	<0.001	9
LS 9 → Library staff	0.713	50.8	22.188	<0.001	10
LS10 → Library staff	0.750	56.3	24.168	<0.001	6

The regression equation for Library staff- Perception

Library staff - Perception= 0.755 LS1+ 0.774 LS 2+ 0.840 LS 3+ 0.835 LS 4+ 0.723 LS 5+ 0.829 LS 6+ 0.728 LS7+ 0.718 LS8 + 0.713 LS 9 + 0.750 LS10

The table 4.12 represents the regression coefficient of user's perception on library staff dimension. The item LSP3 "Competent enough to anticipate library users' needs and work accordingly" has the highest value of 0.810 which indicates that the users perceived competent library staff to meet their changing needs and expectations. The item LSP9 "Re-shelving documents quickly in proper order" has the lowest value of 0.713. In majority of the libraries the documents are always kept misplaced. As an outcome, the user may not get the required document when he/she search for it. It adversely affects the service quality of libraries.
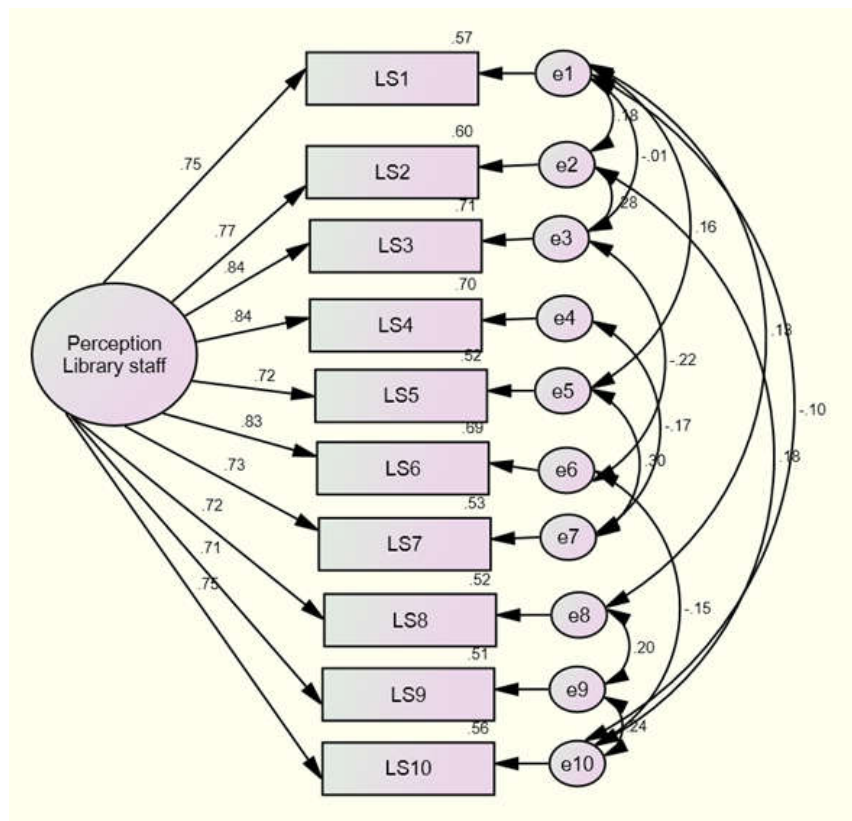
Figure 4.6

The Regression Coefficients-Library Staff-Perception

The figure4.6 shows the diagrammatic representation of regression coefficient of users' perception on library staff. The observed variable in the dimensions are indicated as LS1 to LS10. In which LS 1 for the statement "approachable and welcoming", LS2 for "good knowledge and expertise to provide value added library services", LS3 for "competent enough to anticipate library users' needs and work accordingly", LS4 for "quick response to library users query and request", LS5 for "giving personal attention to library users", LS6 for "willingness to help the library users all the time", LS7 "emotional intelligence to deal with the library users", LS8 "help library users when they fail to locate a document needed", LS9 "re-shelving documents quickly in proper order", LS10 for "good knowledge and expertise in Information Technology".

The loadings for the ten variables on users perception on Library Staff range from 0.71 (LS9) to 0.84 (LS3, LS4). The squared multiple correlations for the Library Staff perception items range from 0.51 for LS9 to 0.71 for LS3. All regression weights are more than 0.71 which indicates that the observed variables given are the most appropriate to explain the Perception of the library staff. The variability explained by perception of library staff ranging from 0.51 to 0.71 indicates a clear picture of how SEM model is interpreting results.

4.4.7. Technical Process - Expectation

A well managed technical section is the backbone of every library. Therefore service quality measurement of libraries is not complete without assessing the quality of technical processes of the library. The regression coefficient measures that statement which better explains the expectation of users about the technical process of the libraries. The model fit indices measures whether the dimension shows an acceptable fit for the model. The following tables and diagrams clearly depicts the model fit indices and regression

coefficient of expectations and perception of technical process dimension separately.

Table 4.13

Model Fit Indices for CFA-Technical Process-Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Technical process-Expectation	27.101	21	.168	1.291	.991	.977	.992	.996	.998	.007	.022

The table 4.13 shows the model fit indices of users' expectation on the technical process dimension. The value shown in the table reflected a reasonable fit of measurement model.

Table 4.14

The Regression Coefficients -Technical Process-Expectation

Path	Estimate	Variance explained	CR	P	Rank
TPE1 → Technical process	0.615	37.9	17.808	<0.001	9
TPE2 → Technical process	0.696	48.5	21.350	<0.001	6
TPE3 → Technical process	0.709	50.3	21.987	<0.001	5
TPE 4 → Technical process	0.662	43.8	19.781	<0.001	7
TPE 5 → Technical process	0.759	57.5	24.687	<0.001	2
TPE 6 → Technical process	0.773	59.8	25.529	<0.001	1
TPE 7 → Technical process	0.610	37.2	17.609	<0.001	10
TPE 8 → Technical process	0.716	51.3	22.340	<0.001	4
TPE 9 → Technical process	0.630	39.6	18.416	<0.001	8
TPE10 → Technical process	0.740	54.8	23.609	<0.001	3

The regression equation for Technical process-Expectation

Technical process-Expectation= 0.615 TPE 1+ 0.696 TPE 2+ 0.709 TPE 3+ 0.662 TPE 4+ 0.759 TPE 5+ 0.773 TPE 6+ 0.610 TPE 7+ 0.716 TPE 8 + 0.630 TPE 9 + 0.740 TPE 10

The table 4.14 shows the regression coefficient of users' expectation on technical process dimension. It can be seen that the item TPE 6 "full-fledged internet access in the library" has the highest score of 0.773. As the special library focused mainly on digital library services and online services, it is inevitable to have an uninterrupted internet connection. Therefore users have high expectation on it. Meanwhile the item TPE7 "Wireless network access (Wi-Fi, WiMAX, Wireless LAN)" have the lowest score of 0.610 indicates that users have low expectation on it.
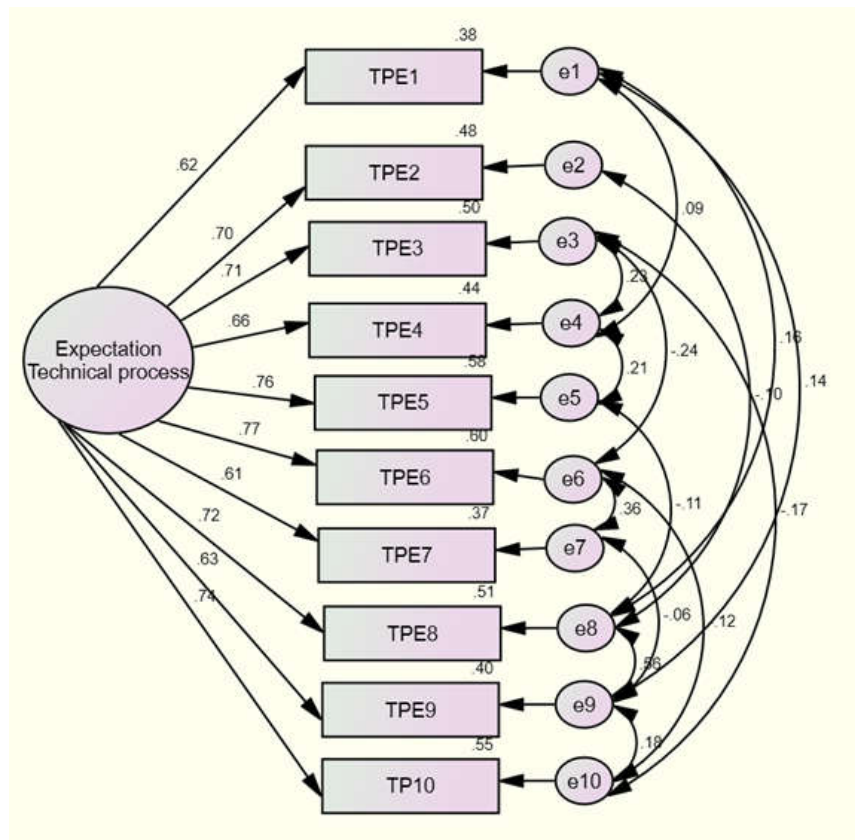
Figure 4.7

The Regression Coefficients -Technical Process-Expectation

The figure 4.7 shows the regression coefficient of users' expectation on technical process. The observed variables are represented by TPE1 to TP10. In which TPE1 denote the statement "Access to well organized library catalogue", TPE2 for "all library functions and operations are automated/computerized", TPE3 for "conduct library users need assessment", TPE4 for "ICT infrastructure of the library is always in good working condition", TPE5 for "well designed and managed library website or portal", TPE6 for "full-fledged internet access in the library", TPE7 for "wireless network access", TPE8 for "classification and arrangement of documents systematically and logically", TPE9 for "protecting library resources from damage and dust", TPE10 for "library frequently updated with latest technologies".

The loadings for the ten variables on users expectation on Technical Process range from 0.61 (TPE7) to 0.77 (TPE6). The squared multiple correlations for the Technical Process Expectation items range from 0.38 for TPE1 to 0.60 for TPE6. The maximum regression weights of these observed variables indicate the possibility that no observed variable is considered as an indicator of another one. Also the variability explained is of maximum percentage values.

4.4.8. Technical Process-Perception

As similar to the expectation, confirmatory factor analysis of perceptions of the users on Technical Process dimension was also conducted. Each statement in the technical process dimension are analyzed to identify the statement having highest regression coefficient value with regard to all other statements and it is treated as the most important statement having good variability while measuring the perceptions of users on technical process dimension.

Table 4.15

Model Fit Indices for CFA-Technical Process-Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Technical process-Perception	36.352	22	.028	1.652	.989	.972	.986	.988	.994	.024	.032

The table 4.15 shows the model fit indices of users' perception on technical process dimension. All the values depicted in the table shows a reasonable fit of measurement for this dimension also.

Table 4.16

The Regression Coefficients -Technical Process-Perception

Path	Estimate	Variance explained	CR	P	Rank
TP1 → Technical process	0.669	44.8	20.093	<0.001	5
TP2 → Technical process	0.745	55.6	23.886	<0.001	2
TP3 → Technical process	0.723	52.3	22.701	<0.001	3
TP4 → Technical process	0.750	56.2	24.168	<0.001	1
TP5 → Technical process	0.408	16.6	10.761	<0.001	9
TP6 → Technical process	0.698	48.8	21.446	<0.001	4
TP7 → Technical process	0.267	7.1	6.797	<0.001	10
TP8 → Technical process	0.645	41.6	19.044	<0.001	6
TP9 → Technical process	0.536	28.7	14.867	<0.001	8
TP10 → Technical process	0.585	34.2	16.643	<0.001	7

The regression equation for Technical Process-Perception

Technical process-Perception= 0.669TP1+ 0.745 TP2+ 0.723 TP3+ 0.750 TP4

+ 0.408 TP5+ 0.698 TP6+ 0.267 TP7+ 0.645 TP8 + 0.536 TPE9 + 0.585 TP10

The table 4.16 shows the regression coefficient of technical process dimension. In which the item TPP 4 "ICT infrastructure of the library are always in good working condition" have the highest score of 0.750. The item TPP7 "Wireless network access (Wi-Fi, WiMAX, Wireless LAN)" have the lowest score of 0.267.
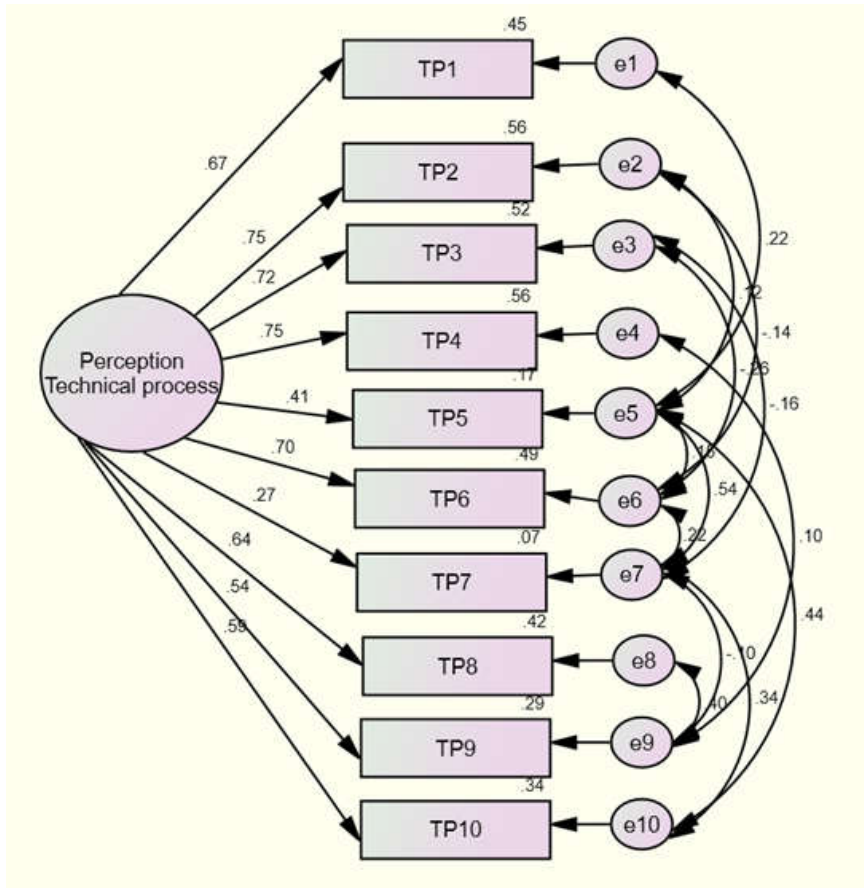
Figure 4.8

The Regression Coefficients -Technical Process-Perception

The figure 4.7 shows the regression coefficient of users' perception on technical process. The observed variables are represented by TP1 to TP10. In which TP1 denote the statement "Access to well organized library catalogue", TP2 for "all library functions and operations are automated/computerized", TP3 for "conduct library users need assessment", TP4 for "ICT infrastructure of the library is always in

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good working condition", TP5 for "well designed and managed library website or portal", TP6 for "full-fledged internet access in the library", TP7 for "wireless network access", TP8 for "classification and arrangement of documents are systematic and logical", TP9 for "protect library resources from damage and dust", TP10 for "library frequently updated with latest technologies".

The loadings for the ten variables on users perception on Technical Process range from 0.27 (TP7) to 0.75 (TP4). The squared multiple correlations for the Technical Process perception items range from 0.07 for TP7 to 0.56 for TP2 and TP4. Except TP5 and TP7 with regression weights 0.27 and 0.41, all other observed variables can be considered as the best indicators of Perception technical process. The regression weights of those variables ranging around 0.50 and also the same can be explained regarding their variability. Most of the percentage variability in those observed variables are mostly explained by the Perception on Technical process. The value above the rectangle box clearly indicates this interpretation.

4.4.9. Library Service - Expectation

As the libraries provide number of services to its users, in order to ensure the service quality, it is essential to measure whether the services meet the expectations of the users. The following tables and diagrams clearly depict the model fit and regression coefficient and show the variability of each statement in the dimension while assessing the expectations of the users.

Table 4.17

Model Fit Indices for CFA- Library Service – Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library service-Expectation	86.411	56	.006	1.543	.981	.960	.986	.990	.995	.009	.030

The table 4.17model fit indices of user's expectation on library service dimension shows that all the values depicted in the table are within the acceptable limit of the model.

Table 4.18

The Regression Coefficients -Library Service-Expectation

Path	Estimate	Variance explained	CR	P	Rank
ServicesE1 → Library service	0.570	32.5	16.084	<0.001	13
ServicesE2 → Library service	0.526	27.7	14.521	<0.001	15
ServicesE3 → Library service	0.530	28.1	14.659	<0.001	14
ServicesE 4 → Library service	0.670	44.9	20.138	<0.001	11
ServicesE 5 → Library service	0.749	56.1	24.111	<0.001	8
ServicesE 6 → Library service	0.764	58.4	24.982	<0.001	7
ServicesE 7 → Library service	0.799	63.8	27.220	<0.001	4
ServicesE 8 → Library service	0.803	64.5	27.497	<0.001	3
ServicesE 9 → Library service	0.765	58.5	25.042	<0.001	6
ServicesE10 → Library service	0.850	72.3	31.202	<0.001	1
ServicesE11 → Library service	0.809	65.5	27.923	<0.001	2
ServicesE12 → Library service	0.715	51.2	22.289	<0.001	9
ServicesE13 → Library service	0.665	44.2	19.914	<0.001	12
ServicesE14→ Library service	0.671	45.0	20.184	<0.001	10
ServicesE15 → Library service	0.774	59.9	25.590	<0.001	5

The regression equation for Library services-Expectation

Library service-Expectation= 0.570ServiceE1+ 0.526 ServiceE2+ 0.530 ServiceE3+ 0.670 ServiceE1+ 0.749 ServiceE5+ 0.764 ServiceE6+ 0.799 ServiceE7+ 0.803 ServiceE8 + 0.765 ServiceE9 + 0.850 ServiceE10 + 0.809ServiceE11+ 0.715 ServiceE12+0.665 ServiceE13+ 0.671 ServiceE14+ 0.774 ServiceE15

The table 4.18 presents the regression coefficient of users' expectation on library service dimension. It is shown that the item Services E10 "Provides bibliographic databases" have the highest score of 0.850 indicates that users have high expectation on the service whereas the item Services E 2 "Provides Xerox service to

library users during library hours" have the lowest score and observed as low expected item by the user under this dimension.
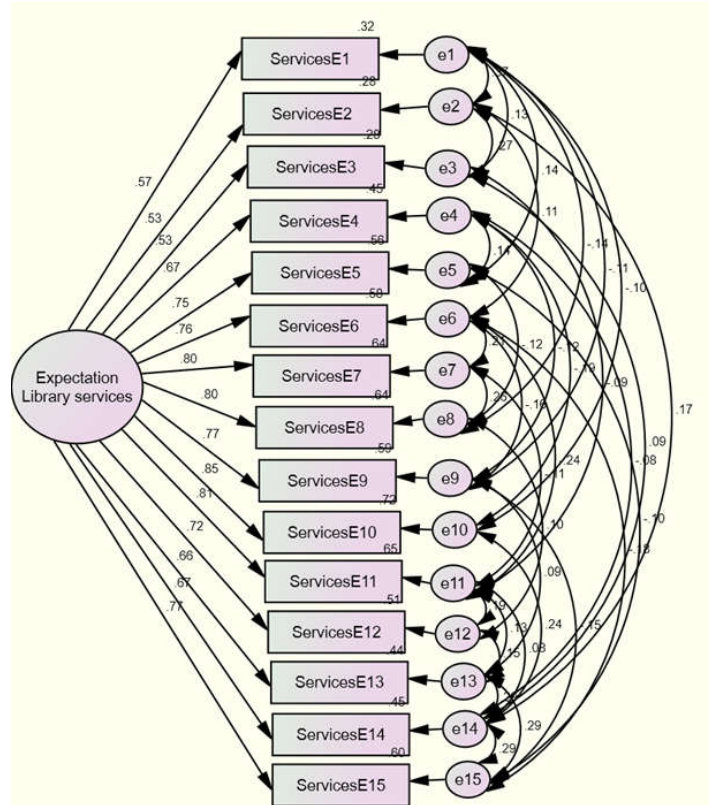
Figure 4.9

The Regression Coefficients -Library Service-Expectation

The figure 4.9 is the diagrammatic representation of regression coefficient of users' expectation on library service. The observed variables are indicated in the diagram as Service E 1 to Service E15. In which Service E1 denote the statement "keep library users informed about new facilities, collections and services provided by the library", Service E 2 for "provide Xerox service to library users during library hours", Service E3 for "convenient library timing", Service E4 for "providing user based alert service in a personal way, Services E5 for "provide digital library services", Service E6 for

"provide institutional repository services", Service E7 for "provide indexing and abstracting services", Service E 8 for providing "content page service", Service E9 for "provide newspaper clipping service", Service E10 for "provide bibliographic databases", Service E11 for "provide video library service", Service E12 for "provide user education/orientation", Service E13 for "provide services to differently abled users", Service E14 for "display of directional signs to reach different sections of the library", and Service E15 for "provide user feedback facility".

The loadings for the fifteen variables on users expectation on Library Service range from 0.53 (Service E 2, Service E3) to 0.85 (Service E 10). The squared multiple correlations for the Library Service Expectation items range from 0.28 for Service E2 and Service E3 to 0.72 for Service E10. Even though there are 15 observed variables expectations to library services require all those observed variables as an indicator which will clearly give a picture of the expectations. Nearly half of the variables have a regression weight of more than 0.70. The values above the rectangle explains the variability in each of those observed variables by the expectation library service is around 60 percent.

4.4.10. Library Service – Perception

In order to assess the model fit and variability of the library service dimension for measuring the perception of the users, confirmatory factor analysis was conducted. It determines the ability of a predefined model to fit an observed set of data. It helps to determine the significance of each statement and confirm it as the components of SERVQUAL scale for measuring service quality. The following tables and diagrams show the model fit indices and regression coefficient of the perceptions of users on library service dimension.

Table 4.19

Model Fit Indices for CFA- Library Service-Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Library Service-Perception	76.267	57	.045	1.338	.984	.966	.979	.990	.994	.034	.023

In table 4.19, the model fit indices of users perception on library services indicates that the hypothesized data have an acceptable fit to the observed data.

Table 4.20

The Regression Coefficients -Library Service-Perception

Path	Estimate	Variance explained	CR	P	Rank
Service1 → Library service	0.676	20.411	45.8	<0.001	5
Service2 → Library service	0.535	14.832	28.6	<0.001	8
Service3 → Library service	0.480	12.991	23.1	<0.001	11
Service 4 → Library service	0.617	17.888	38.0	<0.001	7
Service 5 → Library service	0.695	21.301	48.3	<0.001	4
Service 6 → Library service	0.435	11.576	18.9	<0.001	12
Service 7 → Library service	0.380	9.937	14.4	<0.001	14
Service 8 → Library service	0.725	22.805	52.5	<0.001	3
Service 9 → Library service	0.522	14.384	27.3	<0.001	9
Service10 → Library service	0.501	13.678	25.1	<0.001	10
Service11 → Library service	0.395	10.376	15.6	<0.001	13
Service12 → Library service	0.739	23.555	54.7	<0.001	1
Service13 → Library service	0.073	1.817	0.5	<0.001	15
Service14→ Library service	0.627	18.293	39.3	<0.001	6
Service15 → Library service	0.728	22.963	52.9	<0.001	2

The regression equation for Library service-Perception

Library service-Perception = 0.676Service1+ 0.535 Service2+ 0.480 Service3+ 0.617 Service1+ 0.695 Service5+ 0.435 Service6+ 0.380 Service7+ 0.725 Service8 + 0.522 Service9 + 0.501 Service10 + 0.395 Service11+ 0.739 Service12+0.073 Service13+ 0.627 Service14+ 0.728 Service15

The table 4.24 shows the regression coefficient of user perceptions on library service. The item Service P12 "Provide user education/orientation" has the highest score of 0.739. It is observed that users have high perception on it. The item Service P13 "Provide services to differently abled users" has the lowest score of 0.73 indicates users have low perception on it because majority of the special libraries are not providing any service specifically designed to them.
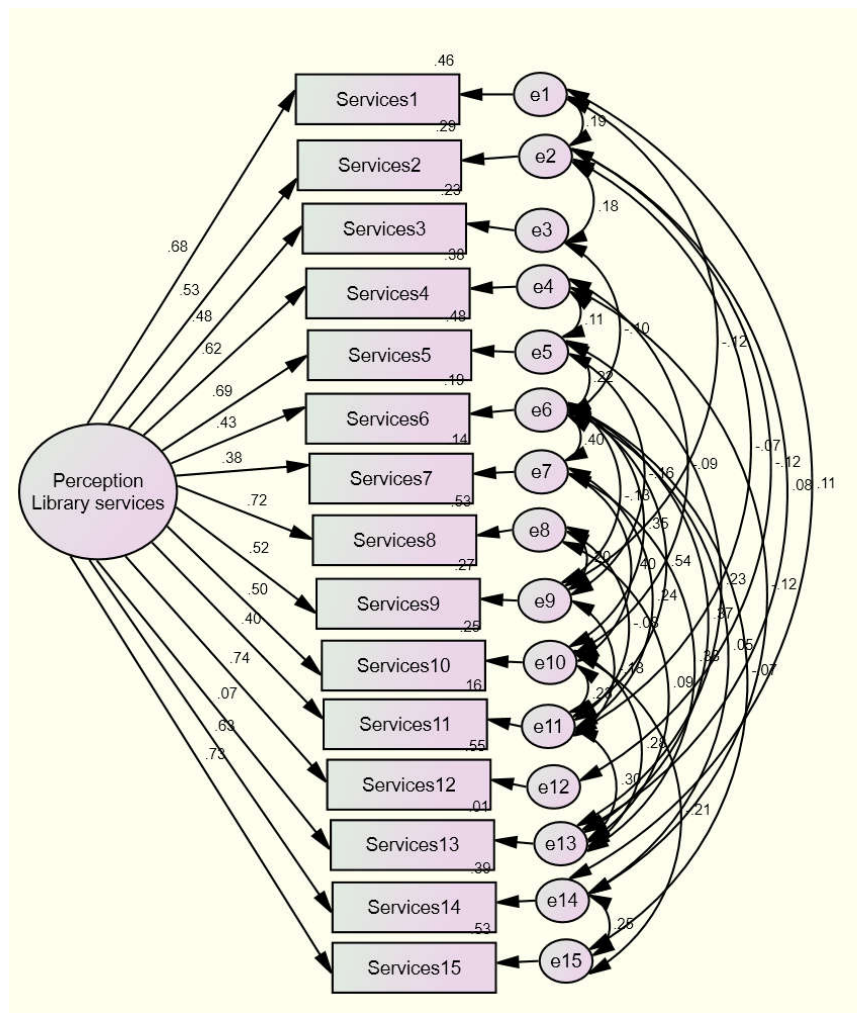
Figure 4.10

The Regression Coefficients -Library Service-Perception

The figure 4.10 is the diagrammatic representation of regression coefficient of users' perception on library services. The observed variables are indicated in the diagram as Service 1 to Service 15. In which Service 1 denote the statement "keep library users informed about new facilities, collections and services provided by the library", Service 2 for "provide Xerox service to library users during library hours", Service 3 for "convenient library timing", Service 4 for "provide user based alert service in a personal way, Service 5 for "provide digital library services", Service 6 for "provide institutional repository services", Service 7 for "provide indexing and abstracting services", Service 8 for provides "content page service", Service 9 for "provide newspaper clipping service", Service 10 for "provide bibliographic databases", Service 11 for "provide video library service", Service 12 for "provide user education/orientation", Service 13 for "provide services to differently abled users", Services 14 for "display of directional signs to reach different sections of the library", and Service 15 for "provide user feedback facility".

The loadings for the fifteen variables on users perception on Library Service range from 0.07 (Service 13) to 0.74 (Service 12). The squared multiple correlations for the Library Service Perception items range from 0.01 for Service 13 to 0.53 for Service 8 and Service15.

4.5. Confirmatory Factor Analysis of the Overall SERVQUAL Model

Finally assesses the SERVQUAL Model itself to find the construct having significant impact on the SERVQUAL. The model is developed separately for expectation and perception.

Table 4.21

Model Fit Indices for CFA- Overall Service Quality Expectation

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Service Quality Expectation	2.534	4	.639	.634	.998	.994	.999	1.002	1.000	.067	.000

All the attributes loaded significantly on the latent constructs. The value of the fit indices indicates a reasonable fit of the measurement model with data. The table 4.22 presents the regression coefficients of expectation.

Table 4.22

The Regression Coefficients - Overall Expectation

Path	Regression coefficient	Variance explained	CR	P	Rank
Physical facility → SERVQUAL	0.648	41.9	16.319	<0.001	5
Library collection → SERVQUAL	0.749	56.1	20.522	<0.001	4
Library staff → SERVQUAL	0.796	63.3	22.994	<0.001	3
Technical process → SERVQUAL	0.893	79.7	30.372	<0.001	1
Library Service → SERVQUAL	0.889	79.1	29.962	<0.001	2

From the table 4.22 and figure 4.11, one can observe that the regression coefficient for Technical process is the highest value followed by Library Service and Library staff. Library collection and Physical facility come in the last two positions. The most influential one is "Technical process" as its regression coefficients is of highest value of 0.893. Library Service and Library staff takes the second and third position. Library collection and physical facility comes in the fourth and fifth position.
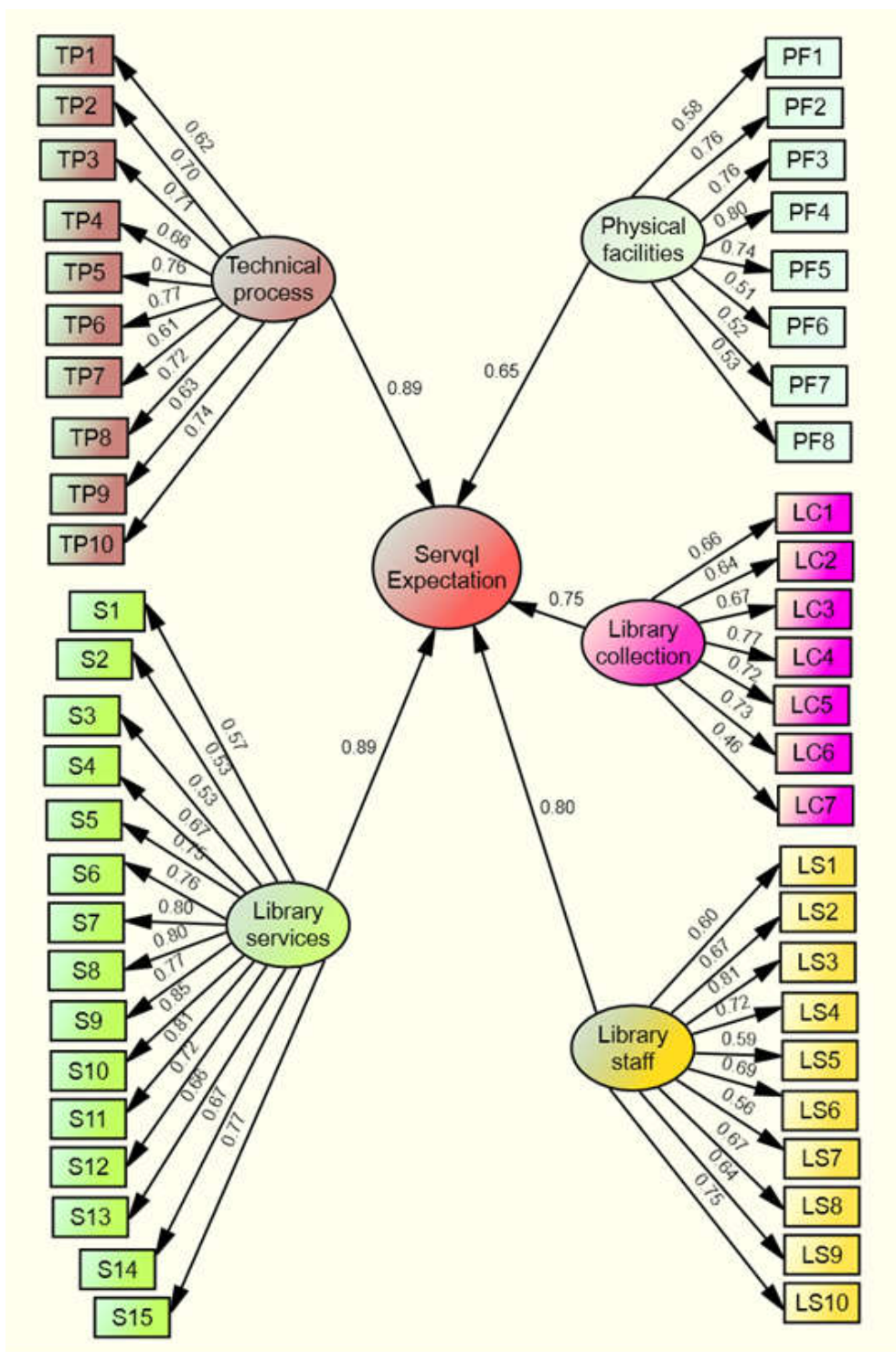
Figure4.11

The Regression Coefficients - Overall Expectation

Figure 4.11 clearly explains the SEM model by giving the Path diagram with rectangles representing observed variables and eclipses representing latent variables. They show the relationships among the latent and observed variables. The service quality expectations are connected by the five latent variables Physical facility, Technical process, Library service, Library collection and Library staff with regression weights respectively of 0.65, 0.89, 0.89, 0.75 and 0.80 which shows all those are best indicators of the service quality expectations.

Table 4.23

Model Fit Indices for CFA- Overall Service Quality Perception

	x^2	DF	P	Normed x2	GFI	AGFI	NFI	TLI	CFI	RMR	RMSEA
Service quality Perception	5.395	3	.145	1.798	.996	.982	.997	.996	.999	.219	.036

Since the calculated value of all the attributes meets the recommended fit, the value of the fit indices indicates a reasonable fit of the measurement model with data. The table 4.24 presents the regression coefficients on Perception.

Table 4.24

The Regression Coefficients – Overall Perception

Path	Regression coefficient	Variance explained	CR	P	Rank
Physical facility → SERVQUAL	0.655	42.9	16.576	<0.001	5
Library collection → SERVQUAL	0.783	61.3	22.265	<0.001	3
Library staff → SERVQUAL	0.729	53.1	19.590	<0.001	4
Technical process → SERVQUAL	0.888	78.8	29.861	<0.001	2
Library Service → SERVQUAL	0.897	80.4	30.797	<0.001	1

From the table 4.24 and figure 4.12 one can observe that the regression coefficient for Library Service is the highest value followed by Technical process and Library collection. Library staff and physical facility come in the last two positions. The most influential one is "Library Service" as its regression coefficients is highest value of 0.897. Technical process and Library collection take the second and third positions. Library staff and Physical facility come in the fourth and fifth position.

The statistical significance of service quality of libraries and its dimensions are very important. Since the P value is less than 0.01, all the path were significant and all the coefficient were positive which indicated that any increase in the dimensions will result in an increase in the quality of libraries.
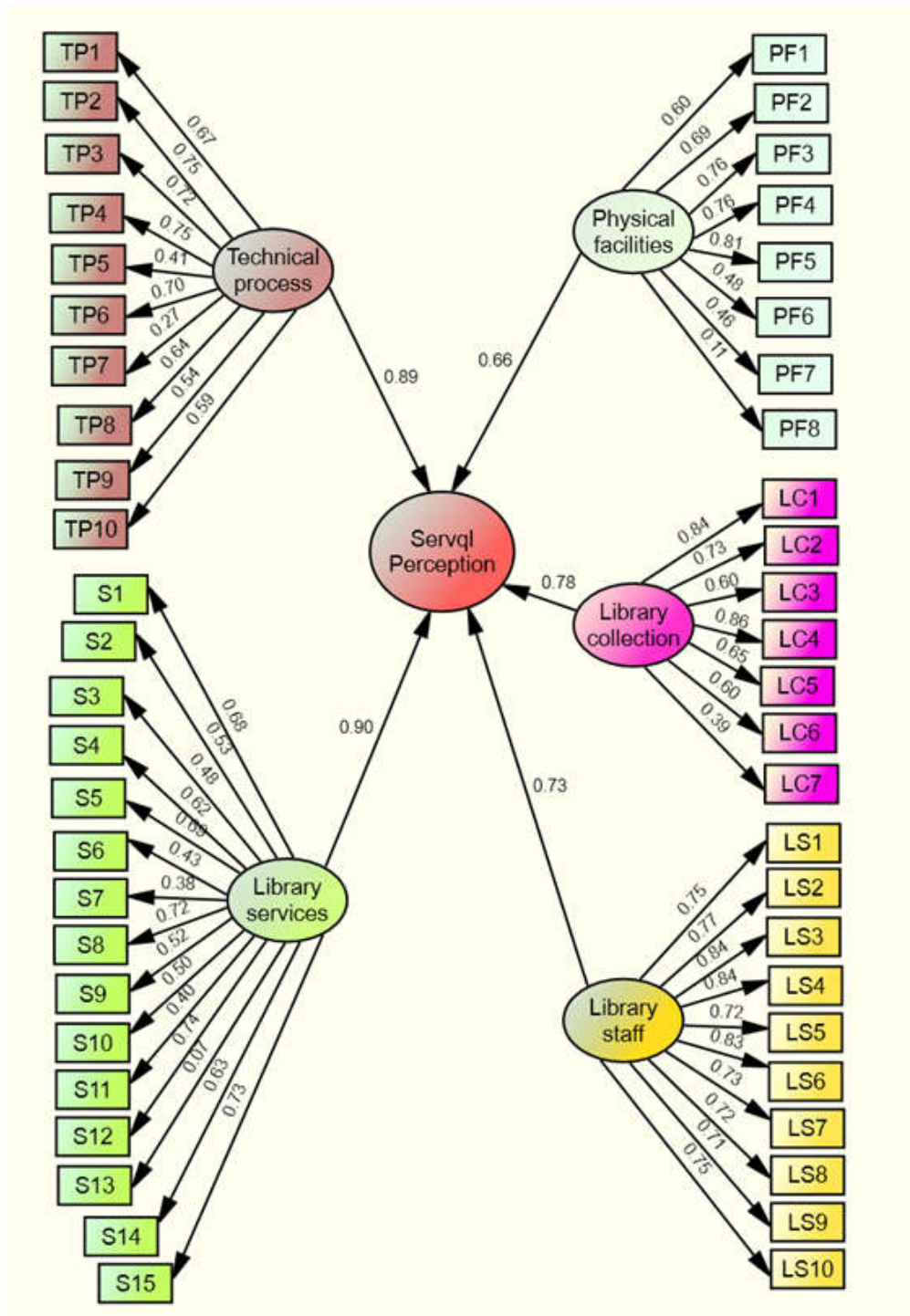
Figure 4.12

The Regression Coefficients – Overall Perception

The figure 4.12 shows to what extend each dimension measures the overall service quality perceptions of the users of special libraries. It is based on five service quality variables such as physical facility, library collection, library staff, technical process and library services. The regression weights of these variables are shown as 0.66, 0.78, 0.73, 0.89 and 0.90 respectively. It establishes that all these variables are better indicators of measuring service quality perceptions of the users of special libraries.

4.6. Service Quality Analysis

The service quality of special libraries is assessed under five dimensions. They are; physical facility, library collection, library staff, technical process and library service. The expectations and perceptions of users regarding each of these dimensions are analyzed in order to find out the service quality gap. The physical facility dimension measures the quality of overall physical facilities of the library which includes location of the library, reading space, lighting and ventilation, cleanliness, adequate furniture, drinking water facility, etc. Library collection dimension measures the quality of the collections of library, whether the collections meet the expectations of the users, accessibility to e-resources, back volumes of journals, audio visual materials, etc. Library staff acts as another important dimension, which evaluates the knowledge and expertise of the library staff, their approach and attitude, quick responses, service mindedness, etc. The technical process dimension examines the efficiency and effectiveness of catalogue, classification techniques, online and web catalogue, library portal, ICT infrastructure etc. and the library service dimension assesses the quality of the services provided by the library such as digital library services, Xerox service, user based alert service, institutional repository service, indexing and abstracting service, newspaper clipping service, video library

service etc. Thus all these dimensions together contribute to the service quality of library.

4.6.1. Dimension Wise Analysis of User Expectation

For measuring service quality of libraries, the study first of all analyses the expectations of users on five quality dimensions. The expectations of users are formed on the basis of their previous experiences, status, designation etc. It is normal human nature that they always expect the best things to happen. The expectations of users are important for the librarians since they act as a benchmark for coordinated library development, arrangement of library services, and improvement of the current collection. Therefore, acknowledging the expectations of library users has turned out to be quite worthy to the librarians. The prime objective of service quality is to provide constant improvement of the offered services against the customer expectations. For understanding the users' expectations, it is essential to construct a communication channel and to have regular and consistent discourse with the users. The inclusion of library users with the development plans of libraries infrastructure and services would marginally improve the usage of library resources.

Calvert (2001) observed in his study that the expectations of the users at different part of the world are more or less similar, national culture was not a factor affecting user's expectations. He found that customer expectations to be similar in the United States, New Zealand, Singapore and the People's Republic of China and he also pointed out that there is perhaps a global set of customer expectations that can be used to measure academic library service quality.

As far as a library is concerned, users naturally expect to have better service for satisfying their information needs. Based on the

requirements of the users, their expectation on each dimensions fluctuate with time. The analysis investigates those dimensions on which users have high expectations and those on which they have low expectations.

Table 4.25

Dimension Wise Analysis of User Expectation

Dimensions	Mean	Standard Deviation
Physical facility	4.62	0.392
Library Collection	4.60	0.428
Library Staff	4.50	0.462
Technical Process	4.56	0.458
Library Service	4.46	0.492

The table 4.25 depicted the dimension wise analysis of user's expectation. It can be seen that users have high expectation on all dimensions. The physical facility dimension appears to be the most expected dimension (Mean 4.62, SD 0.392) followed by library collection dimension.

As library is a place for knowledge creation and enhancement, users want to have a comfortable atmosphere for reading and other intellectual activities. They need better physical facility like adequate furniture, clean and hygienic environment, proper lighting and ventilation, drinking water facility, facilities for differently abled users, etc. It is found that 'physical facility dimensions' is the most important factor as special library users expects the library to perform well. Similarly, in a study conducted by Arshad and Ameen (2010), respondents ranked "tangibles" as the most important dimension. According to them "A library with rich collection but unfriendly library internal environment would not yield good service quality perceptions. The physical facilities like furniture, shelves,

lighting, ventilation, reading space etc. play an important role in improving service quality perceptions".

Users have high expectation on library collection also. They expect specialized collection to meet the specific requirements of users regarding the objective of the parent organization. The collections may include patents, standards, reports, pamphlets, trade literature, government publications, audio visual materials, etc. Meanwhile they have low expectation on library service dimension (Mean 4.46, SD 0.492). This may be due to the unawareness about many of the services. Therefore, proper user orientation is essential to make the users aware of such services.

There have been number of studies assessing the relative importance of service quality dimensions. The study by Manjunatha and Shivalingaiah (2004) evaluated the importance of each service quality dimension. They observed five service quality dimension; reliability, tangibles, responsiveness, assurance and empathy as observed by Parasuraman, Zeithaml and Berry and found reliability to be the most important dimension and empathy to be the least important one (Manjunatha and Shivalingaiah, 2004; Parasuraman, Zeithaml and Berry, 1988).While measuring the service quality expectations of the trainers from the government administrative training institute libraries, Kulkarni and Deshpande (2012) assessed the importance of five service quality dimensions such as resources, staff, services, guidance and environment and found 'environment' as the most important dimension and 'services' as the second important. The least priority was given to 'guidance' dimension. In the view of Waqar, Soroya and Malik (2015) the most expected dimension was "Assurance" and "Empathy" was the least expected. In the study of Wan and Shieh (2006) all the service quality dimensions except responsiveness, which include reliability, tangibles, assurance and

empathy have a positive impact on user satisfaction. It is observed that majority of the studies lay emphasis on physical facilities of the libraries.

The Wilcoxon Signed Rank Test was conducted to assess the significance of the difference between the expectations of users under five dimensions such as physical facilities, library collection, library staff, technical process and library service.

Table 4.26

**Significance of Difference between Users Expectations -
Wilcoxon Signed Rank Test**

Dimensions	'Z' Value	Asymp. Sig. (2-tailed)
Library Collection Expectation - Physical Facilities Expectation	1.365	0.172
Library Staff Expectation - Physical Facilities Expectation	7.417	0.000
Technical Process Expectation - Physical Facilities Expectation	3.099	0.002
Library Services Expectation - Physical Facilities Expectation	9.663	0.000
Library Staff Expectation - Library Collection Expectation	6.623	0.000
Technical Process Expectation - Library Collection Expectation	2.749	0.006
Library Services Expectation - Library Collection Expectation	9.239	0.000
Technical Process Expectation - Library Staff Expectation	5.177	0.000
Library Services Expectation - Library Staff Expectation	3.084	0.002
Library Services Expectation - Technical Process Expectation	9.124	0.000

The table 4.26 exhibits the result of Wilcoxon Signed Rank Test which compared different level of expectations of users at 5% level of significance. It reveals that the expectation of Physical facilities has significant statistical difference in the expectation of library staff ($z=7.417.p=0.000$), technical process ($z=3.099$, $p=0.002$) and library

services (z=9.663, p=0.000). On the other hand, the difference between user expectation on physical facilities and library collection (z=1.365, p=0.172) is not statistically significant.

Similarly, there exist a statistical significant difference in the library collection expectations with the expectations of library staff (z=6.623, p=0.000), technical process (z=2.749, p=0.006) and library service (z=9.239, p=0.000).

Likewise, it is obvious from the table that the expectation of library staff has significant statistical difference among the technical process expectation (z=5.177, p=0.000) and library service expectation (z=3.084, p=0.002). In addition, the difference between the technical process expectation and library service expectation (z=9.124, p=0.000) also shows a statistically significant difference.

Hence, it can be said that, unlike all other dimensions, there is no significant difference between the expectations of the users of special libraries on physical facility dimension and library collection dimension. Indeed, significant difference exist between all other dimensions such as library staff, technical process and library services.

4.6.2. Dimension Wise Analysis of User Perceptions

The perceptions of users denote the experience of the user while using library services. It measures what users actually perceived from the performance of library services. According to Zeithaml (1988), perceived quality is "the consumers' judgment about an entity's overall excellence or superiority". Normally the perceptions of users are lower than their expectations. The findings of the study by Waqar et al. (2015) and Asogwa et al. (2014) substantiated the fact that the perceptions of users are lower than their expectations. When

the perceptions of the user match or exceed with the expectations, the service is said to be quality service. Therefore, in order to provide quality service, libraries attempt to improve the perceptions of the users.

Table 4.27

Dimension Wise Analysis of User Perceptions

Dimensions	Mean	Standard Deviation
Physical facility	3.78	0.575
Library Collection	3.81	0.742
Library Staff	4.00	0.721
Technical Process	3.55	0.738
Library Service	3.21	0.673

The table 4.27 exhibits user's perception on the five dimensions. It can be seen that users have low perception on all dimensions in comparison to their expectation. Even though the mean score indicate an average perception on all dimensions, the dimension "library staff" (Mean 4.00, SD 0.721) has highest perception as compared to other dimensions. It indicates that, as far as the users concerned, the staff of the special libraries has good knowledge and expertise and they are capable of meeting the changing needs of the users as and when required. The study conducted by Vinod Kumar (2009) stressed the importance of the role of leadership and staff management in providing quality service. Staff's attitude towards work is an important factor that affects the quality of service provided. Sherikar and Jange (2006) observed in their study that library staff responded neutrally to the statement 'feeling proud to be part of the library profession' and 'commitment to library goals and values' whereas they were interested in working holidays and Sundays. It shows their dedication in being part of the developmental activities of the library for providing quality services.

The library collection dimension also has good perception (Mean 3.81, SD 0.742). It conveyed that special libraries have almost good collection to meet the needs and requirements of the users. Whereas the dimension "library service" (Mean 3.21, SD 0.673) has the lowest perception. The major reason for the low perception of this dimension is the lack of proper knowledge about the service and unawareness about the existence of various services available in the library. The special libraries may not be able to meet the requirement of the users even after providing numerous services. The users not getting the services as expected results in low perception of services. Therefore, regular assessment of users' need is essential to provide the required services to users. Library users need to acquaint themselves with the library, its facilities and the various resources available. They need to be trained on how to access and retrieve the library resources and materials through the use of the WebOpac and various subscribed database. In view of Waqar et al. (2015), the most perceived dimension is 'tangible' and the least perceived is 'empathy'. In a study on service quality perception on university and college libraries in UAE, Johnosn and Sophia (2014) reported that users have high level of satisfaction on the quality of staff and above average level satisfaction on quality of learning resources, quality of services and quality of physical facilities.

The study carryout Wilcoxon Signed Rank Test to observe the significant difference between user expectations among five dimensions such as physical facility, library collection, library staff, technical process and library service at 5 percent level of significance.

Table 4.28

Significance of Difference between Users Perceptions- Wilcoxon Signed Rank Test

Dimensions	'Z' Value	Asymp. Sig. (2-tailed)
Library Collection Perception - Physical Facility Perception	2.007	0.045
Library Staff Perception - Physical Facility Perception	9.378	0.000
Technical Process Perception - Physical Facility Perception	8.167	0.000
Library Services Perception - Physical Facility Perception	17.893	0.000
Library Staff Perception - Library Collection Perception	7.166	0.000
Technical Process Perception - Library Collection Perception	10.520	0.000
Library Services Perception - Library Collection Perception	19.635	0.000
Technical Process Perception - Library Staff Perception	14.841	0.000
Library Services Perception - Library Staff Perception	20.149	0.000
Library Services Perception - Technical Process Perception	15.474	0.000

The table 4.28 reveals that the users perception on physical facilities elicit a statistical significant difference in the perception of library collection (Z=2.007, p=0.045), library staff (z=9.378.p=0.000), technical process (z=8.167, p=0.000) and library services (z=17.893, p=0.000).

Likewise, there exist a statistical significant difference in the library collection perception with the perceptions of library staff (z=7.166, p=0.000), technical process (z=10.520, p=0.000) and library service (z=19.635, p=0.000).

It can also be seen that the perceptions of library staff has statistical significant difference among the perceptions of technical process (z=14.841,p=0.000) and library service perception (z=20.149, p=0.000). Similarly, the difference between the technical process perception and library service perception (z=15.474, p=0.000) is statistically significant. Therefore, the study concluded that there is significant difference between users perception under the five dimensions.

4.6.3. Dimension wise Service Quality

According to Parasuraman, Zeithaml and Berry (1988), service quality is calculated by measuring the gap between expectations and perceptions of users. The gap score indicates the quality. There is an inverse relationship between service quality and gap score. The high gap score is an indicator of low service quality and the low gap score is an indicator of high service quality. After analyzing the expectations and perceptions of the users, the differences between them are calculated to find out the gap.

The calculated SERVQUAL score evaluate whether the level of services provided matches with customer expectations. These service quality measures provide insight on service provider's indicators regarding the degree and bearing of variation between service perception and expectations of users. These measures can be utilized by the service provider in identifying strengths and also in particular areas that require improvement.

Table 4.29

Dimension wise Service Quality

Dimensions	Mean	Standard Deviation
Physical Facility Gap	-0.84	0.60
Library Collection Gap	-0.79	0.79
Library Staff Gap	-0.50	0.74
Technical Process Gap	-1.01	0.79
Library Services Gap	-1.25	0.76
GAP Score	-0.88	0.61

The table 4.29 shows service quality gap of five quality dimensions. In which, the dimension "Library Service" has the highest gap score (Mean -1.25, SD 0.74) as compared to other dimensions. The special libraries are unable to meet the expectation of the users even after offering different types of services. There are many reasons behind this. It includes lack of awareness about the services, lack of proper interaction between the librarian and users and lack of proper knowledge to use it. Majority of the users are not aware about the existence of various kinds of services available in the library. Haneefa (2007), observed that special libraries in Kerala provides different services to its users such as Selective Dissemination of Information (SDI), user training, e-journals, CD ROM databases, online databases and varied electronic resources. It includes library consortia and digital library service also, even though majority of the services are not fully utilized by the users.

Therefore it is better to conduct user orientation programs, seminars and workshops etc. to make the user updated with the latest services in the library and its functions. Regular user interactions and frequent user studies also help the libraries to identify the user needs and recognize the kind of services they required. User

orientation enables the users to know how to use library resources not only in the confines of the library building, but even when they access the resources remotely. The manipulation and understanding of the complexities of information research are found difficult to most users. A guided focus on proper instruction and knowledge regarding the utilization of these resources can enable increased and effective library usage while preparing them for effective evaluation of resources found during research.

As the special libraries are of specialized nature, it requires specific kind of services. In addition to the regular functions, libraries can organize discussions, debates and other academic programs, celebrate historical days, conduct exhibitions etc. to interact more with the users.

The table 4.29 reflected that the dimension "Library Staff" has comparatively lowest gap score (Mean -0.50, SD 0.74). It conveys that, to an extent, special libraries in Kerala have good and knowledgeable staff as expected by the users. They are maintaining an approachable and welcoming attitude towards the users and are always willing to provide the services as and when required. The negative value indicates that the performance of library staff has not rose up to the expectations of the user and this may be due to the lack of permanent staff in some libraries, lack of adequate skill and expertise of the staff, behavioral shortcomings on the side of the library staff, lack of proper training to the staff etc. Majority of the libraries have only one or two library staff. The inadequacy of library staff may affect the service quality of the library. Similarly, while measuring service quality of Punjab university libraries, Arshad and Ameen (2010) observed that users have low gap on the statement "Library staff who are consistently courteous", "Library staff giving personal attention to users" "providing services at the promised

time", "Performing services right the first time" and high gap on "assuring customers of the secrecy of their transactions", "library staff have the knowledge to answer customer's questions" and "library staff who instill confidence in their users". In contrast to this, a study conducted by Hassanzadeh, Sharifabadi and Derakhshan (2010) showed that the dimension "assurance" has the highest gap. "Assurance" means the knowledge and courtesy of the library staff and their ability to enhance confidence of the users. Ahmed and Shoeb (2009) also observed in their study that the highest gap belongs to library resources and staff related items. They reported that Dhaka University library not having professionally qualified library staff and they also lack ITC literacy. In order to improve the service quality of the staff, library needs to provide constant training and development program to the staff. Besides these, there must be a healthy relationship between the library staff and users. It will help them to identify the problems of the users. Users may feel free to discuss anything with the staff.

The "Technical Process" dimension also have the highest gap score (Mean -1.01, SD 0.79) near to "Library Service" dimension. This dimension includes the activities of classification, cataloguing including online and web catalogue, accessioning, maintenance and preservation, maintaining library website etc. The highest gap score reflected the poor performance of the technical section. Technical section has its own roles to perform in the efficient and effective functions of the library. For the betterment of quality of the technical section, the cataloguing and classification of books should be done systematically, there should be proper maintenance and preservation by using scientific techniques and regular shelving and re-shelving of books is essential. All other dimensions such as "Physical Facility" and "Library Collection" also have negative gap score which indicate

that these dimensions did not completely meet the user expectations. In the study by Waqar et al. (2015), the highest gap was attributed to assurance dimension and the lowest gap was to responsiveness dimension.

As the total gap score is negative (Mean-0.88, SD 0.61), it can be inferred that the service quality of special libraries in Kerala was not up to the expectations of the users. Similarly, the study conducted by Suresh Kumar (2012) observed that service quality of university libraries in Kerala was moderately good. The study by Hassanzadeh, Sharifabad and Derakhshan (2010) on service quality of Central Library of Management and Planning Organization (MPO) in Iran, reported that the library service quality has not met users' expectations. On the contrary, Sahu (2006) observed that JNU library has met the quality expectations of its users.

Users have high expectation than their perception. The study helps to identify those dimensions having highest gap and lowest gap on the basis of user responses, thereby the libraries can provide more attention on lowest quality dimensions. Special libraries need to develop a strategic plan which focuses on the needs and requirements of the users, thus supporting the objectives of the parent organization.

In order to assess the significance of the gap difference between the five dimensions, Friedman's Two Way Analysis of Variance was conducted.

Table 4.30

Differences among Service Quality Dimensions- Friedman Two Way Analysis of Variance

Dimensions	Mean Rank	Chi-Square	Df	Asymp. Sig.
Physical Facility	2.95			
Library Collection	3.36	700.888	4	0.000
Library Staff	4.15			
Technical Process	2.64			
Library Service	1.90			

The table 4.30 shows the mean rank among different dimensions of service quality. From the analysis, the mean rank of library staff (4.15) shows the highest significant difference than that of other dimensions. Meanwhile, the library service dimension has the mean rank of 1.90, which denotes that the difference is less significant than other dimensions. The result of Friedman Two way Analysis of Variance depicts chi square value of 700.888 with significant value 0.000, which is less than the p value 0.05. Hence it can be conclude that there is significant difference among mean ranks of different dimensions. It was supported by findings of the study of Iberahim and Nadzar (2011), which indicates that the service quality dimensions; reliability, tangibles, assurance and empathy has significant relationship with the service quality of reader's advisory desk service of University Putra Malaysia library.

4.6.4. Item Wise Analysis of Service Quality

Quality of a product can be measured by seeing, touching, tasting or on the basis of the functions it performs whereas the quality of a service cannot be seen or touched and can be measured only on the basis of the fulfillment of the requirements and expectations of the users. The term service quality was initially applied in the commercial organization for measuring the quality of the product or

service. Later it was extended to service organizations like hospitals, libraries, etc. A clear understanding of user's needs and expectations is essential to determine the service quality. In order to ensure service quality of a library, the quality of the factors like library collection, library staff, physical facilities, technical process, library services, etc., should be maintained and periodically improved.

Item wise analysis is conducted to assess the expectations, perceptions and gaps of 50 statements under the five dimensions. The analysis attempts to catch on those items having the highest expectations and those having the lowest expectations. It throws light on the immediate requirements of the users. The perceptions of the users on each item were assessed to find out whether the expectations are met or not. Item wise analysis identifies the highly perceived items and least perceived items by the users. The gap between the expectations and perceptions of the users is calculated by their close examination. The gap analysis provided insight into the gap between the importance of the library services to the users and the libraries' performance as perceived by the respondents.

4.6.4.1. Item wise Analysis of Physical Facility

A good library must have adequate physical facilities like proper ventilation, lighting, furniture, etc. A person needs calm and comfortable atmosphere for intellectual activities including reading. An environment that is not physically user-friendly distracts the reading process. Therefore it is one of the major responsibilities of a library to have sufficient physical facilities.

Under this dimension, following items are measured to assess the service quality of physical facilities of the libraries. The table 4.31 shows the expectation, perception and gap of each item in the physical facility dimension.

Table 4.31

Item wise Analysis of Physical Facility

Statements	Expectation		Perception		Gap	
	Mean	SD	Mean	SD	Mean	SD
Comfortable and Inviting Location	4.55	0.59	4.20	0.82	-0.35	0.89
Sufficient space for readers / users	4.73	0.49	4.23	0.82	-0.49	0.86
Adequate lighting and ventilation	4.78	0.44	4.31	0.78	-0.46	0.83
Clean, tidy and hygienic	4.78	0.43	4.40	0.69	-0.37	0.69
Adequate and comfortable furniture	4.63	0.52	4.14	0.86	-0.49	0.91
Drinking water facility	4.49	0.64	3.62	1.16	-0.87	1.23
Lavatory facility	4.49	0.63	3.83	1.06	-0.66	1.09
Physical facilities for differently abled users	4.51	0.65	1.47	0.71	-3.04	0.94

The location or placement of libraries has a great deal of impact on the usage of libraries. If the libraries are located in a distance, it can be inconvenient for the users to visit. On the other hand, an easily accessible location of the library will marginally increase regular usage. But in the case of special libraries, location of the library does not affect the quality to an extent, because they are conveniently located within the parent organization. Its location at a distance from the main office will make it difficult for the users to avail library services. Even though the library should be in a prime location of the campus, it should be free from all the disturbances and events of the institution. Therefore, the location of the library should be at a central place of the institutional complex, which can be easily accessed at any given time. Since the users of special libraries are highly engaged, they are normally occupied with their work and hence they need the library to be easily approachable whenever information is required.

Through the table 4.31, it can be seen that the users of special libraries have high expectation (Mean 4.55, SD 0.59) and perception (Mean 4.20, SD 0.82) on the item "Comfortable and Inviting Location", therefore it has the lowest gap (Mean -0.35, SD 0.89). It reveals that majority of the special libraries have convenient locations, therefore users have ease of access to the libraries. The CDS library was constructed by Laurie Baker, the construction also attracts people to the library.

While measuring the service quality of libraries, it is very important to assess whether library have enough space for readers or users. Libraries should have adequate space for all user activities. Limited space can be discomforting to users and this limits their research, preventing them from enhancing their creativity. If there are a generous number of users, the limited space acts as a barrier to providing quality service to users and thereby hampers the effective functioning of libraries. Even the allocation of available space has to be appropriate for creating a healthy working environment. In addition, a good library need to have different sections such as circulation, stack, periodicals, reference, technical process, reading room, newspaper etc. Sufficient space must be allocated to all these sections. The users accessing audio and video resources should have secluded provisions so that it does not disturb other users of the library.

Table 4.31 makes it clear that the users of special library have high expectation (Mean 4.73, SD 0.49) and perception (Mean 4.23, SD 0.82) on the item "Sufficient space for readers / users". The item has the comparatively lowest gap score (Mean -0.49, SD 0.86), which indicates that it should be improved further for providing quality service. The NIO library and KSCSTE library lack adequate space for reading. They need to expand their reading space whereas the

libraries of VSSC, CMFRI, NISST, CDS, Spices board and CWRDM have vast space. All other libraries such as FCRI library, KFRI library, JNTBGRI library, RRI library, CDB library and CIFT library have moderate reading space even though further expansion is needed for better services.

As the users always need comfortable atmosphere for reading and other research activities, they give prior importance to lighting and ventilation. Adequate lighting and ventilation are the dire necessities of any institution and libraries, without any exception. Inadequate lighting and ventilation can seriously affect healthy reading, consequently decreasing productivity. Lack of proper lighting can cause distraction and even create eye strain. Therefore proper lighting and ventilation have its own role in the quality service of the libraries. The table 4.31 reflects that the item "Adequate lighting and ventilation" (Mean 4.78, SD 0.44) has highest expectation. It can also be seen from the table that users have high perception (Mean 4.31, SD 0.78) on the item and have comparatively lowest gap score (Mean -0.46, SD 0.83). It communicates that most of the special libraries have adequate lighting and ventilation. All the special libraries except CWRDM library, KFRI library, CDS library, TBGRI library, CTCRI library and CDB library, are air conditioned.

As per the study conducted by Sharma, Anand and Sharma (2010), it was observed that users have high expectation on the item "lighting quality adequate" and "conducive academic environment". Similarly, the study conducted by Sherikar and Jange (2006) found that users of different university libraries in Karnataka perceived sufficient lighting and ventilation in their libraries. It implies the high importance of adequate lighting and ventilation in libraries.

Since the cleanliness and hygiene of the library affects the users, they must be provided with a comfortable workspace. Only in a clean and hygienic environment can the users pursue their research and allied activities wholeheartedly. The arrangement of physical amenities and other resources also has to be neat and tidy for preserving a pleasant environment. A cluttered working environment can damage the mood and morale of the users. Therefore, proper cleaning and dusting has to be carried out regularly in order to ensure a hygienic learning environment as part of providing quality services.

Majority of the special libraries maintain a clean and hygienic environment in their libraries. The table 4.31 reveals that the item "Clean, tidy and hygienic" is the most expected (Mean 4.63, SD 0.52) and perceived (Mean 4.40, SD 0.69) item by the users of special libraries. Therefore it has the lowest service quality gap (Mean -0.37, SD 0.69). While considering all other items, it is found that users have high expectation on the items "Clean, tidy and hygienic working atmosphere" and "Adequate lighting and ventilation" because they consider it as their basic need so as to carry out any library activities. Without adequate ventilation and cleanliness, they can't do their information searching properly. The study conducted by Baharainizadeh (2013) also observed that the item "cleanliness of library's physical environment" is the highly perceived item by the users of Persian Gulf University.

As far as any library is concerned adequate number of furniture is required in every section for the users to be comfortable. The available furniture should be adequate such that it provides seating and reading facilities to the users. The furniture should be more reader friendly than casual furniture so that it provides proper support and will be ideal for long hours of reading. If there are

number of users, inadequate furniture can affect the effective use of library services and the users will not be able to avail majority of the library services. As majority of the researchers spend most of their time in the library using its services, inadequate and uncomfortable furniture can affect their workability and may even cause detrimental effect on their physical health. Lack of proper funds or budgetary constraints are the major reason behind inadequate furniture.

It is clear from the table 4.31 that users of special libraries have high expectation (Mean 4.63 SD 0.52) on the item "Adequate and comfortable furniture". The perception of the users is observed as Mean 4.14 and SD 0.86. The item has comparatively low service quality gap (Mean- 0.49, SD 0.91). It conveyed that majority of the special libraries in Kerala have adequate and comfortable furniture.

A good library has to maintain drinking water facility within or at least near its premises. Since some users may use library services continuously for a long time, they might need refreshment after the long and tiring search for information, reading or other allied activities. Providing such physical facilities is necessary to any organization as this ensures productivity and reduces fatigue among its users. The users would feel more relaxed and refreshing if a coffee vending machine is provided as an addition with the drinking water facility. Therefore drinking water facility is a basic necessity that a library should provide as part of the physical facilities of the library.

It is evident from the table 4.31 that users have high expectation on the item "Drinking Water Facility" (Mean 4.49, SD 0.64) but the perceptions of the users are average (Mean 3.62, SD 1.16) therefore the service quality gap shows that Mean -0.87 and SD 1.23. Only four special libraries refrain from providing drinking water when

majority of the libraries have made all necessary arrangements to dispense water. They are: CIFT library, JNTBGRI library, NIO library and FCRI library. These libraries should also provide drinking water facilities to the users for improving the service quality of physical facilities of the libraries.

Lavatory facility is the most primary necessity that libraries should offer as part of their physical facilities. The availability of clean and hygienic lavatory facility is a major concern for female users. If proper facilities are not provided, female users may avoid drinking water during their work, risking heat stress and other health problems. A ladies' refreshment room is also desirable along with such facilities including means for sanitary napkin disposal. A provision, other than bathroom is required for nursing mothers to feed their infants shielded from public view and free from intrusion. Unclean facilities can also result in diseases as well as infections. Separate lavatory facility is needed for transgender users. The lavatory should have clean running water always, as women have a more frequent need for washing, especially during monthly menstrual cycles. Therefore, library should ensure that lavatory is cleaned regularly and maintained hygienically.

The table 4.31 depicts that the special library users have high expectation (Mean 4.49, SD0.63) and average perception (Mean 3.83 SD 1.06) on the item "Lavatory Facility". Hence the service quality gap is Mean-0.66, SD 1.09. Of all the libraries selected, the JNTBGRI library, CTCRI library, RRI library, KSCSTE library, CIFT library and NIO library does not provide lavatory facility in the library. For better physical facilities, library has to provide such facilities too.

The users of special libraries also include differently abled users. They may be either visually challenged or physically challenged

users. As library is a service institution, it needs to address the specific requirements of even differently abled users. They require special attention because they won't be able to access the library functions like normal users. They may feel troubled while using the services without assistance. Specific care has to be carried out in laying obstruction-free paths so that they can access every section of the library. The arrangement of the entire library has to be in such a way that even differently abled users can access its services with ease. The libraries should also contain technological facilities made available especially for the differently abled users including software's and applications such as NDVA, JOSE and e-speak etc. Therefore, library should provide separate physical facilities for them such as wheel chair ramp, wheel chair accessible parking facility, separate lavatory facility, seating arrangement, comfortable furniture etc.

The table 4.31 shows that users of special library have high expectation (Mean 4.51, SD 0.65) in this regard. But their perception (Mean 1.47, SD 0.71) is very low. Hence it has the highest service quality gap (Mean, SD) as compared to all other items. None of the libraries provide any separate physical facilities for differently abled users. Only VSSC library have some steps adopted towards this cause. Therefore, special libraries should make provision for development of physical facilities for differently abled users.

4.6.4.2. Item wise Analysis of Library Collection

The collections of the library should not be confined to a limited subject only. It should ideally cover all types of resources that satisfy the user's needs. Users belonging to different cultures may have differences in their needs and expectations. The collections should be capable of satisfying all such needs. The collections of a special

library mainly cater to the objectives of the parent institution. The collections should include text books, reference books, theses, periodicals, fictions, patents, reports, digital collections, e-resources etc.

In order to measure the service quality of the library collection dimension, the quality of the following things is very important. The table shows service quality of each of the statements in the dimension.

Table 4.32

Item wise Analysis of Library Collection

Statements	Expectation		Perception		Gap	
	Mean	SD	Mean	SD	Mean	SD
Resources meet the requirements of library users	4.64	0.53	3.97	0.96	-0.66	1.01
Access to collections of wide variety of books and journals on the subject the institute specializes	4.70	0.50	3.98	1.07	-0.73	1.13
Access to a wide range of e-resources on the subject the institute specializes (e-journals, e-books, databases, etc.)	4.67	0.56	3.66	1.19	-1.01	1.28
Access to collections include technical reports, patents and annual reports	4.60	0.56	4.00	0.89	-0.59	0.95
Efficiently maintain back volumes of journals	4.62	0.57	4.05	0.89	-0.57	0.91
Efficiently maintains project reports, dissertations and theses	4.59	0.58	4.00	0.92	-0.59	0.95
Provide access to audio visual materials	4.36	0.79	2.99	1.16	-1.37	1.37

The size of the collection is not in any way an indicator of library quality. A large collection does not imply that the library is providing quality services to its users. The collections of library must be able to

meet the requirements of users. As users' needs may vary overtime, libraries must regularly take such changes into account. The library collection also should be enough to support the institutional activities and goals. Inadequate or incomplete collection will affect the institution as well as the users in accomplishing their activities. The library resources include books, journals, e-resources, patent, theses, reports, CD's, DVD's, etc. All these resources should cover the subject area of parent organization and should be capable of meeting the specific requirements of users. Budgetary constraints are the major limitation in expanding the collection for libraries.

The table 4.32 depicts that users have high expectation (Mean 4.64, SD 0.53) on the item "Resources meet the requirements of library users" but not perceived (Mean 3.97, SD 0.96) as expected. Therefore the item has comparatively lowest gap score (Mean-0.66, SD 1.01). The collections of the special libraries meet almost all the requirements of the users. But the negative value indicates that it is not up to the expectations of the users, hence libraries should update its collection regularly on the basis of changing needs of the users in order to meet their specific requirements. The study conducted by Wang and Shieh (2006) observed that the most expected item by the users of CJCU library, Taiwan is "sufficient number of books", "providing loans and returning service" and "overall reading atmosphere".

As special libraries focuses on a specific subject, the books and journals on the subject that the institute specializes should be available for access to all the users of the libraries. Inadequate collection of books would persuade users to visit other libraries for their requirements. Since membership is also provided to external users, access should also be given to all those who come for reference purposes without membership. Library should display

latest arrivals in a more accessible place to users. It is also necessary to update the section of books and journals having national and international recognition at least twice a year.

The table 4.32 makes it clear that the special library users have high expectation (Mean 4.70, SD 0.50) and good perception (Mean 3.98, SD 1.07) also on the item "Access to collections of wide variety of books and journals on the subject the institute specializes". Therefore, the service quality gap is Mean -0.73, SD 1.13. It reflects that majority of the special libraries provide access to its entire collections, even though libraries have to enhance their collection in order to meet every expectation of the users. But the NIO library does not maintain collections of print journals and magazines. For providing quality services to its users, libraries should subscribe to important journals and magazines on the subject that the institute specializes in.

The electronic resource occupies a major portion of the collections of special libraries. It includes e-journals, e-books, databases, e-theses etc. Since vast numbers of books are published each day, it is not possible to locate and read them in the conventional form of hard copies. But, accessing them as e book from an electronic resource is rather easy. Special libraries have subscription to various consortia by its parent body which provides them with access to huge amount of e-resources on the subject in which the parent organization specializes.

It is evident from the table 4.32 that users have high expectation (Mean 4.67 SD 0.56) on the item "Access to a wide range of e-resources on the subject the institute specializes". But it shows only an average perception (Mean 3.66, SD 1.19). Hence it has comparatively high gap score (Mean -1.01 SD 1.28). It emphasizes

the importance of updating the e-resources of the special libraries. Majority of the special libraries have subscription to CeRA consortia and CSIR consortia even though they failed in fully meeting the expectations of the users. Therefore library should subscribe to more e-journals, e-books, full text databases, bibliographic databases and all other e- resources based on the needs of the users.

As far as a special library is concerned, technical reports, patents and annual reports are considered as integral part of its collection. It provides vital information useful to the objectives of the parent organization. Such collections have to be summarized appropriately so that users can access them with ease. A chronological order of various reports provides easier data access for ongoing research activities. Therefore special libraries should maintain adequate number of such collection and provide access to it.

Through the table 4.32 it can be seen that, special library users have high expectation (Mean 4.60, SD 0.56)) and perception (Mean 4.00, SD 0.89) on the item "Access to collections including technical reports, patents and annual reports". Therefore it has comparatively low gap (Mean -0.59, SD 0.95). It indicates that majority of special libraries have good collection of technical reports and annual reports and libraries should attempt to enhance it by making additions to the collections. But only few libraries such as CPCRI, FCRI and KFRI have maintained patents in their collection, therefore, all other libraries should make provision to include patents also in their collections.

A good library should maintain all of the back volumes of journals efficiently in its respective order and made available to the users whenever needed. As the journals are the primary publication of any subject, it is very important to maintain a good collection of journals

and back volumes. Since it contains scholarly articles on the concerned subject of the parent organization, users require it for reference or other research purposes. Back volumes have to be maintained in chronological order, categorized appropriately. Only then will the users be able to easily access the prior volumes.

The table 4.32 shows that the special library users have high expectation (Mean 4.62, SD), perception (Mean 4.05, SD 0.89) and low gap (Mean -0.57, SD 0.91) on the item "Efficiently maintain back volumes of journals". All the special libraries except NIO library and KSCSTE library maintain good collection of back volumes of journals. For improving the service quality, the NIO library and KSCSTE library need to maintain an efficient collection of back volumes of journals.

The collections of special libraries also include the reports of various researches carried out by the members of the parent organization. Besides, they also have project reports, dissertations and theses. Since research is a never ending process, every project report and theses are important for future research and related activities and has to be stored accordingly. Therefore libraries should efficiently maintain such collections and provide access to it.

The table 4.32 makes it clear that the users have high expectation (Mean 4.59, SD 0.58) and perception (Mean 4.00, SD 0.92) on "Efficiently maintains project reports, dissertations and theses". Therefore it has low gap score (Mean -0.59, SD 0.95).

The special library collection should include proper audio and video resources in the subject area that the institute specializes in. The audio or video resources can be utilized when the printed or written collection of a particular topic is unavailable or also an extension to the printed material. With the aid of audio or video resources, users

can understand the subject better than print or written material. The introduction of audio-visual resources (AVR) has far reaching effect on learning. The time needed for learning or data collection has been considerably reduced. The video resources also provide a detailed picture of various topics discussed in the books. Audio books are also available now so that, users can understand the contents of a book without reading. Audio books are of great help to the visually impaired users. Audio-visual collections include DVDs, sound recordings, live TV streaming, recorded TV programmes etc.

The table 4.32 reveals that users of special libraries have high expectation (Mean 4.36, SD 0.79) on the item "Provide access to audio visual materials". But it has lowest perception (Mean 2.99, SD 1.16) therefore the gap score is high. It indicates that the majority of the special libraries do not have a well maintained collection of audio visual materials into which users are granted access.

4.6.4.3. Item wise Analysis of Library Staff

Library staff plays a major role in providing quality services to its users. Their attitude towards users has great impact on user perception. Library staff directs the user to the exact destination where they can locate the required information. The staff should provide fast and quality services to the users. They should respond quickly to users' request and enquiries and attend all their questions and complaints properly. They must have the skill and knowledge to answer users' queries within the reasonable time. Proper training should be provided to the library staff in order to equip them with latest trends and technologies in providing quality information and services.

Following are the basic qualities a library staff is expected to possess. The analysis measures to what extend the users expected and perceived it from the library staff. The following table clearly depicts it.

Table 4.33

Item wise Analysis of Library Staff

Statements	Expectation		Perception		Gap	
	Mean	SD	Mean	SD	Mean	SD
Approachable and welcoming	4.59	0.65	4.14	0.86	-0.46	0.93
Good knowledge and expertise to provide value added library services	4.64	0.53	4.02	0.89	-0.62	0.94
Competent enough to anticipate library users needs and work accordingly	4.55	0.59	3.97	0.91	-0.58	0.96
Quick responds to library users queries and requests	4.62	0.52	4.07	0.92	-0.55	0.98
Gives personal attention to library users	4.20	0.88	3.85	0.99	-0.35	0.99
Willingness to help library users all the time	4.50	0.64	4.04	0.92	-0.46	0.98
Emotional intelligence to deal with the library users	4.09	0.91	3.72	0.95	-0.37	0.96
Help library users when they fail to locate a document needed	4.64	0.55	4.24	0.79	-0.4	0.81
Re-shelving documents quickly in proper order	4.59	0.54	4.02	0.87	-0.57	0.93
Good knowledge and expertise in Information Technology	4.54	0.63	3.92	0.90	-0.62	0.99

Library staff plays an imperative role in the service quality of libraries. They should always keep an approachable and welcoming attitude towards the users. Their attitude and behavior make the users feel that they enjoy good service and their dignity is honored. The staff behavior also has a huge impact on comfortable reading. The conduct of staff encourages the users to visit the library often and in spending more time within the library. On the other hand, if the library staff behaves indifferently to the users, it will adversely affect the service quality perceptions of the users. The users always prefer libraries with well-mannered and approachable staffs along with large collection of books. A welcoming staff could open a world of wide reading to a reader.

The table 4.33 depicts that the users have high expectation (Mean 4.59, SD 0.65) and perception (Mean 4.14, SD 0.86) on the item "Approachable and Welcoming nature", therefore it has low service quality gap (Mean -0.46, SD 0.93). It conveyed that majority of the special library staffs are approachable to the users.

Library staff should have the knowledge and skill to answer all the queries raised by the users and provide service accordingly. Library staffs are expected to have good knowledge about the common contents of books, since they serve as the gate keepers of wisdom. They need to attend refresher courses and training programs at regular intervals to improve their professional expertise. The staff should attempt to update their knowledge with recent developments in their field. They should have a clear understanding of the subject area in which the parent organization is focused, which will help the users to access the required information with the help of library staff. They are most frequently asked for suggestions and help. A library staff without proper training and knowledge can hinder all the activities of the library and affect users' productivity.

Through the table 4.33 it can be seen that users have high expectation (Mean 4.64, SD 0.53) and perception (Mean 4.02, SD 0.89) on "Good knowledge and expertise to provide value added library services". The service quality gap score is Mean -0.62, SD 0.94. Lack of adequate staff is one of the major obstructions faced by the special libraries in providing quality services. Majority of the special libraries have only one or two permanent staff and most of their work are carried out by temporary staff who are appointed for a short period. Therefore they may not have enough experience in handling the issues of users who use the library services.

Library staff should have the competency to anticipate the changing needs of users and provide services based on it. Through regular user interaction, the staff can assess the needs and requirements of the users. It is also welcoming to know the current reading trends of users of the library. Therefore library staff should maintain a healthy relationship with the users.

The table 4.33 shows that users have high expectation (Mean 4.55, SD 0.59) on the item" Competency to anticipate library users' needs and work accordingly" but the perception (Mean 3.97, SD 0.91) is comparatively low. Therefore, the service quality gap is Mean -0.58, SD 0.96. It reflects that the library staff anticipation on user's needs and requirements may not be correct.

Library staff should attend all the queries of the users and provide them answers as quick as possible. In order to provide quality service, they should provide the required services without delay. The long queue at the circulation desk may cause unnecessary delay for performing library functions and can consume valuable time of the users. As the special library users are highly consumed by their work, they may not be able to spare much time at the library desks. Necessary technology could be used in the library to ensure that the queries of readers are duly responded. A diligent library staff performs the requirements of the users with almost accuracy within the limited time.

The table 4.33 indicates that the users of special libraries have high expectation (Mean 4.62, SD 0.52), perception (Mean 4.07, SD 0.92) and low gap score (Mean -0.55 SD 0.98) on the item "Quick response to library users' queries and requests". It is obvious from the result that special library staffs respond immediately to users queries and request.

Sometimes, library staffs need to pay personal attention to users. There may be some members of the parent institution, who are new to the library services. Library staff encourages them to use variety of library services which is useful to their work. The staffs instill confidence in the users for using library services. Even experienced users require personal attention when it comes to certain topics. This saves them time and helps them in completing their work efficiently.

It is evident from the table 4.33 that users have comparatively low expectation (Mean 4.20, SD 0.88) and perception (Mean 3.85, SD 0.99) on the item "Gives personal attention to library users". Therefore, it has the lowest gap score (Mean-0.35 SD 0.99). As there are number of users, library staff may not be able to provide personal attention to users; moreover, most of the users do not want it. In contrast to this, when Somaratna, Peiris and Jayasundara (2010) examined the service quality of University of Colombo library system, they found "Giving users individual attention" as the most expected item by the user, meanwhile similar to this study, the items "Adequate lighting" and "Access to electronic journals" also have high expectations. In a study conducted by Manjunatha (2001)on measuring service quality of academic libraries in Karanataka, it was observed that the most expected items were "Adequate Resources & Collection", "Staffs' Sincere Interest to attend to Customer Problem" and "Excellent Physical Facilities & Services" and the least expected item were "Well Dressed & Neat Appearance of Staff" and "Staffs' Personalised attention towards users".

The library staffs are required to have willingness to help the users whenever needed. They should not exhibit any hesitation when the user approaches him, so that the users will never be embarrassed for asking help from the library staff. Even if the users arrive at the closing time, the staffs should treat them courteously and provide

them with required service. Time should not be a constraint in helping the users to address their issues.

The table 4.33 shows that users have high expectation (Mean 4.50, SD 0.64) and perception (Mean 4.04, SD 0.92) on the item "Willingness to help library users all the time", hence the gap score is low (Mean -0.46 SD 0.98). It is evident from the result that the staff of the special libraries shows their willingness to help the users all time they needed. Nitecki (1996) stated in his study that 'employee's willingness to help users' is the most expected item by the users along with 'providing service within the promised time and sincere interest in solving users' problem'.

There are different types of users having different nature and background, highly sensitive attitude, emotionally imbalanced behavior etc. Therefore, it is better for the library staff to have sufficient emotional intelligence to deal with such users. As the members of the parent organization have hectic schedules of work, sometimes they may behave rude to the library staff, which necessitates the staff to possess the ability to handle with such incidents. Studies points out that approximately one in four adults has a mental illness, so be polite to all those who walk in through the library door. The staffs have to observe and act calmly even if the user seems to act oddly. Emotional intelligence plays a major role in differentiating normal users from those who have an issue.

It is clear from the table 4.33 that users have lowest expectation (Mean 4.09, SD 0.91) on the item "Emotional intelligence to deal with the library users" as compared to all other items. As the perception (Mean 3.72, SD 0.95) also goes low. Hence the service quality gap is Mean -0.37, SD 0.96. It conveys that the libraries and users do not

give much importance to this aspect even though it is an important aspect to be considered.

The library users may not be aware of the arrangement of books in libraries or their exact locations. Besides these, there are chances for books being misplaced or lost, therefore, if they are unable to locate the required book, library staff should assist users in searching and locating the book. Even while accessing e resources, the troubled users should be helped in finding the desired documents. The users might also face difficulties while retrieving desired documents from the e resources, so the library staff has to help them in locating it.

The table 4.33 reveals that users have high expectation (Mean 4.64, SD 0.55), perception (Mean 4.24, SD 0.79) and low gap on the item (Mean-0.40. SD 0.81) "Help library users when they fail to locate a document needed". It indicates that the staff of majority of the special libraries helps the users in searching their requirement.

Shelf rectification is one of the important functions to be carried out in libraries for providing quality services to users. Each book in the stack has its own location. When a book is returned back to the library, the staff should immediately re-shelf it where it belongs. The user may accidently misplace the books while searching for the desired book or may intentionally change positions of books so as to hide them from other users. Every misplaced book is a burden to both the user and library staff. Delay in clearing misplaced books can result in longer queues and would certainly consume the precious time of the library users. Therefore libraries should conduct re-shelving and shelf rectification regularly.

The table 4.33 shows that users have high expectation (Mean 4.59, SD 0.54) and good perception (Mean 4.02, SD 0.87) on the item "Re-shelving documents quickly in proper order". Hence, the service

quality gap (Mean -0.57, SD 0.93) is low. It indicates that special libraries always keep their documents in proper order.

Nowadays most of the library services are facilitated through Information and Communication Technologies. Numerous advanced technologies have been applied in libraries for providing quality services to users. Modern ICT has a huge impact on various aspects of libraries and its functions. The advancements in ICT and its widespread use have resulted in the gradual replacement of conventional forms of information storage and retrieval. Therefore library staff should have enough knowledge and expertise in ICT. They have to attend training programmes, seminars and workshop, etc. in order to make themselves proficient with such technologies.

The table 4.33 shows that the users have high expectation (Mean 4.54, SD 0.63) on the item "Good knowledge and expertise in Information and Communication Technology (ICT)" but the perception (Mean 3.92, SD 0.90) is comparatively low. Therefore the service quality gap is Mean -0.62, SD 0.99. Most of the special library staffs have good knowledge in ICT, even though they need to explore it. The low perception score indicates that there are library staff, who do not have much knowledge in ICT. Therefore libraries should organise training programmes to provide them practical orientation on such technologies.

4.6.4.4. Item wise Analysis of Technical Process

A well-organized cataloguing and classification scheme is quintessential for a library to offer quality information and services. Libraries provide online cataloguing service which helps the users for efficient searching. Systematic rules and procedures are needed in the technical processing of libraries.

The following are the statements measured to assess the quality of technical process of the libraries. The table 4.34 shows the expectations, perceptions and service quality gap of each statement.

Table 4.34

Item wise Analysis of Technical Process

Statements	Expectation		Perception		Gap	
	Mean	SD	Mean	SD	Mean	SD
Provide access to well organized library catalogue either in card or Online catalogue/Web catalogue	4.64	0.58	3.78	1.06	-0.86	1.11
All library functions and operations are automated/computerized	4.46	0.69	3.67	1.03	-0.79	1.14
Conduct continuous library users need assessment	4.34	0.69	3.43	1.06	-0.91	1.15
ICT infrastructure of the library are always in good working condition	4.49	0.62	3.73	0.95	-0.75	0.99
Well designed and managed library website/ portal	4.56	0.64	2.77	1.49	-1.79	1.50
Full fledged Internet access in the library	4.61	0.63	3.76	1.09	-0.85	1.15
Wireless network access (Wi-Fi, Wi-MAX, Wireless LAN)	4.46	0.78	2.92	1.45	-1.54	1.50
Classification and arrangement of documents are systematic and logical	4.66	0.51	4.02	0.89	-0.64	0.93
Protect library resources from damage and dust	4.70	0.53	4.08	0.84	-0.62	0.91
Library frequently updated with latest technologies	4.67	0.55	3.33	1.13	-1.33	1.21

A good library should maintain a systematically organized catalogue of their collections and provide access to all users. It may be either by card or online catalogue or web catalogue. Most of the special

libraries maintain OPAC (Online Public Access Catalogue) and Web OPAC facility. Card catalogues are rarely used. It provides the users all the bibliographic information of the particular book they searched for and the current availability status of the book in the library. A systematically organized library catalogue saves time as it aids in understanding the availability of the required documents with ease.

The table 4.34 reflects that the users have high expectation (Mean 4.64, SD 0.58) and low perception (Mean 3.78, SD 1.06) on the item "Provide access to well organized library catalogue either in card or Online catalogue/Web catalogue". Therefore service quality gap is comparatively high (Mean -0.86, SD 1.11). It is observed that the low perception conveyed that most of the special libraries do not maintain a well organized catalogue. The NIO library and CTCRI library do not catalogue the stock using card, OPAC or Web OPAC facility. Only KSCSTE library maintain card catalogue along with Web OPAC. The CIFT library, CMFRI library, CPCRI library, NIIST library, CDS library, CDB library and VSSC library have both OPAC and Web OPAC facility. All other libraries have OPAC facility only. Majority of the special libraries follow Anglo American Cataloguing Rules (AACR). The libraries such as CMFRI library, CDS library, VSSC library and RRI library follow Classified Catalogue Code (CCC).

In order to provide quality services to users, library should automate its every major functions and services. Implementing Integrated Library Management System (ILMS) library helps in the automation of the process of issue, return, renewal, reservation, acquisition, serials management, cataloguing, etc. Through which reminders can be sent to the users by mail on the due date of book. Library automation reduces the workloads in all section and helps to avoid unnecessary delays and errors in the manual transactions. Automation also helps in backtracking thereby eliminating confusion

and loss of books. Koha, Libsys, Book magic, etc. are normally used library automation software.

The table 4.34 shows that the users have high expectation (Mean 4.46, SD 0.69) and comparatively low perception (Mean 3.67, SD 1.03) on the item "All library functions and operations are automated/ computerized". Hence, the service quality gap is Mean - 0.79, SD 1.14. It is observed that all the special libraries except NIO library are automated. The low perception score indicates that the users face problems with the automated services, therefore, they perceived it low. Most of them don't know how to search with the automated search interfaces. Therefore, library should make proper orientation to them.

Service quality of a library depends upon the extent of them meeting the needs and expectations of the users. Since the users' needs and expectations are forever changing, there should be continuous user need assessment. Library should conduct user assessments at regular intervals to assess their needs and provide services as expected by them. Only user need assessment can provide considerable output for upgrading existing services and facilities from time to time. This also helps in assimilating service quality and the areas that require improvement thereby, strengthening user relationship.

The table 4.34 reveals that the users have comparatively good expectation (Mean 4.34, SD 0.69) and low perception (Mean 3.43, SD 1.06) on the item "Conduct continuous library users need assessment". Hence it has comparatively high service quality gap (Mean-0.91, SD 1.15). It indicates that most of the special libraries do not conducting regular user need assessment, therefore they can't focus on the actual requirements of the users and hence such

libraries are unable to meet the expectations of the users to an extent.

Modern technological advancements have dramatically changed the functioning of a library. In the current scenario most of the special library services are provided using ICT. Therefore, in order to provide quality services, libraries should always ensure that the entire ICT infrastructure of the libraries is in a good working condition. Sometimes, there may be large number of computers but only few of them might be working properly. So, regular maintenance of the computers and other related equipment's are necessary.

It can be seen from the table 4.34 that the users have good expectation (Mean 4.49, SD 0.62) and comparatively low perception (Mean 3.73, SD 0.95) on the item "ICT infrastructure of the library is always in good working condition". Therefore, the service quality gap is comparatively high (Mean -0.75, SD 0.99). The low perception score conveys that the ICT infrastructures of the special libraries are not as much good and effective. Libraries should take adequate measures to replace the old and useless devices with new ones.

A good library is required to have a website of its own. It should provide the complete information about the library, its collection services and staff. It also provides information on upcoming events, notices, user alerts, important notifications, etc. It acts as a gateway to the functions and services of libraries. The library website would be the initial location where other users might access for reliable information regarding various services. Therefore library should update its websites with latest information. It is also desirable to include provision in the website for the users and researchers to request new books or journals.

The table 4.34 shows that the users have high expectation (Mean 4.56, SD 0.64) and comparatively lowest perception (Mean 2.77, SD 1.49) on the item "Well designed and managed library website/ portal", therefore it has comparatively highest gap (Mean -1.79, SD 1.50). As the special libraries work under a parent organization, a good number of special libraries have web page in the institute's websites. But the libraries of NIO, KSCSTE, CTCRI, JNTBGRI, CWRDM and CDB does not have webpage or library portal. Library website act as an access point to all the information and services provided by the library, thereby making it pivotal for every library to develop and maintain a website of its own and it should be updated regularly.

Special libraries provide many advanced online services in their respective area of interest. In order to get access to the services, uninterrupted network connection is needed. The users of the special library have access to the e-resources provided by different consortia under the parent organization. The availability of e-resources and other digital services have necessitated the need for full-fledged internet access in libraries. The users would not be able to explore the benefits of e-resources if the internet nodes and bandwidth are inadequate. Therefore libraries should provide full-fledged internet facility to access its various services.

The table 4.34 reveals that users have high expectation (Mean 4.61, SD 0.63) and low perception (Mean 3.76, SD 1.09) on the item "Full-fledged Internet access in the library". Hence the service quality gap is Mean -0.85, SD 1.15. It is observed that all the special libraries except the NIO library provide internet facility in the library. The low perception score indicates that the users face troubles such as low speed, power failure, network problems, etc. while using the internet.

Therefore special libraries should implement high speed internet connection and ensure uninterrupted flow of data.

For providing better network access, libraries should provide wireless network services. The users of special libraries need to access online library services from anywhere in the organization; if in case they are unable to spare time to visit the library, they can access the library services in their laptop, mobile, tablet etc. using the Wifi service, interruption free. This provides flexibility to the users' schedule as they can access information even while engaged in other routine activities. The availability of wireless network is also beneficial to those who are more comfortable with mobile devices for information needs.

The table 4.34 makes it clear that the users have high expectation (Mean 4.46, SD 0.78) and low perception (Mean 2.92, SD 1.45) on the item "Wireless network access (Wi-Fi, Wi-MAX, Wireless LAN)", therefore it has comparatively highest gap (Mean -1.54, SD 1.50). This is because most of the special libraries do not providing wireless network access, it includes, RRI library, CDB library, VSSC library, MPEDA library and NIO library. Therefore, special libraries should take necessary measures to provide Wi-Fi facility in libraries. VSSC library is not providing Wi-Fi facility for security reasons.

The collections of a good library should follow a systematic and logical order for easy search and retrieval. There are different classification schemes such as Dewey Decimal Classification (DDC), Colon Classification (CC), Universal Decimal Classification (UDC), etc. Libraries are free to adopt any of these methods for the arrangement of books. A systematic and logical arrangement of documents can be of great convenience to the users of the library. The accession number and classification number provides each book

an identity. Users can easily search the required document with the classification number.

The table 4.34 shows that the users have high expectation (Mean 4.66, SD 0.51) and good perception (Mean 4.02, SD 0.89), on the item "Classification and arrangement of documents are systematic and logical", therefore it has lowest gap (Mean -0.64, SD 0.93). All the special libraries follow systematic method for classification. It is observed that majority of the libraries adopt DDC. The CMFRI library follows CC and the libraries such as CPCRI library, NIIST library, FCRI library, VSSC library, KFRI library and RRI library follows UDC.

Preservation of books and other library resources is regarded as the major responsibility of a library. In order to provide better service, it is very important to keep the library resources from damage and dust. Therefore, libraries employ mild chemicals or pesticides. The library should be air proof so that the environmental factors cannot damage its resources. The air conditioning facility in libraries prevents the materials from dust. The longevity of materials depend upon the library staff and patrons, since they are responsible for the binding or packaging, shelving procedures, processing and circulation practices of materials. Implementing techniques and practices for the ideal treatment of documents is necessary to stabilize and sustain their original integrity.

The table 4.34 shows that users have high expectation (Mean 4.70, SD 0.53) and good perception (Mean 4.08, SD 0.84) on the item "Protect library resources from damage and dust" therefore, service quality gap is low (Mean -0.62, SD 0.91). Majority of the special libraries are keeping their resources free from damage and dust.

With the technological advancements in the current world, library technologies are ever changing. Traditional book searching and lending are gradually becoming obsolete. Internet has revolutionized the field of library and knowledge, now users can locate necessary documents in a mouse click from thousands of others. The user preferences have also changed with the technological changes; therefore, in order to satisfy user requirements libraries should adapt accordingly. By implementing advanced technologies, libraries can provide better services to users.

The table 4.34 indicates that the item "Library frequently updated with latest technologies" users have high expectation (Mean 4.67, SD 0.55) but low perception (Mean3.33, SD1.13). Majority of the libraries are not aware and updated with latest technologies. Therefore it has comparatively highest service quality gap (Mean -1.33, SD 1.21). Hence libraries should attempt to implement advanced technologies and improve the quality of services.

4.6.4.5. Item wise Analysis of Library Service

Libraries are providing numerous value added services to its users. Services like current awareness service, selective dissemination of information, bibliographic services, indexing and abstracting services are the major services provided by a library. Evaluation of all these services is needed for maintaining quality in library services.

Users' expectation and perception of the following library services are measured to assess the service quality gap of each service. The table 4.35 indicates to what extend each service is needed by the users.

Table 4.35

Item wise Analysis of Library Service

Statements	Expectation		Perception		Gap	
	Mean	SD	Mean	SD	Mean	SD
Keep library users informed about new facilities, collections and services provided by the library	4.62	0.54	3.76	1.05	-0.86	1.09
Provides Xerox service to library users during library hours	4.53	0.72	3.84	1.09	-0.69	1.13
Convenient library timing	4.62	0.59	3.89	0.99	-0.73	1.09
Provides user based alert service in a personal way	4.15	0.83	3.30	1.05	-0.85	1.22
Provides digital library services	4.52	0.65	3.64	1.09	-0.88	1.18
Provides institutional repository services (e-thesis repository)	4.45	0.67	2.88	1.41	-1.57	1.46
Provides indexing and abstracting services	4.45	0.67	2.80	1.32	-1.65	1.42
Provides content page service	4.40	0.69	3.44	1.06	-0.96	1.15
Provides newspaper clipping service	4.39	0.71	3.46	1.10	-0.92	1.17
Provides bibliographic databases	4.47	0.62	3.19	1.26	-1.28	1.32
Provides video library service	4.36	0.72	2.22	1.03	-2.15	1.25
Provides user education/orientation	4.38	0.69	3.42	1.07	-0.96	1.18
Provide services to differently abled users	4.48	0.66	1.49	0.74	-2.99	1.01
Display of directional signs to reach different sections of the library	4.55	0.59	3.47	1.16	-1.08	1.24
Provide user feedback facility	4.48	0.62	3.28	1.08	-1.2	1.19

Libraries should regularly inform all those who have been working in the parent organization about all its facilities, collections and services provided by the libraries. Otherwise, the users may not be able to know majority of the services provided by the library. Modern

libraries are providing digital services and multimedia facilities such as audio and visual facilities for improved understanding. Such facilities are useless if the users unaware of them. An effective communication system must be in place to convey the desired information. While introducing a new service or arrival of new collection, the users should be informed accordingly.

The table 4.35 reflects that the users have high expectation (Mean 4.62, SD 0.54) and low perception (Mean 3.76, SD 1.05) on the item "Keep library users informed about new facilities, collections and services provided by the library", hence the gap score is Mean -0.86, SD 1.09. It indicates that staffs of parent organization are not informed about many of the services provided by the library. Therefore libraries should develop an effective communication system to make the members of the parent organization aware about library services.

The library collection may only include limited copies of books of high price. In order to make available as many copies of the book as required, libraries should provide Xerox facility. Xerox facility can be utilized at times when the library users might need to copy the content they read which can either be an entire text or a section. The Xerox facility also enables the users to have copies of certain books or documents which are unable to be circulated due to its age and damage. It is essential to make sure that the service is available during library hours.

The table 4.35 shows that the users have high expectation (Mean 4.53, SD 0.72) and low perception (Mean 3.84, SD 1.09) on the item "Provides Xerox service to library users during library hours", hence the service quality gap is Mean -0.69, SD 1.13. It is observed that all

the special libraries provide Xerox facility in library during library hours.

For providing better services, the timing of libraries should be convenient to its users. As the special libraries are attached to the parent organization, its timing is dependent upon the working hours of the institution. This can cause inconvenience to the users, since they might be busy with their work during normal library hours. Therefore, it is better to expand the timing of library beyond the office hours. Hence the users can avail the library services even after their working time. The library timing has to be fixed according to the nature of the library. Most of the users visit library during their free time with researchers being an exception. Usual working hours will not satisfy the needs of all users.

The table 4.35 shows that the users have high expectation (Mean 4.62, SD 0.59) and low perception on the item (Mean 3.89, SD 0.99) "Convenient library timing" therefore, the gap score is Mean -0.73, SD 1.09. It is observed that only those libraries such as FCRI library, CDB library, VSSC library and RRI library have their functioning hours extended beyond normal working hours. All other libraries should follow the same.

As there are different type of users with varying requirements, libraries should acknowledge and cater to all such needs. A profile has to be created for every member and they should be alerted whenever a resource from their respective subject area has arrived. This enables the users to acquire desired documents without delay.

It is evident from the table 4.35 that the users have comparatively low expectation (Mean 4.15, SD 0.83) on the item "Provide personalized user based alert service" because majority of users are not aware about the service and they thought that the alert mail will

be a burden to them (inbox might clutter with huge number of mails). The perception score (Mean 3.30, SD 1.05) also indicates that majority of the libraries do not offer this service. The VSSC library provides it by the name "know your patron". The service quality gap is shown as Mean -0.85, SD 1.22.

The digital library services have started to gradually receive importance among library users. In the near future, digital books might completely replace traditional books. In order to provide quality service to the users, libraries are providing numerous digital library services. It includes digitization of the entire collection of libraries. Moreover, digital library services include all those services which are available digitally such as e-journals, e-books, databases, e-theses, online services, etc. Many of the international publications are easily available in digital format. So, digital content section is an integral part of every library.

The table 4.35 reflects that the users have high expectation (Mean 4.52, SD 0.65) on "Provides digital library services", but they perceived low (Mean 3.64, SD 1.09). It indicates that most of the libraries are providing only few digital library services. Hence the service quality gap is high (Mean -0.88, SD 1.18). Therefore, library should implement new and advanced digital library services.

Institutional repository services are provided by the libraries for capturing the intellectual output of the organization. Through institutional repository service, the scholarly publications of the organization can be made electronically accessible. Generally, it includes theses, dissertations, journal article, conference proceedings etc. The institutional repository service provides global visibility to an institution of research and preserves every digital assets of the institution.

It can be seen from the table 4.35 that the users have expectation (Mean 4.45, SD 0.67) on the item "Provides Institutional Repository services", but their perception (Mean 2.88, SD 1.41) is very low. Therefore, it has the highest service quality gap (Mean -1.57, SD 1.46). As the parent organizations of most of the special libraries are prominent research institutions, there is a need to archive all their scholarly publications and provide access to it. The low gap indicates that most of the special libraries do not maintain them properly. The libraries such as NIO library, CDB library, CWRDM library, JNTBGRI library, CTCRI library, MPEDA library and KSCSTE library are not providing institutional repository service. Therefore these libraries should take measures to initiate institutional repository services. Those libraries offering the service need to update it and improve its access in order to make the available knowledge useful to all the users.

Indexing service provides access points to the specific information required by the users. Abstracting service provides a summary or abstract of publications. As special library is of specialized nature, focused on a specific subject, indexing and abstracting services has its own importance. It makes information searching simpler and time-saving and enables users to take decisions whether the information is needed or not.

The table 4.35 makes it clear that the users have high expectation (Mean 4.45, SD 0.67) and low perception (Mean 2.80, SD 1.32) on the item "Provides indexing and abstracting services". This is because majority of the special libraries are not providing it. Therefore, the service quality gap is high (Mean -1.65, SD 1.42). Only the libraries such as MPEDA library, JNTBGRI library, KFRI library, CDB library, CIFT library, CMFRI library, VSSC library and RRI library are providing indexing and abstracting service. Hence, all

other libraries should realize the importance of the service and take necessary measures to offer it.

This service is intended to provide the content page of the journals or other publications to the users. The page content service provides the users with a refined complete article reading experience so that they can understand the article without spending much time. Library staff scans the content page of a particular journal and mail it to all members concerned with the specific subject area of the journal. Thus they can go through the list to find out the required article.

The table 4.35 reflects that users have high expectation (Mean 4.40, SD 0.69) on the item "Content page service". But their perception (Mean 3.44, SD 1.06) is comparatively low. Therefore, it has comparatively high service quality gap (Mean -0.96, SD 1.15). It conveyed that most of the libraries are not providing the service. As far as a special library is concerned, this service will be make reading and research more convenient to the users because they need not come to the library to access the journals. Therefore special libraries should be aware of its uses and implement it in libraries.

Newspaper clipping service provides all the latest news about the subject the institute specializes or about the institute itself, which appeared in all the available newspapers. Library staff scans and archive all such information and provide the users access to it. This service concentrates its area according to the subject, industry, size, geography, publication, journalist, or editor.

The table 4.35 shows that the users have high expectation (Mean 4.39, SD 0.71) and low perception (Mean 3.46, SD 1.10) on "Provides newspaper clipping service", therefore the service quality gap is Mean -0.92, SD1.17. As the newspaper clipping service is a specific service of the special libraries, majority of the libraries offer it. Only those

libraries such as NIO library, CIFT library, FCRI library and CDS library fail in providing the service.

Libraries provide both bibliographic and subject databases. Bibliographic data base provides information on bibliographic records and references to other published literature. Subject databases are specific to a particular subject alone and provide access to the available literature on that subject. It helps the readers in understanding details of specified terms, usage, books etc. It is an important service to be offered by special libraries.

The table 4.35 shows that the users have high expectation (Mean 4.47, SD 0.62) on the item "Provides database services" but they perceived low (Mean 3.19, SD 1.26) hence the service quality gap is high (Mean -1.28, SD 1.32). All the special libraries except KSCSTE library, CWRDM library and NIO library are providing database service, even though they need to expand the collection of both subject database and bibliographic database in their respective subject areas. Libraries which are not providing this service need to implement it at the earliest.

The traditional library format undergoes transition and is evolving day by day. In the present digital era, libraries are equipped with multimedia content such as video and audio data. The automatic video content provides more detailed information regarding various subjects so that the users can comprehend the subjects conveniently. The information is stored so that the contents can be accessed over networks of varying bandwidth. The video content provides more detailed information regarding various subjects so that the users can conveniently comprehend subjects.

The table 4.35 shows that users have high expectation (Mean 4.36, SD 0.72) and lowest perception (Mean 2.22, SD 1.03) on the item "Provides video library service", therefore it has high service quality gap (Mean -2.15, SD 1.25). The low perception implies that majority of the libraries are not introducing the service yet. With video library service, users can simply perceive the information they require, and will be highly useful to the users. Therefore in order to provide quality service, it is better for the libraries to initiate it.

As the libraries introduce new and advanced services every day, it is essential to provide proper training and orientation to users about such services. Majority of the users are not aware about many services offered by the libraries and most of the users don't know how to use it. The user orientation familiarizes the users with its facilities, functions, services and possibilities. It is a continuous process since new users and service are added gradually.

The table 4.35 shows that the users have high expectation (Mean 4.38, SD 0.69) on "Provides user education/orientation" but their perception (Mean 3.42, SD) is low, hence, it has high service quality gap. Majority of the libraries do not provide proper orientation to users and it results in an inefficient utilization of the library services.

As the differently abled users need special attention, libraries need to design specific services for them. The environment of the library has to be maintained in such a manner that it can embrace differently abled users comfortably. Catering to the specialized needs of the differently abled users is part of humanism and professionalism. Libraries have the obligation to provide the services they require without any hurdles. Their needs and requirements are to be addressed with utmost importance. The specific services to such users include talking book, audio magazines and newspapers, Braille and other tactile materials, Audio tape, Audio and video tape in daisy

format, large-print books, Audio-descriptive videos etc. (Solanki and Mandaliya, 2016). Specially trained staffs may be required, since these users might need special individual attention at all times.

It can be seen from the table 4.35 that users have high expectation (Mean4.48, SD 0.66) on the item "Provide specific services to differently abled users" but their perception (Mean 1.49, SD 0.74) is very low, hence it has the highest service quality gap (Mean -2.99, SD 1.09). The highest gap indicates that none of the libraries provide any specific service specially designed for differently abled users. Therefore, libraries should address the issue of catering to the requirements of differentially abled as one of the basic requirements it ought to fulfill. Like all other users, differently abled users are also entitled to get quality services from libraries. The second law of Library Science "every reader his or her book" by SR Ranganathan emphasized the importance of providing library service to all users (Ranganathan, 1931).

Libraries are sanctuaries of knowledge and they contain various sections, such as circulation section, stack, periodical section, reference section, technical section, etc. Directional signs are important because a new comer would always feel lost, unable to locate his material in the way things are placed in a library. Without signs, people may ask other users, which can disturb reading and concentration. Appropriate signs can avoid confusion and unnecessary chaos in the library. Therefore, it is convenient for the users if the directions to different sections are displayed.

The table 4.35 indicates that the users have high expectation (Mean 4.55, SD 0.59) and low perception (Mean 3.47, SD1.16) on the item "Display of directional signs to reach different sections of the library". Therefore, it has high service quality gap (Mean -1.08, SD 1.24). Most of the special libraries do not display any directional signs in libraries.

In order to provide quality service in libraries, there should be an effective feedback mechanism. It helps the libraries to review their performance and take corrective measures wherever needed. Through the feedback facility, libraries are able to understand the needs and expectations of the users and provide them with services as expected by them. Only feedback can provide valuable information to libraries so as to improve their facilities, book collection and also helps in knowing the further requirements of users. The feedback mechanism may include suggestion box, online review form, user surveys, etc. Collecting feedbacks can also generate more confidence among users as their inputs and suggestions are valued. The whole library experience can be improved by accepting feedbacks.

The table 4.35 exhibits that users have high expectation (Mean 4.48, SD 0.62) and low perception (Mean 3.28, SD 1.08) on the item "Provide user feedback facility", therefore the service quality gap is high (Mean -1.2, SD 1.19). It conveys that majority of the libraries are not maintaining an effective feedback mechanism in the libraries. As a result, most of the services provided by the libraries are not actually required for the users. Without a feedback mechanism, libraries can't realize what the users' requirement actually is. Hence, libraries should develop strategies for assessing the feedbacks of the users and review the library performance.

Throughout the analysis, it can be observed that the following are the 10 items having highest service quality gap. Special libraries should primarily focus on these things for enhancing their service quality.

- Physical facilities for differently abled users

- Provide services to differently abled users

- Provides video library service

- Well designed and managed library website/ portal

- Provides indexing and abstracting services

- Provides institutional repository services

- Wireless network access (Wi-Fi, Wi-MAX, Wireless LAN)

- Provide access to audio visual materials

- Library frequently updated with latest technologies

- Provides bibliographic databases

Meanwhile, following are the items having low service quality gap. Even though, the negative score indicates that it is not yet rose up to the expectations of users. In order to ensure the service quality as expected by the users, libraries should attempt to avoid the gap.

- Comfortable and inviting location

- Personal attention offered to library users

- Cleanliness, tidiness and hygiene

- Emotional intelligence to deal with the library users

- Offering help to library users when they fail to locate a document needed

- Adequate lighting and ventilation

- Approachable and welcoming nature of the staff

- Willingness to help library users all the time

- Sufficient space for readers / users

- Adequate and comfortable furniture

In sum, users' perceptions were consistently low for all the features mentioned through SERVQUAL statements against their expectations. Therefore in order to provide quality services, libraries should strive to avoid or reduce the gap to minimum.

4.6.5. Institute wise Analysis of User Expectations

Since special libraries are meant for catering to specialized group of users, their needs and expectations are different from other academic libraries. Consequently, special library services are directed towards accomplishing organizational objectives.

The special libraries selected are belonging to different institutes having divergent objectives. Needs and expectations of the users varied according to the nature of parent organizations. Institute wise analysis explores the desired expectations of the users in each of the special libraries for excellent service quality. It identifies the library that has the highest expectation and the library that has the lowest expectations.

Table 4.36

Institute wise Analysis of User Expectations

Name of the Institute	Mean	SD
CDB	4.35	0.49
CDS	4.59	0.43
CIFT	4.57	0.37
CMFRI	4.68	0.32
CPCRI	4.59	0.33
CTCRI	4.66	0.35
CWRDM	4.58	0.35
FCRI	4.49	0.33
JNTBGRI	4.64	0.36
KFRI	4.60	0.36
KSCSTE	4.58	0.35
KSPB	4.46	0.37
MPEDA	4.34	0.53
NCESS	4.39	0.43
NIIST	4.54	0.36
NIO	4.44	0.36
RRI	4.56	0.36
Spices Board	4.41	0.41
VSSC	4.58	0.37

The table 4.36 observes expectations of the users in different special libraries in Kerala. In which it can be seen that the users of all the 19 special libraries have high expectations. The table makes it clear

that the users of CMFRI library (Mean 4.68, SD 0.32) have highest expectation followed by CTCRI library (Mean 4.66, SD 0.35). Meanwhile, the users of MPEDA library (Mean 4.34, SD 0.53) and CDB library (Mean 4.35, SD 0.49) have low expectation as compared to other libraries. Since the special libraries focus on particular objectives of the parent organization, it should be competent enough to anticipate the changing needs and expectations of the users in their respective area of specialization. Likewise, in a study Filiz (2007) observed that there are significant differences in the service quality perceptions of students in different universities, but there is no university wise difference in the case of users' perceptions. In the view of Wang and Shieh (2006) also, there is no significant differences in the service quality importance among users from different institutes. Manjunatha (2001) in his study assessed the expectations of the library users across various disciplines such as Engineering, Medical, Science and Social Science and found that, 'reliability' is the most expected dimension and 'empathy' is the least expected in all the disciplines. The users of Medicine have high expectations on all dimensions than other disciplines.

The study conducted Kruskal Wallis test to observe that the differences between the institutions on user expectations are significant or not.

Table 4.37

Significance of Differences between the Institutions on User Expectations - Kruskal Wallis Test

Test Statistic	Df	Asymp. Sig.
36.345	18	0.006

It is noted from the table 4.37, that Kruskal Wallis test shows test statistic 36.345 and p value 0.006. Since the p value is less than 0.05, it is concluded that there is significant institute wise difference among the expectations of the users of special libraries.

4.6.6. Institute wise Analysis of User's Perceptions

The perceptions of the users in each special library vary on the basis of the kinds of services it provided. The availability of adequate resources, staff and facilities in each special library affect their quality perceptions. Perceptions among the users of different institutes tend to be similar for some services but markedly different for others, warranting at least some tailoring of services to specific user groups.

Institute wise analysis of user's perceptions examines which library has high perceptions and which library has low perceptions. On the basis of the analysis, libraries can find ways to improve its service quality perception.

Table 4.38

Institute wise Analysis of User's Perceptions

Name of the Institute	Mean	SD
CDB	3.17	0.44
CDS	3.85	0.57
CIFT	3.84	0.43
CMFRI	4.22	0.46
CPCRI	3.98	0.42
CTCRI	3.39	0.43
CWRDM	3.36	0.52
FCRI	3.47	0.42
JNTBGRI	3.21	0.61
KFRI	3.94	0.49
KSCSTE	3.27	0.22
KSPB	3.73	0.46
MPEDA	3.52	0.59
NCESS	3.19	0.46
NIIST	3.80	0.42
NIO	2.88	0.39
RRI	3.54	0.45
Spices Board	3.62	0.36
VSSC	4.32	0.35

The table 4.38 reveals the perceptions of users of 19 special libraries in Kerala. It is observed that the libraries in Kerala have low perceptions than their expectations. It can be seen that the VSSC library have high perception (Mean 4.32, SD 0.35) followed by CMFRI library (Mean 4.22, SD 0.46). It conveys that both these libraries are providing quality service to an extent as expected by the users. But the NIO library has low perception (Mean 2.88, SD 0.39) as compared with all other libraries. As the NIO library failed to meet the expectations of the users, it should update its resources and services in order to cater to the demands of the users and to provide quality services to the users, thereby meeting their expectations of the users. The mean value of CDB (Mean 3.17, SD 0.44), NCESS (Mean 3.19, SD 0.46), JNTBGRI (Mean 3.21, SD 0.61) and KSCSTE (Mean 3.27, SD 0.22), also have low perception. Lack of adequate staff, financial constraints, inadequacy of sufficient resources, poor physical facilities etc. are the major reasons for the low perception of service quality in these libraries. This result suggests that though users' perceptions and expectations vary by some degrees, their expectations were greater than their perceptions which imply that the offered services do not meet the desires of library users. The Kruskal Wallis Test examines whether the differences between the institutes act as a significant influence on user perception. Similarly when Manjunatha (2001) assessed the perceptions of the users in various disciplines like Engineering, Medicine, Science and Social Science, it was found that library users under the Medical discipline have a high perception than that of other disciplines.

The study conducted Kruskal Wallis test to observe whether the differences between the institutions on user perceptions are significant or not.

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Table 4.39

Significance of Differences between the Institutions on User Perceptions - Kruskal Wallis Test

Test Statistic	Df	Asymp. Sig.
241.537	18	0.000

From the table 4.39 the test statistic and p value obtained through Kruskal Wallis test is 241.537 and 0.000 respectively. It was found that there is significant institute wise difference among the perceptions of the users of special libraries. Similarly while assessing user perceptions of University of Botswana Library, Thapisa and Gamini (1999) also observed that there had significant difference in the perception of service quality between graduate and under graduate students and among various faculties.

4.6.7. Institute Wise Service Quality

The objective of special libraries is fulfilling the information requirements of its parent organization. As these libraries endeavor to aid the researchers and users in professional and specialized fields, it is essential for these libraries to be aware of their performance quality and the level of user satisfaction from their services. According to Thapisa and Gamini (1999) "the clients' information seeking behaviour might be determined not only by their needs for information but also by their status or preoccupation. The activities that people undertake might have a direct influence upon the kind of information they desire". The study assessed the expectations and perceptions of the library users in different institutes and measured the gap between them. On the basis of the gap, it is possible to determine how far each library is successful in providing quality services.

Table 4.40

Institute wise Service Quality

Name of the Institute	Mean	SD
CDB	-1.13	0.63
CDS	-0.67	0.69
CIFT	-0.71	0.44
CMFRI	-0.41	0.48
CPCRI	-0.57	0.36
CTCRI	-1.17	0.42
CWRDM	-1.15	0.58
FCRI	-1.00	0.48
JNTBGRI	-1.39	0.71
KFRI	-0.63	0.53
KSCSTE	-1.29	0.42
KSPB	-0.69	0.47
MPEDA	-0.78	0.67
NCESS	-1.13	0.62
NIIST	-0.69	0.51
NIO	-1.52	0.52
RRI	-1.01	0.50
Spices Board	-0.69	0.37
VSSC	-0.26	0.28

The table 4.40 shows the institute wise gap analysis of 19 special libraries in Kerala. It is obvious from the table that, the NIO library has the highest gap score (Mean -1.52, SD 0.52) followed by JNTBGRI library (Mean -1.39, SD 0.71). It communicates that, according to the user response, these libraries maintain lowest level of service quality. The services provided by the libraries are far behind of the users expectations. Besides these, KSCSTE library (Mean -1.29, SD0.42), CTCRI library (Mean -1.17, SD 0.42) and CWRDM library (Mean -1.15, SD 0.58) also have the highest gap score and low service quality. Poor collection, lack of permanent staff, outdated databases, lack of adequate physical facilities etc. are the major reasons for low service quality. Libraries need to update with latest technologies in order to provide quality services. In the

NIO library and CWRDM library, there are no permanent staffs with library science qualification. Even though, the CWRDM library is so spacious, the collections and services are very limited. The collection of e-resources of CWRDM library is poor.

The VSSC library has the lowest gap value (Mean -0.26, SD-0.41) followed by CMFRI library (Mean -0.41, SD 0.48). It implies that these libraries provide comparatively better services to its users. VSSC library provided many advanced service like "human library" in which the users can interact with experts in each subject field. In addition it provides webscale discovery service, VSSC virtual library, table of contents of journals, etc. Both the libraries have good physical facilities, adequate collections, qualified staff, updated technologies etc. Therefore these libraries almost meet the expectations of the users than all other libraries. However, the negative gap value conveys that there is a need to improve the performance of the libraries further. In addition, the CPCRI library (Mean -0.57, SD 0.36), KFRI library-0.63, 0.53), CDS library (Mean-0.67, SD 0.69), KSPB library (Mean-0.69, SD 0.47), NIIST library (Mean-0.69, SD 0.51) and Spices board library (Mean -0.69, SD 0.37) also have comparatively low gap score. These libraries also meet the expectations of users to an extent. In order to provide quality service, KFRI library developed a library portal and provide 24 hour access to e-resources. The report of all the research work carried out by KFRI library are made available in the library portal and is maintained as digital archive. The library conducts book exhibition and digitizes rare and old books. The major limitation of the library is its limited space and lack of adequate staff. CDS library has the first Social Science blog in Kerala. KSPB library is one of the best libraries in economics.

Libraries are conducting training programs and workshop for the users and also for library staff. NIIST library and KFRI library conducted training program for researchers on reference management software such as Zotero, Mendeley, EndNote, etc, FCRI library have been conducting international training program for digital libraries and knowledge management since 2009.

Majority of the libraries face lack of fund and staff as the major barrier in providing quality services to the users. As a result, libraries can't provide adequate resources and services as needed by the users. They are forced to provide only limited collections and services with their scarce fund. While personally interviewing the librarians of concerned libraries, it was revealed that, the libraries such as FCRI library, TBGRI library, NIIST library, CTCRI library, CPCRI library and RRI library are facing lack of fund and staff. In addition, the libraries of CWRDM, KFRI, CIFT, NIO, KSPB and NCESS also face the problem of shortage of staff.

The study conducted Kruskal Wallis test to observe whether the differences between the institutions on service quality are significant or not.

Table 4.41

Significance of Difference among the Service Quality of Special Libraries - Kruskal Wallis Test

Test Statistic	Df	Asymp. Sig.
183.251	18	0.000

It is found from the result of Kruskal Wallis test that there is significant institute wise difference among the service quality of special libraries (Test Statistic is 183.252 and P value 0.000). Hence, it is inferred that there is institution wise difference among service quality.

4.6.8. Dimension wise Service Quality of Special Libraries (Institute wise)

After testing users' overall expectations and perceptions of the library services, the quality of services of each components of the SERVQUAL instrument was examined. It helps in identifying the problems that exist in each section of the libraries for providing quality services and provide information on what dimension libraries have to be more focused in order to avoid such problems. In dimension wise gap analysis, the quality of each dimension under the 19 libraries is assessed. The study provides current state of the art as well as an indication of quality of each dimension in the service quality of special libraries in Kerala.

Table 4.42

Dimension Wise Service Quality of Libraries (Institute wise)

Name of the Institutions	Physical Facility		Library Collection		Library Staff		Technical Process		Library Service	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
CDB	-1.08	0.70	-0.94	0.74	-0.75	0.69	-1.49	0.81	-1.40	0.80
CDS	-0.82	0.81	-0.49	0.82	-0.21	0.74	-0.52	0.89	-1.29	0.70
CIFT	-0.85	0.57	-0.72	0.59	-0.29	0.50	-0.76	0.65	-0.95	0.55
CMFRI	-0.59	0.54	-0.17	0.53	-0.18	0.51	-0.32	0.57	-0.77	0.78
CPCRI	-0.67	0.36	-0.44	0.53	-0.21	0.49	-0.62	0.50	-0.93	0.46
CTCRI	-0.93	0.42	-0.81	0.59	-0.76	0.63	-1.49	0.62	-1.87	0.55
CWRDM	-0.66	0.51	-1.00	0.66	-1.10	0.87	-1.49	0.74	-1.49	0.70
FCRI	-1.13	0.56	-1.11	0.79	-0.49	0.67	-1.00	0.64	-1.29	0.48
JNTBGRI	-1.35	0.61	-1.36	0.97	-0.90	0.95	-1.53	0.91	-1.79	0.79
KFRI	-0.53	0.42	-0.59	0.75	-0.42	0.56	-0.64	0.73	-0.96	0.61
KSCSTE	-1.19	0.56	-1.75	0.44	-0.38	0.46	-1.47	0.50	-1.70	0.55
KSPB	-0.62	0.41	-0.57	0.54	-0.09	0.52	-1.16	0.64	-1.00	0.74
MPEDA	-0.79	0.53	-0.69	0.83	-0.42	0.69	-0.91	0.83	-1.09	0.83
NCESS	-0.93	0.57	-1.27	0.87	-0.57	0.61	-1.11	0.85	-1.77	0.69
NIIST	-0.80	0.51	-0.57	0.56	-0.41	0.67	-0.59	0.66	-1.09	0.64
NIO	-1.29	0.69	-1.58	0.78	-1.58	0.92	-1.26	0.49	-1.89	0.65
RRI	-1.04	0.62	-1.10	0.64	-0.34	0.48	-1.39	0.56	-1.18	0.72
Spices Board	-0.55	0.38	-0.30	0.51	-0.13	0.46	-1.14	0.45	-1.36	0.46
VSSC	-0.49	0.49	-0.12	0.38	-0.05	0.37	-0.34	0.35	-0.29	0.37

The table 4.42 shows the dimension wise gap analysis of special libraries in Kerala. From the table it can be seen that under the

physical facility dimension, the JNTBGRI library has the largest gap (Mean -1.35, SD0.61) followed by NIO library (Mean -1.29, SD 0.69). It reflects that while comparing with other libraries, physical facilities of these libraries are very poor. There aren't adequate spaces for readers. Users need a calm and quiet place for reading and learning. For a better service quality environment, libraries need to provide comfortable furniture and adequate lighting and ventilation. Besides these, drinking water facility and lavatory facilities are essential in a library. The KSCSTE library (Mean -1.19 SD 0.56) and FCRI library (Mean -1.13, SD 0.56) also have largest gap score and poor physical facilities than other libraries. Meanwhile, the VSSC library (Mean -.49, SD 0.49) has the lowest gap score followed by KFRI library (Mean -0.53, SD 0.42). The spices board library (Mean -0.55, SD 0.38) and CMFRI library (Mean -0.59, SD 0.54) also have comparatively low gap score. It reveals that these libraries provide comparatively better physical facilities meeting the expectation of the users.

In the library collection dimension, majority of the libraries have high gap score. It indicates that the libraries do not have adequate collection and the existing collections are not sufficient enough to meet the needs and requirements of the users. Here the highest gap score belongs to KSCSTE library (Mean -1.75, SD 0.44) followed by NIO library (Mean -1.58, SD 0.78). For improving the service quality, libraries need to update its collections. The collection development strategies of the libraries have to be modified. The size of library collection is not an indicator of service quality. It depends on the quality of the collection and whether the collection meets the requirements of the users. Therefore, regular assessment of users' need is essential. Whereas VSSC library and CMFRI library has only a small gap value of -0.12(Mean), 0.38 (SD) and -0.17 (Mean), 0.53

(SD) respectively. It conveyed that both these libraries have an almost good collection on the subject the institute specializes and it meets users' changing needs and requirements.

The library staff dimensions shows comparatively low service quality gap. In which the NIO library (Mean-1.58, SD 0.92) and CWRDM library (Mean-1.10, SD 0.87) has the highest gap. Both the libraries lack permanent and qualified staff. Therefore the users face difficult to locate the document needed. The existing staff may not be willing to help the users as required. They may not have adequate knowledge about the existing collections of the library. The library staff plays an inevitable role in the service quality of a library. They should have the skill and competency to deal with the emerging queries of the users. Hence library should appoint only qualified staff and provide them with continuous training. Moreover, the VSSC library (Mean -0.05 SD 0.37) scores the lowest gap value followed by KSPB library (Mean-0.9, SD 0.52) because these libraries have excellent staff and they were capable of meeting the users' needs all the time.

In contrast to library staff dimension, the technical process dimension also shows high service quality gap. It is clear from the table that JNTBGRI library (Mean -1.53, SD 0.91) and CWRDM library (Mean-1.49, SD0.74) has the highest gap in this dimension. Besides these, CTCRI library (Mean -1.49 SD 0.62), CDB library (Mean -1.49, SD 0.81) and KSCSTE library (Mean -1.47, SD 0.50) also shows high gap score. It indicates the technical section of the libraries to be weak. There may be many reasons behind it. The online cataloguing of the entries is not updated regularly. There have been many misplaced and damaged books kept in the shelves. There is no systematic process of weeding out. The websites of many of the libraries are not updated recently. As the technical processes affect

the smooth functioning of the library, it should be updated regularly with latest technologies and also ensure proper monitoring. Even though CMFRI library (Mean -0.32, SD 0.57) and VSSC library (Mean -0.34, SD .35) has low gap score on this dimension. This is because these libraries have more systematic and up to date technical section.

Of all other dimensions, the library service dimension has the highest gap on all libraries. The table makes it clear that the NIO library(Mean -1.89, SD 0.65) and CTCRI library (Mean -1.87, SD0.55) has the highest gap score followed by JNTBGRI (Mean -1.79,SD 0.79), NCESS (Mean -1.77, SD 0.69), KSCSTE (Mean -1.70,SD 0.55) CWRDM (Mean-1.49, SD0.70) libraries. It lays bare that the services provided by the libraries are not meeting the quality expectations of the users. Apart from it, majority of the users may be unaware about many of the services provided. Lack of knowledge about how to use the services may also affect it. Therefore libraries should conduct proper user awareness programs, seminars, workshop etc. to make the users acquainted with the available services. In addition, libraries should focus on the types of services needed by the users. For the time being, even in the library service dimension also, VSSC library (Mean -0.29, SD0.37) has the lowest gap value. Therefore it is observed that the services provided by VSSC library reaches up to the expectations of the users to an extent.

Thus, the table makes it clear that, both the VSSC library and CMFRI library has comparatively low gap value on all dimensions. Therefore it can be inferred that these libraries provide almost quality services to the users as expected by them whereas the NIO library, KSCSTE library, JNTBGRI library, CWRDM library has comparatively high gap value, which indicates that these libraries do not meet the quality expectations of the users, therefore the libraries

have to modify their quality management strategies in order to improve the service quality further. In addition, NIIST library, CDS library, MPEDA library etc. shows service quality to some extent. Examining users' expectations and actual service perceptions with regard to the services of the special libraries showed a significant difference between expected and actual service levels in all dimensions. Similarly, while measuring the service quality of Singapore Statutory Board Library, Tan and Foo (1999) compared the relative importance of service quality dimensions in special library, public library and academic library and found that both academic library and special library has similar views. They identified 'Reliability as the most important dimension and empathy as the least important. But the public library users have quite different opinion in this regard; they marked 'Tangibles' as the most important dimension.

In his study Manjunatha (2001) reported that the reliability dimension has highest gap and Assurance has lowest gap on all user group such as Engineering, Medicine, Science and Social Science than all other dimensions.

The study conducted Kruskal Wallis test to observe the significance of the difference between dimension wise service quality of each special libraries.

Table 4.43

Significance of Difference between Dimension wise Service Quality of Special Libraries - Kruskal Wallis test

Dimension	Test statistic	Df	Asymp. Sig.
Physical Facility	118.069	18	.000
Library collection	180.592	18	.000
Library Staff	134.702	18	.000
Technical Process	186.959	18	.000
Library Service	172.971	18	.000

From the above table 4.43, it can be seen that the p value of Physical Facility (Test Statistic -118.069), Library Collection (Test Statistic – 180.592), Library Staff (Test Statistic – 134.702), Technical process (Test Statistic1 - 86.959) and Library Service (Test Statistic – 172.971) are 0.000, which is lower than 0.05. It is inferred that there are significant differences in the dimension wise service quality of each special libraries.

4.6.9. Gender Wise Perception of Service Quality of Special Libraries

Due to the inherent characteristics of male and female users, there may be differences in their needs and expectations also. Sometimes, library staff may give preferences to the queries made by male users and provide services as early as possible, which result in them having good service quality perception than female users. Therefore, library should be impartial in providing services to the users irrespective of his/her gender, caste, status etc. When Sahu (2006) measured the service quality of JNU libraries, it also examined the quality perceptions of faculty and students on different service quality dimensions and observed that faculty members has positive perception on reliability and responsiveness dimension, this is because, library staff provide more attention to faculty requests than students. The users of JNU library were not satisfied with the responsiveness and communication dimensions.

Gender wise gap analysis was undertaken to find out if there are any significant difference existing between male and female users in quality perception.

Table 4.44

Gender wise Perception of Service Quality of Special Libraries

Dimensions	Male		Female	
	Mean	SD	Mean	SD
Physical Facility	-0.88	0.63	-0.79	0.56
Library Collection	-0.84	0.81	-0.72	0.75
Library Staff	-0.53	0.77	-0.46	0.68
Technical Process	-1.02	0.79	-0.99	0.78
Library Services	-1.25	0.77	-1.25	0.76
GAP Score	**-0.90**	**0.63**	**-0.84**	**0.59**

The table 4.44 shows that there is not much difference between the quality perceptions of male and female. The table indicates that the male users have the highest gap value than the female users on all dimensions, but while conducting the Man Whitney U test (Table 4.45), it has been noted that the differences were not significant. It conveyed that male and female users have almost the same experiences when using the library services. Libraries are not showing any gender differences in offering the services. This agrees with the findings of the study conducted by Sharma, Anand and Geeta (2010) on service quality of two Punjab University Libraries. The study pointed out that there is no significant mean difference between the male and female users on any of the service quality dimensions. The total gap score of male and female users indicates that both male and female users have low quality perception irrespective of their gender.

Similarly the study conducted by filiz (2007) also supported it by stating that there is no differences in the service quality perception of male and female users but the differences exist in service quality expectations. It was noted that female users have high expectation

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than male users. Opposed to these results, Waqar etal. (2015) pointed out that female users have better service quality than male users. The most significant difference lies in the reliability dimension.

In their study Simmonds and Andaleeb (2001) opined that female use the library more than male. It was noted that the variable familiarity with library has greatest impact on library usage followed by other variables such as resources, tangibles and gender. According to them, in order to increase the use, libraries should find ways to familiarize themselves to the users. The study also observed that the variable responsiveness, competence and demeanor of the staff did not have significant impact on library use.

The study conducted Mann-Whitney U test to observe the significance of the gender difference in service quality perception of users of the special libraries.

Table 4.45

Significance of Gender Difference in the Service Quality Perception - Mann-Whitney U test

Dimensions	Test Statistic	Standardized Test Statistic	Asymp. Sig.
Physical Facility	49714	1.401	.161
Library Collection	50516.5	1.766	.077
Library Staff	48289.5	0.751	.452
Technical Process	47815.5	0.533	.594
Library Service	46861.5	0.098	.922

The table 4.45 depicts the result of Mann-Whitney Test to observe gender wise service quality. Here the p value of dimensions of service quality such as physical facility (Test Statistic -49714, p value 0.161), library collection (Test Static- 50516.5, P value 0.077), library

staff (Test Statistic-48289.5, P value 0.452), technical process (Test Statistic - 47815.5, P value 0.594) and library service (Test Statistic-46861.5, P value 0.922) are not statistically significant at 5 percent level. Hence the null hypothesis that there is no significant difference in service quality perception of male and female users of the special libraries is accepted.

4.6.10. Management Wise Service Quality of Special Libraries

Special libraries under Central and State Government institutes differ in many aspects such as physical resources, financial resources and human resources. On these grounds, central government institutes are far better than state government institutes. All these have great impact on the quality of services provided by the libraries. In addition, the expectations and perceptions of library users under central government institutes are being different from that of state government institutes. Therefore, an effort was also made to find out if there is any significant difference in the perceived quality of services rendered among the library users under the central and state government institutes.

Table 4.46

Management wise Service quality of Special Libraries

Dimensions	Central Government		State Government	
	Mean	SD	Mean	SD
Physical Facility	-0.85	0.60	-0.84	0.61
Library Collection	-0.72	0.76	-0.99	0.82
Library Staff	-0.44	0.69	-0.66	0.82
Technical Process	-0.93	0.76	-1.24	0.82
Library Services	-1.21	0.76	-1.38	0.77
GAP Score	**-0.83**	**0.59**	**-1.02**	**0.65**

The table 4.46 shows the difference between central and state government institute library users in service quality gap of five dimensions. It can be seen that there are differences in all dimensions except the "physical facility" have highest gap on special libraries of central government and state government institutes. The largest difference exists in the "technical process" dimension. It reveals that central government libraries provide better service than that of state government libraries. Meanwhile there are not much differences in the physical facilities of central and state government libraries. As per the interview with librarian, it is found that financial constraints faced by the state government libraries are major reason for their inefficiency. While comparing with state government libraries, central government libraries have adequate budgetary allocation. Therefore, in order to cope with the changing demands of users, state government libraries have to make strategic plans and policies in the development of library collection, library staff, and technical process and library services. Adequate and proper financial allocation is the primary factor that is necessary. Meanwhile, the total gap score reveals that both the central government (Mean -0.83, SD -1.02) and state government (Mean -1.02, SD 0.65) library users perceive that the service quality has to be enhanced.

In a study, Asogwa et al. (2014) compared the service quality of developing countries and developed countries and reported that the tangibility indicators were no longer the expectations in western countries or developed countries which are rich enough to provide better physical facilities. But in the case of developing countries, it is the most pressing need of the users. Reliability and empathy as identified as the dimension having lowest service quality gap by the users of developing countries. Similarly, Hassanzadeh, Sharifabad and Derakhshan (2010) studied the importance of dimensions by

both organizational and non-organizational users. They consider reliability as the most important dimension and empathy as the least important one. Their viewpoints differed only in the relevant information services and appearance of the library's physical facilities.

The study conducted Mann-Whitney U test to observe the significance of the management wise difference in the service quality of special libraries.

Table 4.47

Significance of Management wise Difference in the Service Quality of Special Libraries - Mann-Whitney U test

Dimensions	Test Statistic	Standardized Test Statistic	Asymp. Sig.
Physical Facility	38600.5	0.541	.588
Library Collection	29968	3.850	.000
Library Staff	31068.5	3.296	.001
Technical Process	29081	4.294	.000
Library Service	32771.5	2.419	.016

The table 4.47 shows the result of Mann Whitney Test conducted to check the significance of the difference in mean. In the case of physical facility the p value obtained is greater than 0.05 (Test Statistic - 38600.5, p value 0.588). Therefore, the mean difference is not significant. On the other hand, the p value of the dimensions such as library collection (Test Statistic 29968, p value 0.000), Library Staff (Test Statistic 31068.5, p value 0.001), Technical Process (Test Statistic 29081, p value .000) and Library Service (Test Statistic 32771.5, p value 0.016) are statistically significant at 5 percent level. So it can be concluded that the service quality of these dimensions varies significantly between the Central Government and State Government Libraries.

4.7. Conclusion

The special libraries in Kerala almost provide quality services to its users. The staffs are effective in providing the service even though the users are of specialized needs and interest. The modified SERVQUAL model derived by the study provides a guiding framework for an understanding of service quality of the special libraries. The Confirmatory Factor Analysis assessed that the SERVQUAL model is fit for measuring service quality of special libraries in Kerala, and also observed the importance of each service quality dimension such as physical facility, library collection, library staff, technical process and library service in measuring the service quality of libraries.

Service quality analysis was carried out to assess the dimension wise service quality, item wise service quality, institute wise service quality and gender wise and management wise perception on service quality. Majority of the users have very high expectations from the quality of service of their libraries. There is no gender difference in the perceptions and expectations of library service quality. But there have been significant differences in the quality perception of library users of central government and state government institutes. Users have low perception on majority of the services provided by the libraries. Libraries should provide more emphasis on the services it provided. All the service provided should be communicated to the users and effective training should be offered to them in order to enable them to efficiently utilize the services offered. The study provides a frame of reference for special libraries to assess its performance on the basis of expectations and perceptions of the users

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Chapter 5

FINDINGS, SUGGESTIONS AND CONCLUSIONS

5.1. Introduction

Quality is the determinant factor when it comes to the success of any organization. Every customer has the right to receive quality services. They also deserve to have knowledge regarding the quality of products they obtain. Service quality is important in library as it is in every other field. Apart from the circulation of books in the library, one has to consider other aspects, such as physical facilities, staff, technical process, collections and services when it comes to an assessment of the quality of library services. Quality services can be provided only if the user expectations are properly understood and met.

The users invariably anticipate that they will be offered faultless and timely services. Quality assurance is a continuing procedure of examination and reconsideration of the necessities of the user, developing methods by which expectation can be met. The study involves the systematic assessment of the resources, facilities and services of special libraries in Kerala with a view to ascertain the quality of each section and thereby improve their services. This chapter summarizes the major findings of the study along with suggestions and recommendations for further improvement. The formulated hypotheses were tested and the conclusion drawn has been given at the end. The potential area of future research has been stated in this chapter.

5.2. Major Findings of the Study

The data regarding service quality of special libraries is analyzed by applying various statistical techniques and major findings are derived out of the study. Following are the important findings of the study.

5.2.1.Expectations of the Users

1. The users have high expectation on all dimensions such as physical facility, library collection, library staff, technical process and library service. But majority of the users expect better physical facilities in libraries. Therefore the most expected dimension by the users is physical facility dimension followed by library collection dimension and technical process dimension.

2. Library service dimension has comparatively low expectation.

3. There is no significant difference between user's expectation on physical facility and library collection.

4. In the institute wise analysis of user expectations, the users of CMFRI library have comparatively high expectation followed by CTCRI library users.

5. The users of MPEDA library and CDB library have comparatively low expectations.

6. There are significant differences in the expectations of the users of each special libraries in Kerala

7. In item wise analysis of user expectation, library users have high expectation on all items.

8. The items "adequate lighting and ventilation in library" and "clean, tidy and hygienic library environment" have comparatively high expectation

9. The items "emotional intelligence to deal with the library users" and "give personal attention to users" has comparatively low expectations.

10. Most of the library users have high expectation on the items like sufficient library space for the users, systematic and logical arrangement of documents, access to collections of wide variety of books and journals in the subject of specialization of the institute and frequent updation of the library technologies.

5.2.2.Perceptions of the Users

11. The perceptions of the users are lower than that of their expectations.

12. The "library staff" dimension has comparatively high perception followed by "library collection" dimension

13. The "library service" dimension has low perception followed by "technical process" dimension.

14. Special library users have average perception on all dimensions.

15. There are significant differences in user perceptions of all dimensions.

16. The users of VSSC library followed by CMFRI library have comparatively high perception on the services the library provided.

17. The users of NIO library have comparatively low perception on the services the library provided.

18. Majority of the users of KFRI, CPCRI, CDS, CIFT and NIIST libraries have good perception on the services provided.

19. There are significant differences in user perceptions of each special library in Kerala.

20. All the items have low perception as compared to that of expectations of the users.

21. The item "clean, tidy and hygienic" and "adequate lighting and ventilation" have comparatively high perception.

22. The special library users have high perception on the items "comfortable and inviting location", "sufficient space for readers/users", "adequate and comfortable furniture" and "library staff are approachable and welcoming".

23. The least perceived item by the users of the special libraries in Kerala is "physical facilities for differently abled users" and "special services for differently abled users"

24. The items "well designed and managed library website/portal", "wireless network access", "video library service, access to audio visual materials" and "indexing and abstracting services also have low perception.

5.2.3.Service Quality of the Libraries

25. The "library staff" dimension has comparatively lowest gap followed by "library collection" dimension.

26. The "library service" dimension has comparatively highest gap followed by "technical process" dimension.

27. There are significant differences in the service quality gap of all five dimensions

28. The male users have highest gap on all dimensions as compared to female users

29. The differences between male and female users on service quality gap of all dimensions are not significant.

30. Special libraries of Central Govt. Institute have comparatively lowest gap than that of State Govt. Institute.

31. There is significant difference existing between the service quality of Central and State Govt. special libraries on the dimensions, library collection, library staff, technical process and library service

32. The quality of physical facilities of central and state government institute libraries are more or less same. There is no significant difference existing.

33. The NIO library has comparatively highest service quality gap followed by JNTBGRI library.

34. The VSSC library and CMFRI library has comparatively lowest service quality gap.

35. The KSCSTE library, CTCRI library and CWRDM library also has comparatively high service quality gap.

36. The institute wise differences between the service quality gaps of all libraries are significant.

37. In dimension wise gap analysis, under the physical facility dimension, the JNTBGRI library has the highest gap followed by NIO library.

38. The KSCSTE library and FCRI library also have high gap on physical facility dimension.

39. The VSSC library followed by KFRI have lowest gap on physical facility dimension.

40. The spices board library and CMFRI library also have comparatively low gap on physical facility dimension.

41. In library collection dimension, KSCSTE library and NIO library have comparatively highest gap.

42. The VSSC library and CMFRI library have lowest gap on library collection dimension.

43. In library staff dimension, NIO library and CWRDM library have comparatively highest gap

44. The VSSC library and KSPB library have comparatively lowest gap.

45. The JNTBGRI library and CWRDM library have comparatively highest gap on technical process dimension.

46. The CTCRI library, CDB library and KSCSTE library also have high gap on technical process dimension.

47. The CMFRI library and VSSC library have comparatively lowest gap on technical process dimension.

48. In library service dimension, the NIO library and CTCRI library has the highest gap

49. The JNTBGRI library, NCESS library, KSCSTE and library CWRDM library also have high gap on this dimension.

50. The VSSC library has lowest gap on library service dimension

51. The VSSC library and CMFRI library have lowest service quality gap on all five dimensions.

52. The NIIST library, CDS library and MPEDA library also have low gap on all dimensions.

53. The NIO library, KSCSTE library, JNTBGRI library and CWRDM library has comparatively high gap on all dimensions

54. The item "physical facilities for differently abled users" have the highest service quality gap followed by the item "provide specific services to differently abled users".

55. In addition, the items, "provides video library service", "well designed and managed library website/ portal", "provides indexing and abstracting services", "provides institutional repository services" and "wireless network access" also have high service quality gap.

56. The item, "comfortable and inviting location" has the least service quality gap followed by "give personal attention to library users".

57. The items "clean, tidy and hygienic environment", "emotional intelligence to deal with the library users", "help library users when they fail to locate a document needed" "Adequate lighting and ventilation" and "Approachable and welcoming staff" also have comparatively lowest service quality gap

58. The libraries do not fully meet the quality expectations of the users.

5.3. Tenability of Hypotheses

The hypotheses of the study were formed on the basis of the objectives of the study. On account of the findings, the tenability of hypotheses is examined.

Hypothesis- 1

The first hypothesis states that the special libraries in Kerala meet the quality expectations of their users.

The finding number 58 conforms that the special libraries in Kerala do not completely meet the quality expectations of their users. The table 4.29 depicts the service quality gap in each dimension and -.88 as the overall service quality gap score. It reflects that there exist service quality gap in each dimension and the special libraries have to minimize this gap in order to meet all the quality expectations of the users. By conducting Friedman Two Way Analysis of Variance and the results given in the table number 4.30, it is clear that there exist significant difference in the service quality gap of each dimension. In addition the table 4.42 reflects the service quality gap of each dimension of all the 19 libraries and the table 4.43 shows the results of Kruskal Wallis test which states that the 'p' value of all the five dimensions lies below 0.05. Therefore the differences between dimension wise gap among each library are significant. The finding number 11 reveals that the perceptions of users are lower than their expectations, it also indicates that the users' expectations are not completely met. The table number 4.40 also support it.

In addition, the findings numbered 20, 29, 33, 35, 36, 37, 38, 41 43, 45, 46, 48 49 and 53 also support the argument that service quality of special libraries in Kerala does not meet the expectations of the

users. All these substantiates that special libraries do not meet the quality expectations of their users.

Thus, based on the above findings, hypothesis 1 is rejected.

Hypothesis – 2

Hypothesis 2 states that there is no significant gender difference in the perceived service quality of the special libraries in Kerala.

According to the finding number 29, there is no significant difference between the service quality gap of male and female users in special libraries in Kerala. The result of the Mann -Whitney U test depicted in the table 4.45 established the fact that the 'p' value lies above 0.05 for all the quality dimensions such as physical facility, library collection, library staff, technical process and library service, therefore the differences are not significant.

As per the findings stated above, hypothesis 2 is accepted.

Hypothesis- 3

Hypothesis 3 states that there is no significant difference in the perceived service quality of the special libraries belonging to State Government and Central Government institutes.

The finding number 31 and 32 conform that there is significant difference between the service quality of the central govt. institute libraries and state govt. institute libraries on all dimensions except 'physical facility'. It is statistically estimated by conducting Mann-Whitney U test. It is clear from the table 4.47 that the 'p' value of all the dimensions except physical facility lies below 0.05, thus making the difference between the perceived quality of the users of central and state government institute libraries is significant. The 'p' value of physical facility is above 0.05, therefore the difference between the

perceived quality of physical facility is not significant among the users of central and state government institute libraries.

Hence, in the light of the above stated findings the hypothesis 3 is rejected.

Hypothesis- 4

Hypothesis 4 states that there is a significant institute wise difference in the perceived service quality of the special libraries in Kerala.

The finding number 36 reveals that there is significant difference exist in the service quality of the special libraries in Kerala. The result of the Kruskal Wallis test depicted in the table 4.41 states that the 'p' value lies below 0.05. It is also observed in the table 4.43 with the results of Kruskal Wallis test that the dimension wise differences exist in the service quality of all the 19 special libraries are significant because the 'p' value of all the dimensions such as physical facility, library collection, library staff, technical process and library service lies below 0.05.

In addition, the finding number 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44,45,46,47, 48,49,50, 51, 52, and 53, along with it the table number 4.40, 4.42, 4.46 and 4.47 also support the statement.

Therefore, in the light of above findings, the hypothesis 4 is accepted.

5.4. Suggestions of the Study

In light of analysis and findings of the study regarding service quality of special libraries, the following suggestions and recommendations are made for improving the service quality of special libraries.

1.   In a quality service scenario, ultimate success is determined by the decisive role played by the user. The results acquired from

the study provide a deeper insight in to the user priorities and the areas that require improvement. Performance improvement can only be achieved by being attentive to the SERVQUAL dimensions through which the service quality is measured. Since libraries have to be user oriented, the service quality is centered on assimilating user requirements and performing those requirements decently. This demands proper dedication from both the management and the employees of the library while developing policies or delivering services to them.

2. Throughout the study, it was reflected that the needs and expectations of the users are not completely met. Therefore, libraries need to conduct regular user need assessment in order to assess the changing needs of user and provide services based on hitherto unattended needs. A systematic feedback mechanism needs to be implemented in libraries for reviewing the user's response on each service. Service evaluation can be carried out on the basis of user studies, suggestion box, regular staff –user interactions, etc. Libraries have to develop specialized collections to meet the specific needs of the users and thereby playing a pivotal role in achieving the objectives of the parent organization.

3. A further important reason for low service quality perception is unawareness about majority of the services provided by the libraries. Special Libraries should conduct user orientation programs, seminars and workshops at regular intervals to make the users acquainted with the services offered by the libraries. Periodic survey, focus group interviews and library usage statistics can be used to gather information regarding the needs and expectations of the users.

4. With furtherance of being more competent, libraries should be regularly updated with latest technologies for providing more advanced services. Library should be open to new developments in the subject areas of interest of users and frequently upgrade their services. New additions to the library collection should be regularly updated in the OPAC. Also changes in item statuses, such as missing/lost book details, binding, changes in location and collection should be timely updated in the automation software so that these are reflected in the OPAC. Libraries should provide full-fledged internet access and wireless network facility like WiFi, WIMAX, etc. Library should provide video library facility and provide access to audio-visual materials.ICT infrastructure of the library should be improved to provide access to digital resources. Besides these, libraries should provide adequate consideration and care so as to maintain the equipments in pristine working condition. The users have to be completely trained and educated for fuller utilization of resources.

5. Libraries should enhance knowledge management practices and develop the intellectual capital of the organization by utilizing the tacit and explicit knowledge of the organization.

6. While assessing users' expectation, it was noticed that the physical facility dimension has high expectation. Infrastructural facilities are very important as far as a library is concerned. Libraries should provide adequate infrastructural facility to maintain a comfortable environment for library activities. Libraries should provide a reading room and a discussion room separately. Libraries should provide drinking water facility. It would be better if tea and coffee vending machine are installed in the libraries. They should also provide

lavatory facility to its users. There should be separate lavatory facility for men, women and transgender. Library management has to undertake appropriate measures to ensure a clean environment. There must be regular dusting of book stacks, ample lighting should be provided in stack area and proper ventilation in the reading areas

7. They should provide ladies room facility, possibly annexed by a feeding room. They should provide printing, scanning and Xerox facility within the library premises.

8. With a view to make provisions for the library service to reach the unreached, libraries should also develop separate physical facilities for differently-abled users such as wheel chair ramp, wheel chair accessible parking facility etc. and should also provide services specifically designed to differently- abled users like talking book, audio magazines and newspapers, audio and video tape in daisy format etc. They need to appoint specially trained staff to deal with their differently abled users.

9. Libraries should also display directional signs to help the users reach different sections of the library. The signboards and other displayed instructions may not be readily comprehensible and might need staff's assistance, Therefore the entire library systems should be self-instructing with clearly expressed sign boards, shelf lists and properly displayed instruction materials.

10. As part of providing quality service, the libraries should consider shelving as an essential activity. If shelving is made a priority, books will be returned to its original positions, which in turn enhance customer service. An attention to enhance the shelving procedure among the library stack is required. The

library staff has to conduct periodical shelf reading/ rectification.

11.   Library collection is the second dimension having high user expectation. Therefore, libraries should provide specialized e-resources and services that cater to the objectives of the parent organization. Libraries have to increase the number of periodicals in respective areas of the parent organizations, especially the national and international journals. Library should systematically maintain back volumes of journals and provide access to it. Libraries should regularly conduct book exhibitions with renowned publishers and vendors so that the users can suggest and recommend new books covering their area of interest

12.   For providing quality services, there should be a proper weed out policy. The old and outdated books have to be withdrawn from the library stock periodically. It is also recommended that the weeding should be carried out in regular intervals. The disposal of withdrawn books can be done by donating them to various libraries with regard to its physical condition.

13.   The timing of the library is also affects the service quality of the libraries. The parent organization of majority of the special libraries are research institutes, therefore, it will be convenient for the research scholars and other staff of the institute if the working hours of the library is extended

14.   Library staff plays a vital role in the service quality of the library. Libraries need to appoint sufficiently qualified staff. Majority of the libraries lack adequate staff and most of the libraries have staff without even a degree in library science. Therefore   libraries   should   conduct   regular   training

programmes and workshops, in order to make them competent enough to anticipate the changing needs of the users. There should be a healthy relationship between library users and the staff. There should be regular interaction between library staff and users. It helps to assess the changing needs and expectations of the users and the problems faced by the users while making use of the service. Libraries should provide proper training to library staff for developing interpersonal skills which includes communication skills, problem solving skills etc. Libraries can conduct personality development program and provide opportunities for professional growth. Incentives and rewards can be offered in order to motivate the staff towards better performance. It is better for the libraries to provide "ask a librarian" service using which users can interact with librarian online whenever needed.

15. Library should identify all opportunities for service excellence by systematic assessment of performances and in case of deviations found, immediate corrective action should be taken. Majority of the users are unaware of many of the services offered by the library. Therefore, adequate publicity should be provided to all the services provided by the library. In order to facilitate publicity, there should be an effective communication system. This is where a well maintained website can help. Libraries should develop and maintain websites of their own. It should be regularly updated with all the latest information regarding the library. Libraries should also provide personalized information services to users in their respective areas of interest.

16. For providing quality services, it is better for the libraries to implement advanced quality management strategies. Also the

library should evaluate all of its approaches towards service, set performance goals and review it frequently to resolve and prevent further problems. It also recommended to develop a quality-policy which oversees the administration of quality system in the library in the impending era. The quality policy of the library has to be displayed properly so that it attracts the attention of users and library staff as well. There should be a quality assessment committee for periodical evaluation of the library performance. The committee should include members of the administrative level, faculty level and the librarian as well. This will aid in developing a quality culture in library.

17. There should be proper financial allocation in libraries. Shortage of fund and failure to allot funds at the proper time also hinders the library from providing quality services.

18. Majority of the libraries do not provide indexing and abstracting services. As it is an important service in special library, library should take adequate measures to provide indexing and abstracting services.

19. To facilitate self-evaluation and correction, a quality assessment form can be attached to library website in which users can provide their responses on library services.

5.5. Conclusions

Service quality measurement of libraries was done to assess the quality of services provided by the libraries. Quality of a service is primarily determined on the basis of fulfillment of the needs and expectations of the users. Therefore, in order to provide quality services, identification of the changing needs of users is the first and foremost thing to be considered. Apart from other libraries, the needs

and expectations of users of special libraries evolve from the objectives of the parent organization. As far as a special library is concerned, all activities, collections and resources are tailored to the particular objectives of the parent organization. The study involves the systematic assessment of the resources, facilities and services of special libraries in Kerala with a view to ascertain the quality of each section of the library and thereby improving the services.

The study applied a modified SERVQUAL instrument having 50 statements under five dimensions, they are; physical facility, library collection, library staff, technical process and library service. The study assessed to what extent each dimension need to be improved in order to provide quality service as expected by the users. It includes dimension wise analysis, item wise analysis and institute wise analysis of user's expectation and perceptions.

While assessing the expectations of the users, it is found that users have high expectations on all dimensions, of which the 'physical facility' dimension is the most expected dimension. This implies on the importance of maintaining adequate physical facilities in the library. A library should have enough furniture, vast and comfortable reading space, proper lighting and ventilation, drinking water facility, lavatory facility, ladies room, facilities for differently abled users etc. so that a better library atmosphere is possible. The 'library collection' dimension also has high expectation. Library should provide access to immense resources on the subject area that the institute specializes and update it frequently. The 'library service' dimension is the least expected dimension. The library users demand the existing services to be offered accurately and dependably rather than providing more services. The perceptions of users make it clear that the most perceived dimension is 'library staff' and least perceived is 'library service'. Even though, the special library users have good

opinion about library staff, the services provided by the libraries do not meet the quality expectations of the users. The dimension wise gap analysis also emphasizes the same fact. As the total gap score is -.88, the special libraries in Kerala need to improve its services to an extent of providing quality services as expected by the users.

In institute wise analysis, the CMFRI library users and VSSC library users have high expectations and perceptions. Therefore it can be observed that they have the lowest gap. These libraries are providing comparatively better services as expected by the users. In addition, KFRI, CPCRI, CDS, CIFT and NIIST libraries also provides quality services to an extent. But the CTCRI library users have high expectations and low perceptions which points out that they are not receiving the services as expected. The library users of MPEDA and CDB have low expectations. As the NIO library have the lowest perception, it denotes the highest service quality gap than that of all other institutes.

It is found that "clean, tidy and hygienic" and "adequate lighting and ventilation" are the highest expected and perceived items by the users. The low expectation of the item "Emotional intelligence to deal with the library users" and "Give personal attention to users" indicates that users do not pay any special attention to them. The item wise analysis stressed the need for providing indexing and abstracting services, video library service and access to audio visual materials. Libraries should develop websites of their own for disseminating all information regarding the library, its functions, resources, staff, upcoming events etc. Users of special library highly demand full-fledged internet access and wireless network access in the library. The greatest gaps were related to "library provide separate physical facility to differently abled users" and "library provides special services to differently abled users. This conveyed

that libraries are not providing any facilities and services specifically designed to them.

Although special libraries under Central Govt. institutes are providing quality services than that of State Govt. institutes, there were not many differences in the physical facility dimension of both the Central and State Govt. institute libraries. Likewise, there are no gender differences in the quality perception of special library users. Both male and female users have almost the similar expectations and perceptions on library services.

Throughout the study, it can be observed that the special libraries in Kerala are not fully meeting the quality expectations of their users. Therefore, service quality of special libraries in Kerala is not up to the expectations of the users. The study was intended to help the special libraries to choose their plan of action for empowering their amenities. The study supports the libraries in strategic planning and strengthening their skills to prepare themselves to address the complexities of the digital age. The study provided a model for other libraries also to evaluate their services and facilitate further improvement. The results of this study will assist managers and library personnel with the identification of dimensions that are vital in service quality and exploring current circumstances and preparing current strategies that fills the gaps and completely fulfills the recipients.

5.6. Recommendation for further Research

This study enables to understand the position of special libraries in Kerala in providing quality services. It provides information to the librarians and the parent organization to what extend their libraries requires improvement in order to provide quality services that fulfill user expectations. The recommendations for further study feature the potential roads accessible for future researchers to extend the research past the limits of the current study.

1. The study focused on the service quality measurement of special libraries in Kerala on the basis of user perspective, there is a possibility for further research in the service quality measurement of special libraries in India focusing on service quality and user satisfaction, including the views of both library staff and library users regarding service quality.

2. The special libraries provide numerous services which however, are not fully utilized by the users. A study that analyses the reasons for the inefficient utilization of the offered services can provide solutions to the crisis.

3. A study on Total Quality Management of libraries along with advanced quality management strategies applied in libraries can be conducted.

4. As special libraries focused on specific subject, study can be conducted on the collection development strategies of special libraries in India.

5. It is possible to conduct a study on the quality measurement of library websites with Webqual.

6. As the special librarian needs specialized skills and qualifications, a study could be conducted on the skill and qualification of librarians and library professionals in special libraries in Kerala

7. A study is feasible on different kinds of special libraries available in India, its functions, collections and services

8. A study on the knowledge management practices followed by special libraries to build up intellectual capital of the organization is also possible.

Appendix A: SERVQUAL Instrument
UNIVERSITY OF CALICUT
DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE

Dear Sir / Madam,

This questionnaire is intended to collect data / suggestions for a study entitled *Service Quality of Special Libraries in Kerala* undertaken by me under the guidance of Dr. Mohamed Haneefa K., Associate Professor & Head, Department of Library and Information Science, University of Calicut. I seek your cooperation and help in obtaining the necessary information. The information furnished by you will be used only for my research work and kept confidential. I request you to fill up the questionnaire with sufficient care and accuracy. Service Quality is the measure of the extent to which service delivered meets library users' expectations.

Thanking you

Sajna K.P.

Research scholar

Service Quality of Special Libraries in Kerala

PART A: GENERAL INFORMATION

Please tick (√) your responses in the spaces provided and write wherever necessary

1. Name of the Institution :

2. Type of Management : Central Government ☐

  State Government ☐

3. Designation :

4. Department :

5. Gender : Male ☐ Female ☐

PART B: EXPECTATIONS AND PERCEPTIONS ABOUT SPECIAL LIBRARY

Each of the following statements is intended to assess your expectations of a good special library and perceptions about your institute library. Kindly read each statement carefully and indicate your degree of agreement on both the expectation part and perception part by using a tick mark (√) in the corresponding column. If by any reason you have to change any of your response, you may put a cross (X) on the wrongly marked one and tick the right choice.

Sl. No.	Statements	Expectations about a good special library					Perceptions about your institute library				
		Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)	Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)
	Physical Facilities										
1	Comfortable and inviting location	SD	D	NAD	A	SA	SD	D	NAD	A	SA
2	Sufficient space for readers / users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
3	Adequate lighting and ventilation	SD	D	NAD	A	SA	SD	D	NAD	A	SA
4	Clean, tidy and hygienic	SD	D	NAD	A	SA	SD	D	NAD	A	SA
5	Adequate and comfortable furniture	SD	D	NAD	A	SA	SD	D	NAD	A	SA
6	Drinking water facility	SD	D	NAD	A	SA	SD	D	NAD	A	SA
7	Lavatory facility	SD	D	NAD	A	SA	SD	D	NAD	A	SA
8	Seperate physical facilities for differently abled users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
Library Collection											
9	Resources meet the requirements of library users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
10	Access to collections of wide variety of books and journals on the subject the institute specializes	SD	D	NAD	A	SA	SD	D	NAD	A	SA
11	Access to a wide range of e-resources on the subject the institute specializes (e-journals, e-books, databases, etc.)	SD	D	NAD	A	SA	SD	D	NAD	A	SA
12	Access to collections include technical reports, patents and annual reports	SD	D	NAD	A	SA	SD	D	NAD	A	SA
13	Efficiently maintain back volumes of journals	SD	D	NAD	A	SA	SD	D	NAD	A	SA
14	Efficiently maintains project reports, dissertations and theses	SD	D	NAD	A	SA	SD	D	NAD	A	SA
15	Provide access to audio visual materials	SD	D	NAD	A	SA	SD	D	NAD	A	SA
Library Staff											
16	Approachable and welcoming	SD	D	NAD	A	SA	SD	D	NAD	A	SA
17	Good knowledge and expertise to provide value added library services	SD	D	NAD	A	SA	SD	D	NAD	A	SA
18	Competent enough to anticipate library users	SD	D	NAD	A	SA	SD	D	NAD	A	SA

Sl. No.	Statements	Expectations about a good special library					Perceptions about your institute library				
		Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)	Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)
	needs and work accordingly										
19	Quick responds to library users queries and requests	SD	D	NAD	A	SA	SD	D	NAD	A	SA
20	Gives personal attention to library users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
21	Willingness to help library users all the time	SD	D	NAD	A	SA	SD	D	NAD	A	SA
22	Emotional intelligence to deal with the library users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
23	Help library users when they fail to locate a document needed	SD	D	NAD	A	SA	SD	D	NAD	A	SA
24	Re-shelving documents quickly in proper order	SD	D	NAD	A	SA	SD	D	NAD	A	SA
25	Good knowledge and expertise in Information Technology	SD	D	NAD	A	SA	SD	D	NAD	A	SA
Technical Process											
26	Provide access to well organized library catalogue either in card or Online catalogue/Web catalogue	SD	D	NAD	A	SA	SD	D	NAD	A	SA
27	All library functions and operations are automated/computerised	SD	D	NAD	A	SA	SD	D	NAD	A	SA
28	Conduct continuous library users need assessment	SD	D	NAD	A	SA	SD	D	NAD	A	SA
29	ICT infrastructure of the library are always in good working condition	SD	D	NAD	A	SA	SD	D	NAD	A	SA
30	Well designed and managed library website/ portal	SD	D	NAD	A	SA	SD	D	NAD	A	SA
31	Full fledged Internet access in the library	SD	D	NAD	A	SA	SD	D	NAD	A	SA
32	Wireless network access (Wi-Fi, Wi-MAX, Wireless LAN)	SD	D	NAD	A	SA	SD	D	NAD	A	SA

Sl. No.	Statements	Expectations about a good special library					Perceptions about your institute library				
		Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)	Strongly Disagree (SD)	Disagree (D)	Neither Agree nor Disagree (NAD)	Agree (A)	Strongly Agree (SA)
33	Classification and arrangement of documents are systematic and logical	SD	D	NAD	A	SA	SD	D	NAD	A	SA
34	Protect library resources from damage and dust	SD	D	NAD	A	SA	SD	D	NAD	A	SA
35	Library frequently updated with latest technologies	SD	D	NAD	A	SA	SD	D	NAD	A	SA
Library Services											
36	Keep library users informed about new facilities, collections and services provided by the library	SD	D	NAD	A	SA	SD	D	NAD	A	SA
37	Provides Xerox service to library users during library hours	SD	D	NAD	A	SA	SD	D	NAD	A	SA
38	Convenient library timing	SD	D	NAD	A	SA	SD	D	NAD	A	SA
39	Provides user based alert service in a personal way	SD	D	NAD	A	SA	SD	D	NAD	A	SA
40	Provides digital library services	SD	D	NAD	A	SA	SD	D	NAD	A	SA
41	Provides institutional repository services	SD	D	NAD	A	SA	SD	D	NAD	A	SA
42	Provides indexing and abstracting services	SD	D	NAD	A	SA	SD	D	NAD	A	SA
43	Provides content page service	SD	D	NAD	A	SA	SD	D	NAD	A	SA
44	Provides newspaper clipping service	SD	D	NAD	A	SA	SD	D	NAD	A	SA
45	Provides bibliographic databases	SD	D	NAD	A	SA	SD	D	NAD	A	SA
46	Provides video library service	SD	D	NAD	A	SA	SD	D	NAD	A	SA
47	Provides user education/orientation	SD	D	NAD	A	SA	SD	D	NAD	A	SA
48	Provide special services to differently abled users	SD	D	NAD	A	SA	SD	D	NAD	A	SA
49	Display of directional signs to reach different sections of the library	SD	D	NAD	A	SA	SD	D	NAD	A	SA
50	Provide user feedback facility	SD	D	NAD	A	SA	SD	D	NAD	A	SA

Thank You Very Much

Appendix B: Interview Schedule

1. Name of the Institution

2. Year of Establishment   :

3. Type of Management   : Central Govt/State Govt/

4. Name of the Library   :

5. Phone   : Email   Website

6. Working Hours   :

7. Do your library services meet the expectations of the users?

8. What measures have you taken to provide quality services?

9. Do you believe that your library has state-of the-art physical facilities?

10. What measures have you taken to improve the physical facilities of your library?

11. How do you assess library users' needs and requirements?

12. What are the strategies for the collection development in your library?

13. Do you believe that the skill and expertise of your staff is adequate to provide value added library services?

14. How do you improve the credibility and competency of your library staff?

15. What are the training /orientation programmes provided to the staffs?

16. What are the procedures for shelf rectification and stock verification of your library?

17. What measures have you taken to protect resources from damage and dust?

18. How do you check the working condition of the audio visual equipments and computers in the library?

19. To what extend the ICT infrastructure of your library are reliable?

20. Which scheme of classification is used in your library?

21. Which is the catalogue code used in your library?

22. Which form of catalogue is used in the library?

23. Whether the library is automated?

24. How the books are arranged in libraries?

25. What are the digital library services provided by your library?

26. What measures have you taken to regularly update the library with latest technologies?

27. How do you address the complaints from your library users?

28. Is there any system for direct interaction with library users by librarian?

29. How do you distinguish your library in respect of some significant innovative services?

30. What are the merits of your library compared to other special libraries?

31. What types of funds are available for your library?

32. Have you ever faced lack of fund as a problem for providing quality services?

33. What are the strengths of your library to provide quality library services?

34. What are the weaknesses of your library to provide quality services?

35. What are the opportunities of your library to provide quality library services?

36. What are the threats of your library to provide quality library services?

Appendix C: List of the Special Libraries Selected

1. Central Institute of Fisheries Technology (CIFT) Cochin

2. Central Marine Fisheries Research Institute (CMFRI) Cochin

3. Central Plantation Crops Research Institute (CPCRI) Kasaragod

4. Central Tuber Crops Research Institute (CTCRI) Trivandrum

5. Centre for Development Studies (CDS) Trivandrum

6. Centre for Water Resources Development and Management (CWRDM) Calicut

7. Coconut Development Board (CDB) Cochin

8. Fluid Control Research Institute (FCRI) Palakkad

9. Kerala Forest Research Institute (KFRI) Trichur

10. Kerala State Planning Board (KSPB) Trivandrum

11. Marine Products Exports Development Authority (MPEDA) Cochin

12. National Institute Of Oceanography (NIO) Cochin

13. Rubber Research Institute of India (RRII) Kottayam

14. Spices Board, Cochin

15. Tropical Botanical Garden And Research Institute (TBGRI) Trivandrum

16. Vikram Sarabhai Space Centre (VSSC), Trivandrum

17. National Centre For Earth Science Studies (NCESS) Trivandrum

18. Kerala State Council For Science, Technology And Environment (KSCSTE) Trivandrum

19. National Institute of Interdisciplinary Science and Technology (NIIST) Trivandrum

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