IOT Based Smart Office Using Wireless sensor Area Network

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Abstract: We propose a smart office system that recognizes office workers' mental and physiological states to improve their quality of life at office. We integrated our systems into a single smart office environment. In this article we show the implementation of the smart office system and the details of each of its components such as I/O device

Keywords: **Internet of things, Smart office**

Introduction

What is a Smart Office?

- It is a workspace where technology enables people to work better, faster and in smarter manner It is also helps people to communicate better.
- Sensor can tell if a person is in the building,where exactly they are at any given movement and even if conference room is booked and for how long
- Smart offices is also offices of future

Objectives

- To save Electrical Energy Consumption: minimize electrical bill
- Automatically air freshening
- To close/open door automatically
- To provide workspace safety

Benefits of Smart Office

- Energy savings: The smart temperature and lightening in the workplace cause to use energy resource more efficiently and save energy
- Comfortable working environment: your work environment impacts your mood, drive and performance.

- Better employee productivity: The design and management of workplaces correlates positively with productivity, creativity and engagement of those who work in them. What smart solutions can help employees' increased productivity
- Increased workplace safety: A well-executed transition to a Smart Office contributes to decreased costs of premise and increased productivity, as well as increasing employee satisfaction

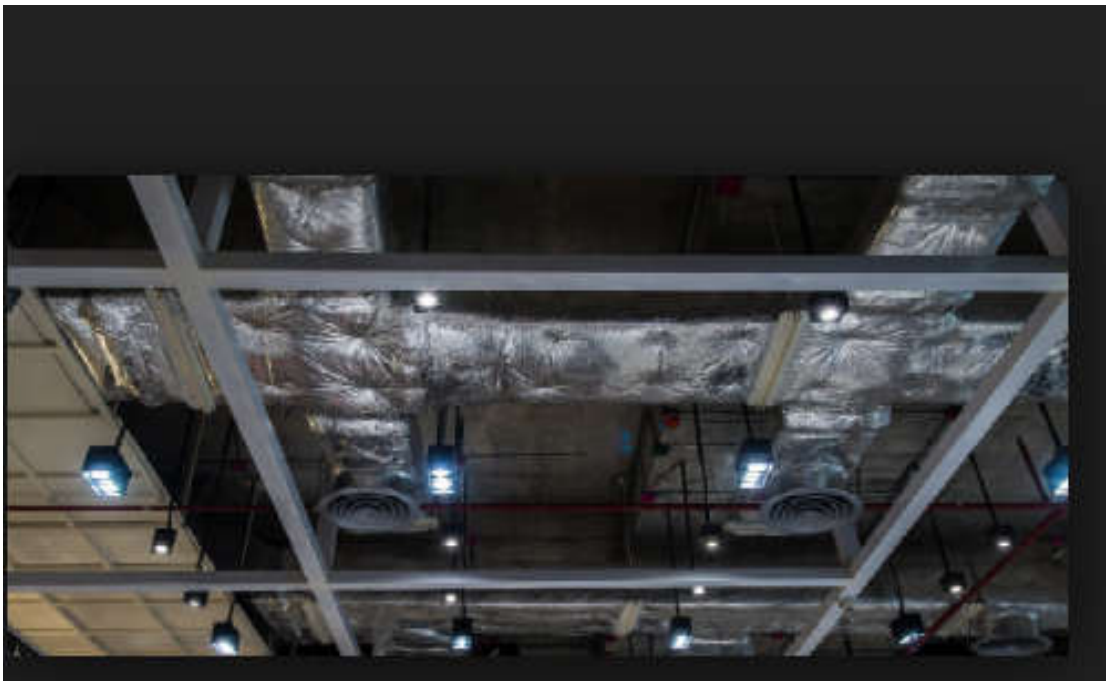
Smart Facilities Provided To Client

- Smart lighting
- Intelligent climate control
- Smart conference rooms, Screen
- Smart Desk
- Video monitoring
- Indoor way finding
- Automatic door opening system
- Smart Parking System

1) Smart lighting



2) Intelligent climate control



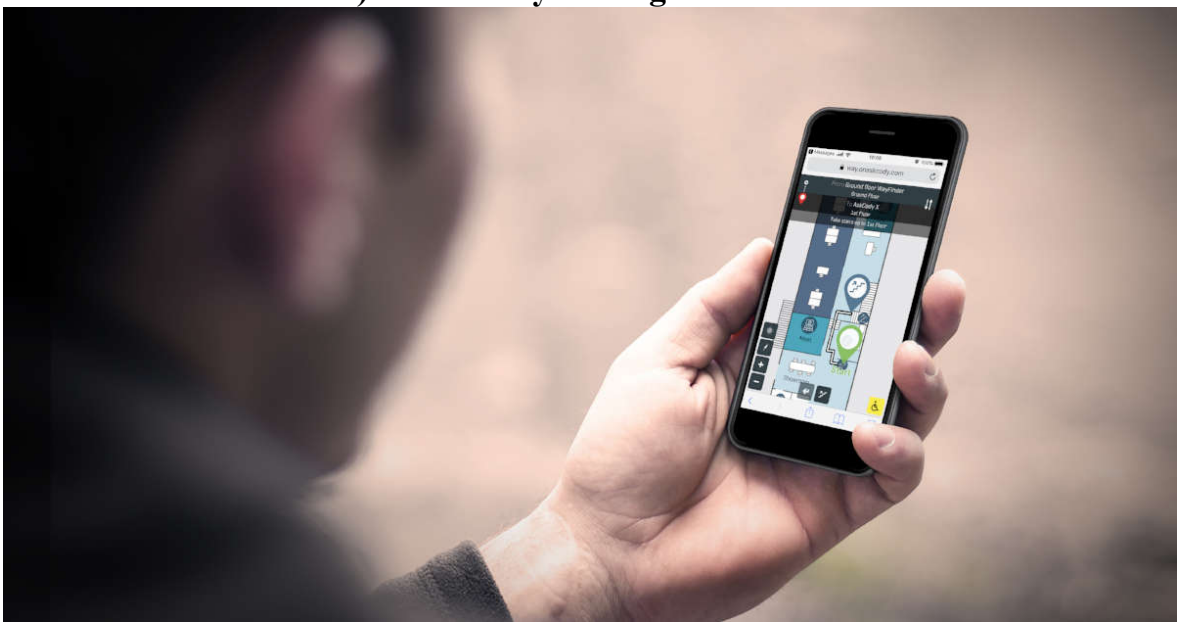
3) Smart Desk



4) Video monitoring



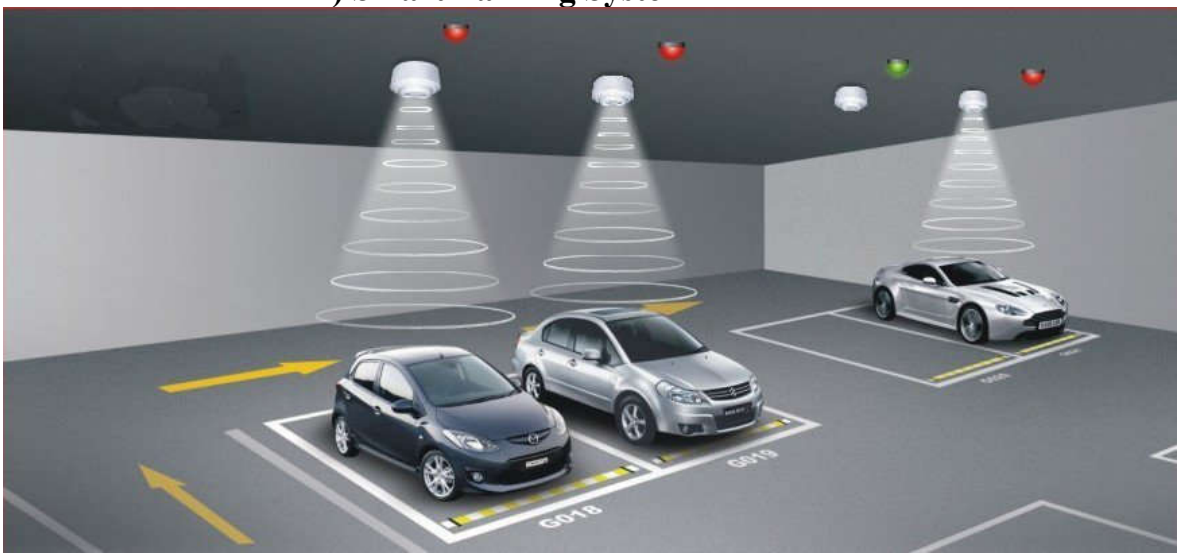
5) Indoor way finding



6) Automatic door opening system

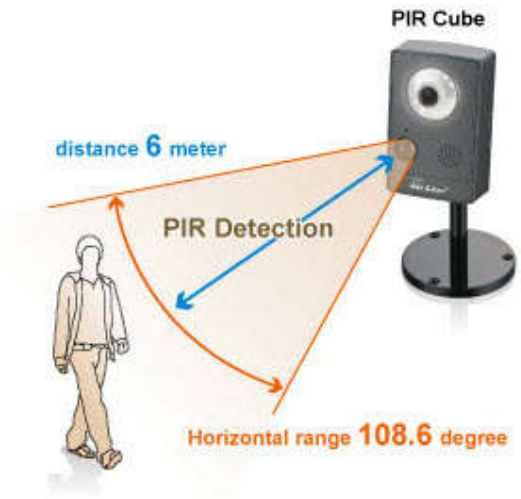


7) Smart Parking System



Types of Sensors

1)PIR Motion Sensor-32



2) Temperature Sensor-33



3) Smoke/Gas/Fire

Alcohol Sensor- 15



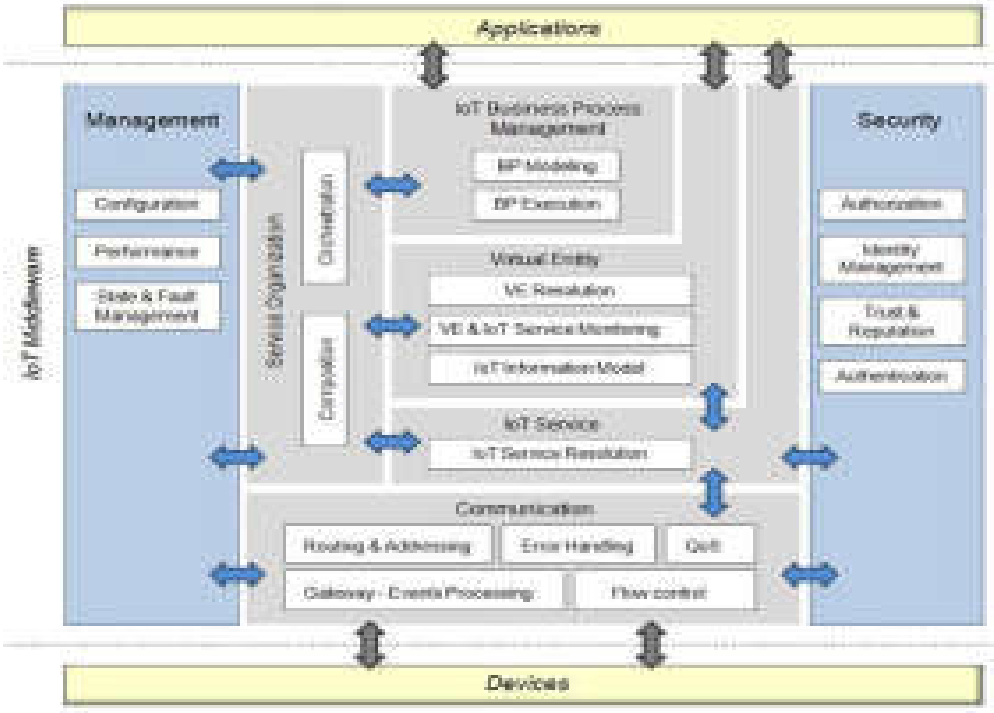
4) **Biometric Sensor- 3**



Architecture of Smart Office:

A general architecture for IoT applications is specifically investigated within the project IoT-A (http://www.iot-a.eu), which also belongs to the IERC participants. IoT-A provides a reference architecture, which can be considered as a generalization of previous research approaches.

The functional view of the IoT-A reference architecture [17], depicted in Figure 1, follows the modular structure of functional blocks organized into layers, as it was proposed e.g. in SENSEI [14]. The middleware layer, encapsulated by the Management and Security modules, includes the Communication module that acts as a gateway to the connected physical devices. Data and interfaces provided by the devices are processed and transformed to respective services by means of the IoT Service and Service Orchestration modules. Connection to external applications and fusion of services into more complex structures of business processes is enabled by the IoT Business Process Management module. Internal Virtual Entity module serves as a virtualization mechanism that



APPLICATIONS

1) Smart Home

Smart Home clearly stands out, ranking as highest Internet of Things application on all measured channels. More than 60,000 people currently search for the term "Smart Home" each month. This is not a surprise. The IoT Analytics company database for Smart Home includes 256 companies and start-ups. More companies are active in smart home than any other application in the field of IoT. The total amount of funding for Smart Home start-ups currently exceeds $2.5bn. This list includes prominent start-ups names such as Nest or Alert Me as well as a number of multinational corporations like Philips, Haier, or Belkin.

2) Smart City

Smart city spans a wide variety of use cases, from traffic management to water distribution, to waste management, urban security and environmental monitoring. Its popularity is fuelled by the fact that many Smart City solutions promise to alleviate real pains of people living in cities these days. IoT solutions in the area of Smart City solve traffic congestion problems, reduce noise and pollution and help make cities safer.

3) Military-Smart Bases

Incorporating IoT devices and sensors into military bases can have several positive effects. Automated security screening, for example, increases safety while decreasing manpower, and a network of security cameras connected to their environment via sensors and to a central network via the Internet will also minimize security risks. Smart management of resources – electricity and water for example – will increase the capacity and output of military bases while ensuring that the wellbeing of all individuals inside the base is protected

References

1)Kiyoshi Kiyokawa et al., “Owens Luis - A Context-aware Multi-modal Smart Office Chair in an Ambient Environment,”Proc. of the 1st International Workshop on Ambient Informa-tion Technology (AMBIT) 2012, 2012

2) P. Barnaghi et al, “D3.6 Final SENSEI Architecture Framework”, Deliverable of the FP7 project SENSEI, Contract No. 215923, 2011.

3) Z. Shelby et al, “Constrained Application Protocol (CoAP) - draft-ietf-core-coap-18”, https://datatracker.ietf.org/doc/draft-ietf-corecoap/, accessed: October 8th, 2013

4)Neha Gabal, Neelam Barak and Shipra Aggarwal, “Motion Detection, Tracking Classification for Automated Video Surveillance”,1st IEEE International Conference on Power Electronics. Intelligent Control and Energy Systems , pp. 1-5,2016

5. B. Gokaraju, D. Yessick, J. Steel, D. A. Doss and A. C. Turlapaty, "Integration of intrusion detection and web service alarm for home automation system using ‘ARM’ microprocessor," SoutheastCon, pp. 1-2, 2016

6. X. Hong, C. Yang and C. Rong, "Smart Home Security Monitor System,"15th International Symposium on Parallel and Distributed Computing,pp. 247-251, 2016

7. Z. He, Y. Fang, N. Sun and X. Liang, "Wireless communication-based smoke detection system design for forest fire monitoring,"31st Youth Academic Annual Conference of Chinese Association of Automation, Wuhan, pp. 475-480, 2016

8. J. Baidya, T. Saha, R. Moyashir and R. Palit, "Design and implementation of a fingerprint based lock system for shared access,"IEEE 7th Annual Computing and Communication Workshop and Conference, pp. 1-6, 2017

Conclusition:

Smart Office System also has several other componentes like safety and security, many safety devices like fire alarm devices is been proposed in the past. Most of the existing alarm systems are based on GSM and GPRS based techniques which are slow in latency as well as quite expensive as the messages and voicemail are not free, in this work we have proposed a novel architecture to offer safety, and automation of the office over IoT architecture. The proposed system can alert the user in case, office catches fire or in case there is an intruder at office, when he is absent. The system as allows the user to operate his office devices purely through his mobile. The entire control and notification system is based on Iot infrastructure,MQTT as well as Gmail are free sites and it can operate over the WiFi data