JOURNAL OF SOFT COMPUTING AND DATA MINING VOL.1 NO. 1 (2020) 46-54

JSCDM

Journal homepage: http://penerbit.uthm.edu.my/ojs/index.php/jscdm

Journal of Soft Computing and Data Mining

Rise of Big Data Due to Hybrid Platform of Cloud Computing and Internet of Thing

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DOI: https://doi.org/10.30880/jscdm.2020.01.01.006
Received 20th December 2020; Accepted 10th February 2020; Available online 1st March 2020

Abstract: Cloud computing and internet of thing are two main technology which are used in different field of life. Cloud resources are providing as universal tools and any user can rent and release these services with the help of internet. It becomes 21st century technology due to combination of high bandwidth communication and low cost computing with storage. The Internet of Things (IoT) refers to a network comprised of physical objects capable of gathering and sharing electronic information. IoT includes a wide variety of "smart" devices, from industrial machines that transmit data about the production process to sensors that track information about the human body. The integration of these two technologies is known as CloudIoT paradigm. The adoptions of CloudIoT paradigm in the different field of life bring huge change. This paper presents a comprehensive review of the current literature on integration of CC and IoT along with their opportunities in different field of life and due to these two technology Big data issue occur.

Keywords: Cloud computing, Internet of thing, CloudIoT paradigm, CC and IoT challenges

1. Introduction

Cloud computing is contemporary equipment which convenient on the demand network access for sharing and spooling of resources on the network like servers, storages, and different application services. Cloud computing mentions both application and hardware. The application carried as facilities on the internet and the hardware and system software in the data centers storage and other applications services [1]. Cloud computing is the collection of interconnection of different virtualization system they consist of parallel and distributed system. Cloud computing consist of different level of architecture and used for different purpose. People are searching new technology for achieving their demand and cloud computing is one of them, due to storage of huge data and processing time [2]. Normally there are four type of cloud computing. According to the user demand the cloud examination wage-earner. The different organization used the different type of cloud according to their demand and cost [3]. Figure 1 show the structure of cloud computing.

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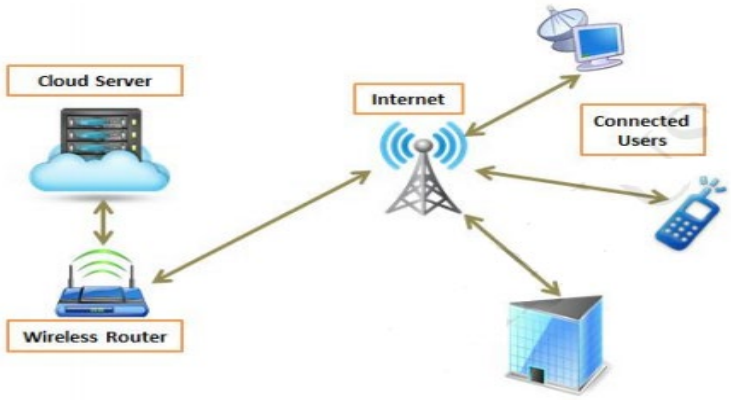

Fig. 1 - Cloud computing

Private cloud computing used for a solitary association and it may be accomplished by the association itself or third parity. It may be sited within the organization or out of organization. A public cloud is an infrastructure which own by an organization selling cloud service for user or any public user and public cloud can be used for public business and so many other activity [4]. Hybrid cloud comprise of two or more cloud computing it's may be private or public and used for different reason and public cloud use for less sensitive data and private used for more sensitive data. Community Cloud when numerous administrations cooperatively build and segment the same infrastructure and as well as their information and values are known as community cloud [5]. Figure 2 show the type of cloud computing.

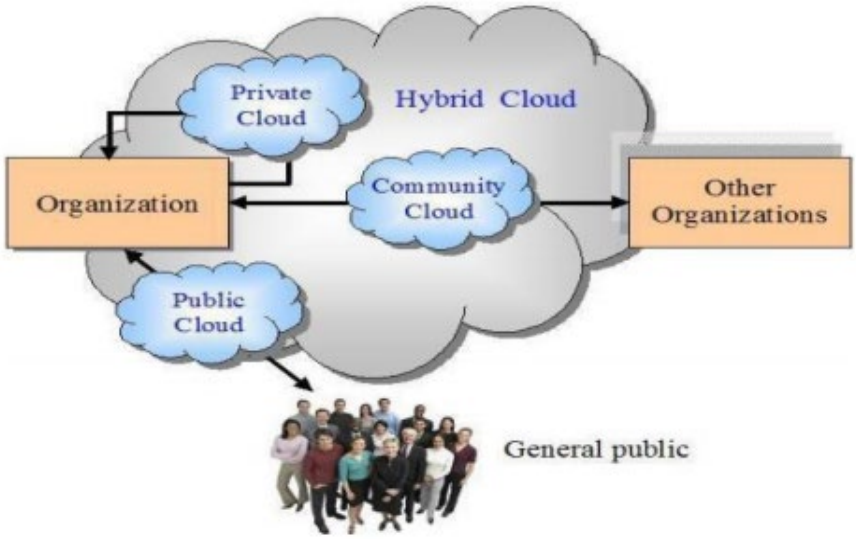

Fig. 2 -Type of cloud computing

Cloud computing architecture normally divided into four layers which hardware layer, software layer, infrastructure layer and platform layer. People adopting new technology in order to achieve their required goals. Cloud computing is one of them people getting a huge amount of data in high speed and large memory storage. The exciting field of cloud computing change in to new it land with large advancement in business and operation [6].The increase of energy and envirment both are concern with cloud computing. Therefore more and more attraction is needed to change cloud computing in to green computing [7].Cloud computing used in different field of life with user get the data with different rule and payment method. Internet of thing (IoT) consists of intelligent and self configuration node or things that are interconnected in dynamically with global infrastructure. It is one of the main disruptive technologies with pervasive computing scenarios [8]. IoT are generally known as with real world and small thing consist of limited storage and processing time, capacity. They device are connected with other connection for processing. While cloud computing consist of unlimited storage and processing system [9].Figure 3 shows structure of IoT.

Fig 3 - Structure of IoT

CC and IoT are two main technology and used in different field of life. IoT, the term first introduced by Kevin Ashton in 1998, is a future of Internet and ubiquitous computing [10].The architecture of IoT is usually considered to be 3-layer, with Perception layer, Network layer, and Application layer, but some add two more layers are Middleware layer and Business layer then it becomes five layer [11].Figure 4 shows the four layer of IoT and it explain that each layer are used for what purpose and using which technique.

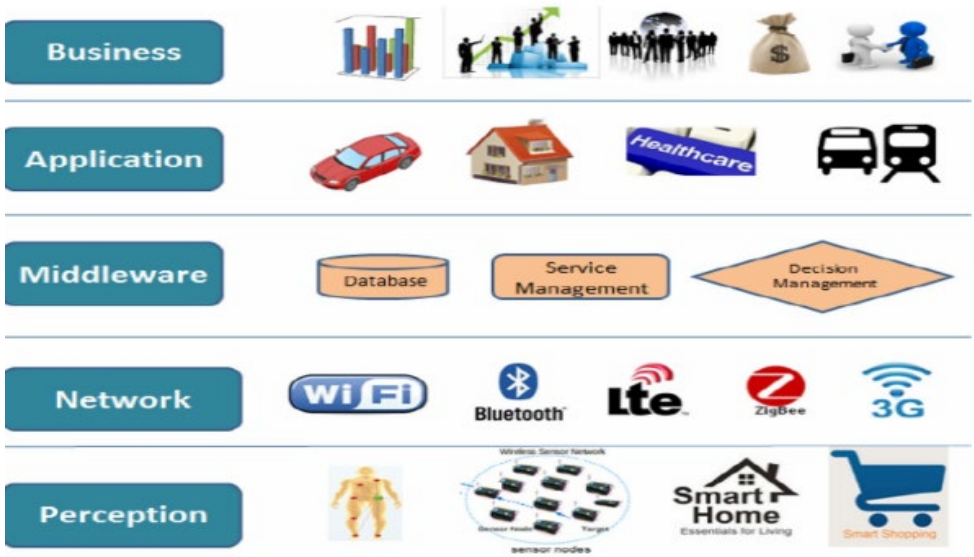

Figure 4: Layer of IoT

Different technologies are used for connection and communication of IoT which are given. Radio-Frequency Identification (RFID) systems composed of one or more readers and several tags. These technologies help in automatic identification of anything they are attached to, and allow objects to be assigned unique digital identities, to be integrated into a network, and to be associated with digital information and services [12].Addressing wireless technologies such as RFID and WiFi, IoT paradigm is transforming the Internet into a fully integrated Future Internet. While Internet evolution led to an unprecedented interconnection of people, current trend is leading to the interconnection of objects, to create a smart environment. Sensor network consists of large number of sensing services which can interconnect .These devices are equipped with enough power to process and support different image from local area. The use of (VSNs) are monitoring of very [13]. Middleware due to the heterogeneity of the participating objects, to their limited storage and processing capabilities and to the huge variety of applications involved, a key role is played by the middleware between the things and the application layer, whose main goal is the abstraction of the functionalities and communication capabilities of the devices [14]. Figure 5 shows the different technology of IoT and where they are used for what purpose they are used.

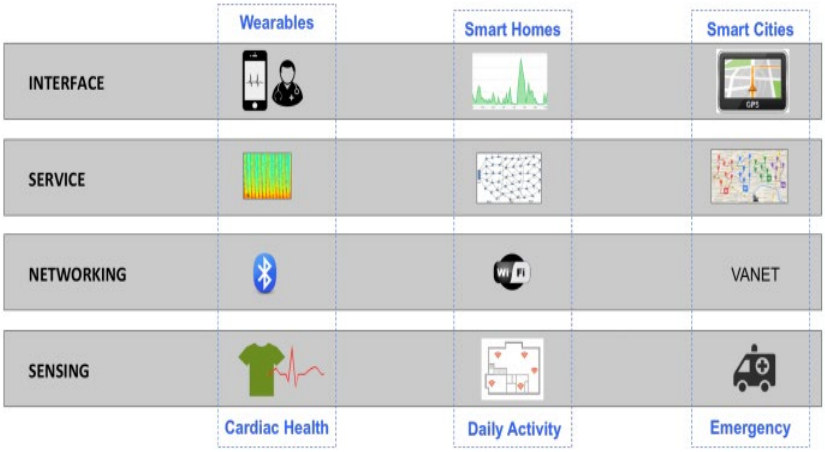

Figure 5 - Technology are used in IoT

Another key component in IoT environments is represented by sensor networks. For example, they can cooperate with RFID systems to better track the status of things, getting information about position, movement, temperature, etc. Sensor networks are typically composed of a potentially high number of sensing nodes, communicating in a wireless multi-hop fashion [15].Table 1 show the basic information about IoT.

Table 1 - Basic information about IoT

Year	Industrial involvement and participation
2000	First internet based refrigerator plan by LG
2003	First paper about IoT present in UN by International Telecommunications Union (ITU)
2008	First European IoT conference was held it consists of different companies who lunched IP base thing and it was approved.
2009	When Cisco start Business Group on based of IoT it was major change
2010	Chinese Govt start industry based on IoT
2011	IPV6 Star new protocols and allow for 340, 282, 366, 920, 938, 463, 463, 374, 607, 431,768,211 456 (2128) addresses

2. Integration of CC and IoT

CC and IoT are the two main technologies which are in every field of life. Some of the main feature of cloud computing and internet of thing are store both technology are internet ,service on the internet ,application over the internet and energy efficiency due to these character both technology are merge together. Through the integration of IoT and Cloud we have the opportunity to expand the use of the available technology that provided in cloud environments. Applications and information that use the Internet of Things technology with this integration can be used through the cloud storage [16].Figure 6 show the different between these two technologies.

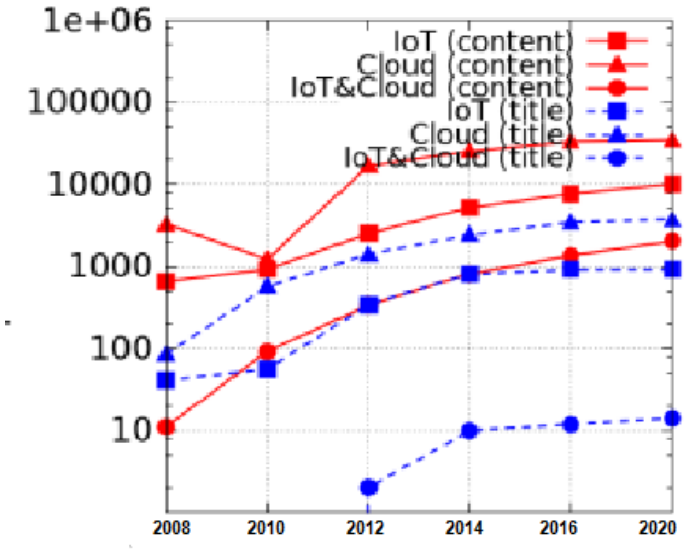

Figure 6: Show the different of two technologies

Figure 6 tell the story that from 2008 to 2010 cloud computing was the large user but from onward it change IoT take the place. From 2016 the new technology CloudIoT is the most user technology of the world. CloudIoT paradigm big data analytic are fall into two main categories. These are capacity and performance. Tables 2 show the main difference of these technologies.

Table 2 - The main difference between CC and IoT

Cloud Computing	Internet of Things
Means to manage big data	Big data source
Service delivery	Limited storage
Unlimited computational	Limited computational
Virtual resources	Real world
Ubiquitous	Pervasive

Table 3 - Services of CloudIoT paradigm

SaaS	**Sensing as a Service**	**Which give access to sensor data**
EaaS	Ethernet as a Service	Connectivity provide to remote device
SAaaS	Actuation as a Service	Control system used
IPMaaS	Identity and Policy Management as a Service	Policy and management system are allow
DBaaS	Database as a Service	Data control and management system
SEaaS	Sensor Event as a Service	Display message service

SenaaS	Sensor as a Service	Manage remote sensor
DaaS	Data as a Service	Give access any type of data

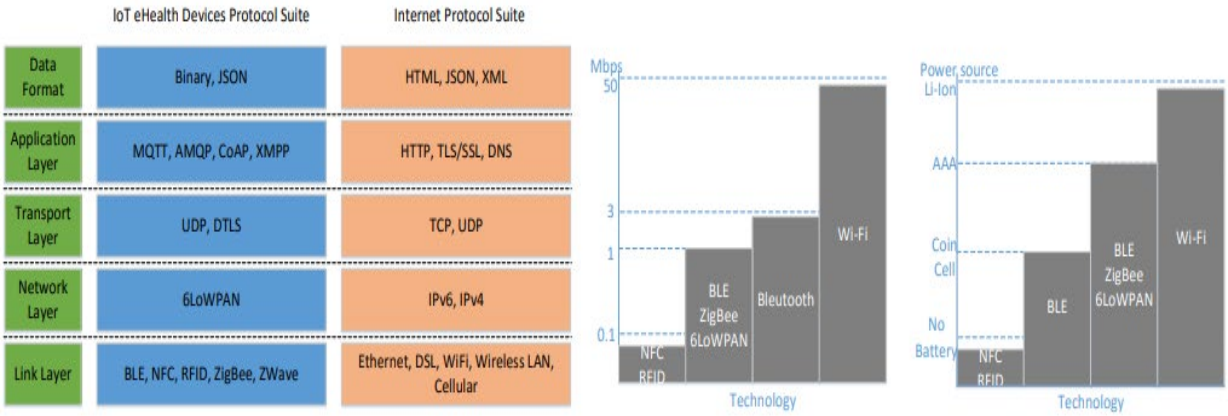

Figure 7 - Different protocols and technique used in CloudIoT paradigm

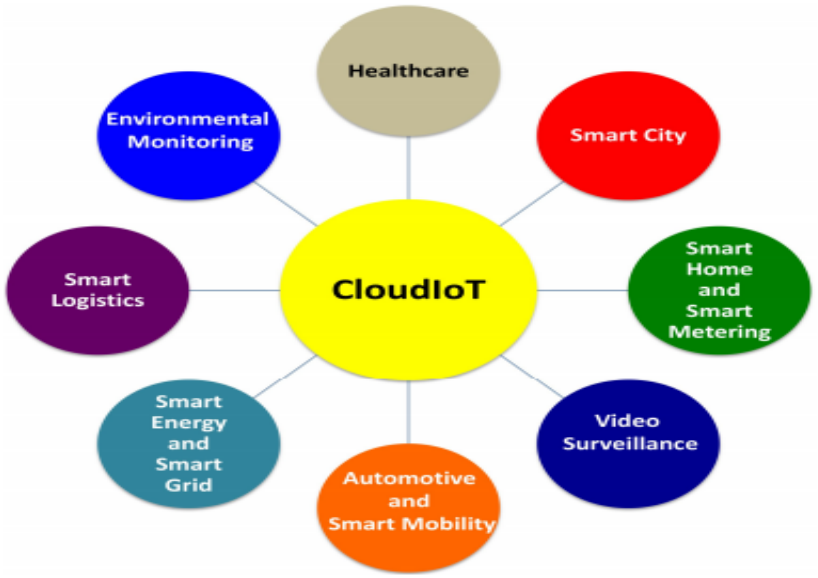

Figure 8 - Use of CloudIoT paradigm in different area of life

Figure 8 shows the different use of CloudIoT paradigm in different field of life where different user can get and use them according to their demand and use.

3. Big Data Concept

Big data consist of many digital earth sources including sensor, numerical molding, video, email and other social resource, and data type consist of text and different video, graphical .Big data relate the massive data sent that we get after sorting, analyzing and visualizing for their process .These data are generated from online transaction, email audio, image click, log and much other resource like heath networking, science. They store on data base and make problems in the process of managing sharing and visualization .From the past 20 year the data size increased in a large number from different field. According to the report of International Data Corporation (IDC) in 2012 it was (1021TB) which is

increased 20 times now days. Big data need revaluation change in to modern data analysis that can be achieved by these three components, variety, velocity and volume [17]. More than 50% present are living in city and they get the effective integration of sensing, email, social media, network, and they get standard life. Nearly future 70% present of world population will joined the city life in 2030,according to this growth of population facing different issue in energy face ,data store face ,also differ field . Volume refers: The amount of all type of data they are generated from different source and continue to expand. These consist of large amount of hidden data and make creation information and data analysis .Varity: means different type of data collected from different social media. Such kinds of data are video text and audio and most of the data are generate from mobile data. Velocity: refer the speed of data transfer and content of data may be changing due to verity of thing therefore velocity of data change from time to time Value is the most important aspect of big data and it refers the processing the discovering value from the hidden data set change from time to time [18].Figure 9 show data classification.

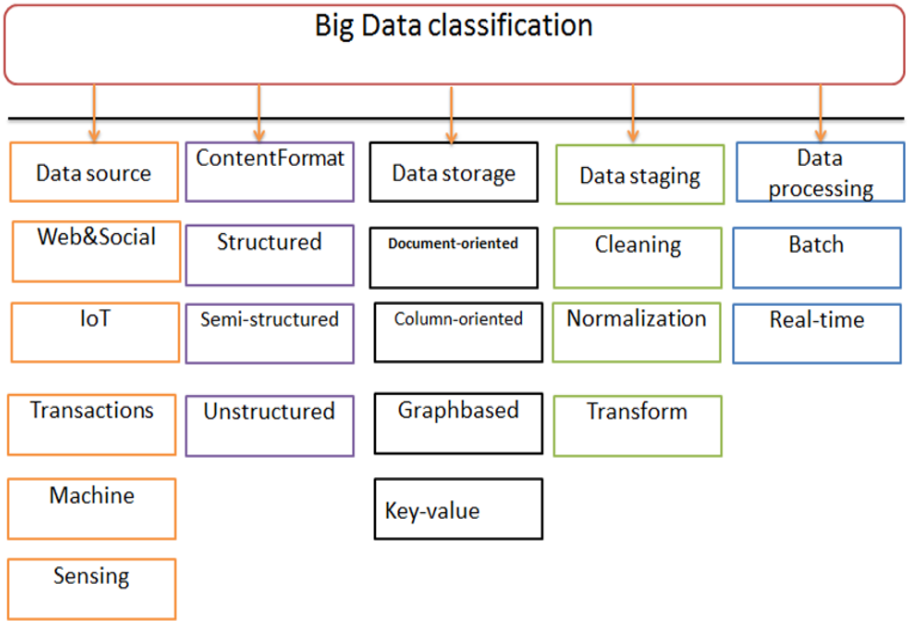

Figure 9 - Big data classification

Through traditional database technologies. The nature of big data is indistinct and involves considerable processes to identify and translate the data into new insights. The term “big data” is relatively new in IT and business. However, several researchers and practitioners have utilized the term in previous literature. For instance, referred to big data as a large volume of scientific data for visualization. Several definitions of big data currently exist. For instance, defined big data as “the amount of data just beyond technology's capability to store, manage, and process efficiently.” Meanwhile, big data as characterized by three Vs: volume, variety, and velocity. The terms volume, variety, and velocity were originally introduced by Gartner to describe the elements of big data challenges. IDC also defined big data technologies as “a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data, by enabling the high velocity capture, discovery, and/or analysis.” [20]. specified that big data is not only characterized by the three Vs mentioned above but may also extend to four Vs, namely, volume, variety, velocity, and value .Figure 10 show the big data element.

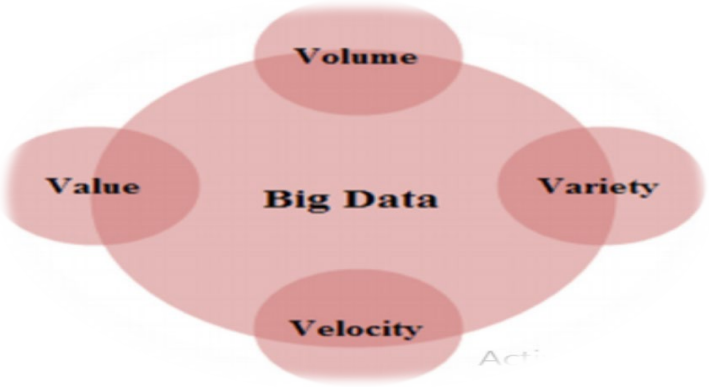

Figure 10 - Big data element

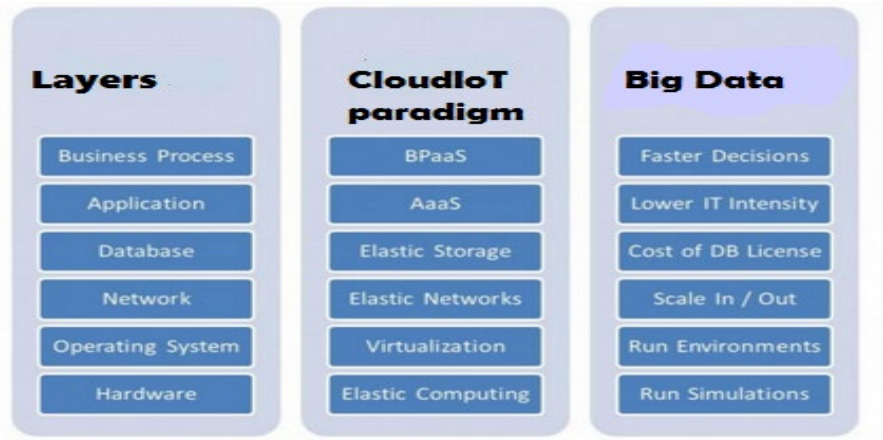

Figure 11 - Layer in which data are generate

Figure 11 show the layer in which different data are generate or data produce in which layer and it make big data issue in new technology.

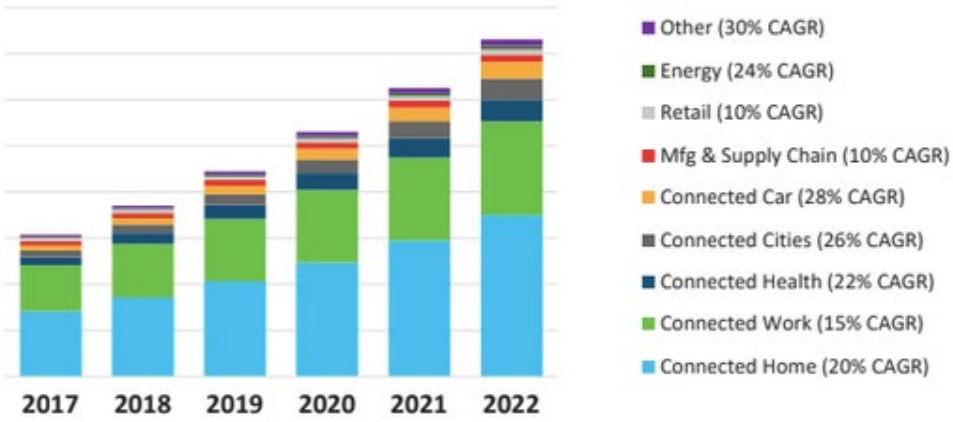

Figure 12 - Energy used in new technology

4. Conclusion

The combation of internet of thing and CC are the big step in future of internet the combations of these two technologies are known as CloudIoT paradigm. In this paper, we surveyed the literature in order to identify the complementary aspects of Cloud and IoT and the main drivers for integrating them into a unique environment. Big data is one of the main issues in the new technology. The size of data at present is huge and continues to increase every day. The variety of data being generated is also expanding. The review covered volume, scalability, availability, data integrity, data protection, data transformation, data quality/heterogeneity, privacy and legal/regulatory issues, data access, and governance. After that some main issue facing this technology are Security and privacy, Intelligence, Integration methodology. Network communications, Storage, Scalability and flexibility, Security and privacy, Network communication.

Acknowledgement

The authors would like to thank Universiti Tun Hussein Onn Malaysia (UTHM) Ministry of Higher Education (MOHE) Malaysia for financially supporting.

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