

# Forged Marksheet detection System Using QR code

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**Abstract**— Digital world requires digital data, so it is important to optimize the data accordingly. Therefore it is important to preserve the digital space for saving digital data. This paper presents an Alternative way to optimize the digital data by utilising the technique of QR code. This QR code is obtained by encrypting the normal digital data. Here in this paper, we are utilising this technique to design Digital Marksheet system. Here the digital data would be the students record which would be saved using QR code because this optimize technique is secure and quite useful. We would be using .NET platform to design the system. This paper provides a new dimension for storing, accessing and authenticating the digital data.

**Keywords**— Digital Code, QR code, Digital Marksheet, Authentication, Encryption, Decryption

## I. INTRODUCTION

This is a computerized era, so mostly the data stored is of digital format. Hence it is required to have a safe and secure algorithm to preserve this data. This paper comprises the usage of digital marksheet system where marksheets will be encrypted and stored in QR codes. Every student record is been optimised and encrypted using TTJSA algorithm [1] and stored in QR code[2] so that it is inaccessible to the unauthorised user. Here we are developing an application based on .NET platform which would decode the encrypted data in QR code to generate the original students marksheet record. We would be creating a database where we will store the original data and whenever the user will scan the QR code present on document, he will be able to fetch the original data using the internet. The original data would be printed with the registered certificate which could be used to verify the data the candidate has received.

A QR code is a two-dimensional barcode or a matrix barcode[2]. It is abbreviated from the term Quick Response Code[2]. Denso wave incorporated is a Japanese corporation that introduced QR codes. Initially QR codes were designed to track the parts of vehicle but because of their secure and safe nature their usage started in more number of urban environments based facilities. Since QR code is in 2-dimensional format, it can contain information in vertical as well as horizontal direction but the normal barcode system is in single direction only, so QR code can hold large amount of data as compared to normal barcode. QR code is a license-free source so anyone can use it.

## II. PROPOSED SYSTEM

The system proposed here comprises of embedded QR code in the mark-sheet[1]. This mark-sheet hides the details and information of the candidate or student. It may contain their

identity, name, contact details, roll number etc. This implies whenever the examiner has to verify the mark-sheet. He just has to grab the device (mobile) and use the QR code application to scan the code. The encoded data can hence be encoded and revealed. Further this can be used for sharing of information between third parties. The alumni can send the required marks to different educational institute in digital format. The process includes scanning of QR code, decryption of data and then the information is ready for transmission. This is a very efficient system for digital data transmission and it can be easily implemented. Since QR code is embedded within the mark-sheet it is very difficult or impossible to change the data. Hence for transmission purpose it is very efficient and secure. Since it comprises of QR code ,the complexity of forgery becomes less. The document which comprises of this code is made of special eco-friendly paper with several layers for security. One advantage of this is that since it is not an ordinary paper, it cannot be torn or fade due to any liquid.

## III. SYSTEM ARCHITECTURE

All the information is updated at the server by the college administrator. This implies all the required changes to the student details are being changed here. This includes student's marks and certificates. These certificates can be further be downloaded on request. QR code is patched on the certificate whenever they are demanded. This contains the data encrypted and digital ID of the certificate in the encoded QR code. The registered user can access this by scanning the digital certificate. This would encode the true information of the certificate. The scanning is done by the application or QR reader installed in the mobile. The authentication PIN is asked to the user. This is already given to user at the initial state of registration. The PIN is also send to the server. IMEI number is also send. This is

required for authentication. If valid user is found then acknowledgement is sent to the mobile application by the server. User now has to scan the QR code printed on the certificate. Further the decoding process is done and the digital data contained in the QR code is being revealed to the user. Further the user is provided with the Digital ID. This ID can be again encrypted by using PIN and is sent to the server. At the server the information is being fetched, decoded and returned back to the user on his mobile application. The application displays the information required to be present on the certificate. Validation hence becomes easy. The user can hence validate and determine the fake information on the certificate.

#### IV. METHODS USED

The system majorly works on QR code [2]. The application presented here utilises encryption with QR codes. All the encryption and decryption is done by using TTJSA algorithm [1].

For this firstly the QR code is created by selecting the string bits. Original message or data is encrypted and some extra information bits are added to the string. The decoder on the other side understands these information bits which reveal the type of QR code and its details.

Further error correction codes are generated. Here we have used Reed-Solomon Error Correction Technique. Various error correction codes use two dimensional bar codes example Maxicode, QR code, Aztec code, etc. This Reed-Solomon correction allows code scanning even if the bar code is unclear or damaged [9]. These codes are non binary cyclic correcting codes invented by Irving S. Reed and Gustav Solomon. According to this a systematic way of building codes is described and it also detects correct and multiple symbol errors. "T" check symbols are added to the data. The RS data code can detect any combination of up to  $t$  wrong code or up to  $t/2$  symbols. These are suitable as multiple burst bit error correcting codes. This is because  $b+1$  consecutive bit errors affect up to two symbols of size  $b$ . However the choice of  $t$  can be selected by the designer which can be wide in range.

Strings and correction bits are ready for process. Outputted matrix can be changed by using 8 different patterns. The mask is determined by the coordinates of the QR matrix. The QR code is hence easily read by the scanner utilising the mask pattern

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#### CONCLUSION

In our current project work we have mainly focused on how we can secure our marksheet data and to do so we have used the technique of applying the same on QR code. The process of retrieving or accessing data from QR code is a very easy process. Any person having a mobile phone with a working and decent camera can use this to check out for any forgery. Mobile OS is not an issue in this because we will be mailing the pictures to the server and from there we will be accessing the data using TTJSA algorithm.

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