QR Code Document Authentication and Retrieval

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Abstract— *A QR code is a quick response code. To access information present in a QR code, we have to scan it by using any type of scanner in order to get stored information. Data is not safe in the system[1] where there is a need for instant sharing of files in a limited time. To overcome problems, in this paper we present JWT (JSON Web Token) Token for Qr generation and to validate whether a user OTP(One Time Password) system is implemented. JSON Web Token creates a JSON object that is used to transfer information between a client and a server on the web. 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 Users & will be able to download their basic documents in different formats. We have used NodeJS to develop the user interface that contains libraries to generate QR codes. This system guarantees the safety of documents as we used JWT and OTP two authentication methods.*

Keywords: **QR Code, JWT, OTP, Document authentication, User**

1. INTRODUCTION

Our primary objective is to create QR codes by which the users will be able to 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. Bar codes are machine-readable tags attached to items that have information related to that detail. Nowadays, the QR Codes are mostly used due to their high reliability and space as compared to barcodes. In QR code the information is mainly stored in formats such as number, alphabet & binary, etc.

QR code, in Fig.1 is scanned by a scanning device, like a camera or scanner, and formatted algorithmically by underlying package till the image is fully understood. information is then discharged from patterns given in each horizontal and vertical part of the image severally. The QR characteristics are listed in table 1. The figure shows a sample of an encrypted QR code used by the proposed system.

QR codes are helpful to users in sending information. QR codes are reliable and have high space. QR can store any kind of data. A QR code is a tag that can only be read by scanner and contains the data related to the product.

Fig. 1 Structure of QR Code

In above Fig.1, the QR code format is clarified in a detailed way. The QR code design comprises different design patterns like arrangement design, position design, rendition data, timing example, and calm zone. Position designs recognize the place of the QR code. An alignment pattern design assists with the change when QR code size is surpassing the cutoff. Timing design pattern , which is addressed by spotted lines, is utilized to decide the size of the information framework. The configuration data locales contain blunder remedy techniques. Whenever QR code size is enormous then alignment pattern designs assist with direction. Different adaptations of QR codes are involved and translation in Fig.1 distinguishes the form of the QR code. The quiet zone is utilized for the end scanning purpose. Shortcoming amendment pieces are put away in the variant data. Real information is available in data and error resolving bits. QR code has some unique attributes that are as follows-

- QR code can organize different types of data.
- It stores data in a small space.
- The QR code can be restored if any malpractice occurs.

QR Code	
Developer (country)	DENSO (Japan)
Numeric	7089
Alphanumeric	4296
Binary	2953
Kanji	1817
Major Features	Large Capacity Small Printout Size High Speed Scan
Standards	AIM International JIS ISO

Fig 2. Capacity, characteristic, and Norms for QR Code

Our system can be merged with the platform used by the institute or it can be made as a separate platform. The following points will describe the tasks of our system.

Our system performs the following tasks:

- Insert information and documents
- System creates QR Codes
- Runs Identity check
- Scan and download the documents including the user's information

In this paper, we will explain about existing systems, their challenges, and lastly our proposed system.

2. RELATED APPROACHES/WORK

In this section the existing system is studied actually, the QR codes are created for storing data and also for fast reading applications like payment apps, shopping referrals, product descriptions and registration etc. In Paper[2] two storage level QR code is used for document authentication which mainly contains 2 levels as private storage and Public Storage. Public Storage level is standard QR code which can be accessed by anyone but private storage level having encoding Of data with error correction. Due to this it is easy to differentiate the original document from the copy one. So there are some drawbacks in this system also. In paper[3] document generation and authentication mechanism is introduced in which the VSS(visual secret sharing) algorithm is used. This algorithm divides the image into two parts and encodes it into two different QR codes. From that share1, one QR code is used for sharing and printing on identity documents, whereas the share2 stores in database. By using scanner If we scan the share1 QR code,

It authenticates with share2 QR code from the database and generates the desired document. System is a little bit confusing and difficult to maintain two QR codes for a single document.

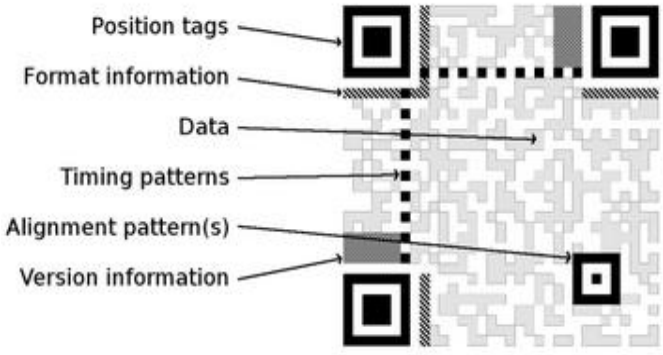

Fig. 3. Detailed QR code structure

Related approaches contain the work other author's have done previously. Existing systems have used QR code as their primary part in their systems in various ways. We will highlight some of the systems that have used QR code along with other features that profoundly contain document sharing. Document verification through QR code has been the simplest system among them all and it uses 2 level QR code for the purpose [4]. It uses QR code as an encryption method for document sharing only. Another system that implements the concept of QR code for image storing and retrieval purposes has been specifically related to the medical field [5]. It uses API for authentication and JSON format to store image and data and whenever needed the DICOM image can be retrieved with the use of QR code. As mentioned above, it only deals with the DICOM image of the patient and stores his image in a database. It uses APIs for authentication of the patient while retrieving the patient's DICOM image. One more system that deals with the implementation of QR code can be highlighted here. File sharing system [1] deals with the working of QR code that contains files encrypted within itself. Thus, QR code along with the encrypted file can be shared to any user that needs the file at the moment. It consists only of encryption that is present in the QR code and not any other frameworks and token systems that we have implemented in our system. Data and files are stored in the QR code by using the benefits of QR code's encryption only. They do not have any other encryption methods that are active and working for their system.

3. CHALLENGES FACED IN EXISTING SYSTEM

- Instead of 2D QR codes they are implemented dynamic QR codes
- Only image retrieval using QR code is present in the existing system.
- Multiple algorithms had made the system complex to run.
- Dedicated storage increases budget.
- Existing system has implemented various techniques only for text storing into the QR code. It has a missing concept of document storage and retrieval.

4. THE PROPOSED SYSTEM

QR codes are systematically used to store and download the private information and documents alongside the General information because of high authentication and security. We proposed a separate concept to enhance the security of the website using the JWT authentication. To use the system, the user registers himself into the system and stores all his documents and other personal details in the dashboard of the particular user. On the basis of those details, the system will generate QR codes respective to the user base of the system. Then the user will be able to scan and download the documents using authentication. When a user sends his/her information to the system, as shown in Figure 6 in response, the system will send the QR code to the user.

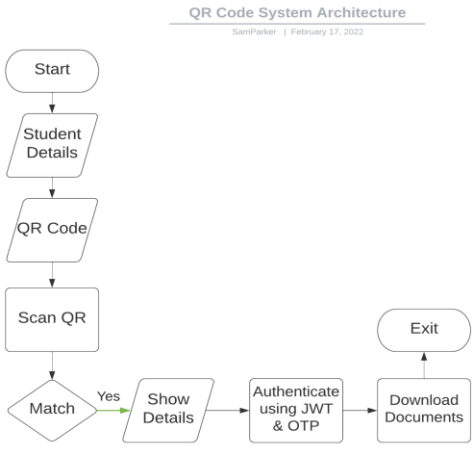

Fig 4. System Architecture

Getting access to the required document with QR code is the cheapest and most adaptable option among all of the solutions. With the automatic generation of JWT tokens, cheating can be avoided.

This is the unique system in which if a user wants to generate their own QR code which contains the all-basic details in text format and the link of all soft copies of the document, then they have to register with the system. In other scenarios, if a user wants to download and access the details of the other user by scanning their QR code, the user need not have registered. Even if you're not the registered user of the System you are able to download the document. For Authentication users need to provide valid credentials so that the document misused cannot be done. In this system we use the JWT authentication process as well as OTP.

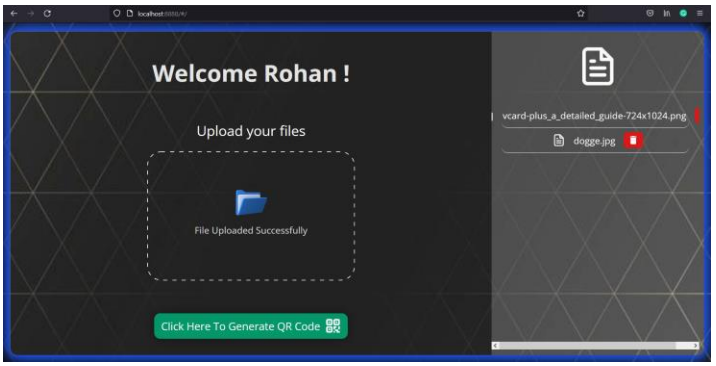

Fig 5. Home Dashboard

In Fig (5) Dashboard allows the user to upload his/her documents. The user needs to 1st signup by entering their basic details such as username and password. After successful registration, users are now able to access their account by providing login credentials. On the server side These details are then verified and along with this JWT token is generated by the server. Session then redirects the user to the web page where they can upload all their documents which can be stored on the share Drive and also generate the QR code if the user clicks on the generated QR code the new web page will be opened where. Fig 6 shows the form where Users can fill up All basic details like name, age, birthdate, address, phone number, email address along with the social media IDs like Facebook and Instagram etc. After filling all the details the user needs to click on the submit in order to generate his QR code. This QR code can be stored and downloaded by the user for further use. If the user has this QR code then there is no need to carry the hard copy of all documents every time. Just carry the QR code which can be printed on the ID card.

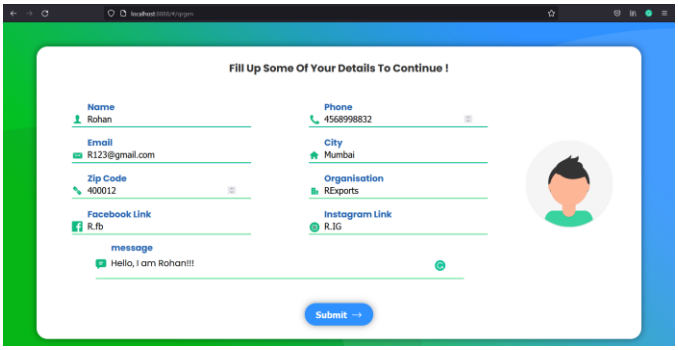

Fig 6. QR Code Generation

After generating QR code, users can now share the generated QR Code which is shown in fig.6 with anyone who wants their details. Suppose if a user is an external user who has not registered with the system, they can scan this QR code. After scanning the QR code, they will be redirected to the page where all basic details are shown along with the link of the storage drive where documents are stored. After clicking on download, the system fetches the respective user's access code. Which is the JWT token said by the owner of the QR code generator for accessing details.

Fig 7. User generated QR Code

After generating the qr code, it gets authenticated via the auth code. Users are then redirected to the document dashboard where they can download the documents after validation of the OTP. Once the validation gets done it redirects to the shared drive portal which contains students/person's personal information as well as his documents. Each user gets a size of 500mb to store their documents. Those documents should be in any form like .pdf, .jpg, .jpeg, .png, .docx, .txt, .xls, etc.

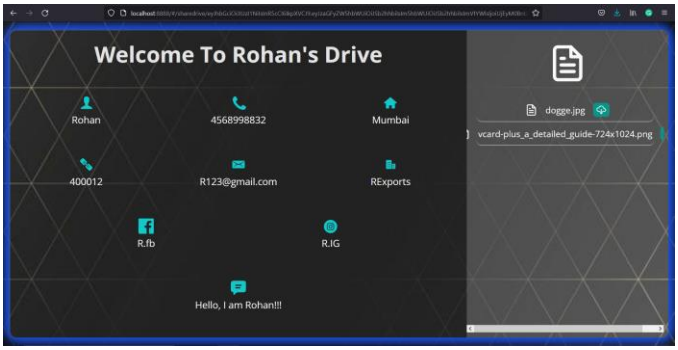

Fig 8. Rohan's shared drive

5. CONCLUSION

Getting access to the specified document with QR code is the cheapest and most adaptable option among all of the solutions. It doesn't require infrastructure changes to adapt to that. With the recognition of the smartphone and internet accessibility, it is often widely utilized in universities. With the automated generation of JWT tokens, cheating is avoided. Because the Technologies still grow, the requirement for QR codes will diminish.

6. REFERENCES

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