IoT based Models for the Implementation of Smart City

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Abstract- IoT (Internet of Things) is the network of physical objects-devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity-that enables these objects to gather and interchange data. The internet of things allows objects to be detected and organized remotely across existing network infrastructure. According to the Gartner, 260 million objects will be allied by year 2020. Numerous companies and governments have tried to make references with IoT in initial times, but nowadays in manufacturing, retail and Social Overhead Capital industries, successful best practices are built recently. In this paper I abridged noticeable IoT based service models which are helpful to academic and industrial world to understand IoT business and for implementation of smart city.

Keywords: IoT, Internet of Things, Smart city, SOC, M2M, IoE

I. INTRODUCTION

A new epoch of IoT (internet of thing) service which will connect everything is on the way. Over 12.5 billion devices were already linked in 2010 and about 50 billion devices will be linked by 2020 [1].

However, little is known about the effects of IoT service to consumer deeds. From the consumer point of view, IoT is both opportunity and possible hazard. Known the importance of understanding consumer for successful IoT service spread in the market, it is serious to research major factors and dynamics affecting IoT consumer attitude.

In this paper, the explanation, status, components, and standards of IoT (Internet of Things) are introduced, and possible business models that can implement IoT in a smart city are inspected. There are many research data on IoT and IoT case studies have been conducted as well. However, there were few lessons on IoT business models that were straight applicable to national and regional expansion. This study was conducted to present practical service models using IoT in line with domestic circumstances, and, thereby, it is expected to contribute to academic circles and related industries underline.

II. IOT

- *Definition of IoT*

The speedy growth of information technology (IT) has brought forward a hyper linked society in which objects are linked to mobile devices and the Internet and communicate with one another [2]. In the 21st century, we want to be attached with whatever anytime and anyplace, which is now happening in several places around the world. The core module of this overexcited linked society is IoT, which is also stated as Machine to Machine (M2M) communication or Internet of Everything (IoE).

III. SMART CITY IMPLEMENTATION MODELS BASED ON IOT

Recently, several local governments have been targeting to implement an IoT-based smart city through the structure of a test bed for IoT confirmation and an integrated infrastructure [4]. This movement also resembles to the creative economy that is emphasized by the Nation.

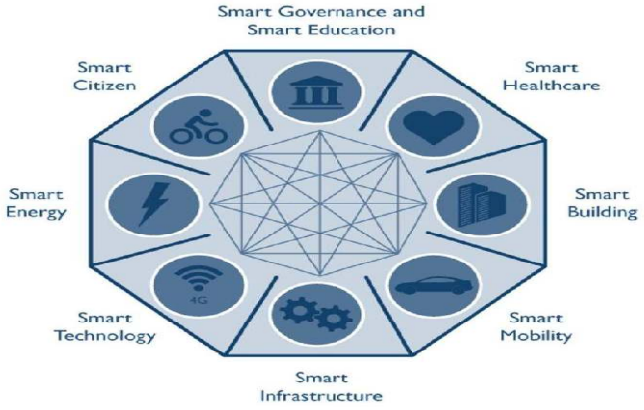

Fig: Smart City Implementation Model

Smart cities:- To make the city as a smart city to involve with the data consume produced from your city and neighborhood.

• Checking of parking areas availability in the city.

• Checking of vibrations and material conditions in buildings, bridges and historical monuments.

• Spot Android devices, iPhone and in general any device which works with Bluetooth connectivity or WiFi .

• Amount of the energy radiated by cell stations and and Wi-Fi routers.

• Checking of vehicles and pedestrian levels to optimize driving and walking routes.

• Discovery of garbage levels in containers to optimize the trash collection routes.

• Smart Highways with warning messages and alterations according to climate conditions and unanticipated events like mishaps or traffic blockages.

• Smart Healthcare Systems.

• Smart Education Systems.

In this section, smart city implementation models based on IoT that can be applied by local governments are defined through examples.

A. Security & Emergencies:-

• Boundary Access Control: Finding and control of people in non-authorized and restricted.

• Fluid Presence: Fluid detection in data centers, sensitive building grounds and warehouses to avoid collapses and corrosion.

• Emission Levels: In nuclear power stations surroundings distributed measurement of emission levels to generate leakage alerts.

• Explosive and Dangerous Gases: Sensing of gas leakages and levels in industrial environments, ambiances of chemical workshops and inside mines.

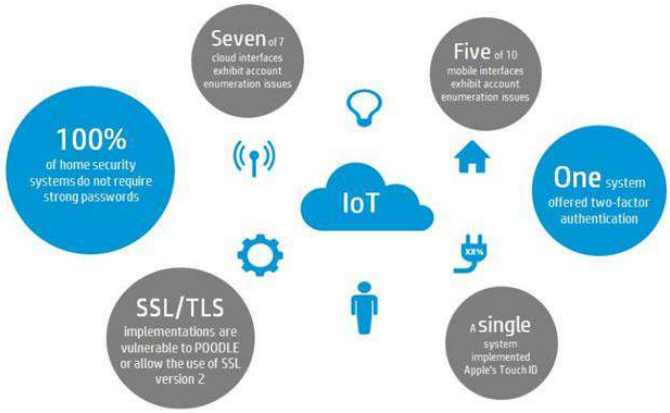

Fig: Smart Security & Emergencies Structure

B. Smart agriculture:-

• Wine Superiority Improving: Observing soil moisture and shaft diameter in vineyards to governor the amount of sugar in grapes and grapevine health.

• Green Houses: Governor micro-climate situations to maximize the production of fruits and vegetables and its quality.

• Golf Courses: Choosy irrigation in arid zones to reduce the water resources required in the green.

• Atmospheric Station Network: Learning of weather conditions in areas to forecast ice formation, rain, drought, and snow or wind changes.

• Fertilizer: Control of humidity and temperature levels in fertilizers, grass etc. to avoid fungus and other microbial contaminants.

Fig: Smart agriculture architecture

***C.** Domestic & Home Automation:-*

In home by using the IoT system remotely observed and manage our home applications and reduce on your monthly expenses.

• Energy and Water Use: Use of Energy and water supply observed to get guidance on how to save cost and resources.

• Remote Control Appliances: Turning on and off remotely appliances to avoid mishaps and save energy.

• Intrusion Detection Systems: Sense of windows and doors openings and violations to prevent intruders.

• Art and Goods Preservation: Observing of situations inside museums and art warehouses.

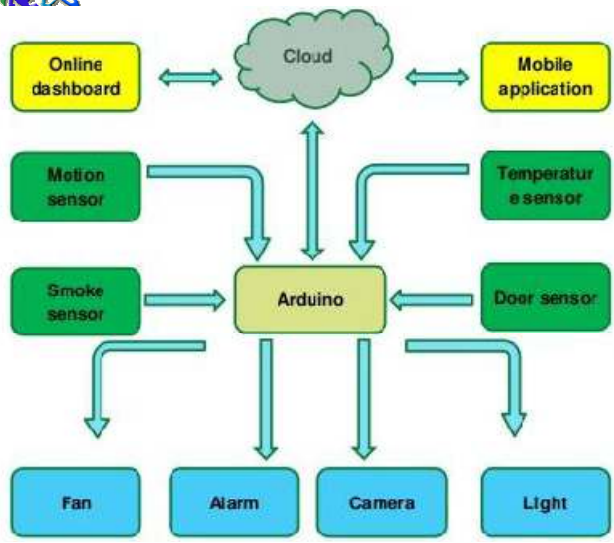

Fig: Smart Domestic & Home Automation

D. Smart Traffic Service:-

Main smart traffic services consist of smart parking services to avoid unlawful parking and help convenient parking [5], resident participation-oriented prohibited parking avoidance services, and smart harmless peaceful crosswalk services. Smart parking states to the building of a platform that enables real-time inspection of available space and parking prices in areas that require parking and assistance of booking/payment via Web and mobile connections. The resident participation-oriented unlawful parking avoidance service is an enhancement of the unlawful parking break down arrangement of the traffic

authority by letting residents (including victims of illegal parking) to expediently report such defilements through their smart phones. Moreover, the smart harmless peaceful crosswalk service can contribute to the avoidance of pedestrian mishaps and secondary car accidents by spotting foot-travelers in children protection zones, and warning foot-travelers and imminent vehicles through electronic display boards

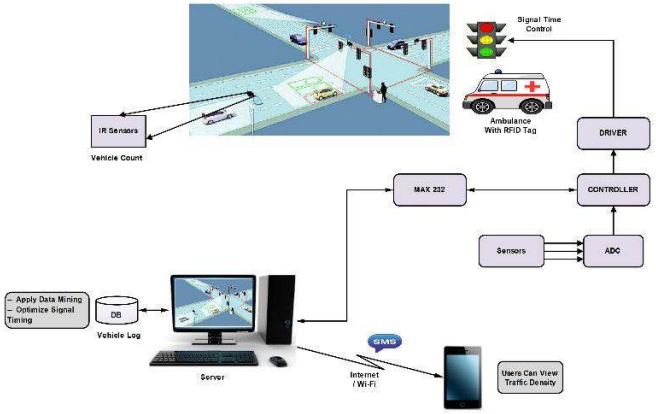

Fig: Smart Traffic Service

E. Medical field:-

• All Finding: Assistance for old or disabled people living independent.

• Medical Refrigerators: Observing and governor of situations inside refrigerator having medicine, vaccine, and organic elements.

• Sportsmen Care: Energetic signs observing in high performance centers and areas.

• Patients Monitoring: Surveillance of situations of patients inside hospitals and in old people's home.

• Ultraviolet Radiation: Measurement of ultraviolet sun rays to advice people not to be bare in certain hours.

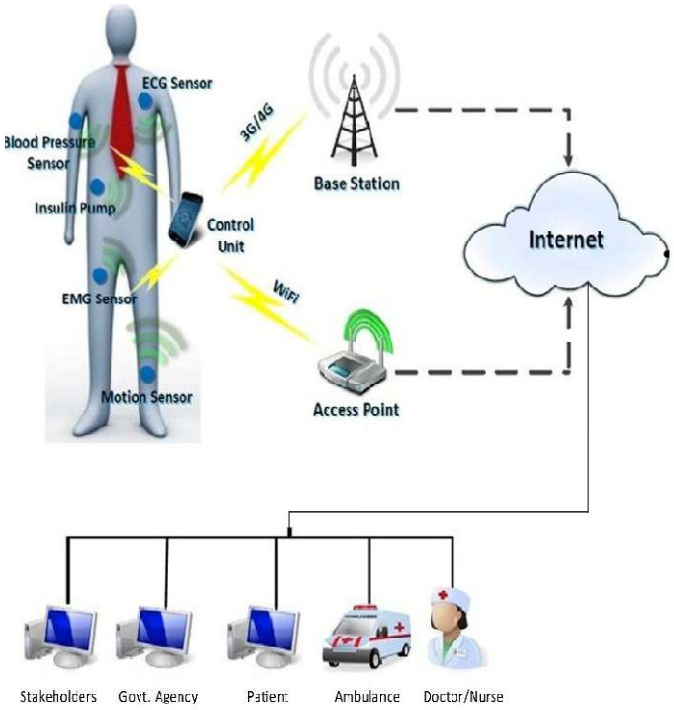

Fig: Smart Medical field

F. Smart Education Service

This facility offers real-time, collaborative high-definition lessons that sense like face-to-face seminars at home via high-definition (HD) facilities and Internet infrastructure. Tutor participate in the session by using equipment in isolated educational institutes or separate places, and even foreign language tutors in other countries can access this facility through the Internet.

Fig: Smart Education Service

IV. CONCLUSION

This study is important in drawing general information about IoT, such as definition, market requirement, and position of IoT, which has become a sizzling IT topic currently, and in giving related IoT business models to support business units and research organizations contributing in associated projects construct a smart city as part of the future dream of native governments by reflecting the novel information model of IoT. A drawback of this research, however, is the lack of obtainable data that hampers the required experimental analysis on the benefits of IoT technology.

Linking those smart nodes or devices to the web has also started happening, even though at a slower rate. The pieces of the technology mystery are approaching together to house the Internet of Things sooner than most people expect. Just as the Internet trend occurred not so long ago and caught like a wildfire, the Internet of Things will touch every part of our lives in less than a decade. We have already seen the extensive applications of internet of things.

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