Online Product Price Comparison Application Using MetaSearch Algorithm

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***Abstract*: Recent trends in Mobile applications have seen a huge up rise in applications that are convenient for practical usage in daily life. This project aims to help the user check the availability and the best price of a product out of all the e-commerce websites that sell the product. The user has to enter the product information in the application and then the application compares pricing of that product from all the websites that sell the product using a MetaSearch algorithm. Product availability or pricing can also be checked by scanning a QR code of the particular product. The application is embedded with a QR scanner service. Once the QR code is scanned, application's databases are searched through using MetaSearch algorithm to display a comparative view of the information in different sites. If a product isn't available in the application, push notifications are sent to users once they are on sale.**

***Keywords*: Mobile Application, MetaSearch Algorithm, QR Scanner, Push notifications**

I. INTRODUCTION

Since the introduction of smartphones, people spend a considerable amount of time in front of their mobile screens. A smartphone operates on various application from the basic calendar application to heavy gaming applications. After the introduction of mobile applications, mundane activities such as shopping and communications were made easy. E-commerce companies released applications that help users shop for products without any hassle.

The application is implemented to reduce any difficulties that a customer may face while buying products in a retail mart. Assume a situation where a customer is not in a position for buying a product from a retail mart due to circumstances such as busy schedule or he is short on money, the customer may obtain the information in the application by scanning the QR code present for the product. The application uses the camera to scan the QR code. Then the user can compare the price of the same product at different e-commerce websites This helps in providing a comparison between all the different prices available for the product and help in selecting the cheapest place from where the person can buy the product.

QR code (or Quick Response code) developed in 1994 is a type of two-dimensional barcode matrix. It is an optical label that is readable by the machine and consists of specified information regarding the item to which the scanner is embedded. It has many advantages over the conventional barcode because of fast readability and that it can store more data, which makes it more reliable for item identification. The application's QR Scanner reads the pattern and accesses the data accordingly from the databases.

Once the QR code is scanned and the application gets the information regarding the product, a complicated algorithm is used to search i.e. Meta Search algorithm. There is a search engine that is available publicly that operates on the algorithm. This engine uses the data from other search engines by sending multiple queries at a single time and generates a revised list of all the data from different search engines. It creates a virtual database of its own to

II. IMPLEMENTATION OF THE APPLICATION

A mobile application is an application software designed to run on a mobile device, generally, these devices are smart phones or a tablet computer. Mobile applications often serve to provide users with similar services and those accessed on PCs. Apps are generally small in size, individual software units with limited function. Mobile applications are designed to move away from the integrated software systems otherwise known as personal computers (pc). Each app is designed in such a way that the functionality is limited and isolated such as a game, calculator or mobile web browsing and extra. Although applications mostly avoid multitasking because of their primitive hardware available in mobile devices but recently that has been improvised. These applications are built in Android Studio for an Android operating system.

The application that is being built is basically coded in the Android Studio. The functionality of the application is to scan the details of a product using QR code and on online search for the best price and display it to the user and the user can place an order for that particular product. This application is related to e-commerce. The application has an embedded QR scanner into the program code and this QR scanner is linked to the camera application in the Smartphone. So once the QR code is scanned, the product is identified and MetaSearch algorithm is all on all retail prices of that particular product and the best retail price is selected

and is displayed to the user. Now using API and e-commerce plugins we can purchase that product. The application's UI is the front end where the data is given as output so once scan option is opened the QR scanner which is embedded opens the QR scanner. The scanner is linked to the phone camera using API's. These API's link the phone and the application. When the QR is scanned the product is being identified and meta search algorithm is run between all the similar products with different price ratings. Out of all the results the best result is picked up and given as output. In total the application is given into four parts front end UI, scanner, API's, backend.

A. Features of the application

QR scanner- The app has a QR scanner embedded which is linked to the camera application of the Smartphone to scan the digital portrayal of QR code and the data associated with QR would be displayed. This is the usage of the QR scanner.

Databases that have been used is an online database to store the details of the product. The rates of products are stored in a SQL database and can be accessed by queries in SQL. The MetaSearch algorithm is implemented in this SQL database. There are actually two ways to store the data, one in online using SQL and one in offline using SQLite. Here since the database keeps updating and the database is huge we use a SQL database. An online database is much easier because the storage is on the server and not in a personal device so it is easy to maintain the database.

III. SOFTWARE REQUIREMENTS

A. Android Studio

Android Studio is the official coordinated improvement condition (IDE) for Google's Android working framework, based on JetBrains' IntelliJ IDEA programming and outlined particularly for Android advancement. Tis software can be downloaded on Windows, MacOS, and Linux based working frameworks. It is a trade for the Eclipse Android Development Tools (ADT) as essential IDE for local Android application improvement. Android Studio was reported on May 16, 2013, at the Google I/O gathering. It was in early access review arrange from 1st in May 2013, at that point entered beta stage beginning from rendition 0.8 which was discharged in June 2014.

B. MYSQL

MySQL is composed in C and C++. Its SQL parser is composed in yacc however, it utilizes a home-blended lexical analyzer. MySQL takes a shot at numerous framework stages, including AIX, BSDi, FreeBSD, HP-UX, eComStation, i5/OS, IRIX, Linux, macOS, Microsoft Windows, NetBSD, Novell NetWare, OpenBSD, OpenSolaris, OS/2 Warp, QNX, Oracle Solaris, Symbian, SunOS, SCO OpenServer, SCO UnixWare, Sanos and Tru64. A port of MySQL to OpenVMS likewise exists.

The MySQL server programming itself and the customer libraries utilize double authorizing circulation. They are offered under GPL variant 2, starting from 28 June 2000 (which is 2009 has been reached out with a FLOSS License Exception) or to utilize an exclusive permit.

Support can be acquired from the official manual. Free help also is accessible in various IRC channels and discussions. Prophet offers paid help by means of its MySQL Enterprise items. They vary in the extent of administrations and in cost. Furthermore, various outsider associations exist to offer help and administrations, including MariaDB and Percona.

IV. APPLICATION WORKFLOW

The method used in implementation of this project is Research and Development (R&D). Also, dynamic system approach was used as it helps to know how significant QR and Barcode is in uniquely identifying products. R&D method is a research method that is specific needs analysis and to test the effectiveness of the proposed application in order to function in society at large.

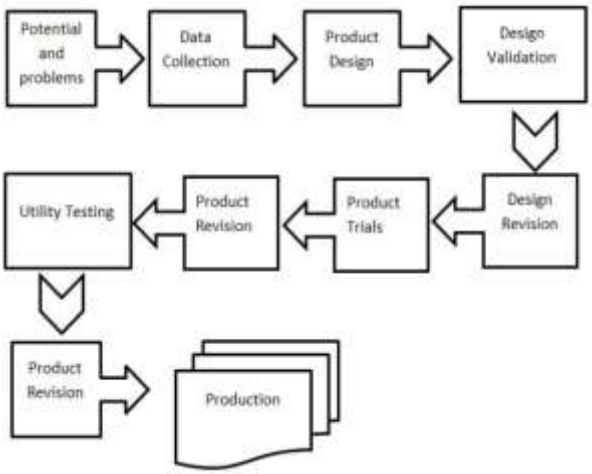

Fig 1. Workflow used in creation of the application

A. Potential and Problems

The potential period of the exploration is to recognize issues of searching for the same product on various different applications and comparing the prices on each of them separately is a very tedious and time-consuming job.

B. Data collection

The data collection stage in this research is by providing the QR code to the various products, such that we get the same hit from the database of the product we are scanning.

C. Product design

The product design of the application is such that it has two users, admin and the users. The admin has full access rights to use the application, such as uploading a new QR code based on new product being introduced or removing existing products. The application users have only the access to scan the QR code and find its price on various applications.

D. Design Revision

Stage plan amendments should be possible if there are any mismatch in links and if appropriate QR code displays the appropriate product. If there are still weaknesses in the product or application, it is necessary to do revisions.

E. Product Revision

The product revision stage will be made after the testing phase of the product. By studying the weaknesses of the product or application that is generated, necessary changes will be made so that the application is bug free and has no bugs.

F. Utility Testing

The use of the pilot phase carried out at the location of the existing land certificate, with the design of applications that have been designed and the data is ready for the tests.

G. Production

This stage can be done if the product or application that is created has been tried and can be applied to real conditions and results to be developed.

V. APPLICATION ALGORITHM

The Technique used in the project is MetaSearch engine. A MetaSearch engine is a search tool that uses another search engine's data to produce its own results from the Internet. MetaSearch engines take the contribution from a client and at the same time convey questions to outsider web crawlers for results. Adequate information is accumulated, designed by their positions and exhibited to the clients. This is a very efficient and sophisticated searching technique. Since it gathers live information from various websites so any change is reflected straight onto the results. There are numerous kinds of meta search engine accessible to enable clients to get to specific data in a specific field. These incorporate Savvysearch engine and MetaSearch engine. This algorithm will accept only a single search query from the user. Then it generates a virtual database so that it can gather information from various sources and integrate the thus acquired data. This has to be made sure that there is repetition of data.

A. Advantages

In this algorithm multiple request are sent to various search engines and so this widens the search coverage and so more information is expected to be found. What happens is that the algorithm searches multiple data result at a single time and also simultaneously compares the result. This algorithm makes the application work like a search engine and also helps in producing faster and better results in a short period of the time. The best advantage is that the algorithm not only searches but also compares multiples products and this all happens in a fraction of second. Multiple works are combined into a single algorithm is what gives the most biggest advantage of all. The search also takes us to actual website instead of just displaying. This makes the work more faster and easier and since we've combined multiple tasks in a single go we whole process is just seconds of work. This could help in a world wide search and products from anywhere in this world can be searched easily and more faster. This search could be for any product from smallest pin till medicines worldwide. This increases the range of search.

First the product is selected through Qr scanning and then the product is identified once the identification is done a simultaneous multiple search is run throughout all the products. The criteria of search given here is the price. The same product will multiple retailers, the price could differ vastly so to identify the best product we use the criteria as price here. In later condition multiple search criteria could also be implemented.

VI. FUTURE WORKS

The future works may include introducing AR (augmented reality) to the scanner, such that when a QR code is scanned it displays the product as a layout over the real time camera interface, by which the user can get to try the product in by sitting at the comfort of home in virtual reality. A lot of products like clothes, cosmetics, decor etc can be tried on at the user's comfort. This could be the future enhancement of the current proposed scanner.

VII. CONCLUSION

Thus, the project aims to provide a more efficient way for the users to utilize the modern technologies for their daily based activities. This project helps easing the effort that is put into daily based activity which is shopping for products. The project can be implemented in numerous ways that provide better results. Sophisticated concepts such as augmented reality to provide users with better interaction with the application and to get a physical essence of the desired product.

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