2LQR Code for Advance Security

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Abstract—The Quick Response (QR) code was designed for storing information. These codes have a huge number of applications including: information storage, identification, message sharing and document authentication etc. In our proposed system the new rich QR code named as 2LQR code .There are two storage levels has public and private storage level. The first is public level , it is same as standard QR code storage level and it is readable by any classical QR code application. And second is private level, it is code with an error correction capacity. Private level is constructed by replacing black module with code words and texture pattern. In this paper , by using this private level storage capacity will be increase and also security is provided for private information of user. The pattern recognition method is used to read the second level information and be used both in a private message sharing scenario. We will be using Reed Solomon algorithm and AES(Advanced Encryption Standard) algorithm. AES algorithm is used to provide security. QR code is commonly used two-dimensional barcode recently with the advantage of larger QR content and error correction capability. Based on this property of QR code we design a secrete hiding technique for QR code. General browser can read the QR content but 2LQR code cannot be readable by any general browser.

Index Terms—QR code, two storage levels, private message, document authentication, pattern recognition.

I. INTRODUCTION

The use of graphical codes like QR codes and Barcode is increased because they are robust to the copying process, easy to read by any device and any user, they have a high encoding capacity enhanced by error correction facilities, they have a small size and are robust to geometrical distortions[11]. Along being as advantageous as they are, codes have many flaws and one of the major flaw of these graphical codes is their lack of security provisions. Anyone can read encoded data from the QR code or Barcode and therefore major overhaul in this technology was necessary. The modified QR code or the Two Level-QR code overcomes the problem of QR Codes [7]. Like the standard QR code, this 2LQR code has the same specific structure, which consists of position tags, alignment patterns,

timing patterns, version and format patterns.2LQR Code has come up with two storage levels:

1) public level
2) private level

Public level as the name itself says the information is publicly available. And if the user thinks that the information should be kept as private ,that information is stored in private level.The private level is constructed by replacing the black modules by specific textured patterns [8].It consists of information encoded using qary code with an error correction capacity. This allows to increase the storage capacity of the QR code. 2LQR Code can be used for document authentication and message sharing. In private message sharing scenario, the black modules of these patterns are also replaced by textured patterns. However, in document authentication scenario, the position tags are not changed i.e. they remain black modules.

II. LITERATURE REVIEW

QR Code Features: The QR code was created for the Japanese car industry by Denso Wave1 partnership in 1994. The most critical qualities of this code are little printout estimate and rapid perusing process [5]. The accreditation of QR code was performed by International Organization of Standardization (ISO), and its entire particular can be found in . A QR code encodes the data into parallel shape. Each data bit is spoken to by a dark or a white module. The Reed-Solomon blunder revision code is utilized for information encryption. Accordingly, one of four mistake revision levels needs to be picked amid QR code era. The most reduced level can reestablish almost 7 percent of harmed data, the most elevated amount can reestablish almost 30percent [2].

Rich Graphical Codes: In order to improve the graphical code properties, several rich graphical codes have recently been introduced. These rich graphical codes aim to add visual significance, to personalize the stored information or to increase the storage capacities [9]. In this section, the different kinds of rich QR codes and several interesting rich graphical codes are presented. The most simple type of rich QR codes is the user-friendly QR code. The target of these codes is to improve the aesthetic view of QR codes. It consists of changing the colors and shape of the modules, or of adding an image into the QR code. Different design QR code generators are proposed as free or paid applications. However, most of

these generators prefer to sacrifice the possibility of error correction for attractive design. Recently, the rich QR code, which adds the significance without losing error correction capacity, was introduced [3].

PS Process Impact: Any QR code creation suggests a printing procedure and a checking process. The PS procedure in verification situations are considered as a physical unclonable capacity . The finished examples, that we propose to use in 2LQR code, are touchy to the PS procedure. In this area, the progressions included amid the PS procedure are talked about, keeping in mind the end goal to get it why the yield pictures experience the ill effects of this procedure. The PS procedure produces obvious and undetectable picture alterations, which can be caused by resampling intrinsic to the PS procedure, inhomogeneous lighting conditions, ink scattering, fluctuating paces of the filtering gadget . The changes gave by the printer are not detachable from changes included by the scanner, that is the reason the bends have a place with them two [5].

III. EXISTING SYSTEM

In earlier days, QR code with only one level was used for different purposes in different application so information hidden within QR code can be readable by any general browser or any QR code scanner. The applications in which these QR Codes are used are as follows:

- Information storage:In that it can be used in advertising, museum art description [6].
- Redirection to web sites [6].
- Track and trace it can be used for transportation tickets or brands [6].
- Identification of flight passenger information, supermarket products [6].
- This will give less security to users information [6].

Disadvantages Of Existing System:
- Less security to users information / data.
- Less storage capacity.
- Barcode decoding speed is low.
- Only public message is transferred and this message can be read by any one.
- Any QR code scanner can scan QR code.

IV. PROPOSED WORK

In Proposed system we are going to develop a new rich 2LQR code that has two storage levels and can be used for document authentication and to avoid remembering username and password and also to ease online transaction in banking. In proposed system we are going to develop an banking application for ease of online transaction using 2LQR code. In proposed system, 2LQR code will provide more security for users information and it has an error correction capability.
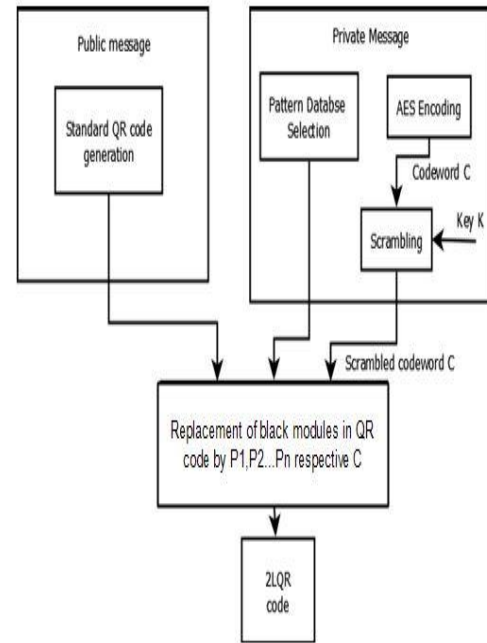

Fig.1. Block Diagram of Proposed System

In proposed system , the first block i.e in public message block users public information is an input given. Here Reed-Solomon algorithm is applied on that information and plain text can be converted in cipher text. And standard QR code of that text will be generated. In second block i.e in private message block, private information of user is given as the input. Pattern database will store different types of patterns. Then AES (Advanced Encryption Standard) algorithm is applied on that information so that more security is provided to private information. After that code words of that information
will get generated and then scrambling technique is applied on that and scrambled code words will get generated by using the following formula ,

$$C(x)=m(x)g(x), \qquad ...(1)$$
$$C(x)= c_0 + c_1x + + c_{n-1}(x(n) - 1) \qquad ...(2)$$

Where, $m(x)$=Polynomial of degree, at most $k-1$ $g(x)$=Generated Polynomial $g(x)$ is a factor of polynomial $(x(n) - 1)$ [6] For third block standard QR code of public information, pattern and scrambled code words are the given inputs. Patterns are placed in position tags of 2LQR code. And scrambled code words are replaced in black modules. Finally 2LQR Code will be generated [6].

V. METHODOLOGY

1) Two Level QR (2LQR) Code Generation depicts the particular structure of the standard QR code. Like the standard QR code, the 2LQR code has a similar

particular structure, which comprises of position labels, arrangement designs, timing examples, form and arrangement designs. Be that as it may, in the standard QR code, we have white and dark modules and in the 2LQR code we have white modules and finished modules rather than dark modules. This substitution of dark modules by finished modules does not disturb the standard QR code perusing process. Yet, it enables us to have a moment stockpiling level, which is imperceptible to the standard QR code peruser. This second level contains the private message, encoded with q-ary (q

2) Code with blunder rectification limit. The finished modules are named finished examples in whatever is left of this paper. These finished examples have particular includes and are utilized for private message Mpriv stockpiling in the proposed 2LQR code [6].

3) Capacity of 2LQR Code In this segment the capacity limits of proposed 2LQR code delineated is talked about. Give N2 a chance to be the quantity of modules in a standard QR code. As QR code development means to have a roughly rise to number of dark and white modules, we can assume that N2/2 is around the quantity of dark modules in standard QR code. It has three position labels, each tag has 33 dark modules. That is why, there are roughly (N2/2 3 33) dark modules in QR code, that could be supplanted by finished examples [6].

4) In this area, we intend to contemplate the capacity limit of the 2LQR code, utilizing a settled surface equivalent to 1.2 1.2 cm2 also, a settled example thickness equivalent to roughly 42percent. The capacity limit of the 2LQR code can be expanded both by expanding the estimation of q, which is the quantity of digits and finished examples and by diminishing the size p p pixels of the finished examples. In the two cases, a few issues in design identification are distinguished. In this way, we need to discover an example estimate and an example number exchange off [6].

VI. CONCLUSION

We believe that QR codes have great potential in business media. This 2LQR code can be used for private message sharing or for authentication scenarios. The private level is created by replacing black modules with specific textured patterns. The proposed 2LQR code increases the storage capacity of the classical QR code due to its supplementary reading level. One important feature of the textured patterns used is their sensitivity to the P&S process and sensitivity. The two level color QR code scheme improves the storage capacity

of the QR code and provide document authentication ensuring overall security. Thus we present a new rich 2LQR code, that has two storage levels and can be used for document authentication. This application avoid remembering username and password and also to ease online transactions, QRLogin is developed. The main aim is to provide secured login systems which also perform online transactions.

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