Enhancing Customer Engagement Using Beacons Mobile-Healthcare Emergency

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Abstract. Most of the people recently utilize cell phones for practically everything. a few advancements are utilized in a cell phone that gives a spread of administrations like Social systems administration, installment, advertising etcetera a substitution approach of selling which utilizes BLE reference point innovation is consolidated with a portable application which is utilized to send customized warnings to clients exploitation the Indoor situating framework utilizing Existing GPS can't be utilized for Indoor Positioning System, as there are a few weaknesses like force utilization and consequently the precision of the framework inside gratitude to obstacles to the RFID innovation is right inside however the change is essentially too minuscule that is scarcely up to fifteen meters. To beat this Beacon is utilized which could be an ease, low-energy transmitter furnished with Bluetooth Low Energy (BLE) or furthermore called Bluetooth 4.0 or Bluetooth reasonable that may complete vicinity based, setting mindful messages over separations beginning from 15 cm to 70m. The Hardware utilized here is a guide which communicates an image which contains a novel ID at ordinary stretches which might be recognized at spans an express range. A custom Mobile App is created which gets the sign while in a specific closeness of the reference point and is customized to compute the separation. The Custom Mobile App associates with an online worker that utilizes the unmistakable Id got related to the sign to recover information and value that particular ID. The net worker contains data which monitors all the Id's and, in this way, the relevant data relating to each unmistaka- ble ID. Inside the proposed, execute Security and Privacy monitoring timeserving pro- cessing (SPOC) also as PING structure focuses on the assurance and seclusion issues, to build up a client driven detachment access the executives of entrepreneurial figuring in Mobile guide.

Keywords: BLE, GPS, Indoor Positioning, Mobile- Healthcare, Radio map- primarily based totally positioning.

1. INTRODUCTION

After the widespread use of the internet and smartphones, almost all businesses pro- vide services to their customers using a mobile phone. There are different applications which

provide different services. But there was no proper technique for the services regarding the Indoor positioning system. Outdoor navigation is possible using a GPS system with the help of satellites. But to locate a person accurately inside a building

or a supermarket is not possible with the existing GPS system. It also cannot send context aware personalized messages inside a store using GPS[2][3]. This is because GPS technology cannot measure accuracy all the way down to one meter because the re- ceivers within the earth struggle with multipath signals. Hence the apt technology to locate something indoor is to use a Beacon device. The beacon device is used for short distance transmissions up to 70 m[4][5]. The Hardware utilized here might be a signal that sends an image which contains a novel ID at standard spans which might be rec- ognized at stretches an unequivocal range. A custom Mobile App is created which gets the sign though during a specific vicinity of the guide and is customized to figure the separation. The Custom Mobile App interfaces with a web worker which utilizes the Id got along the edge of the sign to recover information like that unmistakable ID. Area III clarifies about BLE Technology.

2. LITERATURE SURVEY

Location based marketing and sending context aware messages based on the cus- tomer's location has been increased due to the wide usage of smartphones and tech- nology like Beacon. A few opportunities may be presented for strategic communica- tors, but the technology has a number of challenges to be faced. One such thing is that customers may not be comfortable with push notifications. Now, the customers should download the beacon app and "opt-in" to the services offered by beacon to take advantage of the services that are being offered. To overcome this, marketers should organize campaign strategies to create awareness among the consumers to increase the engagement in beacon technology[2]. The beacons do not send notifica- tions to smartphones. A unique location identifier is send to the app and based on the data received, they are programmed to respond differently. The beacons send out these personalized context aware messages as it enters a predetermined location, via the BLE signals received on the smartphone[6][7]. Beacons are usually very small in size. Any number of beacons can be placed in a store. With the 2 years battery life of Bea- con, it can send the BLE signals to smartphones provided, the smartphone having Bluetooth facility. When the mobile phone, which has Bluetooth switches on, is de- tected by the beacon, it sends the location-aware signals to phone applications, and the personalized messages[8]. Even several offers and coupons could be send to the cus- tomers[1]. For years, the e-commerce giants target their customers using Big data analytics by taking the customer's browser cookies and displaying the banner ads in whichever app they are using. By using Beacons, we could send personalized ads to the brick and mortar retails businesses. The iBeacon was introduced by Apple in 2013. All the iPhones starting from iPhone 4 come completely beacon enabled. Google also ensured that from Android 4.3 and later versions had the built-in beacons in them. Giants like PayPal and Qualcomm are creating the hardware. They think that the beacon technology will determine the future of location-based marketing technol- ogy [5].

The other location-based technology is very different from the beacons. Other loca- tion-based technologies like NFC, GPS, QR codes are not capable of being as widely accessible as beacon technology. Most of the cell/Mobile phones do not use NFC as that requires almost physical touch but beacon has the potential to engage up to 200 feet of distance[7]. Most of

the smartphone users are familiar with GPS. It is used in Google maps for navigation purposes. It is widely used for outdoor navigation. But when it comes to indoor, it is very less capable. In case of QR code, the customer must scan the QR code in each location to get the personalized messages. This is more like manually doing the work and most of the customers would not like to move around the store scanning the QR codes. These technologies demand a pull approach instead of a push approach [8] [9]. Beacon provides the customers a push approach in which they only have to opt-in once they enter the store and they get push notifica- tions based on their location. Since 2014, mostly all mobile brands including Sam- sung, Apple etc. manufacture their mobile phone with the BLE technology. The BLE technology can be used in a wide area and its innovations are endless and when it is creatively put in use better communication initiatives are possible[10]. Then paper fliers, beacon-enabled tools would be the real future. This paper gives an idea of how the beacon can replace fliers in shopping malls and supermarkets. Instead of having flyers and boards which display the discount rate and other details, this information could be sent to the customer's phone as they walk through that particular location using Beacon's feature of sending personalized notification, as long as the customer has a mobile phone with BLE in it[11].

Bluetooth Low Energy Technology and Working of Beacon Mo- bile Healthcare Emergency

Bluetooth Special Interest Group with their continuous effort, developed a new va- riety of functionalities compared to regularly used Bluetooth. The same modulation Scheme and frequency is being used by both Bluetooth and BLE technology. The BLE devices have short signal reachable distance that depends on power usage. The Application throughput of BLE is around 300 kbps which is comparatively very small when compared to Bluetooth. Voice transmission will not be supported by BLE due to low transmission capacity. It has an advantage to operate in low power up to 100 times which is highly dependent on the environment that it is used in. The working of beacon is based on a simple principle where a small ARM computer is placed under a silicon casting and along with a Bluetooth module supported by a battery which forms a little circuit board. The Antenna is a short wire that is stuck in the thinner side of beacon that is used in broadcasting electromagnetic waves with specific length and frequency as shown in Fig 1. If a beacon is opened and invigilated, one could notice an antenna is that which everyone had on radio, but it will be zigzag for a reason. But in real world conditions this is not possible, so a lot of research is going on to find the perfect shape for antennas
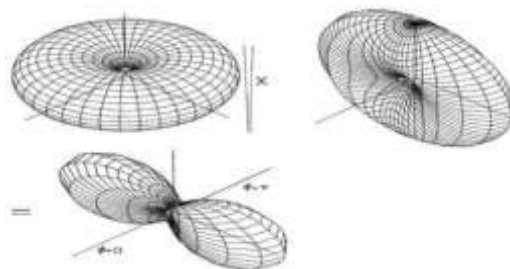

Fig 1: Antenna inside a Beacon

Bluetooth Smart is used by Beacons for communication and implementing SPOC as well as PING framework aimed at the safety and isolation issues, to develop a user- centric isolation access management of timeserving computing in Mobile-Healthcare emergencies.

Limitations in existing system and advantage of beacon over GPS

A. Lack of Proximity and context-based information: Very usually customers don't get correct and timely information. data might be regarding offers for a restricted amount or handiness of a brand-new product within the store. within the absence of knowledge consumers might not be able to build proper choices of buying product or services. *B. Difficulty in locating stores indoor:* One of the major problems faced by customers is finding a particular store among a lot of other stores. Also getting direc- tions to that store is another problem faced as GPS cannot be used for this purpose.

C. Difficult to personalize product suggestions: It is difficult to keep track of previous purchases of a customer and getting personalized after-sale information like offers or discounts or related product suggestions to him the next time he walks into the store.

D. Difficult in getting product details: Due to the crowd in a store, it becomes difficult for the customer to get information about the product in case of salesperson shortage. There is also the problem of the salesperson never leaving you alone when you browse through the products. The main disadvantage of using GPS for a long time, is the power consumption. And moreover, GPS is not good for indoor positioning. GPS drains the battery fast. Thus, when it comes to "always-on" case, GPS is a poor solu- tion. This is the reason I moved to Beacons. In the case of BLE, it is battery powered and can be configured with the help of a mobile application. Hence making the Bea- cons scalable and portable. Since most of the smartphones these days are equipped with BLE technology, it can act as the receiver for the Beacon.

3. PROPOSED SYSTEM

Measuring position has been a dramatic success for out of doors navigation sys- tems, and there's a powerful push to repeat that indoors[11]. Outdoor navigation is possi- ble using a GPS system with the help of satellites. But to locate a person accurately inside a building or a supermarket is not possible with the existing GPS system. To defeat this Beacon is utilized that might be an ease, low-energy transmitter outfitted with Bluetooth Low Energy or BLE conjointly called Bluetooth reasonable that may send vicinity based, setting mindful messages over separations beginning from 15cm to 70m[12][14]. The Hardware utilized here is a reference point which sends an image which contains a novel ID at standard stretches which might be distinguished at spans a clear range. A custom Mobile App is created which gets the sign though during a specific nearness of the reference point and is modified to ascertain the separation. The Cus- tom Mobile App interfaces with a Web Server that utilizes the Id got along the edge of the sign to recover information like that unmistakable ID. The Web Server contains data which monitors all the unmistakable Id's and consequently the worthy data com- paring to each particular ID.
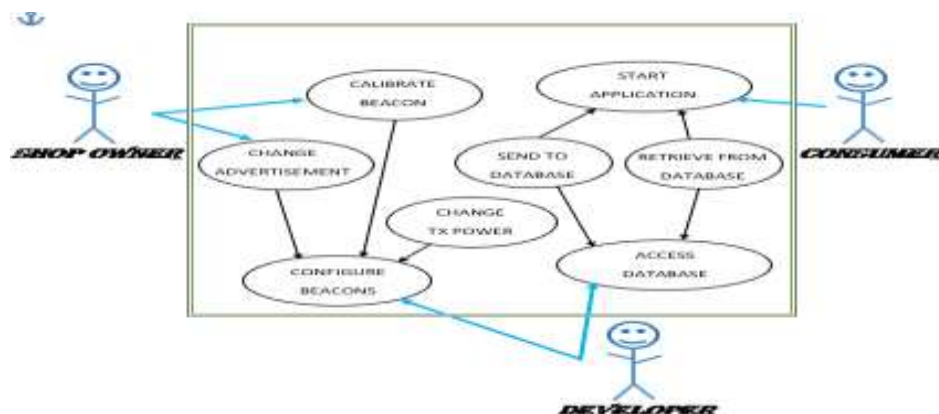
Fig 2**:** Flow chart of Proposed system

Whenever, important battery achieved in users mobile then users will connected with others mobile that who all are having the SPOC software in their mobile, if no SPOC user is available means then automatically implement PING protocol that is sharing the user's data by usual mobile network like Airtel, Aircel, Bsnl etc., but the user's data is transfer to database by encrypting format using Message Digest Algo- rithm (MD5) and to enhance the better health monitoring using new Secure Reliable Emergency Dissemination Protocol (SRED) for Mobile-healthcare emergency be- comes more security preservation system.
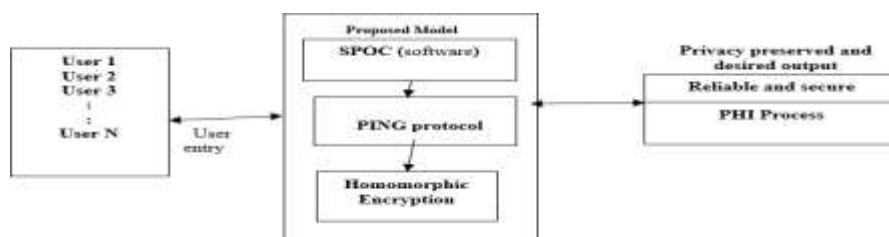

Fig 3**:** System architecture

The unified consideration framework to a patient situated, Distributed medical services framework and slice back medical care costs through a ton of prudent utiliza-tion of clinical assets and prior discovery of ailments Challenges Performance, Relia- bility, Scalability, Quos, Privacy, Security to The test, be that as it may, is conveying a pertinent message at accurately the opportune chance to guide a client.

4. SYSTEM REQUIREMENTS

1.   Mobile signal strength: To download the beacon application, the customer must have good mobile signal strength. Or in other case, the shopkeeper must be ready to provide Wi-Fi to the customer to download the application.

2.   Beacon calibration: Physical barriers in front of the beacons may cause disturb- ances in the Bluetooth signals. Hence each beacon should be calibrated individual- ly to avoid any disturbances.

3.   Position of Beacon: Place the beacons only where it is needed. For example, if many people stand at the bill counter, then place one beacon near that, so that the customers would get the notifications before they bill.

4.   Data security: The Unique Beacon ID and encryption of data should be kept se- cure. Because the competitors may use your data for their own targeting.

5.   Battery life of Beacons: Check whether the beacon has sufficient battery life be-

fore installing. Beacons these days have battery life up to 2 years.

6.   Less is more: Customers get irritated when they find lots of notifications on their screen. Hence make sure that the information that you want to display is short.

5. IMPLEMENTATION PHASE

A). Configuring the Beacon: There are three values to be set in a beacon UUID, Major value and Minor value. The UUID is present in the mobile application hence the bea- con must be configured with the same. If the major value is the same as that of which is coded in the mobile application, the corresponding minor value's advertisement. *B). Mobile Application Development:* There are two activities. Main activity and First activity. In the first activity, the beacons connected, and the advertisements will be displayed. *C). Connecting the Beacons:* The mobile application gets connected to the nearest beacon. The nearest beacon is found using the proximity calculation in the coding part. The Beacon library is used to code. *D). Supporter Node Management:* The system will find the supporter node among the possible other nodes who are hav- ing the same resource. Graphic tools are used by the mobile node for the specifica- tion, management, and installation of profiles and policies. Mobility pattern: Each user randomly needs to register with the PHI system with their unique id. The user health record will be monitored frequently. Base Station: The base station displays all the details about the nodes such as energy, status, and data which have been received. The base station has been created to receive the data from each node. This will help to aggregate all results.*E). Resource level maintenance*: Resource level will be updated frequently. This will help to identify the desire or needed resource. If the resource level is too low, then the data will be send through the neighbor node. The nearest and highest resource availability is more important in the neighbor selection. F). Encryp- tion and data transmission: Every message will be analyzed at the local node and the emergency data alone will be encrypted before sending. MD5 technique has been used for encryption.

Implementing ping protocol:
The PING protocol is used to implement in three ways that is system initialization, user-centric privacy, and security and last is opportunistic computing is mainly used to check
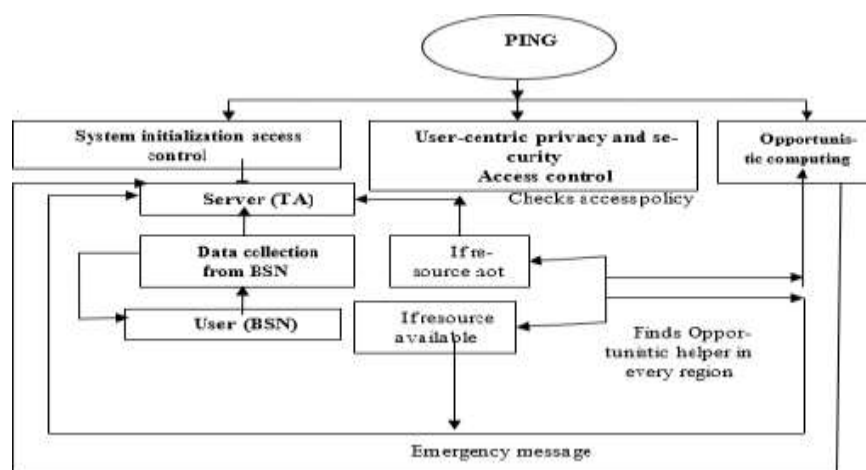
access policy.

Fig 5: PING Protocol

PING protocol is used, the main aim of PING is, in case any emergency for the medical users they have not having battery in the mobiles as well as, nearly they do not having any SPOC

users means at the time the PING protocol is active that is PING means any other networks could be shared the details of medical users data to database by using some other mobile users.

*Comparison Chart***:**
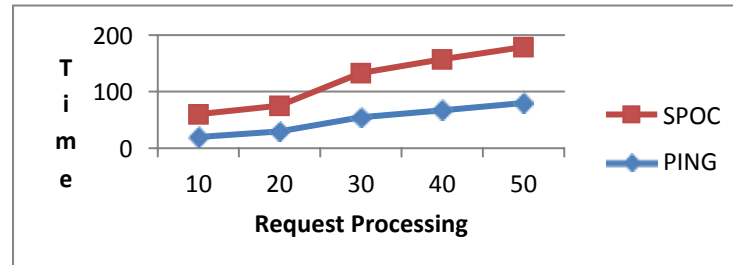In PING system consider two performance metrics: Delay and throughput

Fig 6**:** Performance Analysis

PING systems are much faster than the existing SPOC system in detecting accu- rate and high available resource nodes and responding to it, network and node failures have only temporary impact on the anycast-
based server location and resource distri- bution scheme. Additionally, it has no single point of failure or bottleneck will arise. Because only emergency messages will be spread over the network.

6. CONCLUSION AND FUTURE WORK

The challenge, however, is delivering a relevant message at precisely the right time to steer a customer. Beacons have a wide scope in the upcoming years. BLE being a low powered mode for data transmission, could be easily incorporated in any environment. And due to the adverse use of smartphones, people tend to notice adver- tisements easily on their phones. Hence the application is suitable for any environ- ment which needs personalized advertisements to its customers. The expected out- come is, implement SPOC furthermore as PING structure focuses on the wellbeing and seclusion issues, to build up a client driven confinement access the board of time- serving figuring in Mobile-consideration crisis. In the existing system, they need not provide security and privacy whereas causing the knowledge to database. But the proposed system provides privacy and security to every user and then stores the in- formation into the database in a very safe manner.

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