

# SCANWIZ, AN IOS APP TO INCREASE PRODUCTIVITY IN THE RETAIL SECTOR

Archana Shinde<sup>1</sup>, Ritu Shah<sup>2</sup>, Prashmi Khanna<sup>3</sup>, Prateek Gajbhiye<sup>4</sup>

*Abstract*— Smart phones and tablets are increasingly used to scan visual codes that act as physical hyperlinks to digital information. Barcodes and barcode scanners transformed the retail industry since the 1970s. It was found that early scanners increased a store's labor productivity, on an average, by approximately 4.5% in the initial few years. [1] The effect was larger in stores carrying more packaged products. The application ScanWiz is a barcode scanning iPhone application that is being developed for a US based retail giant. The retailer needs this application to increase its popularity amongst customers and as a result increase its sales. The application uses iPhone's camera to scan the barcode of a particular product that the prospective customer of the retailer wishes to buy. The users can also enter the barcode manually. These barcodes are of UPC and EAN formats. After the application has scanned the barcode, it uses the retailer's database to get the product details which is also being sold by the retailer. The retailer gives complete information about the product along with its selling price which is generally lower than the selling price of various other retailers. The Zbar sdk is used to scan 1D and 2D barcodes in this application, along with Sqlite as database which is an in-built database which gets the information from the retailer database with the help of crawler 4j. The basic result of this paper is to give the overall idea of barcodes and how can they be used for both the consumers and the retailers who uses it and the interrelated link to increase the productivity and make the shoppers experience more reliance and at ease.

*Index Terms*— Barcode, Scan, Json, ZBAR, SQLite, Crawlers, UPC/EAN, Xcode 4.6, iOS 7, iPhone.

## I. INTRODUCTION

Today's smart phones and tablets are increasingly using its camera to scan visual tags (e.g., barcodes, QR-codes) that act as physical hyperlinks to digital information. Consumers are scanning codes on products to compare prices, read reviews, and analyze needed information.[1] Merchants are using

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*Archana Shinde<sup>1</sup>, I.T Department, University of Pune., Pune, India, 9422023313.,*

*Ritu Shah<sup>2</sup>, I.T Department, University of Pune., Pune, India, 9860134471.,*

*Prashmi Khanna<sup>3</sup>, I.T Department, University Of Pune., Pune, India, 9860039946.,*

*Prateek Gajbhiye<sup>4</sup>, I.T Department, University of Pune., Pune, India, 9860039946.,*

smart phones as mobile point of sale systems, or to redeem coupons. Factory workers and employees, on the other hand, need to carry dedicated enterprise handhelds with active laser scanners.[1] These devices are heavy, their proprietary protocols are difficult to integrate into business software, but most importantly, they are very expensive and therefore only selected employees can use them.[1] Hence we use phone applications to scan barcodes which become an easier option. Android OS though has a 70% market share worldwide but in the United States Apple's iOS still tops android after the introduction of iPhone 5. The current trends worldwide reveal that android although has a larger market share, iOS devices represent financial success. Moreover iOS applications have a very high standards set by Apple Inc. Apple's iStore has Human Interface Guidelines that need to be followed, and even minute details like Round application icons play a major role. Developers of iPhone applications need to have a paid Apple Developer ID unlike android OS where any person can create an application and upload it for free. Thus due to the large success of iOS devices in the United States it is quite evident why the retailer chose iOS as its application platform.

## II. LITERATURE SURVEY

### A. History of Barcodes

Barcoding, also known as Automatic Identification (Auto ID), was invented in the early 1970s.[2] It was created to help large retail and grocery stores process their goods. Earlier the Cashiers would take a product and the price of the product was entered into the register by hand and the Cash Register would calculate change and print a receipt. Now with the help of sophisticated technologies, a series of digits representing the product in the form of a barcode is scanned. [4]The computer looks up the price in a master database (product price is not in the barcode), subtracts it from the store's price inventory, and the change is calculated. The products popularity is shown by the software which creates reports regarding inventory levels by creating demographic reports on individual product and customers, and tracks much more. Barcoding became very essential for inventory tracking for many large and mid-size businesses in the 1980s.[8] Barcoding was adopted for industrial and data warehousing applications, hence more commercial enterprises realized the importance of improved data management and accessibility via barcoding. As the use of data collection using barcoding expanded exponentially and various standards were adopted.

Types of barcodes:

BAR CODE	SAMPLE	BAR CODE	SAMPLE
CODE 39		EAN128	
Interleaved 2 of 5		CODABAR (NW-7)	
		CODE128	
UPC-A		POSTNET	
		PDF417	
UPC-E		QR CODE	
EAN13		Micro QR Code	
EAN8			

Fig. 1

*B. Barcode Scanning Scenario*

Barcodes are used almost everywhere. Patient care has been revolutionized at doctor’s offices and hospital. Barcodes on medication and patient ID bracelets ensure medication is given to the right patient and surgery is performed on the correct body part. Law firms are barcoding their case files to help manage account files and more accurately report billable hours.[6] Post Offices are extensively using barcodes to track packages all over the world. Rental car companies use barcodes to help facilitate quicker car rental/returns. Virtually every mid-size and large company employs barcoding in some manner; usually in shipping and receiving stations. And the retail industry is dependent on the valuable data barcodes provide concerning product purchasing patterns. There isn’t one day when we do not come in contact with barcoding in some manner or another.

To illustrate the power of 2D barcodes, the following is one example of a use case from the consumer perspective :

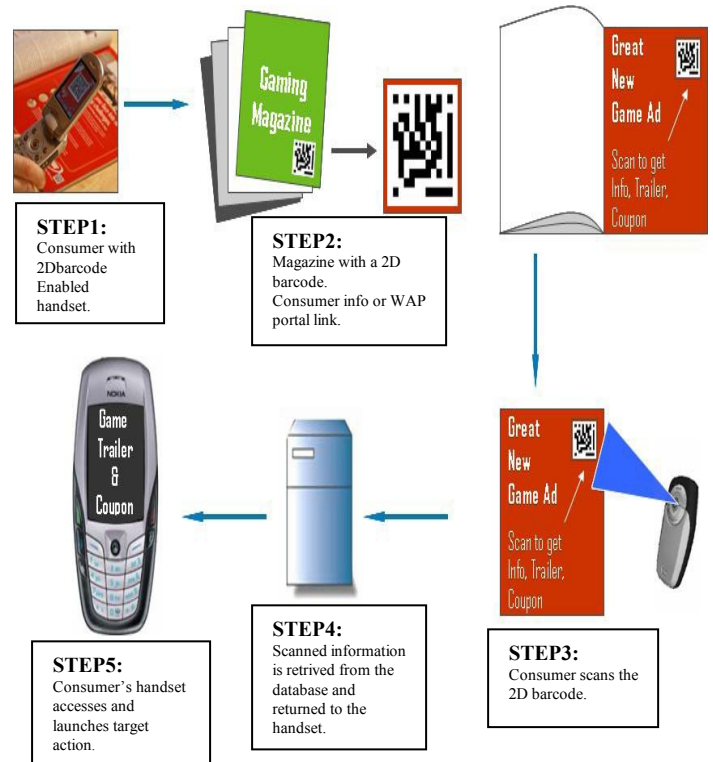


Fig. 2

*C. Related Work*

There are a considerable number of such applications available but what makes ScanWiz stand out is its feature of being an application of only a particular retailer. Other applications provide results based on data from many retailers. Thus ScanWiz is application developed only for promoting a particular retailer which claims to provide better deals on all products. Barcode scanners can be used in Google’s mobile Android operating system via both their own Goggles application and third party barcode scanners. Nokia’s Symbian operating system features a barcode scanner. In the Apple iOS, a barcode reader is not natively included but more than fifty paid and free apps are available with both scanning capabilities and hard-linking to URI. In Blackberry devices, the App World application can natively scan barcodes and load any recognized Web URLs on the device’s Web browser. Windows phone is able to scan barcodes through the Bing search app. Apps such as Smoopo Price Shopper requires the users to register first and create an account. It also requires users to enter their location, store details etc and then the results are obtained accordingly across various markets. Other notable applications that are similar to Smoopo are Price Check (Amazon), Pic2Shop, Price Grabber and Snpattell. All of these apps have more or less the same functionality.

### III. SCANWIZ APPLICATION

The application ScanWiz is an iPhone barcode scanning application that is developed for US based retail giant. The retailer needs this application to increase its popularity amongst customers and as a result increase its sales. The app is only built for the retailer and it shows customers, product details at the retailer's store and compares price at other online stores.

Thus by using the app the customer can get details like product price, reviews, technical specifications etc. As more than 7 in 10 iPhone users use their iPhone while shopping, the retailer can expect significant amount of increase in popularity of his store. Moreover when customers see price comparisons they become confident of getting a good deal. The special features are the QnA widget which would give only those details about the product which customer wants to know. Thus by using ScanWiz customers can scan the barcode and check the prices online at the retailer's store and also read the reviews of the product which leads to saving time, effort and getting the best deal .

### IV. OUTLOOK AND IMPACT

Barcodes have had so much impact on the lives of consumers worldwide as the technology is inexpensive and easily connects physical objects to information systems. How a human can be identified by his name similarly barcodes give a name to any physical object and allow automatic capture of that name using various scanning devices and connect them to a computer system where decisions can be made regarding the object.[2] Barcoding continues to be economical, practical and highly efficient in data capture and reading prices accurately. Thus developing application that scans these barcodes to increase the popularity and sales of the retailer which then takes the shopping experience to a simpler level is the aim of this project. There are several different types of barcode scanners available today hence it is important to know which ones will work well for you. LED, laser, Imager, and 2D are the main forms of barcode scanners. Each one has a different way of scanning the barcode. Laser barcode scanners are a very effective and popular choice.[6] These scanners emit a thin red laser from the scanner which quickly and accurately reads the barcode within a timeframe of about one second. Laser barcode scanners are also able to read barcodes at a much longer distance compared to their older, LED counterparts. LED scanners are still very common at many stores. The 2D scanners scan the barcode as an image, and then the entire code as an image file is transmitted into a database. Similarly Imager scanner goes through the same. Each of these scanners has no moving parts, so they can withstand harsher conditions and can be used more.

Barcodes cannot be read by regular computers. A special scanning device is needed in order to scan the entire code so that it becomes a readable and traceable piece of data after translating codes formula.[6] Most important use of a barcode scanner is to capture the data from the barcode and transmit the data into a computer based system, which then translate the information, and in store it into a database in

most cases. Most scanners are easily compatible with almost all computers and operating systems. Software installation is mostly needed, which is simple and easy to use.[2] Before you choose a scanner, you must consider several factors such as the frequency at which scanning takes place, the distance from which a scanner can scan the barcode efficiently, how to connect the scanning device, and whether the scanning process is to be conducted on a real time basis or not. As there many options available today, it is easy to choose a barcode scanner that will ensure that you get the most accurate readings for your barcode interface.

Barcode systems are most widely used in Retail Operations. The ability to track products from the manufacturer to every reseller and wholesaler to the customer who eventually purchases the product is essential for every retail establishment. Shipping companies depend on barcoding to get products transported quickly and efficiently from one transit hub to another. Without barcoding, delivery companies such as UPS would be unable to process the immense number of packages that flows through their systems each day accordingly. Many factories are using barcoding in the production cycle to help track the product's progress and provide assembly and warehousing instructions. Many companies have a need to track company assets internally; barcoding is the easiest way of tracking this process .

### V. TECHNOLOGY OVERVIEW

A barcode scanner is an electronic device for reading printed barcodes. Additionally, almost all barcode readers contain decoder circuitry which is used for analysing the barcode's image.[2] Data provided by the sensor sends the barcode's content to the scanner's output port. We are using 1D and 2D barcodes in this project and we use the ZBar Barcode Reader iPhone® SDK which is a simple demonstration of the ZBar library on the iPhone 3GS and iPhone 4 platforms. Using the app you can scan EAN/UPC codes and links to Amazon, Google and the Internet UPC database which are predefined. Scan QR codes containing URLs and link directly to the web site.[5] Scan QR codes containing an E-mail address and send mail. Scan a UPS or FedEx tracking number and link to the package tracking web page. Maintain a simple list of scanned barcodes. Send an E-mail containing a single barcode or your entire list of scanned barcodes and can cut and paste barcode data into other apps. We also use SQLite as an in-process library that implements a self contained, zero transactional and configuration SQL database engine. The code for SQLite is free for use as it is in the public domain, thus it can be used for any purpose, commercial or private. SQLite is an embedded SQL database engine.[7] SQLite does not have a separate server process, unlike most of the other SQL database. SQLite performs the reads and writes operation directly into the ordinary disk files. A single disk file has complete SQL database with multiple tables, indices, triggers, and views. As the database file format is

cross-platform - you can freely copy a database between 32-bit and 64-bit system.

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