**Ordering and Delivery Tracker App for Quadro King Water Station Retail Store**

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**DISCLAIMER**

The study has been made the product of hard work of the researchers. It has been approved and accepted by the panel of reviewers. Hence, no part of this paper maybe used without proper citation or approval from the authors.

**Chapter 2**

**RELATED LITERATURE**

**Foreign Literatures**

**Global Positioning System**

The Global Positioning System (GPS) instruments are widely used today to calculate crustal deformation signals from tectonic plate motion, faulting, and glacial isostatic change according to Smead et al. (2019) on the published article entitled, Unanticipated Uses of the Global Positioning System. A variety of new and unforeseen GPS technologies have been developed in tandem with the growth of GPS networks around the world. For example, GPS instruments are now widely used to monitor ground movements during major earthquakes. Access to real-time GPS data sources has contributed to stronger forecasts for tsunamis, flash flooding, earthquakes and volcanic eruptions. Terrestrial water storage shifts can be extracted from GPS vertical time series coordinates. Finally, GPS signals reflected on the surfaces below the GPS antenna can be used to measure soil moisture, snow deposition, vegetation water quality and water levels. Combining GPS with signals from the Russian, European and Chinese navigation constellations will greatly improve these implementations in the future.

The US Global Positioning System (GPS), which became the first operational global navigation satellite (GNSS) main constellation when it was deemed fully operational in 1995 according to the study of Hegarty C.J. (2017) on the published book entitled, Springer Handbook of Global Navigation Satellite Systems on the chapter entitled, The Global Positioning System (GPS). First, the space section is defined, including the main characteristics of the various types of satellites. A summary of the control segment, including its activities and the evolution of its capabilities, is then given. This is accompanied by an outline of the GPS signals, present and future, as well as a summary of the content of the navigation data. The time and coordinate systems used by the GPS are then defined.

**GPS Tracker**

The vehicle monitoring device is a full safety and fleet management solution according to Mo Khin et al. (2018) in their published article entitled, of Real-Time Vehicle Tracking System Using Arduino, GPS, GSM and Web-Based Technologies. This is the technologies used to calculate the location of a vehicle using various methods, such as GPS and other navigation systems, which work via satellite and ground-based stations. The current vehicle tracking device uses GPS technology to detect and locate the vehicle anywhere on Earth, but often other forms of automated vehicle positioning technology are still used. The vehicle monitoring device is mounted inside a vehicle and has an accurate real-time position and data can Save and switch to a server that can be used for future study. This system is an important vehicle monitoring mechanism for any moment the owner wishes to control it, and today it is highly common with people with luxury cars used as crime prevention and recovery of stolen cars. The data obtained can be accessed on electronic maps through the Internet and the website.

A GPS tracking unit, geotracking unit or simply tracker is a navigation device usually used by a vehicle, asset, human or animal using the Global Positioning System to determine its movement and to determine its geographical position (geotracking) of WGS84 UTM. Locations are contained in a mapping unit or sent to an Internet-connected computer via a cellular network (GSM/GPRS/CDMA/LTE or SMS), a radio, or a satellite modem inserted in a unit or a WiFi running worldwide. Various businesses are purchasing position and monitoring marketing data. Often used for military and illegal purposes, to lock down and pick-up repossessions/thefts and find truck loads. Tracks can be viewed in real time with GPS monitoring apps. GPS-enabled smartphones.

**Mobile Application**

A mobile app or mobile application is a computer program or software application designed to run on a mobile device such as a phone/tablet or watch. Apps were originally intended for productivity assistance such as Email, calendar, and contact databases, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, GPS and location-based services, order-tracking, and ticket purchases, so that there are now millions of apps available. Apps are generally downloaded from application distribution platforms which are operated by the owner of the mobile operating system, such as the App Store (iOS) or Google Play Store. Some apps are free, and others have a price, with the profit being split between the application's creator and the distribution platform. Mobile applications often stand in contrast to desktop applications which are designed to run on desktop computers, and web applications which run in mobile web browsers rather than directly on the mobile device.

Most mobile devices are sold with several apps bundled as pre-installed software, such as a web browser, email client, calendar, mapping program, and an app for buying music, other media, or more apps. Some pre-installed apps can be removed by an ordinary uninstall process, thus leaving more storage space for desired ones. Where the software does not allow this, some devices can be rooted to eliminate the undesired apps.

Apps can also be installed manually, for example by running an Android application package on Android devices.

**Firebase**

The web application has become highly based on a vast range of databases and unorganized data such as videos, images, audio, text, files and other random forms according to Khawas et al. (2018) in their published article entitled, Application of Firebase in Android App Development-A Study. It is difficult for the Relational Database Management System (RDBMS) to process unstructured data. Firebase is a comparatively modern technology for processing vast volumes of unstructured files. It's very fast compared to RDBMS. This paper emphasizes on the usage of Firebase for Android and attempts to familiarize it with its principles, associated terms, advantages and limitations. The paper is also attempting to show some of the capabilities of Firebase by creating an Android version.

The Firebase Realtime Database is a cloud-based NoSQL database that syncs data for all clients in real time and offers offline capabilities according to Moreney (2017) in his published book entitled, The Firebase Realtime Database. Data is stored as JSON in the Realtime database, and all related clients share one instance, automatically receiving updates of the latest data.

**Local Literature**

**Mobile Phone**

A mobile phone is a wireless handheld device that allows users to make and receive calls and to send text messages, among other features. The earliest generation of mobile phones could only make and receive calls. Today’s mobile phones, however, are packed with many additional features, such as web browsers, games, cameras, video players and even navigational systems.

A mobile phone may also be known as a cellular phone or simply a cell phone.

Filipino users spend an average of 174 minutes each day online nearly three hours through their smartphones according to a study released by Nielsen Philippines.

At the same time, the international media and consumer research firm revealed that three out of four Filipinos who own smartphones now use them as their main access point to the Internet, pointing to the growing influence that these mobile devices have over online activities previously reserved for desktop and laptop computers.

There are more Filipinos who own cellphones than those who own toilets at home, a study from the Pasig River Rehabilitation Commission showed.

A mobile phone, cell phone, cellphone, or hand phone, sometimes shortened to simply mobile, cell or just phone, is a portable telephone that can make and receive calls over a radio frequency link while the user is moving within a telephone service area. The radio frequency link establishes a connection to the switching systems of a mobile phone operator, which provides access to the public switched telephone network (PSTN). Modern mobile telephone services use a cellular network architecture, and, therefore, mobile telephones are called cellular telephones or cell phones, in North America. In addition to telephony, 2000s-era mobile phones support a variety of other services, such as text messaging, MMS, email, Internet access, short-range wireless communications (infrared, Bluetooth), business applications, video games, and digital photography. Mobile phones offering only those capabilities are known as feature phones; mobile phones which offer greatly advanced computing capabilities are referred to as smartphones.

From 1983 to 2014, worldwide mobile phone subscriptions grew to over seven billion enough to provide one for every person on Earth. In first quarter of 2016, the top smartphone developers worldwide were Samsung, Apple, and Huawei, with smartphone sales represented 78 percent of total mobile phone sales. For feature phones (or "dumbphones") as of 2016, the largest were Samsung, Nokia, and Alcatel (Strategyanalytics.com, 2017).

**Foreign Studies**

Until recently, food innovation has usually taken place in labs and has often included new methods in agricultural processing according to Lattanzi (2020) on her published article entitled, Food delivery platforms revolutionizing the market during COVID-19. Then the digital revolution struck the food market, like any other industry, and the Internet became the tool by which the agro-food chain began one of the most progressive transformations. Purchasing food online is usually performed in the form of supermarket, food or meal packages. Food producers/traders can, for example, create their own marketing website, trade through third-party websites, or even use social media to promote goods. Eating-places can use delivery platforms to communicate with consumers, enabling them to select from a single tap buffet on their smartphone. Users will order a package full of fresh food items and prepare meals using the kit's guidance and recipes from – often-famous – chefs.

The growth rate of the online grocery industry around the world has reached the ceiling in the last 5 years, demonstrating that millions of customers are more interested in seeing food and food shipped by clicking a button rather than spending their time seeking a parking place to buy or waste their evenings in front of the stove.

There was a shift in the emphasis of freight modeling to short-haul (or last-mile) due to a spike in online shopping stated by Moore (2019) on her published article entitled, Innovative scenarios for modeling intra-city freight delivery. This study considers creative ways of distribution of freight and multimodal shifts, in particular for the last-mile segment of intra-city freight delivery. For this analysis, GPS data were collected from a truck fleet from a major parcel distribution company near Columbus, Ohio, and used to develop a freight delivery estimation model. Freight distribution tours were modeled in TransCAD and used to build scenarios for integrating different modal changes to measure energy consumption in kilowatt-hour calculations. Innovative modes of transportation of freight were considered for situations and contrasted to class six trucks: hybrid class six trucks, electric delivery vans, parcel delivery lockers, drones and electric passenger vehicles. Initial results indicate that electric trucks decrease energy consumption because more of the miles driven are in the long-haul or stem segment of the road. Parcel distribution lockers decreased energy use in suburban areas, particularly those with large cul-de-sac communities. The results of this study were intended to provide decision-makers, both in government and industry, with knowledge to consider when identifying effective options for energy-efficient intra-city freight transport.

The world is changing quickly. In order to deal with this, sectors are now evolving according to consumer requirements. Everyone wants it to be cost-effective, quicker and more readily available according to Dutta on her posted article on jungleworks.com entitled, Challenges Faced by the Growing Food Delivery Market. Having food, medication, clothing, and everything else you might think of at your door in a matter of hours was called a daydream a few years ago. Today, the situation has shifted, and food distribution is leading the way in the on-demand world race. Teenagers are changing their preference from conventional dining to various on-demand food delivery systems such as Pizza Hut, Dominoes and Papa John's. The online presence of a wide variety of restaurants and the opportunity to pay online with a single tap made life easier. Digital developments are transforming the food production industry more or less exponentially. Where it comes to online food distribution systems, the food industry is undergoing rapid growth.

**Local Studies**

Increasing urbanization, changing customer preferences and millennial appetite for dining out have helped the country's food service industry in large part according to an article of mordorintelligence.com. Many international players are looking at this potential country and are strategizing to improve market penetration by growing exports to the country. The Philippines is the biggest consumer-oriented food and beverage export market in the U.S. to complement the food service industry. The report released by USDA reported that products such as Condiments & Sauces, Processed Vegetables, Chocolate & Cocoa Products had a strong growth rate.

**Synthesis**

Having the digital rising in every year and growing ever so popular as a way to buy and order food to be delivered to them without having to go outside on an article made by Lattanzi (2020) which states that food innovation is commonly taken place in labs and often has new included methods in agricultural processing. the digital age struck the food market, like any other industry, and the Internet became the tool by buyers and customers to order food and other stuff which gives them a lot more time to prepare and do something else while waiting for the food or items they are waiting for. Having said this the researchers and the program they will be making have a place in the market with the now ever fast-growing digital age.

A study conducted by Amy m. Moore (2019) which produced scenarios for intra- city fright delivery which is named Innovative scenarios for modeling intra-city freight delivery used a GPS data and TransCAD. They used GPS data and TransCAD to create scenarios for fright delivery estimation model to see the effectiveness and its energy efficiency. This shows that delivery and online shipping is becoming the norm for this day and age that having an optimal route is beneficial to customers. Having said the program, the researchers are doing are beneficial and follows the trend of online service, this is also giving the customers less interaction on buying/ordering water and having to go to the trouble on going to the store and risking getting sick.

The world is rapidly changing daily and the digital age is becoming the norm online food service delivery is also becoming the norm for people because of the having not having to go outside and just waiting for the order to be delivered to their doorstep. And according to Dutta on her article posted on jungleworks.com. Having food, medication, clothing, and everything else you might think of at your door in a matter of hours was called a daydream a few years ago. The online presence of a wide variety of restaurants and the opportunity to pay online with a single tap made life easier. The digital age are transforming the food industry for better or for worse but in terms on online food delivery its undergoing a massice growth. This shows that the digital age is more and more becoming a mainstream platform to buy food to be delivered in the comfort of one’s home, and thus the application of the researchers that they are making is beneficial to customers and owners alike. Because they are following the popularity of online service and this will make them the store more accessible to the customers who is wary to the ongoing pandemic and just order their products on the comfort of their own home and they can even track the vehicle is currently to provide a visual aid to the customers and owners to see where their driver is currently.

Increasing urbanization, changing customer preferences and millennial appetite for dining out have helped the country's food service industry in large part according to an article of mordorintelligence.com. Many companies are looking at becoming accessible through online delivery to boost their market range and thus profit. The Philippines is the biggest consumer-oriented food and beverage export market in the U.S. to complement the food service industry. The report released by USDA reported that products such as Condiments & Sauces, Processed Vegetables, Chocolate & Cocoa Products had a strong growth rate. Having this shows that online is currently king on this pandemic and most filipino are one of the biggest food service industry.

**Technical Background**

The researchers will be using android studio using java code to make the program in pair with firebase for the database, they will be using mobile phones specifically android 6.0 (Marshmallow) this will be the base version of android the researchers will be using. Most android devices will have a software version of 6.0 (Marshmallow) this ensures that most customers will have access to the application and this version will have a location service that will be used to locate the customer and driver alike. The application will be posted on google play, and this will be for all the users, having an account base system the database will differentiate the users that will be logging in whether they are a customer or an admin. The application will have a different layout based on the account that logged in, the customer side will see the product page and tracking same goes for the owner but on their product page they can add and edit the price and item of a certain item on their current inventory of their product they have on hand. They will be using their android phones for testing purposes and their laptops and desktops for coding the application. The application will only be available on android phones due to the lack of tools, equipment and money for IOS devices. The current paying method will only be cash on delivery (COD) for the needed API’s for the paying services like Paymaya, Gcash etc. will take longer to implement and lack of knowledge on how to use them, and also the locale for the implementation of the application will be relatively close to the store that it will be first implemented.