



RESEARCH ARTICLE

Generating SMS (Short Message Service) in the form of Quick Response Code (QR-code)

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Abstract— *This article shows how a QR-code can be generated from a simple sms. We can see lot of QR-codes or mobile barcodes around us on websites, books, gadgets, T-shirts etc. which are making our work easier with just 1 click decode with high speed. With respect to old barcodes, QR-codes are very fast and they can store lot of data, making it more superior. QR-Codes originated within the technology hungry country of Japan, and have only recently began to become popular within the Middle East and Europe. Barcodes that you see on any commercial product are extremely beneficial as their reading speed, supreme accuracy and their functionalities are main keys. As barcodes reached their peak and began getting used worldwide, the need for more data and character types to be stored was inevitable. Developers began trying to expand on the current amount of bars within the barcode and how their positioning resides to allow further data capacities. The need for smaller barcodes also was another defining factor in QR-Codes development.*

Keywords— *quick response; data matrix; quiet zone; omnidirectional*

I. INTRODUCTION

QR-Code is the 2-dimensional barcode (data matrix) [1] [2] which is designed to have its contents decoded at a high speed. The acronym QR means “Quick Response”, which was termed by Denso Wave Company [4] because the creator intended that such barcode’s contexts should be decoded at higher speeds.

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In this research paper, I will focus on creation of QR-codes for “ready-to-send” SMSes and accuracy of QR-codes when compare to old barcodes.

II. PREVIOUS WORK

Till now, many researches have been done on “QR-codes” and researchers have successfully generated QR-codes for encoding “URL”, “Phone number” and “email address”. URLs can be encoded in QR-code and it can be decoded using QR-code reader for quick access.

III. OUR WORK

This paper mainly focus on generating a QR-code for a “ready-to-send” message by taking “phone number of recipient” and “message content”. Hence, making to user to reduce his/her work in sending SMS.

QR-Codes first hit mainstream when they were initially used for tracking parts by vehicle manufacturers. After a while, companies began to see a new scope for QR-codes where QR-Codes could be used elsewhere within the world. The most commercial use for QR-Codes is in the telecommunications industry where the mobile phone seems to be the biggest driver of their popularity.

IV. MOBILE PHONES

With the technology of mobile phones [5] constantly expanding, especially within mobile internet, QR-Codes seemed the perfect solution to quickly and efficiently bring mobile phone users onto the mobile web. QR-Codes can be used to store all kinds of data including URLs (Universal Resource Locator). This then allowed offline publications such as Magazines, Papers, Business Cards, Signs, T-shirts or basically any medium that can accept the print of a QR-Code to advertise their online product which would then direct the user to their preferred channel i.e. website.

V. WORKING MECHANISM OF QR-CODES

Take a mobile phone such as the iPhone; nearly ever mobile phone has a digital camera in today’s world. The camera, along with decoding software can be used to capture a picture of the QR-Code, of which the QR-Code software decoder can then transform the data held with the QR-Code to a meaningful action for the mobile phone:

- Connect to a web address
- Download a MP3
- Dial a telephone number
- Prompt your email client with a sender address

This can all be done within a matter of milliseconds making the transformation from a user’s mobile phone to the mobile web instantaneous.

QR-Codes are capable of handling of sorts of data, including numbers, alphabetic characters, Kanji, Kana, Hiragana, symbols, binary and control codes. A total of 7,089 characters can be encoded in one symbol alone.

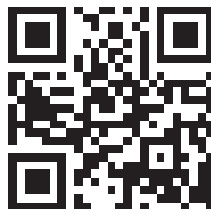


Fig.1 QR-code for URL of google.com

VI. BARCODES VS QR-CODES

QR-Codes have become more popular than the typical barcode as the typical barcode can only hold a maximum of 20 digits, whereas the QR-Code can hold up to 7,089 characters. This makes the use and diversity of QR-Codes much more appealing than their older counter part, the barcode. Partially part of the reason QR-Codes can hold more data, is because if you compare a typical barcode to a QR-Code, you can see one major difference; barcodes only span horizontally whereas QR-Codes can span both horizontally and vertically.



Fig.2 Traditional Barcode

QR-Codes are capable of encoding the same amount of data in approximately one-tenth the space of a traditional barcode. Such minute QR-Codes are called Micro QR-Codes [6].

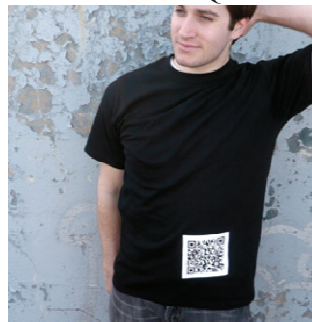
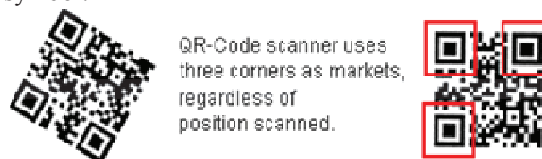


Fig.3 QR-code on man's T-shirt

A great feature of QR-Codes is that you do not need to scan them from one particular angle. QR-Codes are capable of omnidirectional (360 degree's) [7] high-speed reading. QR-Codes scanners are capable of determining the correct way to decode the content within the QR-Code due to the three specific squares that are positioned in the corners of the symbol.



QR-Code scanner uses three corners as markers, regardless of position scanned.

Fig.4 Flexible position of QR-codes

QR-Codes can be combined into one large symbol. One symbol can then be divided into 16 separate symbols making the data capacity extremely large.

VII. ENCODING SMS

For creating a QR-code for “ready-to-sms”, we are inputting “phone number of recipient” and “Message contents”.

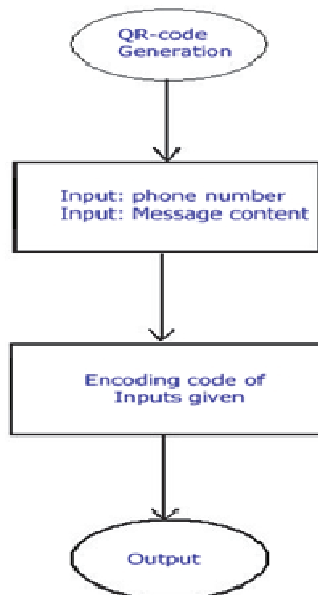


Fig.5 Flowchart to create sms QR-code

The generated QR-codes structure [3] is explained clearly in figure 6.

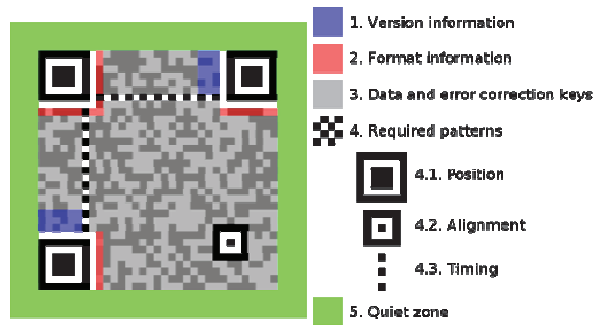


Fig.6 Structure of QR-code

VIII. RESULTS

The below table shows the results generated by entering various phone numbers and messages by various random students of CMR Institute of Technology, Kandlakoya, Hyderabad

The response time of QR-codes is **1.22 seconds** on an average which is far better than old traditional barcodes.

TABLE I RESULTS ANALYSIS

Phone Number	Message Content	QR-Code Generated	Response Time
987654321	Hi, Good Morning		1 Sec
123456789	hello		0.9 Sec
8886846923	I am a good boy		1.2 Sec
9700234569	Hi zain, I would like to play cricket with you on this Sunday		2 Sec
4004004008	Hello brother!!!		1 Sec

Average Response Time= 1+0.9+1.2+2+1 / total readings = 6.1/5 = 1.22 seconds.

IX. CONCLUSION

Due to the vast increase in popularity of QR-codes and usage, we can now say that QR-codes are not only faster but also user friendly, position flexible and large in storage of information. In this paper, generation of QR-codes for “ready-to-send” SMS is focused mainly. The future work can be generating QR-codes for contacts in phonebook for a mobile device. Hope that this will make a good background for future researches in QR-codes.

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