Experiment No: 03

- **Aim: Preparation of software requirement specification (SRS) document in IEEE format.**

- **Theory:**

- **Project Name: - The QR CODE SCANNER**

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1. Introduction:

A QR code is a type of matrix bar code or two-dimensional code that can store data information and designed to be read by smartphones. QR stands for "Quick Response" indicating that the code contents should be decoded very quickly at high speed. The code consists of black modules arranged in a square pattern on a white background. The information encoded may be text, a URL or other data. The QR code was designed to allow its contents to be decoded at high speed. The popularity of QR codes is growing rapidly all around the world. Nowadays, mobile phones with built-in camera are widely used to recognize the QR Codes. QR Codes are created by the Toyota subsidiary Denso Wave in 1994, and was initially used for tracking inventory in vehicle parts manufacturing.

1.1 Purpose:

The first objective of this thesis work is to study the concept of QR Code in detail, which involves the development history and the definition of QR Code. Furthermore, the characteristics of QR Code are introduced, and through different types QR Code the features of different QR Code are analysed. In addition, the underlying and feasible technologies of QR Code will be explored and analysed in the thesis. The analysis involves the symbol of QR Code, encoding and decoding procedures of QR Code. Moreover, regarding the QR Code generator and QR Code reader process implementation are demonstrated in this research.

1.2 Scope

1. Direct customers to a landing page/website
2. Dial your business number
3. Send Message
4. Send an E-Mail
5. Download an Application
6. View Business Location
7. Shopping E-Commerce Business
8. Direct Customer to Social Media Pages

1.3 Definitions, Acronyms, and Abbreviations.

A QR code is a type of matrix bar code or two-dimensional code that can store data information and designed to be read by smartphones. QR stands for "Quick Response" indicating that the code contents should be decoded very quickly at high speed. The code consists of black modules arranged in a square pattern on a white background. The information encoded may be text, a URL or other data. The QR code system consists of a QR code encoder and decoder. The encoder is responsible for encoding data and generation of the QR Code, while the decoder decodes the data from the QR code

1.4 References

- http://en.wikipedia.org/wiki/QR_code
- http://en.wikipedia.org/wiki/Barcode
- http://en.wikipedia.org/wiki/Intent (Android)
- https://developer.android.com/studio/intro
- https://en.wikipedia.org/wiki/Android_Studio
- https://firebase.google.com/

1.5 Overview

The QR Code basically scan QR code as well as generated the QR code

The QR Code Application works on symmetrical key algorithm

2. The Overall Description:

QR i.e. "Quick Response" code is a 2D matrix code that is designed by keeping two points under consideration, i.e. it must store large amount of data as compared to 1D barcodes and it must be decoded at high speed using any handheld device like phones. QR code provides high data storage capacity, fast scanning, omnidirectional readability, and many other advantages including, error-correction (so that damaged code can also be read successfully) and different type of versions.

Different varieties of QR code symbols like logo QR code, encrypted QR code, I QR Code are also available so that user can choose among them according to their need. Now these days, a QR code is applied in different application streams related to marketing, security, academics etc. and gain popularity at a really high pace. Day by day more people are getting aware of this technology and use it accordingly. The popularity of QR code grows rapidly with the growth of smartphone users and thus the QR code is rapidly arriving at high levels of acceptance worldwide.

2.1 Product Perspective

The QR Code application is android based system .The system interfaces with two other system the owner email system ,The information about product and the application is used by users .The system provide a secure environment for all product information about client and for the storing and retrieving of confidential member information.

2.2 Product Functions:

Located at three corners of each code, it allows a scanner to accurately recognize the Code and read it at high speed, while indicating the direction in which the Code is printed. They essentially help quickly identify the presence of a QR Code in an image and it's orientation. Smaller than the position detection markers, they help straighten out QR Codes drawn on a curved surface. And, the more information a Code stores, the larger it is and the more alignment patterns it requires. Alternating black/white modules on the QR Code with the idea of accurately helping configure the data grid. Using these lines, the scanner determines how large the data matrix is. Smaller than the position detection markers, they help straighten out QR Codes drawn on a curved surface. And, the more information a Code stores, the larger it is and the more alignment patterns it requires. This is similar to the importance of white space in design, that is it offers structure and improves comprehension. For whom or what you may ask? For the scanning program. In order to distinguish the QR Code from its surroundings, the quiet zone is vital.

2.3 User Classes and Characteristics

- A person act as user. The user needs to register to use the application.
- The user needs to sign in into android application.
- The user can scan the QR Code for the attendance.

2.4 Operating Environment

The main component of the Automated Examination using QR code project is the software application, which will be limited to the Android operating system (specifically Android 2.2 and above). The application has little resource or graphics-intensive, so there are little practical hardware constraints. The application will rely on several functionalities built into Android's Application Programming Interface (API), so ensuring appropriate usage of the API will be a major concern. Beyond that, the application is a self-contained unit and will not rely on any other Android-related software components.

The application will, however, frequently interact with the image captured by camera of system. Software has two major component one the server and the second one is the mobile application. The server will required Windows XP/Vista/7 machine with minimum 1GB RAM and 100 GB hard disk. The server machine also required WIFI devices sing which it can create Wireless Ad-hoc network. Mobile application will support Android phones so at least 2 Android devices required getting the output.

2.5 Design and Implementation Constraints

- **ANDROID STUDIO**

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development.

- **XML**

Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The World Wide Web Consortium's XML 1.0 Specification of 1998 and several other related specifications—all of them free open standards—define XML.
The design goals of XML emphasize simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services. Several schema systems exist to aid in the definition of XML-based languages, while programmers have developed many applications programming interfaces (APIs) to aid the processing of XML data. TheScan

- **JAVA**

Java is a high-level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let programmers write once, run anywhere (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to byte code that can run on any Java virtual machine (JVM) regardless of the underlying computer architecture. The syntax of Java is similar to C and C++, but has fewer low-level facilities than either of them. The Java runtime provides dynamic capabilities (such as reflection and runtime code modification) that are typically not available in traditional compiled languages. As of 2019, Java was one of the most popular programming languages in use according to GitHub, particularly for client–server web applications, with a reported 9 million developers.

- **INTENT**

An Intent is a messaging object you can use to request an action from another app component. Although intents facilitate communication between components in several ways, there are three fundamental use cases: Starting an activity. An Activity represents a single screen in an app. TheScan

- **MANIFEST**

Every project in Android includes a manifest file, which is AndroidManifest.xml, stored in the root directory of its project hierarchy. The manifest file is an important part of our app because it defines the structure and metadata of our application, its components, and its requirements. This file includes nodes for each of the Activities, Services, Content Providers, and Broadcast Receiver that make the application and using Intent Filters and Permissions determines how they co-ordinate with each other and other applications.
The manifest file also specifies the application metadata, which includes its icon, version number, themes, etc., and additional top-level nodes can specify any required permissions, unit tests, and define hardware, screen, or platform requirements. The manifest comprises a root manifest tag with a package attribute set to the project's package. It should also include an xmls: android attribute that will supply several system attributes used within the file. We use the version Code attribute is used to define the current application version in the form of an integer that increments itself with the iteration of the version due to update. Also, the version Name attribute is used to specify a public version that will be displayed to the users.

- **URI**

A Uniform Resource Identifier (URI) is a unique sequence of characters that identifies a logical or physical resource used by web technologies. URIs may be used to identify anything, including real-world objects, such as people and places, concepts, or information resources such as web pages and books. Some URIs provide a means of locating and retrieving TheScan

information resources on a network (either on the Internet or on another private network, such as a computer file system or an Intranet); these are Uniform Resource Locators (URLs). A URL provides the location of the resource. A URI identifies the resource by name at the specified location or URL. Other URIs provide only a unique name, without a means of locating or retrieving the resource or information about it, these are Uniform Resource Names (URNs).

2.4 User Documentation

Since paper document no longer meet the need of user, you need find a way to present your content so that it'll be used without inconvenience and issues. You goal is to meet the need of clients and provide them with instant access to the information they need. Digitalization of instruction is a great solution. And even better is to additionally use the QR technology. You can create a QR code to store information about the technical characteristics of your product and the peculiarities of its usage. This approach has many advantages:
- Storage of a large amount of data without the need to occupy physical space;

- Quick readability and content navigation;

- Easy exchange of instructions between users, including the ones in image and photo formats;

- Simple editing and adding of information in the file without the need to replace the original document;

All your users have to do is scan the QR code with their smartphone or QR scanner to gain access to comprehensive product information. And you just need to digitize old manuals and instructions, or write new ones, then generate QR codes for files and place the QR codes on product packaging.

Assumptions and Dependencies

Time Dependencies: As mentioned previously, the features of Automated Examination using Qr code are divided into two groups: core features and additional features. Core features are crucial to the basic functionality of the Qr Code application. These features must all be implemented in order for the application to be useful. Optional features, however, are not critical to the function of the application. They are usability improvements and convenience enhancements that may be added after the application has been developed. Thus, the implementation of these features is entirely dependent upon the time spent designing and implementing the core features. The final decision on whether or not to implement these features will be made during the later stages of the design phase. Hardware Dependencies: Some of the additional features rely on hardware components present in Android handsets. The application will use the handset's camera to capture the image of a device at specific instance of time. Consequently, this feature is entirely reliant upon the ability and megapixel of the camera.

D. System Features

The following list offers a brief outline and description of the main features and functionalities of the Automated Examination using Qr code. The features are split into two major categories: core features and additional features. Core features are essential to the application's operation, whereas additional features simply add new functionalities. The latter features will only be implemented as time permits. QR Code generator: It allows us to create the qr code of the required data i.e. we get the data in the pictorial form. QR Code decoder:It allows us to decode the qr code i.e. we fetch the data from the qr code. Start exam: It will allow the end user to start the exam after fetching the qr code. End exam: It will terminate the exam, it can be done manually or can be automatically done after the given time has completed.

2.1.2 Interfaces

The QR Code Interface Asset (IA) is an "off-the-shelf" component of Intuiface permitting the encoding of a given string into a QR code that can then be automatically rendered on screen.

The input parameter of this Interface Asset is the text to be encoded. Although typically used to encode URLs, any text string can be processed.

2.1.3 Hardware Interfaces

Mobile application will get installed on mobile devices. These mobile devices should have WIFI device thorough which it will connect to server.

2.1.4 Software Interfaces:

- Operating System: Windows XP/Windows Vista/Windows7.
- Database: MySQL 6.0.
- Android 2.2 supported mobile handset
- Xml
- Photoshop(ps6)
- UI/UX

2.1.5Communications Interfaces:

Here we will be using WIFI network and going to create our own communication protocol. Software will also support BASE64 encryption logic while sending data to server. Server will support HTTP protocol for web based access.

System Features :-

The following list offers a brief outline and description of the main features and functionalities of the Automated Examination using Qr code. The features are split into two major categories: core features and additional features. Core features are essential to the application's operation, whereas additional features simply add new functionalities. The latter features will only be
Implemented as time permits.

Functional Requirements:

A Server Side:

- registration Form
- Login Form
- Profile Form
- Question paper setting Form
- Results & Report Form
- Admin Login Form
- B Client Side:
- Welcome page
- Camera Open Interface
- Examination start/stop Form
- Question viewing Form
- Answer Submission Form

3.4 Logical Database Requirements

Firebase is a Backend-as-a-Service (BaaS) which started as a YC11 startup. It grew up into a next-generation app-development platform on Google Cloud Platform. Firebase (a NoSQL's database) is a real-time database that allows storing a list of objects in the form of a tree. We can synchronize data between different devices.

3.5 Design Constraints

The symbol versions of the QR Code range from Version 1 to Version 40 [4]. Each version has a different module configuration or number of modules. (The module refers to the black and white dots that make up QR Code.) "Module configuration" refers to the number of modules contained in a symbol, commencing with Version 1 (21 × 21 modules) up

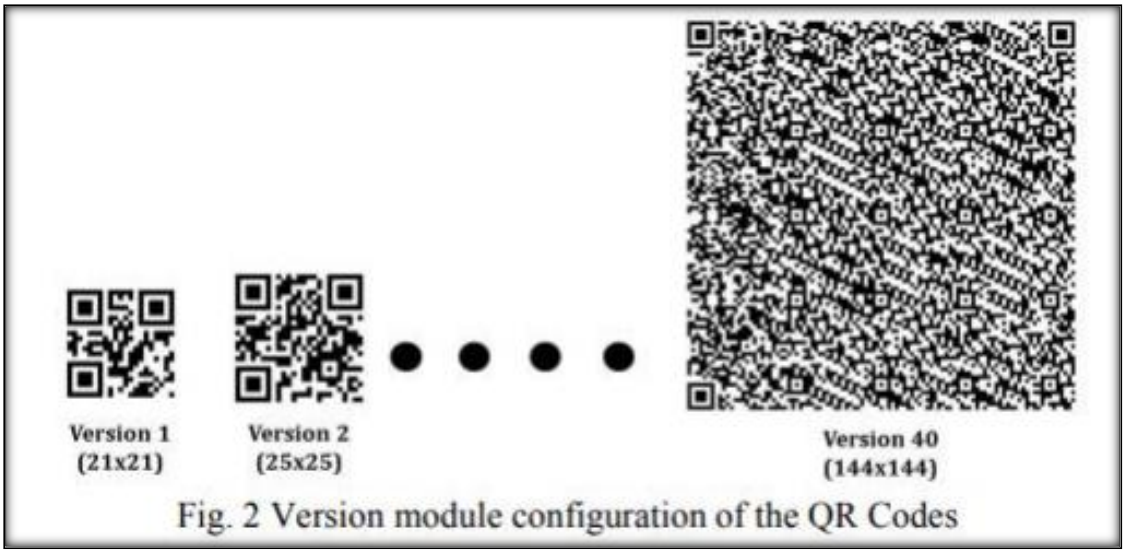
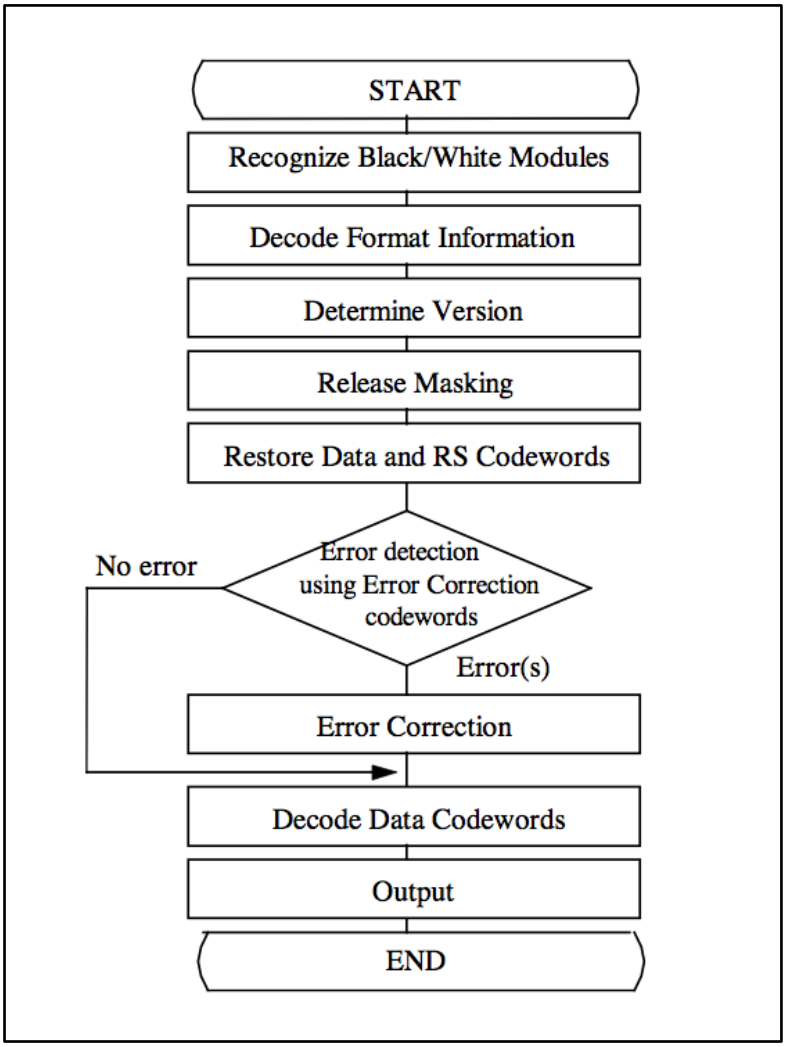


Fig. 2 Version module configuration of the QR Codes

to Version 40 (177 × 177 modules).



3.5.1 Standards Compliance

In compliance with the description of the QR Code illustrates the wide usage of the QR Code in different fields. Yet, the majority of companies are still confused about the concept of QR Code even though they follow the market trend while using QR Code. This research concentrates on the concept of QR Code and attempts to understand the characteristics of QR Code. On the basis of the underlying technologies of QR Code, combinations of essential knowledge of QR Code explore and analyse the benefits of using QR Code for companies. To sum up, this research emphasizes on describing the concept of QR Code for the sake of offering decision guidelines for company managers when they are implementing the platform of QR Code

3.6 Software System Attributes:

- **AVAILABILITY:** The flight should be available on the specified date and specified time as many customers are doing advance reservations.
- **CORRECTNESS:** The flight should reach start from correct start terminal and should reach the correct destination.
- **MAINTAINABILITY:** The administrators and flight in chargers should maintain correct schedules of flights.
- **USABILITY:** The flight schedules should satisfy a maximum number of customer's needs.

3.6.1 Reliability

This Application is reliable for a long time as nowadays most of the work is been carried out under QR Code usage. And as it provides encrypted data it saves memory and it has many use in future.

3.6.2 Availability

There are a great many QR code generators available as software or as online tools that are free and available in open source and it is portable.

3.6.3 Security

All the data will be shared using BASE64 algo with convert binary data into text form. Only sender and recipient will understand the content. Also as we are not using GPRS or internet so system has not more security threads.

3.6.4 Maintainability

QR maintenance also allows clients to perform inspections via their mobile devices and create and edit forms. The solution is accessible via various web browsers as well as Android devices.

3.6.5 Portability

For the Android platform, this software application has the advantage of being portable and convenient to use whenever and wherever. Overall, the application balances both the ease of use and the ease of learning.

3.7 Organizing the Specific Requirements

The purpose of this Software Requirements Specification (SRS) document is to provide a detailed description of the functionalities of the Automated Examination using QR Code. This document will cover each of the system's intended features, as well as offer a preliminary glimpse of the software application's User Interface (UI).

3.7.1 User Class

The proposed system Location automated examination focuses on the user who is using the mobile phone with android Support and willing to reduce work load of manual checking. The system is supported with the "How to use" option for the user who is not aware of this feature. Using this option even a layman can be able to use the applications easily. The layout and UI of the app will be simple enough that users will take no time to learn its features and navigate through it with little difficulty.

3.7.2 Objects

In addition to giving objects identities the QR code can be used as a means of transferring information directly to a mobile phone without the reliance on manual input methods such as email and texting

3.7.3 Feature

The proposed system Location automated examination focuses on the user who is using the mobile phone with android Support and willing to reduce work load of manual checking. The system is supported with the "How to use" option for the user who is not aware of this feature.

3.7.4 Response

A QR code (abbreviated from Quick Response code) is a type of matrix barcode (or two-dimensional code) first designed for the automotive industry. More recently, the system has become popular outside of the industry due to its fast readability and comparatively large storage capacity.

Operating Environment :

The main component of the Automated Examination using Qr code project is the software application, which will be limited to the Android operating system (specifically Android 2.2 and above). The application has little resource or graphics-intensive, so there are little practical hardware constraints. The application will rely on several functionalities built into Android's Application Programming Interface (API), so ensuring appropriate usage of the API will be a major concern. Beyond that, the application is a self-contained unit and will not rely on any other Android-related software components. The application will, however, frequently interact with the image captured by camera of system. Software has two major component one the server and the second one is the mobile application. The server will required Windows XP/Vista/7 machine with minimum 1GB RAM and 100 GB hard disk. The server machine also required WIFI devices sing which it can create Wireless Ad-hoc network. Mobile application will support Android phones so at least 2 Android devices required getting the output.

Design and Implementation Constraints

The primary design constraint is the mobile platform. Since the application is designated for mobile handsets, limited screen size and resolution will be a major design consideration. Creating a user interface which is both effective and easily navigable will pose a difficult challenge. Other constraints such as limited memory and processing power are also worth considering. Location Alert is meant to be quick and responsive, even when dealing with large groups and transactions, so each feature must be designed and implemented with efficiency in mind.

Assumption and Dependencies :-

- **Time Dependencies:**

  As mentioned previously, the features of *Automated Examination using Qr code* are divided into two groups: core features and additional features. Core features are crucial to the basic functionality of the Qr Code application. These features must all be implemented in order for the application to be useful. Optional features, however, are not critical to the function of the application. They are usability improvements and convenience enhancements that may be added after the application has been developed. Thus, the implementation of these features is entirely dependent upon the time spent designing and implementing the core features. The final decision on whether or not to implement these features will be made during the later stages of the design phase.

- **Hardware Dependencies**:

1) Some of the additional features rely on hardware components present in Android handsets. The application will use the handset's camera to capture the image of a device at specific instance of time. Consequently, this feature is entirely reliant upon the ability and megapixel of the camera.
2) References:
http://developer.android.com/reference/android/hardware/Camera.html
http://developer.android.com/guide/topics/location/index.html

Advantages

- Secured transactions.
- Improves operational efficiency.
- High speed.
- Saves time.
- Efficient and Reliable.

Conclusion

The recent interest in the use of visual tags in everyday life is a natural consequence of the technological advances found in modern mobile Phones. Although our proposed system has the potential to make the question paper easily available to students using the QR code also it is handy for the students to give the answers to the questions which is time saving for teacher as well as student and also checking is 99% error free.

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