

QR Code Generator and Document Retrieval

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Abstract — What is a QR code? well, we all know the QR - which stands for “Quick Response”- a barcode on steroids. As barcodes hold information horizontally, the QR code does so both horizontally and vertically. This feature enables the QR code to hold over a hundred times more information. QR code is nothing but a 2D or two - dimensional matrix barcode which is used for its fast readability and comparatively large storage capacity. This paper presents a QR code generator and document retrieval system that allows users to create and manage QR codes and documents easily. The QR code generator allows users to generate QR codes that link to specific documents, such as PDF or Word files, making it easy for users to access and share important information. Overall, this system simplifies the process of creating and managing QR codes and documents, making it a valuable tool for businesses, organizations, and individuals. The main motive of this project is to create QR codes by which the users can view or download all of their documents in different text formats. After generating a QR code we can scan with the help of any device that has a QR scanner as a medium. After scanning the user will get the information about the particular student & will be able to download their basic documents in different formats. NodeJS will be used to develop the user interface on the web browser and encode data in a QR Code symbol.

Keywords: QR-Code, JWT, OTP, Document Authentication, User

I. INTRODUCTION

Document availability is the focused problem that we have seen in our academic field. And also the main issue faced by everyone is the loss of documents. The problem of document loss during academics is a common issue that affects students and faculty alike. This can include the loss of important assignments, research papers, exam papers, and other vital documents. This problem can have a significant impact on a student's academic performance, as well as on the overall functioning of an academic institution. The problems faced by most students are Difficulty in finding specific documents, also Difficulty in sharing or accessing documents remotely, Limited security measures to prevent unauthorized access to documents Inefficiency in managing and organizing documents. This problem can lead to a range of negative consequences such as reduced academic performance, Delays in submitting assignments and research papers, Difficulty in preparing for exams, loss of important data and research, and reduced efficiency and productivity within an academic institution. That is why we have decided to implement this project for the above reasons. To solve this problem, it is important to implement an efficient document retrieval system that can help to make it easier to access and share documents in a secure and efficient manner. Enforcing QR code mills in this machine may be a solution, because it permits for brief and smooth get admission to documents via scanning QR codes. This can improve the document retrieval

process by making it more efficient and secure. We are going to implement this project for students and educational institutes. The projected cost of implementing this project depends upon the cost of cloud storage. The project can be achievable in time, but the cost budget changes as the deployment field area changes, the number of users increases, etc.

QR code generators are software tools that allow users to easily create and distribute QR codes. A QR code is a two-dimensional barcode that can be scanned with a smartphone camera or dedicated QR code reader, and can be used to quickly store and locate information such as website URLs, contact details, or messages text. QR code generators typically provide a user-friendly interface that allows users to enter the information they wish to store in the QR code and then generate the QR code. Some QR code generators also offer additional features, such as custom QR code designs, scan count tracking, or the ability to generate QR codes in batches.

Document retrieval systems are software tools that help organizations manage and access large amounts of information in an efficient and user-friendly way. They typically include a variety of features such as indexing and cataloging of documents, search functionality to easily locate specific documents, security features to control access to sensitive information, version control and collaboration tools, automated workflow and approvals, auditing, and reporting. These systems also may include features such as Optical Character Recognition (OCR) to make scanned documents searchable, document comparison tools, and automatic metadata extraction.

The main goal of this system is to improve the workflow, increase productivity and reduce the amount of time spent searching for information. They can be used in a variety of settings such as libraries, archives, and businesses, where there is a need to efficiently manage and retrieve large amounts of information. Additionally, document retrieval systems can help organizations meet compliance requirements by providing detailed auditing and reporting capabilities.

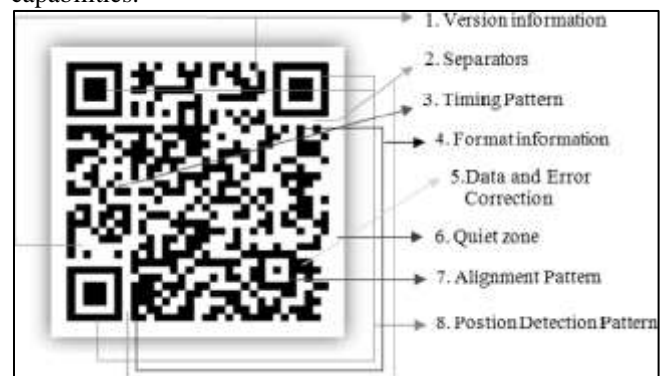


Fig. 1. QR code structure

The diagram above illustrates the structure of a QR code with the appropriate label. A QR Code or Quick Respo

QR Code is a dimensional matrix barcode readable by a smartphone or scanner. The structure of the QR Code can be broken down into three main parts:

Finder Patterns: There are the three big squares placed on the corners of the QR Code. They are used to align and orient the code so that it can be scanned correctly.

Alignment Patterns: These are the smallest squares in the center of the QR code. They are used to help the scanner align the code and ensure high quality scans. to generate QR codes in batches.

Data Region: This is the area of the QR code that contains the coded information. It consists of a series of small black or white squares. The data is encoded in this square form.

Each square in the data region represents a bit of data. A black square represents a binary "1" and a white square represents a binary "0". The data is encoded in the QR code using a specific algorithm that determines the placement of the black and white squares. This algorithm ensures that the QR code can be read correctly, even if part of it is obscured or damaged.

In addition to the above, QR codes can also include format information and version information, which are encoded in the same way as the data. Format information includes information about the type of data stored in the QR code, and version information includes information about the size of the QR code. This information helps the scanner to read the QR code correctly and to determine the error correction level used in the QR code. QR codes can store a wide range of data types, including text, URLs, contact information, and even images or videos. The amount of data that can be stored in a QR code is determined by the size of the code and the error correction level used. Larger QR codes with higher error correction levels can store more data than smaller codes with lower error correction levels.

II. RELATED APPROACHES/WORK

QR code scanning can be used as a convenient way to retrieve documents, especially in scenarios where people need quick access to information on-the-go. Here are some related approaches and works on document retrieval through QR code scanning:

- 1) **QR code-based document management system:** A QR code can be assigned to each document in a document management system, allowing users to scan the code and instantly retrieve the corresponding document. This approach can save time and make document retrieval more efficient.
- 2) **QR code-based library catalog:** Libraries can use QR codes to provide users with quick access to information about books and other resources. Scanning a code can take the user to the library's online catalog, where they can search for and locate the desired item.
- 3) **QR code-based document sharing:** QR codes can be used to share documents between devices or users. For example, a user can generate a code for a document on their device and then have another user scan the code to download the document onto their device.
- 4) **QR code-based document authentication:** QR codes can be used to verify the authenticity of documents. For

example, a company might include a QR code on a document to verify that it is an official document and has not been tampered with.

- 5) **QR code-based document translation:** QR codes can be used to provide translations of documents in different languages. For example, a museum might include QR codes next to exhibits that provide information in multiple languages when scanned.

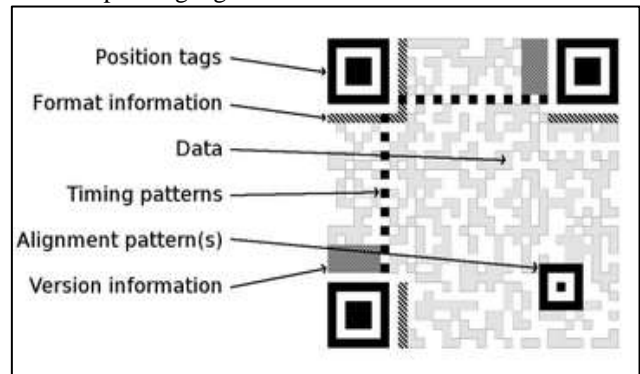


Fig. 2: Detailed QR Code Structure

Overall, QR code-based document retrieval can be a useful tool in many contexts, making it easier and faster for users to access the information they need.

III. CHALLENGES FACED IN EXISTING SYSTEM

- QR codes that are dynamic are used. The current technology only enables image retrieval through QR codes, not 2D QR codes.
- The usage of several algorithms has made the system's functioning complex.
- Dedicated storage increases spending.
- The current system simply employs a variety of methods for encoding text into QR codes.
- It doesn't have a notion for document retrieval and storage.

IV. THE PROPOSED SYSTEM

Due to their high levels of security and authentication, QR codes are routinely used to store and download both personal data and documents alongside general information. With the help of JWT authentication, we put forth a unique concept to increase website security. In order to use the system, the user must first register with it. Once registered, the user can store all of his documents and other personal information on his dashboard. The system will produce QR codes that are specific to the system's user base based on those information. After that, the user will be able to authenticate and scan the documents. In response, the system will send the QR code to the user after receiving their information, as shown in Figure 4.

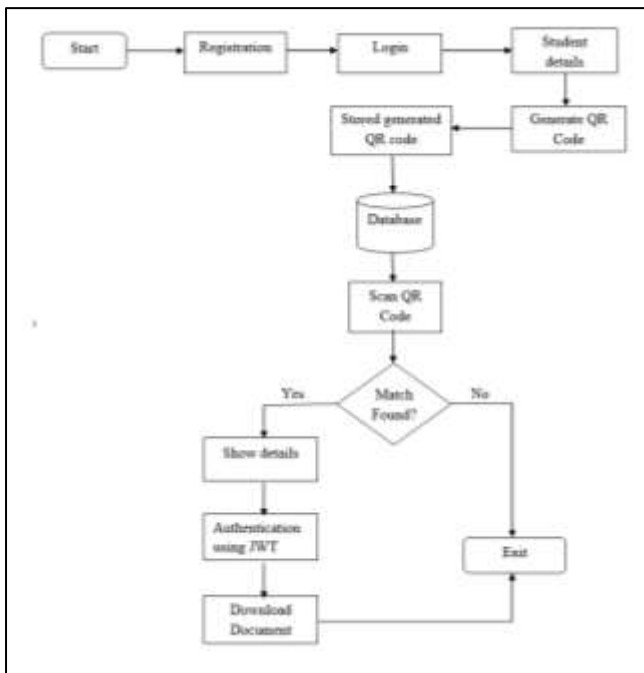


Fig. 3: System Architecture

The least expensive and most flexible of all the solutions is using a QR code to access the necessary document. Cheating can be prevented with the automatic generation of JWT tokens.

This system is unique in that users must register with the system in order to create their own QR codes, which include all pertinent information in text format and links to all soft copies of the document. In other cases, registration is not necessary for a user to download and access another user's details by scanning their QR code. You can download the document even if you aren't a System registered user. Users must supply legitimate credentials for authentication in order to prevent the misuse of the document. In this system, OTP and the JWT authentication procedure are both used.

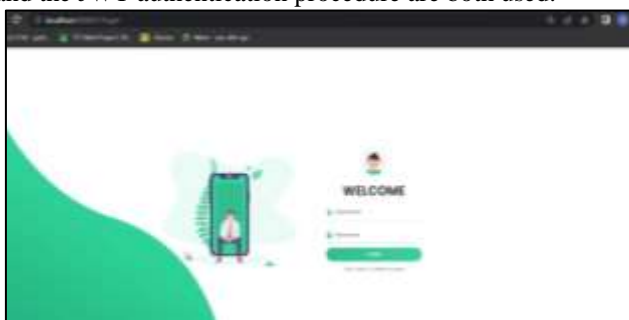


Fig. 4: QR Login Page

The user is given the option to upload documents in Fig. 5. The user must first register by providing their basic information, including their username and password. Users can now access their accounts by entering login information after successfully registering. These details are then verified on the server side, and a JWT token is generated at the same time. The user is then forwarded by session to a web page where they can upload all of their documents that are stored on the shared Drive. The session also generates a QR code, and when the user clicks on the generated QR code, a new web page will be opened. Figure 6 depicts the form where users can enter all of their basic information, including name,

age, birthdate, address, phone number, and email address, as well as their social media IDs for Facebook and Instagram, among other things. The user must then click on submit to create his QR code after filling out all the required fields. For future use, the user can save and download this QR code. There is no need to carry the hard copy of any documents with you if you have this QR code. Bring nothing more than the ID card with the QR code printed on it.

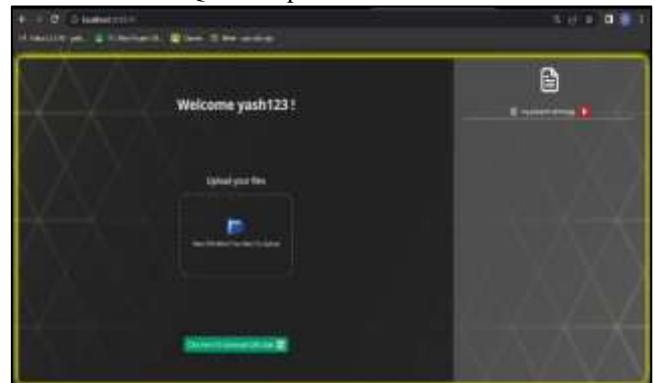


Fig. 5: QR Dashboard

The generated QR code, can now be shared by users with anyone who requests their contact information. Suppose a user can scan this QR code if they are an outside user who has not signed up for the system. After scanning the QR code, they will be taken to a page with all the essential information and a link to the storage drive where the documents are kept. The system retrieves the appropriate user's access code after clicking download, which is the JWT token mentioned by the proprietor of the QR code generator as a means of accessing information.



Fig. 6: User generated QR Code

The auth code is used to authenticate the QR code after it is generated. Following the OTP's validation, users are then forwarded to the document dashboard where they can download the documents. The shared drive portal, which houses the student's or person's personal information as well as his documents, is redirected once the validation is complete. In order to store their documents, each user is given 500 MB. These documents should be in any format, such as PDF, JPG, PNG, TXT, DOCX, etc.



Fig 7: Yash's shared drive

V. CONCLUSION

The most affordable and flexible solution among all the solutions is using a QR code to access the specified document. To accommodate that, there is no need to modify the infrastructure. It is frequently used extensively in universities due to the popularity of smartphones and internet accessibility. Cheating is prevented by using JWT tokens that are generated automatically. The need for QR codes will decrease as technologies continue to advance.

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