# Qr Code Based Mobile App and Business Process Integration

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### Abstract

*QR code is an abbreviation of Quick Response code is widely used in a around the world to keep information about all kind of product industry .These usage starts from automotive industry to all other commercial products because of its two big advantages are fast accessing of data and provide large storage area. There are various traditional ways of marketing and campaign management, profile search and so on. But due to technology adoption and user preference changes small to large business have to adapt to changing scenarios and make their business relevant and hence new system with latest technology trends is very much required to stay competitive. The development of QR based new system will allow technology savvy users to just scan QR codes to complete end to end business process flow execution to complete task at hand. This kind of system is cost effective at the same time available 24 / 7 to do a business transaction*

**Key Words**: *QR v/s Barcode, linear barcodes, optical machine-readable, Information Density, Information Capacity etc.*

## 1. Introduction

### 1.1 Background

We became familiar with the original linear barcodes (or 1D), from our supermarket shopping in the 1980s.They comprise a series of vertical black lines and white spaces of variable width representing numbers, which are read by a barcode reader to extract the information they bear. This code is only used to store numeric and ASCII characters .This code is read by a laser light. This code stores very small information that cannot be used in general purpose .So we want to develop a protocol which can be used for general data storage and which is easily readable. This image should be readable from mobile which we extract the details stored in that image. Thus the invention of QR Code i.e. 2D barcode came into existence

### 1.2 Literature Survey

### 1.2.1 Existing system

A barcode is an optical machine-readable representation of data relating to the object to which it is attached. Originally barcodes systematically represented data by varying the widths and spacing of parallel lines, and may be referred to as linear or one-dimensional (1D). Bar codes consist of bars and spaces that vary in width. The bars and spaces on a bar code correspond to numbers and letters that represent descriptive data.

### 1.2.2 Drawbacks

In 1994.Denso Wave started using a type of barcode for their robots industry. It spread over to the car manufacturing industry. we never really saw the potential that QR Code technology had. Unlike the standard barcode system in use today, QR codes are far more powerful and can contain much more information. While out current bar-coding system holds information only one-way, QR Code holds info both vertically and horizontally. In comparing the current bar-coding system with QR Codes, we also note that QR Code is really about convenience. In order to access the information contained within our current barcode system, we need a special scanner. The type of scanner and system isn't cheap. Therefore, you don't see them in households and the system's use continues to be restricted to retailers and larger businesses.
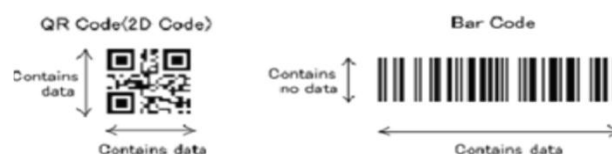


**Fig 1:** QR v/s Barcode

### 1.2.3 Proposed system

The development of QR based new system will allow technology savvy users to just scan QR codes to complete

end to end business process flow execution to complete task at hand. This kind of system is cost effective at the same time available 24 / 7 to do a business transaction. Small business owners know that they need all the marketing that they can get. It brings in sales, allow people to know about them and even introduce these businesses to new customers. A relatively exciting field right now is mobile marketing, which is both very affordable and very effective right now.

Within a few years, QR codes will be an integral part of retail spaces and essential for experiential marketing campaigns.

Now QR Code is seen and used everyday everywhere in Japan for the following reasons:
• Several characteristics superior to linear bar codes: much higher data density, support Kanji/Chinese character, etc.
• It can be used by anybody free of charge as Denso has released the patent into the public domain.
• Data structure standard is not prerequisite for current usages.
• Most mobile phones in Japan equipped with cameras that enable reading of QR Codes can access Internet addresses automatically by simply reading a URL encoded in the QR Code.

**Table 1:** Comparison of Barcode and QR Code

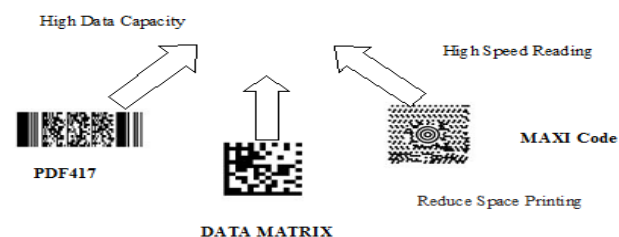| Barcode Type | 1D (Barcode) | 2D (QR Code) |
|---|---|---|
| Information Density | Low | High |
| Information Capacity | Small | Big |
| Information Type | Numbers, Greek Characters. | Numbers, Greek Characters, Chinese Pictures, voice and other binary information. |
| Dependence on database | Must depend on database or communication network | Does not depend on database or communication network |



**Fig 2:** Development of QR code

*1.2.4 Related work done*

Although QR code initially developed for automotive industry to know the status of a machine during manufacturing .Day by day which has been used in many

field like mobile phone, Authentication, web, buildings, images, graphics, even a new research is going on implementation of QR code in teaching field. This literature review shows how QR codes are used in above fields.

• QR Codes In Mobile Phone
Alexandre Alapetite introduces a novel Web architecture that supports session migration in multidevice Web applications, particularly the case when a user starts a Web session on a computer and wishes to continue on a mobile phone. This paper provide a solution for transferring the needed session identifiers across devices is to dynamically generate pictures of 2D-barcodes containing a Web address and a session ID in an encoded form mobile device to a computer (opposite direction), and between two or more mobile phones (possibly back and forth).

• QR Code In Banking For Secure Transaction
Normally in banking are using data base for maintaining the details about the client. But the possibility of attacks on the client details and transactions are day by day becomes more. So QR code is used to maintain client information securely.

• QR Code In Way Finding One of the another usage of QR code is for finding the way by scanning the QR-code tag (which has Location information) through the user PDA that will be sent over Wi-Fi, followed by the navigation server uses that location information to decide which photos to send . The user then follows the direction or prompt displayed on device. The navigation server records the positions, time, and user ID for the tracking purpose. A user interface is provided for job coaches or family members to retrieve the tracking information then which is displayed on a map.

*1.3 Problem Definition*

*1.3.1 System Requirement Specification*

1.  Problem Statement

Generating a QR code and developing a QR code reader which will be used for business process integration. We are going to develop an android application which would be able to read the QR code. This project is intended to small businesses which would use this technology for marketing purpose.

2.  Project Scope

By using QR code reader we will read the QR Code extract the id and fetch the details about that entity from the database and present it to the user. We are also providing search facility so that the user is not completely depended on the QR code and can search the entity directly.

3.  Features

- High Capacity Encoding of data.
- Small Printout Size.
- Kanji and Kana capability.
- Dirt and Damage Resistant.
- Readable from any direction in $360^{o.}$

### 4. Functional specification

- Mobile Module

The mobile application runs as a background process in the customer's mobile phone and it will scan the QR code and will fetch the stored information. There are four sub modules

1. Electronic Items

In this module the mobile application will read the QR code and will fetch the information stored in the QR code .As now for this module we are going to store information about the electronic items that is it's specifications , cost in which shops is that item available, address of the shop etc.

2. Hotel Information

In this module will read the QR code and will fetch the information stored in the QR code. This module will store the hotel information that is booking available in the hotel, cost of the room etc.

3. Famous Places

In this module will read the QR code and will fetch the information stored in the QR code. It will include the famous places, its map (how to reach that place), mode of transport etc.

4. Bus Time Table

In this module will read the QR code and will fetch the information stored in the QR code. It will include the source, destination, the cost of ticket and the bus time table.

## 2. Project Planning and Management

### 2.1 Software Development Life Cycle

The spiral model is a risk-driven process model generator for software projects. Based on the unique risk patterns of a given project, the spiral model guides a team to adopt elements of one or more process models, such as incremental, waterfall, or evolutionary prototyping. This model was first described by Barry Boehm in his 1986 paper "A Spiral Model of Software Development and Enhancement". In 1988 Boehm published a similar paper to a wider audience. These papers introduce a diagram that has been reproduced in many subsequent publications discussing the spiral model.

The early papers use the term "process model" to refer to the spiral model as well as to incremental, waterfall, prototyping, and other approaches. However, the spiral model's characteristic risk-driven blending of other process models' features is already present: Boehm describes the spiral model as a "process model generator", where choices based on a project's risks

generate an appropriate process model for the project. Thus, the incremental, waterfall, prototyping, and other process models are special cases of the spiral model that fit the risk patterns of certain projects.

Boehm also identifies a number of misconceptions arising from oversimplifications in the original spiral model diagram. The most dangerous of these misconceptions are:

- that the spiral is simply a sequence of waterfall increments;
- that all project activities follow a single spiral sequence; and
- That every activity in the diagram must be performed, and in the order shown.

While these misconceptions may fit the risk patterns of a few projects, they are not true for most projects.

### 2.2 Project Deliverables

The following is the list of Deliverables those are to be delivered to the stakeholder at regular interval of time. The list consists of the result obtained at the end of each phase of SDLC.

1. Requirement Gathering
2. Analysis
3. Implementation
4. Testing
5. Software Release

### 2.3 Tasks and Milestones

### 2.3.1 TASKS

The following tasks are to be performed:
1. Requirement Gathering.
2.Analysis.
3. Design.
4. Documentation.

### 2.4 Cost and Effort Estimation

The constructive Cost Model (COCOMO) is generally used estimation measures of cost, project duration, Man power, etc. The information can be specified in the form of
Object Point (OP)
Function Point (FP)
Lines of Source code (KLOC)
For our project, we use the sizing information in the form of lines of source code.
Total lines of source code in our Project, KLOC = 8K (Aprox)
Cost of each Person per month, Cp=3000/-(Per Person Month)

### 2.5 Risks

Risk analysis and management are a series of steps that help a software team to understand and manage

uncertainty. A risk is a potential problem -it might happen, it might not. But, regardless of the outcome, it's a really good idea to identify it. Assess its probability of occurrence, estimate its impact, and establish a contingency plan should the problem actually occur. The primary objective is to avoid the risk. The team works to develop a contingency plan that will enable it respond in a controlled and effective manner.

Types of Risks:

- Cost risk, typically escalation of project costs due to poor cost estimating accuracy and scope creep.
- Schedule risk, the risk that activities will take longer than expected. Slippages in schedule typically increase costs and, also, delay the receipt of project benefits, with a possible loss of competitive advantage.
- Performance risk, the risk that the project will fail to produce results consistent with project specifications.

## 3. Project Design

### 3.1 Data Flow Diagram - Level 0
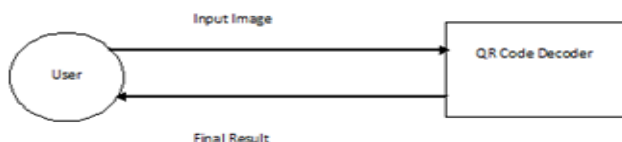


### 3.2 Data Flow Diagram-Level 1
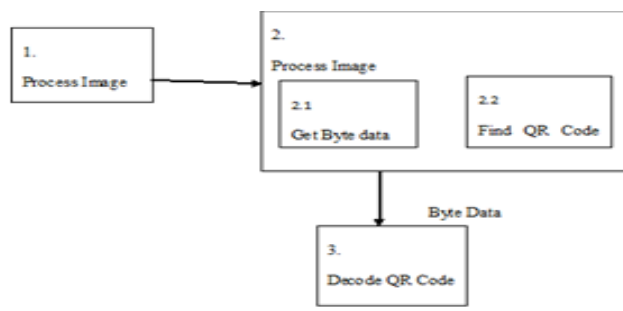


## Conclusion

This project will benefit small & medium business to adopt new technology and increase the consumer traffic. It is cost effective solution to medium sized business as compared to the individual hosted solution.

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