Future retailing based on Industry 4.0

Introduction

According to BBC news, there are about 3,000 stores had been shut down in the first six months last year [1]. Physical stores have lost a lot money since less purchase in stores. It has shown that the retailing industry is experiencing the transformation just aligning with the fourth industrial revolution. [2] Under this background, retailers who want to survive and be more competitive must have the capability to adapt emerging retailing technologies to improve customer shopping experience and reduce operation cost. This paper will exploit the core technologies based on Industry 4.0, such as IIoT, VR, big data analytic, and explain how they change the traditional retailing. The following contents will explain each technology and present with the existed or potential implementations in the retailing industry.

New technologies in retailing

- ***1) Industrial Internet of Things (IIoT)***

Internet of things (IoT) refer to the massive devices could be connected and allow communicate in time through different communication technologies and advanced computing algorithms, while IIoT is a subnet of IoT which implements suitable technologies into industrial sector. To connect everything in the industrial area, the smart label could equip the non-electrical products to interact with other items in the complex network [3]. Radio Frequency identification (RF) as a smart label is the technology that uses radio signals to identify specific targets, which could read and write data without establishing mechanical or optical contact. Currently, the RFID is widely used into industry to label machines and products to contribute smart manufacturing and supply chain.

By connecting products into the network, retailers could track and check the products in the inventory or in store at any time, which will improve the efficiency of supply chain and the operation in store. For example, the application of ESL (Electric label shelve) could allow the retailers change the price remotely in real time [4]. On the other hand, shopping will be more efficient since the smart label could interact with consumers' smartphones directly and provide the location and other information about the products, thus people could easily find the products they want.

- ***2) Augmented reality***

Augmented reality is using computing technology creating a 3-D artificial objects into the real world, which could let user interact with virtual items in real time [5].Through integrating the 3D modelling and gesture detection technology, AR could support the virtual model to be add on the real objects[6]. For instance, after identifying a real car, with AR technology, consumer could change the colour or replace an alternative tire [7]. Before years, a hardware was usually required to implement augmented reality like an AR headset and a smart glass. However, the mobile augmented is become more practical to allow

people to have AR in everywhere and any time with the portable devices such as smartphone and laptop.

When comes to a physical store, the immersive shopping experience could attract more customers to try its products and services. Moreover, consumers could get personalised products or easily make decisions with the virtual try-on service when they pop into a store or use an app, which will satisfy high expectation of current consumers. Certainly, many retailers have invested heavily to implement AR technology into business. For example, IKEA use mobile augment reality technology in the app, by clicking a product in the screen, the 3D virtual furniture with equivalent size will be put into any space as customer wanted[8]. Therefore, customers could examine if the furniture fit to their room in term of size and style before making a purchase decision.

- ***3) Big data analytic***

With the surge of electronic devices in use, there is a huge amount of data collected from various sources in the network. Many papers have defined big data with three basic characters, which are high variety, high volume, high velocity [9]. The key of big data system is extracting valuable data from the large quantity information with less latency. Therefore, efficient data mining to find the useful pattern from the data ocean become the most challengeable thing. However, there are many technologies with high computing capability are mature to enable data processing more efficient, such as cloud computing and machine learning. Moreover, with everything connected which is IoT network, the data generating from could be more comprehensive but also massive.

The data-driven decision making has been applied to different part of industry, like manufacturing, marketing, business management. Furthermore, Big data allow retailers to learn more about their customers by finding the trait of their shopping behaviour from the massive data. Based on the better knowledge of their customers and the market, a more predictive service could be carried out immediately, or a new trend will be detected which could generate a new business. In the near future, though face detection and searching this target from social media, which could get the useful information like purchase preference and demands about the recognized person. So, once consumers walk into a store, they will get personalized services accordingly since a robot shopping assistant may already know everything of the customer based on all information they had in the network [10].

Conclusion

In this paper, it presents the core technologies and related implementations in the retailing industry. Although it's just an iceberg, driven by various technologies, the future retailing trends to be more digitalize both online and offline. The omnichannel operation will work seamless to serve customer and fulfil their shopping experience. However, the retailers are good at marketing but not technology, and innovation in creating intelligent retailing system is expensive and risky. Therefore, retailers have to be more alert of the technology trend and adapt properly because the way they are doing business might be changed completely with the new technologies.

Reference

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