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From Internet-of-Things to Cloud Internet-of-Things

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ABSTRACT

Internet of things is the biggest promise of the technology today, but still lacking a novel mechanism to support using of IOT, which can be perceived through integration of IOT features with cloud environment. In this paper review the phases of integration, challenges facing, the need to propose new model and techniques to deal with it, the new vision of the IOT, and the new paradigm that appears according to cloud-IOT like in smart objects-oriented IOT.

Cloud computing depend on sharing of resources, which is key requirements for IoT platform. The Cloud Computing is not only sharing the resources but also increasing the resources. It is in addition location independent; the users access the cloud services from any location and with any devices through the internet connection. When we talk about the IoT platform then it should also be access from wherever, all time. The virtualization of physical devices is another important characteristic, virtualization allow users to easily share the devices. Expected to virtual world nature, it is also more uniform. The multiply feature of cloud computing allows resources to be shared with multiple users across spatial and temporal distribution. Moreover, Cloud offer resistance and scalable of resources and application, the service and resources are easily accessible and available. Therefore the convergence of Cloud and IoT can provide massive opportunities for both technologies.

***Keywords* - Cloud computing , IOT , cloud-IOT.**

I. INTRODUCTION

The paradigm of the Internet-of-Things (IoT) is quickly becoming a reality, with day-to-day applications continuously and unnoticeably emerging in all contexts of our lives [1]. For example, terms such as smart home or smart transportation have been coined to describe entire categories of products for use in domestic and public transportation environments, many of which are already commercially available. As an example of the latter, smartphone applications that enable us to find and reserve the nearest free park space near our place of work or screen the energy The feasting of our homes is not only a reality today, but also a window into the future "Smart Life". These scenarios and all other application scenarios of the Internet of Things currently conceived and processed share the concept of "intelligence", which is equivalent to the concept of the Internet of Things. While each of such “smart applications” can bring some improvements to the quality-of-life of common citizens in it own right, the fact that they are developed for separated (in the following referred to as “vertical”) scenarios is in contrast to the universal, seamless (“horizontal”) vision of IoT[2].

From an architectural point of view, as far as wireless communication technologies are concerned, the main challenge is interoperability. Solving this challenge requires unifying the "protocol layer", to stand between the transport and application layers, so as to enable seamless integration of various communication technologies under it.

However, the Internet of Things (IoT) is based on intelligent and self-configuring nodes (things) interconnected in a dynamic and global network infrastructure. It represents one of the most disruptive technologies, enabling comprehensive and pervasive computing scenarios. The Internet of Things is generally characterized by real world and small objects with limited storage and processing capacity, and subsequent issues of reliability, performance, security, and privacy. On the one hand, cloud computing has almost unlimited potential in terms of storage and processing power, and it is a more mature technology, and most of the problems of the Internet of Things have been at least partially solved. Hence, a novel IT pattern in which Cloud and IoT are two corresponding technologies merged together is expected to upset both current and future Internet [59], [23] .And more issues related that open the area to proposed new technologies base on cloud-IoT.

II. BACKGROUND

In reviews the literature about the of Converting from IoT to cloud-IoT and reason to solve more challenges that facing IOT.A further advantage of the Cloud model is the flexibility of implementation [59], that increase the integrating of the cloud computing with IOT. Integrations appeared new paradigm and model like a cloud-based IoT mashup service model, called IoT Mashup as a Service (IoTMaaS) [9] ,that propose Integration of Cloud Computing and Internet of Things [10] where the new model involve information gathering , processing and transmissions will produce new challenges which can be addressed and also in multi-cloud environment [30] , challenges face the development of applications related to objects, such as end-user scalability, data storage, objects constrained by heterogeneous resources, variable geospatial deployment, or energy efficiency [3] [4]. Context-aware Dynamic Discovery of Things (CADDOT) developing an ideal of sensor configuration model for the IoT

[11], with the last semantic web addressing schemes interact with each other and They cooperate with their neighbors to reach common goals [12].an agent-oriented middleware for the development and deployment of CSOs, and Body Cloud, a platform for the integration of sensors on the Cloud .

The authors[67] have adopted an open architecture for the IoTCloud framework which, from a bird's-eye view, consists of four primary components: 1. IoTCloud Controller. ,2. Message Broker 3. Sensors,4. Clients in figure 3.

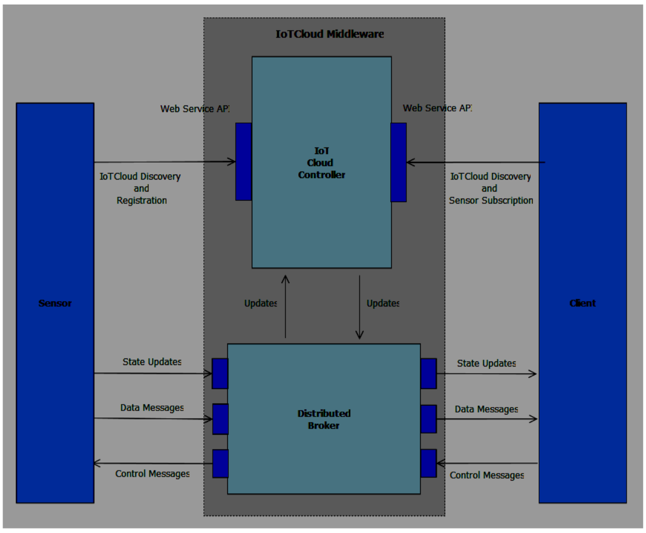


Figure 3. IoTCloud Architecture

III. PHASES OF THE TRANSITION FROM IOT TO CLOUD INTERNET-OF-THINGS

There is several fuzziness about the concept of Internet of Things such as IoT can be broken in two parts Internet and Things. The worldwide network of interconnected computer networks based on a standard communication protocol; the Internet unites (TCP/IP) while a thing is an object not precisely identifiable [2-6]. The convergence of sensors such as smart objects, RFID-based sensor networks, and the Internet has given growth to the IoT. With increased usage of sensors the raw data as well as distributed data is increasing [7].to deal with these huge data there are more proposed solution to deal with and defined new paradigm related. proposed a new mashup service model [9], named IoT mashup as a service (IoT MasS), defined as the configuration of the thing model, the software model, and the computational resource model. During mashup process, three components can be customized depending on end users' preference; end users can select things, processing software, and amount of computation resource to use at run-time. This model relieves heterogeneity of devices following the idea of model driven architecture (MDA), bringing interoperability among devices and mashup service, and not restricting them on the specific platform and protocol. An object definition in IoT MasS is an identifiable object that can have sensing and actuation services. When manufacturers make a product, they select an appropriate combination of input and output. While a product may have many internal sensors and actuators for dealing with input and output, respectively, manufacturers must decide the product's functionalities to expose. These exposed functionalities become sensing and actuation service, which form a thing model with an identifier for identification of the thing in a network.

In [10], the authors summarize the issues solved and the advantages obtained when adopting the CloudIoT according to complementary characteristics of Cloud and IoT arising from the different proposals in literature show in tab1 and inspiring the CloudIoT paradigm that is

1.Storage resources. IoT involves a large amount of information sources (i.e., the things), which produce a huge amount of non-structured or semi-structured data [30] having the three characteristics typical of Big Data [61]: volume (i.e., data size), variety (i.e., data types), and velocity (i.e., data generation frequency). Hence, it means collecting, accessing, processing, visualizing, archiving, sharing and searching large amounts of data [50].Cloud is the most convenient and cost-effective solution for handling data generated by the Internet of Things [50] by providing unlimited, low-cost, and on-demand storage. This integration achieves a new convergence scenario [47], in which new opportunities for data aggregation [32], integration [56], and sharing with third parties [56] emerge. Once in the cloud, data can be processed homogeneously through standard APIs [32], protected by implementing high-level security [27], directly accessed and visualized from anywhere [50] . This integration achieves a new convergence scenario [47], where new opportunities for data aggregation [32], integration [56], and sharing with third parties [56] arise. Once in the cloud, data can be processed homogeneously through standard APIs [32], protected by implementing high-level security [27], and directly accessed and visualized from anywhere [50].

2. Computational resources. IoT devices have limited processing resources that do not allow on-site data processing.. The unlimited processing capabilities of Cloud and its on-demand model allow IoT processing It must be accurately satisfied and enable exceptional analyses of complexity [27], [47]. Data-driven decision making and prediction algorithms can be made at low cost and will provide increased revenue and reduced risk [56].Other perspectives are to perform real-time (on-the-go) processing [50], [27], to implement scalable, real-time, and collaborative, sensor-centric applications [32], to manage complex events [50], and the implementation of offloading tasks to save energy [53].

3.Communication resources. One of the needs of IoT, TABLE I show Complementarity and Integration of Cloud and IoT.

IoT Cloud Ubiquitous (usable resources (things placed everywhere) from everywhere) Real-world objects Limited virtual resources Almost unlimited computational capabilities Limited storage or virtually unlimited storage capabilities The Internet as the Internet's convergence point for service delivery big data source means to accomplish big data is to make IP-enabled devices communicate through dedicated hardware, and supporting such communication can be very expensive. Cloud offers an effective and cheap solution to connect, track, and manage anything from anywhere at any time using customized portals and built-in apps [50].

With the availability of high-speed networks, it enables the monitoring and control of distant objects [50], [32], [47], their coordination [32], [47], [52], and their communications [32],and the real-time access to the produced data [50].

4. New capabilities. Internet of Thing is characterized by a very high heterogeneity of devices, t¬echnologies, and protocols. Therefore, it can be very difficult to get scalability, interoperability, reliability, efficiency, availability, and security. Integration with the cloud solves most of these problems [32], [27], [52] and also provides additional features such as accessibility, ease of use, and lower deployment costs [27].

TABLE I: Complementarity and Integration of Cloud and Internet of Thing [10].

IoT	Cloud
pervasive (things placed in all places)	Ubiquitous (resources usable from in all places)
real world things	virtual resources
Limited computational capabilities	virtually unlimited computational capabilities
Restricted storage or no storage capabilities	virtually unlimited storage capabilities
Internet as a idea of convergence	Internet for service delivery
big data source	means big data management

5.New paradigms. The adoption of the CloudIoT paradigm enables new scenarios for smart services and applications based on the extension of Cloud through the things [50], [52] likes SaaS (Sensing as a Service) [50], [56], [27], providing ubiquitous access to sensor data, SAaaS (Sensing and Actuation as a Service) [50], enabling automated control logic applied in the cloud, SEaaS (Sensor Event as a Service) [50], [27], dispatching messaging services triggered by sensor events, SenaaS (Sensor as a Service) [56], enabling ubiquitous management of remote sensors, DBaaS (DataBase as a Service) [56], enabling ubiquitous database management, DaaS (Data as a Service) [56], providing ubiquitous access to any kind of data, EaaS (Ethernet as a Service) [56], providing ubiquitous layer-2 connectivity to remote devices, IPMaaS (Identity and Policy Management as a Service) [56], enabling ubiquitous access to policy and identity management functionalities, and VSaaS (Video Surveillance as a Service) [49],provide ubiquitous access to recorded videos and perform complex analytics in the cloud.

The application scenarios driven by the CloudIoT model are:

1)Healthcare. IoT and multimedia technologies have made their entrance in the healthcare field thanks to ambient-assisted living and telemedicine [57]. systematic innovation of Healthcare and enable cost effective, efficient, timely, and high-quality ubiquitous medical services [41], [33].Pervasive healthcare applications generate a vast amount of sensor data that t must be properly administered for further analysis and processing [29]. The adoption of Cloud in this scenario leads to eliminating the need for expertise in, or control over, the technology infrastructure [15], [43], and it represents a promising solution for managing healthcare sensor data efficiently [29]. It also makes mobile devices suitable for communicating, accessing, and communicating health information, also on the go [46], which enhances medical data security, availability, and redundancy [41], [15].

2) Smart City. IoT can provide common middleware for future-oriented smart city services [17], [52], obtain information from various heterogeneous sensing infrastructures, access all kinds of geographic locations and IoT technologies (e.g. geo-tagging ,and 3D representations through RFID sensors), and exposing information in a regular way. The integration of sensors and actuators, thus creating platforms able to provision and support ubiquitous connectivity and real-time applications for smart cities [45]. Cloud infrastructure, whilst at the same time meeting complex public sector requirements for Cloud, such as security, heterogeneity, interoperability, scalability, and extensibility, high reactivity, and configurability [17], [52]. Common problems are related to security, resistance, and real-time interactions [52].

3) Video Surveillance. Becoming an alternative to stand-alone internal management systems, complex video analytics require cloud-based solutions (VSaaS [49]).Proposed solutions [34] intelligently store and manage video content originating from (IP and analog) cameras, and efficiently deliver it to multiple user devices through the Internet with physical server resources on-demand, in a load-balanced and fault tolerant fashion.

4) Automotive and Smart Mobility. Providing universal access to recorded video and integrating cloud technologies with WSNs, RFID, satellite networks, and other intelligent transmission technologies presents a promising opportunity to address key current challenges [38]. A latest generation of IoT-based vehicular data Clouds can be developed and deployed to bring many business advantages, such as recommending car maintenance or fixing, reducing road congestion, managing traffic, and increasing road safety [38]. Which also include temporary vehicular Clouds (i.e., formed by the vehicles representing the Cloud datacenters [20]). More in general, ethernet and IP-based routingare claimed to be very important technologies for future communication networks in electric vehicles, enabling the link between the Internet and the vehicle electronics, integrating the vehicle into a typical IoT, and and meeting the demand for robust communications with cloud-based services [37].

5) Smart Energy and Smart Grid. The integration of Cloud platforms in this IoT scenario increases the concerns about security and privacy issues for Smart Grid software

deployment for utilities [10]. These concerns must be appropriately addressed to realize the full potential of such an application: consumers must gain greater confidence in sharing data to help improve and improve the services provided [51].

6) Service delivery. Cloud IoT can enable efficient, scalable, and easily-extensible IoT service delivery [42].Networking and Communication Protocols. CloudIoT involves machine-to-machine (M2M) communications among many heterogeneous machines with different protocols [19], which depend on the certain application scenario. Dealing with this variability to manage things in a uniform way while providing the required performance [22], [18] is a challenge. Most application areas do not include mobility: in stationary scenarios, IoT often adopts IEEE 802.15.4/6LoWPAN solutions [48]. On the other hand, other scenarios such as vehicle networks mostly adopt the IEEE 802.11p specification.

7) Big data. The spreading of mobile devices and sensor pervasiveness, indeed call for scalable computing platforms (every day 2.5 quintillion bytes of data are created) [28]. Treatment this data in good manner is a critical challenge, as the overall application performance is highly dependent on the properties of the data management service [28]. Hence, following the NoSQL movement, both commercial and open source solutions adopt alternative database technologies for big data [25]: time-series, key-value, document store, wide column stores, and graph databases. Unfortunately, there is no perfect data management solution for the cloud to manage big data [56].

8) Sensor Networks. It defined as the major enabler of IoT [56] and as one of the five technologies that would constitute the world, offering the ability to measure, conclusion and understanding environmental indicators, from sensitive environments and natural resources to urban environments [35].Recent technological advances have made efficient, low-cost, and low power reduction devices available for use in large-scale, remote sensing applications [14]. In this context, the timely processing of massive and streaming sensor data, which is subject to power and network limitations and uncertainties, has been identified as the main challenge [58].Moreover, with the lack of mobility being a typical aspect of popular IoT devices, the mobility of sensors offered by smartphones as well as wearable electronic devices presents a new challenge [48].

9) User Participation. It would be convenient to give the opportunity to users to participate in submitting data that represent a thing [16].Users could also enable with new building blocks and tools: accelerators, frameworks and toolkits will enable users to participate in the Internet of Things as in the Internet through wikis and blogs [26].

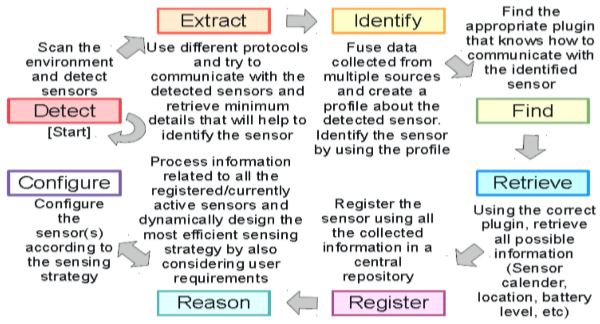
10) Monitoring. is an essential activity in Cloud environments for capacity planning, for managing resources, SLAs, performance and security, and for troubleshooting [13].the importance of sensor configuration, several major challenges and factors that need to be considered. The process of sensor configuration

IV. CONTEXT-AWARE DYNAMIC DISCOVERY OF THINGS (CADDOT)

In the IoT is significant due to two major reasons. First, it establishes the connection between the sensors and the software systems that allow data to be retrieved from the sensors. Secondly, it allows optimizing the sensing and data communication by considering several factors. We summarize the needs to configuration the sensor in the IoT environment to major factors that are : 1) the number of sensors, 2) heterogeneity, 3) scheduling, sampling rate communication frequency, 4) data acquisition, 5) dynamicity, and 6) context [21].to start direct communication between the sensor hardware and cloud-based IoT middleware named " Smart Link tool and other tasks are performed by cloud-based IoT middleware" ,using wireless technologies (GPRSGSM , ZigBee , WiFi, Bluetooth). Figure 1 describes The Context-aware Dynamic Discovery of Things (CADDOT) main phases of the proposed model [11]

Fig. 1: CADDOT Model for Sensor Configuration

The System Architecture of The CADDOT model consists of three main components: sensors, a mobile device (i.e.SmartLink), and the cloud middleware.



The three components need to work collectively in order to successfully perform sensor detection and configuration. The implementation ror CADOTT model needs hardware Setup that employed the Global Sensor Network (GSN) [64] middleware as the cloud IoT platform and hosted it on a laptop With 4GB RAM and an Intel Core i5 CPU during a proof of concept. However, our CADDOT model can accommodate any other IoT middleware as well.. We deployed the SmartLink application in a Google Nexus 4 mobile phone (Qualcomm Snapdrago S4 Pro CPU and 2 GB RAM), which runs Android platform 4.2.2 (Jelly Bean). and software setup where GSN [64] is developed in Java. We extended GSN using the techniques proposed in [55], so it can configure itself accordingly. The Android platform has been used to develop the SmartLink application.Helpful Hints.

V. FUTURE INTERNET OF THINGS

The author in [24] explored Internet of Things is a vision which is under development and there can be many stake

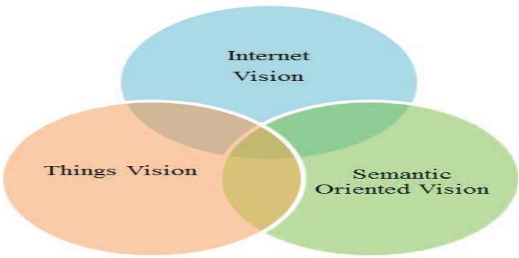


Fig.2Three Main Visions of Internet of Things

holders in this development depending upon their interests and usage A simple and broad definition of the internet of things [31,36].Fig.2 show three main visions of internet of things that discussion given by [39] .

Things Oriented Vision The tracking of anything done by using sensors and pervasive technologies using RFID[40]. The basic philosophy is Friday identifying any object using specifications of Electronic Product Code (EPC) .This technique is extended using sensors. It is important to appreciate the fact that future vision will depend on sensors and their capabilities to achieve "things" oriented vision. We'll be able to collectively create the data with the help of sensors, the kind of embedded sensor system. The brief vision will be based on sensor-based networks as well as RFID-based sensor networks that will be concerned with the integration of RFID-based technology, sensors, advanced computing, and a global connectivity philosophy [24].

Things Oriented Vision it supported by RFID[40] identify any object using specifications of Electronic Product Code (EPC)and the future depend upon sensors and its capabilities to fulfill the "things" oriented vision, based on RFID and advanced sensing and computing devices and the global connectivity philosophy [24].

Internet Oriented Vision it need to connected smart objects that have attributes of IP protocols as one of the major protocols being followed in, it makes the base For embedded smart objects that can be expected to be small computers with computing resources.

Semantic Oriented Vision powered by the fact that the number of sensors which will be available at our disposal will be huge and the data that they will collect will be enormous in nature. We are able to convert datasets into homogeneous and heterogeneous formats, then the interoperability problems of understanding the data will depend on the semantic techniques of data processing.

VI. SMART OBJECTS-ORIENTED IOT

The Internet of Things (IoT) represents a world-wide network of heterogeneous cyber physical objects [54] such as sensors, actuators, smart devices, smart objects, RFID, embedded computers. The authors in [44] show that a networking perspective, IoT represents an ecosystem of interconnected "cyber-physical things" that are uniquely addressable, provide specific services and communicate through standard protocols [60].here there are two importance paradigms are: Agent-based Computing paradigm models distributed software systems in terms of multi-agent systems (MAS). In particular, agents are networked software entities that can perform specific tasks for a user and have a degree of intelligence that permits them to perform parts of their tasks independently and interact with their environment in a useful way. Agents are characterized by important features (e.g. autonomy, sociality, rationality, responsiveness, reactiveness, situatedness , mobility) [62], which make them very suitable to effectively model CSOs.

Cloud Computing paradigm provides flexible, robust and powerful storage and computing resources, which supports extreme scale computation through virtualization, dynamic data integration and fusion from multiple data sources [63].

Things include actuators ,sensors,, sensor networks, embedded systems, RFID tags and readers, etc. Such things can be deployed and exploited in different physical environments to support diversified cyber-physical applications domains. They are communication-oriented objects that provide identification and storage of information (e.g. RFID tags), information collection (e.g. sensor networks) , information processing (e.g. sensor networks and embedded devices), and control and actuation (e.g. Embedded systems including smart actuators and objects). The main disadvantages are that such huge heterogeneity of things makes distributed communication and particularly management very complex and that "intelligence" is not embedded, so it should be provided at a higher level by means of smart environments-based system[44]. A high-level layered architecture for the smart objects-oriented IoT, where the main four layers are:

1.The Application layer, which includes services and applications based on SOs and also on their cyber-physical and/or business-oriented IT infrastructures.

2. The Middleware layer, which provides a set of fundamental mechanisms for SO naming, discovery, high-level interaction (and coordination), and management.

3.The Internet layer, which embodies application, transport, and network protocols for effectively supporting communication with and among SOs.

TABLE II: Topics and challenges pertaining CloudIoT.

4. The Smart Object layer, which makes it available programming frameworks and tools for the design and implementation of SOs- The Smart Object layer, which makes it available programming frameworks and tools for the design and implementation of SOs..

The proposed Cloud-assisted and Agent-based IoT (CAIoT) architecture consists of a set of fundamental agents, embedded in the cyberphysical environment, integrated with a cloud computing platform.

As the Internet of Things continues to develop, further potential is estimated by a combination with associated technology approaches and concepts such as Cloud computing, Big Data, , Future Internet robotics and Semantic

VII. OPEN ISSUES AND FUTURE DIRECTIONS

standardization of IoT and Cloud paradigms, a clear importance of standard protocols, architectures and APIs is being demanded in order to facilitate the interconnection between heterogeneous smart objects and the creation of enhanced services. Moreover, the latest technologies lack domain-specific environments for rapid development and resourceful CloudIoT service delivery. Indeed, most architecture proposed at the initial stage of IoT either have come from the WSN perspective or are based on Cloud at the center.

The need for Standards there is deployment and energy saving.

New Protocols. MAC and routing protocols are essential for the system to function efficiently.Even though several protocols have been proposed for various domains (with TDMA, CSMA ,and FDMA schemes), none of them It has been accepted as a standard, and with the increasing number of things, more research is needed. IETF ROLL workgroup (which deals with routing over low-power lossy networks) claims that existing routing protocols such as OSPF, IS-IS, AODV, and OLSR have been round to not satisfy Routing requirements for Low Loss Power Networks (LLNs) in their current form (e.g. typical point-to-multipoint traffic patterns, optimization for energy saving, restricted frame-sizes, limits in trading efficiency for generality). Therefore RPL (ripple) protocol outline has been proposed [65].

TABLE II: Topics and challenges pertaining CloudIoT.

	Efficiency	Scalability	Extensibility	Reliability	Security	Privacy	Interoperability	Availability	Mobility	Pervasiveness	Energy saving	Uniformity	Maintainability	Cost effectiveness	Large scale
The Service delivery	yes	yes	yes	No	No	No	No	No	No	No	No	yes	yes	yes	yes
The Monitoring	yes	yes	yes	yes	yes	yes	No	No	No	No	No	No	No	No	No
Big Data	yes	yes	No	No	No	yes	yes	yes	yes	No	No	yes	No	yes	yes
Sensor Networks	yes	No	No	yes	No	No	yes		yes	yes	yes	yes	No	yes	yes
User Participation	No	No	No	No	No	yes	No	yes	yes	yes	yes		No	yes	yes
Networking and Communication Protocols	yes	No	No	No	No	No	No		yes		yes	yes	No	No	No

As brief in Table II ,in the following we report how providing confident capabilities has shown challenging in the fresh Literature when addressing several main topics pertaining to CloudIoT.

Complex Data Mining. Existing technologies are not able to fully solve all the issues related to the complexity of big data. The large number of big data producers and the high frequency of data generation, and the gap between the data available to organizations and the data they can process is getting wider. New techniques and query improvements are required to analyze large amounts of data faster with resource and energy efficiency [56]. Noted that data coming from IoT elaborations are not always ready for direct consumption using visualization platforms. New visualization schemes have to be developed (e.g. GIS , 3D), in order to generate attractive and easy-to-understand visualizations [35].

Participative Sensing. The problem of missing samples is critical in anthropocentric sensing.In fact, relying on users volunteering data is a severe limitation of the ability to produce meaningful data.In fact, relying on users volunteering data is a severe limitation of the ability to produce meaningful data.Furthermore, issues of data ownership and privacy must be addressed and appropriate engagement incentives must be defined to achieve genuine end-user engagement [35].

Energy Efficient Sensing. WSN typically consists of lowcost, low-power, and energy-constrained sensors. Each operation, calculation, and inter-communication consumes the node energy. Several technologies can be adopted to achieve

The CADOTT model can facilitate very high dynamicity and mobility. HomeOS [66] is a home automation operating system that simplifies the process of connecting devices together. Similar to the plug-in architecture, HomeOS is based on applications and drivers that are expected to be distributed via an online store called HomeStore in the future. Enabling technologies for the Internet of Things such as sensor networks,RFID, mobile Internet, M2M, semantic data integration, IPv6, semantic search, etc.

VIII. CONCLUSIONS

In this paper, we have provided the change from IOT to cloud _IOT with novel architecture and the features and advantages. The application driven by the Cloud-IoT like smart cites, healthcare, Video Surveillance, big data, etc. future internet of things that classified in to three type according to interests and usage simple and broad definition of the internet .In the last show internet of things cloud paradigm is for smart objects-oriented IoT systems based on Cloud and Agents, cloud assisted and agent-oriented smart objects could be used as basis for the development of large-scale IoT services and systems, BodyCloud is a platform for the integration of sensors on the Cloud. The platform must be complemented by a software engineering approach.

Future work will be focused developing an efficient technique to identify a given sensor using context information and probabilistic techniques in circumstances where information extracted in step 2 in CADDOT model is not adequateon ,defining a novel methodology for the development of IoT applications, simulation-based prototyping and develop of Cyber Physical System.

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