

QR Codes Making Smart and Effective Library Services: A Case Study

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ABSTRACT

Using QR codes in school libraries can indeed be a valuable and innovative approach to enhance the utilisation of library resources and services. Implementing these strategies can create an interactive and engaging library experience, motivating students to visit the library more frequently and make the most of available resources. The study explains the various uses of QR codes in promoting school library resources and its services, with all possible implementations to maximize their use. It encourages freely available tools to generate QR codes. It also tries to show, how the school library at B.V.B. Vidyashram Pratapnagar uses QR codes to create an experience that makes students want to go there more often.

Keywords: QR code; Marketing library services; ICT; Barcode; Fiducial markers; QR code reader

1. INTRODUCTION

Today, ICT has transformed the core functions of school libraries, including the selection and acquisition and management of electronic resources, including e-books, online journals, databases, and multimedia content. With the availability of information in various formats, it becomes challenging for library professionals to identify the right information resources. This emphasises the need for efficient tools and strategies.

QR codes is one such technological tool that has proven to be beneficial in modernising and streamlining library operations. They provide a practical solution to bridge the gap between information and users. They offer a fast and simple method for spreading data to users. Users can scan QR codes to access online databases, e-books, articles, and other digital content. They are user-friendly. To get to the encoded data, users just have to open a committed QR code examining application or utilize the underlying camera application on their gadget, making the interaction speedy and natural.

Libraries should take proactive steps to implement QR code technology in various areas, such as book shelves, promotional materials, and informational displays. Encouraging users to scan QR codes for quick access to relevant information enhances the user experience and simplifies their interaction with library resources. Libraries can conduct instructional courses to teach users about the advantages of QR codes. Promoting the use of QR codes among library patrons can enhance their convenience and make their interactions with library services more efficient.

In conclusion, the adoption of QR codes in school libraries is an essential move to use innovation to support users. It not only facilitates quick access to information but also aligns with the evolving digital landscape, making it a useful tool for libraries.

2. OBJECTIVES OF THE STUDY

- The goals of this study are as per the following -
- To investigate students' awareness of QR code technology.
 - To learn about the QR code creation procedure and available tools.
 - Lastly, to have an outline of executing these innovations and offering different types of assistance to their students at the library of BVB Vidyashram Pratapnagar, Jaipur.

3. WHAT IS QUICK RESPONSE CODE?

A QR code, or Fast Reaction code, is a two-layered standardised identification that can store different sorts of data. Initially created in 1994 by a Japanese organisation called Denso Wave, QR codes have become generally famous because of their quick meaningfulness and the capacity to store a lot of information. The data encoded might be comprised of information (numeric, alphanumeric, byte/double, Kanji) or, through upheld expansions, for all intents and purposes any sort of information." Quick Response code comprises of dark squares organised in a square framework on a white foundation, including a few Fiducial markers, which can be perused by an imaging gadget, like a camera, and handled utilising Reed-Solomon blunder rectification until the picture can be fittingly deciphered. The expected information is

then removed from designs that are available in both the level and the upward parts of the QR picture. Figure 1 outlines the Quick Response code and its various parts of representing data.

Quick Response codes are utilised in light of multiple factors as they can store different sorts of information. They are frequently used to store data like simple text; Addresses; Telephone numbers; Email addresses; URLs; App-linked links; Payments; authentication for Wi-Fi, among other things.

As they enable rapid decoding of the contents, they are referred to as QR codes. A particular device, a QR code scanner, must also read and reach the respective hyperlinked object.

4. AVAILABLE TOOLS FOR QR CODE GENERATION

There are numerous websites that provide free QR code generators. A few sites are as follows.¹ www.the-qrcode-generator.com/; www.i-nigma.com; www.kaywa.com or <http://qr.kaywa.com/>; www.qr-code-generator.com; www.qrstuff.com; www.quickmark.cn/ ; www.qrcode-monkey.com/ ; www.goqr.me/

5. REVIEW OF LITERATURE

The use of Quick Response codes in libraries has acquired prominence for its efficiency and convenience in information retrieval. They are easily accessible to individuals with smartphones or devices equipped with cameras, making them a user-friendly technology. The

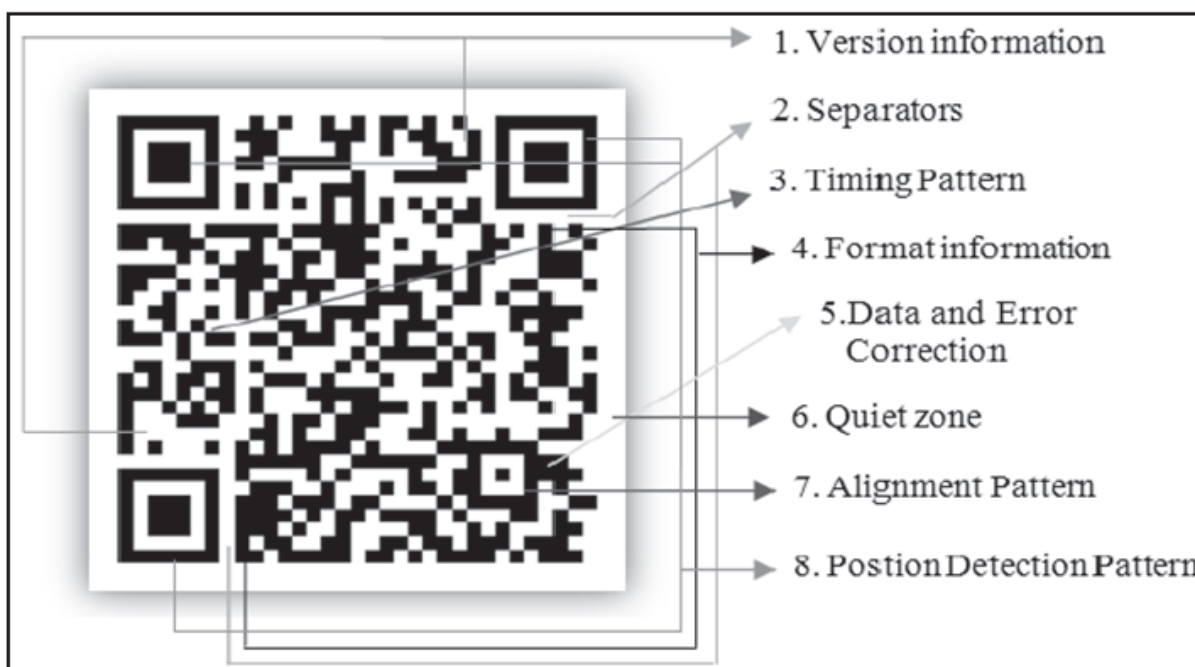


Figure 1. Specimen of quick response code.

Table 1. Outline of prior examinations on areas of utilisation of QR codes in school libraries

Author	Type of library	Outline of prior examinations on areas of utilisation
Lamd & Johnson ⁹	School Library	The writer suggests numerous ways of utilising QR codes in school libraries, i.e., Promotion, Presentation, Tours, Book connections, Online reading, Scavenger hunts, Worksheets, QEtA activities, Annotated bibliography, Bulletin boards, maps, Walking exhibits, Transmedia storytelling.
Sharma ¹⁰	School Library	Accessing websites, Special reports, Treasure hunts, green classrooms, Show Exemplars, promotions, assignments, providing homework, added in school magazines, guided tours, digital portfolio, etc.
Ashford ¹¹ ; Hoy ¹² ; Lombardo, Morrow & Le Ber ¹³ .	School Library	Awareness about QR codes, uses, and benefits of QR Codes in teaching and research.
Parker ¹⁴ , <i>et al.</i> ¹⁴ , Wells ¹⁵ , V A	School Library	QR code scavenger hunt for Library orientation for staff and students.
Gressick ¹⁶	School Library	Engaging students through an interactive scavenger hunts
Stephen ¹⁷	Academic Library	Linking to library resources, Providing additional information, Promoting library events, and Streamlining library services.

use of Quick Response codes in libraries has been the subject of numerous studies. These tests look at how Quick Response codes are used in an establishment, how members are used, how usage statistics are tracked, and how data assets and services are promoted.

Pons², *et al.* shared their experience of utilising Quick Response codes to give access to their websites, downloading records to advance writing online journals for data proficiency, and so on.

Momin & Gaonkar³ found various approaches to using Quick Response codes in library services. Quick Response codes are used inside libraries to associate things to a file record, find illustrative information, pictures, and accommodating URLs, and give speedy reaction administration to the new age of understudies.

Parabhoi⁴, *et al.*, found that Quick Response codes are in a general sense used by libraries to propel their administrations and give quick access to their resources.

Mishra & Umre⁵ proposes various models, similar to e-resource management, library direction, OPAC, and connecting to electronic resources by various libraries, to effectively utilise Quick Response code as a thorough device for the library framework.

A case study was done by Wasim Rahman⁶ about the execution and utilisation of Quick Response codes and achieved client fulfilment at the Central Library, NIT, Rourkela. A full description of QR codes and their application in libraries is given by Dani and Patil⁷.

Das⁸, *et al.* (2020),⁸ presents a logical analysis of the development of Quick Response codes at the IIT Gandhinagar Library for Android-based phones and how they have evolved into a common application for reimaging library resources and services.

The studies that have been done earlier are highlighted in Table 1, with a particular emphasis on how QR technologies can be used in academic or school libraries.

From the above examinations, we can close, that Quick Response codes have been utilised in libraries in various ways for over 10 years now. Taking into account these and different other effective sensible studies, featuring the use of Quick Response Codes in school libraries, the library at BVB Vidyashram Pratapnagar attempted to utilise this advancement in 2020. As of now, for pretty much three years, from a genuine perspective in each possible piece of library benefits, the library has familiar Quick Response Codes making access with the substance significantly more straightforward than beforehand.

6. EXECUTION OF QUICK RESPONSE CODES IN THE LIBRARY, BVB VIDYASHRAM PRATAPNAGAR

Bharatiya Vidya Bhavan Vidyashram Pratapnagar is a CBSE-affiliated Co-Educational English Medium School established in 2010 in Jaipur. The school library currently has 15,000+ books of different kinds and genres, encompassing literature, dictionaries, fiction, languages, autobiographies, encyclopedias, biographies, dramas, quizzes, general knowledge, folklore, and stories. Also,

the library subscribes to 7 newspapers and 30 periodicals, a good number of puzzles, charts, maps, and audiovisual aids to inculcate a reading habit among children. The library uses a barcoding facility for issuing and returning books to its users. Importantly, the library is successfully maintaining four websites, one podcasting channel, and one mobile app for providing a variety of e-resources to its users. Considering the advantages and experience of various libraries in using Quick Response codes and moreover wanting to meet their speedy requirements, the library decided to attempt various things with this development.

The following services and resources are being implemented in the author's library, and he is involved in this process as well:

6.1 QR Code for the Library Website

The school library has its website, (<https://librarybvbvprtpjpr.wordpress.com/>). Through the website, the school library provides various e-resources, e-books, question papers, sample papers, various textbooks, and many more to its users. The author made Quick Response codes for the library site to improve and extend the library's perceivability and make its assets and administrations accessible to end users. (See Fig.2, 22)

6.2 QR Code for the Quizzing Website

The school library has also developed a quizzing website for its users: <https://quizephillia.home.blog/>. The site is very useful for quiz lovers. Various quizzes developed by the students are also available on this site. (See Fig.3, 27)

6.3 QR Code for Digital Repository

The author also created a QR code for the digital repository (<https://egyansangrah.wordpress.com/>) for the school's children. The repository contains various e-resources, e-books, e-maps, useful links, question papers, sample papers, textbooks, and many more useful resources. The site is accessible through the web and through a mobile app, which is also available on the Google Play Store. The mobile app also has QR code scanning facility. (See Fig.4-5, 25, 32)

6.4 QR Code for Virtual Tour

A virtual visit is a generally comprehensive perspective or video redirection of an ongoing identification that should be visible on the web. A virtual visit is usually an assortment of extensive pictures that are played in a social event to seem to be a moving video with added sound and text influences, or a virtual visit might utilize models as opposed to genuine records and pictures. The school library has likewise fostered its virtual visit, which is accessible on the school site and available through QR codes. (See Fig.6, 23)

6.5 QR Code for Library Access on a Mobile Phone

Recently, a versatile form of the library site has been created through a link tree tool. This contains storybooks, formats, resources and various activities for different age groups of students to inculcate reading habits among students. (See Fig.7, 24)

6.6 QR Code for E-Magazine Link

The school library is maintaining its online magazine, (www.apitara.wordpress.com/). We have utilised the connection to the library site and made Quick Response codes to enhance the library's perceivability and the assets and administrations accessible to end clients. (See Fig.8, 29)

6.7 QR Code for the Podcast Channel

'Bhavan's Vaani' A podcast channel was also designed as a platform for children and teachers, which aims to nurture the creative minds of our youngsters and empower them to express their thoughts, ideas, and dreams. This is also linked to a QR code and circulated to students, parents, and teachers through WhatsApp and social media. The QR code is also displayed on the library soft boards. (See Fig.9, 26)

6.8 QR Code for Digishelf

Digital shelf of learning resources: The school library developed a digital shelf for its users during the pandemic. The library provides puzzles and games for its users through this digital shelf. (See Fig.10, 30,31)

6.9 QR Code for Maps & Charts List

The author generated, and affixed QR codes for maps and charts to the school library notice board, and same has been posted on the school library website. (See Fig.11)

6.10 QR Code for Library Rules

QR codes have been produced and affixed to the library notice board, and also uploaded on the school library website. (See Fig.12)

6.11 QR Code for Epic Digital Library

The school library has subscribed Epic Digital Library, which contains eBooks for different age groups of readers. (See Fig.13)

6.12 QR Code for Various Formats

To inculcate reading habits among the students, the library conducts various reading programs for its users. The instructions, guidelines, and formats of these programs, i.e., book mark-making, book review writing, book creator tool, story pyramid, book talk, Readworks.org, reading bingo, and blind date with a book, are available through QR codes to their users. (See Fig.14)

6.13 QR Code for Social Media Channels

The school library has its social media channels. (See Fig.15, 16)

6.14 QR Code for Bhavan Dhara Magazine

The school has released his annual magazine every year. The same has been put up on school website and different social media platforms through QR code. (See Fig.17, 18)

6.15 QR Code for Various Online Forms and Surveys

QR innovation is also used for various surveys and forms for data collections and during the teaching and learning process. The same has been circulated through various posters and social media platforms. (See Figure -19, 28)

6.16 QR Code for Audios-Videos (CDs/DVDs) Materials

QR codes have been produced and affixed to the school library notice board, and uploaded on the school library website. (See Fig.20)

6.17 QR Code for Puzzles List

QR codes have been produced and affixed to the school library notice board, and uploaded on the school library website. (See Fig.21)

Note: QR codes have been generated and affixed to the school library notice board (see Fig.33), library website, also posted on different social media channels time to time. These were also circulated to the parents and students through a WhatsApp group in routine basis. Some has been displayed in Annexure 2.

Using the "Free QR Code Generator sites- www.qr-code-generator.com/ and www.qrcode-monkey.com/," the author has successfully created free QR codes for URLs, texts, and other types of files, which were served as an example in this study mentioned in Annexure-1.

7. EXPERIENCES, OBSERVATIONS AND OUTCOMES OF THE STUDY

In the second phase of the study, the author collected feedback from students of classes 9 and 11 in an orientation session and through personal interviews in their library periods. The respondents who were familiar with QR codes indicated that they were aware of the technology and could utilise it in a variety of ways. Some of these are reported here under:

"QR codes till date have been found useful in all cases. I think that even in our school library they will be of great use and informative."

"My experience is good for using QR codes because it is a fast and efficient way to access knowledge about a product"

"QR codes are more convenient, they offer a larger amount of security. It saves time as it is easily accessible."

“It is a pretty great shortcut for things that used to take hours, but on the other hand, it may cause problems if you don’t have internet access.”

These statements indicate that students are utilising QR codes successfully and recognise the potential for expansion. Their adaptable nature considers scores of utilisations in showcasing and advancement drives in school libraries.

The study was an eye-opener to the author in many ways. Here are a few observations and outcomes of the study:

- Respondents are aware about QR codes and their expansive applications.
- Understudies are more acquainted with QR codes from installment applications like Paytm, Phone Pay, and Google Pay.
- As of now, the fundamental reasons for QR codes are making purchases and getting to extra information.
- Students have seen and are aware of various posters and pamphlets posted on school library websites, social media channels, and library notice boards.
- Students are able to use this facility more conveniently from home as they do not bring mobile phones to school.
- Most students found it a lot simpler to utilise.
- By making this innovation part of our work process, we have had the option to contact such a large number of clients and improve the use of the library.
- Positively, students and library staff both get benefit from the utilisation of such a simple yet fundamental innovation.
- Experience obtained through using such development helps the conviction of staff and besides explores other more exceptional instruments, which were in a general sense made for various locales yet could without a very remarkable stretch conform to the school library working environment.

With these experiences, the library has proactively recognised a few new and more regions to apply Quick Response codes and is currently execution.

8. CONCLUSION

The technology behind QR codes demonstrates its versatility. Anybody can get to whatever is in the QR code with one speedy sweep utilising their cell phones, which makes this tech apparatus profoundly advantageous for educators and understudies. The possibilities for using QR codes are endless but realistic. However, they’re now more popular, so take advantage of their popularity in the library too. Keeping this in mind, the school library needs to organise awareness programs to educate their users. Likewise, implanting QR codes with connections to instructive sources to help understudies in their learning progress, linking their quizzes and exams through QR codes, and creating interactive activities and games that would encourage students to participate.

REFERENCES





















1. Shettar, I.M. Quick Response (QR) Codes in Libraries: Case study on the use of QR codes in the Central Library, NITK. *In Proc. TIFR-BOSLA National Conference on Future Librarianship*, Mumbai. pp. 129-134. https://www.academia.edu/40932547/QR_Quick_Response_Codes_Application_in_Academic_Libraries_Case_study_of_KRRC_Central_Library (Accessed on 20 December, 2023).
2. Pons, D.; Valles, R. ; Abarca, M. & Rubio, F. QR codes in use: The experience at the UPV Library, *Serials*, 2011, **24** (3), Retrieved from UKSG Serials: <https://serials.uksg.org/articles/10.1629/24S47/doi:10.1629/24S47>.
3. Momin, S. & Gaonkar, R.C. QR (Quick Response) Codes Application in Academic Libraries: Case study of KRRC (Central Library), 2013. https://www.researchgate.net/publication/301557209_QR_Quick_Response_Codes_Application_in_Academic_Libraries_Case_study_of_KRRC_Central_Library
4. Parabhoi, L.; Bhattacharjya, N. & Dhar, R. Use of QR code in library, 2017, *Applications of Modern Tools and Technology in Library Services*, 237-243, Chapter-25, *In* S.K. Pal, & B. Ram, *Applications of modern tools and technology in Library Services*. Delhi: Studera Press. Available at: https://www.researchgate.net/profile/Lambodara-Parabhoi/publication/318259063_Use_of_QR_Code_in_Library/links/595f28e0458515a3578153eb/Use-of-QR-Code-in-Library.pdf(Accessed on 22 December, 2023).
5. Mishra, A. & Umre, S. QR code in library practice. *International Journal of Engineering Sciences and Research Technology. Int. J. Eng. Sci. Res. Technol.*, 2017, **6**(2), 319-326. doi: 10.5281/zenodo.290267.
6. Rahaman, W. Enhancing library services using barcode, QR code and RFID technology: A case study in central library of National Institute of Technology, Rourkela. *Int. J. Digital Libr. Serv.*, 2016, **6**(3), 39-50. <http://www.ijodls.in/uploads/3/6/0/3/3603729/39-50.pdf>
7. Dani, A. & Patil, R. QR Code based Library Management System. *J. Emerging Technol. Innovative Res.*, 2020, **7**(6), 1876-1883 <https://www.jetir.org/papers/JETIR2006271> doi: JETIR2006271.
8. Das, T.K. ; Kumbar, T.S. & Ramswaroop, A. Use of QR codes for enhancing access to library resources and services: A case study of IIT Gandhinagar library, *Ann. Libr. Inf. Stud.*, 2020, **67**(3) 156-163. doi: 10.56042/alis.v67i3.31482.
9. Lamb, A & Johnson, L. QR Codes in the School Library: A Dozen Practical Uses. *Teach Libr.*, 2013, **40**(3), pp. 63. Gale Academic OneFile, link.gale.com/apps/doc/A319811517/AONE?u=anon~787d6b21&sid=googleScholar&xid=f098fbb4.(Accessed 1 Jan 2024). doi: GALE|A319811517
10. Sharma, V. QR Codes in Education – A Study on Innovative Approach in Classroom Teaching. *IOSR J. Res. Method in Educ. (IOSR-JRME)*, **3**(1), 62-70.

- doi: 10.9790/7388-0316270.
11. Ashford, R. QR codes and academic libraries reaching mobile users. *College and Research Libraries News*, 2010, **71**(10), 526530. doi: 10.5860/crln.71.10.8454.
 12. Hoy, M.B. An introduction to QR Codes: linking libraries and mobile patrons. *Medical Ref. Serv. Q.*, 2011, **30** (3), 295-300. doi: 10.1080/02763869.2011.590423
 13. Lombardo, N.T.; Morrow, A. & Le Ber, J. Rethinking mobile delivery: using Quick Response codes to access information at the point of need. *Medical Ref. Serv. Q.*, 2012, **31**(1), 14-24. doi: 10.1080/02763869.2012.641817.
 14. Parker, R.; Helwig, M. & Phinney, J. Engaging students with new technology: Using a QR code scavenger hunt for library orientation, 2012. <https://dalspace.library.dal.ca/bitstream/handle/10222/75491/Parker%20Helwig%20Phinney%20Fall%202012.pdf?sequence=1>
 15. Wells, V. A. Hunting for QR codes: Linking students to the music collection. *Music Ref. Serv. Q.*, 2012, **15**(3), 137-148. doi: 10.1080/10588167.2012.700831.
 16. Gressick, J.; Spitzer, B.A. & Sagarsee, K. Designing interactive scavenger hunt using QR codes. *J. Teaching Learning with Technol.*, 2014, **3**(1), 90 - 93. doi: 10.14434.jotlt.v3n1.4239.
 17. Stephen, G. QR Code and their application in academic libraries: A case study from St. Xavier's University, Kolkata. *Int. J. Inf. Movement.*, 2023, **8**(2). <https://www.researchgate.net/publication/371956122>.

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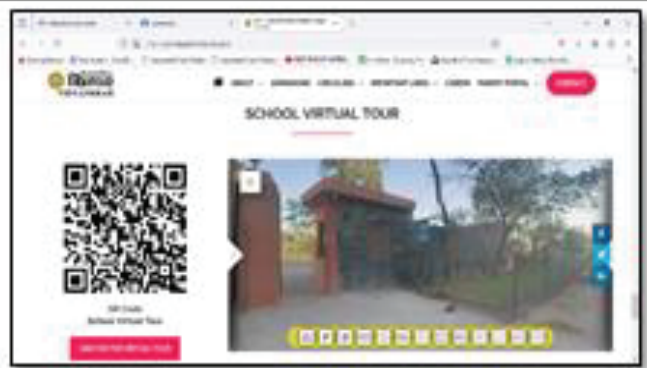
ANNEXURE 1: QR Codes generated and used by the library

 School Library Website (Figure. 2)	 Quizephillia Quizzing Website (Figure. 3)	 EGyansangrah Website (Figure. 4)	 eGyansangrah Mobile App (Figure. 5)
 Virtual tour Link (Figure. 6)	 Access Library on Mobile Phone (Figure. 7)	 E-magazine website (Figure. 8)	 Bhavans Vaani Podcast channel (Figure. 9)
 Digishelf (Figure. 10)	 Map List (Figure. 11)	 Library Rules (Figure. 12)	 Epic Digital library (Figure. 13)
 Different Formats (Figure. 14)	 School Library FB page (Figure. 15)	 eGyansangrah FB page (Figure. 16)	 Bhavan Dhara 21-22 (Figure. 17)
 Bhavan Dhara 22-23 (Figure. 18)	 Registration form (Figure. 19)	 CDs Available (Figure. 20)	 Puzzles (Figure. 21)

ANNEXURE 2: Screenshots of websites and posters circulated to the parents showing QR Codes



(Figure. 22)



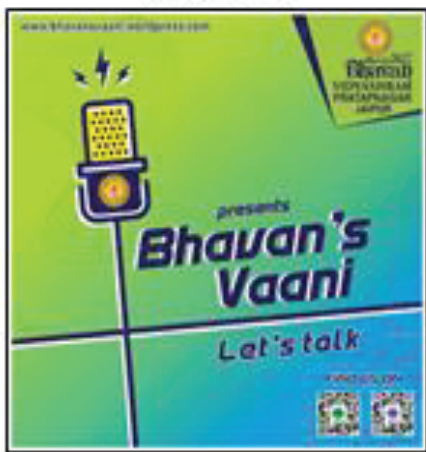
(Figure. 23)



(Figure. 24)



(Figure. 25)



(Figure. 26)



(Figure. 27)



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(Figure. 28)



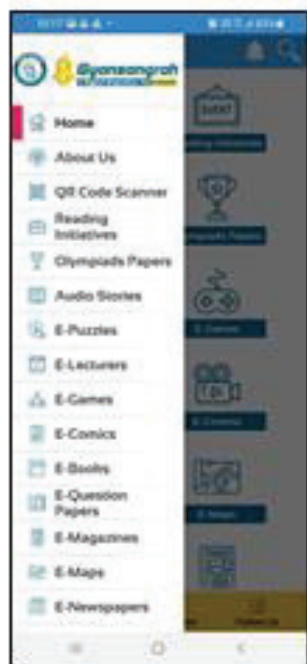
(Figure. 29)



(Figure. 30)



(Figure. 31)



(Figure.32)



(Figure.33)