CHAPTER I

INTRODUCTION

1.1 INTRODUCTION

Today QR code are in the early stage and will take some time to grasp the world to shift as a whole to the digital world. As internet has become a part of everybody live in the same way QR code will also become a necessity to access any particular information. The libraries should take a step to implement it various areas and encourage there users to go through that as they are implemented to make users lives easier. It offers new ways for communicating and exchanging of information and knowledge, with the help of ICT tools are affecting revolutionary steps to changing in the way information stored, retrieved and dissemination for automating their activities, creating dynamic website with useful features context, easily accessible links etc. They are striving hard to cater the information needs of its patrons by providing point of need assistance with just-in-time virtual and physical spaces. In this connection, QR code is a new technology which helps libraries to affordably connect its patron by context-sensitive without visually assaulting them. This technology has the potential to connect patrons to information about its materials and services.

1.2 REVIEW OF LITERATURE

(**Walsh, 2013**)He states that QR (Quick Response) codes are a matrix codes, like a two dimensional bar code. They can be read by mobile phones with cameras, with a small application installed. Some mobiles come with the application pre-installed, though it can also be download for free from the internet and installed on PDAs, smartphones and other mobile devices. At the University of Huddersfield they have used QR codes to supply context appropriate help and information to blur the boundaries between the physical and electronic world. They developed mobile friendly materials to deliver information skills materials directly to our users at the point of need, linked by QR codes on printed materials and on correct locations in the physical library. This article outlines the practical uses found for QR codes and gives initial results of how they've been received by library users.

(Shettar I. M., 2016)this paper examines that QR codes are twodimensional matrix barcodes. Last decade witnessed a steady growth in profitmaking and business oriented usage of these QR codes with the advent of smartphone and web capable mobile phones. But the movement of using QR codes in Library & Information field is still in its initial stage. This paper explains application of QR Codes in Library resource and service awareness activities the study focuses on brief introduction to QR codes along with how it works and its features. It also explains the use of QR codes in libraries, with special reference to QR code implementations in Central Library, NITK.

(Dantrea Hampton, 2012) the authors discuss the rapid growth in the use of smart devices and the subsequent need for libraries to meet patrons where they are, via quick response code. Suggestions for use include marketing of library services, strengthening bibliographic instruction, supplementing reader's advisory services, and enhancing online public access catalogue records.

1.3 NEED OF THE STUDY

With the growth in the use of mobile devices/smartphones which is a tool in using QR code services among the library users and its limitless advantages over traditional means of information search, academic/educational libraries in this part of the world are still in the embryonic stage in terms of providing library services through QR code technologies. Hence, the need for this study.

1.4 STATEMENT OF PROBLEM

The use of QR code technology is becoming increasingly popular in this Internet era, this study seeks to explore whether librarians and are familiar with the QR code technological innovations and to know the several application of QR code technology in libraries, to find out the most common QR code based services offered by libraries to their users.

1.5 OBJECTIVES SCOPE AND HYPOTHESIS

Objective

a) To study the different aspects of QR code to be used in library.

b) To know the different functions of QR code.

c) To know the cost benefit analysis and technological advancements in the QR code technology.

Scope

a) QR code technology is latest development in libraries and can be used in all sections of the library. The study will highlight the different modalities available to implement QR code and its cost benefit ratio.

b) Furthur the investigator will learn the QR code technology to bring awareness among library users.

Hypothesis

a) There is very less knowledge about QR code technology.

b) Hardly any study has been done to use QR code technology.

c) Library   professionals needs to learn to use QR code technology in libraries.

1.6 RESEARCH METHODOLOGY

a) The investigator has browsed all the literature available on the topic.

b) Further the investigator has browsed all the website related to the topic .

c) The investigator will conduct interview with librarians regarding use of QR code technology.

d) The investigator has discuss with expert to analyse functioning of QR code.

e) The investigator has tried to gather different information by using different tools such as questionnaire interviews and personal discussion regarding QR technology .

f) The investigator has made use of suitable statistical techniques in finalizing data and also of statistics, chart and graph in presentation of result to make interpretation clear and precise.

1.7 LIMITATION

The study is limited to collage libraries functioning in North district of Goa state.

1.8 ORGANISATION OF STUDY

The study will be organised into following chapters:-

Chapter I- Introduction

Chapter II- Review of Literature

Chapter III-QR Code concept and its features

Chapter IV- QR Code at National and International level

Chapter V- Data Interpretation and Analysis

Chapter VI - Observation, Suggestions, findings and Conclusion

Chapter VII- Bibliography

1.9 CONCLUSION

The study will highlight the services and cost benefit ratio of QR code technology in libraries for benefits of library professionals and students. The study will allow further scope to enhance the research in the topic.

1.10 REFERENCES

Dantrea Hampton, A. P. (2012). Extending Library Services with QR Codes. *The Reference Librarian, 53*(4), 403-414.

Shettar, I. M. (2016). Quick Response (QR) Codes in Libraries: Case study on the use of QR. *TIFRBOSLA National Conference*, (pp. 129-134).

Walsh, A. (2013). QR Codes – using mobile phones to deliver library instruction and help at the point of need. *Journal of Information Literacy,, 4*(1), 55-65. Retrieved from https://ojs.lboro.ac.uk/JIL/article/view/1458

CHAPTER II

LITERATURE REVIEW

LITERATURE REVIEW

1. (lombardo, 2012)This article covers the use of Quick Response (QR) codes to provide immediate mobile access to information, digital collections, library website, subject guides, text messages, videos, and library personnel. The array of uses and the value of using QR codes to push customized information to patrons are explained. A case is developed for using QR codes for mobile delivery of customized information to patrons. Applications in use at the Libraries of the University of Utah will be reviewed to provide readers with ideas for use in their library

2. (Dantrea Hampton, 2012)the authors discuss the rapid growth in the use of smart devices and the subsequent need for libraries to meet patrons where they are, via quick response code. Suggestions for use include marketing of library services, strengthening bibliographic instruction, supplementing reader's advisory services, and enhancing online public access catalogue records.

3. (Shettar I. M., 2016)this paper examines that QR codes are twodimensional matrix barcodes. Last decade witnessed a steady growth in profitmaking and business oriented usage of these QR codes with the advent of smartphone and web capable mobile phones. But the movement of using QR codes in Library & Information field is still in its initial stage. This paper explains application of QR Codes in Library resource and service awareness activities the study focuses on brief introduction to QR codes along with how it works and its features. It also explains the use of QR codes in libraries, with special reference to QR code implementations in Central Library, NITK.

4. (Rahaman, 2016) this article emphasis that a library should try to cope up with the digital world through various technologies in this current age. Users of the present days especially the new generation students are having information in just single click. They became more used to retrieving information from the internet then a tradition library. As each generation becomes more in tune with the internet, their wish to retrieve information as quickly and easily as possible has raised. For them, finding information

by simply searching the internet could be much easier and faster than reading a book. So libraries must update their techniques time to time accordingly and with the need of the future users'. In this article, three modern technology initiatives in the library i.e. Barcode, QR code and RFID were debated. These are becoming very useful technology not only to serve the users but for library security also. The overall technology, its uses, advantages, challenges of using these technologies were also discussed here.

5.   (Gopale, 2019)stated that QR code and advantageous applications in libraries as an developing technology within the current state of libraries hand trend access resources with simple a scan of a code are termed as store of information by having its top quality and rich information resources which are freely provided for tutorial user community. It also covers the way to create in addition as decode QR code through various online accessible that are free and straightforward to use.

6.   (parabhoi, Bhattacharya, &dhar, 2013)Emphasis that the use of QR codes, particularly in Libraries. The QR code technology is just like the barcode technology QR code technology is widely used as a channel to deliver a message to end users. The QR codes are mainly used by libraries for the purpose of endorsing their services. Nowadays the QR code technology is widely used by many libraries for providing quickly access to their resources.

7.   (Shettar I. , 2017)discusses that potential role of QR Codes in managing and presentation of the Library resources to ensure maximum usage of resources; and in Information Distribution. The article focuses on brief overview of QR codes, use of QR codes in LIS field with examples and also list out major QR code generators and readers.

8.   (Elmore & Stephens, 2012) in their article on QR code States that it is relatively new in the United Kingdom, although they have been used very effectively in Japan. Two examples of the use of QR codes for commercial product promotion are outlined, one successful, the other one a failure. This article reflects the increasing need for academic libraries to endorse their services and resources to a "mobile clientele." It reports on two case studies of UK academic libraries that use QR codes to promote library resources. It also gives an account of a pilot exercise at Loughborough University Library where QR codes were tested. The research found that, although awareness and use of QR codes in the UK was increasing and that certain types of QR codes, when used in academic

libraries, were more successful than others, none of them were as successful as anticipated.

9. (Mohamed, 2013)this paper reports on an innovative project which was developed out of the desire to facilitate access to information using the Quick Response (QR) Code. Easily read by mobile phones with cameras, the QR Code provides a simple but effective means for library patrons to access library resources. The article highlights the need to use the QR Code in the Brand van Zyl Law Library, University of Cape Town (UCT), for accessing academic library services. Although relatively new in South Africa, QR Codes have been used successfully by some native educational institutions. The article reports on a needs analysis which was conducted at the Brand Van Zyl Law Library and mentions the fast-tracking use of QR Codes in the academic environment.

10. (Walsh, 2013)He states that QR (Quick Response) codes are a matrix codes, like a two dimensional bar code. They can be read by mobile phones with cameras, with a small application installed. Some mobiles come with the application pre-installed, though it can also be download for free from the internet and installed on PDAs, smartphones and other mobile devices. At the University of Huddersfield they have used QR codes to supply context appropriate help and information to blur the boundaries between the physical and electronic world. They developed mobile friendly materials to deliver information skills materials directly to our users at the point of need, linked by QR codes on printed materials and on correct locations in the physical library. This article outlines the practical uses found for QR codes and gives initial results of how they've been received by library users.

11. (Coleman, 2011)This paper highlights that QR (quick response) codes are two dimensional pictures that when scanned by a smart phone's camera, direct the smart phone to open a web-page or display an image, video, or text. QR codes are, therefore, principally pictographic links that can be embedded in the physical environment. This technology has the potential to transform the way libraries deliver instruction, connect patrons to information about library materials, and market their services. Although use of QR codes has not yet become prominent in Kansas communities, there are several reasons to believe that it soon will be. These reasons include increasing popularity of QR

codes on the coasts, rapid increases in smart phone use in communities, and expected improvements in cellular data capacity in much of Kansas. By implementing QR codes now, academic libraries in Kansas can help accelerate the adoption of this exciting technology and can concomitantly improve their reputations as user-centred, innovative, sites for discovery and exploration. In this paper it is described how individuals with smart phones can download free QR code reader and use their phone's camera to read the code; show several examples of creative ways libraries and other organizations are using QR codes to provide rich, point-of-need information to patrons, customers, and prospective user; describe in detail the process of creating QR codes and distributing them throughout physical and online environments.

12. (J. Rouillard, 2008)This paper proposes the idea of contextual QR codes that merge a public QR code and private information, in order to provide data associated to a particular context if the system is able to obtain data such as the name of the user, the language used on the machine and the moment when the interaction takes place.

13. (Bajpai, 2015)this paper highlights that the scope of information is now much easier and effective in the age of information technology. Electronic documents and resources have changed the entire pattern of education and research. Students, teachers, professionals, academicians and researchers may get their information on their desktop/laptop/Smartphone through electronic platform. The availability of Information and Communication Technology (ICT) and their use has also produced some challenges amongst the library professionals to make ideal use of information resources available. It has been observed that in spite of awareness programs, several eresources are being underutilized or less used. There are several tools which may be used to increase the usage of e-resources to the maximum. One of them is QR Code technology. Quick Response codes are principally made for product promotion more likely as Barcodes.

14. (Oasay, 2011)the paper introduces to the use of QR (Quick Response) codes is defined with an emphasis on how libraries can apply them. As smartphones use increases, people are turning to their phones for instant access to information using mobile tagging. This provides a quick history of one of the types of two-dimensional barcode technology; explains the QR code—what it is and how it generally works; and describes how libraries are incorporating QR codes into user services.

15. (Shettar I. M., 2017)this article emphasis that Smart phone has brought many innovative changes in human day to day life. Libraries are also forced to adopt smart phone based library services. QR Codes are the handy solution to bring smart phone based library services. This paper provides brief introduction to QR codes, how to generate and read and a brief comparison between barcodes and QR codes. This paper also identify potential QR code application in libraries. An attempt has been made to describe the QR code application in NITK Surathkal with examples. The paper delivers an insight to all the professionals who would like to introduce QR Codes in their Library.

16. (Naik, 2015)the paper highlights that with the advancement in information technology, the information is no longer limited to a single physical location. With the parallel progression in mobile technology, the information is available anywhere and at any time with a single click. The quick response (QR) code has further concentrated it easier to access information using QR scanner installed smart phones without remembering complex web addresses. The intent of research is to enable an end user a quick access to the CSIBER library resources by revealing its current location in the library. To enable this an open source tool is designed and developed which queries an end user for book inforation and instantly reveals its physical location in the library.

17. (Hoy, 2011) the article states that QR codes, or "Quick Response" codes, are two-dimensional barcodes that can be scanned by mobile smartphone cameras. These codes can be used to provide rapid access to URLs, telephone numbers, and short passages of text. With the rapid adoption of smartphones, librarians are able to use QR codes to endorse services and help library users find materials quickly and independently. This article will explain what QR codes are, discuss how they can be used in the library, and describe issues surrounding their use. A list of resources for generating and scanning QR codes is also noted.

18. (Whitchurch, 2012)this paper proposes that the use of quick response (QR) codes in libraries is just commencement to evolve, with a varied and vast future. At the Harold B. Lee Library of Brigham Young University, two projects that use QR codes have been

implemented. This article presents details of these executions and briefly describes QR code uses at other libraries. In addition, some pros and cons, cautions, and potential implementation issues are discussed.

19. *(Law, 2010)*here the author states that *QR* codes, developed by a Japanese company, have been around for over fifteen years. With the advent of smart and Web capable mobile devices, we witness a stable growth of interesting profitmaking applications using QR codes.

20. (Vrkić, 2013)In this article author discusses that Although QR were initially intended exclusively for use in shipment industry, Quick Response code is gaining popularity with extensive use of smartphones and has begun to be used and implemented in various types of libraries for engaging and assisting patrons. Absolutely free, allow access to more data than standard bar-codes, can be read with almost all types of smartphones and with great potential to bridge the gap between digital and physical objects.

21. (Medar&Hulamani, 2018) This paper states that The Quick Response codes are two dimensional pictures which have the potential to revolutionize the way libraries deliver instruction, connect patrons to information about library materials, and market their services. The article is meant to identify the key case studies from the available literature and sharing some of them which can be implementable in Indian Library System. This article also describe in detail the process of creating QR code, QR code accessibility, application of QR code in libraries and highlights the new ideas to enhance access to library resources.

22. (MacDonald, Implementation of QR Codes at Indiana University's Fine Arts Library, 2012)This articles examines A project to integrate QR codes into the program of the Fine Arts Library at Indiana University-Bloomington (IUB), launched during the summer of 2011, had two goals designed to increase access to course-related research materials: to embed traceable QR codes in course syllabus leading to custom course resource web pages developed and hosted by the library, and to place QR codes on the library's website and in noticeable locations throughout the facility. The author concludes that web pages personalized to courses are a useful way to introduce research materials to tech-savvy students in the classroom, and that

implementation of a QR code and accompanying URL on a course syllabus is an effective tool for the library and faculty in their work with students.

23. (lombardo, 2012)This article covers the use of Quick Response (QR) codes to provide immediate mobile access to information, digital collections, library website, subject guides, text messages, videos, and library personnel. The array of uses and the value of using QR codes to push customized information to patrons are explained. A case is developed for using QR codes for mobile delivery of customized information to patrons. Applications in use at the Libraries of the University of Utah will be reviewed to provide readers with ideas for use in their library

24. (Das &Kumbar, 2020)the articles highlights that The Quick Reference (QR) Code is the attribute for two-dimensional barcode. This code system has become a popular technology in the present era because of its rapid readability and greater storage capacity compared to the barcode. The QR code is a multidimensional barcode with various colour, size, and shapes. The main goal of this code is to direct groups to particular products or resources through links. Quick Response Code is, usually developed, for product promotion like the barcodes. This paper attempts to present a quick overview of the technology and how libraries adopted it early, to promote their resources and services. IIT Gandhinagar library has been one of the early users of this technology for endorsing its services amongst its user community. It has adopted and verified the benefits of this technology by applying it to several areas of library services. Because of its ease of use and speed, it has been observed that during the last two-three years, recognition and use of this technology among the current generation of students has gone up for retrieving and downloading information. In fact, more number of students have been asking for applying QR in other areas of library services. Paper present here a successful case study of how QR code technology has been implemented at IIT Gandhinagar Library on Android-based mobile phones and how it has now become a part of the routine application for improving access to library resources and services.

25. (Farashbandi, 2014) the paper proposes that Barcode is a graphical depiction of data on a surface that can be read by a machine. Unlike old barcodes, matrix barcodes can store all kind of information in a 2- dimensional pattern. Recently, installing barcode reader

applications on mobile phones, has allowed them to read barcodes. Quick Response Code is a two dimensional barcode with several features, it can be scanned and transferred by a smart phone, log in users to a website, start a phone call, and confirm a library card. These codes can be used in libraries as paper-free labels, library ID cards, and for acquiring information from a librarian, library instruction, and also for marketing. The paper, which applies library study for gathering data, is a review of QR code development history, its structure, capabilities, benefits, challenges and its applications in library and information centres.

26. (Tandel, 2019) in this article author discusses that Upgrading is the aim of all academic libraries in the 21st century. With the help of this kind of technology libraries can provide their services to their users. QR codes are the suitable method to add the virtual to physical, and libraries often at the time of need to provide useful content. This paper discusses how QR codes are generated, how it works and how library can use their services through QR codes. Nowadays all users are using smart phone to reaching the library with the help of application. Paper also presents the types and features of QR codes.

27. (Pons, 2011) paper states that QR codes are beginning to be introduced in libraries and are an easy way to give additional information to mobile web users in a given time and place. In this paper, it shares the experience and give some examples of the introduction and use of QR codes at the
Universitat Politècnica de València (UPV) Libraries in Spain. it describes how we use QR codes to give access to our mobile website, to download documents.it also describe how to promote QR codes to both users and librarians, including some best practices

28. (Momin&goankar, 2013) the paper proposes that in libraries there are a number of ways to get using QR codes. Barcodes are used within libraries mainly to link items to a catalogue record. Using the traditional barcode the information contained is very partial and only by scanning the barcode you will be able to find further information contained within the catalogue record. If instead starts the use QR codes to label books, journals, audio/visual, offprints and a user wanted to see further information about that resource all they'd need to do is scan the QR code. They'd be able to find expressive information, images, useful URLs etc all at the touch of a button on their phone. This paper discusses QR codes and how they can be composed and scan and decode by a camera. QR code is

2dimensional barcode used for quick response service in academic libraries to a new generation students. The article contains a small sampling of current QR code implementations as well as a summary of what has been done to boost student engagement with the library through the use of QR codes at the AIKTC (Anjuman-I-Islam's Kalsekar Technical Campus) Central Library.

29. (Wani, 2019)the paper examines that There is a need and the trend of the world to collect, manage, protect and deliver information in digital form. To get information is now easy in the age of information technology. Students, professionals, research scholars get related information on their desktop/laptop/smart phone using information technology. Information communication technology produced challenges to library professionals in the era of technology its must to introduced library resources and resources to user's community through technological tools. One of them is QR code technology. In this paper, brief talk about the quick response code trends and use in academic libraries have been described, also discuss about how quick response code is useful in various function of academic libraries.

30. (Kadli, 2020)the article highlights that New and developing technologies have always been playing the vital role in shaping the different services of libraries. These technologies not only help the users to quick, quality and efficient services but also provide a chance to library and information professionals to think outside the box to make their services effective. QR code is one of the technologies which can be used with smart phones. In India the use of QR Code and smart phones though started late but in these days emerging as basic element of their day to day life and fast-tracking technology adoption. In this paper author has discussed and highlighted on QR codes and their use in library. It discusses on how the QR Code technology can enhance the library services with Quick and Quality as prime role.

31. (Wilson, 2012)the paper emphasis that The literature is filled with probable uses for Quick Response (QR) Codes in the library setting, but few library QR Code projects have revealed usage statistics. A pilot project carried out in the Eda Kuhn Loeb Music Library of the Harvard College Library sought to determine whether library patrons actually understand and use QR Codes.

32. (Ratajeski, 2014)the paper states that as collections of e-books grow, librarians face the challenge of making patrons aware of the titles comprised in these collections and how to access them. To promote e-book usage, quick response (QR) codes were posted throughout the print book collections at two medical libraries. Once scanned, the QR codes led users to a subject page, listing e-book titles with links for access. The codes were created using URL shortness, allowing scan data to be recorded. The codes were scanned infrequently at both institutions, however because of minimal cost for creation and maintenance their use is still viewed as beneficial.

33. (Sekyere, 2012)this article discusses the uses of Quick Response (QR) codes in libraries and how to assess their practicality. It describes a step-by-step approach to developing a system to track the scans of QR codes by library users for assessment.

34. (Hampton, 2012)the authors states that the rapid growth in the use of smart devices and the resultant need for libraries to meet patrons where they are, via quick response code. Suggestions for use include marketing of library services, firming bibliographic instruction, supplementing reader's advisory services, and augmenting online public access catalogue records.

CHAPTER III

QR CODE CONCEPTS AND   FEATURES

3.1 WHAT IS QR CODE?

Quick Response codes are 2-D (Two Dimensional) matrix barcodes that are scanned using mobile devices / phones having camera, with QR Reader present as default application, allows you to access some pre-written content such as a web site URL, email address, details of things within the catalogue, phone numbers etc.

QR Code is a 2-D symbology developed by Toyota subsidiary Denso Wave in 1994 with the first aim of being a symbol that is easily decoded by scanner instrumentation at high speed with additional knowledge content than conventional barcodes. Conventional Universal Product Code contains decoded data in one direction i.e. vertically into bars and house in between; whereas QR Code contains decoded data in each the directions i.e. vertical and horizontal direction. QR code is capable of holding extra volume of information than barcode.

3.2 HISTORY

The QR code system was invented in 1994 by Masahiro Hara from the Japanese company Denso Wave. The first design was influenced by the black and white pieces on a Go board. Its purpose was to track motor vehicles during manufacturing; it was designed to high-speed component scanning. QR code technology is now used in a much broader context, including commercial tracking applications and convenience-oriented applications aimed at mobile-phone users. QR codes can be used to display text to the user, to open awebpage, to add avCardcontacts to the user's device, to open a Uniform Resource Identifier(URI), to compose an email or text message or to connect to a wireless network. There are many QR code generators available as software or as online tools that are either free of cost, or require a paid subscription. The QR code has become one of the most-used types of two-dimensional code

3.3 STANDARDS

There are many standards that cover the coding of data as QR codes:

➢ October 1997 – AIM (Association for Automatic Identification and Mobility) International ☐January 1999 –JISX 0510

➢ June 2000 –ISO/IEC 18004:2000 *Information technology – Automatic identification and data capture techniques – Bar code symbology – QR code* (now withdrawn) Defines QR code models 1 and 2 symbols.

➢ 1 September 2006 – ISO/IEC 18004:2006*Informationtechnology – Automatic identification and data capturetechniques – QR code 2005 bar code symbologyspecification*(now withdrawn)[12]

Defines QR code 2005 symbols, an extension of QR code model 2. Does not specify how to read QR code model 1 symbols, or require this for compliance.

➢ 1 February 2015 – ISO/IEC 18004:2015*Information –Automatic identification and data capture techniques – QR Code barcode symbology specification*

Renames the QR Code 2005 symbol to QR Code and adds clarification to some procedures and minor corrections.

➢ At theapplicationlayer, there is some variation between most of the implementations. Japan'sNTTDoCoMohas establisheddefactostandards for the encoding of URLs, contact information, and several other data types.[The open-source "ZXing" project maintains a list of QR code data types. (htt3)

3.4 USES

QR codes technology become common in consumer advertising.

a smartphone is used as a QR code scanner, displaying the code and converting it to some advantageous form QR code has become a focus of advertising tactic, since it offers a way to access a brand's website more quickly than by manually entering a URL.

Although firstly used to track parts in motor vehicle manufacturing, QR codes are used over a much extensive range of applications. These include commercial tracking, entertainment and transport ticketing, product and loyalty marketing and in-store product labelling. Examples of marketing comprise where a company's discounted and percent discount can be captured using a QR code decoder which is a mobile app, or keeping a company's information such as address and related information alongside its alpha-numeric text data as can be seen in Yellow Pages directory.

They can also be used in storing private information for use by organizations. An example of this is Philippines National Bureau of Investigation (NBI) where NBI clearances now come with a QR code. Many of these applications target smart-phone users. Users may receive text, add avCardcontact to their device, open a URL, or compose amailor text message after scanning QR codes. They can create and print their own QR codes for others to scan and use by visiting one of several pay or free QR code-generating sites or apps.Google had an API, now deprecated, to generate QR codes and apps for scanning QR codes can be found on almost all smartphones.

QR codes storing addresses and URLs may appear in periodicals, on signs, on buses, on business cards, or on almost any object about which customers might want information. Users with a camera phone equipped with the correct reader application can scan the image of the QR code to display text, contact information, connect to a wireless network, or open a web site in the telephone's browser. This act of linking from physical world objects is termed hard   linking or object hyper linking. QR codes also may be linked to a location to track where a code has been scanned. Either the application that scans the QR code retrieves the geographical information by using GPS or the URL

encoded in the QR code itself is linked with a location. In 2008, a Japanese stonemason announced plans to engrave QR codes on gravestones, allowing visitors to view information about the deceased, and family members to keep track of visits.

Psychologist Richard Wiseman was one of the first authors to include QR codes in a book, in *Paranormality: Why We See What Isn't There*(2011).

QR codes have been incorporated into currency. In June 2011 The Royal Dutch Mint (*Koninklijke Nederlandse Munt*) issued the world's first approved coin with a QR code to celebrate the anniversary of its current building and premises. The coin can be scanned by asmartphoneand formerly linked to a website with contents about the historical event and design of the coin.

In 2014 the Central Bank of Nigeria issued a 100-naira banknote to honour its centennial, the first banknote to integrate a QR code in its design. When scanned with an internet-enabled mobile device, the code goes to a website which tells the centenary story of Nigeria.

In 2015, the Central Bank of the Russian Federation issued a 100rubles note to honour the annexation of Crimea by the Russian Federation. It contains a QR code into its design, and when scanned with mobile device, the code goes to a website that details the historical and procedural background of the commemorative note.

In 2017, the Bank of Ghana issued a 5-cedis banknote to celebrate 60 years of Central Banking in Ghana, and contains a QR code in its design, which when scanned with a mobile device, that code goes to the official Bank of Ghana website.

Credit card functionality is under development. In September 2016, the Reserve Bank of India (RBI)launched the eponymously titled as Bharat QR, a common QR code jointly developed by all the four major card payment companies - National Payments Corporation of India that runs RuPay cards along with MasterCard, Visa and American Express. It will also have the ability of accepting payments on the unified payments interface (UPI)platform .

3.5 HOW DOES IT WORK?

Information may be encrypted into a QR code by QR Code generator. Data may be easily encrypted in to QR codes by using any freely available QR code generators, enter the information to be encrypted in to the domain provided by generators. QR code generators may ask you to enter data to 1 to numerous Data Fields available, supported what data you're encrypting. Once all the information fields crammed with essential data in precise format QR code generator can publish the QR code for the data, which is able to be in the main in image format (JPEG, BMP, and PNG etc.). This could be used directly on internet or mails or may be publicised in Print format. It's additionally manageable to disarrange the colour and even attainable to feature image in to QR codes to supply creative embellishment.

Decoding of those QR codes may be done by on-line QR code decoders associated with any internet enabled good phone that has QR code Reader software package program already installed, If not the software may be downloaded from various sites that are freely available on internet . QR codes may be decoded with on-line decoder like ZXing Decoder on-line, MiniQR, on-line Barcode Reader. QR codes can also be decoded with good Phone's

Camera by inform towards QR code and scanning with image capture. Then pre-installed QR code reader decodes the QR code and shows content as text or URL format. QR Codes also prompt your mobile device direct to an internet page actions like dial variety, send SMS, Save Reminders, save variety to Phone Book etc. Most common QR Code functions are given below:

➢ Encode phone numbers, text messages, commands and phone data.

➢ Prompt to direct to open a URL

➢ Bookmark a site link

➢ to form a call from mobile

➢ to send a SMS from mobile

➢ to begin an mail

23

- Send a vCard

- Store a date in your calendar

- Encryption

Some of the QR Codes designed to offer multiple functions from advanced smart phones.

3.6 FEATURES OF QR CODE

According to Denso Wave [2], developers of QR Codes:

- Barcode can store a maximum of 20 digits; whereas QR Code can be capable of storing hundred to thousand-folds of extra information.

- QR codes are capable of holding all data varieties, such as Alpha-Numeric, Special characters, binary and control codes.

- A QR code Data storage capacity: Max. 7,089 numeric characters, Max. 4,296 alphanumeric characters.

- For QR Codes very less output Size is needed, as QR code transmits data both horizontally and vertically. QR Code has error rectification capacity. Even dirty or broken image is repaired and max. up to 30% code will be corrected.

- QR Code is readable from any direction across 360 degree

- QR Code has got Organised Append Feature, where QR Code is divided into multiple data areas and all the information is stored in several QR Code symbols that can be re-formed as single data symbols.

3.7 NEED FOR QR CODE IN MARKETING OF LIBRARY PRODUCTS:

Present day libraries need to be advanced with new technologies to deal with modern tech savvy users. Online catalogues to be replaced with these new generation interfaces to reach the expectation of Mobile-Tech savvy library users. Using your smart phone to scan the QR code to get Book review and rating by other readers on publisher websites. QR codes can be most efficiently added to the communication as a dynamic element which otherwise non interactive. Marketing of Library products and services is essential to make the awareness amongst the library users.

QR codes can be used in order to:

➢ Promote information resources and events;

➢ Create need for information;

➢ Manage information explosion; Make awareness.

➢ Information distribution.

➢ Connect with user community.

3.8 HOW TO USE QR CODE IN LIBRARY?

With the beginning of smart and Web capable mobile devices, we are witnessing a firm growth in commercial and business oriented usage of these QR code technology. As the programme of using QR codes in Library & Information field is still in its primary stage. Modern Libraries and its services are best engaged to implement application of these QR Codes. These codes are capable to supply required information to modern Library users and give them quick access to the information whenever and wherever needed. Library Instructions such as Library Rules, Timings, Contact details, E-mail address, Telephone Number, Links to Library Website, its services page, mainly to the Library Catalogue and even to the dedicated bibliographic list, can be linked using these codes. As well as these codes save the time of Library users.

Some of the Library services or activities that can be coded are:

- To share Contact information

- Link to websites and online information sources.

- Promotion of the use of information resources.

- Links to videos.

- Links to full text of journals/ Articles.

- Ask your Librarian through Call, SMS, and mail.

- Send Library Notices and announcements.

- Library Outreach / Events Details popup / Reminder Alerts.

- In Library Catalogues – To note the Book Call Number details for reference on Mobile.

  These QR Codes can be fixed on any uniform surface in the Library like Printed handouts, shelf ends, Web OPAC Desk, Reference Desk, Magazine racks, etc.

3.9 HOW TO GENERATE A CODE?

There are many QR code generators some are listed below

- Kaywa (http://qrcode.kaywa.com/)

- GoQR.me (http://goqr.me)

- QRMobilize (http://qrmobilize.com)

- QR Code and 2D Code Generator by KeremErkan

  (http://keremerkan.net/qr-code-and-2d-code-generator/)

- QR Stuff (http://www.qrstuff.com)MyQR (http://myqr.co/)

- Quickmark (http://www.quickmark.com.tw/En/qrcodedatamatrix-generator/)

- BeQRious (http://www.beqrious.com/qrcode/create)

3.10 HOW TO GET CODE READERS?

Most of the present day Smart mobile phones available in market come with already installed QR Code readers. However one can download the QR Reader software from various online service providers. Here is the list of the QR Code reader software available on web for free to download.

- KAYWA Reader (http://reader.kaywa.com/)

- i-nigma Reader(http://www.i-nigma.mobi/)

- Lynkee Reader (http://m.lynkee.com/)

- UpCode (http://www.upcode.mobi/)

- QuickMark

    (http://www.quickmark.com.tw/En/basic/downloadMain.asp)

- SnapMaze (http://mobile.snapmaze.com/jar/)

- BeeTagg (http://get.beetagg.com/)

- NeoReader (http://get.neoreader.com/)

- ScanLife (http://www.getscanlife.com/)

- MobileTag (http://m.mobiletag.com/) (shettar I. , 2016)

27

CHAPTER IV

QR CODE NATIONAL AND INTERNATIONAL LEVEL

QR CODE AT NATIONAL AND INTERNATIONAL LEVEL

QR code in libraries at National and International level is how at National and international level, QR code technology in the libraries is implemented and use in the different libraries in different ways.

The purpose of the study at International and National level is to know the success of QR code technology by the libraries worldwide and to see what are the various use and applications of QR code technology and how it is useful to provide best possible library services to the users of libraries.

4.1 QR CODE AT INTERNATIONAL LEVEL

At International level, following are the examples of academic libraries and different activities they undertake in their campus using QR code

San Diego State University

San Diego State University has made book research very clean with QR Codes. As the read er is going on their website, and scroll via the catalogue, there may be a QR Code with each item record. Upon scanning, the reader can realize the title of the book, which floor is it on, and if the book is available.

Bath University library, United Kingdom

The library in Bath University has delivered QR Codes on catalogue records. The QR Code gives fundamental records about an object with inside the record which includes location and contact number.

Half Hollow Hills Community Library

Half Hollow Hills Community Library in New York makes use of QR Codes to offer subject guides associated with the topics of the book on the shelves. So, if the books which are placed on a shelf are based are on 'cooking', the QR Code positioned will direct readers to a guide on food as well as drink

Derby Academy, Massachusetts

The library in the academy makes use of QR Codes significantly to offer information. QR Codes are positioned on book covers. Here, they hyperlink to book trailers published on the writer or publisher website. Students can take hold of an ipad in the library and scan the QR Code to look at videos.

Contra Costa County Library,

California Contra Costa County Library, California, made outstanding use of QR Codes. They collaborated with Tri Delta transit and provided access to library offerings at the go. But only the library cardholders ought to avail this privilege. The QR Code has linked 550 audiobook titles. Upon scanning, the library cardholder who's travelling in the bus, can pick out from the books and wirelessly download it to their mobile phone. And listen to it while finishing the rest of the journey. Furthermore, the library additionally makes use of QR Codes on famous books to endorse similarly reading.

Tompkins County Public Library, New York

The library makes use of QR Codes to advertise its ebook service. Besides, it hyperlinks QR Codes to its social networking sites. Upon scanning, the visitors can effortlessly follow/like the social media accounts.

Syracuse University Library,

New York Syracuse University Library, Learning Commons, in New York is creatively making use of QR Codes for this purpose. The library created bookmarks for their patrons that have a QR Code at the bottom. The QR Code, upon scanning, redirects users to the Research Assistance web page on their website. From here, the end user can upload the contact information to their listing effortlessly.

Lafayette College Library

Pennsylvania Lafayette College Library in Easton, Pennsylvania, used QR Codes to assist college students learn about the library. They created a QR Code treasure hunt game to make studying funfilled. The game was called 'Carmen Sandie go's trail'. Here, college students needed to pursue Carmen's trail to find a sword. The game entailed

visiting different stations positioned at some point of the library. Librarians standing at every station gave college students a QR Code encoded with a clue. In this manner, going alongside the way, college students discovered a few beneficial guidelines approximately the usage of the library.

Harold B. Lee Library, United States

Harold B. Lee Library at Brigham Young University makes use of QR Codes to take college students on an audio tour. The library makes use of 21 QR Codes positioned in a place of 665,000 rectangular foot building. These QR Codes are positioned in those areas, which the scholars want to know to pass the post-tour quiz. Upon scanning, college students can concentrate to the audio relaying the necessary information.

4.2 QR CODE AT NATIONAL LEVEL

In this we will see how some of the academic libraries from India have use QR code to help their services to reach to the users easily

TEZPUR UNIVERSITY ASSAM

Central library from Tezpur University is doing the use for QR code to provide better and fast services to their user

- First of all they have generated the QR code of their URL of library website any of their who want to access the website can direct scan that QR code and go on the web page of university website

- University library have also design QR code of the OPAC so that user and scan and get to know different types of document which are there in the library

- For the benefit of user the library has also encoded the link to electronic thesis and dissertation via QR code. User can directly access the e-thesis and dissertation by scanning that QR code

- URL of the library blog is also encoded into QR code user and scan and get to know what library is posting on its blog.

Central Library, IISER Bhopal

Central Library, IISER Bhopal is a State -of-the -Art modern academic library having high quality research based information resources

- 9000 print books

- 34000 e-journals

- 1000 e-books

- Audio-Visual materials

- Theses and Dissertations

- Projects Reports, etc.

This university library has done most use of QR code service for the betterment and to save the time of their user

Library Website	Web OPAC	List of Ph.D. Theses	e-Resources
Book Requisition / Library Membership Form	Digital Payment for Library Book overdue	List of CD-ROMs	Library Guide
Library Manual	Institutional Digital Repository (IDR)	Open Access Resources	Union Catalogue of e-Resources
New Arrivals	List of print magazines	Discovery Tool Service	List of News Papers
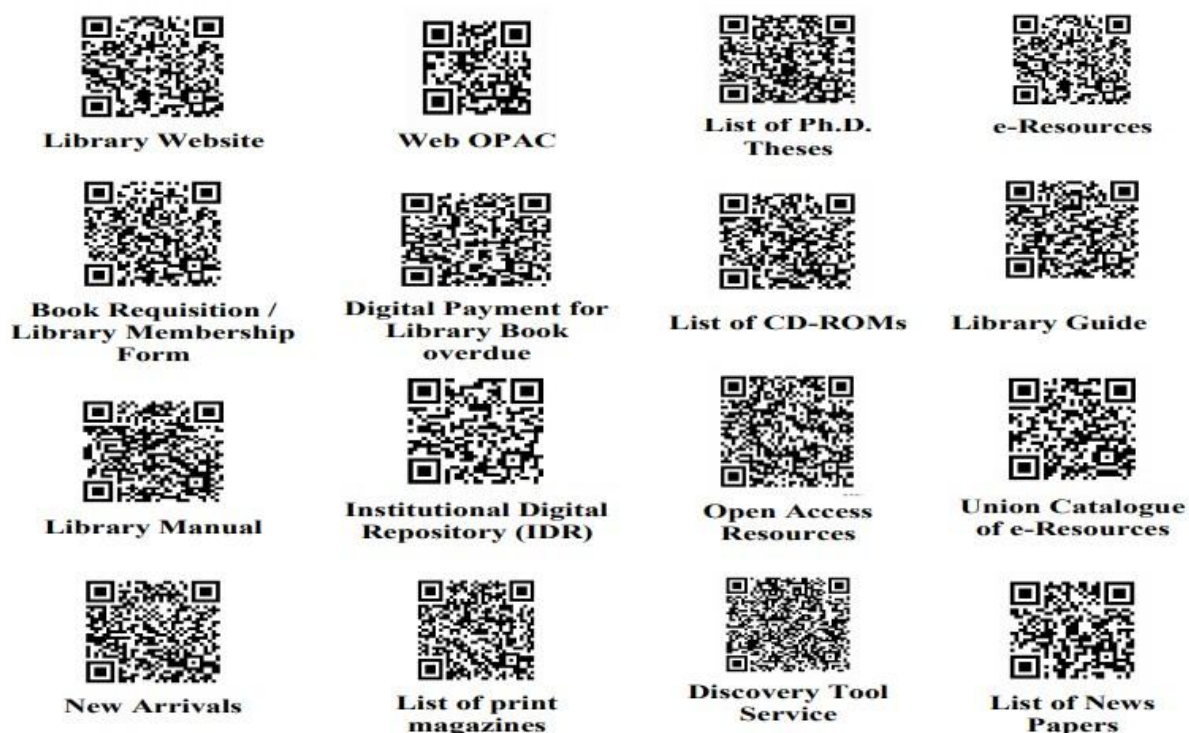
They have generated QR code for

- Library website
- webOPAC
- List of Ph.D. theses
- E-resources
- Library membership form
- Institutional repository
- Open access resources
- Union catalogue of e resources
- New arrivals
- List of print magazine
- Discovery tools services
- List of News paper papers

GGSIP University Delhi

Here catalogue records to offer patrons basic info about an item, including the location and call number.

Users can scan the code and go to the stacks rather than writing or printing.

•QR Code placed on staff directory pages and research guides that go to mobile friendly websites for reference. •QR Code placed over audio book directs to author interviews or books for reviews.

•QR Code placed on study room doors connect to room reservation forms.

•Library exhibits that include a QR code link to songs, videos, Web sites, surveys, contests, etc. or other information that augments the exhibits.

•Codes in the library stacks/end caps or magazine/journal areas that point to online electronic holdings of print materials or related subject guides. •Linking to library audio tours for orientations.

•QR Code in print handouts for additional information on mobile friendly sites.

•QR code with text that loads the library's text message reference service and other contact information into the patron's phone.

IIT Gandhinagar Library

- Library website: They have used the link to the library website and created QR codes for enriching and increasing the library visibility and the resources and services to end user.

- Library web OPAC link: Using QR code given for library OPAC, user can get access quickly the holdings of the library and find out the status of required readings.

- Library brochures: More than a dozen library brochures created for different memberships and services have now QR codes. Within each brochure QR codes have been provided to link resources, catalogues, contact details etc.

- E-resources list: QR Code to link the user to the physical and virtual collections subscribed by the library anytime and anywhere has been implemented.

- Audio-visual (CD/DVDs) material list: Codes have been generated and affixed on PDF list of Audi Visual materials uploaded on website.

- New arrival list: Weekly new arrival lists (print and digital) have also QR Codes attached. With this, once download the entire directory on their smartphones.

- Bibliographies: To retrieve the information using a variety of methods, they have created the QR code to download the list of books in pdf format.

- Book of the week (URL and PDF): weekly display of Book of the Week and its complete list has QR Code.

- List of full-text print journals: A list (10-12 pages printed and pdf) containing bibliographic details of print journals subscribed in the library also has QR Code.

- Digital repository link: They have created the QR code for the URL repository

Name of the Institutions or Libraries	Activity for which QR codes are used
DITM, Pune	Audio/Visual collection, bibliography
Baburaoji Gholap College, Pune	Library URL, contact details, product information, etc.
CSIBER Kolhapur Library	Kolhapur Library OPAC, Location finding, Audio/Visual collection
IIT Jodhpur	New Arrival list, Audio/Visual collection, book indent form, contact details, etc.
IIT Kharagpur	Events information, different URLs, departmental information
Karnataka State Open University Library	Mysore Staff contact information, Pathfinder, Section location, emails
NITK-Suratkal	Application of QR Codes in Library resource and service awareness activities
National Law University	Lucknow Library website URL, Library Guide
Karve Institute of Social Service, Pune	Notification, Exam Periodicals, Rare books collection, CD/DVDs list results

CHAPTER V

DATA ANALYSIS AND INTERPRETATION

DATA ANALYSIS AND INTERPRETATION

To know the current situation about the use of QR code technology and to know the cost benefit ratioof QR code technology in colleges of North Goa I have framed a questionnaire and sent it to the most of the college libraries of North Goa. 12 librarians responded to questions I have asked. I tried to cover basic question to know how much extent the librarians are aware of QR code. Based on the total responses I received for the framed questionnaire I have prepared a chart for every question which was asked, this will make it simple to analyse and interpret

The Questions which were asked are as follows

Do you have smartphone ?
12 responses

12 responses

0%

100%

Yes
No
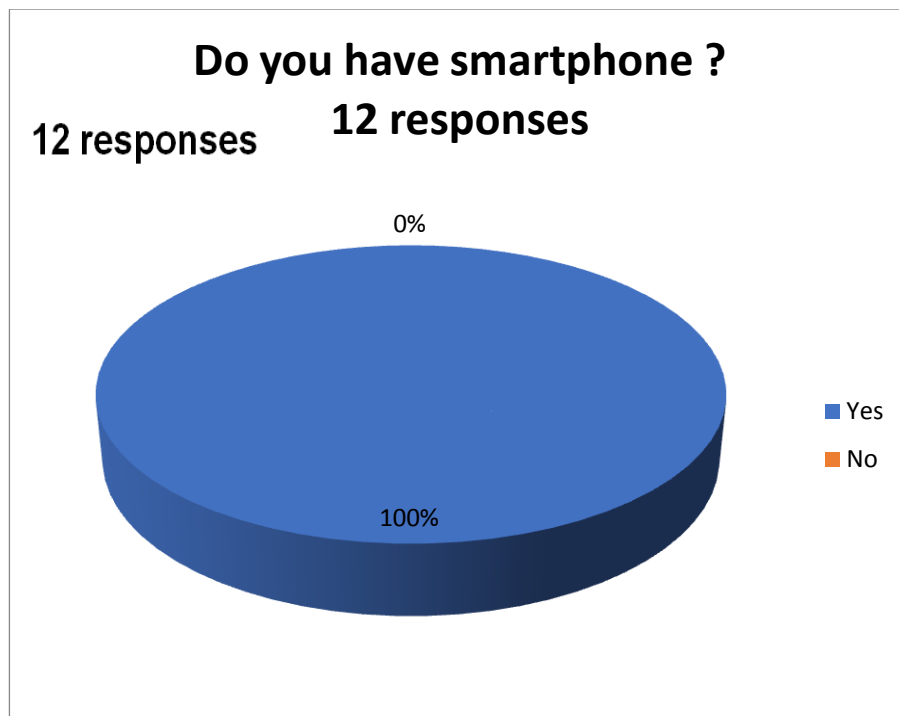
Figure 1 showing % of librarian having smartphone

All the respondents under the study has smsrtphones as it is mandatory to study in a situation like covid -19 pandemic.

+

If yes, how long do you use your mobile phone ?

12 responses

■	Less than 1 hour
■	2 to 3 hours
■	4 to 6 hours
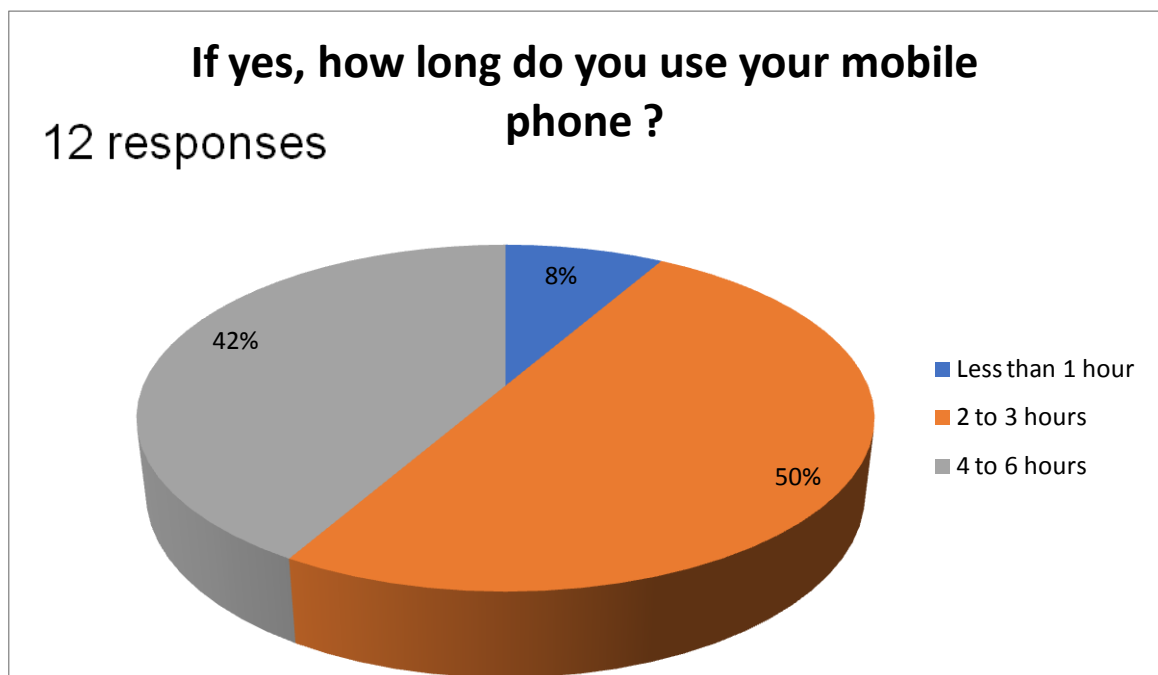
Figure 2 shows time librarian uses their smartphone per day

About 50% of librarians from different colleges of North Goa uses their smartphone for 2 to 3 hours per day. About 42% of librarians uses their smartphone for nearly 5-6 hours per day. About 8% of librarians uses their smartphone for less than 1 hour per day.

Do you allow patrons to use moibile in library ?

12 responses

25%

75%

Yes

No
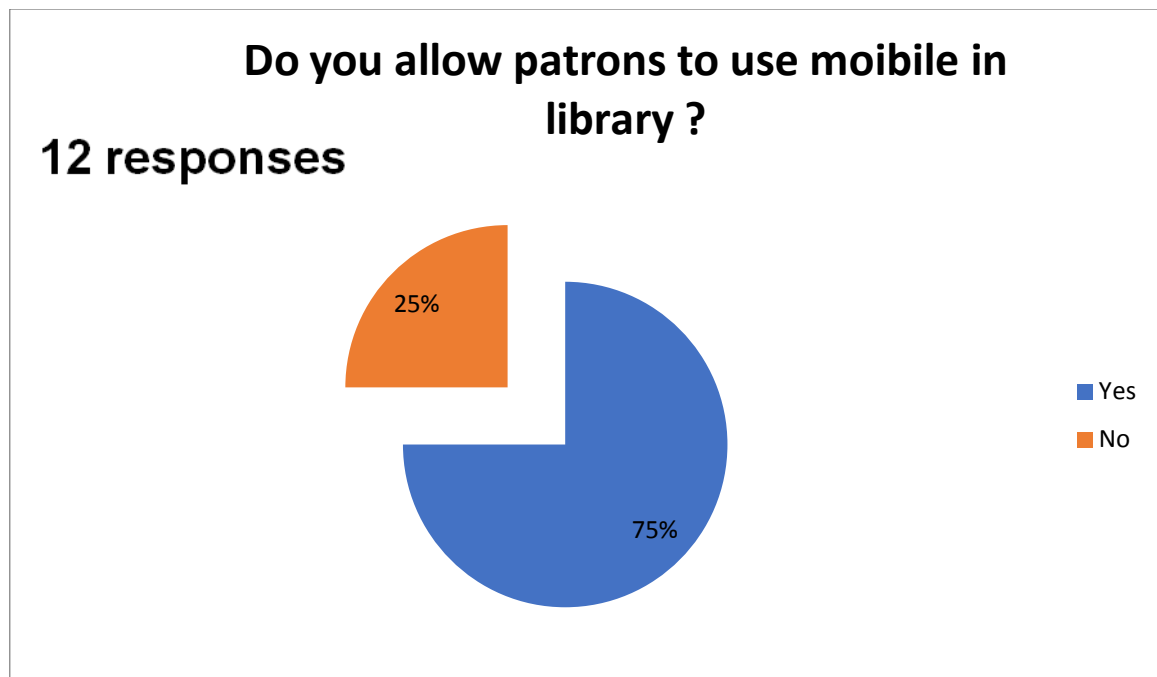
Figure 3 shows how many libraries allow patrons to use smartphone

Next questions was about if the libraries allow their patrons to use smartphone in library campus or not and amongst all the libraries 25% of them Do Not allow their patrons to use smartphone in library campus and 75% of libraries allows their patrons to use smartphone in library campus. This shows that most of the libraries allows their patron or users to use their mobile phone in library.

Does your library has proper internet/WI-FI facility ?
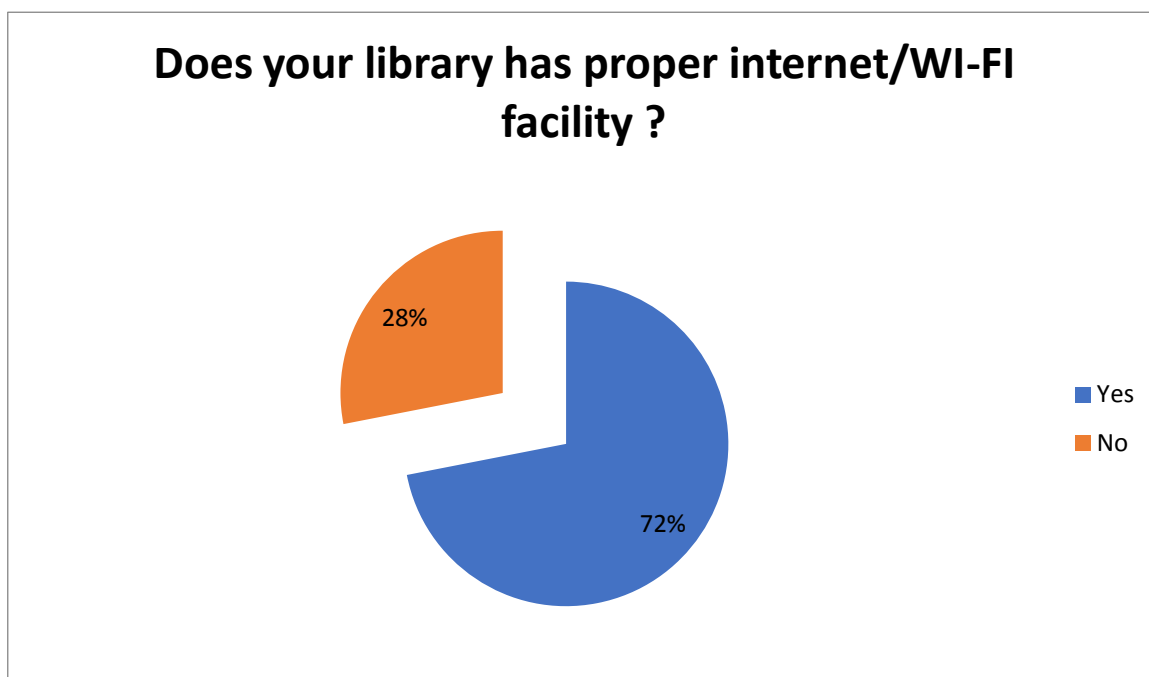
Figure 4 shows percentage of libraries having Wi-Fi/internet facilities

Then next question was about do their library have proper Wi-Fi and internet connectivity or not and the results are about 28% of libraries do not have proper internet facilities and 72% of libraries have proper Wi-Fi connectivity or internet facility which enable them to make the use of internet and fetch digital content available over internet very easily nowadays having a proper internet connection is very necessary as wide variety of data and information is available on digital platform which is very easy to get and some of them are open access.

Do you know what is QR code ?

12 responses

0%

100%

Yes
No
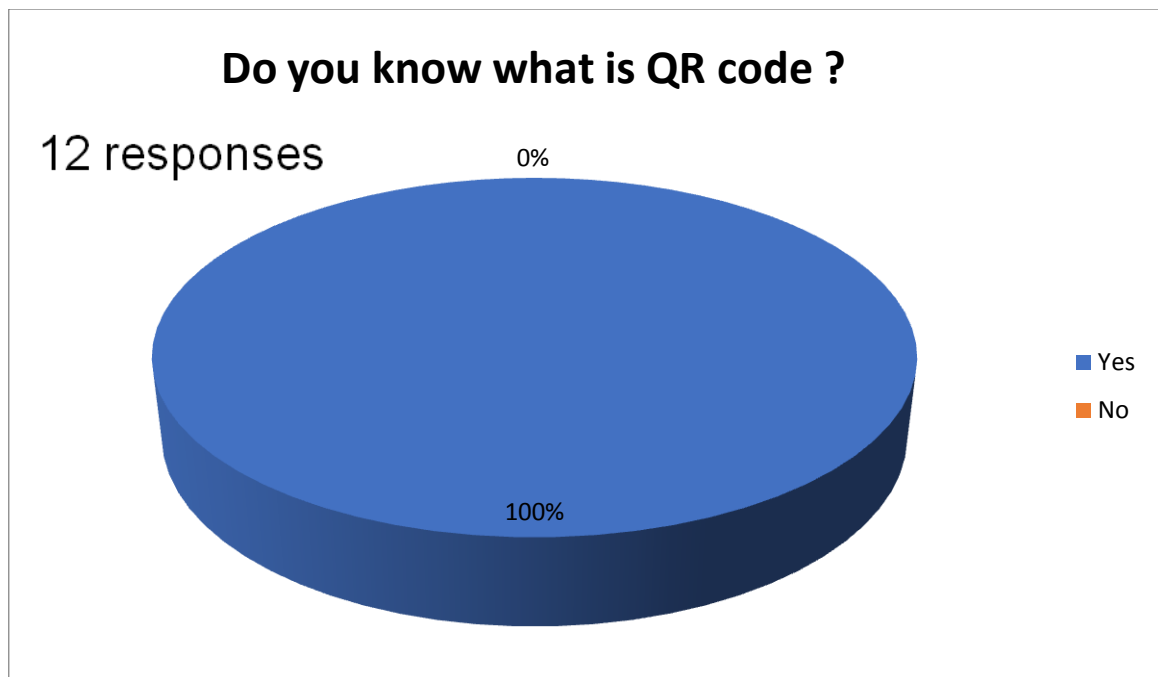
Figure 5 show % of librarians who knows what is QR code

All the respondents are aware of the QR code facilities and the techniology however it seems that implementation is lacking.

Have you ever used QR code ?

12 responses

0%

100%

Yes

No
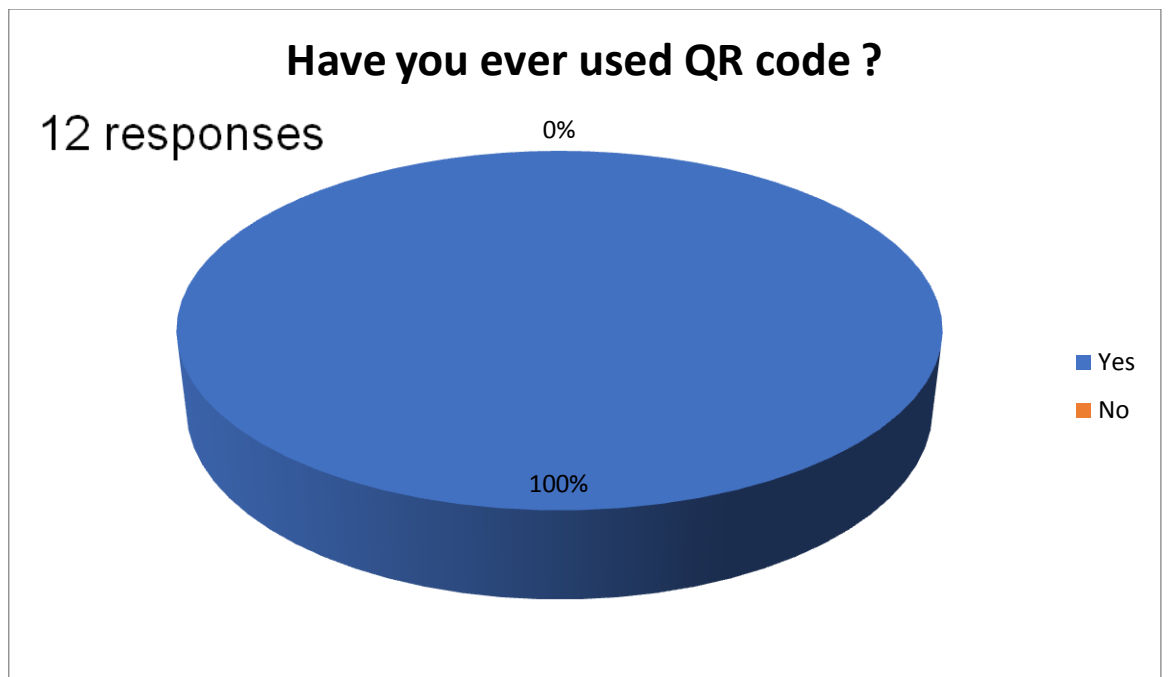
Figure 6 shows % of libraries who have used QR code

After knowing that all of them knows what is QR code next question if they have used it and good to know that all the librarians from different colleges of North Goa have used the QR code.
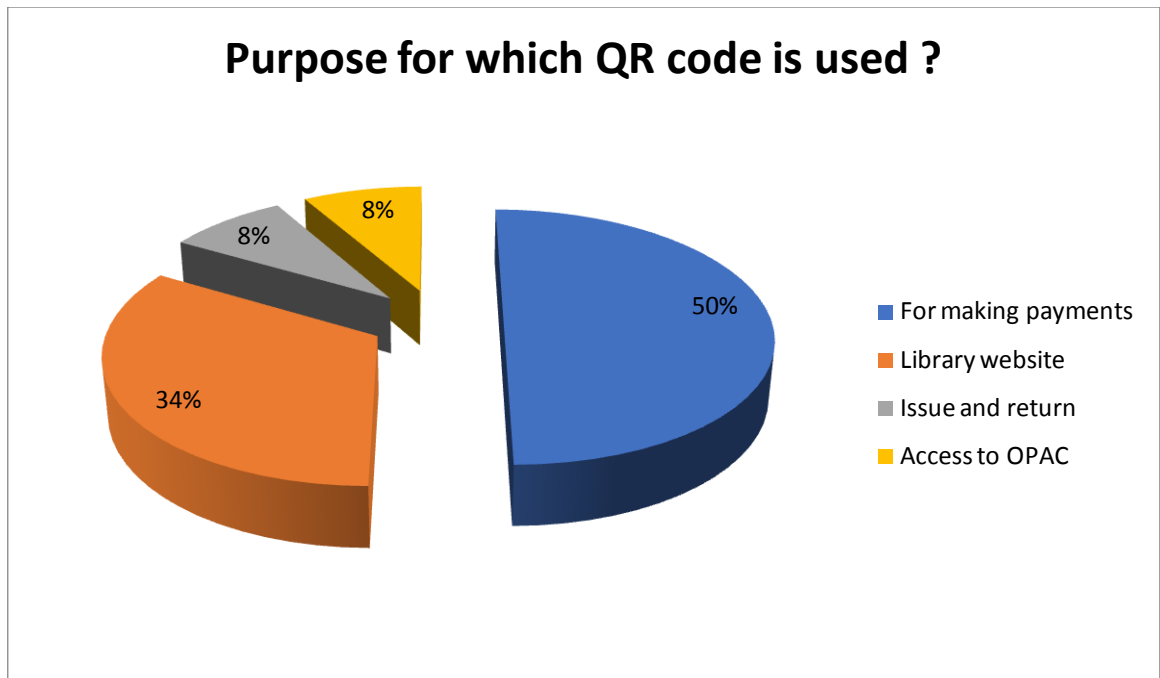
Figure 7 show purpose for which QR code is used

Next question I asked about purpose for which libraries have used QR code and the answer are

50% of the college librarians have used QR code for making payments on online payment apps like Google Pay and related platforms, 34% of the librarians have used QR code for their library website, about 8% of the college librarians have used it for issue and return of documents which means they have used it in circulation section of their library and another 8% of them have used QR code for accessing their online public access catalogue.

Do you know how to generate QR code ?
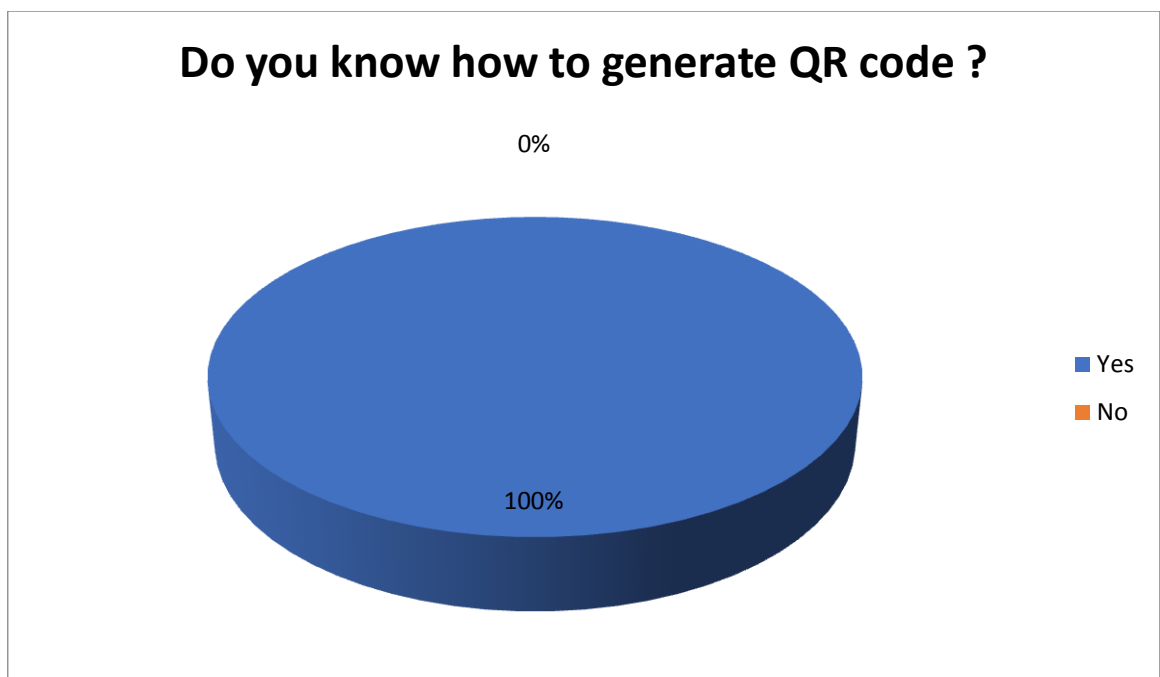
Figure 8 shows % of librarians knowing how to generate QR code

Next question was about if the librarians know how to generate QR code and all the librarians from the colleges of north Goa who responded knows how to generate QR code and they have generated it for different purposes in their libraries.

Have you ever generated QR code ?

12 responses

Legend: ■ Yes ■ No
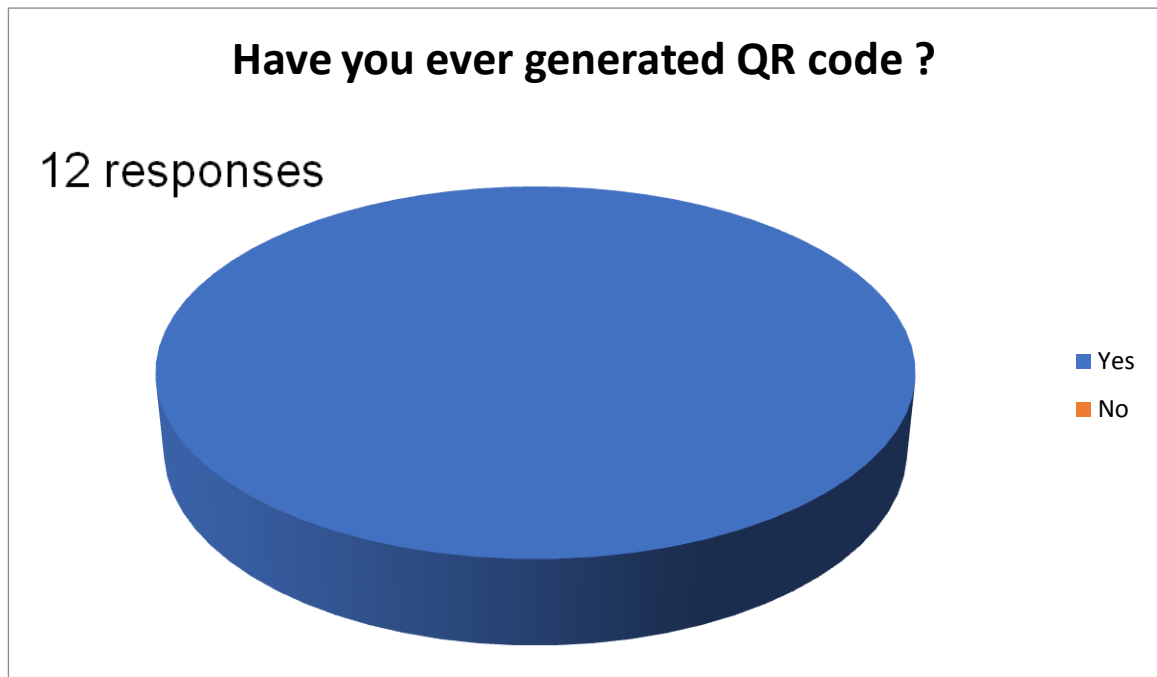
Figure 9 shows % of librarians who have generated QR code for library purpose

All the respondents under the study has generated the QR code indivisually and has the experience of using QR code technology.

Does your library has QR code services ?

46%

54%

- Yes
- No
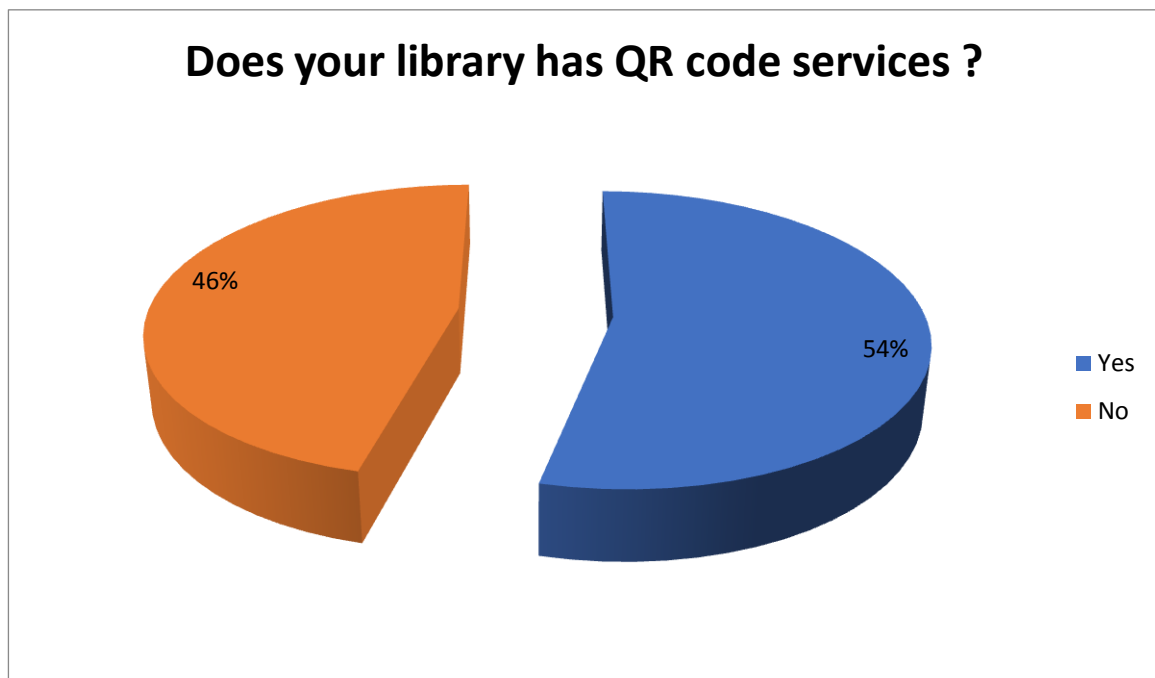
Figure 10 shows% of libraries having QR code service

Then I asked how many of the libraries provide QR code services to their user and about 54%of libraries from different academic colleges have QR code services in their library and 46% of libraries do not have QR code service in their colleges.

If yes, does your patrons search for information using QR code ?

12 responses

- 42% — Yes
- 58% — No
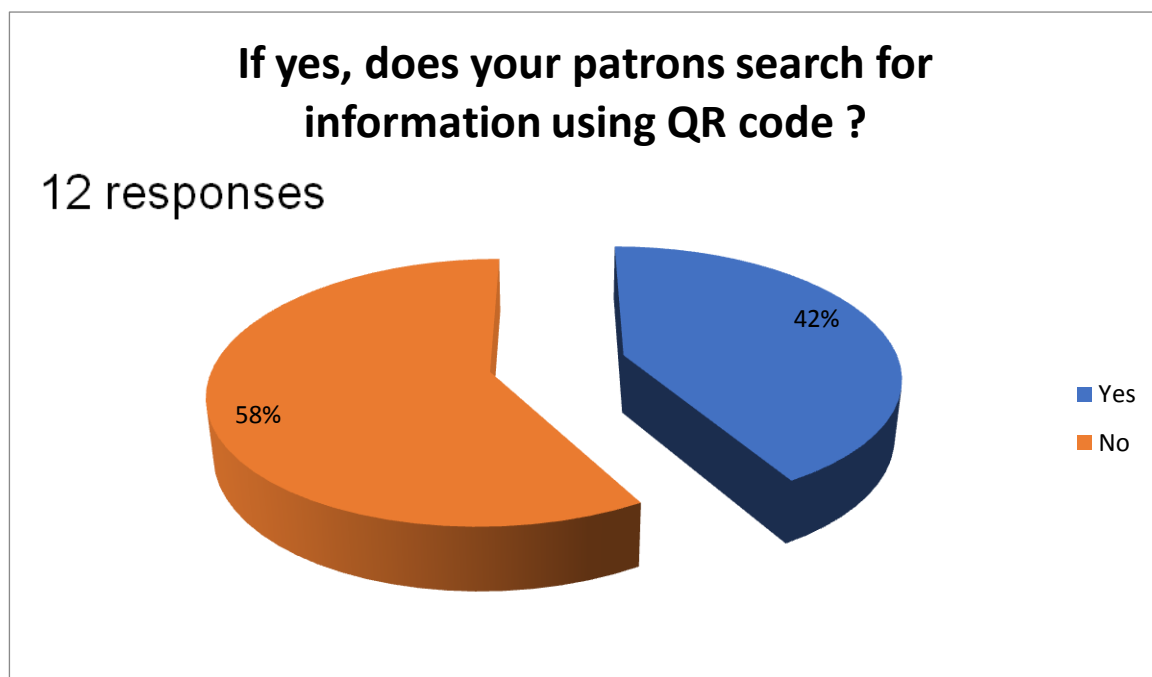
Figure 11 shows % of user searching information via QR code

If libraries have QR code services then how many of the libraries have the facility to scan QR code get information this was the question asked and about 42% of libraries have the facility to scan and get information and 58% of libraries still do not have this facility.

Have you encoded library rules,contact details, email address, telephone number using QR code?

12 responses
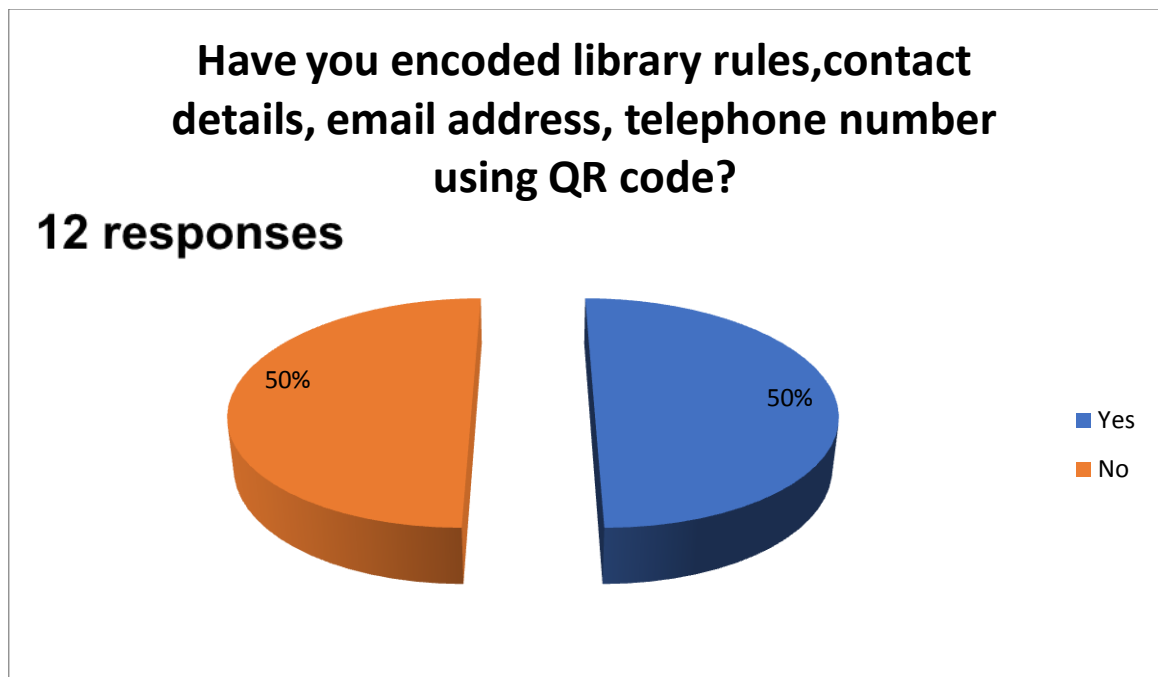
Figure 12 shows % of libraries having details encoded using QR code

One of the best thing about QR code is that it can encode number, text contact details, URL etc. Based on this the question was asked if the libraries have encoded library rules, contact details Email address telephone number using QR code and according to responses I received about 50% of libraries have done it and 50% haven't done it till now.

Does your library has website

12 responses

25%

75%

Yes

No
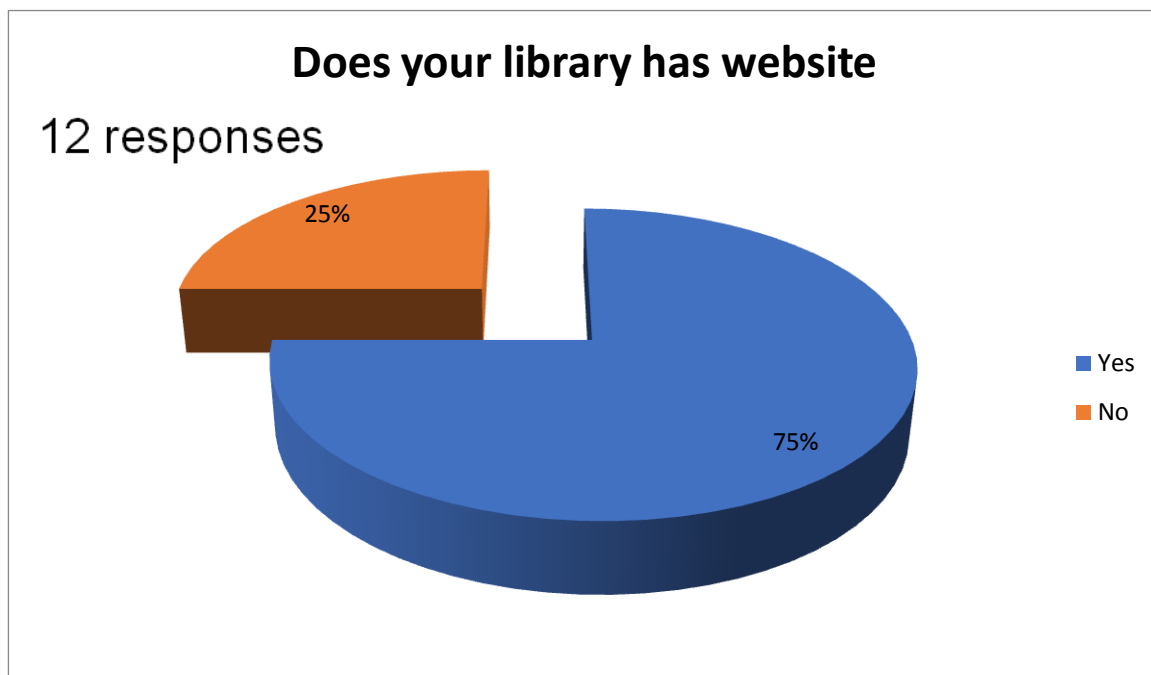
Figure 13 shows% of libraries having website

Libraries this days are advanced and have their website to showcase their collection, new arrivals, notices and other details to user which user can check anywhere in world over the network. Among different college libraries form North Goa majority that is 75% libraries have their independent library website and 25% libraries do not have independent library website.

Have you encoded URL of your college website using QR code ?

12 responses

33%

67%

■ Yes
■ No
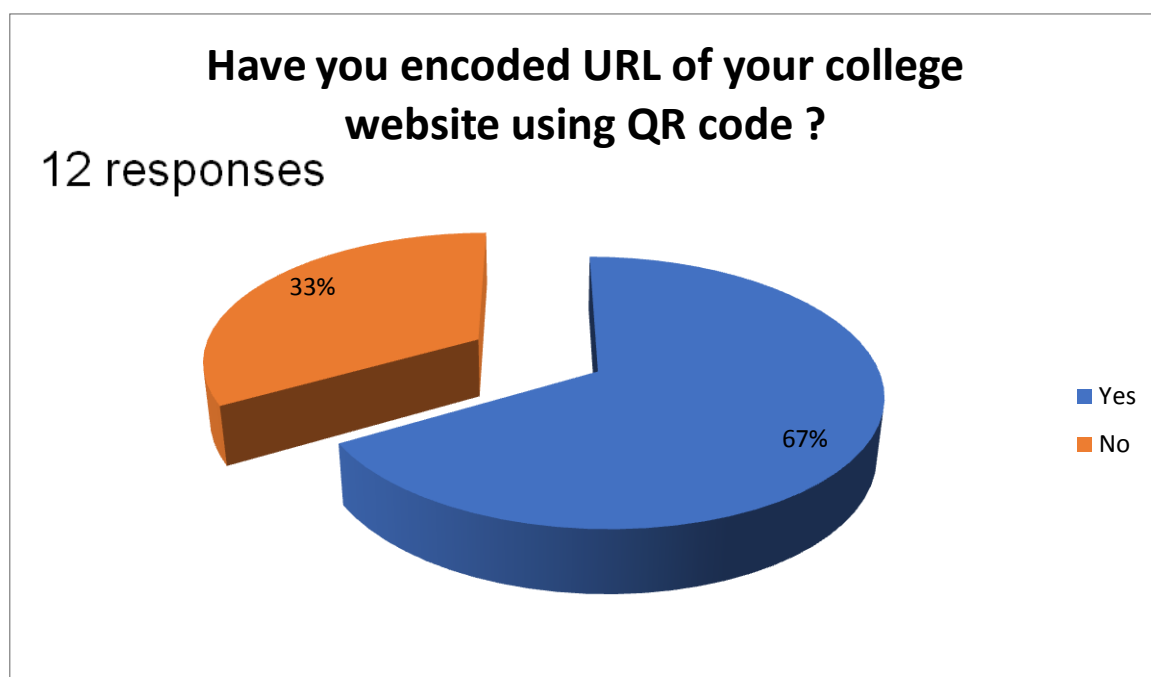
Figure 15 shows % of libraries which have encoded URL using QR

From the libraries who have their independent library website about 67% libraries have encoded the URL of library website using QR code and 33% of library have not encoded the URL of library website using QR code. Encoding URL using QR code saves the time of the user he/she can directly scan the QR code and go to website effortlessly.

Have you encoded link to your OPAC using QR code ?

42%

58%

■ Yes
■ No
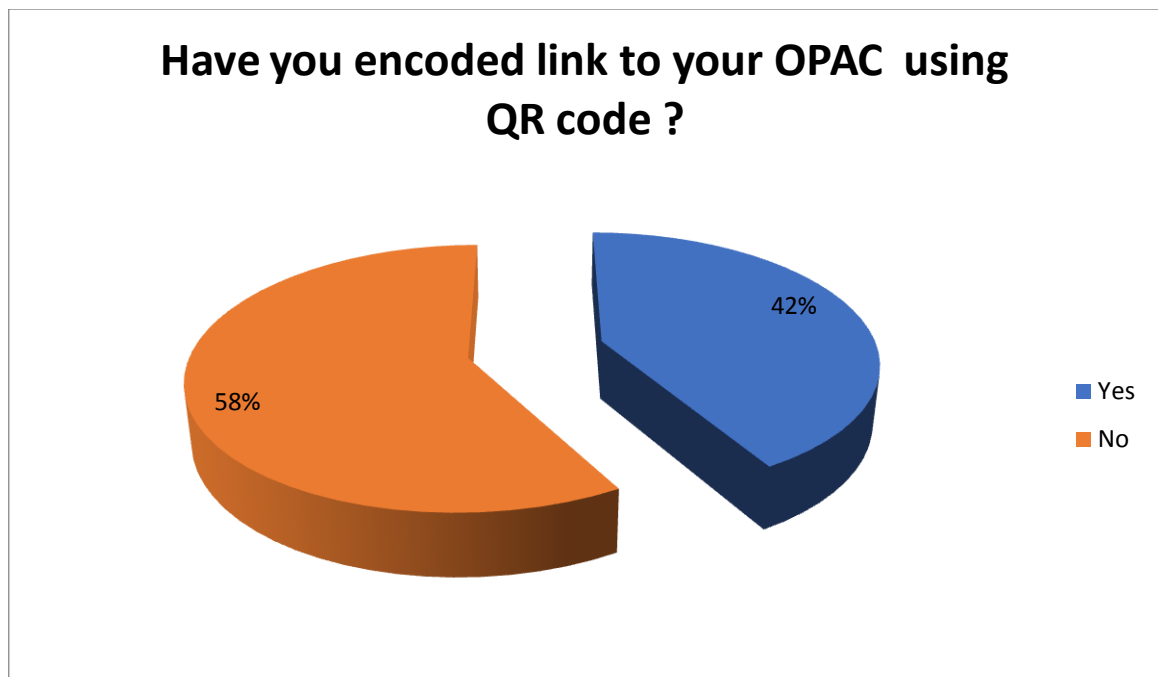
Figure 15 shows % libraries which have encoded link to OPAC

Online public access catalogue is the catalogue of library collection which is in digital form where you can get details about the collection new arrival whether the book you are searching is available or not likewise there are many feature of OPAC. The Question asked was how many of the libraries have encoded the URL or link of their OPAC using QR code and the result is about 42% of libraries have encoded the link to OPAC using QR code and about 58% of libraries do not have that facility. Linking OPAC using QR code saves the time of user and makes it easy to use.

Do you collect fines from patrons directly using QR code ?   12 rersponses

8%

92%

Yes

No
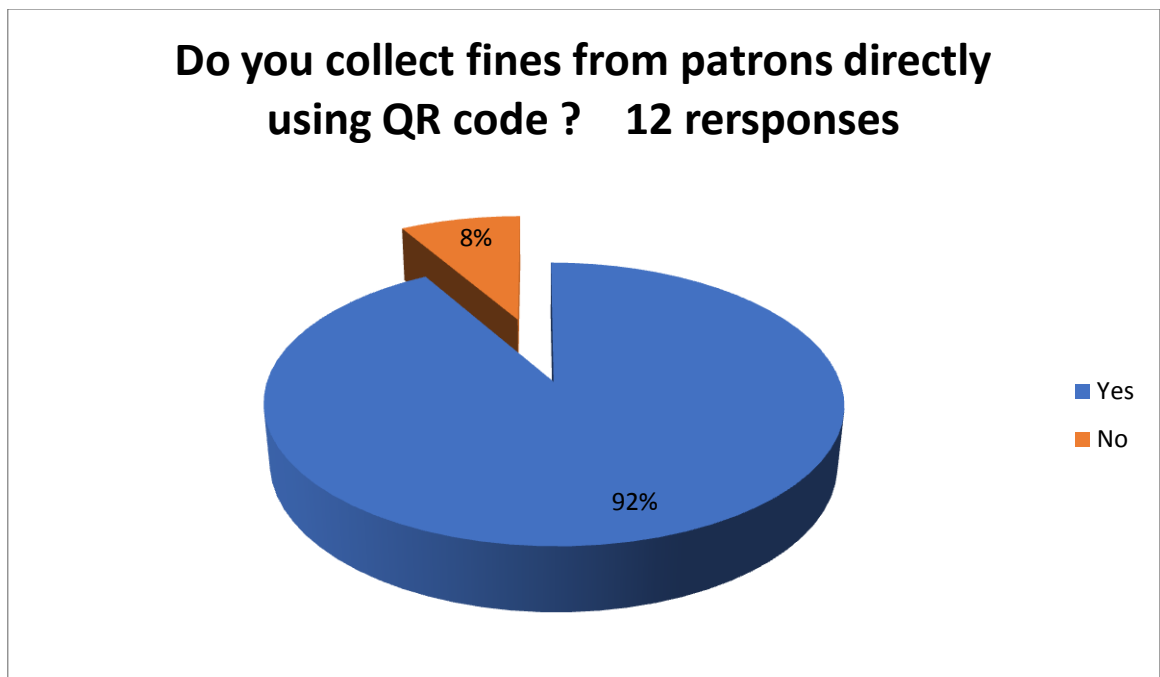
Figure 16 shows% of library collecting fines using QR

Another best thing about QR code is it is been widely used in the world to make the payments as it safe to use. there are many banking application and other applications like google pay phone pay uses QR code to make payments and go cashless relating to this I asked whether libraries collect fines from user using QR code or not and only 8% of total libraries collect fines directly by scanning QR code and 92 % of libraries collect fines directly by cash.

Does your library has facility to directly scan QR code pastes on book to get book review by other readers directly from publishers site ?

12 responses

8%

92%

- ■ Yes
- ■ No
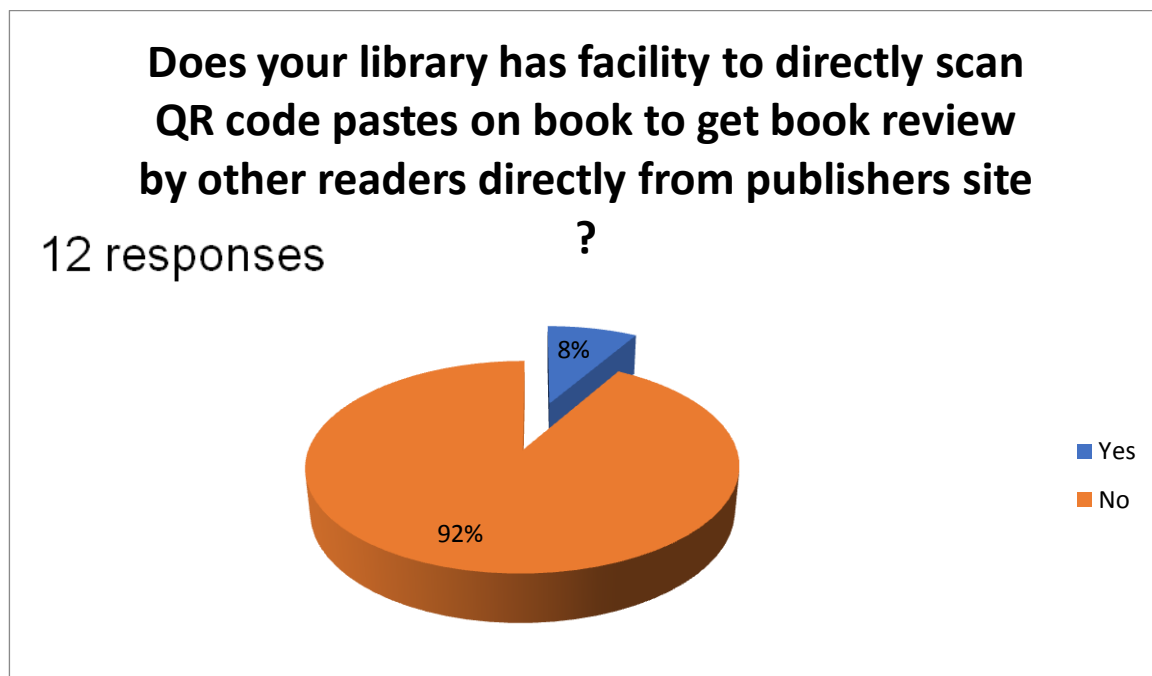
Figure 17 show % library that scan and get book review

There is one best use of QR code which we can make is that we can paste QR code on each book when reader will take the book and scan that QR code user will get review about that book from other reader directly from publishers website this will help the user to decide according to the review to read that particular book or not keeping in mind this facility I asked whether this feature is there in libraries and the result is only 8% of total libraries from North Goa have this facility and rest that is 92.% of libraries do not have this facility.

Have you encoded link to full text database or article using QR code ?

12 responses

8%

92%

■ Yes
■ No
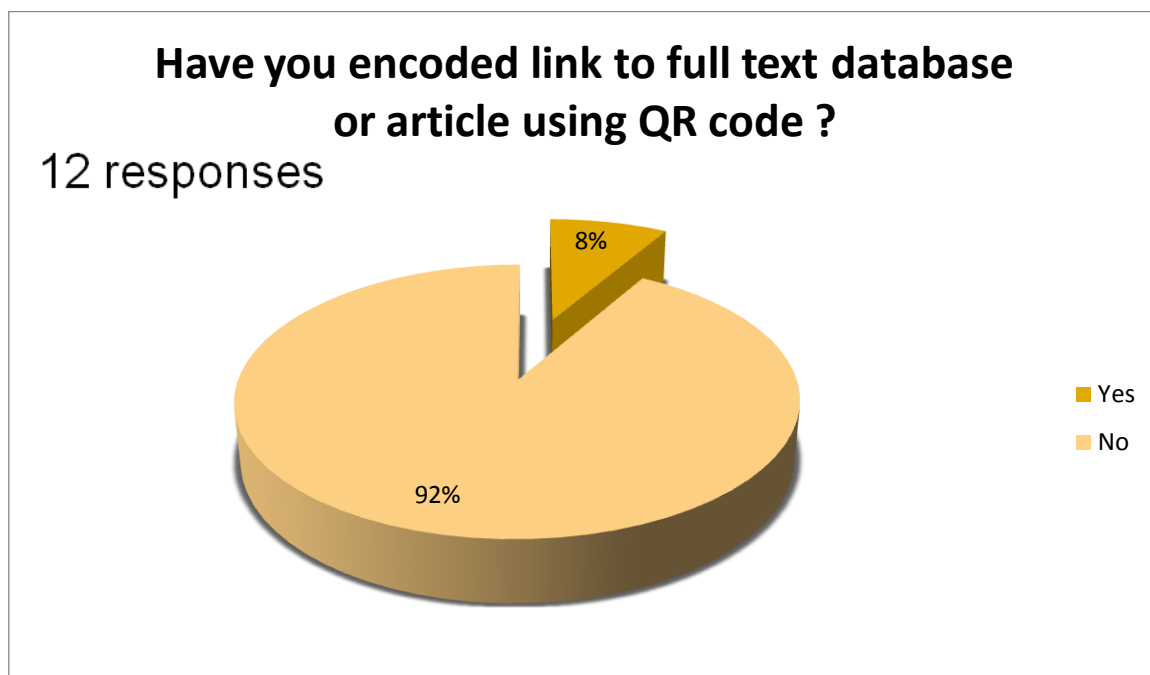
Figure 18 shows % of libraries which encoded link to full text journal using QR

Nowadays there are lot of journals which are available on internet or publish online also there are publisher which publishes article directly over the internet there are platforms like DOAJ where we get wide range of journal which are open access so to know whether my target libraries have encoded links to full text journal using QR code and the result is only 8% of that libraries have encoded it and about 92% of libraries have not done it till now.

Does your library has facility to scan a QR code and capture a book cover and call No. for references ? 12 responses

8%

92%

Yes

No
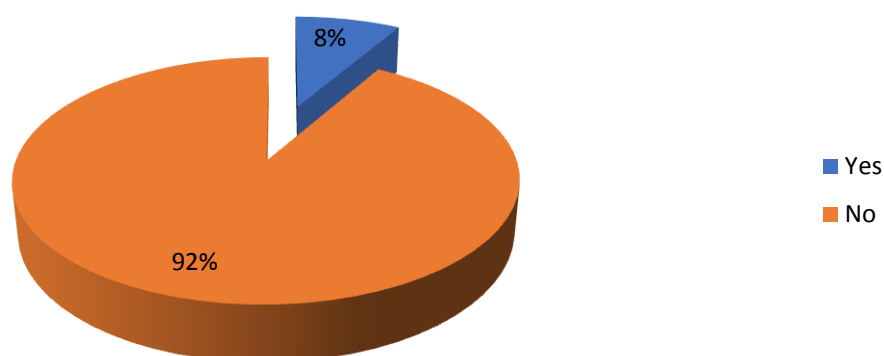
Figure 19 shows % libraries which have facility save the book for reference

One more feature where we can make best use of QR code. We can paste QR code on each book and by scanning it we can capture book cover page where there are details about the book and also the device can remember the call no. of the book for reference and from my target libraries only 8% of libraries have this facility and majority that is 92% of libraries do not have this facility

Do you feel QR code is cheaper than other softwares ?

12 responses

8%

92%

Yes
No
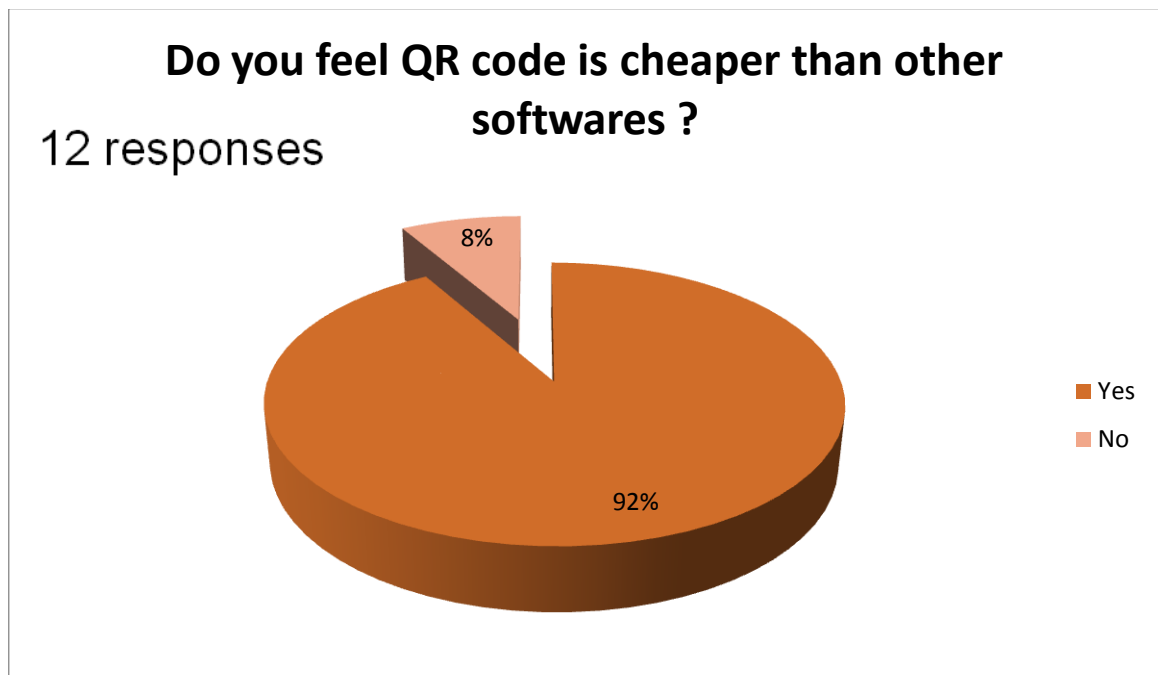
Figure 20 shows % of librarians who says that QR code is cheaper than other softwares.

Another question which asked was, do u feel QR code technology is cheaper than any other softwares, the responces I got are about 92% of the college librarians says that QR code technology is cheaper than any other softwares, and about 8% of the college librarians said that QR code technology is costly as compared to other softwares.

If there is no QR code technology in your library, are you interested to use QR code technology to deliver best possible services to users ?

12 responses

- Yes
- NO

17%

83%
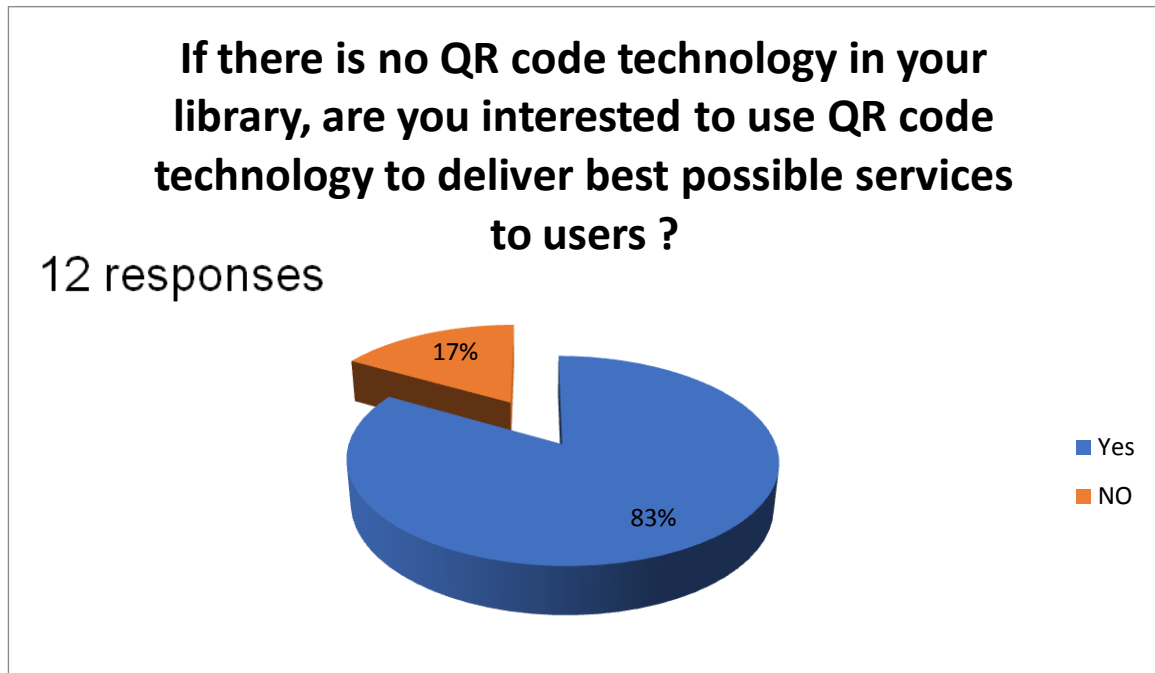
Figure 21 shows % of libraries which are ready to deliver best possible services using QR code

Next question was that how many libraries are interested to make use of QR code to deliver best possible services to their user which will really help their user to get best out of library within few seconds .

About 83% of libraries are interested to make use of QR code to deliver best services and 17% of libraries are not interested in making use of QR code.
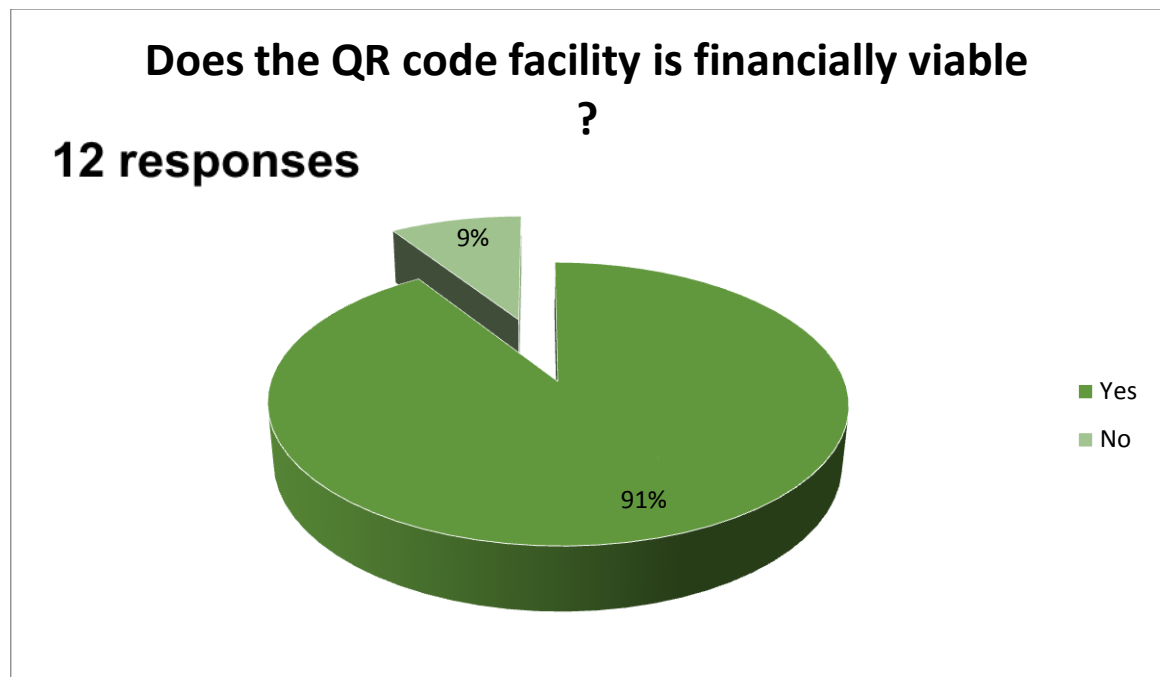
Figure 22 shows the financial viability of QR

To a query regarding cost benefit analysis 91% respondents feels that there is no cost involved in installation of QR code technology and 9 % respondents has less confidence about the financial implication of QR code technology.

CHAPTER VI

OBSERVATION FINDING SUGGESTION AND

CONCLUSION

6.1 OBSERVATIONS

From the data which was collected following things where observed

1. All the librarian have a smartphone and they use it for average of 2 to 4 hours a day.

2. All the librarians know how to use the mobile phone.

3. Majority of libraries allows their patron to use mobile phone in the library.

4. Almost all the libraries have proper internet facility or wifi facility.

5. Almost all the librarians are familiar with the QR code and they have used it for different purpose (for making payments, library website etc.)

6. All of them know how to generate QR code and they have generated it for various purpose

7. Half of the libraries i.e. 50% of North Goa have code service among them 50% of patron search for information by scanning the QR code.

8. Majority of libraries have not encoded contact details library rules email address using QR code.

9. Majority of the libraries have their independent Library website.

10. Among the majority of libraries have encoded URL of their library website using QR code.

11. Majority of them have not yet encoded link to OPAC using QR code

12. Majority of libraries do not collect fines from patrons using QR code technology.

13. Majority of libraries do not have the facility to directly scan the QR code pasted on books and get reviews direct from publishers site.

14. Majority of the college libraries have not encoded links to full text journal articles using QR code.

15. Majority of the libraries do not have the facility to directly scan the QR code and capture book cover and call No. for references.

16. QR code technology is cheaper than any other softwares for providing library services.

According to my observation there is still lack of awareness about this service. Awareness should be done in order to implement QR code services in libraries of North Goa. It is clearly noticed that librarians are interested to accept this technique and deliver best out of it. QR code technology is cheaper than any other softwares.

6.2 FINDINGS

❖ The study reveals that hardly any library have adopted QR code technology in their libraries.
❖ There is no awareness of QR code technology among library authorities for implementing QR code technology.

- ❖ There are less initiatives from the working librarians to know about QR code and its implementation in library services to patrons.
- ❖ The developers of library management softwares are not promoting QR code enebled softwares and the reasons are not known.
- ❖ The study found that network connectivity should be upgraded by agencies which are providing connectivity at the earliest.
- ❖ Study also found that innitiatives from government sideshould be involved with high end technology for providing uninterrupted network connections.
- ❖ QR code technology is recent development the conidfence level of librarian seems to be inefficient.

6.3 SUGGESTIONS

- ❖ The modern day librarians should acquaint with QR code technology and should implement in near future.
- ❖ Training programme should be arranged by library officials to the librarians in respect to QR code technology applications and its benefits.
- ❖ The government and internet service providers should initiate the high end connectivity of internet and infrastructure.
- ❖ QR code technology should integrate with library management software.
- ❖ QR code technology is inexpensive and will not have any financial implications.
- ❖ There should be awareness about new technologies like QR code among user as well as professionals.

6.4CONCLUSION

QR code is one of the recent technology in which librarians can adopt in their libraries. As the libraries are called as treasure house of the knowledge it is an ardent duty of the librarians to adopt the same immediately. Further smartphone facility available with the

students it can be easily used by students and the facility will have immence benefits for library development. It is also highly beneficial as there is no much financial implication to library authorities.

CHAPTER VII

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73

Impementation Of QR Code In Providing Library Services: A Cost Benefit Ratio

Dissertation submitted in partial fulfilment of the requirements of Goa University for the degree of Master of Library and Information Science (MLISc)

By

Shankar Alias Sahil Ladu Gaothankar

Under the supervision of

Dr.CarlosFernandes

Department of Library and Information Science Goa University,

Taleigao Plateau, Goa

2021-2022

Certificate

This is to certify that Dissertation entitled "**Implementation of QR code in providing library services: A cost benefit ratio** "submitted by **Master**

Shankar Alias Sahil Ladu Gaothankar in partial fulfilment of requirement of the degree of Masters in Library and Information Science of Goa University is his own work carried out under my guidance and worthy of examination.

Dr.CarlosFernandes

Research guide and Teacher In charge,
Department of Library and Information Science, Goa University.

Declaration

I declare that dissertation entitled "**Implementatiom of QR code in providing library services: a cost benfit ratio** "submitted by **Master Shankar Alias Sahil Ladu Gaothankar** in partial fulfilment of requirement of the degree of Masters in Library and Information Science of Goa University, has been prepared by me and not previously formed the basis for the award of any degree or other similar titles.

Master. Shankar Alias Sahil Ladu Gaothankar

Department of Library and Information Science

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Contents

LIST OF FIGURES