MODERN IDEAS OF INTERNET KNOWLEDGE AND CLOUD COMPUTING

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Abstract

The computer science and electronics are the notable technological advances. Modern service innovation is an important encouragement and enabled by developments of information technology. A fairly recent technical development is classified Ideas of Internet Knowledge (IOIK) based on the devices and objects of the Internet. The IOIK also means that individual objects, and interrelated collections of objects e.g. home connected electronic devices with help of internet (Wi-Fi) and cars, can be made uniquely identifiable by radio tags, sensors and actuators and thereby become virtually represented in wireless and wired internet structures in the form of consciousness of the Ideas of Internet Knowledge and Cloud Computing. The IOIK has the potential to deliver solutions that improve security, health, education and many other aspects of daily routine life. This paper discusses on the vision, challenges, and technological blocks of the Ideas of Internet Knowledge and its various applications. And also covers the future development and challenges.

Keywords- *Ideas of Internet Knowledge (IOIK), Applications Cloud Computing, Wireless Sensor Network (WSN).*

I. INTRODUCTION

The Ideas of Internet Knowledge and cloud computing is the extension of the Internet and the Web. In the IOIK, everything real becomes virtual which means that each person and thing has a locatable, addressable and readable counterpart on the Internet. These virtual entities can produce and consume services and collaborate towards a common goal. The user's phone knows about the physical and mental state through a network of devices that surround his body, and can act on his behalf. This concept in future in which digital and physical entities can be linked by means of appropriate information and communication technologies, to enable a whole class of applications and services. In this article, we present a survey of technologies application and challenges of Ideas of Internet Knowledge and Cloud Computing,

II. CONCEPTS, DEVICES AND RESOURCES

Internet Knowledge is related to the integration of the physical world with the virtual world of the Internet. There are physical objects one wants to track, to monitor and to interact with examples include inanimate objects like pallets and boxes containing consumer goods, cars, machines, fridges and maybe even the infamous carton of milk or cup of yoghurt as well as animate objects like animals and humans. These are the Internet entities of interest. In order to monitor and interact with one or more entities and make the connection to the Internet, technical communication devices are required. The devices are embedded to connect the installed in the environment of the things to be monitored. Devices are a subset of all the things in the internet concept. However, reasons of clarity for this case where the concept, the device and the entity of interest should be treated as a special case. Devices usually host resources: these are computational elements that provide the technical link to the entities of interest e.g., they offer information about the identifier or sensed data, and they may provide actuation capabilities as well as access to resources from the outside world. Finally

happens through services. Resources may offer a service interface directly, or services inside the network act as proxies for the actual resources, possibly providing additional levels of aggregation and abstraction. These services can be used as the most appropriate when accessing resources directly through various technology components implementing.

Services: System integrators and service organizations provide integration and solution for implementation of services to IOIK projects.

Software: Middleware and application infrastructure vendors provide information for analytical engines regarding IOIK endpoints and enable upward market solutions.

Hardware: Global Processing System chips, sensors, actuators, and embedded and external hardware devices capture location and status information.

Network: Network access, satellite, and transport infrastructure vendors provide the network connectivity that underlies IOIK solutions.

Solutions: Business intelligence and analytical software solutions such as data mining and predictive analytics, video image analysis, pattern recognition, and artificial intelligence algorithms determine whether to act on or ignore a pattern.

III. APPLICATIONS

There are several application domains which will be impacted by the emerging Internet of Things. The applications can be classified on the bases of the network availability, coverage, scale, heterogeneity, repeatability, user involvement and impact. We categorize the applications into four application domains:

1. Personal and Home
2. Utilities
3. Mobile.

3.1 Personal and Home:

The sensor information collected is used only by the individuals who directly own the network usually Wi-Fi is used as the back bone enabling higher bandwidth data (video) transfer as well as higher sampling rates (Sound).

Applications of IOIK

IOIK gives a perfect platform to realize the vision using body area sensors and IOIK to upload the data to servers. For instance, a Smartphone can be used for communication along with several interfaces like Bluetooth for interfacing sensors measuring physiological parameters. So far, there are several applications available for Apple iOS, Google Android, Ubuntu and Windows Phone operating systems that measure various parameters. However, it is yet to be centralized in the cloud for general users to access the same control of home equipment such as air conditioners, refrigerators, washing machines etc., They will allow better home and energy management. This will see consumers become involved in the IOIK revolution in the same manner as the Internet revolution itself. An interesting development will be using a FaceBook like concept where individual concept in the house can periodically

message the readings which can be easily followed from anywhere in the world.

3.2. Utilities:

The information from the networks in this application domain is usually for service optimization rather than consumer consumption. It is already being used by utility companies for resource management in order to optimize cost verses profit. These are made up of very extensive networks for monitoring critical utilities and efficient resource management. The backbone network can vary between cellular, Wi-Fi and Satellite communication. Smart grid and smart metering another potential IOIK application which is being implemented around the world. Efficient energy consumption can be achieved by continuously monitoring every electricity point within a house and using this information to modify the way electricity is consumed. This information at the city scale is used for maintaining the load balance within the grid ensuring high quality of service. Video based IOIK, which integrates image processing, computer vision and networking frameworks. It will help to develop a new challenging scientific research area at the intersection of video, infrared, microphone and network technologies. Surveillance, the most widely used camera network application helps to track targets, identify suspicious activities and monitor unauthorized access. Water network monitoring and quality assurance of drinking water is another critical application that is being addressed through IOIK. Sensors measuring critical water parameters are installed at important locations in order to ensure high supply quality. This avoids accidental contamination among storm water drains, drinking water and sewage disposal. The same network can be extended to monitor irrigation in agricultural land.

3.3. Mobile:

Smart transportation and smart logistics are placed in a separate domain for data sharing and backbone
implementation. Urban traffic is the main contributor for traffic noise pollution and a major contributor to urban air quality degradation and greenhouse gas emissions. Traffic congestion directly imposes significant costs on economic and social activities in most cities. Supply of chain efficiencies and Productivity including just-in-time operations are severely impacted by this congestion causing freight delays and delivery schedule failures. The transport IOIK will enable the use of large scale WSN for online monitoring of travel times, origin–destination (O–D) route choice behavior, queue lengths and air pollutant and noise emissions. The IOIK is likely to replace the traffic information provided by the existing sensor networks of inductive loop vehicle detectors employed at the intersections of existing traffic control systems. The prevalence of Bluetooth Technology (BT) devices reflects the current IOIK penetration in a number of digital products such as mobile phones, car hands-free sets, navigation systems, etc. There are many privacy concerns by such usages. And digital forgetting is an emerging domain of research in IOIK where privacy is a concern. Another important application in mobile IOIK domain is efficient logistics management. This includes monitoring the items being transported as well as efficient transportation planning.

IV. CLOUD CENTRIC IDEAS OF INTERNET KNOWLEDGE

The vision of IOIK can be seen from two perspectives of Internet centric. The concept of internet architecture will involve internet services which is the main focus while data is contributed by the objects. In the object centric architecture, the smart objects take the center stage. In order to realize the full potential of cloud computing as well as ubiquitous sensing, a combined framework with a cloud at the center

seems to be most viable. The Sensing service providers can join the network and offer their data using as a storage cloud. Analytical tool developers can provide their software tools. Artificial intelligence experts can provide their data mining and machine learning tools useful in converting information to knowledge and finally computer graphic designers can offer a variety of visualization tools. Cloud computing can offer these services as Infrastructures, Platforms or Software where as the full potential of human creativity can be tapped using as services. The data generated, tools used the visualization created disappears into the background and tapping the full potential of the Ideas of Internet Knowledge in various application domains. Cloud integrates all ends by providing scalable storage, computation time and other tools to build new businesses and visualization paradigms. Furthermore, we introduce an important realm of interaction between clouds which is useful for combining public and private clouds using Aneka (It is platform and a framework for developing distributed applications on the cloud). This interaction is critical for application developers in order to bring sensed information, analytics, algorithms and visualization under one single seamless framework.

However, developing IOIK applications using low-level Cloud programming models and interfaces such as Thread and Map Reduce models. To overcome this, we need a IOIK application specific framework for rapid creation of applications and their deployment on Cloud infrastructures. This is achieved by mapping the proposed framework to Cloud APIs offered by platforms such as Aneka. Framework should be able to provide support for:

• Reading data streams either from sensors directly or fetch the data from databases.
• Easy expression of data analysis logic as functions/operators that process data streams in a transparent and scalable manner on Cloud infrastructures.
• If any events of interest are detected, outcomes should be passed to output streams, which are connected to a visualization program.

Using such a framework, the developer of IOIK applications will able to harness the power of Cloud computing without knowing low-level details of creating reliable and scale applications.

V. CHALLENGES AND FUTURE DIRECTIONS

The specific challenges of IOIK include challenges such as privacy, participatory sensing, data analytics, GIS based visualization and Cloud computing apart from the standard WSN challenges including architecture, energy efficiency, security, protocols, and Quality of Service. The ultimate goal is to have Plug and Play smart objects which can be deployed in any environment with an interoperable backbone allowing them to blend with other smart objects around them. Standardization of frequency bands and protocols play a pivotal role in accomplishing this goal. A roadmap for key developments in IOIK research in the context of pervasive applications is shown, in which includes the technology drivers and key application outcomes expected in the next decade. The section ends with a few international initiatives in the domain which could play a vital role in the success of this rapidly emerging technology able to navigate the data better than ever before. With the emerging 3D displays of navigate system, this area is certain to have more research and development opportunities.

VI. CONCLUSION

The devices with communicating–capabilities is bring closer to the vision of IOIK, where the sensing and
actuation functions seamlessly blend into the background and new capabilities are made possible through access of rich new information sources. The evolution of the next generation

mobile system will depend on the creativity of the users in designing new applications. The IOIK is an ideal emerging technology to influence the domain by providing new evolving data and the required computational resources for creating revolutionary applications we present here a user centric model for approaching this goal through the interaction of private and public clouds. Allowing for the necessary flexibility to meet the diverse and sometimes competing needs of different sectors. It provides us a framework allows networking, computation, storage and visualization themes separate. Thereby of independent growth in every sector but complementing each other in a shared environment. The consolidation of international initiatives is quite clearly accelerating progress towards IOIK, providing an overarching view for the integration and functional elements that can deliver an operational IOIK.

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