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Beacon Based Smart Shoping System

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Abstract: *A shopping system is said to be efficient which provides a better user experience. IOT plays a main role in implementing an efficient shopping system. Location of Everything (LoE) system plays a key role to improve most services in IoT area. On the other hand, data mining techniques are essential analyses when we have big data from IoT platforms. Indeed, integration of location-based methods and data mining analysis process can make a smart system service for IoT scenarios and applications. For this purpose, we design a smart shopping platform including four components, location of everything component, data collection component, data filtering/analyzing component and data mining component. Then a novel accurate localization scheme named "location orbital" is developed that estimates the current location of mobile objects (users or everything) based on both current and the previous locations.*

I. Introduction

User friendly location based shopping is implemented with the help of beacon sensor. All the shopping malls near to the user, products availability in each of the shopping mall and discount information or the sale information will be provided to the user. As the user has all the information he/she can shop based on distance and based on availability of the products or based on the cost of the product. Beacon sensor helps user in finding the object in the shopping mall. products selected by the user will be present in the cart as the user where user can increase or decrease product quantity .once the user identifies the product in shop with the help of beacon sensor which is attached to the rack of each and every product user scans the barcode of the product with the scanner in his device .as the user scans the product product is sent to the basket where changes cannot be implemented. QR code generation to the user depends on the payment method selected by the user. purchase details of the user are maintained for future recommendations.

II. Implementation Techniques

2.1 Collaborative Filtering

Collaborative filtering is a way of making automatic predictions about the user interests by collecting preferences or taste information from many users.

2.2 Content-Based Filtering

Content-based filtering, recommends items based on a comparison between the content of the items and a user profile. It works with existing profile of the user.

2.3 Hybrid Filtering

This combines both colloborative filtering and content-based filtering methods.

III. Literature Survey

3.1 Marjan Moradi, Javad Rezazadeh and Abdul Samad Ismail,"A Reverse Localization Scheme for Underwater Acoustic Sensor Networks", 2012.

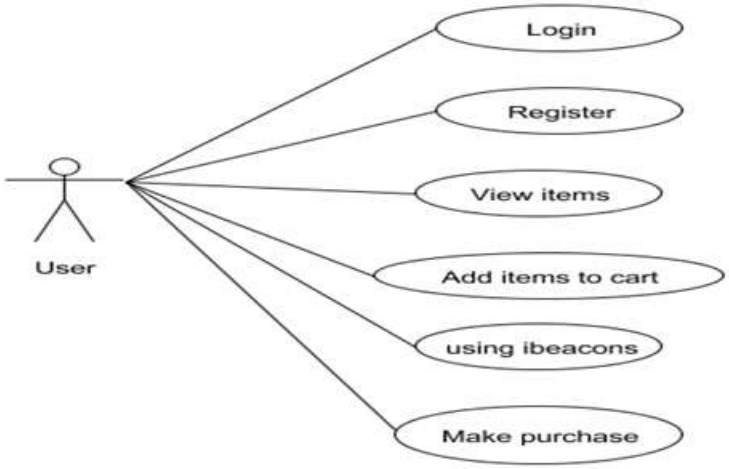
Abstract: Underwater Wireless Sensor Networks (UWSNs) provide new opportunities to observe and predict the behavior of aquatic environments. In some applications like target tracking or disaster prevention, sensed data is meaningless without location information. In this paper, we propose a novel 3D centralized, localization scheme for mobile underwater wireless sensor network, named Reverse Localization Scheme or RLS in short. RLS is an event-driven localization method triggered by detector sensors for launching localization process. RLS is suitable for surveillance applications that require very fast reactions to events and could report the location of the occurrence. In this method, mobile sensor nodes report the event toward the surface anchors as soon as they detect it. They do not require waiting to receive location information from anchors. Simulation results confirm that the proposed scheme improves the energy efficiency and reduces significantly localization response time with a proper level of accuracy in terms of mobility model of water currents. Major contributions of this method lie on reducing the numbers of message exchange for localization, saving the energy and decreasing the average localization response time.

3.2 Dhananjay Singh, Yongin, Gaurav Tripathi, Antonio J. Jara," A survey of Internet-of-Things: Future Vision, Architecture, Challenges and Services",2014.

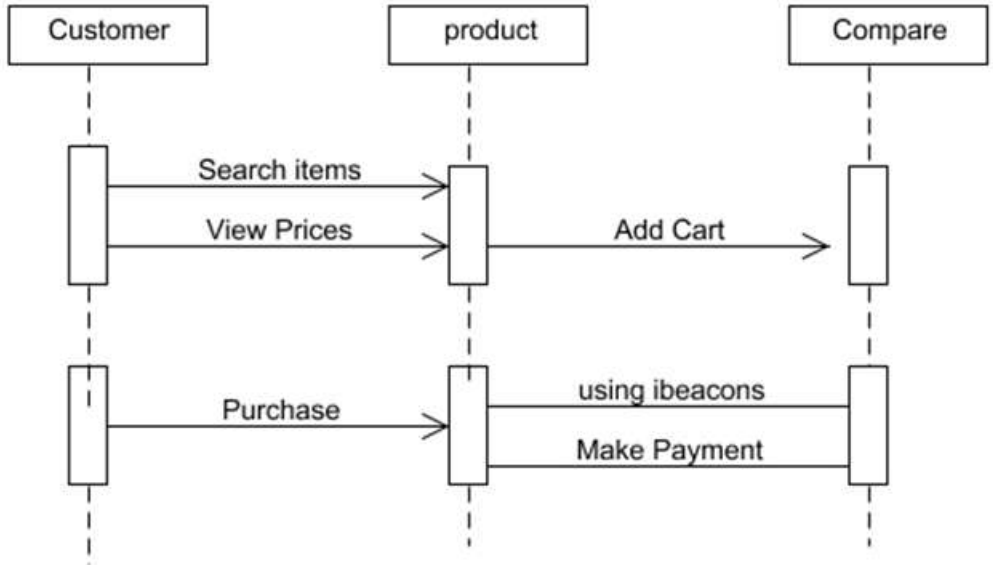
Abstract: Internet-of-Things (IoT) is the convergence of Internet with RFID, Sensor and smart objects. IoT can be defined as "things belonging to the Internet" to supply and access all of real-world information. Billions of devices are expected to be associated into the system and that shall require huge distribution of networks as well as the process of transforming raw data into meaningful inferences. IoT is the biggest promise of the technology today, but still lacking a novel mechanism, which can be perceived through the lenses of Internet, things and semantic vision. This paper presents a novel architecture model for IoT with the help of Semantic Fusion Model (SFM). This architecture introduces the use of Smart Semantic framework to encapsulate the processed information from sensor networks. The smart embedded system is having semantic logic and semantic value based Information to make the system an intelligent system. This paper presents a discussion on Internet oriented applications, services, visual aspect and challenges for Internet of things using RFID, 6lowpan and sensor networks.

IV. System Design

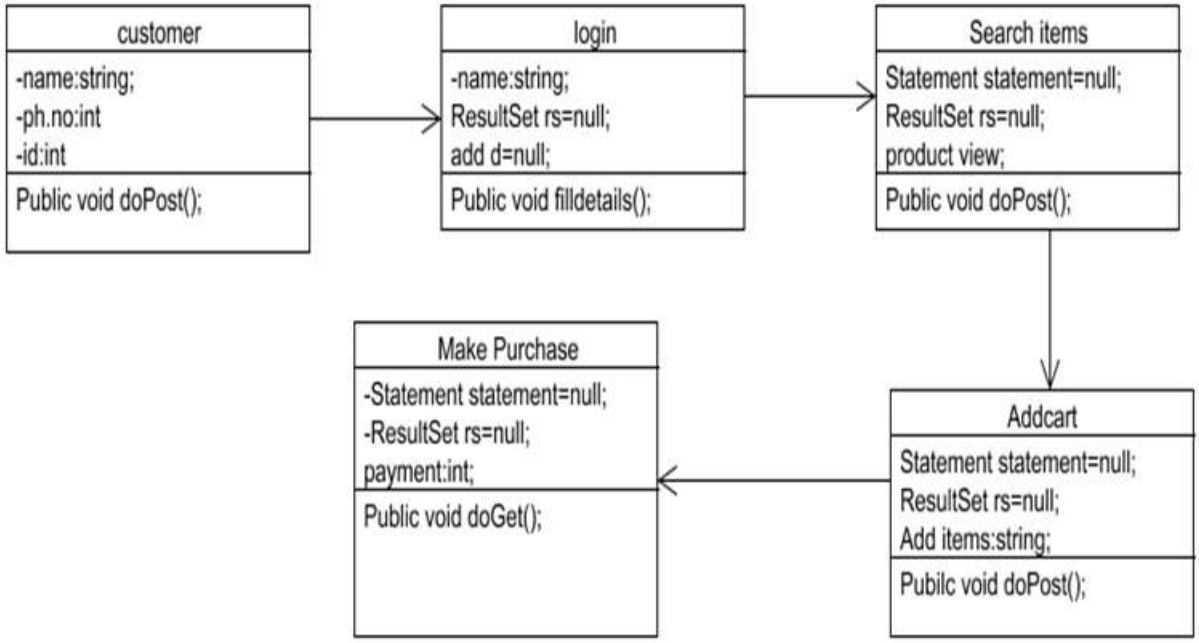
4.1 Use Case Diagram



4.2 Sequence Diagram



4.3 Class Diagram



V. Module Description

5.1 Location Of Everything Component:

This component provides location of devices, goods, staff, customers and any objects that have a role in the system. Locations of everything are recorded at the central server and the system can track and navigate all objects based on an accurate localization mechanism

5.2 Data Collection Component:

In this component two groups of data will be collected. The first group is users data (location, interest, social connections etc). The second group is shopping mall relevant data (stores, products, offers, etc.). Online central server collects data from customers smart mobile phone (crowd sourcing) and sensors with IoTs devices. Some complementary sources may be available in particular services (like wifi access point) which will be considered as well.

5.3 Data Filtering/Analyzing Component:

This component provides pre-processing on the collected data to unify the format as well as filtering unreliable data (e.g., faulty signals from sensors). Analyzing phase is performed on a trustable, useful content to enhance the output of the system. Thus, different sampling methods such as random sampling and stratified sampling are tested. A distributed parallel analyzing system is established while the collected data is various in natures. NoSQL database is utilized to address the analyzing challenges of the large volume of the data. Different sources of data are analyzed separately. One of the main tasks in this module is to build profiles of customers and keep their historical purchases for future recommendations. In addition, this component will ensure privacy of users is guaranteed.

5.4 Data Mining Component & Location-based Suggestions:

The designed service is specified based on the real time shopping application. In this component, an efficient data mining and machine learning technique is performed on all data filtering component. Thus, the output is recommendation/ prediction services for end users (customers) and advanced services for service providers/businesses as well as the planning and decision making. The localization scheme in this research is developed for mobile sensor/object like customers. In a mobile network, every object needs to get its location periodically. Finally the estimated location in current time-slot can be calculated by averaging the coordinates of location orbital. This phase includes two steps, firstly the mobile object should select the optimum numbers of signal samples.

VI. Conclusion

There fore a beacon based smart shopping system is being created and implemented with a better user experience

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