

An Emerging Technology with Iot Network Communication

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ABSTRACT: The IOT is a network which is capable of connecting the planet with one another with communications between every living and non living things. As it is an emerging technology which has been developing worldwide gradually with the inbound technologies like sensors and embedded products that can make objects we use are made as smart using the iot, but the development variations are huge in number when compared to different countries. There are many types of IOT devices or micro controllers that are used for coding, connecting, sensing, monitoring, and transferring data to other devices.

KEYWORDS: IOT; Network; Sensors; Communication; Smart Parking; Transportation etc

I. INTRODUCTION

The internet of things is typically a network which has everything in it like cloud, RFID, wireless sensor network etc so all the things like coding, designing, data connection, data transfer etc which makes IOT a smarter one of all the existing technologies.

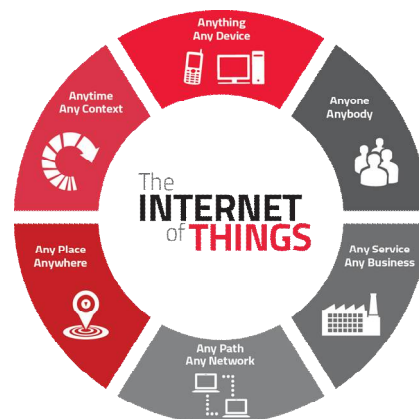


Figure 1.IOT CONNECTION STRUCTURE

The IOT is capable of connecting anything in the world like a connection between a mobile phone to home appliances, computer with enabled data transfer for the communication over the network. It also provides different services for the business solution for making the industrial technology bigger by comparing it to other industries.

According to the Organization for European Economic Co-operation (OEEC) with 34 countries has been found in 1961 after the World War II to increase in the economic progress of the world. They formed a forum for the development of all the economical condition by making the things better in each

country through the growth. They provided the chart for usage of IOT on each country with its online status.

Rank	Country	Devices online	Relative size
1	South Korea	37.9	
2	Denmark	32.7	
3	Switzerland	29.0	
4	United States	24.9	
5	Netherlands	24.7	
6	Germany	22.4	
7	Sweden	21.9	
8	Spain	19.9	
9	France	17.6	
10	Portugal	16.2	
11	Belgium	15.6	
12	United Kingdom	13.0	
13	Canada	11.6	
14	Italy	10.2	
15	Brazil	9.2	
16	Japan	8.2	
17	Australia	7.9	
18	Mexico	6.8	
19	Poland	6.3	
20	China	6.2	
21	Colombia	6.1	
22	Russia	4.9	
23	Turkey	2.3	
24	India	0.6	

Figure 2. List of countries by IoT devices online per 100 inhabitants

It is listed with the following countries which are using the IOT devices for the communication by implementing on the real time usage. South Korea which has the maximum usage of the IOT devices in their country and the least usage or it may be the start to the Indian country for IOT usage. Even the United States which are leading in all the technologies are placed fourth in number. In the upcoming 2020 there will be a massive change in the usage of IOT devices all over the world by implementing smarter things in everything that helps to reduce the man power usage.

II. LITERATURE SURVEY

Automated car parking system is based on miniature model to regulate and manage the number of cars that can be parked in a given parking space in a specific time allocated for particular parking spot. The method of parking is based on automated parking through android application. The command entered is using sensing devices of parking IOT. When the system is automated the human have less work to do [1].The cognitive radio will transmit the vehicle location information and to find the parking space through parking congestion computing center. Cellular automata are used to detect the parking space in IOT. The recommendation will be sent to drivers through wireless communication CR model.it increased the congestion avoidance and reduces parking space time.[2].Intelligent Bicycle Parking System is based on modules of composition and the algorithm of implementation. It demonstrates the work flow of bicycle parking system and analysis the advantages of design. It is based on three subsystems.[3]

III. TYPES OF IOT DEVICES & USAGES

A. PanStamp

PanStamp are the autonomous low power wireless programmable modules it uses arduino IDE for coding. The 868-900-915 MHz bands are used with alkaline batteries which could be used for even a year depending on the duty period of the process programmed in it. The panStamp are used to measure temperature, humidity and light intensity etc. It cost around 16 dollars

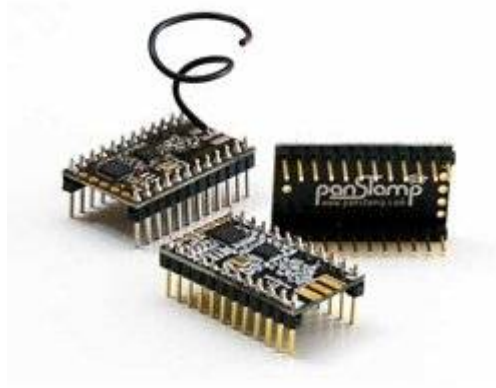


Figure 3.panStamp Module

B. TinyDuino

TinyDuino is one of the ultra compact microcontroller boards with a size of a coin which is Arduino compatible board with same Atmega328p microcontroller and 14 digital input/output pins and 6 analog inputs. It uses 8 MHz ceramic resonator instead of 16MHz that can be operated with Li-ion coin battery.



Figure 4.TinyDuino Microcontroller

C. Arduino UNO

The Arduino Uno is the basic micro controller which is used for IoT is an open-source electronics prototyping platform and it's a very easy user friendly architecture has its own Arduino IDE platform can be code with C,C++ programming languages for the user. It has 14 input/output pins and 6 analog inputs with 16 MHz working.



Figure 5.Arduino Uno Microcontroller

D. RFduino

RFduino is "A finger-tip sized" Arduino compatible, wireless enabled microcontroller, low cost enough to be used in all the projects which is a Arduino-compatible development board. It is a low cost, tiny board with features of the expensive arduino board.

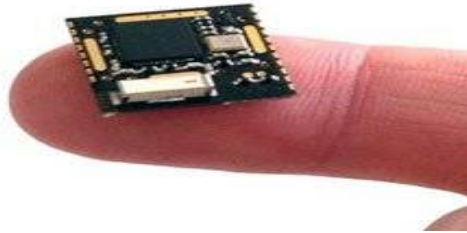


Figure 6.RFduino Microcontroller

E. *Pinoccio*

A wireless, web connected Arduino-compatible microcontroller with WiFi, LiPo rechargeable battery, meshes networking & built-in radio with real time streaming REST API. It uses scout script - instant feedback with no waiting time for compiling. Hq which helps to give your hardware of ease of use GUI environment on API.



Figure 7.Pinoccio

F. *Raspberry Pi*

The Raspberry pie is a next level to Arduino Uno which is single board computer developed in United Kingdom with different manufacturers with same hardware. The Raspberry Pi itself include VideoCore GPU with single or quad core. The size of RAM is 512 MB or 1GB. It also has the microSDHC for boot and storage. The Raspberry Pi is based on the [Broadcom BCM2835 system on a chip](#) (SoC), which includes an 700 MHz [ARM1176JZF-S](#) processor , [VideoCore IV GPU](#) , and RAM. It has a Level 1 [cache](#) of 16 [KB](#) and a Level 2 [cache](#) of 128 [KB](#).



Figure 8.Raspberry Pi Microcontroller

G. *BeagleBone*

BeagleBone is a low powered open source hardware computer with a mini computer capability with ARM Cortex-A8 core processor, HD capable, PowerVR 2D/3D for graphics, 256 MB NAND flash memory. Other added features are DVI-D, S-video, USB OTG, USB port, SD/MMC card slot, Stereo I/O audio, RS-232 port and a5v power socket. It has different types of boards like BeagleBoard-x15, BeagleBone Black, BeagleBone-xM, are added with more features.



Figure 9. BeagleBone Microcontroller

H. WeIO

WeIO is an open source hardware and software for wireless connectivity and rapid prototyping platform. It uses the HTML5 and Python for programming. Plug and web helps to connect easy installation. WeIO uses web of things for connecting and controlling objects from any devices to web browser to smart devices.

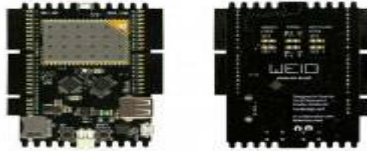


Figure 10. WeIO module

I. UDOO

Ultimate Single Board Mini PC is used for Android and Linux with the Arduino-compatible processor. It has a powerful quad-core processor. It has all I/O pin needed to connect it to external devices with 76 GPIO and with only 3.3 V it can be operated and compatible with all arduino shields.



Figure 11. UDOO Microcontroller

J. The Rascal

The Rascal is a single board computer which is used to monitor and controls the devices remotely. It is compared to the brain of i-Phone with its own web-based editor and works with all arduino shields. Python language is used for programming the board.



Figure 12. The Rascal Microcontroller

IV. CONCLUSION

IOT based microcontrollers are used for making the world smarter and making things easy to be used by everyone. It helps to connect all technology available into a data transferring devices. The Microcontrollers which are discussed above are low cost and more feature enabled devices. The upgraded device modules and micro controllers are available in the market with more added features are periodically updated.

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