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Research Article

Internet of Things for Smart StoreKeeper

Revathi Lavanya Baggam*

CVR College of Engineering, Hyderabad, India

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Abstract

The Internet of Things (IoT) shall be able to incorporate-rate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. Building a general architecture for the IoT is hence a very complex task, mainly because of the extremely large variety of devices, link layer technologies, and services that may be involved in such a system .As a working woman or working professionals its challenging to keep track of each and every items whether it's there in stock or not. In this paper, I focus specifically to an IoT which handles store keeping task in a smart way. This smart StoreKeeper IoT in fact is designed for helping working professionals to handle household things in an effective way.

***Keywords**: Sensor system integration, service functions and management, Smart Storekeeper, Wifi , MQTT , cloud, Raspberry Pi.*

1. Introduction

The Internet of things (stylised Internet of Things or IoT) is the internetworking of physical devices, vehicles (also referred to as connected devices and smart devices), buildings and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet of Things (IoT-GSI) defined the IoT as the infrastructure of the information society. (A. Laya, V. I. Bratu, and J. Markendahl et al, 2013) The IoT allows objects to be sensed and/or controlled remotely across existing network infrastructure (H. Schaffers, N. Komninos, M. Pallot, B. Trousse, M. Nilsson, and A. Oliveira et al,2011) creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, smart health ,smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.

However, such a heterogeneous field of application makes the identification of solutions capable of satisfying the requirements of all possible application scenarios a formidable challenge. This difficulty has led to the proliferation of different and, sometimes, incompatible proposals for the practical realization of IoT sys-tems. Therefore, from a system perspective, the realization of an IoT network, together with the required backend network ser-vices and devices, still lacks an established best practice because of its novelty and complexity. In addition to the technical difficulties, the adoption of the IoT paradigm is also hindered by the lack of a clear and widely accepted business model that can attract investments to promote the deployment of these technologies.

Work–life conflict is not gender-specific. However, because of the social norms surrounding each gender role, and how the organization views its ideal worker, men and women handle the work–life balance differently. Organizations play a large part in how their employees deal with work–life balance. Some companies have taken proactive measures in providing programs and initiatives to help their employees cope with work–life balance. In addition to all these , the latest trends in technology lending a helping hand to humans to finish their tasks in much easy and efficient way. Today's generation human is continuously at back of committed work schedule. In this scenario the smart StoreKeeper would definitely ease the burden of keeping track of house hold provisional list. The smart StoreKeeper is also helpful to pharmacists to keep track of the drugs available along with their stock .Now a days in many pharmacies drugs are out of stock and pharmacists are facing hard time to keep track of the

*Corresponding author: **Revathi Lavanya Baggam**

same. The smart StoreKeeper is very much helpful in wholesale shops to keep a track on the wholesome products.

The object of the paper is to discuss about the smart StoreKeeper architecture and blue print of the project model .The following are the topics which will be covered, section II : Smart StoreKeeper Concept and Services section III:Smart StoreKeeper architecture , section IV:Advanatges of StoreKeeper and section V: Conclusion.

2. SMART StoreKeeper concept and services

Smart StoreKeeper is an application that gives information about the stock with respective to an item, which gives a remainder to the user who wants to know about the stock of item. Users in their busy daily life need not spend time to trace all shelves manually; instead the IoT would help the user to know about the stock information of items in the house from anywhere. In similar lines, even a pharmacist who needs to keep track of the various drugs of various companies used to spend daily record maintenance, so that he/she could order for the drugs once they reached a minimal stock value. With this IoT app , pharmacist work gets reduced and alerts the pharmacist on the deficiency of the drug.

Smart StoreKeeper for Home: As part of household provisions, residents buy many items and at times with the hectic day work at home or at office, they may miss out that they are in deficit of particular items. So in order to help the residents with the same, This application would ease the residents to plan the house hold chores effectively.

Smart StoreKeeper for Pharmacy: Pharmacists take in lot of effort to keep updated themselves with the in-store drug stock data. Inorder to overcome the same the smart StoreKeeper is an application with some very good IoT feature being proposed which would follow up with the stock count with help of sensor and a small touch screen that would be present on every repository tray of drug. The pharmacist should mention the count of how many of each drug is being given away, whenever the pharmacist is giving away the drugs to the patients. On doing so whenever the stick count limit reaches the deficit value the repository sends message to the pharmacist by accessing to internet through WiFi and passing the message via the cloud medium.

Smart StoreKeeper for WholeSale shops : Owners of the wholesale shops who would maintain huge stocks of items or provisions or vegetables, need to consistently maintain record of the stock data manually or by entering into a computerized system for audit purpose. This is a tedious process and consumes lot of time and effort. Using the smart StoreKeeper the owner of the wholesale shop would get simple reminder messages once the stock of each time has reached a minimum deficit range. In absence of this IoT application the owner had to regularly follow up on the items, in case the number of items in the wholesale shop are more than the more the amount of time consumption in updating data about the stock. The IoT application works by using a sensor under each container as similar to that of the one used for Home, but this is of heavier capacity, since the content stored in the containers of the wholesale shop would be 50 or 100 times more than what is maintained at home. This sensor calculates the weight of the stock, and once the weight reaches a certain minimum range of the deficit value a message is sent to the owner reminding about the deficit stock of that particular item.

Smart StoreKeeper for Waste Management: The similar application when incase used along with dust bins that are installed on roads or highways would help the government in maintaining very hygiene, neat and clean city/state/country. This is achieved by deploying a dust sensor on to the dustbin which would measure weight, and another sensor at the top of it to sense if the dustbin was full or not. Once the limit exceeds the Wi-Fi chip that is injected on to the dustbin would send a message to the person in-charge by a reminder message that the dust bin is full and needs to be emptied. This approach would help to keep the society neat and clean and would prevent the miscommunications among people if any.

3. SMART StoreKeeper Architecture

The below figure Fig.1 depicts the architecture of the smart storekeeper.

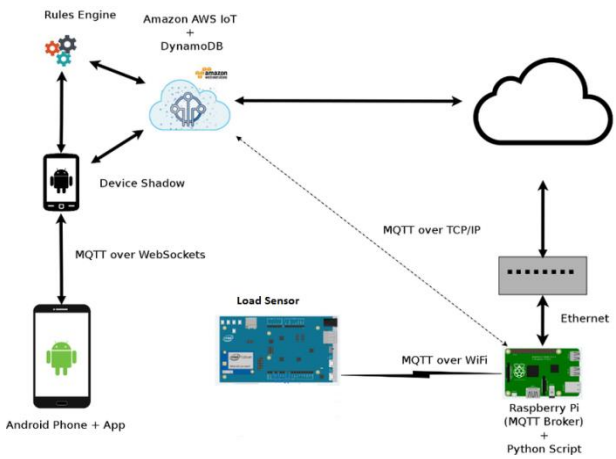

Fig1: Smart StoreKeeper Architecture

The Load sensor that is the sensor used to calculate weight of the items at stores, home, wholesale shops and for waste management. The sensor should send data to the cloud using MQTT over Wi-Fi through Raspberry Pi by using the logic present in the python script through Ethernet medium. The data present in the cloud can be shared through Amazon AWS IoT using Dynamo DB .This data is further sent to various devices using Android .So the users using the Android phone or devices would get alert message from sensor via the cloud whenever the sensor senses that weight

reaches the deficit limit for each item. So this message is sent for every item on to which sensor is ported. Here each and every container, which contains a particular item, is deployed with sensor along with Wi-Fi, Raspberry Pi which uses the logic present in the python scripts the user would be alerted with a reminder for every item that could be from a home, wholesale shop, pharmacy or the dustbin. Here the user can be a resident, pharmacist, wholesale shop owner or an in charge of the dustbins of a particular area.

4. Advantages of Smart Storekeeper

This latest IoT app would definitely result in many advantages like:

1. It eases the life of the residents by knowing about the quantities of the provisions at home in a very easy way through a reminder. So that any resident need not travel too many times to the provision store for items. Thus this app is reducing the time and overburden on the residents of a home.
2. For a pharmacist, who needs to maintain the data of a particular when being sold to patients, now can make the work easier when the drug container reminds the pharmacist with just a simple alert message? So that the pharmacist can place order for more quantities of a particular drug in seconds.
3.A wholesale shop owner who maintains various items or provisions in huge quantities can now easily keep track of the quantities which this application, as this would send reminder to the owner device, whenever a particular item would fall below deficit limit.
4. The dustbins present at various places in a city are not maintained properly, but with this new application, the in charge of the dustbins of a particular region/district/city would get a reminder or alert message on the device that the quantity in a particular dustbin had crossed a maximum limit. So that this would help the in charge to send a team to unload the dustbin and thus by making that particular area clean and neat.

Conclusion

This application would definitely lend a helping hand to the society by managing things properly by reducing time, cost and effort. The Internet of Things which emerged in this latest advanced technology is definitely making surroundings manage in a smart way. In present scenario of managing both work and life one will always opt for leading a smart life with smart devices which are making the surrounding smarter. The idea present in the paper which was drafted needs to be implemented which would be the future scope of this paper.

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Revathi Lavanya Baggam, BTech and MTech in Computer Science and Engineering from Jawaharlal Nehru Technological University, worked for Infosys Ltd for 8 years as Team Lead on Core Banking Solutions called Finacle for banks like URALSIB which is a bank in Russia, banks in Cairo, Egypt, Sout Africa and many Indian banks like SBI,ICICI etc. Currently working as Assistant Professor for CVR College of Engineering, Hyderabad, Telangana, India.