

Hospital Management System Using Beacon

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ABSTRACT: In today's world Hospital Management System is essential, which creates better environment for patients and visitors. Bluetooth Low Energy (BLE) beacons provide an opportunity for hospitals to reform both the visitor and patient experience, while also improving hospital operations and patient care. Along with digital wayfinding, mobile devices, and digital indoor maps, BLE beacons can enable hospitals to improve location and proximity awareness, creating a more familiar atmosphere for patients. The location-aware technology provides users with additional precise indoor navigation by broadcasting location information that may be utilized in conjunction with a mobile app, to assist employees and patients to navigate location, large, complex hospital facilities.

KEYWORDS: Bluetooth Low Energy (BLE), Digital Wayfinding, Indoor Mapping, Mobile device.

I. INTRODUCTION

Hospital management system is powerful, flexible and easy to use and is designed and developed to deliver real conceivable benefits to hospital and clinics [3]. Bluetooth Low Energy (BLE) beacons work by broadcasting a short range signal up to fifty meters that has the power to signal compatible devices, such as a Bluetooth-enabled smartphone or tab. Because the signal is brief, simple, and frequently unchanging, the beacons don't need net property, and therefore usually have battery lives that last from months to years relying on the beacon. This location-aware technology provides users with plenty of precise indoor navigation by broadcasting location knowledge which will be utilized in conjunction with a mobile app, to assist workers and patients navigate large, complex hospital facilities.

Hospitals area unit usually difficult areas containing a maze of hallways, division wings, and doctor consultation rooms that cause undue confusion and anxiety for patients. Traditional wayfinding signage has come a long way, but may be difficult to decipher, or unhelpful when there are multiple buildings, so patients and visitors are often known to solicit directions from busy work members, that isn't ideal given the shortage of resources in most hospitals. Using a combination of wireless and BLE Beacon technology, patients and visitors can be provided with accurate turn-by-turn directions to wherever they need to go, using their previously installed hospital app.

Aside from the steering part, BLE beacons have the power to accommodate and improve machine-controlled patient arrival. Patients with a hospital's mobile app, that once activated by a beacon signal triggers an occasion within the patient flow management system, area unit other to the registration queue and given estimated wait times. Once registered, the app prompts the patient to follow indoor directions supported beacon signals to their appointment location. By victimisation beacons in a very time period location health system, hospitals have the power to trigger notifications and different kinds of communication supported patient or worker locations. For instance, content relevant to a patient's condition are often streamed to them whereas awaiting a consultation. Internal employees communication will be expedited via the app, and in emergency situations, the closest available staff can be routed to the patient. These types of technology applications wreak a quicker response rate once moments square measure important.



Fig 1.1 BEACON DEVICE

II. RELATED WORK

Hospital Management system: A unique cloudbased hospital stuffs (Doctors, Management). The primary target to design is to make hospital experience better than currently we have. Hospital is a place where no one willingly wants to visit but there are times when we need [1]. It is meant for any hospital to exchange their existing manual, paper primarily based system. Hospitals use a manual system for the management and maintenance of critical information. This system requires numerous paper forms, with data stores spread throughout the hospital management infrastructure. Often info is incomplete, or doesn't follow management standards. The existing system is designed for multispecialty hospitals, to cover a wide range of hospital administration and management processes. It is associate degree integrated end -to- end hospital management system that gives relevant information across the hospital to support effective higher cognitive process for patient care. The system is to control patient personal information, medical history, room availability, staff and operating room schedules, and patient invoices. These services area unit to be provided in associate degree economical, cost effective manner, with the goal of reducing the time and resources currently required for such tasks. The system is a software package suit designed to enhance the standard and management of clinical care and hospital health care management within the areas of clinical method analysis and activity based costing. a significant part of the operation of any hospital involves the acquisition, management and timely retrieval of nice volumes of knowledge. The system enables hospitals and doctors to better serve their patients with improved quality of patient care, increased nursing productivity, reducing the time spent and control over the costs incurred by diagnosis-related groups.

III. PROPOSED METHOD

The proposed method is using combination of wireless and beacon technology for hospital management. BLE beacon will have one transmitter and many receivers. So the transmitter will be with the doctor and receiver will be with nurse. Beacons use BLE (Bluetooth Low Energy) to speak with smartphones and allow them to apprehend the gap they are aloof from a specific beacon. The proposed method is designed for Indoor mapping & experiential wayfinding, patient check in, clinical care, location based communications, facilities management. While most folks are quite snug finding our method outdoors victimization the trade normal GPS, this solution is not functional indoors. So however does one move finding your method indoors? When you move from the outdoor GPS environment into a building you can be guided using an app on your phone that is connected to an Indoor Positioning System (IPS). A large network of Beacons is needed to supply the accuracy necessary for an IPS. Because the signal is brief, straightforward and typically unchanging, the beacons don't need web property. This also have battery lives that last from months to years depending on the beacon. The

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proposed system reduces the complexity and provides an efficient environment for patients and visitors. It reduces staffs interruption. These services are provided in an effective manner with the goal of reducing the timing and more complicated work [2].

IV. BLOCK DIAGRAM

TRANSMITTER SIDE

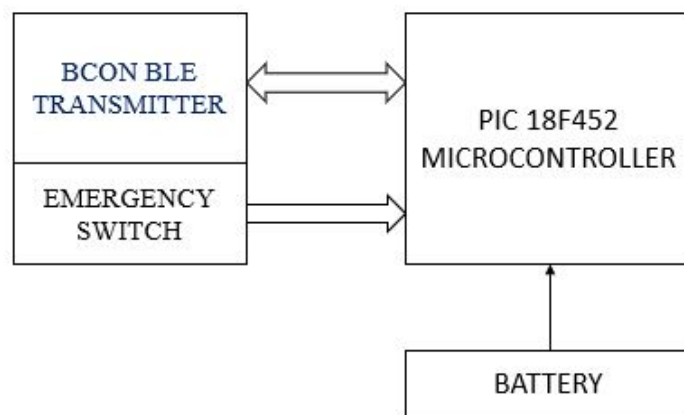


Fig 4.1 TRANSMITTER SIDE

RECEIVER SIDE

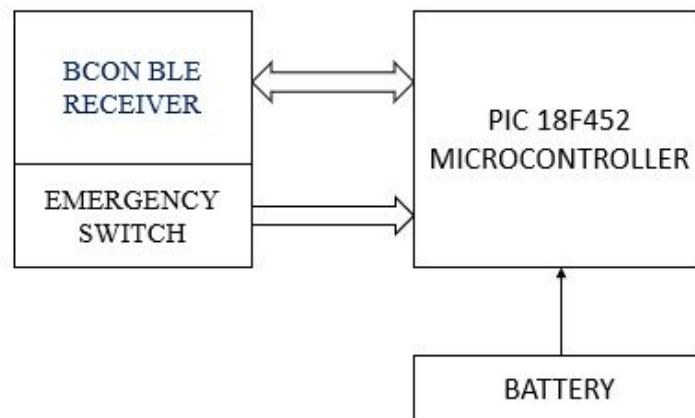


Fig 4.2 RECEIVER SIDE

V. WORKING PRINCIPLE

TRANSMITTER SIDE

BLE beacon has one transmitter and many receivers. The transmitter will be with the doctors of respective hospital. It enables the doctors to track the nurses. Using signal strength the transmitter detects the receiver of the beacon device.

Hence doctors can find their respective nurses with the help of beacon device.

The hospital system designed in such a way that each doctor's consultant room are located within 100 meters spacing large network of beacons is required to provide the accuracy. The actions that are to be done were already coded in PIC microcontroller. Messages can be sent to receiver through mobile app.

RECEIVER SIDE

The receiver here is the nurses. All the physician consultants will have their beacon receiver with them. Their task will be given from the transmitter in the form of message and they should complete that particular task. Also with the beacon receiver an emergency switch will be attached. During any emergency of patients the physician consultants can inform to their respective doctor through message.

MOBILE APPLICATION

Mobile application plays a major role in this hospital management system. BLE scanner is the mobile app which should be installed by visitors. It helps them to find the indoor positioning of the doctor. It works under the principle of IPS which is known as Indoor Positioning System.

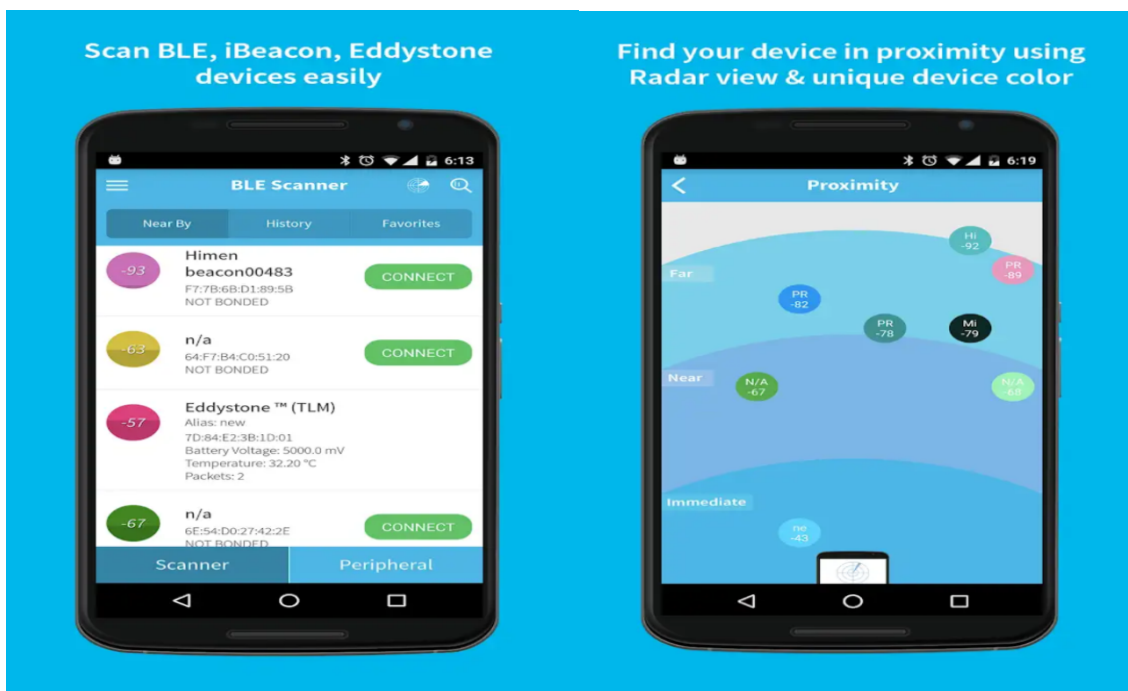


Fig 5.1 BEACON APP

VI. RESULT AND DISCUSSION

Visitors can find the location through beacon device. Beacon triggers the signal which helps to find the directions. Also beacon helps to track the staffs using signal strength. The information is passed in the form of message.

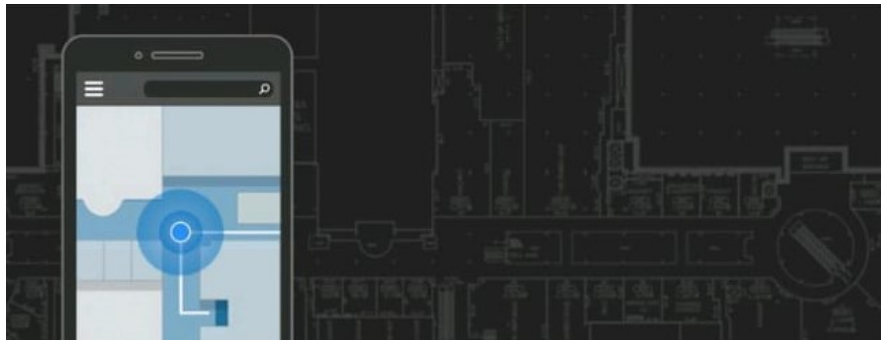


Fig 6.1 INDOOR MAPPING

VII. CONCLUSION AND FUTURE ENHANCEMENT

Thus the hospital management system is designed in such a way that patients care can be done easily. The respective doctor's location is tracked through mobile application. Sharing of information is achieved through beacon transmitter and receiver. Hence, it reduces the time consumption and staffs interruption and it provides an efficient environment for patients and visitors.

Later on it can be enhanced with the addition of storing the patient database. Whenever the patients enter the hospital and searches for the respective doctor, the mobile application shows the indoor way to the respective doctor at the same time the details of the particular patient will be sent to the doctor within the patients arrival.



Fig 7.1 HOSPITAL MANAGEMENT SYSTEM



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