Identification of Gap in Knowledge Capturing and Dissemination in Jadavpur University Central Library Using Knowledge Management Tools

Thesis Submitted for the Degree of

DOCTOR OF PHILOSOPHY (ARTS)

at

Jadavpur University

by

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I am dedicating my work to the memory of my beloved mother Late Subhadra Majumdar.

Certificate

Certified that the thesis entitled "**Identification of Gap in Knowledge Capturing and Dissemination in Jadavpur University Central Library Using Knowledge Management Tools**" submitted by me for the award of the Degree of Doctor of Philosophy in Arts at Jadavpur University, is based upon my work carried out under the supervision of Prof. Goutam Maity, Department of Library and Information Science, Jadavpur University, West Bengal. And neither this thesis nor any part of it has been submitted before for any degree or diploma anywhere/ elsewhere.

Countersigned by Supervisor   **Candidate**

Dated: **Dated:**

Preface

Knowledge Management system plays a very important role in today's information processing and dissemination era. It emerged as a process of creating, capturing, organizing, storing and dissemination of diverse forms of knowledge to serve the interests of an enterprise to sustain and to lead in a market of growing competitions. It is highly used in business enterprises for protecting their intellectual capitals, increasing focus on their most important assets, i.e. human resource, building a knowledge sharing culture, help in cost reduction, finding out the cause of delay in a process, reason for failure of projects to improve organizational profit in terms of saving manpower, money and time. Existing literary output on the field and its related areas shows evidences of growing research on the applications of knowledge management principles, tools and techniques for improving the capability of knowledge creation, capturing, storing and dissemination of the business enterprises in a market of growing competitions.

Now a days Knowledge Management system is also hugely used in academic sectors too. Basically, two types of organizational knowledge have been identified i.e. (a) tacit knowledge and (b) explicit knowledge. Tacit knowledge is considered as the most valuable assets of any organization. Tacit knowledge is tough to capture or transform it into explicit form. In the process of knowledge management, creation of knowledge is an act of converting tacit knowledge into explicit form. Besides, knowledge management system also includes required data selectively from among the existing stock of explicit

knowledge. It is our observation that the implementation of the principles, tools, and techniques of knowledge management can enhance the capability of knowledge creation, capture, storage, and dissemination within an academic institution. This current study attempted to identify the knowledge gap in JU central library resources and services using the parameters of the Knowledge Management tool LIBQUAL. In order to accomplish this, the initial step is to ascertain the requirements of the users. It is evident that a library cannot satisfy users without a comprehensive understanding of their requirements. Following the need analysis, an inventory study was conducted to understand the library's holdings. The selection of LIBQUAL as the quality assessment tool was based on a comparative study. The comparative study was done among TQM, SERVQUAL and LIBQUAL. The basic structure of LIBQUAL is based on SERVQUAL structure. LIBQUAL has 22 set of questions which was used during data collection. Data analysis was conducted by using "R" software. Finally, a customized Knowledge Management (KM) model based on existing Knowledge Management (KM) models is proposed to bridge the knowledge gap as well as for improving the knowledge capturing and dissemination process.

(Protiti Majumdar)

Date:

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(Protiti Majumdar)

Date:

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List of Abbreviations

df: Degree of Freedom

e.g.: exempli gratia (=example)

et al.: etalii (=And others)

etc.: Et cetera

i.e.: idest (= That is)

IFLA: International Federation of Library Associations and Institutions

IT: Information Technology

KM: Knowledge Management

LIBQUAL: Library Quality

OPAC: Online Public Access Catalogue

p.value: Probability value

rep: Replicating

SERVQUAL: Service Quality

SOP: Standard Operating Procedure

TQM: Total Quality management

Abstract

In this present era of Information technology, the expectations of any Library users are changing or can be said as increasing every now and then. Providing right information to the right user is the main motto of each library. JU central library is none other than that. Only by getting expecting resources or information from the library a user can be satisfied. Number of satisfied users can be used as the basic parameter for quality assessment of any library. This study has been conducted to assess the quality of JU library. Comparing users' satisfaction with users' expectation the gap or areas of improvement have been identified. To satisfy the library users, the first and foremost step is to understand the need of the users. For better understanding a thorough need analysis has been done. A separate questionnaire was made for collecting the data about users' need in respect of Library resources as well as services. To do so, all the enrolled central library users of JU have been selected as the population of the study. Population of JU central library users are too large and heterogenous on nature as the type of the users varies such as students of UG, PG, research scholars, ex- students, faculty members, staff etc. as well as the age group also varies. A simple random sampling technique has been chosen for selecting sample. The formula $n=N/1+N(e)2$ has been applied to finalize sample size. Based on the formula the ideal sample size was 388 but the number of actual participants in the survey was 364. LIBQUAL a quality assessment tool has been used to conduct the survey. Students (UG, PG), research scholars, faculty members and staff members participated in this study. Before selecting LIBQUAL as the assessment tool various existing tools were thoroughly studied. Specially a comparative study has been done among TQM, SERVQUAL and

LIBQUAL. People have answers same set of 22 questions twice. Once as satisfaction perspective answer were collected in 5 point Likert scale. Data has been graphically represented by radar chart and analysed by using R software. The range of Knowledge gaps which was identified during the study by comparing users' satisfaction and users' expectation data varies from -2.31 to +2.3. The rejected hypothesis shows the higher expectation than satisfaction. It's indicating the areas for improvement. In chapter six a customized Knowledge Management model has been proposed for JU central library with few recommendations for improvement of service quality. Methodology behind developing a customized model was started with a vast literature search on existing knowledge management model then consulted the knowledge gap areas which all identified during the study and finally a lay out of a customized Knowledge Management model has been designed which can bridge the identified gaps. During literature search fifteen existing KM models were studied. Customized model named as 3R knowledge management model here 3R denotes Reason, Region, and Remedy. At the end of this chapter all the identified knowledge gaps were tried to fit in 3R model.

Keywords: Knowledge Management, Knowledge Management tools, KM model, TQM, SERVQUAL, LIBQUAL, R software, Need analysis, Gap analysis, Knowledge Mapping, Knowledge Audit, Users' expectations, Users' satisfaction.

Chapter – 1

Introduction

Libraries are the platform which link the society with the world of knowledge. The status of library in 20th century have transformed from storehouse to knowledge hub. The immense use and development of information technologies forced to change the status, collection and services of Libraries. The focus of Libraries or Information centres is to satisfy the library users by fulfilling their needs. The nature, need, behaviour, etc. of the users varies from library to library based on its type. User satisfaction comes from the quality of service they get from the library. Library staff always tries to update or upgrade their service quality to satisfy the users. Service quality can be expressed as a comparison of Knowledge Expectations (KE) with Knowledge Satisfaction (KS). This may be expressed as:

SQ=KS-KE
Here,
SQ- Service Quality
KS- Knowledge Satisfactions
KE- Knowledge Expectations

Library is a system of various interrelated subsystems such as circulation, reference, current awareness, information service, maintenance, acquisition, technical, user orientation, etc. In a nutshell Library system is basically nothing but an amalgamation of process and its delivery. To maintain the service quality, the action needs to be taken from the acquisition of Library resources which must be carried up to resource delivery.

Quality of any library can be judged by its collection, size as well as the regular footfall of its users. Maintaining the quality of library services and collection are the key for any successful institution.

To understand the users' need time to time, the feedback from the Library Users' needs to be collected. Not only that but also the quality of service needs to be measured and justified.

This study will basically deal with identifying the Jadavpur University Central Library users' expectation and in respect to their satisfaction regarding collection of Jadavpur University Central Library. By studying the above things, the gap areas were identified with the help of Knowledge Management tools and data were analysed to understand how we could bridge the gap.

1.1 Statement of the Problem

The problem of this research can be framed as follows:

How could we find out the gap between Knowledge capturing and dissemination of Jadavpur University Central Library by using Knowledge Management Tools, and how could we bridge those gaps by following a suitable Knowledge Management (KM) model.

1.2 Objective of the Study

The objective of this study was to find out the gap between Knowledge capturing and dissemination of Jadavpur University Central Library by using Knowledge Management Tools, and to bridge those gaps by following a suitable Knowledge Management (KM) model.

In order to achieve the objective, the study required the following tasks.

      i.   To know the various user groups of Jadavpur University,

      ii.   To find out the need of various users' groups,

      iii.   To rank the user needs based on the priority,

      iv.   To understand the available services provided by the Central Library,

      v.   To understand Library organisational structure,

      vi.   To know about the library collection of Central Library Resources,

      vii.   To map the users' need with the existing resources,

      viii.   To find out the area of gaps,

      ix.   To find out the way of bridging the gap and mitigate the same, and

      x.   To propose a suitable model for smooth running of Jadavpur Central Library.

1.3 Hypotheses

Based on the objective of the study the following hypotheses were framed out:

Hypothesis 1

Ho: Library staff members are well trained and qualified.

H1: Library staff members are not well trained and qualified.

Hypothesis 2

Ho: Library staff will provide right direction to retrieve right information.

H1: Library staff will not provide right direction to retrieve right information.

Hypothesis 3

Ho: Library staff will willingly guide the user.

H1: Library staff will not willingly guide the user.

Hypothesis 4

Ho: Library staff understands the need of the users.

H1: Library staff will not understand the need of the users.

Hypothesis 5

Ho: Behaviour of Library staff is very co-operative and polite.

H1: Behaviour of Library staff is not at all co-operative and polite.

Hypothesis 6

Ho: Library staff provides personal attention to individual users.

H1: Library staff doesn't provide personal attention to individual users.

Hypothesis 7

Ho: Library staff have enough knowledge to solve user queries.

H1: Library staff doesn't have enough knowledge to solve user queries.

Hypothesis 8

Ho: Library staff makes information easily accessible.

H1: Library staff couldn't make information easily accessible.

Hypothesis 9

Ho: Library staff members make arrangement of fruitful user orientation for better service.

H1: Library staff can't arrange effective user orientation for better service.

Hypothesis 10

Ho: Library has sufficient Printed books required for the users' work.

H1: Library does not have sufficient Printed books required for the users' work.

Hypothesis 11

Ho: Library has sufficient Printed journals required for the users' work.

H1: Library doesn't have sufficient Printed books required for users' work.

Hypothesis 12

Ho: Library has sufficient e-book/e-journals/ digital library.

H1: Library doesn't have sufficient e-book/e-journals/ digital library.

Hypothesis 13

Ho: Library provides satisfactory Information search gateway (card catalogue/ OPAC/ WebOPAC).

H1: Library doesn't provide satisfactory Information search gateway (card catalogue/ OPAC/ WebOPAC).

Hypothesis 14

Ho: Library has sufficient newspaper/ magazine.

H1: Ho: Library doesn't have sufficient newspaper/ magazine.

Hypothesis 15

Ho: Library has sufficient computer/ internet facility.

H1: Library doesn't have sufficient computer / internet facility.

Hypothesis 16

Ho: Library provides satisfactory photocopy/scanning/ printing service.

H1: Library doesn't provide satisfactory photocopy/scanning/ printing service.

Hypothesis 17

Ho: Library has sufficient notice boards/ new arrival display/ current awareness service.

H1: Library doesn't have sufficient notice boards/ new arrival display/ current awareness service.

Hypothesis 18

Ho: Library reading room is very calm, quiet, neat and clean.

H1: Library reading room is not calm, quiet, neat and clean.

Hypothesis19

Ho: Library furniture are modern and comfortable to use.

H1: Library furniture are not modern and comfortable to use.

Hypothesis 20

Ho: Library has good lighting and very much airy.

H1: Library don't have good lighting and not much airy.

Hypothesis 21

Ho: Library is very safe for self-study.

H1: Library is not very safe for self-study.

Hypothesis 22

Ho: Enough reading room place and enough place for group study.

H1: Don't have enough reading room place and enough place for group study.

1.4 Methodology

This research work is a case study, and Jadavpur University Central Library was chosen as the case for the study. This study covered students and faculty members among the users of the JU Central Library. In the year 2018-19[1], the total number of students and faculty members was 12872. With regard to the objective of the study, the population, however, was huge and heterogeneous. Hence, for convenience and to make the study manageable, a representative sample was chosen using a stratified random sampling technique. The users were divided into strata, such as ― students and teachers from the faculty of Arts, faculty of Science, faculty of Engineering & Technologies and the faculty of Inter Disciplinary School Law and Management. It was intended to cover 3% of the users in each stratum. A total of 387 users were selected as the sample and questionnaires were distributed to them. However, responses from only 364 users were received. The details of the sampling for data collection are provided below (Table-1.1)

Table1.1: Sampling for Data Collection

Name of the Strata	Name of the Faculty	Total number of users	Questionnaire distributed to selected sample	Questionnaire returned
Students	Science	1549	46	43
	Arts	4170	125	121
	Engineering and Technologies	5858	176	166
	Inter Disciplinary School Law and Management	532	16	14
Teachers	Science	136	5	4
	Arts	162	5	5
	Engineering and Technologies	299	9	7
	Inter Disciplinary School Law and Management	166	5	4
	Total	**12872**	**387**	**364**

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[1] Jadavpur University. (2019). Annual Report 2018-2019. Retrieved from

http://www.jaduniv.edu.in/new_upload/ar2019.pdf

During 2018-19, data were collected from 364 users using a questionnaire. Collected data were duly analysed and interpreted, and findings were drawn.

To achieve the goal of the research different tasks needed to be done in different stages.

In the first stage, data for need analysis and inventory study were collected by using questionnaires (details given in annexure 1 and 2).

In the second stage a questionnaire for users' expectation and users' satisfaction were prepared using the parameters of knowledge management tool LIBQUAL (details given in chapter 3 section 3.4.A.1).

In the last stage the collected data were measured in 5-point Likert scale and interpreted through R software (details given in chapter 3 section 3.4.C.1).

1.5 Scope of the Study

Conducting a gap analysis of any process or system or organisation is a tedious task. As we know, people share their success but hardly disclose their failure. Finding out the failure and gap analysis are interrelated processes. The current study was a case study. Information dependency was from both side-- from organisational side, it was to get information regarding library holding, and from different user categories to understand their needs.

To get information regarding yearly Library collections such as books, journals, magazines, e-books, etc. is a very huge task. Even getting data about subject-wise collection was more difficult. Therefore, for convenience fifty most used books for last five years, and fifty less used and unused books for last five years were identified.

During the time of studying the users' need, some hurdles came on the way, as a few self-contradictory answers were found. Due to this reason, such questions were modified, without compromising the outcome of the study. The questionnaire format was prepared based on 5-point Likert scale.

1.6 Significance of the Study

This research has significant value in increasing footfall of any library. The aim of any library and information science professional is to satisfy the user needs. Data analysis part of this study highlighted the gap between users' expectation and users' satisfaction of Jadavpur University central library users. Such identified gaps can direct the library professionals as well as the administration, toward the areas of improvements. Not only that but also the proposed KM model can be implemented to the library for improving the quality of library system.

1.7 Style of Reference

In this study American Psychological Association (APA), 6th ed., 2010 had been used for citations of print and non-print materials in the text and for the list of references.

1.8 Chapters

This study has been divided in seven chapters as below:

Chapter- 1 (Introduction) gives an idea about the statement of the problem, objective of the study, hypothesis, methodology, scope and significance of the study.

Chapter- 2 (Review of Literature) provides a through idea about the existing literatures in relation to the problem of the research.

Chapter- 3 (Tools and Techniques used for Data Collection and Organisation) describes parameters, issues, tools, techniques, etc. which has been used during the study.

Chapter- 4 (Knowledge Management Tools for Library Service Quality Assessment) deals with a comparative study of three quality assessment tool i.e., TQM, SERVQUAL and LIBQUAL.

Chapter- 5 (Analysis and Interpretation) deals with data analysis part of the study.

Chapter- 6 (Proposed KM Model for JU Central Library Quality Assessment and Improvement) Proposed a customised model based on existing KM model for JU central library which may help in quality assessment and improvement.

Chapter- 7 (Summary of Findings and Conclusion) is the final chapter which provides summary of findings and conclusion.

Review of Literature

This chapter deals with a critical review of literature on knowledge management, knowledge management tools, models, etc. Literature review is nothing but a survey of existing resources such as book, articles, projects, dissertations, thesis online documents, etc. to understand the existing knowledge on the studied subject. Such study helps in understanding basic terminologies related to broad subject along with overlapping vocabularies. By studying relevant literature, the existing knowledge management tools can be understood and also helps in selecting a suitable tool for this study. Existing literature shows that TQM, SERVQUAL and LIBQUAL are the Knowledge Management tools which helps in quality assessment of any organization. LIBQUAL is basically designed to assess library service quality and find out the gap between user expectation and user satisfaction. It is developed by following SERVQUAL principles. It has three main areas. Feedback from users' needs to collect by covering these three areas containing 22 questions. Finally, the gap needs to measure from two sets of data against same set questions once as users' perception and another as users' expectations. Studying KM models helps in proposing a suitable KM model for JU central library. Such model may help in improving library service quality or bridge the gap. Apart from these areas one more area also has been covered i.e., the role

of academic libraries in higher education. It has been helped to understand whether the libraries are still on demand in the era of internet or not.

2.1 Objective

The objective of this study is to review the existing literature on the topic and its related areas.

2.2 Methodology

To attain the objective of the study, a comprehensive literature search was done. To gather such relevant information various resources had been consulted, such as journal articles, conference papers, research reports, theses and dissertations, books, electronic information sources. To get access to such sources, both print and electronic document substitutes like bibliographies, indexes, library catalogues, and guide books had also been used. However, a major portion of data had been collected from different databases, like Library and Information Science Abstract (LISA), Indian Library Science Abstract (ILSA), Indian Science Abstract, Web of Science, Scopus, Library, Information Science & Technology Abstracts (LISTA), Nlist, NDL, ProQuest Dissertation & Theses Global, Indian Dissertation Abstracts and University News.

2.3 Observations

2.3.A Data, Information and Knowledge

Weiss feels that understanding Data, Information, Knowledge and Wisdom is an outdated topic. As per him data in itself does not have any meaning as it is available only in raw format. Whereas processed data is information. Knowledge is about collecting right information and understanding it. Weiss has used 'atom' as an example of data, 'matter' as information and 'content' as knowledge (Weiss, 2020).

Surbhi claimed that people often mistaken the term information and knowledge. People are not able to find out the delicate differences among the terms. After collection and

filtration of data it converts into information and such information becomes knowledge when it turns into useful materials (Surbhi, 2018).

Duan explained how data, information and knowledge can be relevant in business process modelling. During their study on 'transformation from artefact-activity view to data, information, knowledge activity view' they have observed presence of data information and knowledge are in both areas i.e. in origin as well as in ending phase. They had built up a model of user capability of these concepts which they have denoted by a matrix i.e.

"Mu =(mij)n3m (Duan, 2017)

Nake had mentioned he observable fact of data, information and knowledge and he has also mentioned in his study that how they are essential for any organisation to run properly (Nake, 2017).

Sanders defined knowledge is the constant suitable response to a given input (Sanders, 2016).

Dorji & Kirikova mentioned that three concept data, information and knowledge sometime misunderstood as synonym but the differences among them can be clearly identified in practical field (Dorji & Kirikova,2016).

Dorji & Kirikova mentioned the similarities among data, information and knowledge apart from the differences.

Data:

- ➢ Data is pieces of facts, ideas, observations or some symbols.
- ➢ It is the reason for calculation.
- ➢ For transformation it into information it needs to be analysed properly.

Information:

- ➢ Information is the organised facts, meaningful idea, sequentially arranged symbols and structured observations.
- ➢ Properly analysed data becomes information.
- ➢ It directs toward decision making or getting any outcome.

Knowledge:

- ➤ Knowledge comes from experience.
- ➤ To gain proper knowledge a thorough study about a subject is must be required (Dorji & Kirikova, 2012).

Jashapara suggested the Data-Information-Knowledge model which can be used to identify the differences among these three terms data, information and knowledge. As per Jashapara it is a cyclic process which performs in a loop in which each loop aided the occurrence of another one (Jashapara, 2010).

Klimesova said knowledge is multifaceted approach along with multilayered meaning. Knowledge is tough to describe and to formulate and formalize. He has mentioned the type of knowledge too i.e. explicit knowledge and tacit knowledge. As per him the interaction between tacit and explicit gives birth of new knowledge (Klimesova, 2009).

Bellinger, Castro & Mills had categorized the content of the human mind in five categories:

a) Data (b) Information (c) Symbol (d) Understanding (e) Wisdom.

As per them the first four categories are based on what is already known whereas the fifth one deals with future. They have also mentioned that achieving wisdom is very tough job (Bellinger, Castro & Mills, 2004).

Boisot & Canals tried to explain the differences and misconceptions among the concepts data, information and knowledge. As per them some people jumbled up between data and information some may between information and knowledge. Although they have treated information as an extraction from data and after modifying this information it has a capacity to perform as a useful agent in knowledge base (Boisot & Canals, 2004).

Burgin considered data as an incomplete knowledge where as he has explained information as organised collection of facts and data. So, he felt that information come into sight as a connector leading a data towards knowledge (Burgin, 2017).

Hey tried to apply metaphorical analysis to clear up the identical characteristics of the concepts data, information and knowledge. As he found a large number of literatures where confusion still exists regarding the differences among the said terms (Hey, 2004).

Bellinger, Castro & Mills tried show how data converts into wisdom step by step with a diagram
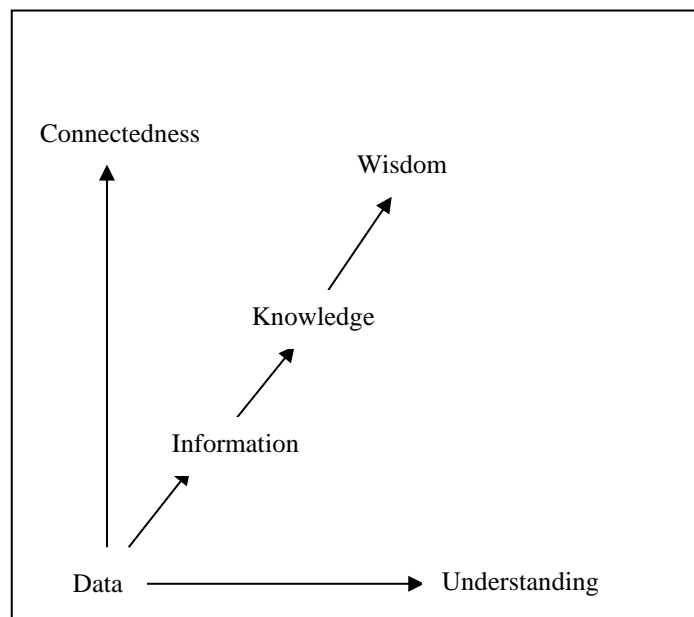
Fig 2.1: Data to Wisdom

In continuation of this diagram, they have explained each term with very common examples like:

Data: "It's raining" (As data indicates fact or statement)

Information: "The temperature dropped 15 degrees and then it started raining" (As information indicates some meaningful fact.)

Knowledge: "If the humidity is very high and the temperature drops substantially the atmospheres is often unlikely to be able to hold the moisture so it rains." (Knowledge indicates some meaningful fact along with personal experience.)

Wisdom: "It rains because it rains. And this encompasses an understanding of all the interactions that happen between raining, evaporation, air currents, temperature gradients, changes, raining." (Wisdom indicates understanding of knowledge and applications. It's basically more systematic) (Bellinger, Castro & Mills, 2003).

Ackoff compared the classification of human mind with data, information, knowledge, understanding and wisdom as:

Data as symbols

Information is as processed data. It may give answer to 'who', 'what', 'when' and 'where'.

Knowledge is as application of the previous two concepts. It may give answer to 'how'.

Understanding is as admiration of 'why'

Wisdom is as evaluator of understanding (Ackoff, 1999).

Ahmesd said some information can be data for someone where as some knowledge can be information to others. He has also mentioned that these three concepts are interrelated and not possible to define with any distinct term (Ahmesd, 1999).

Fleming said that:

(a) Set of data can't be information.
(b) Set of information can't be knowledge.
(c) Set of knowledge can't be wisdom (Fleming,1977).

Dretske believed that Knowledge is a powerful resource which can change the economy of any society (Dretske,1981).

2.3.A.1 Types of Knowledge

Bolisani & Bratianu believe that knowledge is an intangible thought which cannot have any specific definition. They have classified knowledge in three categories (a) experiential (b) skill and (c) knowledge claims.

(a) Experiential Knowledge is such knowledge which we acquired from practical experience from our surroundings.
(b) Skill means which gives us an idea about how to do anything though it is based on experiential knowledge.

(c) Knowledge claims described as our knowledge about our personal knowledge i.e. what we know and what we don't. It can be tacit or explicit (Bolisani & Bratianu, 2018).

Bakken & Dobles had classified knowledge in four categories:

(a) Declarative Knowledge (b) Procedural Knowledge (c) Contextual Knowledge (d) Somatic Knowledge. They have identified the impact of such four categories on leadership concept (Bakken & Dobles, 2016).

Jasimuddin found that Knowledge was identified as the primary source of competitive advantage for any organisation in post-industrial society. Due to this fact academician, practitioners, industrialist al have shown their interest in managing, capturing and storing their organizational knowledge. Although they believe tht a visible gap is there in between understanding of organizational knowledge and where, how and when to use or transmit. They have identified converting tacit knowledge into explicit became challenging task for organization. To do such job organizations are setting up separate KM team too. In simple way they have explained these two categories s skills, experiences of employees are the tacit knowledge of that organization whereas code, process documents, SOPs, etc. are the explicit knowledge resources of that organization. They have also mentioned that tacit knowledge is indefinite in nature (Jasimuddin, 2013).

Keglovits had distinguished two types of knowledge i.e., tacit and explicit. Barbara has described explicit knowledge as such knowledge which can be acquired formally from any documentary resources whereas the other one is tacit knowledge can be acquired from experience from other human resources. He has also mentioned that such kind of knowledge is tough to convert or store for future use. Barbara has mentioned if people want to share such knowledge, then only it can be transfer or store. A lot of research work is ging on behind this process i.e., how easily organisation can capture or store the valuable tacit knowledge (Keglovits, 2013).

Collins distinguishes knowledge in three categories:

(a) Weak or relational": Kind of tacit knowledge without any basic philosophical grounds.

(b) Medium or somatic: It is such kind of tacit knowledge which attached with human directly.

(c) Strong or collective: When tacit knowledge became socialised is termed as strong or collective (Collins, 2010).

Olomolaiye & Egbu mentioned Knowledge is more organic than mechanical. They have divided knowledge in two categories i.e., tacit and explicit. As per the tacit means hidden it stored inside human brain and very tough to transfer it in any other form. Tacit knowledge is very valuable assets for any organization. That's why organization are spending a lot to capture the tacit knowledge or transfer it into explicit form. Tacit knowledge goes along with the employees who left the organisation. Explicit knowledge i such knowledge which can be easily translate in format language and easy to capture and store (Olomolaiye & Egbu, 2005).

Frick have categorised knowledge in six categories based on knowledge of education and scope of knowledge is as below:

i) Situated scientific knowledge of education

ii) Theoretical scientific knowledge of education.

iii) Situated praxiological knowledge of education

iv) Theoretical praxiological knowledge of education

v) Situated philosophic knowledge of education.

vi) Theoretical philosophic knowledge of education (Frick, 2004).

Smith stated that precious human knowledge or tacit knowledge may get wasted unless and until it captured & stored properly. Organizations have developed various interactive sessions to capture tacit knowledge and convert it into explicit form. Various models, process have been developed to codify and manage personal human knowledge (Smith, 2001).

Jong believed that knowledge can be stored in two ways either as verbal (analytical) or as image (analog). He had classified knowledge in four categories i.e.

(a)Situational Knowledge: Situation based knowledge which is domain specific.

(b) Conceptual Knowledge: It is static in nature. It helps in problem solving and idea generation. It is also domain specific.

(c)Procedural Knowledge: it helps in problem solving. It helps in identifying the problem and provides a procedure to solve that.

(d) Strategic Knowledge: It helps in problem solving with various stages and strategies (Jong, 1996).

2.3.B Knowledge Management

Hajric said Knowledge Management is not a very complex process but need to understand where and what forms of knowledge already exists and here is the gap. It also works on new knowledge creation, storing of existing knowledge, sharing and transfer it as much as possible in explicit form knowledge management is not only about managing knowledge for sake. Main objective is to create a valuable and useable knowledge base for any organization. Successful implementation of knowledge management is not a very easy job. Before implementing a knowledge management system a few pre-requisites must be taken in consideration such as-

   (a) A proper planning needs to be made.
   (b) Strategies need to be made for successful implementation
   (c) Need-to understands the organizational culture for avoiding any unwanted consequence.
   (d) Setting up a proper change management system to handle the obstacles during changes.
   (e) Choose the suitable process for the organization before implementing Knowledge Management.
   (f) Hiring competent and experienced leaders each level such as-CKO, knowledge manager, knowledge brokers and so on.
   (g) Right tool, technologies new select for smooth running of KM system.
   (h) Last but not least an invisible factor i.e., organizational politics need to deal with utmost care (Hajric, 2018).

Mohammed has mentioned few models with diagram of Knowledge Management for better understanding of the concept. Such as:

a) Frid Model of knowledge management.
b) Duffy Model of KM processes
c) SECI Model of Forming Knowledge (Mohammed, 2015).

Lee said that before sharing knowledge group members should develop mutual trust among them (Lee et al., 2013).

Liao claims that tacit knowledge is retained by tradition, way of living, values, procedure of performing, etc. (Liao et al, 2011).

Pasher & Ronen (2011) found that the solutions provided by KM always gives benefits to an organization. During their study they have identified several organizations already understood the value and need of KM and they have actively started doing it but few other still unaware about the effectiveness or importance of KM or organizational benefit. They have also examined how important the human capital is for any organization.

Chen said that organizational structure of any organization is an important tool of knowledge management process. As knowledge flow depends upon organizational structure (Chen et al, 2010).

Gerami explained KM as a process which makes right information to the right user. Mohsen felt that a good KM system can change the culture of an organization by involving the people of that organization in sharing their knowledge i.e., their own creativity and expertise. A well-organized KM system can motivate people of any organization in sharing their knowledge voluntarily (Gerami, 2010).

Chen & Huang thought that employee should get motivated to share their experiences, thought, ideas, insight, etc. Reward is not always necessary recognition also may help to motivate people. Knowledge sharing is essential for all organizations to avoid knowledge loss (Chen & Huang, 2009).

Irani said that a culture should develop within organization for sharing knowledge among employees. Some informal session may need to arrange for sharing knowledge (Irani et. al.,2009).

Quigley felt that knowledge management initiative cannot get success unless and until people will willingly share knowledge and expertise. They also felt that lack of proper recognition may discourage people to share their knowledge (Quigley et. al.,2007).

Lytras & Pouloudi described Knowledge Management as a "phenomenon of technical and social order". It connects the three main parameters of Knowledge Management process such as:

a) People: who share their experience, ideas, expertise, insight, etc.
b) The groups: the entity which creates a connection between people with their goal.
c) Organizations: This gives a direction of Knowledge flow to people or group to achieve the targeted goal (Lytras & Pouloudi, 2006).

Caroline said that people manage knowledge in everyday life without knowing it. All of we have our personal knowledge stored in our brain which we gathered from our own experiences and utilises it when it required.   So, he feels that the term Knowledge Management misleads us. As everybody have their knowledge stored in their own brain so managing it is not possible in real scenario. The main motive behind any KM system is to build such an environment where people can voluntarily create, share and transfer their tacit knowledge to stop organizational knowledge loss (Caroline, 2005).

Morrissey believes that KM is a system which helps in managing organizational explicit as well as tacit knowledge. It helps to identify the areas where to concentrate for capturing organizational knowledge, mapping the organizational knowledge and finding out the knowledge gap. He also tried to extinguish the confusion between knowledge management and information management. As many people thinks that these two are synonymous word (Morrissey, 2005).

Cross & Speoull feels that knowledge creation can only possible by involvement of qualified people (Cross & Speoull, 2004).

Gottschalk & Khandelwal compares Lawyers as knowledge workers. As such professionals achieve their knowledge through explicit knowledge during formal education system and through tacit knowledge during learning from job (Gottschalk & Khandelwal, 2004).

Willard mentioned that Knowledge Management initiatives can help to change organisational culture smoothly. It has been observed many a time that changing the organizational culture is very crucial. At that point of time setting a proper change management strategy can help. Many a time people think that Knowledge is power so hide it. So, implementation of successful knowledge management can motivate the employees to share their tacit knowledge voluntarily or convert it into explicit form. Knowledge Management strategy helps in building employee's faith towards organization (Willard, 2004).

Yousef had tried describe the connection between acceptance of Knowledge Management and its proper implication in modern organizations. As per him more use and application of knowledge management can give more efficiency and achievement to an organization (Yousef, 2016).

Alavi & Leinder felt that knowledge management is a class of information system which is used to manage organizational knowledge. Such systems are IT based system which basically developed for organizational knowledge creation, storing, retrieval and transfer purpose. They have developed a systematic framework identifying the exact role of information technologies in organizations are treated as knowledge systems. This consists of four interrelated subsystems i.e. (i) creation (ii) storage/retrieval (iii) transfer and (iv) applications (Alavi & Leinder, 2001).

Gold et. al. said Knowledge Management is an intra-organizational process that helps in collection, creation, storing of tacit as well as explicit knowledge of any organization. They also help in identifying and capturing knowledge from external sources too (Gold et. al., 2001).

Rowley mentioned some fact regarding the utilization of knowledge. Regarding knowledge utilization he said people of any organizations should have capability to locate, or access and utilize the stored knowledge at right time at right place. They should have capability to create new knowledge based on organizational existing knowledge (Rowley, 2001).

Lee & Yang refers knowledge distribution as a process by which existing stored knowledge can be shared and utilised properly. Based on utilisation of existing knowledge new knowledge can be created (Lee & Yang, 2000).

Davenport et. al. recognized Knowledge as the chief resource of this century. This gives advantages in long term. A number of studies have conducted to understand Knowledge Management (Davenport et. al., 1998).

Amidon explained how tacit knowledge can be transferred either in explicit or tacit form through informal channel. He has mentioned 'Community of Practice' as an informal channel for transferring tacit knowledge. Such process can happen at anywhere at any time may be in coffee table, lunch break or in any other gathering (Amidon, 1997).

Nelson & Winter considered knowledge as tacit and explicit. Explicit knowledge means the coded knowledge which is easy to preserve in repository. Whereas the tacit form of knowledge is stored in human brain difficult to capture or convert. Knowledge sharing culture can only help (Nelson & Winter, 1982).

2.3.C Knowledge Management Tool and Techniques

Bheenick & Bionyi said that over the years Knowledge Management tools and techniques are also adopting ICT for smooth running the Knowledge management process. They have mentioned few Knowledge Management tools in their work such as:

- Blog
- Knowledge Fair
- Exit interview
- Knowledge Cafe
- Community of Practice
- Brown bag Lunch
- Knowledge Exchange session
- Best Practice Sharing
- Fish Bowl
- Knowledge Audit
- Knowledge Map
- Social Networking
- Repository

- ➢ Blog
- ➢ Wiki
- ➢ White Paper
- ➢ Six thinking Hat
- ➢ K Base
- ➢ Blame vs. Gain behaviour
- ➢ Topsy -turvy
- ➢ Reward and Recognition
- ➢ Mind Mapping, etc (Bheenick & Bionyi, 2017).

Morgan mentioned that the most common KM tool is 'Information Repositories'. Though the name may vary from organization to organization. It is nothing but a database of organization policies, processes documents, manuals, SOPs, etc (Morgan, 2017).

Chugh explained how knowledge management tools can make benefit to any organization.

a) Intranets: By using intranet people within organization can share or transfer and store their tacit knowledge.

b) Document management system: It is nothing but the repositories or hub of organizational knowledge. it has a vital role in converting tacit knowledge to explicit form.

c) Information retrieval System: It is also kind of repositories. Generally found in several organizations as Knowledge silo. In such repositories vendors use to add their updates regarding new products, discount continuously in natural language. The system arranged them automatically rank wise and helps the information seeker to get the information easily.

d) Groupware and workflow system: It is a platform for sharing organizational tacit knowledge and maintains the knowledge flow process.

e) Brain storming session: This one is such platform where organizational tacit knowledge converts into explicit form informally. It also helps in new knowledge creation. For example, community of practice, brownbag lunch session, etc. are very powerful tool of brainstorming session.

f) Data warehousing and data mining tools: organizations create their data ware for the manager and give them data mining tools to help them taking decision. These re open database. It also gives facility to access data subject wise (Chugh, et al., 2013).

Liebowitz explained few knowledge management tools with its applications. Such as:

➢ Reward system: reward system motivates people to share their knowledge.

➢ Cross functional projects: work with cross functional team helps in getting knowledge and ideas from multidisciplinary areas.

➢ After action review

➢ Exit interviews helps to understand the reason behind employee resignation and also helps in restrict knowledge loss up to certain extent.

➢ Storytelling is very interactive and interesting process of conveying a message easily.

➢ Job rotation is very important to restrict organizational knowledge.

➢ Making process manual help the new employee to understand the process.

➢ Involving Knowledge retirees also helps to give valuable imputes to the organizations (Liebowitz, 2011).

Antonova, Gourova & Nikolov claimed that without Knowledge Management tools knowledge management process can't be run. The process of creation to storage, storage to retrieval, retrieval to transfer and transfer to application can't be conduct without application of any KM tools (Antonova, Gourova. & Nikolov,2006).

Bali mentioned that without application of IT Knowledge discovery or knowledge sharing is not possible. With the help of IT hidden knowledge also can be extract and store it for future use. Invisible college, Community of practice, data mining and text mining are such KM tools which uses IT for knowledge discovery. These are helpful to work with explicit knowledge (Bali et al, 2009).

They have also identified the areas and way of capturing tacit knowledge with the involvement of IT tools. Such as:

➢ Act as an expert locator: it helps to locate the tacit knowledge via different systems like corporate yellow pages.

➢ Helps in socializing the organizational tacit knowledge: informal channels like chat, social network, video conference, blog, etc. can help a lot to socializing tacit knowledge.

➢ Helps in externalization of tacit knowledge: discussion forum, groupware, etc. helps to externalize tacit knowledge.

Wellman thinks that IT can be used as a tool in knowledge management process for gaining and storing of organizational knowledge. It prevents organizational knowledge loss too (Wellman, 2009).

Leask had classified the available knowledge management tools in three broad categories which are as follows:

A) KM tool for linking people with information and knowledge such as:
- Case Study
- Rapid Evidence Review
- Knowledge Banks
- IDeA knowledge

B) KM tool for linking people with people such as:
- Community of practices
- Knowledge Cafe
- Peer assist
- Knowledge Market place

C) KM tool for improvement of organization such as:
- After Action Review
- Knowledge Exchange
- Retrospective Review (Leask, et al., 2010),

Lu & Liu stated that technology as a tool in KM process is needed to run a knowledge management process but without human involvement it can't work. So as per them human beings are the heart of KM process whereas technologies act as a support system (Lu & Liu, 2008).

Gammelgaard & Ritter) have identified Community of Practice (CoP) as a powerful Knowledge Management tool for any organization. Tacit knowledge is the most

valuable asset of any organization. CoP is such a tool which mainly concentrates on capturing organizational tacit knowledge. It is not mandatory that CoP can be from only inside the organization but also globally (Gammelgaard & Ritter, 2005).

Hislop explained how rewards or promotions can motivate employees to share their knowledge. Different database management, content management tools can make the process of knowledge sharing easy (Hislop, 2013).

Rao said that only Knowledge Management tools, technologies can't make a Knowledge Management process successful unless and until people have the culture or willingness of sharing knowledge. tools and techniques only can enhance the process (Rao, 2005).

Damian & Zowghi said that a good knowledge management tools or a proper knowledge management strategy can assist software engineer (Damian & Zowghi, (2003)

Markus allocated the role of creating, organizing, and storing of organizational knowledge to a knowledge conciliator. A knowledge conciliator can be a knowledge manager, knowledge procure, knowledge convertor or someone else. The main aim behind this process is to use or reuse of knowledge. Various KM tools can be used in his process need basis (Markus, 2001).

Wexler believes that getting a right knowledge at right time is much tougher than managing it. He has suggested that only Knowledge Map is the process which can make this work easy. He has also compared Knowledge map with geographer's map. Such map not only helps in finding right resources but also makes organizations aware of upcoming threats or opportunities too (Wexler, 2001).

Renker & Buntzen said that to run a KM process tool must be needed but pattern of tool may be varied from one process to another. So, selection of Knowledge Management tool is very crucial work which may need to be done very seriously. Selection of a wrong tool may lead to failure of a process (Renker & Buntzen, 2000).

Ruggles mentioned the purpose of using Knowledge Management as tools are as below:

1. Helps in knowledge creation, codification and transformation.

2. Helps in new knowledge generation by data mining, etc.
3. Makes knowledge usable
4. Modifies knowledge based on organization's need (Ruggles, 1998).

2.3.D Knowledge Management Tool for Library Quality Assessment and Improvement

Reddy 2017 pointed out three important knowledge management tools for library quality assessment i.e.

i) TQM

ii) SERVQUAL

iii) LIBQUAL (Reddy, 2017)

2.3.D.1 TQM

Poonkothai said that the application of Knowledge Management tool in academic Library helps in development of library staff members, building good relation between library users and library human resources as well documentary resources. Apart from these activities, such tools help in new knowledge creation, building knowledge networks and maintaining knowledge flow (Poonkothai, 2016).

Byrd believes that application of TQM principles can transform library services in broader way like:

➢ Supervision
➢ Training and development
➢ Staff growth plans
➢ Application of ICT (Byrd,1998).

Pilling pointed out few important features of TQM which can be useful for betterment of library services, such as:

➢ Priority should be given to Library users.
➢ Proper work distribution system needs to be maintained
➢ Processes should be maintained accurately rather functions.

> ➢ Focusing continuous service quality improvement and maintenance (Pilling, 1997)

Raina said that the concept of TQM and its application in various fields is an old concept. Such applications in Library sector have been identified in 1980's which has the motto to increase users' satisfaction by fulfilling their need. This old concept became more relevant in this technical era as Raina said (Raina,1995).

Clack mentioned about the application of TQM in various academic libraries. Harvard college library is one of them. Clack has said that how Harvard college library has modified the vision statement and changed the organizational work culture after applying TQM principles (Clack, 1993).

Jurow & Barnard said that Libraries can be benefitted by using TQM principles in three ways which are:

1. By breaking the interdepartmental blockade
2. Modifying the recipient of library services as in-house customers such as library staff members and outside customer such as library users.
3. Continuous supervision to main and improve library service quality (Jurow & Barnard, 1993).

Jurow & Barnard have pointed out few barriers for implementing TQM principles in Libraries. These are:

1. Vocabulary
2. Commitment
3. Process
4. Professionalization (Jurow & Barnard,1993)

Sirkin provided a guideline for library based on TQM principles to improve library service quality. Such as:

> ➢ Creation of process document
> ➢ Organize user survey on library resources and service quality
> ➢ Suitable Library working hour for users.
> ➢ Easy circulation procedure.

- ➢ Flexibility in staff job
- ➢ Work in cooperation with local Government.
- ➢ Before purchasing a product asking vendor to provide product demonstration.
- ➢ Arranging library orientation for library new users' as well as new staff members.
- ➢ Create a library advisory group with members from various departments.
- ➢ Collect and track feedback in regular interval.
- ➢ Organise various events, activities with the library.
- ➢ Plan for branding and communication of library new services.
- ➢ Develop a through but easy to handle know your organization for both new users as well as for new staff members.
- ➢ Making provision of electronic document delivery system.
- ➢ Maintaining Library Vision and Mission
- ➢ Make library user as well as library staff happy (Sirkin, 1993).

Riggs has given few important features of TQM. Such as:

- ➢ Decision making after through instigation of the fact. Investigation can be done by using various tools such as: checklist, charts, diagrams, graphs, etc.
- ➢ Helps in removing duplication of work. Such can save time, money and manpower.
- ➢ Make employees feel important for the organization.
- ➢ Give the Library staff appropriate authority to take decision for improvement of Library service quality (Riggs, 1992).

2.3.D.2 SERVQUAL

Magi & Julander carried out a survey to measure the service quality; understand the customer feedback and customer constancy on various grocery stores. They have received a positive linking service quality. To conduct the said study they have not used SERVQUAL but they have used performance scale measure the quality (Magi & Julander, 1996).

Khan suggested a model named ECOSERV for measuring service quality in eco-tourism based on SERVQUAL five dimensional structures (Khan, 2003).

Cook &Verma believed that SERVQUAL instrument is one of the most successful and globally used instrument for measuring service quality. It uses a structured questionnaire with twenty-two questions judged on 5- or 7-point rating scale (Cook & Verma, 2002).

O'Neil & Palmer had developed a model for maintain service quality based on SERVQUAL named DIVEPERF (O'Neil & Palmer, 2013).

Asubonteng et al. believed that "Until a better but equally simple model emerges, SERVQUAL will predominate as a service quality measure"(Asubonteng et al., 1996).

Buttle said in one review that application of SERVQUAL means any one of the following: item-by-item, dimension-by-dimension and calculation of service quality to find the service gap. SERVQUAL instruments The SERVQUAL instrument runs twice in altered forms, first to calculate expectations and second to calculate perceptions (Buttle, 1996).

Buttle had proposed the drawbacks of SERVQUAL theory:

1. It is unable to give any economical, statistical and psychological theory.
2. It does not support the system of user evaluation for service quality by finding out the gap between perception and expectation
3. It concentrates on the system of service delivery instead of the outcome of the service.
4. Five dimensional terminologies of SERVQUAL are not universal (Buttle, 1996).

Dabholkar et al. have tried to implement SERVQUAL model in the retail industries but they failed to implement it. As per the retail industry should include measure both service quality as well as product quality to run the model successfully (Dabholkar et al.,1996).

Gabbie& O'neill described about the structure of SERVQUAL instrument i.e., it has twenty-two statement which get measured across 5 dimensions by using a seven-point likert scale which measures both customers' expectations as el as customers' perceptions. They have also mentioned that without having sufficient information

regarding customer expectation of service quality and what their perception after receiving the service it's not possible to draw the appropriate gap statement (Gabbie & O'Neill, 1996).

Cronin & Taylor suggested SERVPERF as an alternative model of SERVQUAL. It has tested upon hospitality and tourism industries. The outcome of the study claimed that SERVPERF is better than SERVQUAL (Cronin & Taylor, 1992).

Knutson et al. has suggested a model based on SERVQUAL theory named as LODGSERV. It has three dimensions. It has developed to for maintaining the service quality of hospital, tourism industries (Knutson et al., 1990).

Carman stated that SERVQUAL the service quality measurement tool helps to fining out the gap between service performance and consumer expectations. As per Carman many researchers say that finding out the consumers' perception is enough to understand the gap (Carman, 1990).

Babakus &Mangold said that SERVQUAL layout has been adapted in various service industries globally for e.g., hospital, etc. for maintaining, measuring and improving the service quality of that industry (Babakus & Mangold, 1992).

Parasuraman, Berry & Zeithaml have mentioned five identical dimensions of SERVQUAL: Tangibles, Reliability, Responsiveness, Assurance, and Empathy (Parasuraman & Zeithaml, 1988).

Berry & Zeithaml said that service quality measure is required to understand how much the delivered service matches with the customers' expectations (Berry & Zeithaml, 1985).

Parasuraman et al. have considered ten components to measure service quality such as:

1. Reliability
2. Responsiveness
3. Competence
4. Access
5. Courtesy
6. Communication

7. Credibility
8. Security
9. Understanding the customer and
10. Tangibles (Parasuraman et al., 1985)

In future they have revised their said components and make it into five components:

1. Reliability
2. Assurance
3. Tangibles
4. Empathy, and
5. Responsiveness.

2.3.D.3 LIBQUAL

Ramanjaneya identified LIBQUAL for measuring library products as well as service quality. It is developed based SERVQUAL principles. The goals of LIBQUAL are as below:

a. Establishing library product and service quality assessment programme.
b. Developed a web-based assessment tool for library
c. Standardize protocols and procedure for assessing library
d. Pointing out the best quality of library services (Ramanjaneya, 2017).

Stavridis & Tsimpoglou said that LIBQUAL is basically a tool for measuring the outcome of libraries by using web-based instruments. It can work on any academic library where size doesn't matter. Such tool is well tested and assists library staff members to improve their services (Stavridis & Tsimpoglou, 2012).

Tiemensma said LIBQUAL is a four-dimensional Knowledge Management tool developed to measure library users' perception and expectation regarding library product and services (Tiemensma, 2010).

Chen & Shiau pointed out few tools for various process like ISO and Quality Assessment for evaluation, MBNQA for strategy and budgeting, etc. SERVQUAL and LIBQUAL are also such tools which help in assessing library service quality. LIBQUAL helps to find out the service gap of any Library (Chen & Shiau, 2006).

Roskowski & Jones considered LIBQUAL as the tool for gap identification of Library product and services (Roskowski & Jones, 2005).

Shi & Levy had identified the problem areas of LIBQUAl tool i.e., the tool is completely depended upon users' response (Shi & Levy, 2005).

Snyder believes that LIBQUAL is the modified version of SERVQUAL which was coined by Fred Health and Colleon Cook (Snyder, 2002)

Cook & Heath conducted a study to understand the usefulness of LIBQUAL and they found that LIBQUAL tool plays very important role in assessing quality of library programmes and the use of LIBQUAL is increasing day to day globally (Cook & Heath, 2001).

2.3.E Knowledge Audit

Dante said that Knowledge Audit can be divided in four categories (Dante, 2008).

Olivier said that knowledge audit can have multiple purposes, but the most common is to provide tangible evidence of what knowledge an organization needs, where that knowledge is, how it is being used, what problems and difficulties exist, and what improvements can be made (Olivier, 2008).

According to Makambe Knowledge audit can be classified in two categories (Makambe, 2015).

According to Dalkir the knowledge audit identifies the core information and knowledge needs and uses in an organization, their gaps, duplications and flows, how they contribute to business goals, and which areas need improvement (Dalkir, 2005).

Wiig mentioned a comprehensive list of techniques supporting the KM initiative: i.e. Knowledge surveys and Knowledge audits (Wiig, 2004).

Hylton defined the Knowledge audit as a methodical assessment but scientific, of tacit as well as explicit resources of any organization (Hylton, 2002).

Basically, a knowledge audit means to understand the processes which constitute the actions of a knowledge worker, and observe how well knowledge workers finds the knowledge goals of the organization (Lauer & Tanniru, 2001).

Liebowitz explained a knowledge audit as a tool that assets potential stores of knowledge. It is the first step of any Knowledge Management strategy. By identifying that, knowledge is possessed, then possible to find the most effective method of storage and dissemination. Vital part of the knowledge audit is capturing "tacit" knowledge (Liebowitz, 2000).

According to Stevens a knowledge audit will consist of two major functions, both are independent. The first one called knowledge mapping, involves locating repositories of knowledge throughout the organization. This effort is primarily technological and usually prepares the way for creating a knowledge database. The knowledge mapping process is relatively straightforward. It takes an inventory of what people in the organization have written down or entered into information systems, as well as identifying sources of information employees use that come from the outside (such as public or university libraries, Web sites or subscription services). Finding and organizing all that data may be time-consuming, but it is not conceptually difficult. The second, more intensive category of audit task attempts to capture the patterns of knowledge flow in the organization. This knowledge flow audit examines how people process information that ultimately determines how well an organization uses and shares its knowledge (Stevens, 2000).

Tiwana focuses on several steps for implementing KM, whereas inventories take an important place in strategy formulation, both analysis of available infrastructure, as well as making knowledge-based SWOT and thorough KA. He suggests a 6-step KA process including: defining the goals, selecting the audit method, determining the ideal state, performing the knowledge audit, documenting existing knowledge assets, and determining the organization strategic position within the technology framework (Tiwana, 1999).

2.3.F Knowledge Mapping

Watthananon & Mingkhwan said that knowledge map portrays a relation among process, idea and capability and gives simple and useful access to knowledge resources (Watthananon & Mingkhwan, 2012).

Eppler mentioned that knowledge map can be classified in various categories. Different variety is used for different purpose. Types of knowledge maps are as below:

- Mind Maps
- Concept Maps
- Argument Maps
- Casual Maps
- Knowledge Asset Map
- Social Network Analysis
- Topic Map
- Folksonomy
- Process Knowledge Mapping
- Functional Knowledge Mapping
- Competency Mapping
- Information flow Mapping
- Petri nets
- Semantic Map
- Cognitive Map (Eppler, 2012).

Ling, et.al. told that knowledge map is a method retrieving knowledge which is arranged by the knowledge brokers (Ling, et al ,2008).

Ebener said that knowledge mapping is a process of developing knowledge map. The process is consisting of 5 steps such as:

- Acquire data
- Manipulate data
- Store data
- Process data
- Visualize data (Ebener, 2006).

Wexler felt that not a single type of knowledge map can fulfil all the domain of a knowledge management process so a vital task for any Knowledge management system is to develop a customise knowledge map which is suitable for the particular process (Wexler, 2001).

Grey said that knowledge map shows the organizational knowledge flow. Organizational knowledge includes both tacit and explicit knowledge of the organization (Grey, 1999).

Herl et.al. believes that knowledge map became very crucial for knowledge management in the era of internet (Herl et. al., 1999).

Liebowitz described knowledge map as the graphical representation of organizational internal knowledge (Liebowitz, 2000).

2.3.G Knowledge Gap Analysis

Sora and Yingru divided gap analysis in four steps these are:

1. Identifying the basic needs
2. Determining the desired future for the organization
3. Find out the gap existing and desired state
4. Plan for bridging the gap (Sora & Yingru, 2018).

Jannetti defined gap analysis as the difference between what the organization is doing and what they should do (Jannetti, 2012).

McBriar et. al. simply said that gap analysis can be define as the difference between current statues with the desired one (McBriar et. al.,2003).

Hatch & Schultz believes that a gap analysis can help in identifying and diagnose the problem areas of a corporate organization (Hatch & Schultz, 2003).

Zack explained the term strategic gap i.e. the gap between what an organization is doing in real and what they should do to win the competition (Zack, 2002).

Moteleb & Woodman said it is impossible to get the real gap in any knowledge process in any organization. As getting a success story is easy but getting a failure story is not easy (Moteleb & Woodman, 2007).

2.3.H Role of Academic Library in Higher Education

Parmar highlighted the latest depiction of Govt. Initiatives in higher education and how a library plays a vital role in promoting those initiatives. Libraries are using various platforms with the immense use of Information Technology to promote the initiatives such platforms are library networks, consortium, library portals developing and increasing digital collection, online catalogue, information literacy programme, etc. How the role of library professionals' changes as per user need i.e. educator, information officer, knowledge manager, information scientist, etc. also mentioned in the study (Parmar, 2019).

Salim claimed that University libraries plays a vital role in teaching and research activities not only that but also it helps in group study, finding new resources and technologies too (Salim, 2019).

Chaudhuri feels that due to immense use and application of technology the role of library as well as librarian has changed drastically. He has also mentioned that the importance of library is much more in higher education i.e. in University than in primary education. As per Kothari Education Commission (1964-65) Libraries are getting damaged due to giving it a low priority (Chaudhuri, 2017).

Chaudhari mentioned the University Library as the central organ of any academic activities (Chaudhari, 2018).

Kolhe explains how the role of academic libraries has changes in the era of e-learning. He has also mentioned about the evolvement of different technologies and its implications in academic libraries. As per Kolhe e-leaning is well accepted by the students and teachers. Though e-learning has various benefits along with challenges likes sufficient fund, required technical support, availability of hardware and software, database management system, training and support (Kolhe, 2018).

Lawson said that Public Libraries are facing challenges due to rapid changes in user demand and evolvement of various information resources. To overcome such challenges various studies has been conducted, dialogued has been exchanged among various professional forums, conferences took places (Lawson, 2016).

Patil said that knowledge plays a vital in world of organisation. Knowledge Management, a newly evolved subject has become a key concern for library as well as the library professionals. Knowledge Management has three main areas: people, process and technology. Library and information professionals are slowly getting expert in information search, selection, organisation, dissemination, and creation information pool for future use (Patil, 2013).

Arjun feels that Library is a place or medium of exchanging ideas. They also mentioned that Library can be treated as the heart of the institution. To describe what Library is they have mentioned that it is consist of printed and other resources classified, arranged such a way so that user can easily get access of it (Arjun et all.,2010).

Arthur & Brafi conducted a thorough survey on use of library by the students in tertiary education institutions in the Sunyani Municipality of Ghana (Arthur & Brafi, 2013).

Arthur, Paul & Kuranchie found during their study that majority of the tertiary students' still more dependent on the printed resources from their Library instead of online resources in the ear of internet (Arthur, Paul & Kuranchie, 2013).

Jennings has discussed an appropriate and vital topic in his study i.e. what is the status of Library professionals in this Google era. Does Libraries will be obsolete or it will be without user or it needs customization as per user need to sustain (Jennings, 2013).

Shukla have tried to establish a relation among library, literacy and education. They have also described that libraries are the basic need of any academic institution irrespective to any level. As per the authors view in absence of library running any educational institute cannot be possible (Shukla et al., 2013).

Tenopir, Birch & Allard considered Academic libraries as the platform for helping the academic institutions in their research data. In today's world researches must need to know about data collection procedure, analysing power, data sharing techniques and

preservation of data. In this regards data management is very important. The process is not very easy and in many cases been found to be lacking. Authors found that there are several barriers behind data sharing by researchers. Libraries and Library professionals make the process easy and help to access information smoothly (Tenopir, Birch & Allard, 2012).

Hart & Kleinveldt mentioned that academic libraries are basically typically identify as the support system for research. Researchers starts their work from institutional library only (Hart & Kleinveldt, 2011).

Parthasarathy said that education is the basic need for country's economic, cultural, social development. To provide proper education accessing the wealth of knowledge is necessary. To provide right knowledge to the right user developing Library in every academic institution very much essential. The importance of libraries in any levels such as school, college, and university or research institute is very much well identified. The libraries are not only the information provider but also helps in overall development of a student in various aspects such as personality, skill enhancement idea generation, creativity, etc. The quality of teaching is directly linked with the information collection and dissemination of that institute (Parthasarathy, 2009).

Sen considered academic libraries as the nervous system of any academic institutions. Which can help in teaching, research and other academic activities. Sen also mentioned that due to the demographical change, advancement of technical development and globalization has brought a complete change in education sector. Though Sen believe that teaching learning is a delicate process which needs to be standardized worldwide (Sen, 2015).

Brown & Swan had identified few factors that influences the traditional Library functions. Such as:

➢ Increase in availability and accessibility of digital information. Access to digital information.
➢ To cope up with increasing user demand for digital collections Library professionals are also involves in creation of digital collection which is highly expensive.

> ➢ To avoid high expense in developing digital collections libraries are taking help of interlibrary loan. Libraries can get the needed document via mail from another library.
>
> ➢ Librarian can help the faculty members in discovering and accessing different online documents if they want (Brown and Swan, 2007).

Elkin claimed that books are still very important in digital age. Such result came out from a study conducted in 2003. The sample was collected from 37 countries. Study says most of the people read for achieving a goal instead of leisure. This fact says that importance of academic library is still very much important in digital age too (Elkin, 2007).

Pearsn has nicely explained the concept why the libraries are needed in his paper.

As per him earlier people use to think that Library as a store house. People needed knowledge for various reasons such as education, research, medical purpose, cultivation, business, invention or sometime may be simply for leisure. It was a common myth that all this knowledge can be available from books very easily. Libraries are the place to store such books. Surprisingly very often the standard of library been measured in terms of the number of collections how big the collection is instead of the quality of collection or the number of serious readers in that library. Though the picture has changed now due to the huge application of internet still books are on high demand among various information resources in aspect of accuracy, authenticity and trustworthy (Pearsn, 2007).

Chaudhary has mentioned that the International Federation of Library Associations and Institutions (IFLA) recognize that University Libraries are indispensable in reaching their academic achievement (Chaudhary, 2006).

Kathy has compared old paradigm of higher education with the new paradigm as below:

OLD PARADIGM	NEW PARADIGM
Predefined courses	Courses on demand
Age restriction	No age restriction

Printed resources are main medium for study	Information as primary medium
Classroom	From anywhere
Technology as expenses	Technology is basic need
Institutional oriented	Market oriented
Student as 'pain'	Student as customer

(Kathy, 2002)

Singh has explained in her paper that how important internet is in today's Library world. How internet helps in organising and bridging the information gap. Due to evolvement of internet the nature of library and information services has changed as below:

- ➢ Creation of Library Websites: The visibility as well as the usability of Library can be increased by creation of library website.
- ➢ E Bulletin Board service: it can help in give a complete idea about Library services, products and various events organised by Library
- ➢ Ready reference service can be given more easily by using internet
- ➢ Documentary resources can be ordered online only without any hindrance.
- ➢ Processing of books can be done very quickly and easily.
- ➢ (e) E-mail services can be used for sending updates regarding new arrivals, circulation, etc.
- ➢ E- SDI services is also very helpful for users.
- ➢ Remote access to information is possible by using internet (Singh, 2001).

Harrison & Beenham framed out the objectives of academic libraries:

- a. Serve the need of student and teacher.
- b. Provide the right information to the right users.
- c. Provide right place for study
- d. Library beyond the campus (Harrison and Beenham, 1985).

2.4 Summary

A critical review of literature on a particular concept gives the background details of the concept along with the related areas. As the current study deals with identification of the gap of JU central library services and resources. Knowledge management tools had been studied for the same. The study started with the concept data, information and knowledge then the differences among these three terms. During the literature survey it had been cleared that how these three terms are varied from each other with identical characteristics and how they were linked with each other. Such discussion helps to better understand about the term knowledge and how important it is for the organization. Study says that knowledge commonly divided in two categories i.e., tacit and explicit. Tacit knowledge has been identified as the most valuable assets for any organizations. Knowledge management is a set of process, strategy to collect, store, modify knowledge and provides right knowledge at right time. Knowledge management uses various tools, techniques, models to execute the process. Each tool has its own identical character. TQM, SERVQUAL, LIBQUAL, etc. Knowledge management tools help in quality assessment and gives direction for the areas of improvement. In case of library two main areas are resources and users. Fulfilling the users need is the main aim of any library. So, a good quality library denotes good quality resources with satisfied users' community. To satisfy users first need assessment is needed then audit of existing knowledge needed to be done. Based on these two-results knowledge mapping can be conducted. This step can help to find out the areas or areas for improvement. By using LIBQUAL as a Knowledge Management tool library authority can find out the gap between users' expectation and users' perception. LIBQUAL has a standardized questionnaire with 22 questions divided in three main areas. LIBQUAL structure basically developed based on SERVQUAL principle. Based on the result the gap areas can be identified and the ways for mitigation can be pointed out. By conducting a critical review of literature s well as based on the results found from data analysis a suitable model for JU central Library service improvement can be proposed.

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Tools and Techniques used for Data Collection and Organisation

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This study deals with the tools and techniques which had been used during the study.

The purpose behind this study is to discuss and explain various tools for data collection and organisation regarding users' need, library holdings, users' satisfaction, gap analysis, and data analysis. The reason behind selecting a specific tool or technique in this study had also been discussed with proper justifications. It is to be noted here that the basic research design had already been discussed in chapter 1, section 1.4. Methodological details regarding the tools and techniques used for this study are described here.

3.1 Objective of the Study

The objective of this study was to find out suitable tools and techniques for conducting survey and analysis of the survey results.

3.2 Methodology

To attain the objective of the study, a comprehensive literature search was done. To gather such relevant information various resources had been consulted, such as journal

articles, conference papers, research reports, theses and dissertations, books, electronic information sources. To get access to such sources, both print and electronic document substitutes like bibliographies, indexes, library catalogues, and guide books had also been used. However, a major portion of data had been collected from different databases, like Library and Information Science Abstract (LISA), Indian Library Science Abstract (ILSA), Indian Science Abstract, Web of Science, Scopus, Library, Information Science & Technology Abstracts (LISTA), Nlist, NDL, ProQuest Dissertation & Theses Global, Indian Dissertation Abstracts and University News.

3.3 Stages of Work

The entire work had been conducted in various stages which are as follows.

3.3.A Need Analysis

Basic feature of any Library and information centre is to recognise and understand the requirement of the users. As the motto of any Library is to provide right information at right time to the right user, so without knowing the need of the user it cannot be achieved. To conduct the need analysis, a questionnaire was prepared (given in annexure 1) for collection of data.

3.3.B Library Holding

Type of Library collection varies based on the type of library such as academic, public, special, etc. So, to understand the library holding of JU central library a questionnaire was made (given in annexure 2) for collection of data.

3.3.C Users' Satisfaction

By providing right information to the right user at right time only can satisfy a user. Users' satisfaction may be described as:

Knowledge expectation is lower than knowledge satisfaction.

$$KE < KS$$

Based on LIBQUAL parameters a questionnaire was made for collection of users' expectation as well as users' satisfaction data (details given in section 3.4.A).

3.3.D Gap Analysis

Gap analysis can be described as the comparison between users' expectations and actual.

> **Knowledge Gap= Knowledge Satisfaction- Knowledge Expectation**

Basically, it helps to get answer of 'What is the current situation?' and 'what is the condition that can be achieved or desired?' By comparing both the data (Users' expectation and users' satisfaction) knowledge gap was identified in this study.

3.4 Tools and Techniques Used for the Study

Tools which all were used in various stages of the study are discussed below.

3.4.A Study of Users' Satisfaction and Users' Expectation

LIBQUAL (Cook, 2015) tool was used for Users' satisfaction and Users' expectation study. A questionnaire was made based on LIBQUAL parameters for data collection.

3.4.A.1 Questionnaire Format

The questionnaire was basically divided in two broad categories i.e., main part and optional part. Layout of the questionnaire was designed based on LIBQUAL format.

Main part of the questionnaire had 22 questions.

Optional part of the questionnaire had 16 questions.

3.4.A.1.A Main Part

Table 3.1 shows the parameters used in main part with the number of questions covered in each parameter.

Table	AREAS	NO. OF QUESTIONS	3.1:
	Affect of Service	09	
	Information Control	08	
	Library as a Place	05	

Parameters of LIBQUAL Tool included in Main Part

Table 3.1 reveals the numbers of questions in each parameter. Affect of Service contains 9 questions, Information control contains 8 questions and Library as a place contains 5 questions in it.

The following Table 3.2 shows the LIBQUAL questionnaire layout which includes the questions used in each parameter for the study.

Table 3.2 LIBQUAL Questionnaire Layout Used for the Study

AREAS	1	2	3	4	5
Affect of Services					
Library staff are well trained and qualified.					
Library staff will provide right direction to retrieve right information					
Library staff will willingly guide the user					
Library staff understands the need of the users					
Behaviour of Library staff is very co-operative and polite.					
Library staff provides personal attention to individual users.					
Library staff has enough knowledge to solve user queries.					
Library staff makes information easily accessible.					
Library staff makes arrangement of fruitful user orientation for better service.					
Information Control					
Printed books you required for your work					
Printed journals you required for your wok					
e-book/e-journals/ digital library					
Information search gateway (card catalogue/ OPAC/ WebOPAC)					
Newspaper/ Magazine					
Computer / Internet facility					
Photocopy/Scanning/ Printing service					
Notice boards/ new arrival display/ current awareness service					
Library as a Place					
Library reading room is very calm, quiet, neat and clean					
Library furniture are modern and comfortable to use					
Good lighting and airy					
Library is very safe for self-study					
Enough reading room place and enough place for group study					

The above-mentioned table 3.2 shows the questions which all were used for data collection.

3.4.A.1.B Optional Part

Table 3.3 shows the parameters used in optional part with the number of questions covered in each parameter.

Table 3.3: Parameters of LIBQUAL Tool included in Optional Part

AREAS	NO. OF QUESTIONS
Optional questions	05
Information Literacy questions	05
General Satisfactions	03
Library Questions	03

Table 3.3 reveals the areas of optional parts covered in survey.

3.4.B Tool Used for Data Measurement

Likert scale had been used for measuring data. It is psychometric scale mainly used in research data analysis. This scale helps to rank the responses from very poor to very good or low to high in these two extremes (Likert, 1932).

5-point Likert scale had been selected for the study as the population size was too large.

Strongly agree	Agree	Neither agrees nor disagree	Disagree	Strongly disagree
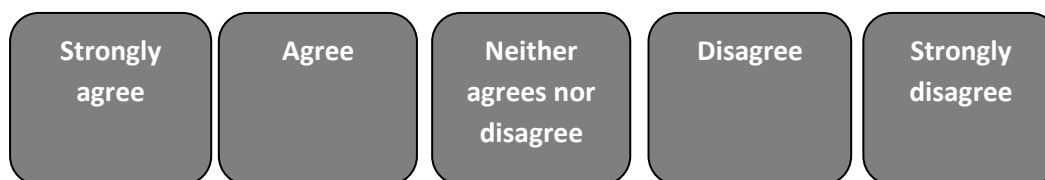
Fig. 3.1: 5 Point Likert Scale

The above-mentioned figure 3.1 shows the format of 5-point Likert Scale.

3.4.C Tool Used for Data Analysis

Collected data had been analysed by using R software.

3.4.C.1 Details of Software R

R is an open-source software which is basically the open-source version of programming language S. It was developed by R Gentleman and R Ihaka during 1990s. Now a days, R is widely used by statistician, data miners for data analysis (Matloff, 2011).

3.4.C.2 Interface of R Software

Interface of R software is given below.
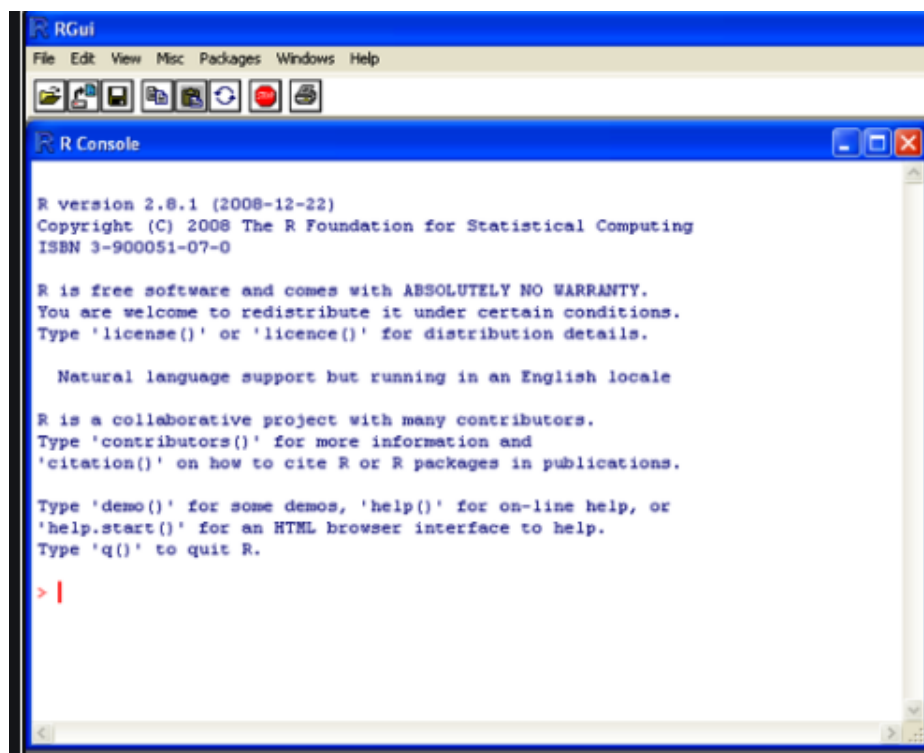
Fig. 3.2: Interface of R Software

Figure 3.2 shows the interface of R software, where the commands need be written.

3.4.C.3 Notations of R

Notations from R, used for the study are described below.

1. **rep:** This notation used for replicating object.

   Example:

   Question 1: Library staff members are well trained and qualified

   Answer retrieved from 5 Point likert scale as:

   94 people selected point 1

   151 people selected point 2

   83 people selected point 3

   26 people selected point 4

   10 people selected point 5

   This had been written in R as:

   X1<-c(rep(1,94), rep(2,151),rep(3,83), rep(4,26), rep(5,10))

2. **length:** This notation had been used to check the total number.

   This has been written in R as:

   Length(X1)

3. **mean:** This function had been used to calculate the mean.

   This had been written in R as:

   mean(X1)

4. **t.test:** this function had been used to calculate the p value from users' expectation data and users' satisfaction data.

   This has been written in R as:

   t.test(X2,X1, paired=TRUE)

3.5 Summary

This study gave justifications for the tools and techniques used in the study along with their justifications. The format of LIBQUAL, a quality assessment tool had been used for collecting users' expectation and user's satisfaction data. LIBQUAL format composed of 22 main questions. 5-point Likert scale was used for measurement of collected data. R software was used to conduct the statistical analysis as well as for data representation.

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Knowledge Management Tools for Library Service Quality Assessment

Revolution of information and communication technology has transformed the role of library from store house to knowledge centre. Librarians are not only dealing with books rather they deal with information. They provide right knowledge at right time. Understand the users' need is very much needed before providing right knowledge and fulfilling the users' need. This only can make the users satisfied. User satisfaction is the main aim of any library. Less the gap between users' expectation and satisfaction makes a library more successful. To maintain the quality of library a quality assessment tool needs to be used on regular basis.

Considering the importance of the knowledge management tools and techniques in knowledge capturing and dissemination, an endeavour was made to examine the performances of the existing knowledge management tools and techniques.

4.1 Objective of the Study

The objective of this study was to compare the performances of the existing Library Service Quality assessment tools for finding out the suitable quality assessment tool for knowledge management in JU central library.

4.2 Methodology

To attain the objective of the study, a comprehensive literature search was done. To gather such relevant information various resources had been consulted, such as journal articles, conference papers, research reports, theses and dissertations, books, electronic information sources. To get access to such sources, both print and electronic document substitutes like bibliographies, indexes, library catalogues, and guide books had also been used. However, a major portion of data had been collected from different databases, like Library and Information Science Abstract (LISA), Indian Library Science Abstract (ILSA), Indian Science Abstract, Web of Science, Scopus, Library, Information Science & Technology Abstracts (LISTA), Nlist, NDL, ProQuest Dissertation & Theses Global, Indian Dissertation Abstracts and University News.

4.3. Library Service Quality Measurement Tools

Tools which can be used for library service quality assessment are as below

4.3.A TQM

It emerged in around 1920. TQM deals with users' satisfaction by fulfilling their need and providing right services at right time (Omachonu, 2005).

The areas where TQM is mostly used are: Finance, Banking, Manufacturing, Food Supply and Medicine.

TQM has five parameters. Such as Product, Process, Organization, Leadership and Commitment.

4.3.B SERVQUAL

SERVQUAL was developed in between 1985 to 1994, developed by Parasuraman et al. SERVQUAL model was developed based on a gap model which says that the service quality gap means the gap between users' expectation and perception.

The areas where SERVQUAL can be used are: Business schools, Travel & tourism, Accounting firms, Airlines, Mobile telecommunications, etc.

Widely used five parameters of SERVQUAL are namely: Tangible, Reliability, Responsiveness, Assurance, and Empathy. The original SRVQUAL model had ten parameters.

4.3.C LIBQUAL

LIBQUAL model is based on SERVQUAL principle. This model was developed to understand the thought of library users', regarding the library services and products. It helps the libraries not only to assess and improve service quality but also to find out the gap between users' expectation & satisfaction.

It is comprising of 22 core questions which helps in identifying users' expectations as well as satisfaction. These 22 questions are divided in three parameters such as: Affect of Services, Information Control and Library as a Place.

4.4. Parameters of TQM, SERVQUAL and LIBQUAL in Context to Library

4.4.A Parameters of TQM

Parameters of TQM in context of Library can be presented as below

Table 4.1 shows the parameters of TQM in context of Library

Table 4.1: Parameters of TQM

Parameters	Library Context
Product	➢ Collection of printed documents. ➢ Collection of updated e-documents. ➢ Digital Library facility.
Process	➢ Service status (providing services as promised). ➢ Easy membership registration process. ➢ Smooth and easy fine payment system. ➢ Useful and easy to handle information search and retrieval gateway.
Organization	➢ Physical facilities (building, lighting, seating arrangement). ➢ Equipment (computer, printer, scanner, etc.). ➢ User friendly library hour. ➢ Self-issue return facility.
Leadership	➢ Knowledge of Librarian's and library staff members. ➢ Reward recognition for motivating the staff members. ➢ Maintaining the unity among library staff members for better performance.
Commitment	➢ Promptness (readiness of library staff members). ➢ Willingness (library staff members hospitality). ➢ Skill (library staff members' technical and professional skill). ➢ Courtesy (hospitality of library staff members).

Table 4.1 shows how the parameter of TQM can fit with library process.

4.4.B SERVQUAL Parameters

Parameters of SERVQUAL in context of Library are as below:

Table 4.2 shows the parameters of SERVQUAL in context of Library

Table 4.2 Parameters of SERVQUAL

Parameters	Library context
Tangible	➢ Library Collections (print and digital). ➢ Support services (guidance of library staff towards users' community). ➢ Physical facilities (building, lighting, seating arrangement). ➢ Equipment (computer, printer, scanner, etc.).
Reliability	➢ Accuracy (authenticity of information/ resources). ➢ Service status (providing service as promised).
Responsiveness	➢ Promptness (readiness of library staff members). ➢ Willingness (library staff members hospitality). ➢ Knowledge (librarians' and library staff members knowledge).
Assurance	➢ Skill (library staff members' technical and professional skill). ➢ Courtesy (hospitality of library staff members).
Empathy	➢ Sincerity (librarians' and library staff members' sincerity towards their work). ➢ Concern (fulfilment of user demand).

Table 4.2 explains the parameters of SERVQUAL in context of library services.

4.4.C Parameters of LIBQUAL Model

Parameters of LIBQUAL are as below.

Table 4.3 shows the parameters of LIBQUAL in context of Library

Table 4.3 Parameters of LIBQUAL

Areas	Library context
Affect of service	➢ Qualification and training development status of library staff members. ➢ Willingness and ability to serve the user need. ➢ Behaviour, hospitality of the staff members toward the users. ➢ Proper arrangement of a useful user orientation.
Information control	➢ Collection of printed books and journals as per users' need. ➢ Collection of proper e-books, e-journals for digital library can fulfil users need. ➢ A well-maintained, user-friendly information search and retrieval gateway. ➢ Availability of sufficient newspaper and magazines as required. ➢ Enough number of computer terminals with good condition and internet connectivity for users. ➢ Useful current awareness service for the users.
Library as a place	➢ Calm, quiet, neat and clean reading room. ➢ Good lighting and airy reading room. ➢ Well maintained safety policy. ➢ Enough place for group study as well as self-study.

Table 4.3 shows the parameters of LIBQUAL along with the areas where can get it implemented.

Two sets of data i.e., users' expectation and users' satisfaction can give an idea about the gap areas or areas for improvement.

4.5 Summary

Total Quality Management is a management tool which is basically used to improve the quality of an organisation. It was made for manufacturing sector but it has been used by various other industries too for their quality improvement process. Based on TQM principle SERVQUAL was developed. SERVQUAL was developed for measuring service quality of any organisation by capturing respondent's perception as well as expectations. A questionnaire has been used for data collection whose format it pre-defined. Parasuraman, et. al. (1988) designed this model for calculating the gaps. SERVQUAL is widely used in business schools, travel & tourism, accounting firms, airlines, mobile telecommunications, etc Based on SERVQUAL principle few more industry specific service quality assessment tool was developed. Such as DINESERV, ECOSERV, SELEB, LIBQUAL etc. Out of these tools LIBQUAl was developed for measuring the quality of library process and services. So, LIBQUAL had been selected for this study as quality assessment tool.

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<div align="right">**Chapter – 5**</div>

Analysis and Interpretations

This part of the study will deal with analysis of collected data and present those with various bar diagram and charts. The area of the study was Jadavpur University Central Library and the various user groups of the same. Collected data were analysed and interpreted in various stages.

5.1 Library Profile

The library profile is given below.

5.1.A General Information

This section deals with the general information about JU central library. Such as:

Name of the Library: Jadavpur University Central Library

Type of the Library: Academic

Nature of the Library Building: Independent

Total Area of the Building: Old Building: 36000sqft.

Annex Building: Four storied building where each floor is about 5500sqft.

Total Seating Capacity: 800

5.1.B. Number of Participants from Each Strata

The below mentioned diagram shows the number of users got selected from each strata. Questionnaire were distributed among each strata equally which is 3% from each strata.
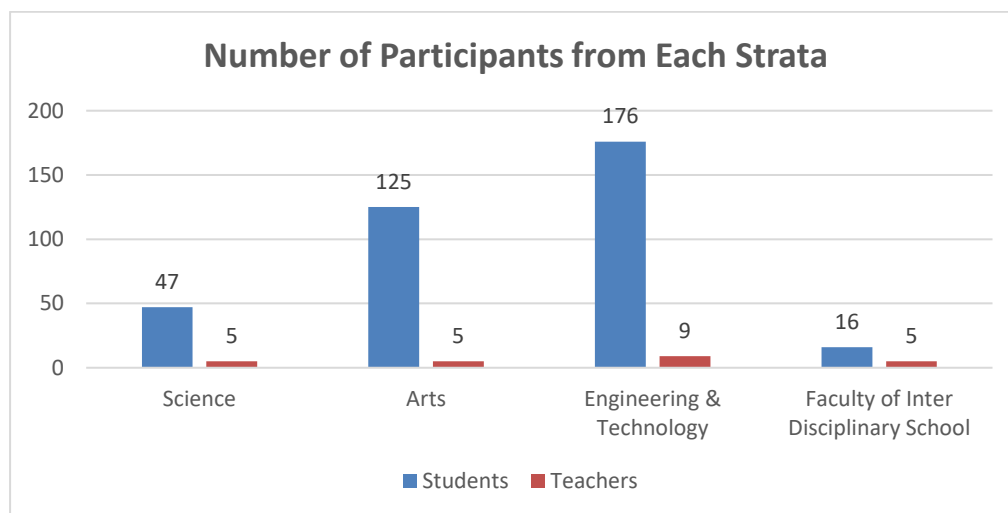
Fig. 5.1: Number of Users from Each Strata

Explanation:

Total number of students in Science were 1549 out of which 47 got selected for the study, whereas total number of teachers were 136 in which 5 got selected. In Arts faculty total number of students were 4170 out of which 125 got selected, and out of 162 teachers 5 got selected in the survey. Out of 5858 students in Engineering and Technologies, 176 students got selected and out of 299 teachers 9 got selected for the study. 16 students got selected from faculty of Inter Disciplinary School Law and Management out of 532 students and 5 teachers got selected out of 166 teachers.

5.1.C Age Group of the Participants

The below mentioned figure 5.2 shows the number of participants from various age groups.
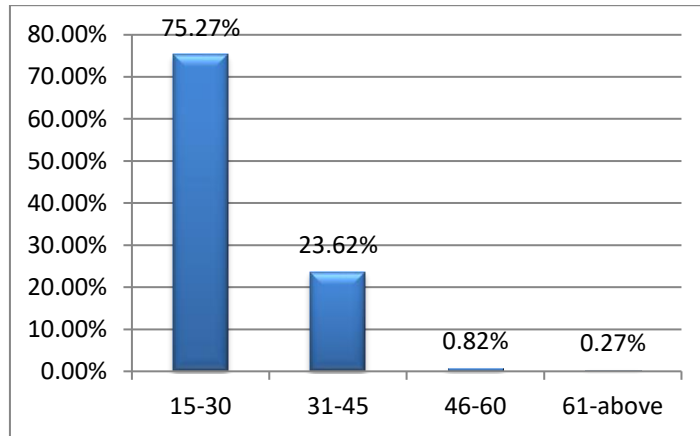
Fig. 5.2: Participants from Various Age Group

Explanation:

The data shows that the sample size is 364. Out of 364 users 75.27% are in 15-30 years age group, 23.62% are in 31-45 years age group 0.82% are in 46-60 years age group and 0.27% in 61 and above age group.

5.1.D Male Female Ratio of the Participants

The below mentioned diagram shows the male female ratio of the participants.
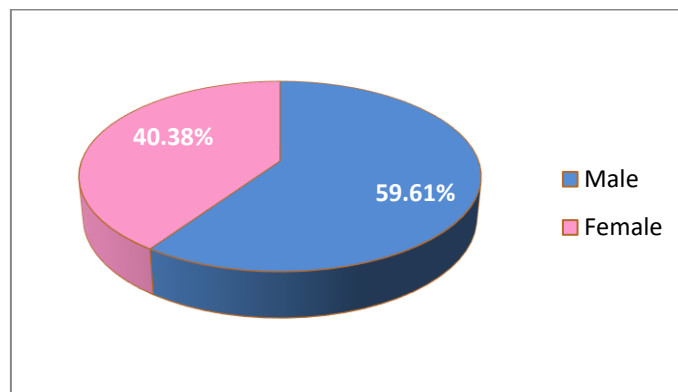
Fig. 5.3: Male Female Ratio of Participants

Explanation:

Out of 364 participants 40.38% were female and 59.61% were male.

5.1.E Frequency of Central Library Visits

The below mentioned diagram shows the frequency of central library visits by the participants.
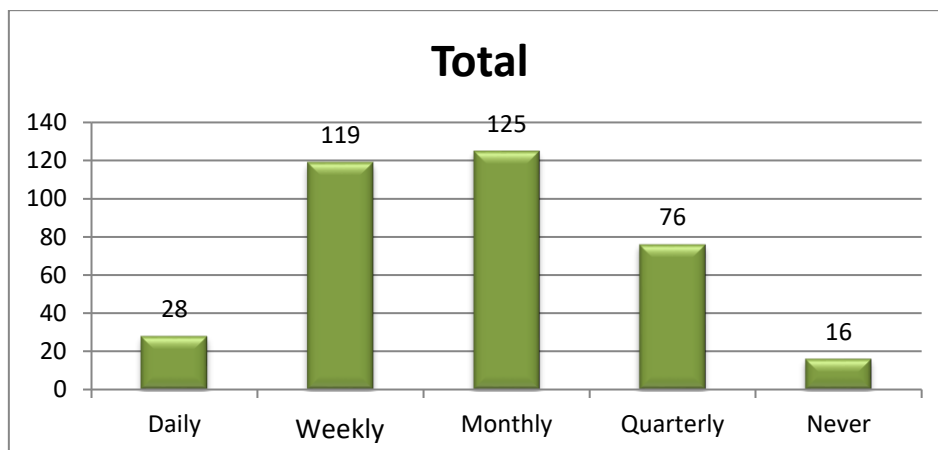
Fig. 5.4: Frequency of Central Library Visit

Explanation:

Out of 364 participants in the survey 28 were regular visitors 119 visited weekly 125 visited monthly 76 visited quarterly whereas 16 users said they never visited central library.

5.1.F Frequency of Departmental Library Visit

The below mentioned diagram shows the frequency of departmental library visits by the participants.
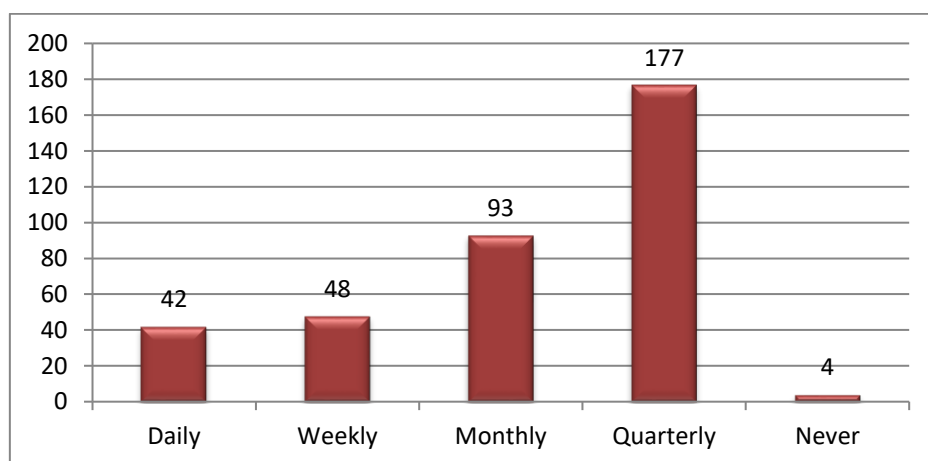
Fig. 5.5: Frequency of Departmental Library Visit

Explanation:

Among 364 participant 42 answered that they visits departmental library regularly 48 said weekly 93 said monthly whereas 177 said quarterly and 4 people said they never visits departmental library. Here one thing may need to be added that out of 4 people (who said never visited departmental library) 3 were staff members so they may not need to visit any departmental library for their personal use.

5.1.G Frequency of Library Webpage Visit

The below mentioned diagram shows the frequency of library webpage visits by the participants.
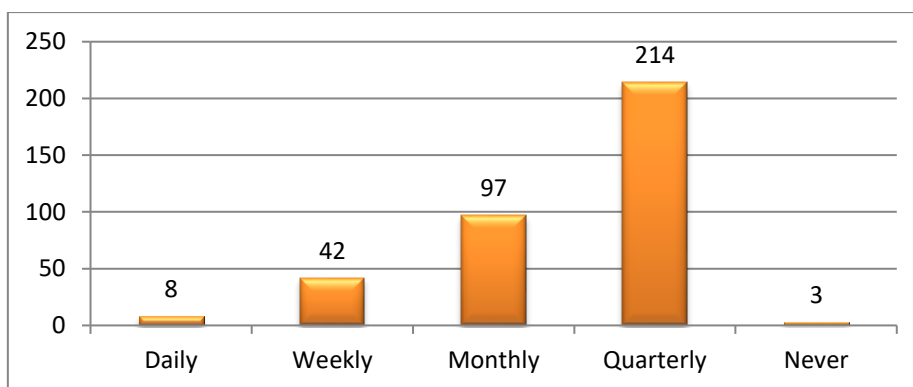
Fig. 5.6: Frequency of Library Webpage Visit

Explanation:

In case of library webpage visits the result shows only 08 user regularly viewed Library webpage, 42 said weekly 97 said monthly, 214 said quarterly and 03 said they never viewed it.

5.1.H Frequency of Visit to Other Library

The below mentioned diagram shows the frequency of visit to other library by the participants.
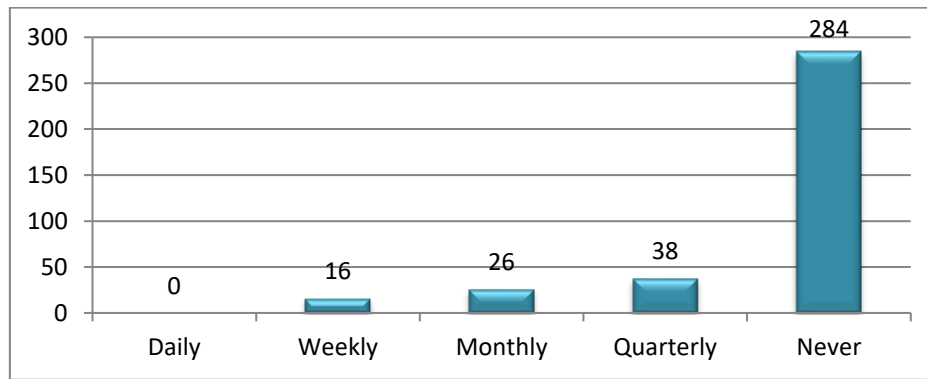
Fig. 5.7: Frequency of Visit to Other Libraries

Explanation:

Out of 364 participants no one answered yes for regular visits to another library. 16 users said that they visit weekly out of which one visits Golpark Ramkrishna Mission Library for doing professional course. Another one said she visits a public library at her locality to get storybook for her grandmother. Two of them visits weekly to get employment newspapers such as 'Karmakhetra', 'Karmasansthan', 'Jibika Dishari', etc. Two more said they visits to attain Spoken English classes. 36 users said they visits monthly 38 said they visit quarterly and 284 said they never visited any other library apart from their own institutional library.

5.1.I Frequency of Non-Library Gateways Visits

The below mentioned diagram shows the frequency of non-library gateways visits by the participants.
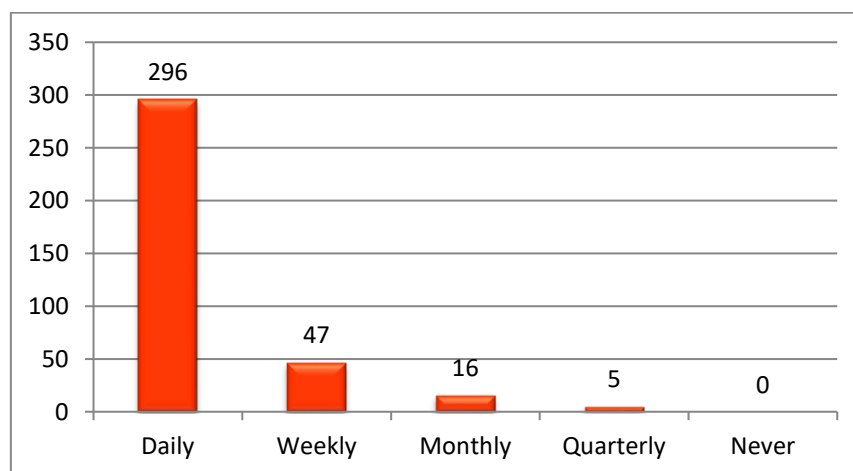
Fig. 5.8: Frequency of Non-Library Gateways Visits

Explanation:

Surprisingly the answers of this question were little bit different from previous answers. Out of 364 users all were using non-library gateways for getting information though the need may various. For example, few may look for travel information, few were searching cooking recipes, few may try to get job vacancy related information, few may try to get information regarding higher studies, etc. Though these were not directly related to traditional library's main functions. The concern was participants, who were searching e-books, e-journals, syllabus, etc. from various databases which may lead towards the downfall of users' attendance at Central Library.

So, the result says out of 364 users 296 said they regular visits other gateways 47 said weekly 16 said monthly and 05 said quarterly.

5.2 Library Holding and Services

5.2.A Library Collection

The below mentioned table 5.1 gives an idea about holding of Central Library.

Table 5.1: Library Collection

Library Collection as per 2018-19 Annual Report	
Item Type	**Number**
Books	685043
Journals (Bound volumes)	82154
Thesis	8688
Dissertations	8631
CD	3047
Braille	122
eBook	4813
Standards	3000
Non-book material	37000

Table 5.1 shows the number JU central library collection resource wise.

5.2.B Availability of the Following Library Services

The results of various parameters are described in below mentioned table 5.2

Table 5.2: List of Library Services

Library Services	Availability
Book issue	Yes
Book return	Yes
Book reserve	Yes
Card catalogue	Yes
OPAC	Yes
Mobile OPAC	No
Access to current issues of journals	Yes
Access to back volumes of journals	Yes
Reference and information services	Yes
Library webpage	Yes
Access to database, abstracting and indexing journals	Yes
Access to rare books	Yes
Inter-library loan	Yes
Photocopy /scanning/ printing	Yes
Current Awareness Service	Yes
Display of new arrivals/ notice boards	Yes
Computer/ internet facility	Yes
Newspaper	Yes
Magazines	Yes
e-book/ e-journal	Yes
Institutional repositories	Yes
Availability of previous year question papers	Yes
Talking books	Yes
Brail documents	Yes
Digital library	Yes
Self-issue	No
Self-return	No
Library mobile app	No

Table 5.2 shows the availability of library services at JU central library.

5.2.C Library Working Hour

Table 5.3 will give an idea about the Jadavpur University central library working hour.

Table 5.3: Library Working Hour

Days	Central Library (Main Campus)	Salt Lake Campus
Monday to Friday	10.00 a.m. to 6.30 p.m.	10.00 a.m. to 6.30 p.m.
Saturday	10.00 a.m. to 5.30 p.m.	10.00 a.m. to 5.30 p.m.
Sunday	11.00 a.m. to 6.00 p.m.	11.00 a.m. to 6.00 p.m.

Table 5.3 shows JU central library's working hour.

5.3 Users' Need Analysis

To understand users' need, most wanted library services were identified and ranked as per users' demand.

5.3.A Most Wanted Services from Parameter Affect of Services

Based on the collected data nine most wanted services were selected for the study from affect of services parameter.

Table 5.4 shows the rank of library services based on users' data selected from affect of services area.

Table 5.4: Most Wanted Library Services

Affect of services	Rank
Library staff makes information easily accessible	1
Library staff will willingly guide the user and provides personal attention to each user	2
Library staff understands the need of the user	3
Library staff makes arrangement of fruitful user orientation for better service	4
Behaviour of Library staff is very co-operative and polite	5
Library staff will provide right direction to retrieve right information	6
Library staff have good knowledge of modern technologies	7
Library staff has enough knowledge to solve user queries	8
Library staff are well trained and qualified	9

Table 5.4 shows rank wise wanted library services.

5.3.B Most Wanted Library Services from Information Control

Eight most wanted Library services based on user preference are described below.

Table 5.5 shows the rank wise list of 8 most wanted library services from information control

Table 5.5: Most Wanted Library Services from Information Control

Library Collection	Rank
Printed Books you required for your work	01
Computer facility/ Internet	02
Information search gateway (Card Catalogue/OPAC/WebOPAC)	03
Printed Journals you required for your work	04
Newspaper/ Magazines	05
Library Notice Boards/ New arrival display/ current awareness services	06
e-Book/e-journals/ Digital Library	07
Photocopy/ Scanning/ printing Service	08

Table 5.5 shows the rank wise important library services in the area of information control.

5.4 Users' Expectation

Data were collected from the users to understand their expectation from the central library. Answers were collected in 5-point likert scale.

Table 5.6, given below, shows the result of users' expectation in 5-point likert scale

Table 5.6: Result of Users' Expectation

AREAS	1	2	3	4	5
Affect of Services					
Library staff members are well trained and qualified (X1)	94	151	83	26	10
Library staff will provide right direction to retrieve right information (Y1)	05	37	151	104	67
Library staff will willingly guide the user (Z1)	00	31	89	124	120
Library staff understands the need of the users (A1)	10	21	94	130	109
Behaviour of Library staff is very co-operative and polite (B1)	00	31	172	94	67
Library staff provides personal attention to individual users (C1)	16	47	129	114	58
Library staff has enough knowledge to solve user queries (D1)	26	42	151	93	52
Library staff makes information easily accessible (E1)	00	16	58	130	160
Library staff makes arrangement of fruitful user orientation for better service (F1)	26	42	62	156	78
Information Control					
Printed books you required for your work (G1)	00	00	10	10	344
Printed journals you required your work (H1)	16	37	120	108	83
e-book/e-journals/ Digital Library(J1)	16	58	149	104	37
Information search gateway (card catalogue/ OPAC/ WebOPAC) (K1)	26	89	109	98	42
Newspaper/ Magazine (L1)	47	160	68	52	37
Computer / Internet facility (M1)	58	108	104	57	37
Photocopy/Scanning/ Printing service (N1)	16	67	78	94	109
Notice boards/ new arrival display/ current awareness service (P1)	31	146	109	52	26
Library As a Place					
Library reading room is very calm, quiet, neat and clean (Q1)	0	37	52	104	171
Library furniture are modern and comfortable to use (R1)	88	110	73	52	41
Good Lighting and airy (S1)	05	21	68	83	187
Library is very safe for self-study (T1)	26	68	151	88	31
Enough reading room place and enough place for group study (U1)	10	16	88	94	156

Table 5.6 reveals the result of users' expectation.

5.5 Users' Satisfaction

Data were collected from the users to understand their satisfaction after using central library. Answers were collected in 5-point likert scale.

Table 5.7, given below, shows the result of users' satisfaction data on 5-point likert scale

Table 5.7: Users' Satisfaction

AREAS	1	2	3	4	5
Affect of Services					
Library staff are well trained and qualified (X2)	00	10	58	83	213
Library staff will provide right direction to retrieve right information (Y2)	05	26	68	94	171
Library staff will willingly guide the user (Z2)	05	31	98	120	110
Library staff understands the need of the users (A2)	05	37	104	114	104
Behaviour of Library staff is very co-operative and polite (B2)	05	16	73	104	166
Library staff provides personal attention to individual users (C2)	05	31	94	120	114
Library staff has enough knowledge to solve user queries (D2)	15	26	68	104	151
Library staff makes information easily accessible (E2)	35	58	73	104	94
Library staff makes arrangement of fruitful user orientation for better service (F2)	10	42	58	62	192
Information Control					
Printed books you required for your work (G2)	44	110	129	73	08

Printed journals you required for your work (H2)	151	110	58	42	03
e-book/e-journals/ digital library (J2)	68	83	104	78	31
Information search gateway (card catalogue/ OPAC/ WebOPAC) (K2)	51	94	104	73	42
Newspaper/ Magazine (L2)	27	52	145	114	26
Computer / Internet facility (M2)	166	98	68	30	02
Photocopy/Scanning/ Printing service (N2)	98	130	83	37	16
Notice boards/ new arrival display/ current awareness service (P2)	31	78	94	73	88
Library As a Place					
Library reading room is very calm, quiet, neat and clean (Q2)	94	104	120	3	9
Library furniture are modern and comfortable to use (R2)	86	58	94	110	16
Good Lighting and airy (S2)	74	83	114	62	31
Library is very safe for self-study (T2)	00	10	47	104	203
Enough reading room place and enough place for group study (U2)	187	104	68	05	00

Table 5.7 reveals the result of users' satisfaction.

5.6 Graphical Representation of Users' Expectation and Users' Satisfaction

Collected data were graphically presented and interpreted in this section.

5.6.1 Library Staff are Well Trained and Qualified

The below mentioned diagram will depict the perspective of users in relation to qualification and training status of the Library staff members.
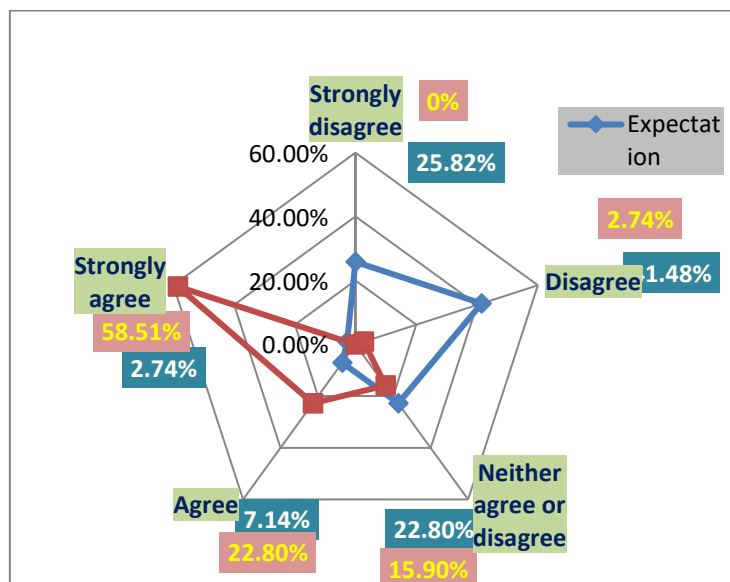
Fig. 5.9 Library Staff are Well Trained and Qualified in Respect to User Expectation and Satisfaction

After viewing user expectation data, it can be said that out of 364 users 94 (25.82%) were strongly disagreed upon the fact that 'Library staff are well trained and qualified.' 151 (41.48%) were disagreed, 83 (22.80%) were neutral, 26 (7.14%) were agreed and 10 (2.74%) were strongly agreed. Whereas the user satisfaction data says that 00 user was strongly disagreed upon the statement, 10 disagreed, 58 (15.90%) were neutral, 83 (22.80%) were agreed and 213 (58.51%) were strongly agreed upon the statement.

So, it can be said that in case of the statement 'Library staff are well trained and qualified' users' satisfaction is much higher than their expectation. As the value of mean gap between expectation and satisfaction is a positive value.

5.6.2 Library Staff will Provide Right Direction to Retrieve Right Information

The below mentioned diagram will depict the perspective of users in relation to friendliness of the Library staff members.
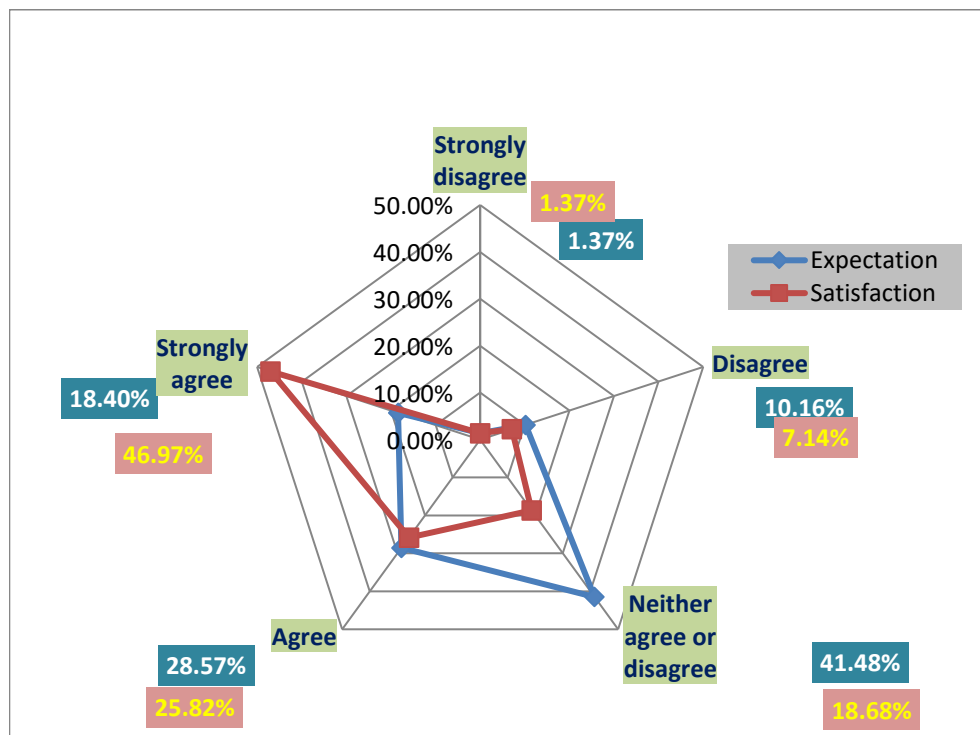
Fig. 5.10 Library Staff will Provide Right Direction to Retrieve Right Information-User Expectation and User Satisfaction

Users' expectation data says that out of 364 users, 05 (1.37%) were strongly disagreed upon the statement i.e., 'Library staff will provide right direction to retrieve right information', 37 (10.16%) were disagreed, 151 (41.48%) were neutral, 104 (28.57%) were agreed, 67 (18.40%) were strongly agreed. Whereas the user satisfaction data says that 05 (1.37%) were strongly disagreed, 26 (7.14%) were disagreed, 68 (18.68%) were neutral 94 (25.82%) were agreed and 171 (46.97%) were strongly agreed upon the statement.

Hence the value of mean gap between user expectation and satisfaction is 0.57 which is a positive value. So, it proves that in this case expectation is lower than the satisfaction. The remarkable point which should be mentioned here is out of 364 users 171 users strongly feels that Library staff will provide right direction to retrieve right information.

5.6.3 Library Staff will Willingly Guide the Users

The below mentioned diagram will depict the perspective of users in relation to willinness of the Library staff members.
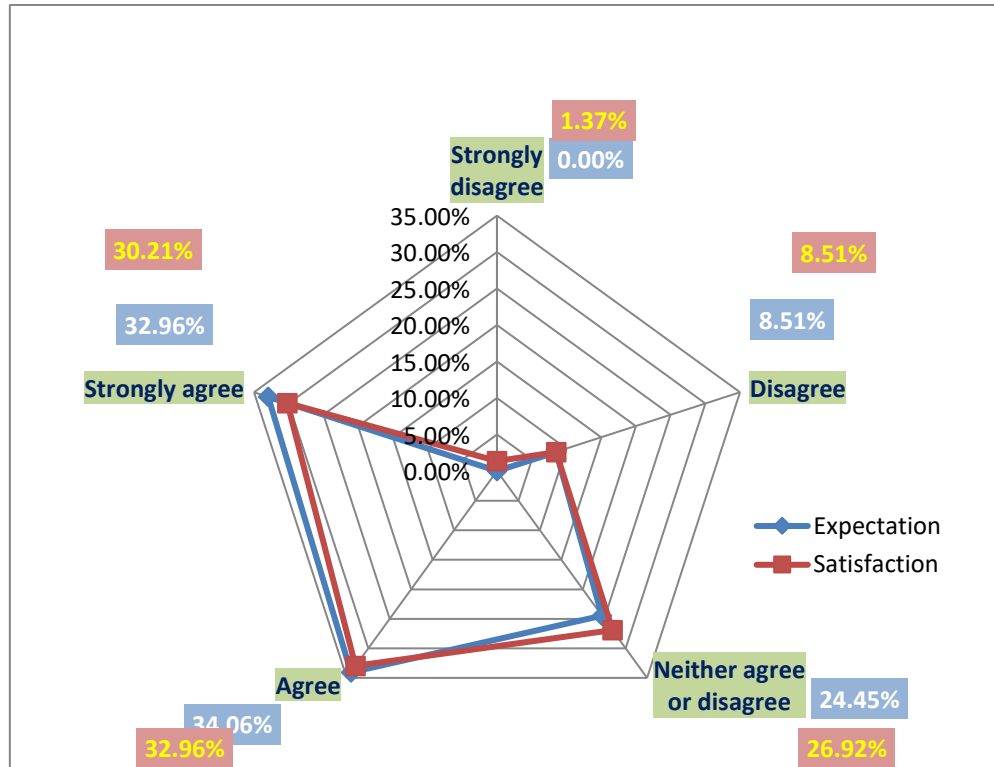
Fig. 5.11 Library Staff will Willingly Guide the User in Respect of User Expectation and User Satisfaction

Users' expectation data for the statement 'library staff will willingly guide the user' says that out of 364 users 00 (0%) were strongly disagreed, 31 (8.51%) were disagreed, 89 (24.45%) were neutral, 124 (34.06%) were agreed and 120 (32.96%) were strongly agreed upon the statement. Whereas the user satisfaction data says that 05 (1.37%) were strongly disagreed which needed to be pointed out, 31 (8.51%) were disagreed same as expectation, 98 (26.92%) were neutral, 120 (32.96%) were agreed which lesser that expectation, 110 (30.21%) were strongly agreed which is again lesser than expectation.

Hence, the value of mean gap is -0.09 which is a negative value. It's indicating that for this case users' expectation is higher than the satisfaction. It means this area needs to be improved. As this area comes under the library staff so management need to be careful about the human resource of the library, if required they may need to send for some professional training and development programme.

5.6.4 Library Staff Understands the Need of the Users

The below mentioned diagram will depict the perspective of users in relation to understanding of the Library staff members regarding users need.
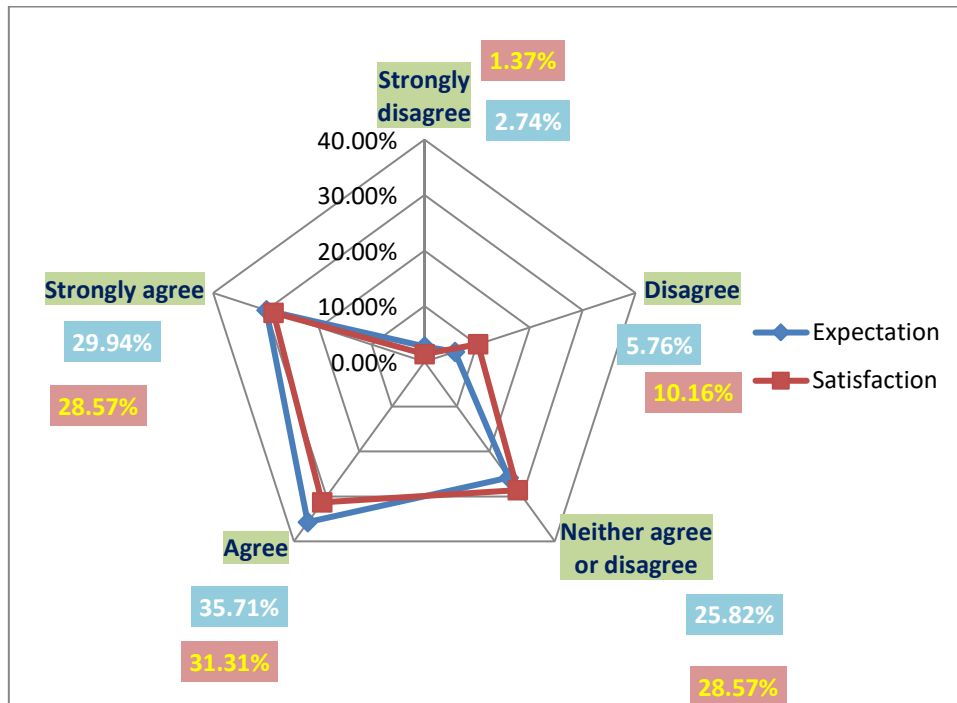


Fig. 5.12 Library Staff Understands the Need of the Users in Respect to Users'
Expectation and Users' Satisfaction

User expectation data regarding the statement 'library staff understands the need of the user' says that out of 364 users 10 (2.74%) were strongly disagreed, 21 (5.76%) were disagreed, 94 (25.82%) were neutral, 130 (35.71%) were agreed and 109 (29.94%) were strongly agreed upon the statement. Whereas users' satisfaction data for the same statement says that 05 (1.37%) were strongly disagreed which is lesser than the expectation and that gives positive remarks for library, 37 (10.16%) were disagreed, 104 (28.57%) were neutral, 114 (31.31%) were agreed which is lesser than expectation which is not at all good for the library and 104 (28.57%) were strongly agreed upon the statement which is again lesser than the expectation. Hence, the mean gap between user expectation and satisfaction is -0.09 which is a negative value. So, library management may need to look on this area for betterment.

5.6.5 Behaviour of Library Staff is Very Co-Operative and Polite

The below mentioned diagram will depict the perspective of users in relation to behaviour of the Library staff members.
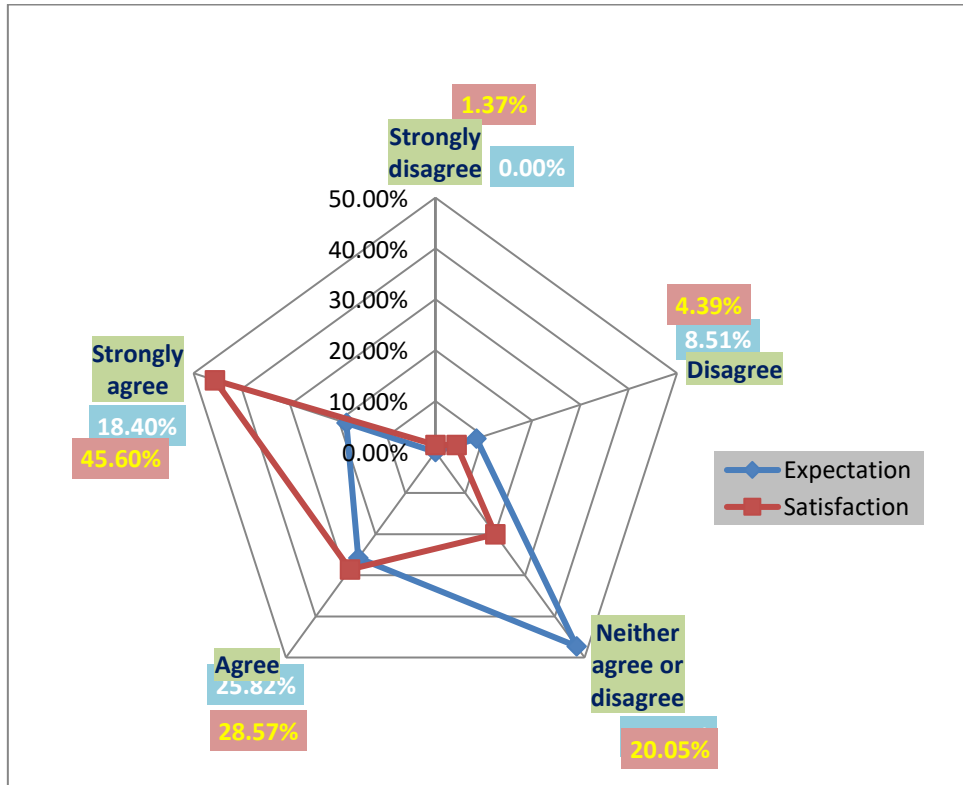
*Fig. 5.13 Behavior of Library Staff are Very Co-Operative and Polite in Respect to Users' Expectation and User's Satisfaction*

Users' expectation regarding 'Behavior of library staff are very co-operative and polite' shows that out of 364 users 0 (0%) user was strongly disagreed, 31(8.51%) were disagreed, 172 (47.25) were neutral, 94 (25.82%) were agreed and 67 (18.4%) were strongly agreed. Whereas the users' satisfaction data says that out of 364 users 5 (1.37%) were strongly disagreed, 16 (4.39%) were disagreed, 73 (20.05%) were neutral, 104 (28.57%) were agreed and 166 (45.60%) were strongly agreed. It must be mentioned here that in case of strongly agreed and agreed data for users' satisfaction is higher value than that of the user's expectation. On the other hand, the value of strongly disagree for user satisfaction is also higher than users' expectation.

Hence, the gap of mean value between users' satisfaction and users' expectation is 0.54 which is a positive value. It means users' satisfaction is higher than their expectation in this case.

5.6.6 Library Staff Provides Personal Attention to Individual Users

The below mentioned diagram will depict the perspective of users in relation to personal attention received from the Library staff members.
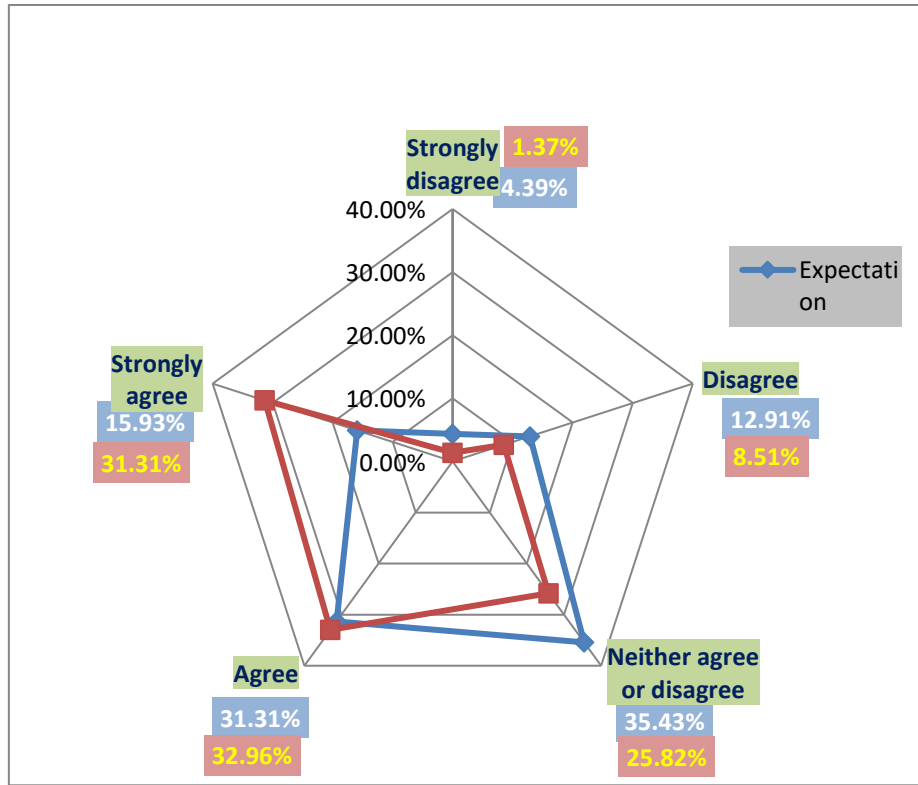
Fig. 5.14 Response to Library Staff Provides Personal Attention to Individual Users in Respect to Users' Expectation and Users' Satisfaction

User expectation data for the statement 'Response to library staff provides personal attention to individual users' says that out of 364 users 16 (4.39%) were strongly disagreed, 47 (12.91%) were disagreed, 129 (35.43%) were neutral, 114 (31.31%) were agreed and 58 (15.93%) were strongly agreed. Whereas user satisfaction data says that out of 364 users 5 (1.37%) only strongly disagreed which is lesser than expectation, 31 (8.51%) were disagreed, 94(25.82%) were neutral, 120 (32.96%) were agreed and 111 (30.49%) were strongly agreed. In this case change of value for strongly disagree, disagree, strongly agree and agree shows that library staff provides personal attention to individual users.

Hence, the gap of mean value is 0.43 which is a positive value which indicated that users' satisfaction is higher than users' expectation.

5.6.7 Library Staff has Enough Knowledge to Solve User Queries

The below mentioned diagram will depict the perspective of users in relation to knowledge of the Library staff members.
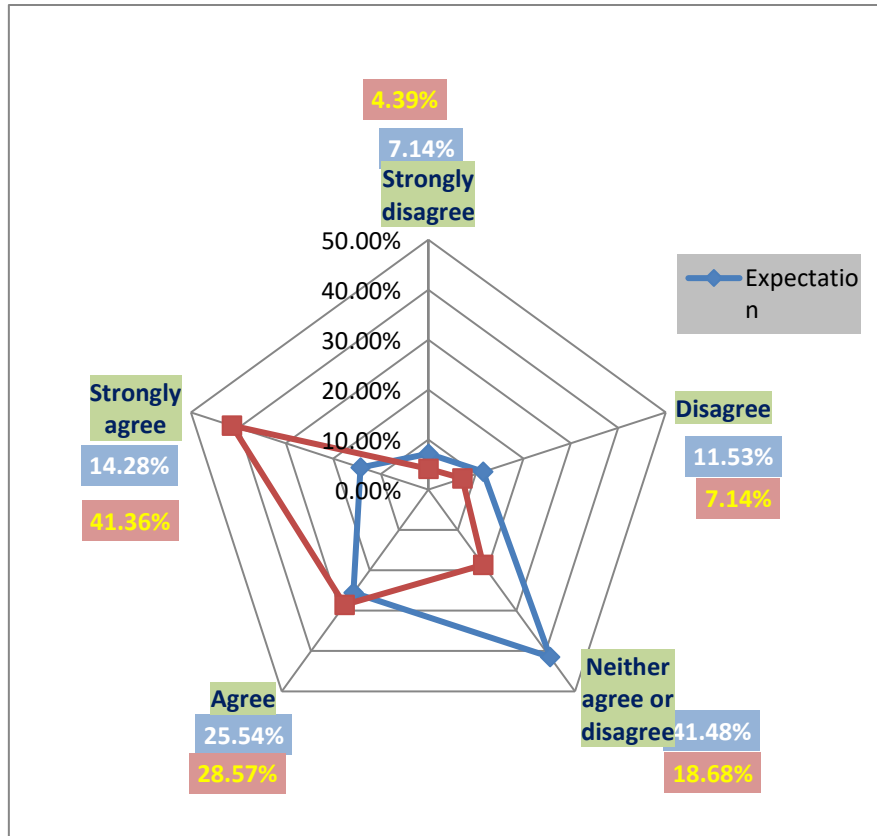

Fig. 5.15 Library Staff have Enough Knowledge to Solve User Queries in Respect to Users' Expectation and Satisfaction

In response to the statement 'library staff has enough knowledge to solve user queries', users' expectation data says that 26 (7.1%) users were strongly disagreed out of 364 total users, 42 (11.53%) were disagreed, 151 (41.48%) were neutral, 93 (25.54%) were agreed and 52 (14.28%) were strongly agreed. Whereas users' satisfaction data says that 15 (4.12%) users were strongly disagreed, 26 (7.14%) were disagreed, 68 (18.68%) were neutral, 104 (28.57%) were agreed which is higher than expectation, and 151 (41.48%) were strongly agreed which is also higher than the expectation. Hence, the gap of mean value between user satisfaction and user expectation is 0.68 which is a positive value that indicates users' feels that library staff have enough knowledge to solve their queries which is higher than their expectation.

5.6.8 Library Staff Makes Information Easily Accessible

The below mentioned diagram will depict the perspective of users in relation to easy acess of information.
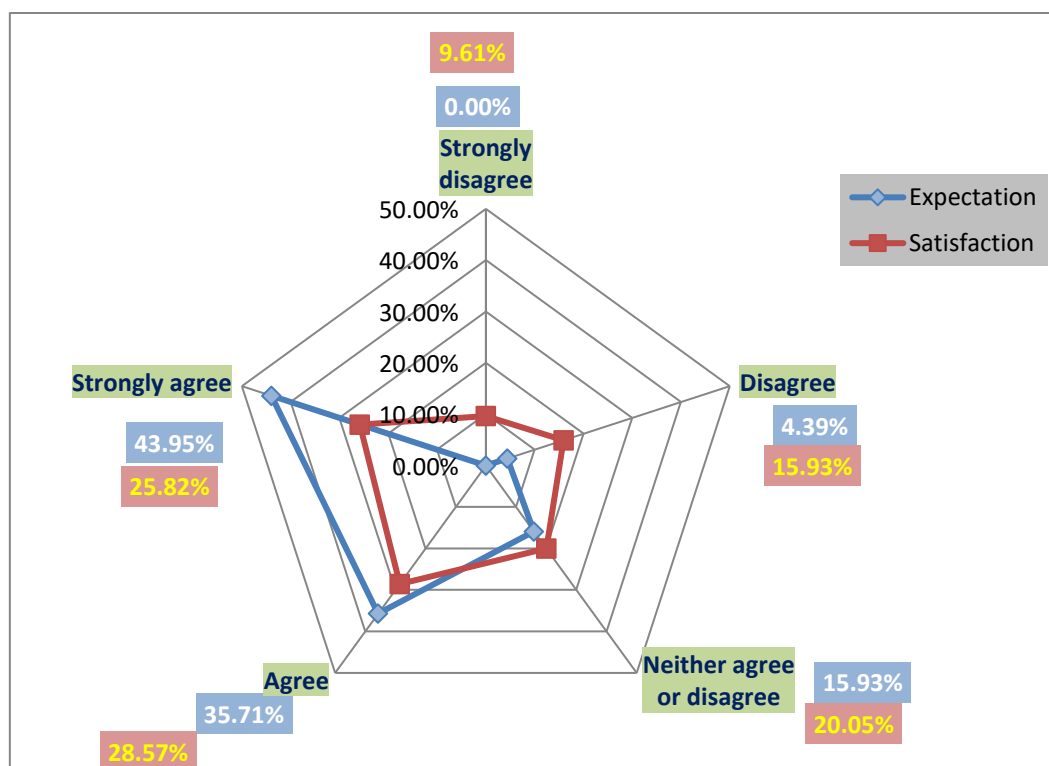
Fig. 5.16 Library Staff Makes Information Easily Accessible in Respect to Users' Expectation and Satisfaction

User expectation data for the statement 'library staff makes information easily accessible' says that out of 364 users' 0 (0%) was strongly disagreed, 16 (4.39%) were disagreed, 58 (15.93%) were neutral, 130 (35.71%) were agreed and 160 (43.95%) were strongly agreed. Whereas the user satisfaction data says that 35 (9.61%) were strongly disagreed, 58 (15.93%) were disagreed, 73 (20.05%) were neutral, 104 (28.57%) were agreed which lesser than expectation and 94 (25.82%) was strongly agreed this too is lesser than expectation.

Hence, the gap of mean value between user satisfaction and expectation is -0.74 i.e. a negative value. Expectation value is higher than the satisfaction value.

5.6.9 Library Staff Makes Arrangement of Fruitful User Orientation for Better Service

The below mentioned diagram will depict the perspective of users in relation to Library orientation.
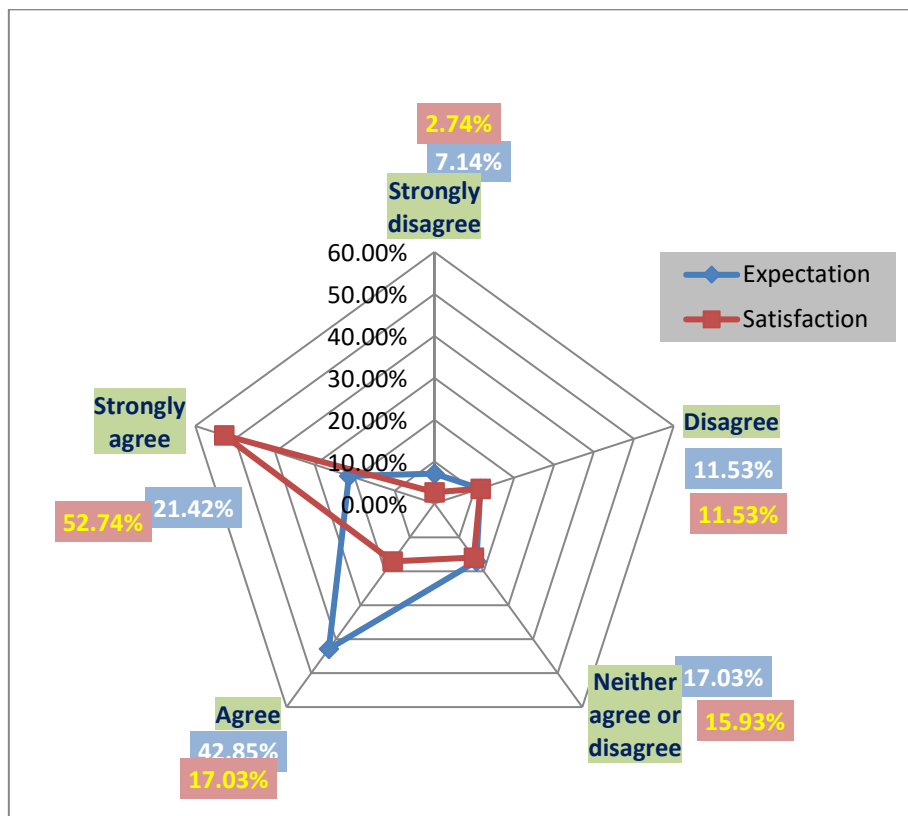
Fig. 5.17 Library Staff Makes Arrangement of Fruitful User Orientation for Better Service in Respect to User Expectation and User Satisfaction

User expectation data for the statement "library staff makes arrangement of fruitful user orientation for better service" says that out of 364 users 26 (7.14%) were strongly disagreed, 42 (11.53%) were disagreed, 62 (17.03%) were neutral, 156 (42.85%) were agreed and 78 (21.42%) were strongly agreed. Whereas the satisfaction data says that 10 (2.74%) were strongly disagreed, 42 (11.53%) were disagreed which are same as their expectation, 58 (15.93%) were neutral, 62 (17.03%) were agreed and 192 (52.74%) were strongly agreed that indicates that users' satisfaction is higher than their expectation for this statement.

Hence, the mean of gap value between users' satisfaction and users' expectation is 0.45 which is a positive value.

Information Control

5.6.10 Printed Books You Required for your Work

The below mentioned diagram will depict the perspective of users in relation to availibility of printed books.
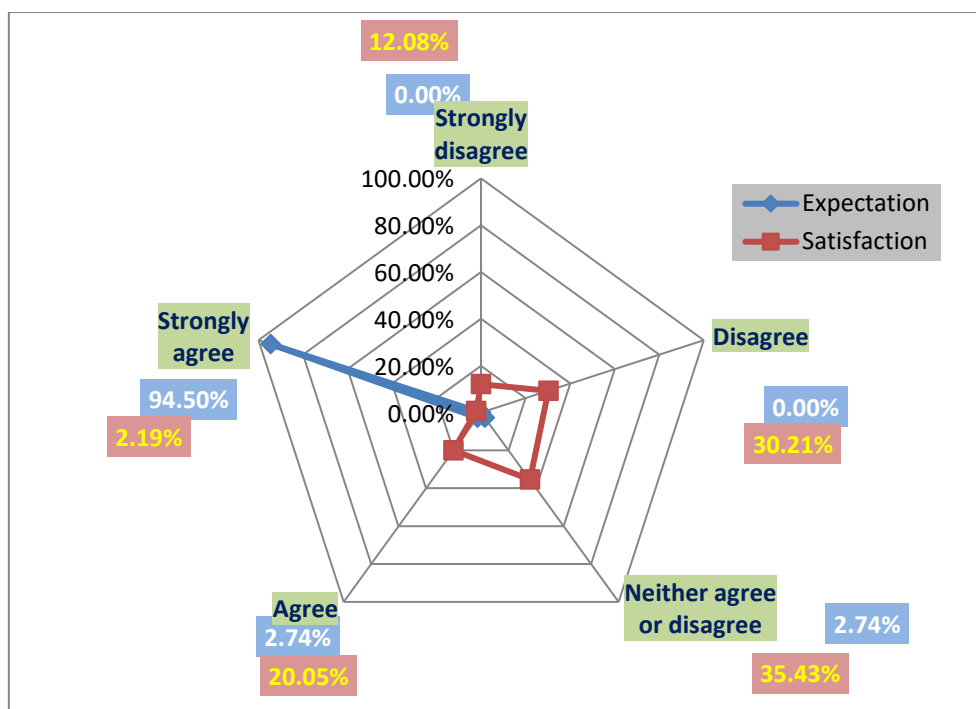
Fig. 5.18 Printed Books you Required for your Work in Respect to Users'
Expectation and Users' Satisfaction

User expectations data in respect to the statement 'printed books you required for your work' says that out of 364 users 00 (0%) was strongly disagreed, 00 (0%) was disagreed, 10 (2.74%) were neutral, 10 (2.74%) were agreed and 344 (94.50%) were strongly agreed upon the statement which is quite obvious as users come to library to get their required printed books only which they don't have their own. Whereas users' satisfaction data shows just opposite data which is really alarming. 44 (12.08%) were strongly disagreed which indicates they are not at all satisfied with the collection, 00 (0%) was disagreed, 129 (35.43%) were neutral, 73 (20.05%) were agreed i.e., only 20.05% out of total population and only 8 persons were strongly agree i.e. 2.19% out of total population. This result shows that Library management must think about the collection of printed books which can serve users need.

Hence the gap of the mean value between satisfaction and expectation is -2.19. The value is a negative value and it is quite high.

5.6.11 Printed Journals You Required for Your Work

The below mentioned diagram will depict the perspective of users in relation to availbility printed journals.
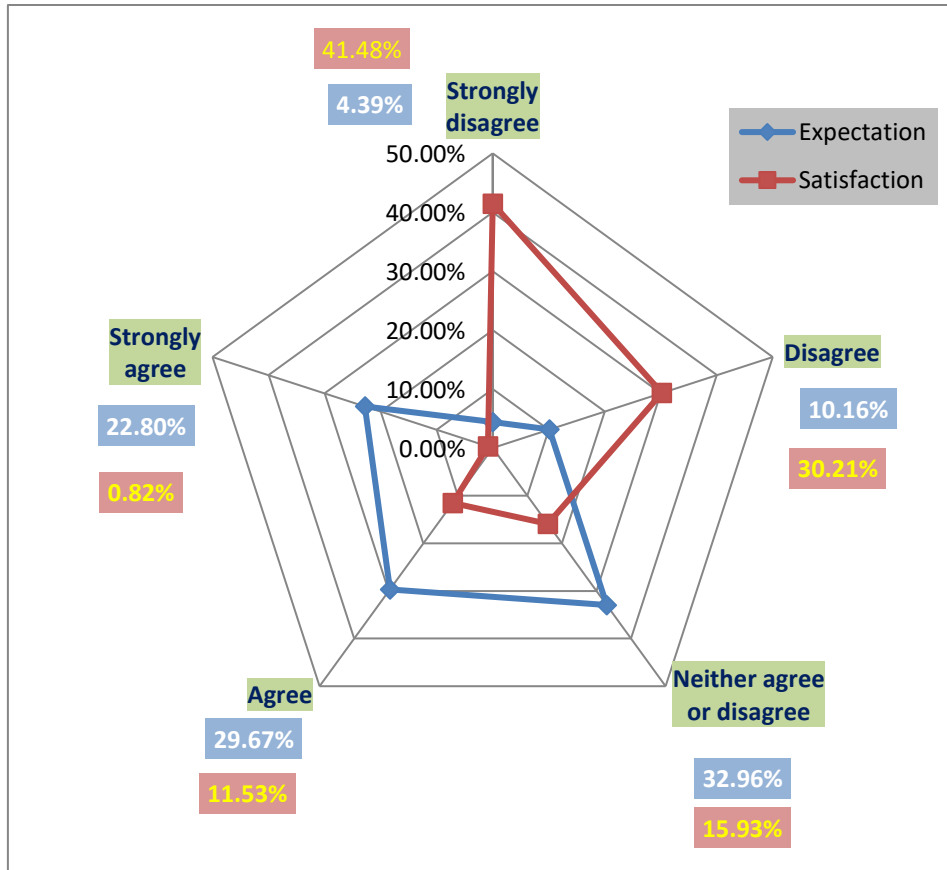
Fig. 5.19 Printed Journals You Required for Your Work in Respect to Users'
Expectation and Satisfaction

Users' expectation for the statement 'Printed journals you required for yourwork' says that out of 364 users 16 (4.39%) were strongly disagreed, 37 (10.16%) were disagreed, 120 (32.96%) were neutral, 108 (29.67%) were agreed and 83 (22.80%) were strongly agreed. Whereas the users' satisfaction data says that out of 364 users 151 (41.48%) were strongly disagreed, 110 (30.21%) were disagreed ,58 (15.93%) were neutral, 42 (11.53%) were satisfied and only 3 (0.82%) users were strongly satisfied. In this case management should take necessary action to improve the collection of printed journal collection to fulfil the users need.

Hence, the mean gap between satisfaction and expectation is -1.56. As this is a negative value which indicates area for improvement.

5.6.12 e-book/e-journals/ Digital Library

The below mentioned diagram will depict the perspective of users in relation to e-books / e-journals / digital library
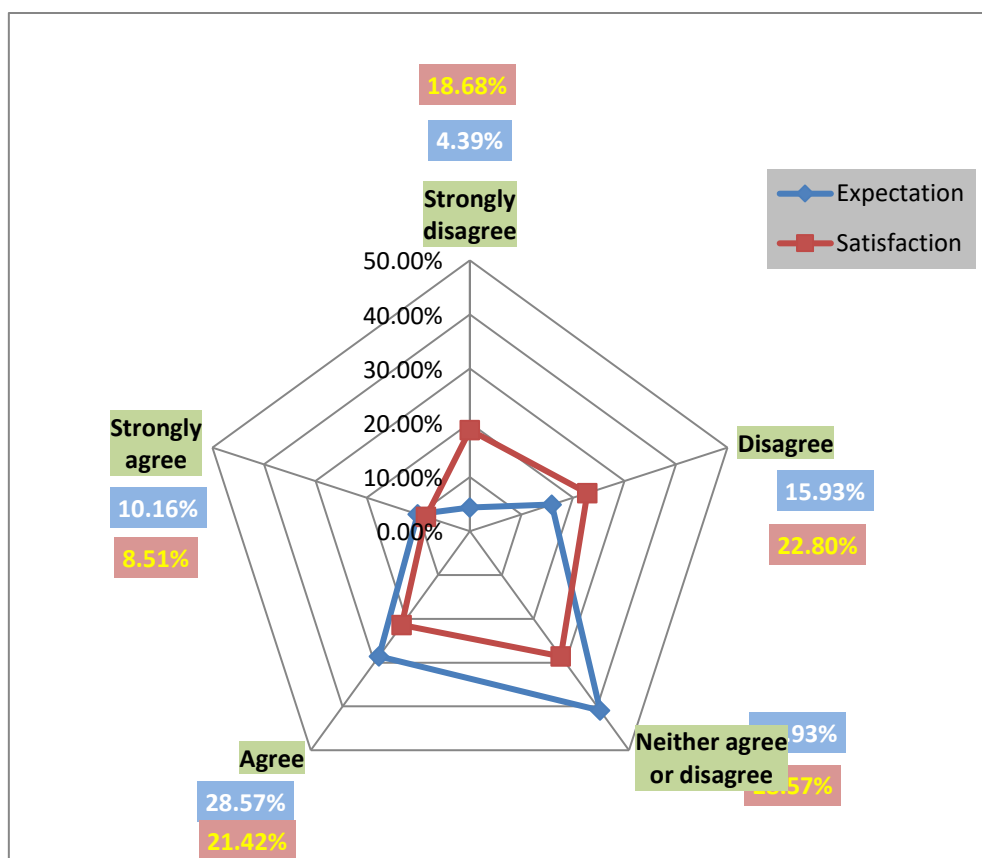
Fig. 5.20 e-Book/ e-Journal/ digital library in Respect to Users' Expectation and Users' Satisfaction

Users' expectation data for the statement regarding 'e-book/ e-journal/ digital library' says that out of 364 users 16 (4.39%) were strongly disagreed, 58 (15.93%) were disagreed, 149 (40.93%) were neutral, 104 (28.57%) were agreed and 37 (10.16%) were strongly agreed. Whereas users' satisfaction data says that 68 (18.68%) users were strongly disagreed, 83 (22.80%) were disagreed, 104 (28.57%) were neutral, 78 (21.42%) were agreed and 31 (8.51%) were strongly agreed.

Hence, the gap of the mean value between users' satisfaction and expectation is - 0.46. As the value is negative, Library authority should take a proper action to improve this area.

5.6.13 Information Search Gateway (Card Catalogue/ OPAC/ WebOPAC)

The below mentioned diagram will depict the perspective of users in relation to information search gateway of the Library.
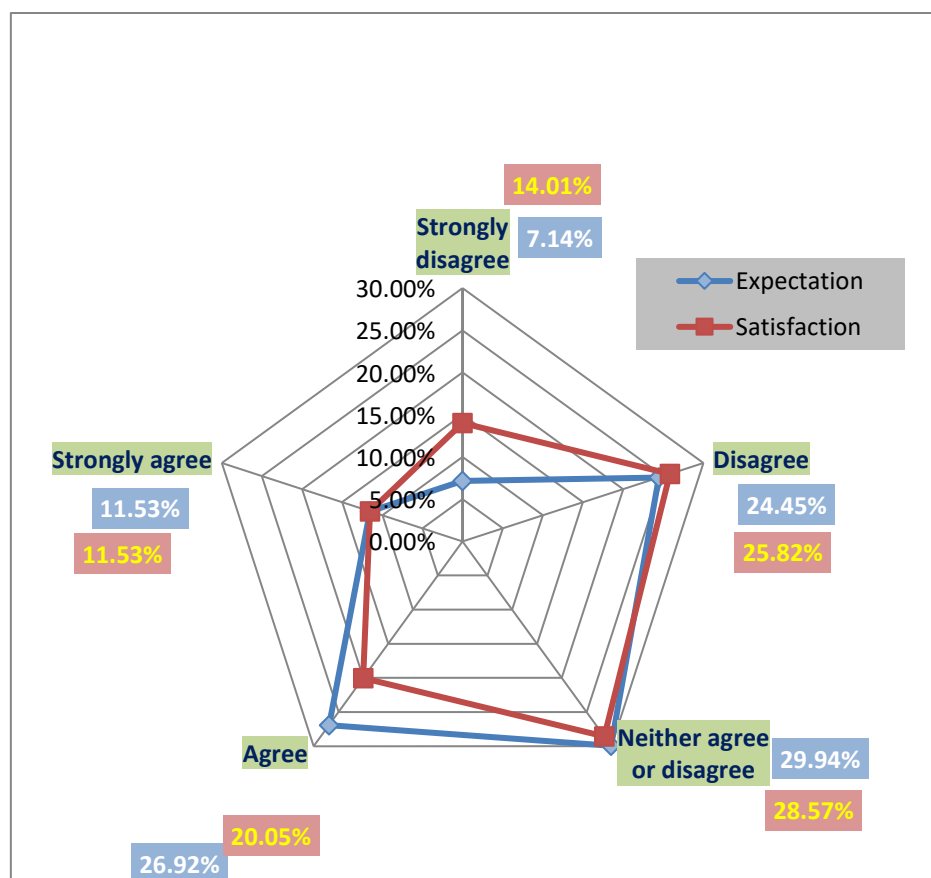
Fig. 5.21 Information Search Gateway (Card Catalogue/OPAC/WebOPAC) in Respect to User Expectation and User Satisfaction

Users' expectation data for the statement regarding 'information search gateway (card catalogue/OPAC/WebOPAC)' says that out of 364 users 26 (7.14%) were strongly disagreed, 89 (24.45%) were disagreed, 109(29.94%) were neutral, 98 (26.92%) were satisfied and 42 (11.53%) were strongly agreed. Whereas users' satisfaction data says that 51 (14.01%) were strongly disagreed which is nearly half of the expected value, 94 (25.82%) were disagreed, 104 (28.57%) were neutral, 73 (20.05%) were agreed which is approximately three times higher than expectation and 42 (11.53%) were strongly agreed which is surprisingly just equal as users' expectation.

Hence, the gap of mean value between users' satisfaction and expectation is -0.22 which is definitely a negative value but still it can be said that the value of strongly

agreed is equal in both cases where as the value of agreed is also higher in case of users' satisfaction than users' expectation.

5.6.14 Newspaper/ Magazine

The below mentioned diagram will depict the perspective of users in relation to availbility of Newspaper and Magazine.
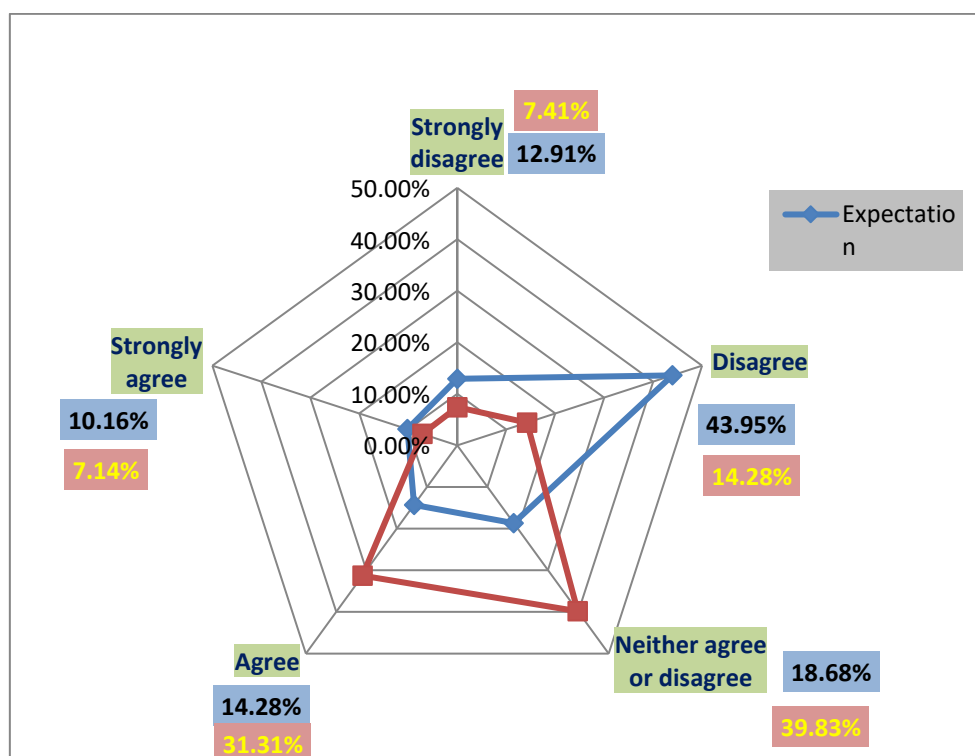
Fig. 5.22 **NEWS Paper/Magazine in** *Respect to Users' Expectation and Users' Satisfaction*

Users' expectation data for the statement 'NEWS paper/magazine' says that out of 364 users 47 (12.91%) were strongly disagreed, 160 (43.95%) were disagreed, 68 (18.68%) were neutral, 52 (14.28%) were agreed and 37 (10.16%) were strongly agreed. Whereas the users' satisfaction data says that out of 364 users 27 (7.41%) were strongly disagreed, 52 (14.28%) were disagreed, 145 (39.83%) were neutral, 114 (31.31%) were agreed and 26 (7.14%) were strongly agreed.

Hence, the gap of mean value is 0.52 which is a positive value. This indicates that users are satisfied with newspaper/ magazine collection of the library and the value

5.6.15 Computer/ Internet Facility

The below mentioned diagram will depict the perspective of users in relation to availability of Computer and Internet facility.
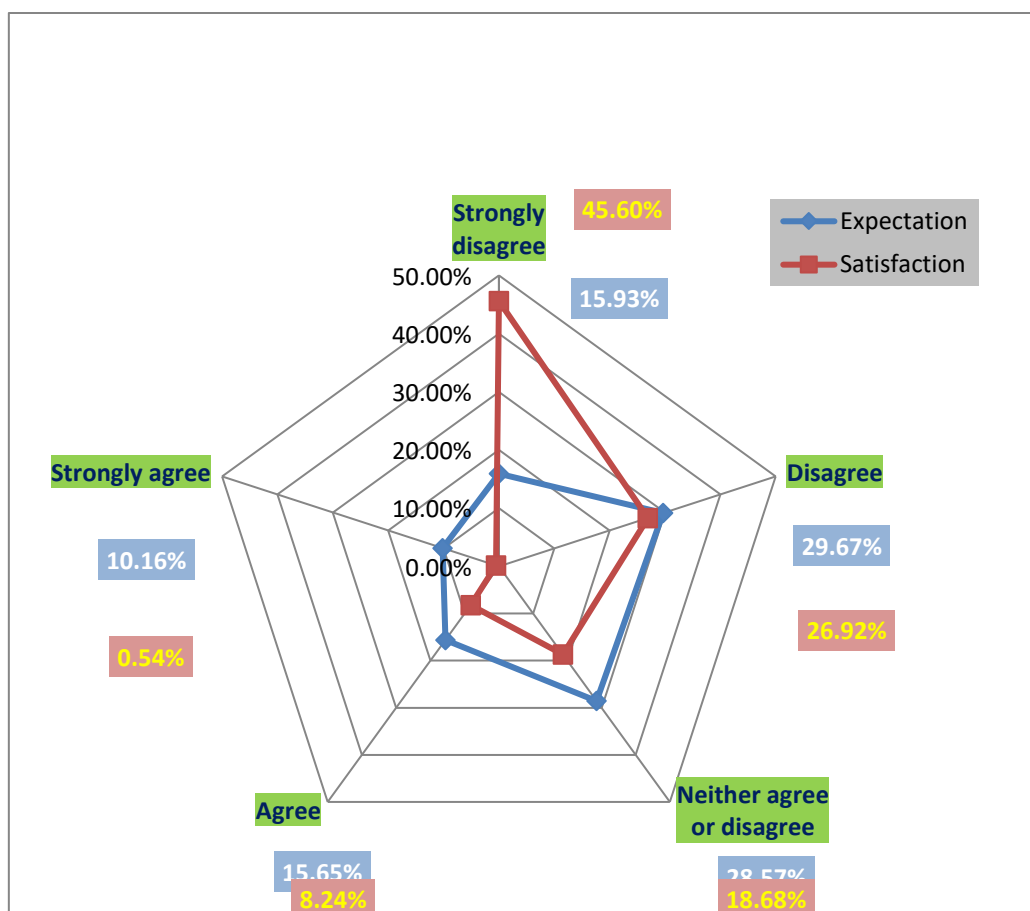
Fig. 5.23 **Computer /Internet Facility in** *Respect to Users' Expectation and Users' Satisfaction*

Users' expectation data for the statement 'Computer /internet facility' says that out of 364 users 58 (15.93%) were strongly disagreed, 108 (29.67%) users disagreed, 104 (28.57%) were neutral, 57 (15.65%) were agreed and 37 (10.16%) were strongly agreed. Whereas the users' satisfaction data says that 166 (45.60%) were strongly disagreed, 98 (26.92%) were disagreed, 68 (18.68%) were neutral, 30 (8.24%) were agreed and 02 (0.54%) were strongly agreed.

Hence, the gap of mean value is -0.83 which is a negative value and indicates that Library authority should take necessary action for increasing the number of computer terminals.

5.6.16 Photocopy/Scanning/ Printing Service

The below mentioned diagram will depict the perspective of users in relation to photocopy, scanning or printing services.
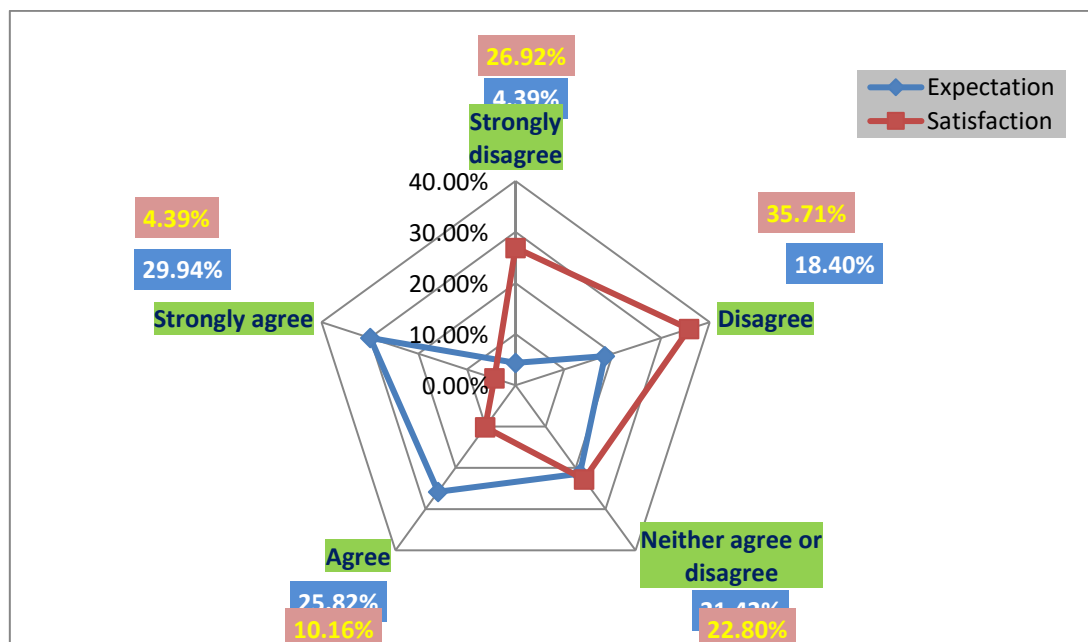
Fig. 5.24 Photocopy / Scanning/ Printing Service in Respect to User Expectation and User Satisfaction

User expectation data for the statement '*Photocopy / Scanning/ Printing service*' says that out of 364 users 16 (4.39%) were strongly disagreed, 67 (18.40%) were disagreed, 78 (21.42%) were neutral, 94 (25.82%) were agreed, and 109 (29.94%) were strongly agreed. Whereas user satisfaction data says that out of 364 users 98 (26.92%) were strongly disagreed, 130 (35.71%) were disagreed, 83 (22.80%) were neutral, 37 (10.16%) were agreed and only 16 (4.39%) were strongly agreed. It indicates that number of computer terminal may need to increase.

Hence, the mean value of the gap between users' satisfaction and users' expectation is -1.29 which is a negative value. That indicates users' expectation is much more than they are getting. In this case library management need to take necessary action to improve the photocopy/ scanning/ printing services in library

5.6.17 Notice Boards/ New Arrival Display/ Current Awareness Service

The below mentioned diagram will depict the perspective of users in relation to Library notice boards/ new arrival display boards and current awareness services.
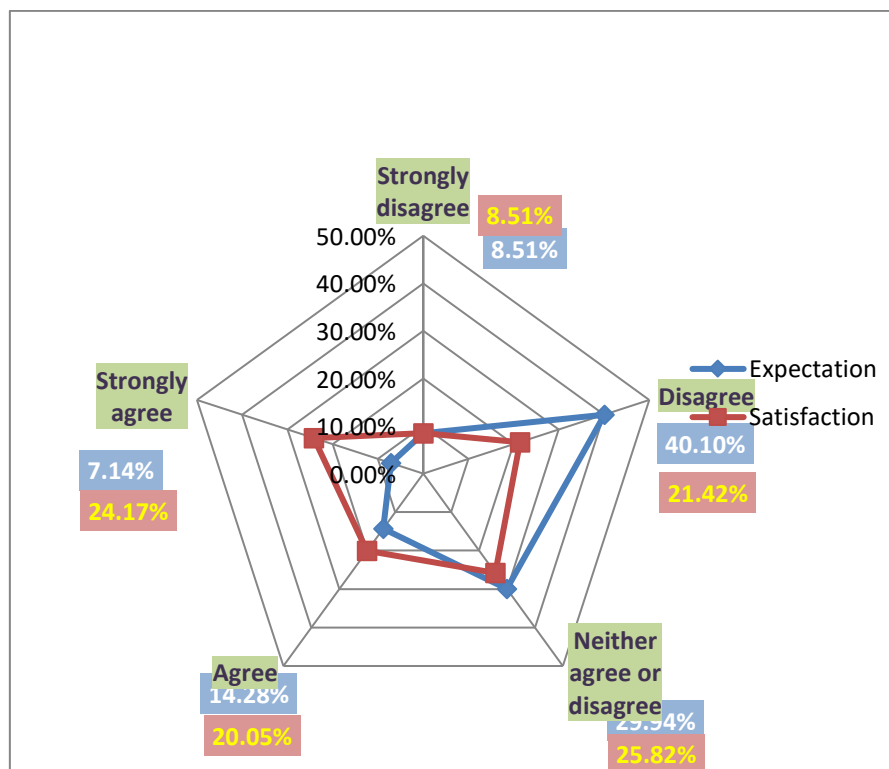
Fig. 5.25 Notice Boards/ New Arrival Display/ Current Awareness Service in Respect to Users' Expectation and Users' Satisfaction

Users' expectation data for the statement 'Notice boards/ new arrival display/ current awareness service' says that out of 364 users 31 (8.51%) were strongly disagreed, 146 (40.10%) were disagreed, 109 (29.945) were neutral, 52 (14.28%) were agreed, and 26 (7.14%) were strongly agreed. Whereas users' satisfaction data says that out of 364 users 31 (8.51%) were strongly disagreed, 78 (21.42%) were disagreed, 94 (25.82%) were neutral, 73 (20.05%) were agreed and only 88 (24.17%) were strongly agreed. Users are getting more than their expectation regarding number of notice boards for getting information related to library announcement, new arrival alert and current awareness service.

Hence, the mean value of the gap between users' satisfaction and users' expectation is 0.58 which is a positive value. That indicates users are happy with such services and what they are getting is more than their expectation.

5.6.18 Library Reading Room is Very Calm, Quiet, Neat and Clean

The below mentioned diagram will depict the perspective of users in relation to ambience and cleanliness of reading room.
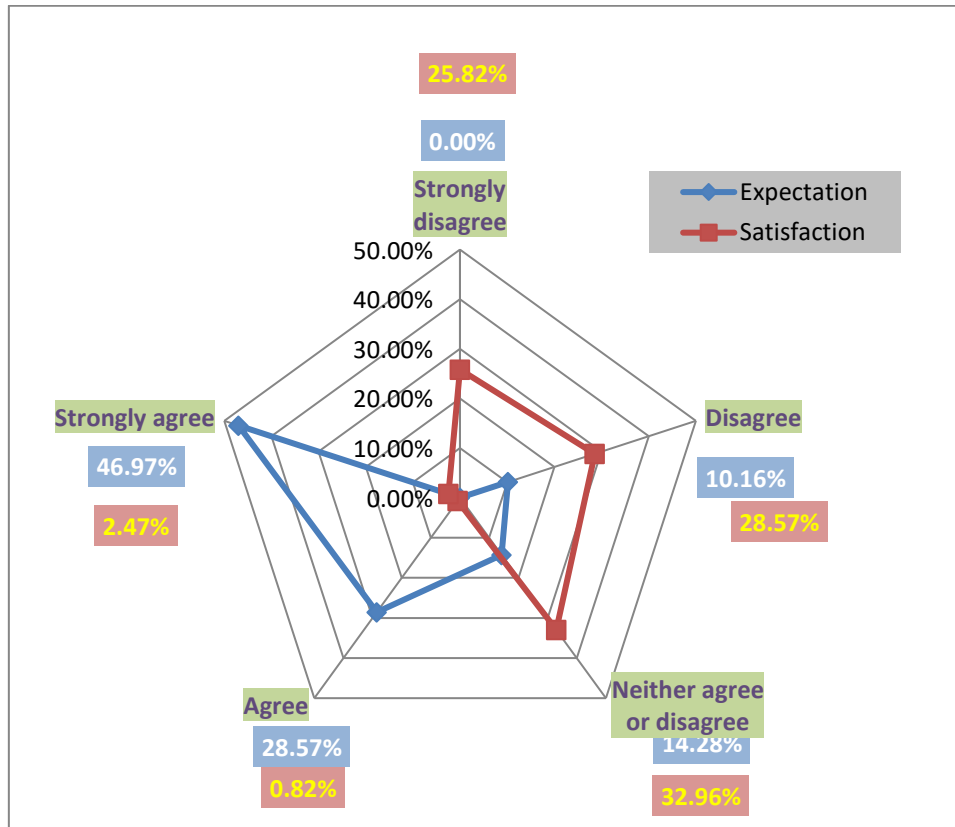
Fig. 5.26 Library Reading Room is Very Calm, Quiet, Neat and Clean in Respect to Users' Expectation and Users' Satisfaction

User expectation data for the statement 'Library reading room is very calm, quiet, neat and clean' says that out of 364 users 00 (0%) was strongly disagreed, 37 (10.16%) were disagreed, 52 (14.28%) were neutral, 104 (28.57%) were agreed, and 171 (46.97%) were strongly agreed. It means users were expecting the reading room must be quiet, calm, neat and clean, whereas user satisfaction data says that out of 364 users 94 (25.82%) were strongly disagreed, 104 (28.57%) were disagreed, 120 (32.96%) were neutral, 03 (0.82%) were agreed and only 09 (2.47%) were strongly agreed. It says that users are not at all satisfied with library cleanliness,

Hence, the mean value of the gap between users' satisfaction and users' expectation is -1.78 which is a negative value and clearly indicates that users' expectation is much higher than their satisfaction.

5.6.19 Library Furniture are Modern and Comfortable to Use

The below mentioned diagram will depict the perspective of users in relation to comfortness of library furnitures.
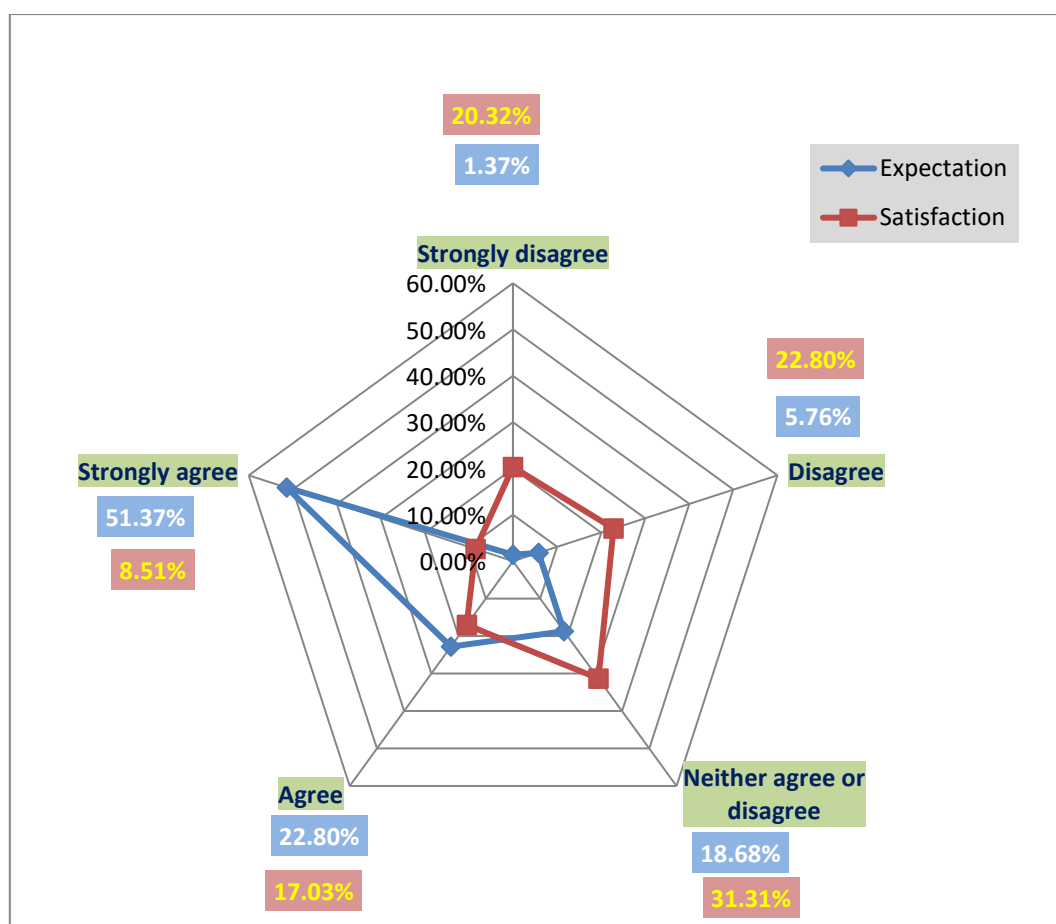
Fig. 5.27 Library Furniture is Modern and Comfortable to Use in Respect to Users' Expectation and Users' Satisfaction

Users' expectation data in response to 'Library furniture is modern and comfortable to use', out of 364 users 05 (1.37%) were strongly disagreed, 21 (5.76%) were disagreed, 68 (18.68%) were neutral, 83 (22.80%) were agreed and 187 (51.37%) were strongly agreed. Whereas users' satisfaction data says that out of 364 users 74 were strongly disagreed and 83 (22.80%) were disagreed 68 (18.68%) were neutral, 62 (17.03%) were

agreed and only 31 (8.51%) were strongly agreed. It means library authority may need to think about renovation of library furniture.

Hence, the mean of the gap value is -1.47, which is a negative value means the area for improvement.

5.6.20 Good Lighting and Airy

The below mentioned diagram will depict the perspective of users in relation to Library lighting and how much airy it is.
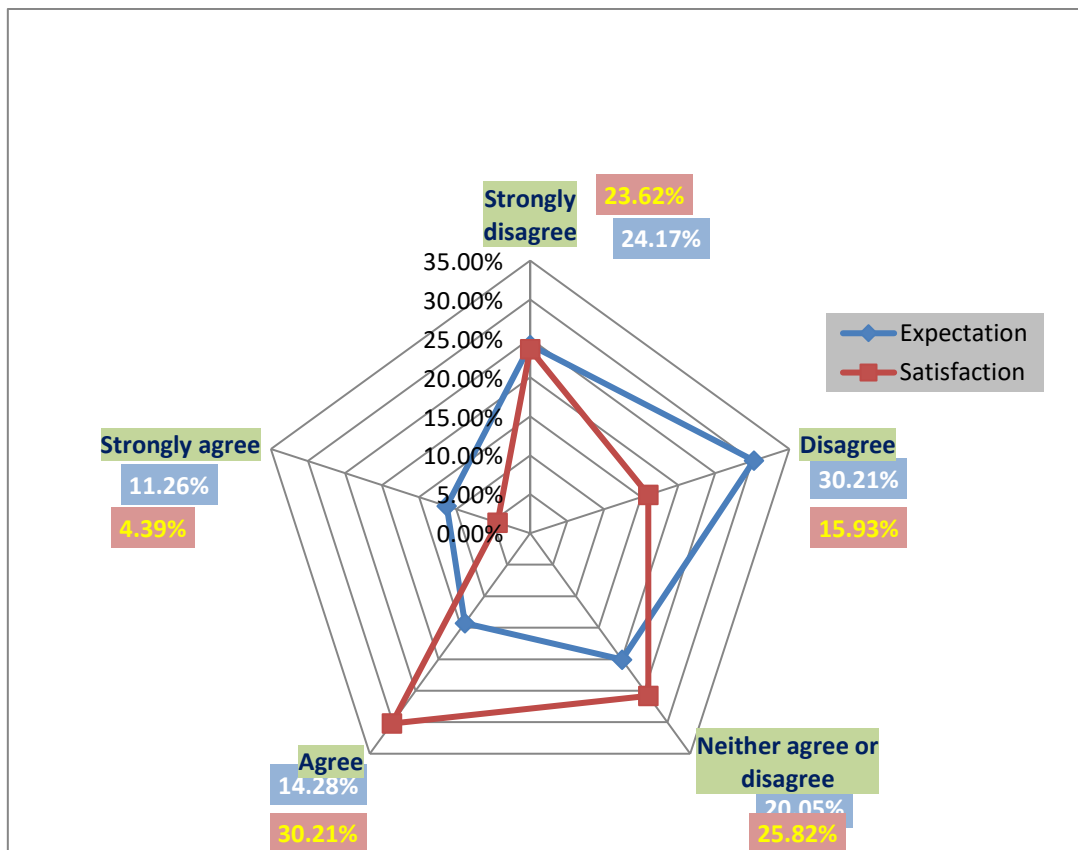
Fig. 5.28 Good Lighting and Airy in Respect to Users' Expectation and Users' Satisfaction

Users' expectation data in response to 'library has Good lighting and it's airy' says that out of 364 users 88 (24.17%) were strongly disagreed, 110 (30.21%) were disagreed, 73 (20.05%) were neutral, 52 (14.28%) were agreed and 41 (11.26%) were strongly agreed. Whereas out of 364 users 88 (24.17%) were strongly disagreed, 58 (15.93%) were disagreed, 94 (25.82%) were neutral, 110 (30.21%) were agreed, 16 (4.39%) were strongly agreed upon the statement. Good lighting is very much necessary for readers

to read and airy not only important for the users but also for the longevity of library resources.

Hence, the mean value of the gap between users' satisfaction and users' expectation is 0.17. Though the gap value is positive but the gap is very low. So, Library management may look in to this area.

5.6.21 Library is Very Safe for Self-Study

The below mentioned diagram will depict the perspective of users in relation to safety inside the Library for self-study.
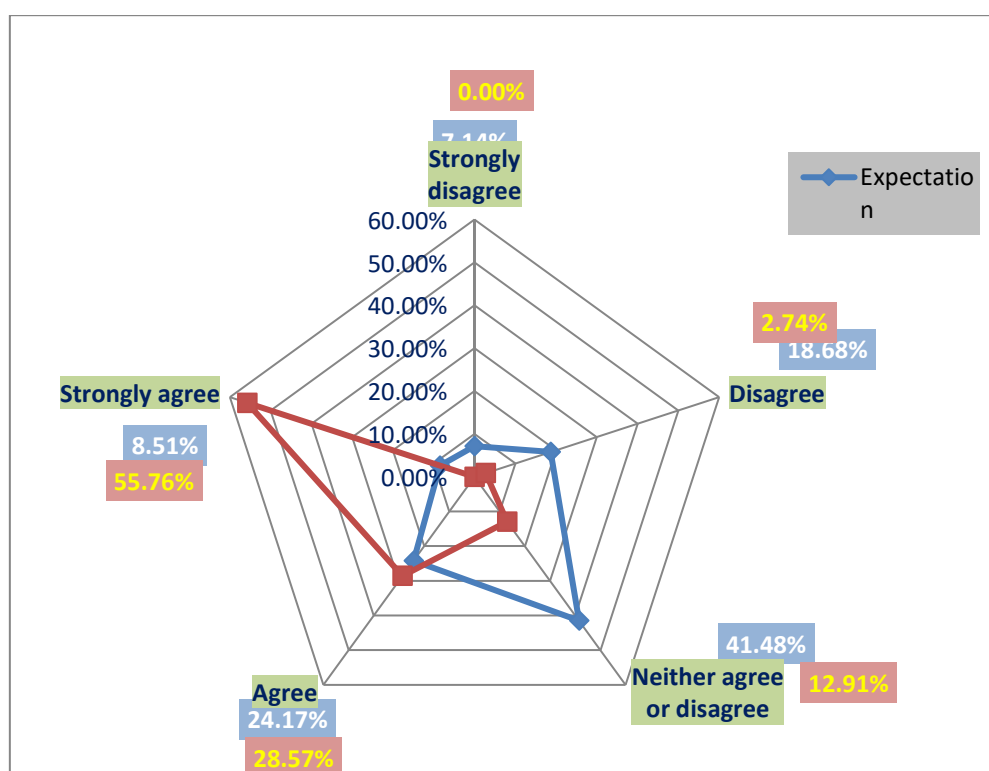
Fig. 5.29 Library is Very Safe for Self-Study in Respect to Users' Expectation and Users' Satisfaction

Answer to the question i.e., whether Library is very safe for self-study or not? Users' expectation data says that out of 364 users 26 (7.14%) were strongly disagreed, 68 (18.68%) were disagreed, 151 (41.48%) were neutral, 88 (24.17%) were agreed and 31 (8.51%) were strongly disagreed. Whereas users' satisfaction data says that 0 (0%) was strongly disagreed, 10 (2.74%) were disagreed, 47 (12.91%) were neutral, 104 (28.57%) were agreed 203 (55.76%) were strongly agreed. It should be

highlighted that in users' satisfaction data number of strongly disagreed was 0 means no one was strongly disagreed, and number of disagreed was 10.

Hence, the mean value of the gap between user satisfaction and user expectation is 1.29 which is a positive value.

5.6.22 Enough Reading Room Place and Enough Place for Group Study

The below mentioned diagram will depict the perspective of users in relation to area of reading room.
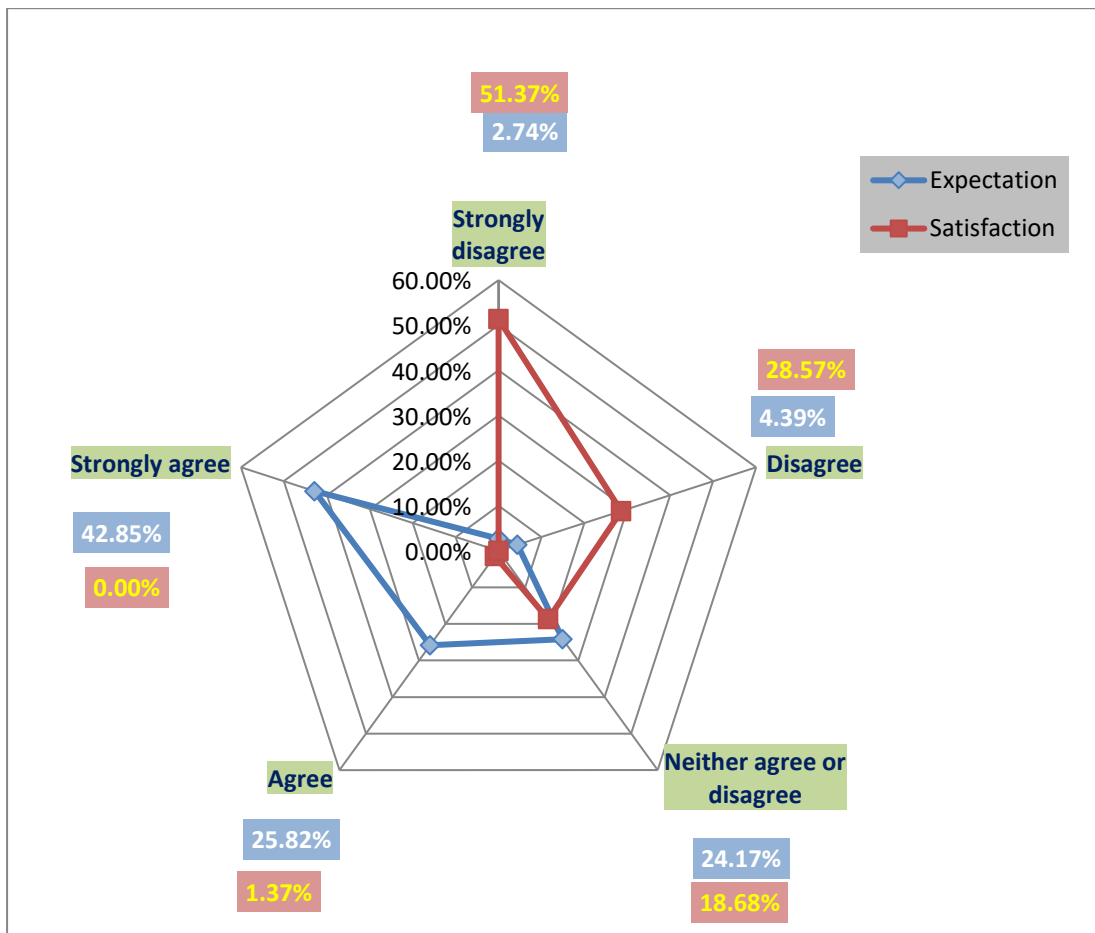
Fig. 5.30 Enough Reading Room Place and Enough Space for Group Studies in Respect to Users' Expectation and Users' Satisfaction

Users' expectation data for the statement 'Enough reading room place and enough space for group studies' says that out of 364 users 10 (2.74%) were strongly disagreed, 16 (4.39%) were disagreed, 88 (24.17%) were neutral, 94 (25.82%) were agreed, 156 (42.85%) were strongly agreed. As users' expectation from the library says it should be spacious enough for group studies but the satisfaction data says something else. Out of 364 users 187 (51.37%) were strongly disagreed, 104 (28.57%) were disagreed, 68

(18.68%) were neutral, 5 (1.37%) were agreed and 0 (0%) was strongly agreed. Library authority must take the necessary action in this regard. Though it is well known to all library professional that Library is a growing organism, its collections will grow every year, along with that increasing of space too is not very easy.

5.7 Results of Paired t.test

To conduct a paired t.test 'R' programming had been used. Results are as below:

Result of Question1: Library Staff Members are Well Trained and Qualified.

R program:

X1 <-c(rep(1,94),rep(2,151),rep(3,83),rep(4,26),rep(5,10))

X2 <-c(rep(1,0),rep(2,10),rep(3,58),rep(4,83),rep(5,213))

t.test(X2, X1, alternativ="l",paired =TRUE)

Program output:

Data	t value	df	p value	Mean differences
X2,X1	30.758	363	1	2.044948

Result of Question 2: Library Staff Will Provide Right Direction to Retrieve Right Information

R program:

Y1 <-c(rep(1,5),rep(2,37),rep(3,151),rep(4,104),rep(5,67)

Y2 <-c(rep(1,5),rep(2,26),rep(3,68),rep(4,94),rep(5,171))

t.test(Y2,Y1,alternativ="l",paired=TRUE)

Program output:

Data	t value	df	p value	Mean differences
Y2, Y1	22.124	363	1	0.5741758

Result of Question 3: Library Staff Will Willingly Guide the User

R program:

Z1 <-c(rep(1,0),rep(2,31),rep(3,89),rep(4,124),rep(5,120))

Z2 <-c(rep(1,5),rep(2,31),rep(3,98),rep(4,120),rep(5,110))

t.test (Z2, Z1,ALTERNATIV="I",paired=TRUE)

Program output:

Data	t value	df	p value	Mean differences
Z2,Z1	-6.1156	363	1.244e-09	-0.09340659

Result of Question 4: Library Staff Understands The Need Of The Users

R Program:

A1 <-c(rep(1,10),rep(2,21),rep(3,94),rep(4,130),rep(5,109))

A2 <-c(rep(1,5),rep(2,37),rep(3,104),rep(4,114),rep(5,104))

t.test (A2, A1,alternativ="l",paired=TRUE)

Program output:

Data	t value	df	p value	Mean differences
A2,A1	-5.1048	363	5.353e-07	-0.08791209

Result of Question 5: Behaviour of Library Staff Is Very Co-Operative and Polite.

R program:

B1 <-c(rep(1,0),rep(2,31),rep(3,172),rep(4,94),rep(5,67))

B2 <-c(rep(1,5),rep(2,16),rep(3,73),rep(4,104),rep(5,166))

t.test (B2, B1,alternativ="l",paired=TRUE)

Program output:

Data	t value	df	p value	Mean differences
B2, B1	20.434	363	1	0.5851648

Result of Question 6: Library Staff Provides Personal Attention to Individual Users.

R program:

C1 <-c(rep(1,16),rep(2,47),rep(3,129),rep(4,114),rep(5,58))

C2 <-c(rep(1,5),rep(2,31),rep(3,94),rep(4,120),rep(5,114))

t.test (C2, C1,alternativ="l",paired=TRUE)

Program output:

Data	t value	df	p value	Mean differences
C2, C1	16.5	363	1	0.4285714

Result of Question 7: Library Staff Has Enough Knowledge to Solve User Queries.

R program:

D1 <-c(rep(1,26),rep(2,42),rep(3,151),rep(4,93),rep(5,52))

D2 <-c(rep(1,15),rep(2,26),rep(3,68),rep(4,104),rep(5,151))

t.test (D2, D1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
D2, D1	25.801	363	1	0.6785714

Result of Question 8: Library Staff Makes Information Easily Accessible.
R program:

E1 <-c(rep(1,0),rep(2,16),rep(3,58),rep(4,130),rep(5,160))

E2 <-c(rep(1,35),rep(2,58),rep(3,73),rep(4,104),rep(5,94))

t.test (E2, E1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
E2, E1	-22.336	363	< 2.2e-16	-0.7417582

Result of Question 9: Library Staff Makes Arrangement of Fruitful User Orientation for Better Service.

R program:

F1 <-c(rep(1,26),rep(2,42),rep(3,62),rep(4,156),rep(5,78))

F2 <-c(rep(1,10),rep(2,42),rep(3,58),rep(4,62),rep(5,192))

t.test (F2, F1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
F2, F1	17.445	363	1	0.456044

Result of Question 10: Printed Books you Required for your Work

R program:

G1 <-c(rep(1,0),rep(2,0),rep(3,10),rep(4,10),rep(5,344))

G2 <-c(rep(1,44),rep(2,110),rep(3,129),rep(4,73),rep(5,10))

Result of Question 11: Printed Journals you Required for your Wok

R program:

H1 <-c(rep(1,16),rep(2,37),rep(3,120),rep(4,108),rep(5,83))

H2 <-c(rep(1,151),rep(2,110),rep(3,58),rep(4,42),rep(5,03))

t.test (H2, H1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
H2, H1	-50.313	363	< 2.2e-16	-1.563187

Result of Question 12: E-Book/E-Journals/ Digital Library

R program:

J1 <-c(rep(1,16),rep(2,58),rep(3,149),rep(4,104),rep(5,37))

J2 <-c(rep(1,68),rep(2,83),rep(3,104),rep(4,78),rep(5,31))

t.test (J2, J1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
J2, J1	-17.542	363	< 2.2e-16	-0.4587912

Result of Question 13: Information Search Gateway (Card Catalogue/ OPAC/ WebOPAC)

R program:

K1 <-c(rep(1,26),rep(2,89),rep(3,109),rep(4,98),rep(5,42))

K2 <-c(rep(1,51),rep(2,94),rep(3,104),rep(4,73),rep(5,42))

t.test (K2, K1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
K2, K1	-10.112	363	< 2.2e-16	-0.2197802

Result of Question 14: Newspaper/ Magazine

R program:

L1 <-c(rep(1,47),rep(2,160),rep(3,68),rep(4,52),rep(5,37))

L2 <-c(rep(1,27),rep(2,52),rep(3,145),rep(4,114),rep(5,26))

t.test (L2, L1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
L2, L1	17.669	363	1	0.5164835

Result of Question 15: Computer facility/ Internet

R program:

M1 <-c(rep(1,58),rep(2,108),rep(3,104),rep(4,57),rep(5,37))

M2 <-c(rep(1, 166),rep(2,98),rep(3,68),rep(4,30),rep(5,02))

t.test (M2, M1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
M2, M1	-38.813	363	< 2.2e-16	-0.8324176

Result of Question 16: Photocopy/Scanning/ Printing Service

R program:

N1 <-c(rep(1,16),rep(2,67),rep(3,78),rep(4,94),rep(5,109))

N2 <-c(rep(1,98),rep(2,130),rep(3,83),rep(4,37),rep(5,16))

t.test (N2, N1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
N2, N1	-39.791	363	< 2.2e-16	-1.291209

Result of Question 17: Notice Boards/ New Arrival Display/ Current Awareness Service

R program:

P1 <-c(rep(1,31),rep(2,146),rep(3,109),rep(4,52),rep(5,26))

P2 <-c(rep(1,31),rep(2,78),rep(3,94),rep(4,73),rep(5,88))

t.test (P2, P1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
P2, P1	20.434	363	1	0.5851648

Result of Question 18: Library Reading Room Is Very Calm, Quiet, Neat And Clean

R program:

Q1 <-c(rep(1,0),rep(2,37),rep(3,52),rep(4,104),rep(5,171))

Q2 <-c(rep(1,94),rep(2,104),rep(3,120),rep(4,37),rep(5,09))

t.test (Q2, Q1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
Q2, Q1	-64.024	363	< 2.2e-16	-1.774725

Result of Question 19: Library Furniture Are Modern and Comfortable to Use

R program:

R1 <-c(rep(1,88),rep(2,110),rep(3,73),rep(4,52),rep(5,41))

R2 <-c(rep(1,86),rep(2,58),rep(3,94),rep(4,110),rep(5,16))

t.test (R2, R1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
R2, R1	6.3052	363	1	0.1758242

Result of Question 20: Good Lighting and Airy

R program:

S1 <-c(rep(1,5),rep(2,21),rep(3,68),rep(4,83),rep(5,187))

S2 <-c(rep(1,74),rep(2,83),rep(3,114),rep(4,62),rep(5,31))

t.test (S2, S1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
S2, S1	-41.75	363	< 2.2e-16	-1.464286

Result of Question 21: Library Is Very Safe for Self-Study

R program:

T1 <-c(rep(1,26),rep(2,68),rep(3,151),rep(4,88),rep(5,31))

T2 <-c(rep(1,0),rep(2,10),rep(3,47),rep(4,104),rep(5,203))

t.test (T2, T1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
T2, T1	40.08	363	1	1.291209

Result of Question 22: Enough Reading Room Place and Enough Places for Group Study.

R program:

U1 <-c(rep(1,10),rep(2,16),rep(3,88),rep(4,94),rep(5,156))

U2 <-c(rep(1,187),rep(2,104),rep(3,68),rep(4,05),rep(5,0))

t.test (U2, U1,alternativ="l",paired=TRUE)

Program Output:

Data	t value	df	p value	Mean differences
U2,U1	-62.631	363	< 2.2e-16	-2.315934

5.8 Results of Hypotheses Testing

Result of 22 hypotheses testing are given below

Hypothesis1:

Ho: Library staff members are well trained and qualified

H1: Library staff members are not well trained and qualified

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library staff members are well trained and qualified.

Hypothesis2.

Ho: Library staff will provide right direction to retrieve right information

H1: Library staff will not provide right direction to retrieve right information

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library staff will provide right direction to retrieve right information

Hypothesis3.

Ho: Library staff will willingly guide the user

H1: Library staff will not willingly guide the user

In this case p value is lesser than 0.05 so null hypothesis is **rejected.**

It means Users feels that Library staff will not willingly guide the user

Hypothesis 4

Ho: Library staff understands the need of the users

H1: Library staff will not understand the need of the users

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library staff will not understands the need of the users

Hypothesis 5

Ho: Behaviour of Library staff is very co-operative and polite.

H1: Behaviour of Library staff is not at all co-operative and polite.

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Behaviour of Library staff is very co-operative and polite.

Hypothesis 6

Ho: Library staff provides personal attention to individual users.

H1: Library staff doesn't provide personal attention to individual users.

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library staff provides personal attention to individual users.

Hypothesis7

Ho: Library staff have enough knowledge to solve user queries.

H1: Library staff doesn't have enough knowledge to solve user queries.

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library staff have enough knowledge to solve user queries.

Hypothesis8

Ho: Library staff makes information easily accessible.

H1: Library staff couldn't make information easily accessible.

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library staff couldn't make information easily accessible.

Hypothesis 9

Ho: Library staff members make arrangement of fruitful user orientation for better service.

H1: Library staff can't arrange effective user orientation for better service.

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library staff members make arrangement of fruitful user orientation for better service

Hypothesis10

Ho: Library has sufficient Printed books you required for your work

H1: Library has sufficient Printed books you required for your work

In this case p value is lesser than 0.05 so null hypothesis is **rejected.**

It means Users feels that library doesn't have sufficient printed books as they required for their work.

Hypothesis 11

Ho: Library has sufficient Printed journals you required for your work

H1: Library doesn't have sufficient Printed books you required for your work

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library doesn't have sufficient Printed journals as they required for their work

Hypothesis12

Ho: Library has sufficient e-book/e-journals/ Digital Library

H1: Library doesn't have sufficient e-book/e-journals/ Digital Library

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library doesn't have sufficient e-book/e-journals/ Digital Library

Hypothesis 13

Ho: Library provides satisfactory Information search gateway (card catalogue/ OPAC/ WebOPAC)

H1: Library doesn't provide satisfactory Information search gateway (card catalogue/ OPAC/ WebOPAC)

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library doesn't provide satisfactory Information search gateway (card catalogue/ OPAC/ WebOPAC)

Hypothesis 14

Ho: Library has sufficient newspaper/ magazine

H1: Ho: Library doesn't have sufficient newspaper/ magazine

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library has sufficient newspaper/ magazine

Hypothesis 15

Ho: Library has sufficient computer facility/ internet

H1: Library doesn't have sufficient computer facility/ internet

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library doesn't have sufficient computer facility/ internet

Hypothesis 16

Ho: Library provides satisfactory photocopy/scanning/ printing service

H1: Library doesn't provide satisfactory photocopy/scanning/ printing service

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library doesn't provide satisfactory photocopy/scanning/ printing service

Hypothesis 17

Ho: Library has sufficient notice boards/ new arrival display/ current awareness service

H1: Library doesn't have sufficient notice boards/ new arrival display/ current awareness service

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library has sufficient notice boards/ new arrival display/ current awareness service

Hypothesis 18

Ho: Library reading room is very calm, quiet, neat and clean

H1: Library reading room is not calm, quiet, neat and clean

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library reading room is not calm, quiet, neat and clean

Hypothesis19

Ho: Library furniture are modern and comfortable to use

H1: Library furniture are not modern and comfortable to use

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library furniture are modern and comfortable to use

Hypothesis 20

Ho: Library has good lighting and very much airy

H1: Library don't have good lighting and not much airy

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Library don't have good lighting and not much airy

Hypothesis 21

Ho: Library is very safe for self-study

H1: Library is not very safe for self-study

In this case p value is greater than 0.05 so null hypothesis is **accepted.**

It means Users feels that Library is very safe for self-study

Hypothesis 22

Ho: Enough reading room place and enough place for group study

H1: Don't have enough reading room place and enough place for group study

In this case p value is lesser than 0.05 so null hypothesis is **rejected**.

It means Users feels that Don't have enough reading room place and enough place for group study.

5.9 Gap between Users' Satisfaction and Users' Expectation

Gap were identified between users' satisfaction and users' expectation by calculating the mean value of users' satisfaction and expectation.

Table 5.8 shows the gap score. The red areas show the negative values which indicates the satisfaction is higher than expectation.

Table 5.8: Identified knowledge gaps

AREAS	Mean of Satisfaction (2)	Mean of Expectation (1)	GAP (2-1)
Affect of Services			
Library staff are well trained and qualified. (X)	4.37	2.07	2.3
Library staff will provide right direction to retrieve right information(Y)	4.0	3.52	0.57
Library staff will willingly guide the user(Z)	3.82	3.91	-0.09
Library staff understands the need of the users(A)	3.75	3.84	-0.09
Behaviour of Library staff is very co-operative and polite. (B)	4.12	3.54	0.54
Library staff provides personal attention to individual users.	3.84	3.41	0.43
Library staff has enough knowledge to solve user queries.	3.96	3.28	0.68
Library staff makes information easily accessible.	3.45	4.19	-0.74
Library staff makes arrangement of fruitful user orientation for better service.	4.04	3.59	0.45
Information Control			
Printed books you required for your work	2.72	4.19	-2.19
Printed journals you required for your wok	2.00	3.56	-1.56
e-book/e-journals/ Digital Library	2.78	3.24	-0.46
Information search gateway (card catalogue/ OPAC/ WebOPAC)	2.89	3.11	-0.22
Newspaper/ Magazine	3.16	2.64	0.52
Computer facility/ Internet	1.91	2.74	-0.83
Photocopy/Scanning/ Printing service	2.29	3.58	-1.29
Notice boards/ new arrival display/ current awareness service	3.29	2.71	0.58
Library As a Place			
Library reading room is very calm, quiet, neat and clean	2.34	4.12	-1.78
Library furniture are modern and comfortable to use	2.75	2.58	0.17
Good Lighting and airy	2.70	4.17	-1.47
Library is very safe for self-study	4.37	3.08	1.29
Enough reading room place and enough place for group study	1.70	4.01	-2.31

5.10 Summary

The study helped to listed out the areas with higher expectation than satisfaction. Such areas can be treated as the areas for improvement.

➢ Library staff will willingly guide the user

➢ Library staff understands the need of the users

➢ Library staff makes information easily accessible.

➢ Printed books you required for your work

➢ Printed journals you required for your wok

➢ Information search gateway (card catalogue/ OPAC/ WebOPAC)

➢ Computer / Internet facility

➢ Photocopy/Scanning/ Printing service

➢ Library reading room is very calm, quiet, neat and clean

➢ Good Lighting and airy

➢ Enough reading room place and enough place for group study

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Proposed KM Model for JU Central Library's Quality Assessment and Improvement

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Knowledge is identified as the most precious asset of any organization. Knowingly or unknowingly, everybody uses it in day-to-day life to sustain in environment, society or in any organization. Knowledge management is the process which helps in knowledge capturing, knowledge processing, storing for future use and using it in right place at right time. This chapter deals with study of existing Knowledge management models and based on that developing a layout of a customise KM model to assess, improve and maintain library service quality of JU central library. Not only that but also such model can take part in bridging the knowledge gap which had been identified during data analysis of the study.

6.1 Objective of the Study

The objectives of this study are as below.

- ➢ Develop a suitable model for JU central library.
- ➢ To bridge the knowledge gap.
- ➢ Asses the library service quality and improve it.
- ➢ Enhancement of library users' footfall.

6.2 Methodology

Methodology behind designing a customize knowledge management model for Jadavpur University central library can be depicted as below.

i.   To know about the existing knowledge management model, a thorough literature review had been conducted at the beginning.

ii.   To find out the grey areas in the process knowledge gaps had been identified, based on the result found from data analysis.

iii.   Finally, to bridge the knowledge gap a layout of a customised knowledge management model had been designed.

Diagrammatic Representation

The below mentioned diagram shows the path of designing customized knowledge management model.
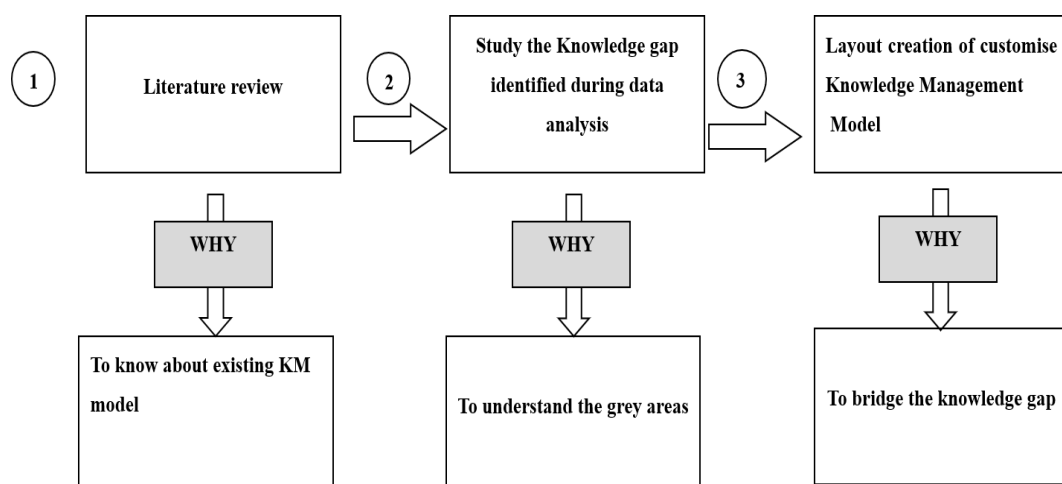
Fig 6.1: Methodology of KM Model Creation

6.3 Study of Existing Knowledge Management Models

Existing knowledge management models had been identified and studied. Based on the available literature on existing KM model a table has been prepared which is as below.

Table 6.1 describes the names, who had developed it and reason behind such creations of the existing KM models

Table 6.1: Description of Existing Knowledge Management Models

Name of the model	Creator	Purpose
The Choo KM model (Mohajan, 2017)	Chun Wei Choo	Creation of new knowledge
Hedlund and Nonaka's KM model (Nonaka & Nishiguchi, 2001)	Gunnar Hedlund and Ikujiro Nonaka	Distinguish between different levels of knowledge
The Von Krogh and Ross KM model (Cristea, Capatina, 2009)	Georg Von Krogh and John Ross	Manage organizational tacit knowledge
The wiig KM model (Wiig, 1993)	Karl M Wiig	Find out how organizational knowledge is built and used
The Boisot I Space KM model (Sannito, 2014)	Max H Boisot	Converts data into information
Wenger's Community of practice Model (Li, Grimshaw, Nielsen & Judd, 2009)	Jean Lave and Etienne Wenger	Collaborate and create knowledge together within specific domain informally.
Kakabadse KM model (Kakabadse, Kouzmin & Kakabadse, 2001)	Andrew Kakabadse, Nada K Kakabadse and Alexander Kouzmin	Makes knowledge dynamic
Skandia Intellectual Capital KM model (Wiig, 1997)	Swedish insurance company	Measuring intellectual capital of the organization

Stankosky and Baldanza's KM model (Ternes, 2012)	M. Stankosky and C Baldanza	Find out four major foundations of any organization such as: learning, leadership, technology infrastructure and organizational structure.
Kogut and Zander's KM model (Tallman, 2003)	Bruce Kogut and Ud Zander	Creation and transfer of knowledge inside the organization
Demerest KM model (Mirza, 2009)	Demerest	Knowledge creation, dissemination, use and embodiment
Frid's KM model (Caganova, 2015)	R. Frid	KM maturity assessment and KM implementation
The 360 Degree KM model (Hariharan & Cellular, 2005)	Arun Hariharan	Assess the inside as well as outside knowledge and expertise.
Complex Adaptive System KM model (Onix, Fielt & Gable, 2017)	H. Holland	To describe nonlinear systems.
The 7- Circle KMM (Ologbo & Nor, 2015)	---------	To know about knowledge initiative, culture, people, technology, interaction and motivation of the organization.

Table 6.1 shows the details about existing knowledge management models.

6.4 Knowledge Gap Areas

During the study after analysis of data, gap areas were identified which are as below.

Table 6.2 shows the gap areas found from data analysis along with scores.

Table 6.2: Gaps with Gap Score

AREAS	GAP
Library staff will willingly guide the user	-0.09
Library staff understands the need of the users	-0.09
Library staff makes information easily accessible.	-0.74
Printed books you required for your work	-2.19
Printed journals you required for your wok	-1.56
e-book/e-journals/ digital library	-0.46
Information search gateway (card catalogue/ OPAC/ WebOPAC)	-0.22
Computer / internet facility	-0.83

6.5 Proposed KM Model for JU Central Library

A model had been proposed for quality assessment and improvement of JU central library. The said model was developed based on results found from data analysis.

Name of the model: 3R Knowledge Management Model.

Build for: JU central library service assessment and improvement.

6.5.A Structure of the Proposed Model

```
┌───────┐   ┌──────────────────────────────────────────┐
│   R   │   │              LIBRARY SYSTEM              │
│   E   │   └──────────────────────────────────────────┘
│   A   │                     ↓
│   S   │   ┌──────────────────────────────────────────┐
│   O   │→  │      UNDERSTANDING USERS' EXPECTATION     │
│   N   │   └──────────────────────────────────────────┘
│       │                     ↓
│       │   ┌──────────────────────────────────────────┐
│       │   │  USERS' FEEDBACK AFTER USING THE LIBRARY  │
│       │   └──────────────────────────────────────────┘
│       │                     ↓
│       │   ┌──────────────────────────────────────────┐
│       │   │            DATA VERIFICATION             │
│       │   └──────────────────────────────────────────┘
│       │                     ↓
│       │   ┌──────────────────────────────────────────┐
│       │   │       FINDING OUT THE ROOT CAUSE         │
└───────┘   └──────────────────────────────────────────┘
```

LIBRARY SYSTEM

UNDERSTANDING USERS' EXPECTATION

USERS' FEEDBACK AFTER USING THE LIBRARY

DATA VERIFICATION

FINDING OUT THE ROOT CAUSE

REASON

CONFIRMATION OF THE REASONS

MATCHING THE REASONS WITH SUBSYSTEMS OF THE LIBRARY

HIGHLIGHTING THE AREAS OF GAP

REGION

FINDING THE REMEDIES FOR MITIGATING THE GAP

IMPLEMENTATION

REMEDY

Fig 6.2: Proposed KM Model

Figure 6.2 explains the structure of 3R model

6.6 Fitting the 3R Model with Identified Gap

Here 3R denotes Reason- Region-Remedy. How this proposed model can be fitted with the identified gaps are depicted below.

6.6.A Reason

The below mentioned reasons had been identified where users were not satisfied:

- ➢ Library staff members are not willingly guides the user.

- ➢ Library staff members don't understand the need of the users.

- ➢ Library staff members can't make information easily accessible.

- ➢ Insufficient collection of printed books.

- ➢ Insufficient collection of printed journals.

- ➢ Information search gateways (card catalogue/ OPAC/ WebOPAC) are not easy to handle.

- ➢ Computer / internet facility is not satisfactory.

- ➢ Photocopy/scanning/ printing service not satisfactory.

- ➢ Library reading room is not sufficient calm, quiet, neat and clean.

- ➢ Absence of good lighting and air.

- ➢ Non availability of enough reading room place for group study.

6.6.B Region

Based on the reasons the regions were identified for improvement

Reason	Region
Library staff members are not willingly guides the user	Human resource
Library staff members don't understand the need of the users	Human resource
Library staff members can't make information easily accessible	Human resource
Insufficient collection of printed books	Documentary resources
Insufficient collection of printed journals	Documentary resources
Information search gateways (card catalogue/ OPAC/ WebOPAC) are not easy to handle	Information search and retrieval
Computer / internet facility is not satisfactory	IT resources
Photocopy/scanning/ printing service not satisfactory	Support service
Library reading room is not sufficient calm, quiet, neat and clean	Library hygiene
Absence of good lighting and air	Maintenance of library building
Non availability of enough reading room place for group study	Library area coverage

6.6.C Remedy

Based on the regions identified from the analysis remedies can be mentioned as below.

Region	Remedy
Human resource	i. Library staff members should undergo professional training in regular interval for better performance. ii. Library staff members should be motivated for knowledge sharing. iii. Reward and recognition can be started to motivate the staff members.
Documentary resources	i. Based on the users' need, library collection need to be updated on regular basis. ii. Stock verification should be conducted every year. iii. To understand exact need of the user a survey can be conducted. Only regular and real users should be included in the survey. iv. Budget allocation should be done carefully based on the subject wise strength of the user. v. New arrivals should be displayed properly as an advertisement.
Information search and retrieval	i. Department wise user orientation needs to be conducted in regular basis.

	ii. A proper documentation may need to supply with detail steps of how to use the search gateways.
	iii. A mobile app can be helpful for users to search from anywhere.
IT resources	i. Number of computers may need to be increased as the number of students.
	ii. Internet speed needed to be increased.
Support service	Facility of students photocopy/ scanning/ printing service may need to be improved.
Library hygiene	i. Everyday dry dusting is mandatory.
	ii. Pest control once in a year needed to be done.
	iii. Dedicated support staff needs to be assigned for cleaning and dusting purpose.
	iv. Regular monitoring may require.
	v. 'Silence please' boards must be hanged at various places to remind user for maintaining silence.
	vi. Monitoring through CCTV must be needed to maintain cleanliness of the library.
Maintenance of library building	i. Number of high-power lights should be increased.
	ii. Provision of proper air circulation need to check regularly.

Library area coverage	Library is a growing organism. Scarcity of spaces is a very common problem for all the libraries. Still spaces can be divided category wise, so that research scholars can get space for single or group study without any disturbance.

6.7 Summary

The data analysis result shows out of 22 areas, in 11 areas users' expectation is lower than satisfaction. This current chapter is completely dedicated to Knowledge Management model and based on the existing model an ideal model had been designed. The areas with greater expectation were tried to fit in the proposed KM model named 3R model. 3 R denotes Reason for dissatisfaction, Region of dissatisfaction and Remedy to solve such reasons. 11 areas were identified where users were not satisfied. Out of these 11 areas one was found where users were not satisfied with the library space. This problem is very common for all library. As Library is a growing organism, it is highly difficult to define 'sufficient place'. Another problem was unhappiness with the calm and quietness of the library. This is also a common problem for all libraries which is really tough to solve. Users were not satisfied with the documentary sources of the library. Such problem may be solved up to certain extent. Various factors can be there behind such problem. Sufficient fund requirement is one of them. Publication of new edition frequently may not possible to collect always. There were so many users who were not aware about the authentic sources of information. Users were not satisfied with the information search and retrieval gateway hence user orientation need to be conducted most seriously.

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Chapter – 7

Summary of Findings and Conclusion

Considering the existing literature, cases from various libraries, the need of JU Central Library users, it's clear that an assessment study on library resources and service will be very much helpful for quality improvement. JU central library was established in the year 1955. The university has four faculties i.e., Arts, Science, Engineering & Technology and Inter Disciplinary School Law and Management. Types of services and resources requirement may change as per the category of users. As students are more dependent on text books as suggested in their syllabus. Whereas research scholars, faculty members may look for reference books more than the text books and journal articles. So, fulfilling such diversified user need is really difficult for any library. JU central library is also none other than that. Apart from this the huge application of IT is also a matter of concern.

7.1 Summary of Findings

Findings reviled from data analysis show the existence of Knowledge gaps in between Users' expectation and Users' satisfaction data of Jadavpur University central library. Though the range of the gap varies from one parameter to another, as well as the score too. The range of the knowledge gap in this study lies between -2.31 to +2.3.

Identified scores of the knowledge gap related to the parameters are as depicted below (starting from extreme negative).

The gaps with negative values are incorporated.

7.1.A Gap 1

Score: -2.31

Question: Enough reading room place and enough place for group study

Area: Library as a place

Finding: In this case t value is -62.631 and p value is $< 2.2e-16$ which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.B Gap 2

Score: -2.19

Question: Printed books you required for your work

Area: Information control

Finding: In this case t value is -5.1048 and p value is $5.353e-07$ which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.C Gap 3

Score: -1.78

Question: Library reading room is very calm, quiet, neat and clean

Area: Library as a place

Finding: In this case t value is -64.024 and p value is $< 2.2e-16$ which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.D Gap 4

Score: -1.56

Question: Printed journals you required for your wok

Area: Information control

Finding: In this case t value is -50.313 and p value is $< 2.2e-16$ which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.E Gap 5

Score: -1.47

Question: Good Lighting and airy

Area: Library as a place

Finding: In this case t value is -41.75 and p value is $< 2.2e-16$ which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.F Gap 6

Score: -1.29

Question: Photocopy/Scanning/ Printing service

Area: Information control

Finding: In this case t value is -39.791 and p value is < 2.2e-16 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.G Gap 7

Score: -0.83

Question: Computer facility/ Internet

Area: Information control

Finding: In this case t value is -38.813 and p value is < 2.2e-16 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.H Gap 8

Score: -0.74

Question: Library staff makes information easily accessible.

Area: Affect of services

Finding: In this case t value is -22.336 and p value is < 2.2e-16 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.I Gap 9

Score: -0.46

Question: e-book/e-journals/ digital library

Area: Information control

Finding: In this case t value is -10.112 and p value is < 2.2e-16 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.J Gap 10

Score: -0.22

Question: Information search gateway (card catalogue/ OPAC/ WEBOPAC)

Area: Information control

Finding: In this case t value is -5.1048 and p value is 5.353e-07 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.K Gap 11

Score: -0.09

Question: Library staff will willingly guide the user

Area: Affect of services

Finding: In this case t value is -6.1156 and p value is 1.2444e-09 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.1.L Gap 12

Score: -0.09

Question: Library staff understands the need of the users

Area: Affect of services

Finding: In this case t value is -5.1048 and p value is 5.353e-07 which is lesser than 0.05 so null hypothesis is **rejected**.

It proves that users' expectation is higher than satisfaction.

7.2 Conclusion

Based on the findings drawn from the study, it may be generalised that:

There are considerable similarities in the information requirements of the users. There are, however, some differences in their information requirements. There are numerous gaps between library collections and services and users information needs. Using a KM model can help reduce the gaps and find areas for improvement.

7.3 Scope of Further Research:

Further research can be conducted on the following areas.

- ➢ Identification of gap between perceptions and expectations of public library users.
- ➢ Measuring gaps in service quality of University libraries in West Bengal from users' perspectives.

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Questionnaire for Need Analysis

Record identification no.:

Dear Sir/Madam,

This questionnaire has been created as a tool for collecting data for a research work entitled: Identification of Gap in Knowledge Capturing and Dissemination in Jadavpur University Central Library using Knowledge Management Tools. You are requested to follow the guideline while filling up the questionnaire. Your responses will be kept strictly in confidence. You may enquire explanation or interpretation on the question(s), if you feel so necessary. Your cooperation, will highly be solicited.

Thanking you,

(Prof. Goutam Maity)   (Protiti Majumdar)

Supervisor   Research Scholar

Dept. of Library and Information Science   Dept. of Library and Information Science

Jadavpur University   Jadavpur University

West Bengal   West Bengal

India   India

A. GENERAL:

A1. Name:

A2. Category

○ Facult   ○ Officer   ○ Staff   ○ Student   ○ Research Scholar

A3. Age Group:

○   15-30

○   31-45

○   46-60

○   61-75

○   76 above

A4. Sex:

○ Femal   ○ Male

B. SPECIFIC:

B1. Importance of library resources:

Information Sources	Very imp	Less imp	Not imp	Don't use
Article Database	○	○	○	○
Printed Books	○	○	○	○
Electronic Journals and Magazines	○	○	○	○
Faculty Guidance	○	○	○	○
Catalogues	○	○	○	○
Printed Journals and Magazines	○	○	○	○
Librarian	○	○	○	○
Multimedia	○	○	○	○
Special Collection	○	○	○	○
CD ROM Database	○	○	○	○
e-book	○	○	○	○

B11. Specify Information resources using most:

Information Sources	Name of resources
Article Database	
Printed Books	
Electronic Journals and Magazines	
Catalogues	
Printed Journals and Magazines	
Multimedia	
Special Collection	
Other	

B2. Satisfaction with Library Collection:

Library Collection	Satisfied	Not Satisfied
Article Database		
Printed Books		
Electronic Journals and Magazines		
Catalogues		
Printed Journals and Magazines		
Multimedia		
Special Collection		

B3. Please specify your comments regarding library collection:

B4. How frequently you use library resources:

Library Collection	Daily	Weekly	Monthly	Quarterly	Never
Article Database					
Printed Books					
Electronic Journals and Magazines					
Catalogues					
Printed Journals and Magazines					
Multimedia					
Special Collection					
Newspaper					
Current List					
Library Notices					
Ebook					
CD ROM database					

B5. Awareness about Library Services:

Library services	Aware but not used	Used	Not aware
Reference Service			
CAS			
OPAC			
WEB OPAC			
Xerox			
Scan			

Internet facility			
Digital Library			
CD ROM database			
Digitized rare text			
"JU Digital Library beyond Campus"			
Listing of the reference websites			
Using library in weekends			
Booklet named "Know Your Library			

B6. How frequently you avail Library services:

Library Services	Daily	Weekly	Monthly	Quarterly	Never
Reference Service					
CAS					
OPAC					
WEB OPAC					
Xerox					
Scan					
Internet facility					
Digital Library					
CD ROM database					
Digitized rare text					
"JU Digital Library beyond Campus"					
Listing of the reference websites					
Using library in weekends					
Booklet named "Know Your Library					

B61. Specify any other services which you wanted to incorporate:

B7. What are the online database you are aware about?

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B8. How frequently you use central library?

    ○ Daily   ○ Weekl   ○ Monthl   ○ Quarterl   ○ Never

B9. How frequently you use departmental library?

    ○ Daily   ○ Weekl   ○ Monthl   ○ Quarterl   ○ Never

B10. Are you a member of any other library apart from institutional library? If yes please specify.

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B11. Reason behind visiting other library

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B12. Any suggestion regarding library collection:

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B13. Any suggestion regarding library services:

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B14. Your availability at campus

```
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Questionnaire for Inventory Study

Record identification no.:

Dear Sir/Madam,

This questionnaire has been created as a tool for collecting data for a research work entitled: Identification of Gap in Knowledge Capturing and Dissemination in Jadavpur University Central Library using Knowledge Management Tools. You are requested to follow the guideline while filling up the questionnaire. Your responses will be kept strictly in confidence. You may enquire explanation or interpretation on the question(s), if you feel so. Your cooperation, will highly be solicited.

Thanking you,

(Prof. Goutam Maity)	(Protiti Majumdar)
Supervisor	Research Scholar
Dept. of Library and Information Science	Dept. of Library and Information Science
Jadavpur University	Jadavpur University
West Bengal	West Bengal
India	India

Questionnaire Used for Inventory Study

Note: Please (i) put a (√) mark in the appropriate responses (ii) specify if necessary (iii) strike out if not applicable.

1. Name of the Library:

    1.1 Address:

    1.2 Year of Establishment :

2. Type of Library

    (i) Academic   ☐

    (ii) Special   ☐

    (iii) Public   ☐

3. Who is the authority of the library:

    i) Central Government   ☐

    ii) State Government   ☐

    iii) Aided (Semi- government)   ☐

    iv) Private   ☐

4. Nature of Library Building

    i) Separate   ☐

    ii) Attached   ☐

4.1 Please give a general Layout ………………….

4.2 Total seating capacity ……………………..

5. Total Collection

5.1 Total Collection of Books and Journals:

Year	Total Collection of books	Total No. of Journal
2017-18		

2018-19		
2019-20		
2020-21		
2021-22		

5.2 Total Collection of Manuscripts: ………………

5.3 Total Collection of CD-ROM/DVD-ROM: ……………

5.4 Total Collection of e-books: ……………….

   5.5 Total Collection of braille book: ……………….

   5.6   Total Collection of e-Journals: ……………….

   5.7   Total Collection of Thesis/ Dissertation: ……………….

5.8 Any other please specify: ……………….

6. 9 How many newspapers are subscribing at present:

Sl. No.	Language	Number
1.	English	
2.	Hindi	
3.	Bengali	
4.	Others	

7. Whether the collection is classified or not   Yes ☐   No ☐

7.1. If Yes –Name of the classification scheme adopted:

      i) CC   ☐

      ii) UDC   ☐

      iii) DDC   ☐

      iv) Any other   ☐

8. Whether the collection is catalogued or not   Yes ☐   No ☐

8.1. If Yes –Name of the cataloguing scheme adopted

i) CC ☐

ii) AACR –I ☐

iii) AACR- II ☐

iv) Any other ☐

9. Detail about library Staff

Sl. No.	Name of the staff	Designation	Qualification	
			Academic	Professional
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				

24			
25			
26			
27			
28			
29			
30			

10. Whether library is automated or not: Yes ☐   No ☐

    11.1) If Yes Please specify:

    11.2) Status of automation   Fully ☐   Partly ☐

    11.3) Area of Automation

        i)

        ii)

        iii)

        iv)

        v)

12) Working hours of the library:

    i) General Days :   From ……………   To …………..

    ii) Sunday and Holidays: From ……………   To …………..

13) Services provided by the central library:

    i)   Circulation Service   ☐

    ii)   Cataloguing   ☐

    iii) Reference Service   ☐

    iv)   CAS   ☐

    v)   SDI   ☐

    vi)   Reprographic   ☐

vii)   Wi-fi ☐

viii)   Printing/ Scanning ☐

ix)   Orientation ☐

x)   Digital Library ☐

16. Number of users enrolled:

Year	Number of enrolled
2017-18	
2018-19	
2019-20	
2020-21	
2021-22	

17. Library Statistics:

Year	Average Daily Visitor	Average Daily Issue of Books
2017-18		
2018-19		
2019-20		
2020-21		
2021-22		

18 Any Suggestion:

Note: A) Strike out whichever is not correct

B) Special information if any please mention that:

C) If space is not inadequate please attach a separate sheet:

Signature of the Respondent/Reporter