Research on Application of Key IoT Technology and Computer IoT Technology

Maliping

Shanghai Overseas Chinese Vocational and Technical College 201514 Shanghai China

Abstract: China has enjoyed breakneck development of technology in these years, Internet technology is widely used in diverse industries, and by virtue of its advantages, draws wide attention and becomes the modern society's key technologies. Adoption of key IoT technology and computer IoT has boosted advancement of medical service, traffic and transportation, power grid management, people's daily lives and agriculture, so they are indispensable support for smart cities. In this context, this paper first introduces the definition, features, and structure of Internet of things, and from the perspective of reality, makes in-depth analysis of key technology of Iot and its application in hopes of giving the value of IoT full play in people's daily lives.

1. Introduction

Internet of things is an inevitable product of civil and scientific development. As we enter the information age, information technology is creating a new wave of scientific revolution. Internet of things comes into being at this moment, combining Internet with offline resources. It facilitates urban construction and promotes upgrading of different industries. Having become a vital engine of social progress in this new era, IoT technology undertakes the responsibilities to modernize cities, make cities more digitalized and intelligent. It also provides a new door and perspective for intelligent, convenient and efficient urban life. It has a great prospect for development and is bound to play more positive roles. Therefore, the application value of key IoT technology and computer IoT is large, and it is directly connected to construction of smart cities and improvement of people's lives.

2. Definition of Internet of Things

2.1. Definition of Internet of Things

The word "IoT" is not new to anyone living in the modern world, and it has penetrated into every aspect of daily life. Internet of things refers to the technology of connecting things through the Internet and indicates the scientific progress in the information age[1]. It is proposed and established one the basis of Internet development and is extension of functions of Internet. Besides, IoT can realize connection of resources, devices, controllers and sensors by technical measures. Build new platforms for materials, human resources and effective applications, and creates Internet networks for remote control and intelligent control. It is also worth a mention that all elements including communication, resources and devices involved in Internet of things are becoming private and personalized.

2.2. Features of IoT

The private and personalized characteristics mentioned above are two prominent features of IoT, which are reflected in the following aspects: first, things in IoT refer to not only virtual things, but also physical things, and all things are effectively identified; second, things in IoT can realize exchange of

digital information and physical information in the Internet environment, and can compete with other things in services and resources. Third, the surroundings of IoT can interact with each other through sensors and things in IoT; fourth, things in IoT can realize self-duplication, self-control and have social characteristics.

From the angle of attributes, IoT can break through the limits of space and time through special measures, realize effective connection between things and things, between things and people, and between people and people through the Internet and other channels, so it has the attribute of connection of scenarios, collection, content and concentration.

2.3. Structure of IoT System

In a scientific way, the IoT system can be divided into the following four sub layers.

The first is the perception layer. Different types of sensors are used to collect and analyze the dynamic information, static information, activity trend, surrounding environment and relevant attributes of things involved in the system. According to the tasks, IoT controls all information through effective coordination, inputs acquired information onto the Internet and reaches the goal of resource sharing.

The second layer is the access layer. Existing network facilities including the mobile communication network, satellite network, local area network and wireless network are used to input perceived information onto the network.

The third layer is the network layer. The wireless network platform is built to effectively integrate data to build a super-large new intelligent network and provide a reliant, stable, efficient and safe network platform.

The fourth layer is the service management layer. Existing network information is controlled in real time by large computer systems to provide good environment and quality service for upper layers of the system.

The last layer is the application layer. This layer is the fundamental facilities layer in the IoT system and can provide diversified and personalized application technologies according to the different requirements of IoT for the Internet environment. These technologies include real-time health monitoring, remote health service, intelligent power grid and natural disaster forecast.

3. Key IoT Technology

3.1. Cloud Computing Technology

Cloud computing technology can be used to deploy different computing applications on different computers in the IoT system, but it should be noted that the computers herein do not mean local computers. Through cloud computing, computer users can make flexible use of resources, access computer systems according to actual needs, integrate entities through the Internet, and build an Internet of things through strong computation.

3.2. RFID Technology

In the current social Internet of things, RFID is one of the most widely used key technologies. Many call it digital labelling and it is the core and fundamental part of Internet of things. In actual applications, RFID is used to transmit information and recognize information, and the technical content consists of three elements: the antenna, the reader and the labels. It is an advanced IoT technique in the modern world, and can recognize and manage information in different states. Its advantages are mainly reflected in aspects like saving human labor, strong resistance against disturbance, and strong adaptability, so it is widely adopted in different aspects in the modern world[2].

For instance, many large chain pharmaceutical stores uses RFID in operation and management to improve the supply chain management mode, reduce the number of staff members required for supply chain management, guarantee the overall management quality and reduce the influence of reduction in staff members, enhance the efficiency of supply chain management.

3.3. Network Communication Technology

Communication technology is a key technical measure for connection and communication among things in the Internet of things, playing an irreplaceable role in development of IoT. Communication technology involves network gateway technology, wireless technology and cable technology. Among the most widely used network technologies are M2M (machine to machine communication) technology. Close-distance transmission technologies, such as BlueTooth, RFID (non-contact data communication between the reader and the labels), Wifi (wireless local area networks based on the IEEE 802.11b standard), enjoy bright prospect of application and progress in the Internet of things, providing a reliable technical support for effective information transmission in the whole Internet of things system.

3.4. Sensing Technology

This is a common technology among key IoT technologies. As the IoT needs long time to contact the natural environment, so the sensors may need to work in harsh environments and thus the standards for design and use of sensors are increased. From the angle of functions, sensing technology is primarily used to collect information. When the computers can be used as human brains to collect, assemble and analyze information, the communication system then works as a human neural networks and the sensors are used to feel the surrounding environment. In simple terms, the sensors convert the sensed information into signals and transmit the signals onto devices. This technology plays a vital role in modern life. Once it is lost, the sensed information cannot be converted correctly and the information in the Internet of things will no longer be reliable.

Current research on IoT sensing technology focuses on network management during propagation, intelligent management and information sensing. Given the current social development, it is foreseeable that sensing technology is bound to the direction of novel materials, intelligent transmission and functional diversity, and its integration with biological technology will be furthered.

4. Application of Computer IoT

4.1. Logistics Field

With the fast advancement of urbanization, the demand to develop the logistics industry also increases, and it needs to be extended both in terms of scale and services[3]. IoT will be more closely connected with the logistics field and play a positive role in the later. As the computer IoT is intelligent and integrated, this technology can realize intelligent internal management of the logistics system, allow the logistics to mimic human thinking to match human in decision-making and thinking. The transportation vehicles are monitored in real time to obtain information on the status, performance and conditions of the cargos and vehicles to facilitate the logistics staff's work, control the whole logistics process effectively, collect and apply the ever-changing logistics information in real time.

4.2. Family Life

To introduce IoT into family life can provide people with more comfortable living conditions, realize efficient operations of house appliances, manage each sub system in the living community efficiently and improve the living environment.

For example, the modern upscale residential communities optimize layout of sample houses by IoT when making presentation to the consumers, increase the physical systems inside the houses, including the temperature adjustment system, the wiring system, the security system, the lighting control system, etc. After moving in, the residents can use these physical systems through IoT technology and intelligent systems to facilitate daily life, make the houses more comfortable and intelligent.

4.3. Agriculture Field

China is a great agricultural power, and it is necessary to make use of cutting-edge technologies in agriculture, and it is closely connected to the country's economic development[4]. Application of IoT in

agriculture is mainly reflected in smart agricultural production systems, agricultural security systems and control systems. Cloud computing can realize efficient integration of information on each steps in agricultural production, make modern agriculture more informatized, digitalized and intelligent. Sensors deployed in the agricultural Internet of things can acquire and switch human factors and environmental factors, make timely analysis, ensure production quality, realize remote-control of the production process to lead agriculture to efficient, low-carbon and green agriculture, optimizing the agriculture system.

4.4. Transportation Field

IoT can be used to realize intelligent transportation systems, and advanced IoT communication technologies like network transmission technology, information technology, electric sensing technology, computer technology and data control technology can be used to build smart traffic systems and make traffic management systems more intelligent and refined. As the IoT technology is accurate, efficient and can realize real-time transmission, it can reduce the traffic load, alleviate the pollution of traffic pressure on the natural environment, improve the quality of urban traffic system and increase transportation efficiency.

4.5. Power Grid

Electricity is a vital energy for our life. Construction of power grids is connected with Internet of things to create safe, reliable and advanced power grids. IoT technology can improve the efficiency of power grids, realize recording of dynamic data in the power grids, spot and solve anomalies in real time, establish emergency solutions, improve security and reliability of power grids, and provide quality power service for the society[5].

4.6. Medical Field

As people's awareness of health increases, the standard for medical service increases. By adopting IoT technologies, the medical field can verify, record the patients' data and query disease cases by scanning, rationalize procurement and usage of drugs, realize dynamic monitoring of the patients' conditions, improve medical service and management. Moreover, it can upload and query information of drugs directly, and facilitate authentication of drugs.

5. Conclusion

To sum up, the key IoT technology and computer IoT technology has been widely used in our daily life and play a more and more important role in different fields, opening a door for development of different fields. In the future, Internet of things will be upgraded and promoted. More experiences should be concluded to explore more of its value.

Author profile: Maliping(July 1972-),female，Xianyang City, Shaanxi Province,lecturer, Master's degree in circuit and systems,The main direction of application of Internet of Things technology,At present, he is the director of the Internet of Things application technology at Shanghai Zhongqiao Vocational and Technical College.

References

[1] Jie Cheng. Application of Internet of Things Technology in Smart Cities[J]. China Science & Technology Panorama Magazine, 2019(15):43-44.
[2] Mi Meng. Analysis of Internet of Things Technology and Application Strategy[J]. Shandong Industrial Technology, 2019(11):165.
[3] Zuquan Chen. Brief Analysis of Key Technologies of Internet of Things and Prospects of Application Direction[J]. Information & Communications, 2019(6):101-104.
[4] Jinze Li. Discussion on the Application and Development of Computer Internet of Things Technology[J]. Business Conditions (Shangqing), 2019(7):220.

[5] Huan Liang, Zhongwang Leng. Analysis of Key Technologies of Computer Internet of Things[J]. Digitization User, 2019, 25(7):143-144.