

QR Code Generation Using Google Maps API

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Abstract—Nowadays with the increased use of smart devices such as mobile phones (namely android phones and iPhones collectively) constantly make use of GPS (Global Positioning System) and geo-location services present in the 'devices'. Geo-location service is the geographical (Latitudinal and Longitudinal) location of a device connected to the Internet. Unlike the GPS, geo-location services can also use information from nearby network towers to triangulate/pin-point the position although not as precise as GPS. In this paper we will cover main aspects and effectiveness of the project. The primary goal of the project is to develop an android application which converts the location detail i.e. the coordinates of a given location and embeds it in a QR code. Using the application user will first select the desired location then convert it to a QR Code. This will lead to more accurate result. The QR code will provide a secure feature for the generated location data.

Keywords: Barcode, QR Codes, Security, Scanner, Google Maps API, Smartphone, URL

I. INTRODUCTION

A QR Code is a two dimensional barcode developed by Denso Wave, a Japanese organization. As QR code is a two dimensional matrix it can store more information than the traditional barcode. Information stored within a specific QR code can be instantly accessed by simply scanning through a camera (e.g. smart phone). QR Code technology has been there for over two decades, but with the increase in use of smart phones the importance of QR codes in market and other sectors has grown over time and has various applications in

real time. One of the main reason for increase in application QR code is that level of security it provides with comparison to one dimensional barcodes. QR Codes are more efficient compared to one dimensional barcode in terms of scanning and data manipulation. The key difference between the two is the measure of information they can hold or share. We can scan a QR code with a camera enabled smart phone, connect and open in the specified application depending on the information stored in the QR code

Google Maps API is an application programming interface provided by Google which can be integrated in different application to use the Google map functionalities

Using QR Code and Google Maps API we can generate geo-location QR codes. Using Google map API we first obtain coordinates of the device with the help of GPS service and android location services alternatively we can pin the desired location on map and generate its QR code. And thereby making places or local businesses present or not present on Google maps easier to search or navigate, with the help of QR Codes.

1. PROBLEM INGREDIENTS:

In this, User will search for a particular location or pin the location from the application on their smartphone.

The QR code generator will generate the desired QR code for the desired location. The user can either save the QR code to their gallery or share it. QR code once scanned by smartphone camera will direct to the Google maps application. Where it will direct to the place stored in the coordinates format stored in QR code.

2. PRODUCT PERSPECTIVE:

Using this system the users will be able to share QR code with the location information. It will provide a better option unlike the traditional written address on the cards. The errors due to misspelled words will be eliminated. It will be easy for people with less or no knowledge to reach to a particular location. It will be of great help for people booking cabs to mark destination location.

3. GOALS AND OBJECTIVES:

Goals:

The primary goal of the project is to develop an android application which converts the location detail i.e. the coordinates of a given location and embeds it in a QR code.

As there exists no system with all the functions integrated as one the main objective is to provide an integrated standalone application, which uses no third-party application.

Objective:

To reduce time required for explaining the address

Provide accurate information.

Minimize efforts required.

Easy to use user interface.

Secure environment

Save QR code and use it in future without doing the same task again.

4. SCOPE:

- The main scope of the product is to improve the location sharing and navigation using a QR code. The existing methodologies fail to provide ease of use, thus we aim to provide an application which will be efficient as well as easy to use.

- QR Code of desired location can be generated
- Can be integrated with existing applications
- QR code scanning feature will also be present via the application

II. LITERATURE REVIEW

In[1], This paper we learned about the QR code and it's working. This paper mainly focuses and covers all the basic aspects of the QR code. This paper also states a few existing systems i.e. web application, used to generate QR code instantly. And also the history of QR code features of a QR code such as data storage, various other applications, and benefits of QR over the traditional barcode which was earlier used.

In[2], This majorly focuses on the security provided by QR Code. There are multiple ways a QR code can be used, namely contact information, calendar event, URL, geo-location and any form of textual or numerical data. Thus even more a reason for QR code to be more secure, the data once stored in the QR code cannot be manipulated

III. PROPOSED SYSTEM

In the proposed system we are going to integrate Google maps using API provided by Google. Using the API we will obtain the coordinates (latitudinal and longitudinal points) of the device or desired location using GPS or location services.

Once the coordinates are obtained, they will be embedded with a Google maps URL which will then be given to the QR code generator and which will in turn generate the QR code for the given link. On scanning the QR code, it will open in Google maps application pointing the location embedded within the QR Code.

III.I. ADVANTAGES OF PROPOSED SYSTEM:

- Propose system reduce the user searching time
- Requires basic hardware and software i.e. camera and android operating system.
- Can be integrated with existing systems using maps service.
- Provide accuracy
- QR code can be shared multiple times, need to be generated every time.
- Ease of use.
- Secure and reliable

IV. SYSTEM ARCHITECTURE

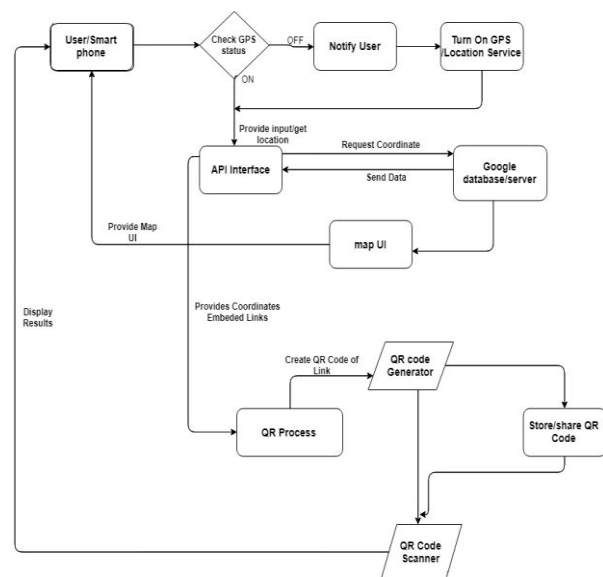


Fig1. Architecture Diagram

Initially the system will ask the user to login using Google account. The system will then check if the GPS (global positioning system) or location service on the device is enabled or not. If the GPS or location service is disabled the device will notify the user to enable/turn on the location service. After the location service is enabled the user will search for the desired location using the Google maps API. The user interface will also enable the user to pin the location user is searching for.

After the user selects desired location or pins a location, the API will communicate with the Google server to obtain the coordinates of the selected location.

The Google server sends the location coordinates to the user, these coordinates are processed and verified again with accordance to the Google maps database.

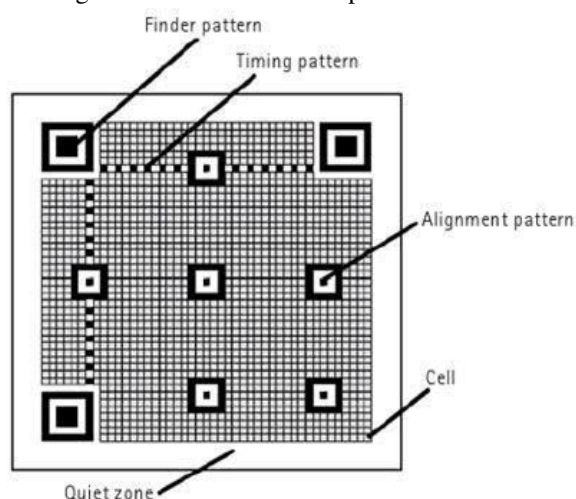
After selecting the location the user can convert the selected location to QR Code. The conversion of coordinates to QR takes place on the user device. For this conversion the coordinates are embedded into a shareable Google maps link, this link is further embedded in a QR code via the QR code generator.

On generation the QR code, the user will be prompted to share or store the QR locally. Through this system we also aim to deliver a scanner algorithm to scan the QR stored locally.

IV.I. COMPONENTS OF Fig :

IV.I.I. QR Code:

QR Code is a sort of 2-D (two-dimensional) technology created by Denso Wave the essential aim of being an image that is easily interpreted by scanner hardware. QR Code (2D Code) contains data in both vertical and horizontal directions, while a bar code contains information in one way. QR Code holds large volume of data as compare to bar codes.



Each QR code symbol looks like a square pattern. This square pattern consists of two regions: encoding region and function patterns. The function patterns concentrate on the positioning where the encoding region represents the data encoding.

The function pattern comprises finder patterns, timing patterns and alignment patterns. Three common structures on the three corners of QR code symbol are called finder patterns. Finder

pattern is used for deciding the correct orientation of the symbol. Timing patterns are used by the decoder software to find the side of pattern. Alignment patterns are used in the case of image distortion to correctly decode the symbol by decoder software. The rest of the region i.e. other than function pattern is the encoded region where data code words and error-correcting code words are stored. The Quiet zone is the spacing provided to distinguish between QR code and it's surrounding. It is important for the scanning program

IV.I.II. Google Maps API:

API stands for Application Programming Interface. An API is a set of methods and tools that can be used for building software applications. It is an interface or communication protocol between a client and a server intended to simplify the building of client-side software. An API may be for a web-based system, operating system, database system, computer hardware, or software library.

Your phone's data is never fully exposed to the server, and likewise the server is never fully exposed to your phone. Instead, each communicates with small packets of data, sharing only that which is necessary.

APIs have become so valuable that they comprise a large part of many business revenue. Major companies like Google, eBay, Salesforce.com, Amazon, and Expedia are just a few of the companies that make money from their API security

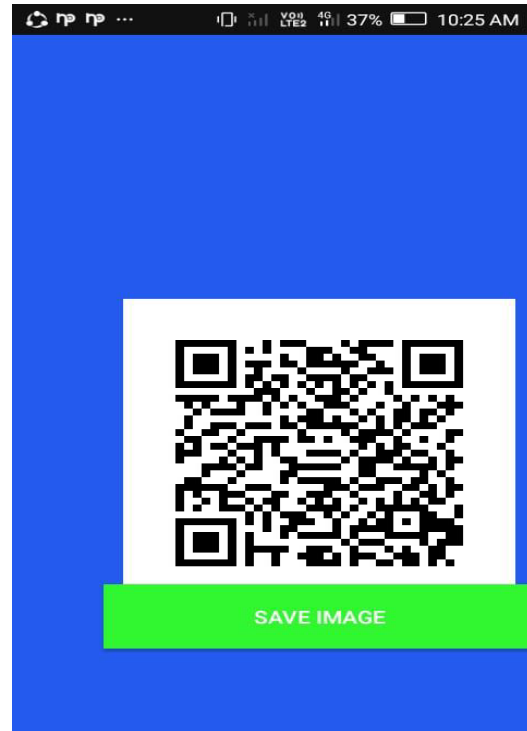
V. RESULT

V.I. Application Screenshots:

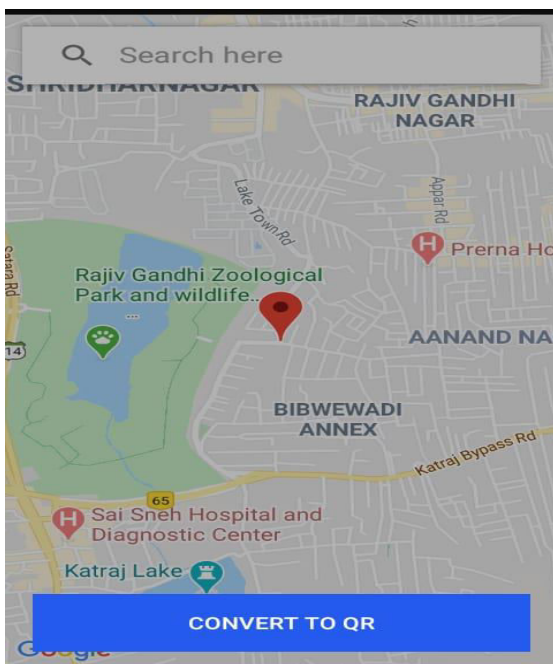
V.I.I. Search Page



V.I.II. Pinned location



V.I.III. Generate QR code screen



VI. CONCLUSION AND FUTURE WORK

In this project “QR CODE GENERATION USING GOOGLE MAPS API”, name suggest that geolocation QR Code generation is improved as it is integrated as one. As compared to other traditional methods and existing systems this system is less time consuming . It is more reliable . Here we conclude that the proposed system is time saving, reliable, easy to use and accurate.

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