Volume 3, Issue 12, December-2016, pp. 654-658 ISSN (O): 2349-7084

International Journal of Computer Engineering In Research Trends

Available online at: www.ijcert.org

"Cloud Centric IoT Based Farmer's Virtual Market place"

Lalchand G. Titare[1], Prof. Riya Qureshi[2]

Department of Computer Science and Engg, BIT, Ballarpur, India [1]

Lecturer, Department of Computer Science and Engg, Ballarpur, India [2]

lalchand.t@gmail.com, rpshaik@gmail.com

Abstract: - Cloud computing is aimed at providing IT as a service to the cloud users on-demand basis with greater flexibility, scalability, reliability and availability with utility computing model. This new ideal model of computing has a tremendous potential in it to be utilized as a part of the agriculture furthermore in rural improvement viewpoint in creating nations like India. The fragmented supply chain and inadequate health, safety and quality mechanisms (means the quantity and quality of fruits and vegetables) often do not meet the demands of high-end or international markets. Moreover, Indian farmers receive less than a fifth of the end price for the fruits and vegetables they produce, while a long line of middlemen, transporters, wholesalers and retailers get the rest. So, the aim behind developing this app is to give India's huge farming community a fair and consistent price for their produce. Using this android based app "Cloud centric IoT based platform for Farmer's virtual marketplace", this paper concentrates on how Cloud Computing idea improves virtualization of supply chains in agribusiness segment which will help some of the farmers to overcome this problem. Using these app farmers can directly connect with the end users and supply the product directly to them. Farmers can get most advance grade cultivating and virtualization of supply chains systems, additionally track and check the entire methodology from production, distribution to consumption

Keywords: Android, Cloud of things, Internet of Things, Virtual Commerce, Agriculture.

1. INTRODUCTION

Agriculture sector is the broadest economic division and assumes a critical part in the general economic development of India. Agriculture is the main occupation in India. Two-third of population is dependent on agriculture directly or indirectly. It is not merely a source of livelihood but a way of life. "Agriculture needed top most priority because the Government and the nation would both fail to succeed if agriculture could not be successful". It is the main source of food, fodder and fuel. It is the basic foundation of economic development. Beside that a farmer is one of the most important members of society. He is the giver of food to the people, to all practical purposes. But from long time, Agriculture sector has been suffering from different problems like less rain, increased insecticides and pesticides prices, etc. Now-a-days, to generate useful crop has been become a very difficult task for a farmer due to insufficient rainfall. If he generates a useful crop then another difficulty for him is to get the right buyer who will purchase his crop or goods at a right price. To referring to that problem, We have decided to develop a mobile app for farmers that will helps them in easily finding buyers for their crops or goods directly to buyers which help farmers to earn more money. By using this app not only farmer will get his right buyer but also different vendors and merchants will get there right seller or farmer. This is a win-win situation for farmer or seller as well as vendors, merchants or buyers.

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 DOI:10.22362/ijcert/2016/v3/i12/xxxx

from farm to fork. Introduced in the 1960s, these legally-enshrined committees prohibit farmers from dealing directly with buyers and require them to sell to licensed middlemen. The aim was to give India's huge farming community a fair and consistent price for their product. But over the years, the system has created several layers of intermediaries, lengthening the supply chain and increasing the opportunity for cartels to form, which in turn drive prices down for farmers and up for consumers. Removing fruits and vegetables from the control of these committees would allow the product to find its true market value and damp down inflation, according to analysts.

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So, the goal of this project is to design an application using "Android Technology ", which will use to connect farmers & consumers (it may be people or final product development companies like fruit juice making company) & also will pinpoint farmer's products shop or farm within 1 Km range with the message with location, name & distance from current location of the purchaser. By using this application, farmers can sell their products to end users directly.

2. RELATED WORK

All Supply chain management (SCM) is the strategic, systematic coordination of the traditional business functions and the tactics across business functions. The purposes of the supply chain are to improve the long term performance of different companies. [10] The requirements of the SCM are sensing objects, the proposed deployment, development, and management of the IoT applications over the cloud, namely, cloud-centric IoT framework. In a cloud-centric IoT framework [4], sensors provide their sensed data to a storage cloud as a service, which then undergoes data analytic and data mining tools for information retrieval and knowledge discovery. Built-in sensors in mobile devices can leverage the performance of IoT applications in terms of energy and communication overhead savings [11], [12]. Therefore, It has a benefit of strong candidate for front-end access to the cloud centric IoT, where mobile devices provide their sensed data based on the pay-as-you-go fashion [13].

3. LITERATURE REVIEW.

The situation here in India is totally different than what it is in foreign countries. There, farming techniques are far advanced than what we see in our Country. Overall, the image of a farmers' market doesn't immediately evoke "high-tech." Over the years, however, farmers' markets have slowly adopted digital technologies to reach an increasingly connected consumer. Today's farmers' markets are embracing digital technology in a number of ways just like a few taking advantage of online tools to connect to their customers. In foreign countries, promoting farmers' markets and other local agricultural businesses is the goal of the MI Farm Market Finder. Using a smart-phone's GPS, the app reveals farm markets, cider mills, farmers' markets and pick-your-own orchards closest to a user when they search the app. More than 350 listings in the app include hours of operation with a link to a market's website, a map to the market and a list products.

Also, the creators of food information app Food tree took a cue from the local food movement and launched an app allowing farmers to broadcast their daily harvest, along with details on where to buy their food local. The app launched in collaboration with the Vancouver Farmers market Association and this app expanded to include 15 North American cities. In foreign countries, online Farmers' Markets are available. They provide a new way for the local food movement to grow and combine it with a grocery delivery service and easy-to-use website. By allowing such kind of technology in Indian farm product market will encourage farmers in selling their yield. But there is some problems associate with the farmers such as middlemen, climate, etc.

a) Effect of Middlemen on Farmer

Farmers sell their produce to licensed middlemen at the APMC (Agricultural Produce Marketing Committee) mandis. These middlemen resell the same produce to wholesalers at the APMC market in urban areas. At these urban APMC markets, the produce passes on to retailers and then to the end-consumers at the urban retail markets. In the absence of market information farmers do not get remunerative prices and the middlemen get the major share in profit. Thus there is wide gap between the wholesale and retail prices with middlemen consuming the best of the pie. The suicide incidence among the farmers is on the increase for reasons of high indebtedness, low productivity, less remunerative agricultural produce prices, fragmentation of land holdings because of population growth, harassment by the middlemen and money lenders and the widening gap between the urban and rural incomes.

b) Android Platform

Android was built from the ground-up to enable developers to create compelling mobile applications that take full advantage of all a handset has to offer. It was built to be truly open. For example, an application can call upon any of the phone's core functionality such as making calls, sending text messages, or using the camera, allowing developers to create richer and more cohesive experiences for users. Android is built on the open Linux Kernel. Furthermore, it utilizes a custom virtual machine that was designed to optimize memory and hardware resources in a mobile environment. Android is open source; it can be liberally extended to incorporate new cutting edge technologies as they emerge.

Android provides access to a wide range of useful libraries and tools that can be used to build rich applications. In addition, android includes a full set of tools that have been built from the ground up alongside the platform providing developers with high productivity and deep insight into their applications. Android allows background processing, provides a rich user interface library, supports 2-D and 3-D graphics using the OpenGL libraries, access to the file system and provides an embedded SQLite database.

c) Data Base

SQLite is an Open Source Database which is embedded into android. SQLite supports standard relational database features like SQL syntax, transactions and prepared statements. In addition it requires only little memory at run time (approx. 250 Kbyte). SQLite supports the data types TEXT (similar to String in Java), INTEGER (similar to long in Java) and REAL (similar to double in Java). All other types must be converted into one of these fields before saving them in the database. SQLite is available on every android device. Using a SQLite database in android, does not require any database setup or administration. The SQLite statements are defined for creating and updating the database only once. Afterwards the database is automatically managed by the android platform.

d) Global Positioning system (GPS)

GPS is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on the Earth. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver. A GPS receiver calculates its position by precisely timing the signals sent by GPS sidelight high above the Earth. Each satellite continually transmits messages that include: the time the message was transmitted and, satellite position at time of message transmission. The receiver uses the messages it receives to determine the transit time of each message and computes the distance to each satellite using the speed of light. Each of these distances and satellites' locations defines a sphere. The receiver is on the surface of each of these spheres when the distances and the satellites' locations are correct. These distances and satellites' locations are used to compute the location of the receiver using the navigation equations. This location is then displayed, perhaps with a moving map display or latitude and longitude; elevation or altitude information may be included, based on height above the geoid.

e) Internet of Things (IoT)

This work is an attempt to provide a definition of the word 'Things' in the context of the Internet of Things (IoT). It does this partly by reviewing the existing descriptions of, and variations to, the IoT phrase as well as the alternative terms that have so far been used

to replace the word 'Things' in the phrase. This review was done to draw from these different terms and descriptions a sense of the wide breadth of the examples of ways that 'Things' in the IoT can manifest. An attempt is made to relate all the relevant but varied definitions and descriptions in order to draw up a definitive definition which can serve as a reference for stakeholders who are keen to understand the IoT concept as it exists presently as well as in the future. The IoT is an internetwork composed of Things where 'Things' include any physical or logical object/objects or element identified as being necessary by the agents requiring the network OR as dependent and specified by the agent requiring the interconnection

f) Cloud computing

Maintains a user database where objects, sensing tasks and associated events are stored. This middleware enables a seamless exchange of object information between different supply chain participants. Cloud centric IoT framework processes functionalities for service management and service composition. The data exchange and information integration is done by this platform

g) Smart Phone User

The farmers will send the request for the specific cloud service using a user friendly device such as smart phone users, and the cloud service provider will analyse and handle the request dynamically. A user who to publish his sensed object data on object management layer must use the benefit of smart phones by installing application on his smart phone. System Architecture performs following operations.

- Users of these systems submit the request to cloud platform.
- Cloud computing platform answers the users who corresponding location.
- Updating of user database is done by this computing platform. Users publish their sensed object information.
- The Cloud performs computing operation upon receiving sensed object. And it sends user-task matching according to physical location.
- The data processing server does operations of analysis, sharing, conversion on sensed object sends the sensed data of submitted task to end user information.

h) Security

Android has security features built into the operating system that significantly reduce the frequency and impact of application security issues. The system is designed so you can typically build your apps with default system and file permissions and avoid difficult decisions about security. Some of the core security features that help us build secure apps include:

- The Android Application Sandbox, which isolates app data and code execution from other apps.
- An application framework with robust implementations of common security functionality such as cryptography, permissions, and secure IPC.
- An encrypted file system that can be enabled to protect data on lost or stolen devices.
- User-granted permissions to restrict access to system features and user data.
- Application-defined permissions to control application data on a per-app basis.

4. CONCLUSION

Modern technology is rapidly altering and enhancing all aspects of our lives. The communication sector has been improving continuously. The Cloud computing is a game changing phase of IT that promises several benefits but the challenges too need to be considered when planning for Cloud adoption in agricultural sector. Agriculture has traditionally been maintained by families and communities where passing on and sharing of knowledge is regarded very important. Various reasons have been conjectured as the causes behind farmer's apathy, ranging from droughts to debt. But middlemen problem is very crucial problem now days, so to remove this chain of middlemen this app will help. Using this app buyer can find particular fruits farm & they can directly buy that vegetables or fruits from farmers buy going there. This will beneficial to both buyer & producer of fruits. Research also

continues to analyse Cloud computing implementation that provides less or no expenditure, On-Demand, Efficient Agricultural Knowledge Management. The cloud can offer a centralized knowledge bank which plays a big role in agriculture sector.

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 DOI:10.22362/ijcert/2016/v3/i12/xxxx