

WAU- IoT Enabled Smart Places

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Abstract

The vast research and implementation of the Internet of Things (IoT) is allowing Smart City projects to be implemented and initiatives all over the world. With over 50 billion objects will be connected and deployed in smart cities in 2020 and according to Juniper Research looks at the IoT market and forecasts 200% growth in connected devices. The heart of smart city operations is IoT communications. IoT is designed to support the Smart City concept, which aims at utilizing the most advanced communication technologies to promote services for the administration of the city, tourism, and citizens. This paper is presenting a comprehensive review of the concepts of IoT and smart places a subpart of smart cities and their motivations and applications. Moreover, this paper describes the various applications of IoT networks and IoT devices to make intelligent buildings, public places, and government premises.

Keywords—Internet of things (IoT); Smart City; Smart places; communication technologies.

I. INTRODUCTION

The Internet of Things is an infrastructure that includes physical devices, modern vehicles, buildings, and even essential electrical devices which we use on a consistent basis inter-connected to each other over the internet so that they can accumulate and exchange data amongst themselves. These "Things" have the priority and the ability to self-organize and communicate with other things without human intervention. There are more than six devices connected to the Internet per person. The concept of IoT aims to present the Internet even more pervasive and even more immersive. Moreover, by enabling easy access and interaction with an extensive variety of devices such as for instance for home appliances, monitoring, surveillance cameras, sensors, displays, actuators, and vehicles. The IoT will improve the development of various applications that make use of the massive amount and diversity of data produced by objects to implement further services to companies, citizens, and public administrations. IoT applications are various and brought to several areas and domains, for example, home automation, healthcare via mobile, manufacturing automation, elderly assistance, medical aids, automotive, smart grids, and intelligent energy control, traffic management, etc. So let's discuss WAU-Smart Places. It enables new services to be developed and existing services to be improved for citizens, local businesses and anyone associated with the area; whether it be through services such as smart tourist places, smart roads, tourist management, smart traffic, smart housing, smart parking, intelligent buildings or access to various services through smartphone.

A successful Smart Place will deliver significant improvements and opportunities for the local economy, becoming a place where people want to live, work and play. WAU is one of the new concepts which can deliver the end to end infrastructure and applications fundamental to any Smart Place.

As cities and towns become ever larger and more complex there is an increasing demand for traditional services such as transport, healthcare, utilities, navigation, transportation, and the environment. There is a need to address these challenges to ensure sustainable growth in the future. It is important to note that technology is an enabler, it is not the solution, the real benefits are realized when we use the technology to address the identified challenges and operational needs.

II. WHAT IS WAU?

WAU stands for Wireless Access Unit. This is the newly invented term and concept which is under research by the authors of this paper. WAU has various capabilities which can make things simpler and interesting. It includes various networking concepts used to communicate with various places, buildings, and even roads. It is a server-based communication system that emits source information to the users nearby.

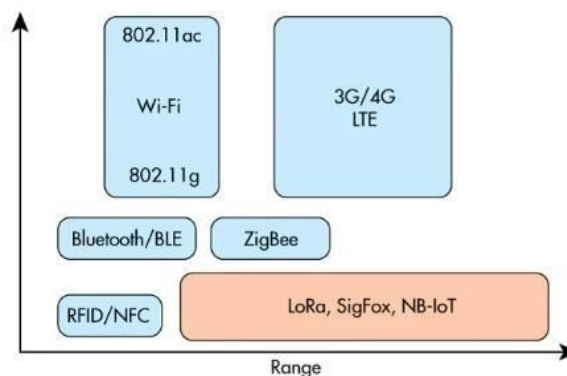


FIG.1 IOT RANGES.

There are a number of ways to address low-power, long-range IoT, but the three main competitors at this point are Sigfox, LoRaWAN Alliance LoRaWAN, and 3rd Generation Partnership Project (3GPP) NB-IoT (narrow band IoT). Each has a different set of attributes that designers may prefer, but usually a solution will utilize one or the other.

III. ROLE OF THE SMARTPHONE IN IOT

IoT for the average person is the smartphone because it is going to be everywhere and everyone carries a smartphone all day. We use it for a large number of daily tasks to interact with other smart devices. Interaction with IoT using a smartphone simply because this is the computing platform that we are most likely to have with us at any point in time. Concerned that something is not quite right with our IoT-enabled device (e.g. when your own car got a “Check Engine” light), we will be able to run a professional vehicle scan diagnostic tool from our smartphone to read diagnostic trouble codes which is cheaper than bringing it to a professional car mechanic to diagnose the problem. IoT means that consumers will have more options when it comes to smart devices (interaction with those devices through the smartphone).

More possibilities like connecting your smartphone with a washing machine to get a graph to see the water usage and electricity over the past few weeks/months In all, every IoT device such as washing machines, refrigerators or cars are able to send and receive data to specially configured servers on the Internet – they are able to connect and communicate over the Internet

IV. WAU APPLICATIONS.

A. *Smart Tourist Places*

India belongs to lots of historic places as compared to other countries. Based on collected data from various tourist places this paper aims to mainly focus on getting the proper information about those places. Now a day we all know that visiting a tourist place we doesn't get the proper information regarding that places thereby tourist pays a lot of money to the guide and hence they also don't guide properly also visiting a tourist place it gets difficult to find a proper guide who instructs properly regarding that places. So basically this approach is to help the tourist to get proper enlightenment (brief knowledge) about the particular locus. So by Deploying Smart places device at various tourists places, it can guide the tourist about the famous places to visit nearby. Not only it will suggest the places to visit at the same time it will tell them about the history behind that place or about the famous things that the tourist should do at that place. The smart place device will be a local server-based device that will work for the people to know them the place in a better way. So this Project will help in such a way that whenever a tourist visits the new place they will get a pop-up on their cell phone's notification bar. In the present smart era, everyone has their own smartphone. So in that particular area a Server booth will be covering that area so that they can get help from that server cloud. There will be several operations or functions provided by the project.

Firstly, it will be giving brief knowledge about that place selecting their regional language or the language they are comfortable with by a single click. Then it will be also displaying Nearby shops, hotels, motels, restaurants, police stations and nearby places to visit. Also, it will be providing the transportation facility to reach the particular nearby places and the estimated fares so that none of the new tourists can be fooled and also the main aim of this project that there will be a feedback facility. If a tourist thinks that there is no development in that Particular tourist area, he can't find the proper site to complain. So there will be a provision provided for feedback that will be directly linked to the ministry of tourism so that it will help them too for the development. Also, there will be a help section provided for the user/tourist in case they faced some problems at that particular place.

This device is not like google places because google won't tell you anything unless and until you search the place on the search bar. Smart server-based app-based devices installed at various famous places will automatically get your location and guides you to explore the places by small animations and by pre-recorded voices of the tourists or the AI software.



FIG.2 SMART PLACES

B. Smart Institutes.

Nowadays we know that the educational institute is developed in vast areas/acres. Several no. colleges are present in one educational institute. Though it becomes difficult for students or visitors to find a particular college or particular place if they are visiting there for the first time. Also, they don't have a brief idea and knowledge about the particular institute and colleges. So this project basically approaches helping the student or a visitor totally in a smart way. The basic idea of this project that it will send a pop up to the nearby person inside the campus and giving a brief idea about the institute or college campus also it will be helping the student to get a proper fees estimate/hostel facilities/nearby mess/Source of transportation to visit the institute/etc. The main aim of this project is that it will be helping the student or visitor to find a particular college or department of any respective college by guiding them with proper directions so that it will assist them in such a smart way without facing any problem to reach over there. Also, it will be proving the details of the respective Dean/principal of that institute and respective professors of that particular college with their contact details/subject they are teaching over there and their particular cabin situated in the department. Smart and light notifications may ease the problem faced by various people. Also, there will be a provision provided for feedback which will be helpful for the students/visitors and the institute for their further improvements and regarding the issue. also, there will be a help section provided for the students and visitors if they needed.

C. Smart Hospitals.

It is observed in big hospitals there are various buildings with different wards. There are variously admitted in different wards with various diseases. To locate the particular patient is time-consuming as well as difficult. If the patients want to get admitted or the visitor wants to visit the ward they have to struggle or ask nearby persons. So this paper basically approaches that whenever a new patient or visitor visits the hospital it will help in such a way that it will get all the information on their smartphone and patient can directly get the ward and building where they have to check-up and also it will help the visitor to get the proper destination of patient in which ward and building they are admitted with proper room no. and floor no. with the special patient

ID's which can be tracked by the authorized person of the patient.

Also, a uniquely special patient id will be provided to each patient so that whenever a visitor arrives at the hospital they should not face some difficulty to find their patient's proper ward by just entering the patient ID in the server platform. Also, this will be helping in such a way that whenever a new patient wants to get admitted the main problem in the big hospital is to generate a new case paper. So this will be helping the patient to get the case paper of the hospital directly generating through the server. also the main attribute of this project is that it will be providing the doctors name and their details with their respective specialist. Also it will be providing an feedback section to the hospital development and changes and also it will be providing an help section that will be useful for emergency/blood banks/etc.

D. Smart Highways.

Nowadays city connectivity is the main area for development of the nation. There are various expressways, highways, roads, bypasses are constructed to make easier connectivity between the cities. Though it becomes difficult for citizens to find a particular Road or particular place if they are visiting there for the first time.

So this paper basically approaches that whenever a new or existing citizen visits the Road they will get all the information on their smartphone with WAU smartapp. It will help the visitor to get the proper destination on time with all the details of the road. The information the roads will be stored on the local server which will be installed on the particular area with all the information of the road. It will display various information like the speed limit, nearby medical facility, name of the road. Shortcuts connected to the roads with precise location with local servers provided by the local authority.



FIG.3 SMART HIGHWAYS

V. CONCLUSION

The future of IoT is unlimited. It provides solutions in all sectors including manufacturing, fashion, restaurant, healthcare, education etc. This paper covered some of the details of Internet of Things (IoT) technology along with the new applications. IoT can be combined with existing technologies for improving the way we explore the things in simple way with the transfer of data between two electronic devices.

Thus by implementing such technology in societies, the places could really become smart and the use of IoT can be extended to the new level. Application of IoT is increasing day by day and this is one of the best scopes to make people more informative about their place. This paper plays an important role in thinking applications of IoT in new fields. So, we have discussed about the building servers on various places and connecting them with users' smartphones with the help of various available technologies like Sigfox, LoRaWAN Alliance LoRaWAN, and 3rd Generation Partnership Project (3GPP) NB-IoT (narrow band IoT). These technologies must be used for different purposes to make the life comfortable and easy for the citizens.

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