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Overview of the combination of IoT technology and 3D printing equipment

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ABSTRACT. *The core of the Internet of Things technology is based on the Internet. Based on 5G network technology, it can effectively carry out multi-address access. The number of accesses is growing very fast, and the capacity is also large, and the delay probability is very low. It can realize the mobile terminal Integration, miniaturization and diversified development; 3D printing is based on a digital model, which is quickly formed by printing layer by layer, and piled up into a three-dimensional entity. 3D printing technology has the characteristics of "fast, smart, full customization, reduced loss, and partial manufacturing", and has a wide range of applications. 3D printing technology helps companies implement product improvements, accelerate design iterations, bring new and innovative business models in terms of material selection and product design, and allow companies to more effectively save costs. Due to the additional functions brought by the development of the Internet of Things, 3D printing can be more promising, and the combination of the two technologies is expected to give birth to exciting future enterprises. Become the mainstay of various innovations that constitute Industry 4.0.*

KEYWORDS: *Internet of Things technology, 3D printing technology, technology combination*

1. Introduction

Among the various innovations of Industry 4.0, the Internet of Things (IoT) and 3D printing technologies are arguably the most exciting. One is to start a new communication function, and the other is a revolution in manufacturing. At present, 3D printing has allowed different levels of IoT to make progress in production and design. Engraving communication in equipment has also become a branch of additive manufacturing. The industry and consumers are paying more and more attention to smart cities, smart buildings, smart homes and smart products. The combination of the two technologies can quickly trial and complete prototypes in just one day without affecting quality or performance. They no longer need to wait two weeks to find out whether their smart devices are working properly. Improved product and cost efficiency and shortened the time to market, which means that consumers can enjoy the benefits of these products faster than ever..

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2. Internet of Things Technology

The core of the Internet of Things technology is based on the Internet. Based on 5G network technology, it can effectively carry out multi-address access. The number of accesses is growing very fast, and the capacity is also large, and the delay probability is very low, which can realize the integration of mobile terminals, Miniaturization and diversified development. It is playing an increasingly important role in the aerospace, automotive, electronics, and healthcare industries. The Internet of Things can play an important role in these industries, ensuring efficient quality control by connecting monitoring results to big data analysis. Not only that, the Internet of Things also collects every possible data through an ever-growing number of sensors, analyzes human-related behaviors and interactions, and allows companies to collect their product behavior information to understand and predict future behavior.

3. 3D printing technology

Consulting firm IDTechEx predicts that by 2025, the 3D printing market will reach 20 billion U.S. dollars (£14 billion). The global 3D printing expenditure is expected to maintain a compound annual growth rate (CAGR) of 27%. Since 2020, Chinese The export volume of consumer-grade 3D printers (especially desktop-grade FDM and LCD light-curing equipment) has seen explosive growth. Foreign users use to print PPE personal protective equipment, such as masks, face masks, ventilators, protective glasses, and other accessories Components. Many 3D printing manufacturers released some of the financial reports for the first half of 2020. In particular, most foreign manufacturers saw a significant decline in revenue of 20% to 40%. Only a few Chinese manufacturers can grow year-on-year: From the perspective of application fields, domestic 3D printing Applications are mainly concentrated in the fields of aerospace, home appliances and consumer electronics, mold testing, medical and dental orthodontics, cultural creativity and cultural relic restoration, automobiles and other vehicles. Especially in the manufacturing of precision instruments such as aerospace and medical equipment, the technical advantages of 3D printing are almost irreplaceable.

4. Technology combination

Nano Dimension announced that they have successfully developed a fully 3D printed IoT transceiver. This not only marks the first ever fully 3D printed IoT device, but also marks the emergence of an incredibly fast process (18 hours of production time). The device can perform extensive and simple testing of "smart" products and other prototypes developed by the company in the future. Although the device is still in the appraisal stage, it is still a miracle. It has a span of approximately (16 x 33 x 1.6 mm), is as small as a coin, and is fully functional. The production method uses Nano Dimension’s Dragonfly 2020 printer to develop various electronic products, especially famous for PCBs. In addition to simple

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production, manufacturers can easily convert IoT devices for two-way communication purposes, turning them into transmitters or receivers.

Connect the Internet of Things and 3D printing to get a smarter way to deal with competition. In the competition, combining these two technologies will make the production process more effective than ever before. The combination of the Internet of Things and 3D printing is two-way. One direction is that the implantable sensors and other monitoring devices made by 3D printing technology are directly "embedded" into the product as a manufacturing technology to directly connect with the Internet of Things; One direction is to feed back a large amount of big data accumulated by the Internet of Things to the 3D printing manufacturing system to achieve more lean production and supply chain management and product design more suitable for user needs.

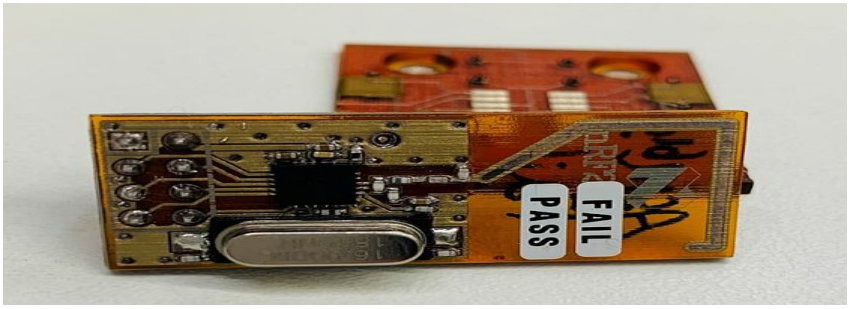

Figure 1 Segmentation results

5. Conclusion

KPMG has predicted that the Internet of Things and 3D printing are among the top three technologies that change the way people live and work. By 2020, the number of active wireless connected devices will exceed 40.9 billion, which provides ample for the combination of the two Data space. my country can improve service quality by forming industry-university-research alliances, try to unite large-scale 3D printing companies to establish practice bases, and use Internet of Things technology and 3D printing to achieve mass production of results; establish entrepreneurial incubation funds in conjunction with government agencies and non-profit social organizations, Proactively meet user needs, and provide users with one-stop, full-process 3D printing entrepreneurial assistance.

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