Security System based on QR Code with Iris Recognition

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ABSTRACT

Now a day's security is inevitable in each aspect. There are some existing systems like smart cards, biometric etc. but they are vulnerable. These smart cards are meant to be carried and presented accordingly. Thus the user is entrusted with a responsibility of caring for the card. In biometric like fingerprint scanner, injury to the fingers of the user may result in the failure of the system. In retina scanning systems, if user suffers from diseases like cataract, diabetes then it causes slight deformation in retina, resulting to the failure of the system. By considering above flaws in systems the level of security is increased in the proposed system by using QR Code with Iris recognition. QR-Code is portable and can be used securely in untrusted computers. QR-Code is extremely secure as all the sensitive data stored and transmitted is encrypted, but it is also easy to use and cost-efficient solution. Iris doesn't get affected throughout the life of human being. By understanding the vulnerability of the existing system, a new two level security system is proposed. This system takes the best suitable characteristics of both iris and QR code; this enhances the isolation of the system.

Keywords

QR Code, Iris Image, Webcam.

1. INTRODUCTION

With the latest development in technology there has been many ways of ensuring the access to particular space. The widely used technologies are Fingerprint, Face-recognition, Bar-code, Username-password method.

Fingerprint and Face recognition been costly, is not common man's cup of cake. Barcode on the other hand is one dimensional and becomes unreadable when damaged. Barcode have some limitations like bar code only stores up to 20 digits. So in bar code we are not able to store complex phrases or passwords, hence it doesn't provide best authentication method. Hence QR code was selected as fit for the project.

1.1 Iris Image

Iris based recognition is most safe for high security environments among various biometric technique (face, fingerprint, palm vein, signature, palm print etc.) because of its unique, stable, and non-invasive characteristics [4]. The iris has a set of bits, each indicates whether a given band pass texture filter applied at given point on the iris image has a negative or positive result.

The iris patterns of the two eyes of an individual or of identical twins are completely different and uncorrelated. Irises also differ between identical twins and even between the left and right eye.
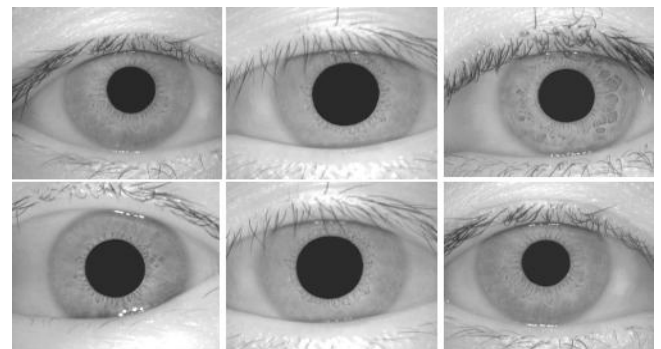

Figure: 1 Sample of Iris Images

Iris detection is one of the most accurate, robust and secure means of biometric identification while also being one of the least invasive [4]. The iris is shows little variation over a life's period yet a great hit for authentication over a long period of time.

1.2 Qr Code

QR codes (Quick Response Codes) were introduced in 1994 by Denso-Wave, a Japanese company subsidiary of Toyota. QR codes are two dimensional bar codes, which can be read from any direction in 360.It has capacity to store up to 4,296 alphanumeric characters. So it is much more than the barcode can store. Another advantage is QR code is that it is readable after being partially damage. Its advantage made QR code very powerful and popular in security and advertisement industry. QR code structure is as shown:

Figure: 2 QR Code

The QR code is a matrix consisting of an array of square modules arranged in an overall square pattern, including a unique pattern located at three corners of the symbol and intended to assist in easy location of its position, size and inclination. It has four levels of error correction. Module dimensions are user specified to enable symbol production by a wide variety of techniques.

2. EXISTING SYSTEM

Fingerprint scanner takes the biometric thumb impression from the user and compare it with the databases to prove the authenticity.

Retina scanner takes the pattern of the fibers in one's retina to verify the authenticity, but fails in case of cataract patients.

Pin code authentication are vulnerable.

Smart card system is less user-friendly as the user is made to carry a card that in case of any damage is rejected by the system, resulting to a long wait for a regeneration of smart card.

Face recognition, as many pre-requisites like proper lighting, angle of camera etc.,and fails if there are minor changes in the face of the user due to the evolution process.

3. NEED OF PROJECT

This basic need gave rise to this project that can handle the system and provide the features of both iris recognition and QR code.

4. PROBLEM STATEMENT

Enhancement of System Security by combining Iris and QR Code.
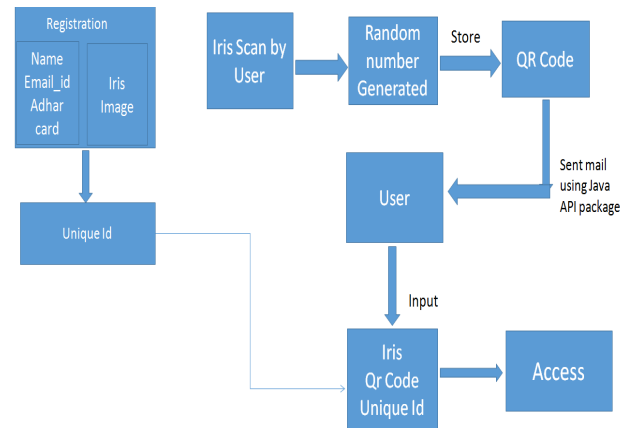
4.1 System Architecture

Figure: 3   System Architecture

A)   Registration:

The user is first made to register his iris attributes and other personal details like email-id, name, pan card number etc. in the database, after successful registration user is provided with a unique code.

B)   Scanning:

When the user need an access, he as to first scan his iris to the camera fitted on the system. This data is passed to the database for verification,   after successful verification a QR code is generated.

C)   QR code generation:

The QR code is generated by using the random number generator algorithm. The generated QR code is forwarded via email.

D)   Authentication:

The user shows QR code received to the same camera. The verification algorithm than compares both the QR code received and the iris image to provide the authentication.
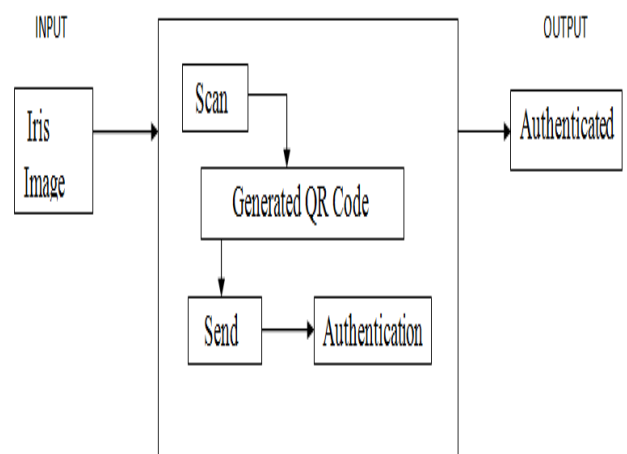
4.2 DATAFLOW DIAGRAM
Level 1

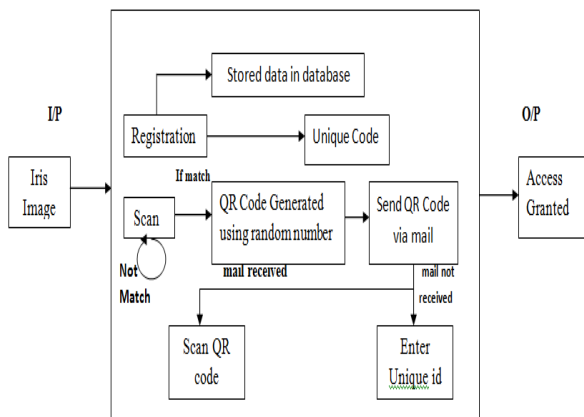**Figure: 4 DFD Level 1**

Level 2:

Figure: 5 DFD Level 2

5. CONCLUSION

Using the latest technology like Iris scanning and QR code, implemented a cost effective and reliable security system.

5.1 Future Scope

The system can be converted into multiple systems i.e. in network as currently we are using single system.

6. ACKNOWLEDGEMENTS

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