Research on the Application of "Non-contact" IoT Industry Based on the Epidemic

An Example of IoT Application Scenarios Spawned in the Post-epidemic Era

Shaoyi Guo[✉] and Hanwei Liu

School of Design and Art, Shenyang Jianzhu University, WuSan Street, Shenyang, China
598604548@qq.com

Abstract. Internet of things is the Internet of things connected, is a kind of ubiquitous network built on the Internet, is an extension and expansion on the basis of the Internet, the combination of various information sensing devices and the Internet and the formation of a huge network, to achieve at any time and place, the interconnection of people, machines and things, the information of objects in real time, accurate transmission, is the main component of a new generation of information technology. In this paper, the post-epidemic era has given rise to the Internet of Things application scenarios as an example to do some discussion, the epidemic under the "non-contact" Internet of Things industry has become a universal key to open the "smart life", as a number of technology integration of the Internet of Things, has covered many aspects of urban life, giving rise to "non-contact" under the application scenarios and a variety of new products, objectively promote the application and development of the Internet of Things industry.

Keywords: Outbreak · "Non-contact" · Internet of Things · Application scenarios

1 Introduction

The Internet of Things (IoT) has covered every aspect of urban life after this epidemic outbreak, especially after this epidemic, IoT has rapidly become a role of "raising soldiers for a thousand days". Through the epidemic on the one hand, the application and effect of IoT has been tested, and on the other hand, the application scenario of new products under "non-contact" has been generated [12]. In this epidemic, Tencent, Alibaba and Baidu not only donated money and strength, but also committed to the research, development and promotion of IoT product solutions, contributing to the national resistance and joint prevention and control of science and technology. Through the mirror of the epidemic, it reveals the possible hidden dangers of IoT in the past and present and the challenges to be faced in the future. It is the severe situation of the epidemic that blocks the connection between people, but makes the connection between people and things closer and more frequent, and the ever-maturing IoT is bringing more possibilities to this fight against the epidemic [6]. The development of IoT as a national infrastructure strategy is crucial for us both in the present and in the future after the epidemic.

2 The Development Opportunities of the Internet of Things Industry Under the Epidemic

We know that the epidemic will eventually pass, but it will just take time, thanks to the joint efforts of the whole country to fight the epidemic. The choice of application scenarios will also be adjusted as factors change in the post-epidemic era, such as economic policies and customization of user behavior. The Internet of Things (IoT) is an extension and expansion of the Internet. It is a huge network formed by the combination of various sensors, smart devices and the Internet, a network where everything is connected and ubiquitous [4]. Although the epidemic has impacted traditional offline service industries such as restaurants, tourism, and education, it has objectively boosted the development process of the entire IoT industry. This event is a great challenge for us. At the same time, it also brings new opportunities for the development of IoT industry.

3 The Epidemic Has Given Rise to IoT Application Scenarios

From the beginning of the epidemic outbreak to now, people's daily work and lifestyle has changed a lot. From the various material assistance of the epidemic, to the people's homes in the back, universal prevention and control, to now the epidemic control slowly stabilized, began to resume work and production, the global IoT market scale is growing rapidly (as Fig. 1) we can see that the IoT technology has a better application in all aspects,) helped solve various problems in the epidemic.

3.1 Smart Healthcare Drives IoT Growth Beyond Expectations

The need for smart healthcare under the epidemic has revitalized the entire Internet of Things. Medical IoT devices can continuously collect medical parameters such as body temperature, blood pressure, brain activity and pain levels through sensors to track physiological indicators 24/7 and detect early signs of disease onset or activity [10]. All patients can be equipped with vital sign monitoring devices to monitor their health
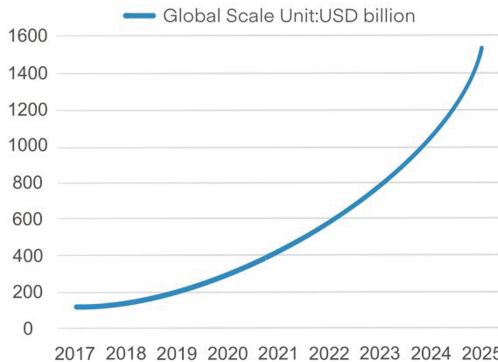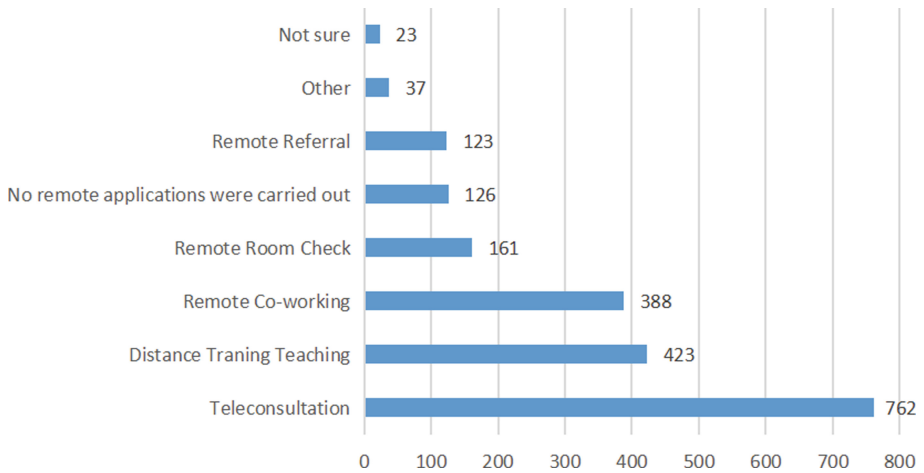

Fig. 1. Global IoT Market Size Forecast, 2020 Data Source LOT Analysis

Fig. 2. Remote information system application during the outbreak, Source: Arterial Network

status in real time with the help of 5G or wifi and provide real-time feedback on their body data. All medical instruments, too, can provide real-time feedback data to the data center through wireless IoT technology, and medical personnel can realize telemedicine based on real-time data [15]. Under the epidemic, telemedicine becomes the key to solve the problem due to the lack of frontline doctors' resources and the difference in level between doctors. In the face of infectious diseases, "doctor-patient" telemedicine and a large number of "doctor-doctor" teleconferences are inevitably needed. Through a "teleconsultation platform", specialists located in the field can consult patients remotely with local healthcare workers (e.g., Fig. 2). This approach allows local health care workers to quickly resolve issues while reducing offline contact and avoiding the risk of infection for both specialists and health care workers.

In addition, based on the development of the epidemic, many drugs are being sold online on an expanding scale (e.g., Fig. 3). In the epidemic environment, as retail stores access electronic price tag IoT product applications, by remotely monitoring prices and incorporating government regulatory mechanisms during the epidemic, it can be done to avoid random price increases in offline stores and reduce many livelihood issues [13]. At the same time, through the electronic price tag stores to collect information, combined with the backstage big data and artificial intelligence algorithm empowerment, can achieve the effect of optimal allocation of resources, through the supply chain optimization, to alleviate the shortage of protective supplies on the front line of the epidemic [7].
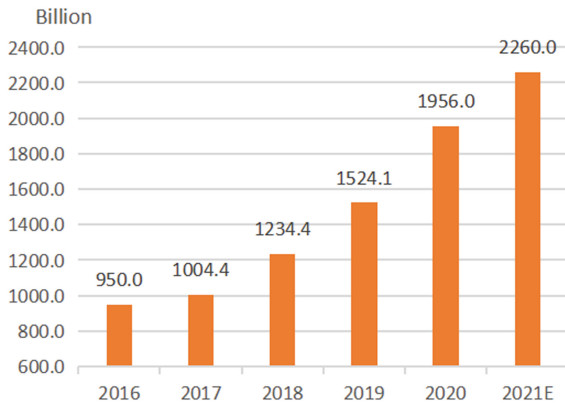
Fig. 3. China's pharmaceutical e-commerce sales scale and forecast, 2016–2021 Data source: Ai Media Consulting

3.2 Effective Dispatch of Vehicles for Safe Distribution of Materials

Facing the huge demand of epidemic prevention work, efficient dispatching has become an urgent task. Intelligent positioning terminals, intercoms, and car-linked management platforms realize multi-directional positioning and monitoring of vehicles, which provide a decision basis for the command center to formulate extermination and rescue work and make the dispatching of police cars, ambulances, extermination vehicles, and other vehicles more accurate and remote [8]. In addition, to grasp the dispatching of emergency supplies, it is necessary to unify the deployment and fixed-point transportation to ensure that emergency supplies can be delivered to each medical personnel and patients efficiently and safely. By installing intelligent sensors on emergency vehicles, acquiring massive geographic data, accurately grasping the real-time location and behavior of vehicles, personnel, and supplies, and intelligently regulating the supply chain based on the big data management platform, we can not only resupply in a timely manner, but also track the destination of supplies to ensure that supplies can be delivered to the most urgent places with the shortest path and time, avoiding untimely dispatch and warehouse backlogs [3].

3.3 Smart Cities, Intelligent Management of Epidemic Prevention and Control

In the event of an epidemic, for public places across the country, AI cameras, thermal imagers and other equipment are used to conduct real-time detection of mask wear and body temperature of mobile personnel, platform alarms or audio-visual linkage alarms for those who are not wearing masks, and in the case of abnormal body temperature, the system automatically alerts managers to take further epidemic detection measures for those with abnormal body temperature to achieve efficient, reliable, and contact-free safety detection, the system can help one-stop epidemic prevention and control [8]. For

small communities and households, handheld thermometers can enable accurate and efficient non-contact measurements, automatic data recording, and fever alarms to help screen for outbreaks at low cost [14]. Realizing that every person and object can be connected and tracked, intelligent management of epidemic prevention and control can be achieved with the help of IoT technology.

3.4 Smart Cities, Intelligent Management of Epidemic Prevention and Control

Local life industry as the last takeoff track of the Internet of Things, the epidemic catalyzed the acceleration of the online process. Catering takeaway, local supermarket, crosstown delivery, online live streaming, online vending and other businesses, the consumption scenario has been greatly expanded, opening the era of everything to home, the catering industry further concentrated to the head, and with the expansion of the scale effect, the average single profitability is increasing, which is expected to become the new cash cow business (Figs. 4 and 5) [11].

Local supermarkets same-city delivery community group buying and other new retail formats, volume and price, the epidemic will cause certain changes to the current IoT users to home, forming to home business scale, demand scenarios and penetration rate is expected to increase significantly [5]. E-commerce in the living circle is gradually replacing the traditional centralized e-commerce, while the opening of WeChat ecology further promotes the rise of private domain traffic. From consumption to logistics, the epidemic promotes the optimization and upgrading of the "instant" industry chain. Covering multiple categories, and gradually completed a nationwide "front warehouse/store + instant delivery of the end service network layout, instant delivery industry scale continues to expand (Fig. 6) [9].
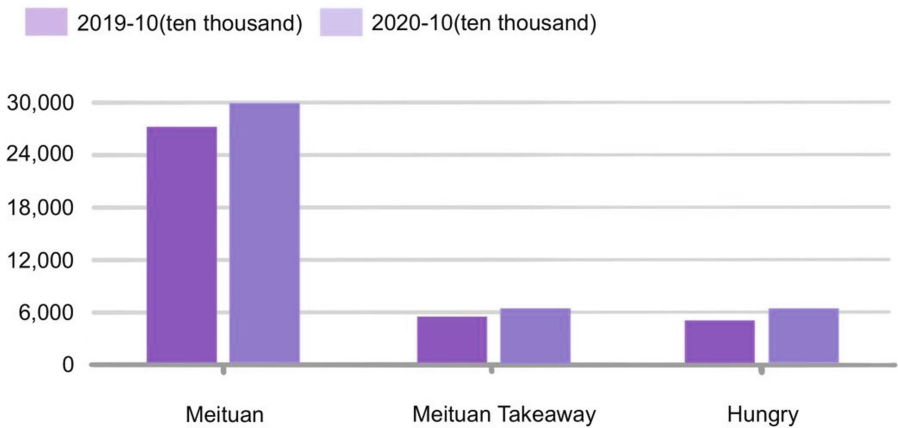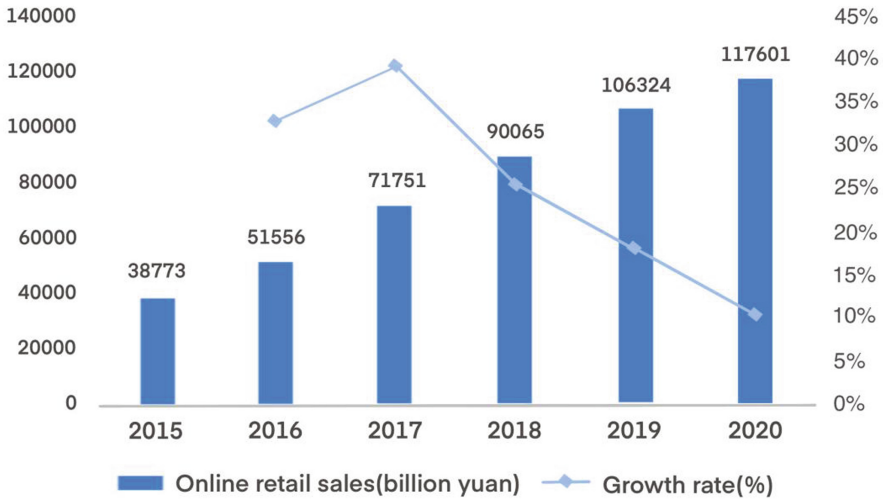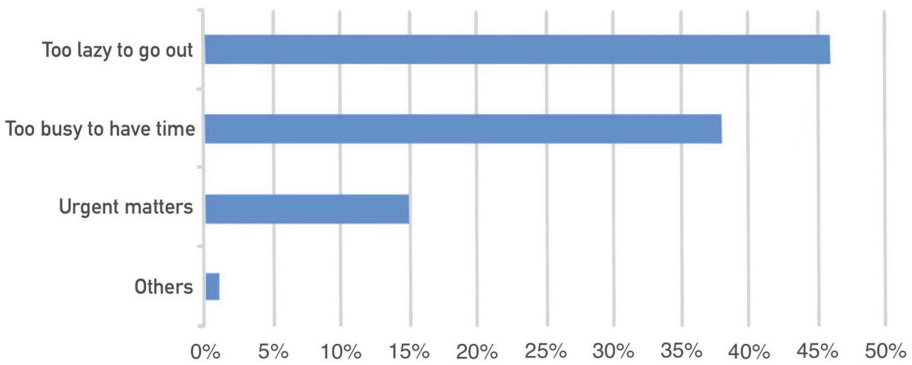

Fig. 4. Monthly Active User Scale of Life Service APP, Source: Quest Mobile

Changes in China's online retail sales,2015-2020(unit:billion yuan,%)

Fig. 5. Changes in China's online retail sales, 2015–2020, Source: National Bureau of Statistics Foresight Industrial Research Institute collated

Fig. 6. Reasons for instant delivery users in China, 2019 Source United Retail Research Center

4 Conclusions

Epidemic prevention and control is a battle of confidence and a battle of technology, the emergence of epidemic means new technological changes, the pace of human progress never stops, and technologies such as IoT, AI, 5G, and cloud computing will continue to iterate and upgrade to promote the development of human society to intelligence, automation, and information [2]. It can be seen that IoT technology plays a rather crucial role in the pre-, mid-, and post-epidemic prevention and control, and the epidemic also

puts forward higher requirements for the development of IoT, especially the 5G cellular mobile-based IoT, which will usher in its explosion in the future. The ultimate purpose of technology application is to serve human beings. With the help of technology, and combined with the strength of all parties, the up and down, and the will of all, we can surely win the epidemic prevention and control blockade.

References

1. Cheng H (2020) The epidemic of IoT technology war epidemic. Zhihu 198:76–86
2. Chu WQ (2019) In 2019, 5G+Cloud+AI becomes the new engine for smart upgrade of government and enterprises. China Net Sci 428:17–22
3. Guo WL (2020) A look at the Internet healthcare industry under the epidemic. Dysprosium Data 343:118–134
4. Liu J (2020) White paper on internet of things. China Acad ICT. 43:22–26
5. Li S (2020) Internet local living in the post-epidemic era. Huachuang Secur Res 258:117–129
6. Lin Z (2020) Three changes in the relationship between human beings and nature. People's Forum Netw 34:87–88
7. Shi XY (2019) 36Kr–2020 China new economic trends insights enrollment, no 432, pp 45–49
8. Sun ZM (2020) Smart healthcare: new opportunities for IoT after the epidemic. ZSE Secur 236:74–79
9. Wang DW (2020) Internet local living in the post-epidemic era. Huachuang Secur Res 324:279–283
10. Wei LL (2020) Where the value of the epidemic-proof norm belongs. Eggshell Inst 256:88–93
11. Xin JQ (2011) China internet of things white paper, no 334, pp 38–45
12. Yu F (2020) Contactless service construction of commercial banks: a study based on the application of new technologies. China Electron Bank Netw 12:45–47
13. Yuan L (2019) AI+Healthcare industry research report. 36Krypton Inst 86:122–134
14. Zhou J (2020) Smart healthcare: new opportunities for IoT after the epidemic. ZSE Secur 552:98–114
15. Zhang YF (2020) Science and technology war epidemic shows "hardcore" power. Farmer's Daily 54:115–118