

## **Mobile Based Accessible Shopping System for Visually Impaired people**

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### **Introduction**

A blind person needs another person to guide, select and aware of information while he is shopping at the supermarket. In such a situation a proper system is needed to guide them in an efficient way. The 'Mobile Based Accessible Shopping System' is an ideal solution that addresses the above problems.

The combination of QR-Code reading and the Voice guidance is the best solution to make the communication between the system and the blind person. The blind person needs only his mobile to utilize all the functionalities of this system. The system has been customized for a visually impaired person to use in a very simple manner by using voice commands. The navigation facility helps him to make aware of directions while he is shopping at the supermarket.

### **Technologies and Methodologies**

The system has basically two major components. Those are the Web system and the Mobile system. The web system developed by using HTML/CSS, PHP, JavaScript, (<http://jquery.com>), PHP QR Code library (<http://phpqrcode.sourceforge.net>), MySQL. The mobile system contains two users as administrator and the supermarket assistant. The supermarket assistant is allowed to generate QR codes automatically by giving the barcode of the actual product. The details of the product will automatically retrieve from the web server database through PHP Web services (<http://php.net/manual/en/refs.webservice.php>). The generated QR-Code will be printed and it is ready to paste on the shelf of the super market. The QR-Code will be pasted as a Tag that can be tangible. So, the blind person can touch and identify the QR-Coded tag easily.

The mobile application is used by the visually impaired person. The Mobile system is working on Android Mobile Operating System. It runs on Android 2.1 Eclair version (<http://developer.android.com/about/versions/android-2.1.html>) and above versions. It contains all the functionalities that blind person needs. Such as, Voice guidance using Android text-to-speech (<http://developer.android.com/reference/android/speech/tts/TextToSpeech.html>), Voice recognition using Android Recognizer Intent (<http://developer.android.com/reference/android/speech/RecognizerIntent.html>), Navigation guide, Shopping list memo etc.

The mobile system has very simplified interfaces. By giving voice commands to the mobile, user can navigate between the interfaces easily. The product selection mode helps to make aware of the details about selected product. The user can focus his camera to the tangible QR-Code tag and mobile gives all the details of that product in a voice form such as product name, price, expiry date etc.

The shopping list memo mode can be used to store a reminder of product list as an Audio clip. In any time he/she can hear the shopping list to memorize the goods that are needed to buy.

Navigation guide mode helps to navigate through the supermarket. First the user needs to scan the nearest QR-Code to identify his current location. Then he can give a voice

command to say which good he needs to buy such as sugar, milk powder, fruits etc. Then system will identify the possible navigation routs to reach the destination. By analyzing all those routes the system will select the shortest path automatically and inform it to the user in a voice form. So, the system helps to do all basic functionalities to the visually impaired person while he is shopping at the supermarket.

## **Results and Discussion**

The Mobile based Accessible Shopping system provides a convenient guidance to the visually impaired person. The person needs only the mobile which installed this special application. All the inputs are captured by the mobile and it sends data to the web server. The web server processes the information and sends back the result to the mobile. Mobile delivers all the information in a voice form to the user. So, blind person can hear the received information easily.

The supermarket assistance can generate QR-Codes by using the web system easily in online basis. The generated QR-Code can be pasted on the shelf of the relevant item. The main feature of the system is the simplicity. The complex functions are simplified to minimize the errors.

## **Conclusion**

The Mobile based Accessible Shopping system provides better solutions while a blind person doing shopping at a supermarket. As this mobile application is based on verbal communication facility, it facilitates the blind person to retrieve information about consumer goods in quick and easier manner without asking help form anyone else.

## **References**

<http://jquery.com/>

<http://phpqrcode.sourceforge.net/>

<http://php.net/manual/en/refs.webservice.php>

<http://developer.android.com/about/versions/android-2.1.html>

<http://developer.android.com/reference/android/speech/tts/TextToSpeech.html>

<http://developer.android.com/reference/android/speech/RecognizerIntent.html>