Mobile Application for Water Tanker Delivery

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ABSTRACT

Water scarcity is a major problem in urban areas due to inadequate rain and heavy population. Many areas have faced water scarcity for the past three years, making it difficult and expensive to buy water. People rely on water supply through trucks. To overcome this problem, an android application is proposed to track the user's location through GPS and list all the details of water suppliers for that area. The application is user-friendly and developed using Android Studio. Delivering water is a stressful job for drivers and dealers, and a medium is required to make the process efficient and transparent.

Keywords: Water delivery, android application, water tanker.

I. INTRODUCTION

Chennai, being the capital for the Tamil Nadu state and an important metropolitan city, acts as a home town for billions of people, although most of them have a different native. Though the crowded city faces many issues, the main problem lies in very basic need of such a population, which is the water. Water acts as a life source which is not easily available as well as which is in need especially in metropolitan cities like Chennai. It faces the water scarcity problem for last few decades due to inadequate rain and heavy population. The city consists of 4,100 water sources with storage capacity of 150,000 million cubic feet which actually cannot fulfill the complete need in the city.

These cases imply that it is difficult to survive in the city during summer season without other sources. To solve these issues, Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) have formed to supply metro water which is also inadequate due to increasing population. According to Times group, 830 million litres of water is consumed by the city out of which more than 650 million litres of water is consumed in the city area only to serve the purpose of domestic usage and the rest is contributed to Industrial purpose. Domestic need is fulfilled by ground water and water trucks. The ground water level is normally 1.5m which can fulfill the need to a limited extend. Water transport services acts as an external source for supplying water to domestic needs .There are more than 3000 water suppliers available in the city which supplies nearly 60 percent of water to the city and its suburbs.

But they also suffer a lot in summer time to deliver water since the need increases and the trip for the drivers also increases. So they cannot cope up with the consumers need on time and also confrontation arrives

between the consumers and drivers actually where no one could be blamed in these problems. Most of these problems arise due to time consumption in travelling for various localities. At the same time, there is no chance for the consumer to know about the current location of the particular driver. Also problem arises while paying for the water since there is no standard communication between consumers and dealer.

To serve this purpose, we propose an android application which acts as an intermediate between the consumers and the dealers. The primary objective of the proposed system is to maintain smooth communication between the dealers and customers. By using the proposed android application, the customer can get the water whenever they want and also dealer scan promote their water transport service. The proposed system avoids the conflicts in delivering water since customer can access the driver who is available to delivery and who is nearby to the customer location and also there arrives no problem during payment since payment is standardized by application. The customer has the option for reviewing the service and rating which is actually useful to other customers as well as dealers for promotion purpose. The process involved in the proposed android application is very simple and transparent and also it will be beneficial to the society in overcoming water scarcity. .In order to overcome the shortage of water and to get water through trucks easily and to communicate with the suppliers directly and to get all the information regarding the water suppliers, quantity and price.

Government information construction will also establish mobile e-government with mobile devices dominated by Smartphones. Now more and more cities began to develop applications in Smartphones and other mobile terminals, which also created convenient conditions for the development of water information.

OVERVIEW OF WATER SUPPLY MANAGEMENT

Water scarcity is a pressing issue in urban areas that have a heavy population and inadequate rainfall. This has led to a significant increase in the cost of buying

water, making it difficult for people to access this basic necessity. In such circumstances, people often rely on water supply through trucks, which is not always efficient and transparent.

To address this problem, an android application is proposed that utilizes GPS to track the user's location and list all the available water suppliers for that area. The application is user-friendly and has been developed using Android Studio. By using this application, users can easily find water suppliers in their area, which will help to eliminate the difficulties and uncertainties associated with water supply through trucks.

Delivering water is a stressful job for drivers and dealers, and a medium is required to make the process efficient and transparent. The proposed android application acts as an intermediary between water suppliers and users, enabling smooth communication and eliminating the conflicts that may arise during the delivery process. By using the application, users can access the driver who is available to deliver water and who is nearby to their location. This will not only help to reduce the delivery time but will also make the process more efficient and transparent.

In addition, the proposed android application provides a standardized payment system that eliminates any problems that may arise during payment. Users can rate and review the service they receive, which will be useful for other customers as well as water suppliers for promotion purposes.

Overall, the proposed android application is a simple, transparent, and user-friendly solution that will help to overcome water scarcity in urban areas. With the increasing use of smartphones and mobile devices, this application has the potential to become an essential tool for ensuring access to clean water for all.

II. LITERATURE SURVEY

A literature review is a piece of academic writing demonstrating knowledge and understanding of the academic literature on a specific topic placed in

context. A literature review also includes a critical evaluation of the material; this is why it is called a literature review rather than a literature report.

This chapter focuses on the in-depth discussion of literature relevant to financial literacy, financial education, experiential learning, game-based learning, and the design of experiential games. The widespread financial literacy programs are being established in response to serious financial illiteracy among youth. The empirical evaluations of these programs validate financial literacy movement and sums up the best practice for financial education. Experiential learning with the affordance of multimedia is more able to catch students' attention and help them to apply what they learn in class to real life situations.

Related works/Literature review

1. Evaluation of bacteriological and sanitary quality of drinking water stations and tanker in Makkah Al-Mokarama

Mihdhdir, Alaa A.

The present study was conducted to evaluate the bacteriological and sanitary quality of drinking water produced in Makkah Al-Mokarama during the high season in the month of Ramadan. Water samples were collected both from the drinking water stations and the water tankers (in Arabic language called whitest) used to transport and distribute water in different places in the Holy city. Water samples were analysed to determine the densities of HPC at 22 and 37 degrees C, total coliforms, E. coli and S. aurous.

 The bacteriological analysis of drinking water samples at 37 degrees C proved that 6.7-33.3, 20-46.7, 0-20 and 0-6.7% of total water samples contained HPC, total coliforms, E. coli and S. aurous, respectively which were higher than the safe limits for drinking water. The bacterial analysis of drinking water varied from one water station to another. On the other hand, drinking water transported by tankers appeared to be in the lowest category of water quality. Because out of

total water samples 40-59%, 60-68.8%, 31.2-37.5%, 10-25% contained HPC, total coliforms, E. coli and S. aurous, respectively, which were higher than the established safe limits of drinking water.

Summary:
One possible reason for poor quality of drinking water could be attributed to the application of inadequate water disinfection treatments and also the absence of sanitary aspects as supported by the bacteriological analysis which holds true especially for water supplied by tankers.

2. Research on Water Management System Based on Android

Songlin Hu

 Smart water is an important part of Smart city, which is paid more and more attention. It obtains and deals with urban water information through information technology. It can effectively manage urban water supply, the sale of water and other processes. At the same time, due to the popularity of Smartphones, Smartphone applications have covered every aspect of life and become an indispensable part of people's daily life. Through the Smartphone applications, the user can achieve online mobile water purchase, query the water situation, water quality and other basic situation, greatly facilitate the use of the user, for wisdom water construction is of great significance.

In this paper, the water management system based on Android is designed and implemented according to the user's needs. It includes intelligent water meter terminal, monitoring centre server, Smartphone application and wireless communication network.

Summary:
The user can use the Smartphone at any time and at any place to view the user's water information in real time providing great convenience for users. So its application prospect is very broad as an important part of smart city.

3. A public safety application of GPS-enabled smart phones and the android operating system-

John Whipple William Arensman

While the Apple iPhone single handedly redefined the term "smartphone" during its first two years of release, Google's Android platform for mobile devices has quickly developed into a serious open source alternative. We explored the Android Operating System (OS) and software development environment and evaluated several of its capabilities by constructing a working application. This application collected speed and location information from the Global Positioning System (GPS) receiver, used the Google Maps Application Programming Interface (API) to determine the location of nearby schools, and sounded an alarm if a person drove over the speed limit in a school zone. The platform proved capable of supporting a melding of different services, and we believe such smartphones have broad applicability to public safety problems.

Smartphones have become ubiquitous as newer, less expensive models with greater feature sets have been released.

Summary:

While much attention has been given to the danger posed by drivers distracted by talking on the phone or sending text messages, responsible application of smartphone technology could have a net positive effect on public safety.

4. Detection of pathogenic viruses, pathogen indicators, and fecal-source markers within tanker water and their sources in the Kathmandu Valley, Nepal

Malla, Bikash, Rajani Ghaju Shrestha

Tanker water is used extensively for drinking as well as domestic purposes in the Kathmandu Valley of Nepal. This study aimed to investigate water quality in terms of microbial contamination and determine sources of fecal pollution within these waters. Thirty-one samples from 17 tanker filling stations (TFSs) and 30 water tanker (WT) samples were collected during the dry and wet seasons of 2016. Escherichia coli was detected in 52% of the 31 TFS samples and even more frequently in WT samples. Of the six pathogenic viruses tested, enter viruses, nor viruses of genogroup II (NoVs-GII), human adenoviruses (HAdVs), and group a rotaviruses were detected using quantitative PCR (qPCR) at 10, five, four, and two TFSs, respectively, whereas Aichi virus 1 and NoVs-GI were not detected at any sites. Index viruses, such as pepper mild mottle virus and tobacco mosaic virus, were detected using qPCR in 77% and 95% out of 22 samples, respectively, all of which were positive for at least one of the tested pathogenic viruses.

Summary:

At least one of the four human-associated markers tested (i.e., BacHum, HAdVs, and JC and BK polyomaviruses) was detected using qPCR in 39% of TFS samples. Ruminant-associated markers were detected at three stations, and pig- and chicken-associated markers were found at one station each of the suburbs. These findings indicate that water supplied by TFSs is generally of poor quality and should be improved, and proper management of WTs should be implemented.

5. Unified platform for the delivery of notifications to smart phones notification

Mojzisova , Slovakia

During the monitoring of information systems, experiments in progress, etc. it is often required that people are alerted about some events in real time, preferably via a mobile phone. Modern smartphones offer advanced means of notification, however these techniques are usually vendor specific. In this paper we design an unified platform for the delivery of short messages and notifications to smartphones. Our solution is based on a RESTful Java Web Service with simple interface and secure access. Although it is primarily targeted for the delivery of iOS Push Notifications, it can be easily extended for other platforms and/or transport methods (Android, SMS messaging, etc.).

III.Proposed Water Supply Management Framework

The proposed mobile application works purely based on location and there is no need of dependency on particular dealer. Anyone who is in need of water can request for the suppliers nearby according to their

requirement. The supplier gets notified by user's request and user's need of water is satisfied accordingly. Advantage of the proposed mobile application is its simplicity, effectiveness of time, user friendly and cost effective. In the next section the modules of the proposed applications are explained.

1) Flow Diagram

As shown in the below figure 1, Activity diagrams are utilized to depict the company as well as functional sequential procedures that comprise the elements of the system. It depicts the entire process of management.
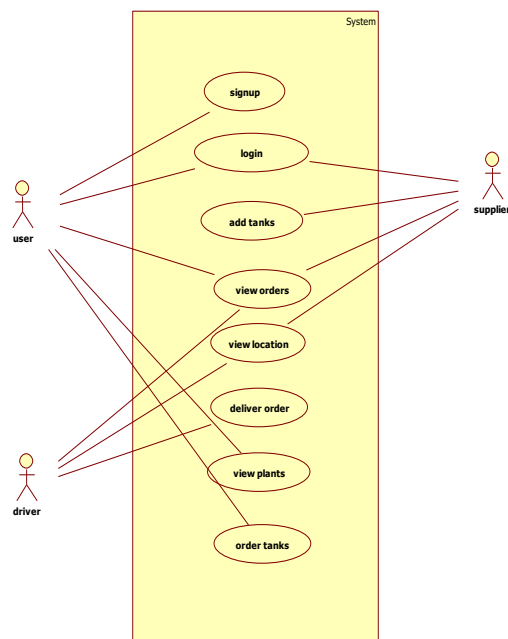

Figure 1. Block Diagram of the proposed Intelligent and Safe Management Framework for Water Supply Management

2) Operation

The proposed mobile application for water supply management comprises of three key modules, namely the User Module, the Supplier Module, and the Admin Module. The User Module enables users to register and log in to the application, view nearby water suppliers, and place requests for water supply according to their requirements. The Supplier Module allows water suppliers to register and log in to the application, view user requests, accept or reject them, and update the status of the water supply. The Admin Module is used by the application administrator to manage and monitor user and supplier accounts, ratings, and reviews. They can also update the application and resolve any issues reported by users. The proposed system is expected to be user-friendly, cost-effective, and efficient in managing water supply and addressing the issue of water scarcity in urban areas.

3) Requirements

The fundamental requirements such as hardware and software requirements essential for the proper functioning of the proposed framework are listed below.

1. Hardware

The hardware components that are utilized in the proposed framework are provided here.

- Processor- I3/Intel Processor.
- RAM- 8GB (min).
- Hard Disk- 1 TB.
- Key Board- Standard Windows Keyboard.
- Mouse- Two or Three Button Mouse.

2. Software

The software constituents that are implemented within the proposed framework are given as follows.

- Operating System- Windows 7.
- Programming- Java
- Server-side Script- PHP
- IDE- Android Studio.
- SDK- Android
- Libraries Used- Volley, Material design.

4) Modules and its Implementation

Two main modules involved within the proposed framework are discussed elaborated along with their main functionalities.

1. User

The main functions of the user are provided below:
- Allows users to register and log in to the application.

- Provides information about nearby water suppliers, their ratings, and reviews.
- Enables users to place requests for water supply according to their requirements.

2. Supplier

- Allows water suppliers to register and log in to the application.
- Displays user requests and enables suppliers to accept or reject them.
- Enables suppliers to update the status of the water supply and track the delivery.

3. Admin

- Used by the application administrator to manage and monitor user and supplier accounts.
- Provides access to ratings and reviews for both users and suppliers.
- Enables administrators to update the application and resolve any issues reported by users.

Figure 2 Block diagram of typical Water Supply Management
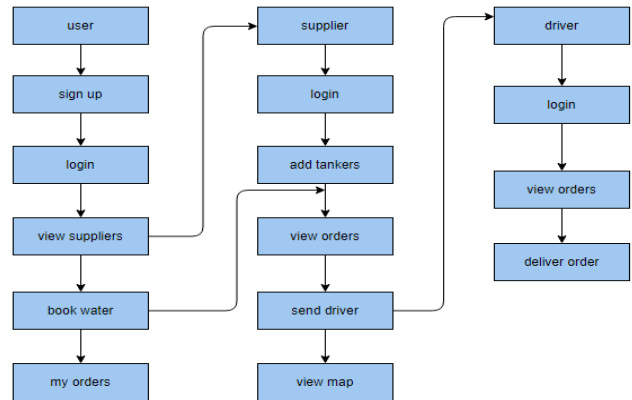
5) Advantages

The key advantages of the proposed framework are provided below:

- Reviews for dealer
- Location based delivery

IV. RESULTS AND DISCUSSION

The results of the proposed water management is given in this section in the form of test cases.
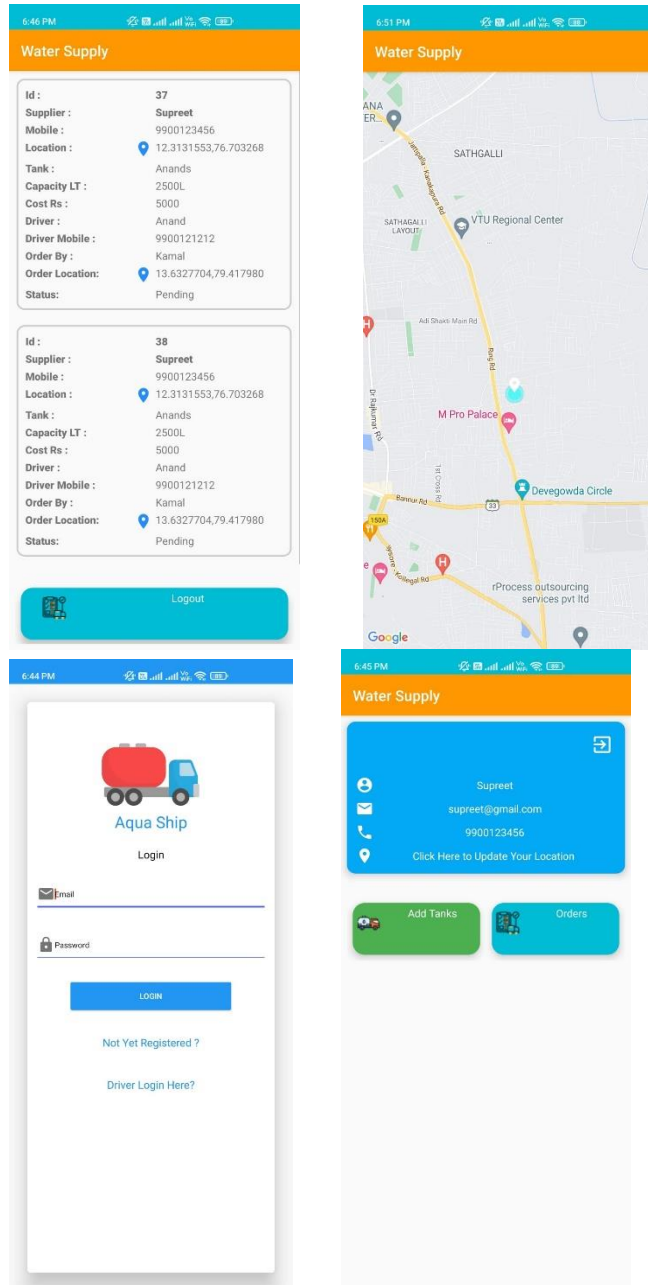
Table 1 Test Cases

Test case id	Test Scenario	Test Steps	Prerequisites	Test Data	Expected result	Actual result	Test status
#CVD001	To authenticate a successful signup with user data	User navigate the signup page Enter the valid user data Click on signup button	User data	Username Password Mobile Email location	When the user submit the user data, data should be store in database successfully	As Expected	Pass
#CVD002	To authenticate a successful login with user data	User navigate the login page Enter the valid username ,password Click on login button	Username, password	Username, password	When the user submit the user data, data should be authenticate successfully	As Expected	Pass

The test cases for the proposed water supply Management are tabulated in the above table 1. Two

different test cases are provided in the table for various factors such as the test scenario, test steps, prerequisites, test data, expected result, actual result and test status.

Testing Results

V. CONCLUSION

This paper presents an innovative step towards digitizing the water supply system in both urban and rural areas. It aims to improve the water supply system and provide a platform to promote water conservation. The proposed real-time water supply system will control the water flow in each area based on a time schedule, ensuring efficient distribution and conservation of water resources.

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