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IoT Based Smart Traffic Management And Education Service for Smart City

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Abstract. *IoT is acronym for Internet of Things. This refers to the ever-augmenting network of objects. This feature has an IP address for communication between objects and other internet- based devices based on internet connectivity. It extends the internet connectivity beyond traditional devices to diverse range of devices that utilized embedded technology*.
Keywords: *Internet of Things, Smart traffic signal, smart education, HVAC, Tracking and various sensors.*

Introduction

In this paper, the standards and status of IoT and possible models that can be implemented for smart traffic service and smart education are examined. Hyderabad is being called as the smart city of India since it provides Wi-Fi all over the city. These kind of IoT based studies have been conducted around the world. However, there are few models of IoT that can be implemented in national and regional development of India. This study conducted for the practical presentation of service based IoT models, can be implemented in domestic level and it is expected to contribute for the academic and industrial circles too.

Definition of IoT

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

In the present generation, we want to be connected with anything anytime and anywhere and the core component of this hyper connected society is IoT, which is also referred to as Machine to Machine (M2M) communication or Internet of Everything (IoE).

Smart City Implementation Models based on IoT

In recent time, many government departments are aiming for the implementation of IoT based models. Through the verification of integrated infrastructure, the government is planning to implement the smart traffic services and smart education models based on IoT, which are described in the following examples.

Smart Traffic Signal

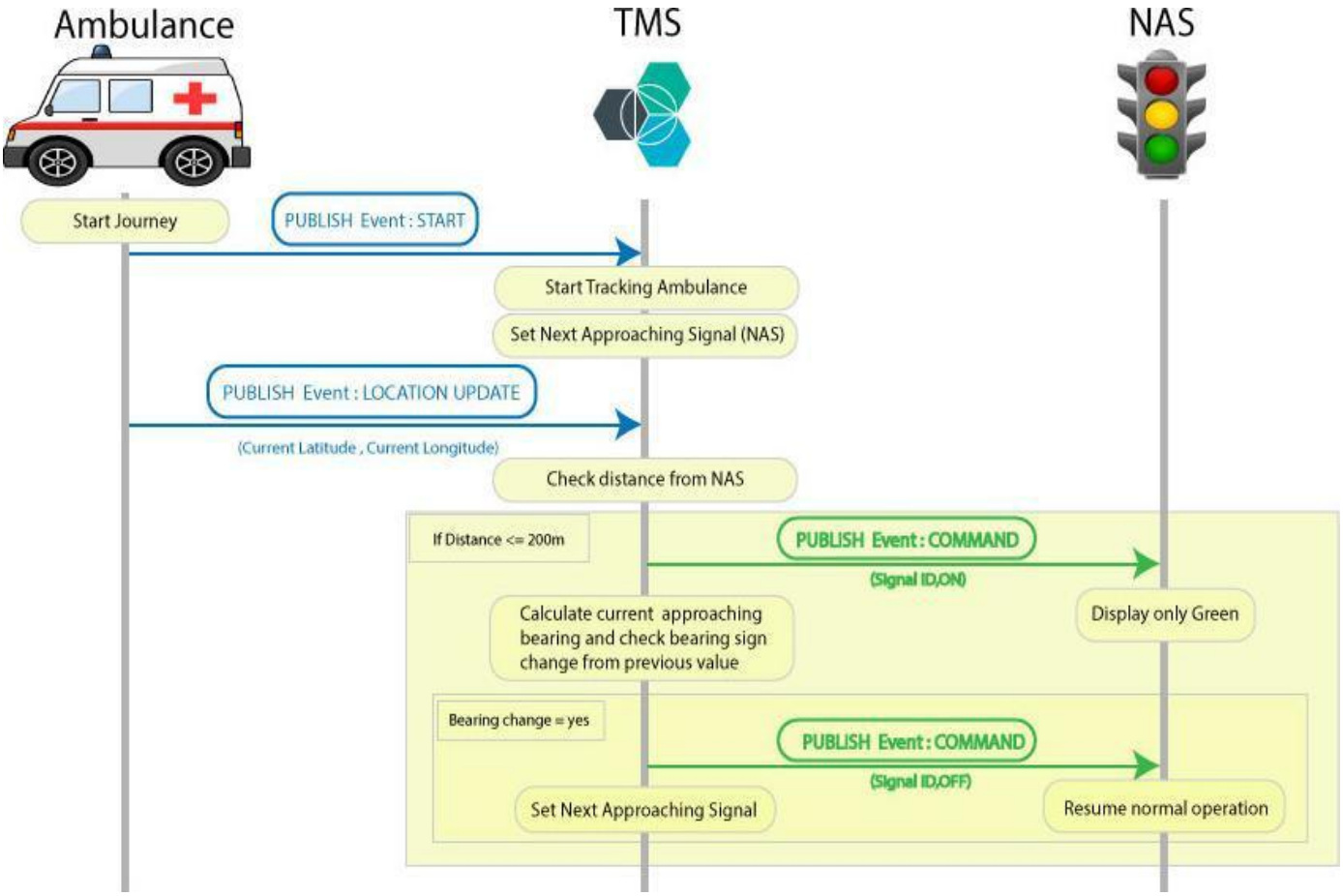
(1) Service Outline

In this fast moving world we come to know about many accidents occurring at road, houses and many industries. According to a survey there is a death in every 2 minutes. Thousands of people are dying because of the late arival of ambulances to the accident site. A heart attack patient in India takes more than 400 minutes to reach a hospital, which is almost 13 times more than the ideal window of 30 minutes as per the government data. A two-year data from the ongoing Management of Acute Coronary Event (MACE) Registry of the Indian Council of Medical Research (ICMR) shows that at some places it even takes 900 minutes as a lot of time is wasted in transportation. The lifesaving traffic signal sometimes may be the reason for death of someone. Traffic signal may lead the traffic jam and can block the route of the ambulance which is one of the reasons of ambulance delays.

So to avoid this problem a smart traffic signal can be built using IoT. When an emergency call is arrived to the hospital, the ambulance will start the journey. The driver will set shortest and less traffic route to the site and return route also. After setting the route, all the traffic signals occurring at that route will activate an algorithm. A tracker will track the ambulance using GPS technology and report to the TMS (Traffic Management System). When ambulance arrives within 200-meter area of NAS (Nearest Occurring Signal) then it will turn into green and will allow the

traffic to resolve or easy access to ambulance. When the ambulance crosses the NAS it will again work in normal condition. Similarly, all the signal on the route will act on this algorithm. This may help the ambulance to reach in time and many lives can be saved.

Service Diagram



Courtesy : Ref: IBM Cloud Blog, https://www.ibm.com/blogs/bluemix/2015/11/pubnub-smart-traffic-management-system-for-emergency-services
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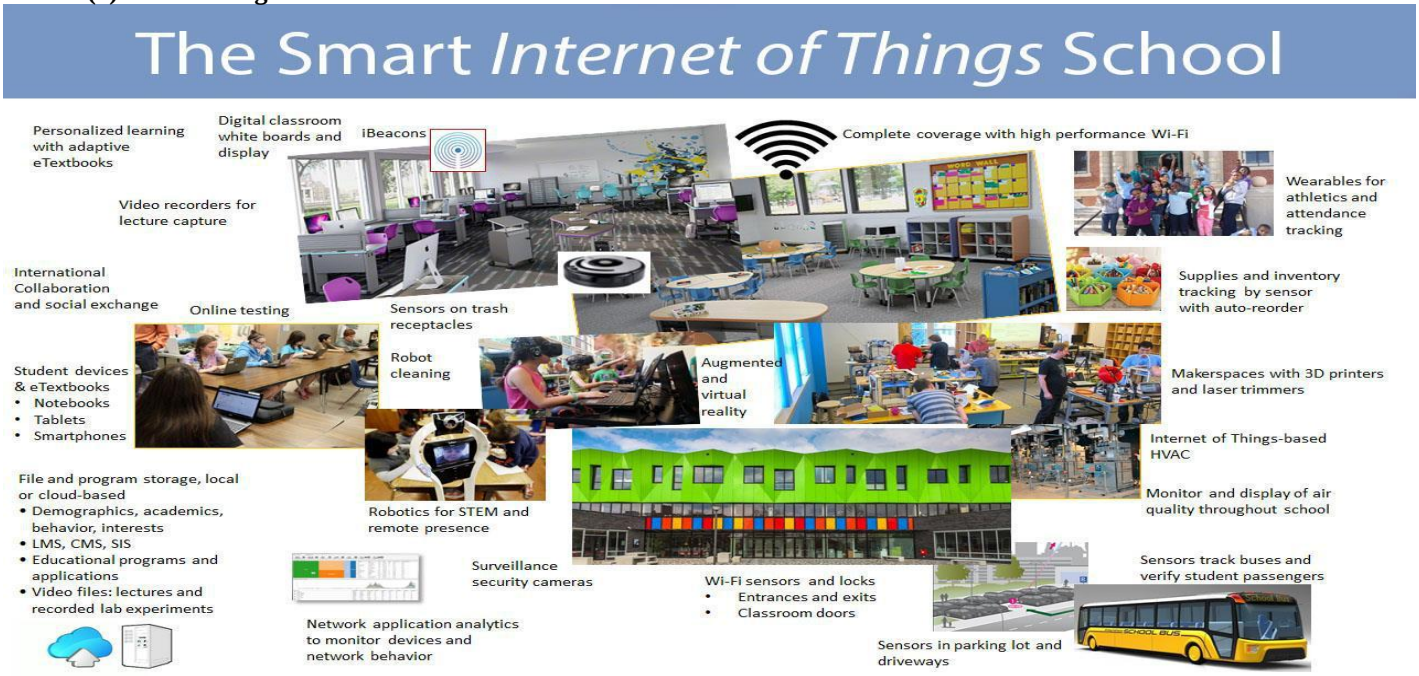
Smart Education Service
(1) Service Outline

This service provides an interactive, real-time lecture that makes the client feel like face-to-face communication being at home using the Internet infrastructure and through HD services. Instructors participate in the lectures using their own equipment in their personal educational institutes, and the client from their private place.

IOT based HVAC (Heating, Ventilation and Air Conditioning) systems can be installed for more safety of the educations institutions.
HVAC can be installed in mechanical labs and computer labs to minimize accidents, and can also be installed in chemical lab in both school and colleges.
Installation of sensors in school buses that tracks and verifies the location of the student passengers.

(2) Service Diagram



Courtesy : Ref: https://content.extremenetworks.com/extreme-networks-blog/is-your-school-an-internet-of-things-smart-school

Conclusion

Many times we come to hear about cases where a person loses his life because of late arrival of ambulance. And about 40-50 %of them are late because of being trapped in traffic. So to avoid this problem a smart traffic signal can be built. This traffic signal will follow an algorithm according to which he NAS will turn Green when ambulance will arrive in its allotted area. This will give an easy access to ambulance to reach the site easily.

IoT also help to make a school or institution a smart institute. What we see in all science fiction movies can become true using IoT. All those things are applicable by IoT. Like keeping the tracking sensor on institute or school bus for safety purpose. Heat Ventilation and Air Condition (HVAC) can be installed at computer labs, Mechanical lab and school kitchen where the temperature will change according to the lab setting, which will help to maintain the machineries cool.

The main initiative of this topic is to solve the problem faced by the people in traffic service such as ambulance delay, and to make the school/institute safe, comfortable and interactive. IoT will give the

citizens the futuristic feel of everything around them and making comfortable to them.

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