Application of Unmanned Sales Supermarkets in Helsinki

Bachelor’s thesis
Valkeakoski and International Business
Spring and 2021
Wanquan Ma
The author is studying whether there is a potential market for the implementation of unmanned supermarkets in Helsinki Finland. Combined with the research question, the author introduced the topic background, what the unmanned supermarket project is, and then analyzed the differences, advantages, and disadvantages between traditional retail stores and unmanned stores, and whether it is suitable for use in Finland.

In addition, the author adopted quantitative research methods through survey data samples, one being a Chinese student studying in Helsinki, the other is a Finnish student, and an International student who lives or has been to Helsinki. By collecting survey data, the survey results show that most Helsinki consumers are fresh and curious about the novel retail operation model of unmanned supermarkets. Self-service shopping is attractive to consumers and has certain potential consumer groups.

In conclusion, the business model of the unmanned supermarket caters to the needs of some consumers to a certain extent and has a certain potential for market development, indicating that the unmanned supermarket has a certain degree of recognition among Helsinki consumers. Many people are willing to experience the fresh shopping model of unattended and self-service shopping. Therefore, the implementation of the Helsinki unmanned sales project is a potential market. The operation of unmanned supermarkets would make the lives of consumers in Helsinki more convenient.

Keywords: Unmanned supermarket, sharing economy, new sales

Pages: 45 pages
# Contents

1  Introduction .......................................................................................................................... 3  
   1.1  Analysis of new technologies applied in unmanned supermarkets .............. 6  
   1.2  New technologies trigger changes in development trends ......................... 8  
   1.3  Research Question ....................................................................................................... 9  
2  Theory .................................................................................................................................... 10  
   2.1  SWOT analysis .................................................................................................................. 10  
      2.1.1  Strengths unmanned supermarkets ................................................................. 10  
      2.1.2  Disadvantage unmanned supermarkets ............................................................. 12  
      2.1.3  Opportunities of unmanned supermarkets ....................................................... 13  
      2.1.4  Challenges of unmanned supermarkets ............................................................ 14  
   2.2  Unmanned supermarket marketing strategy ............................................................. 16  
      2.2.1  Promotion strategy of unmanned supermarket .................................................. 17  
      2.2.2  Promoting the development of unmanned supermarkets strategy suggestions .............................................................................................................................. 17  
   2.3  An unmanned supermarket sales determination method based on inventory big data ........................................................................................................................................ 20  
   2.4  Unmanned supermarket management method and system ................................. 21  
   2.5  Mobile home for unmanned supermarket point-of-sale terminal .................... 21  
   2.6  The impact of unmanned supermarkets on traditional retail ............................ 22  
3  Case Study ............................................................................................................................ 24  
4  Research Method .................................................................................................................. 28  
   4.1  Survey .............................................................................................................................. 28  
5  Results .................................................................................................................................... 37  
6  Conclusion ............................................................................................................................ 39  
References .................................................................................................................................. 41
1 INTRODUCTION

The unmanned economy is a product of highly developed information technology. It is based on the Internet and uses big data, artificial intelligence identification, radio frequency identification, Internet of Things, and other sensing technologies to reduce labor output, reduce costs, and improve efficiency structure. With the rapid development of emerging technologies and the penetration of the real economy, the industrialization characteristics of the unmanned economy have become more and more obvious, and it has gradually become an innovative economic form. At present, the main performances are unmanned supermarkets, unmanned logistics, unmanned driving, unmanned factories, unmanned banks, etc. (KWAK, Y 2019.)

At present, unmanned sales are developing rapidly all over the world. E-commerce has the advantages of providing goods and services without time and space restrictions, but it has not been able to completely solve the cost and time limit caused by logistics. Traditional supermarkets have the advantage of purchasing goods in real-time, and users can experience the goods on-site. However, traditional supermarkets have problems such as rising rents for business premises, limited business hours, high personnel costs, limited product varieties, and long waiting times for customers to wait for settlement. Driven by the actual shopping needs of customers, stimulated by all-weather online shopping brought by e-commerce, and supported by the development of new technologies, unmanned supermarkets have emerged. (Huili, Z 2018.)

Most of the current unmanned supermarkets are positioned as unmanned convenience stores. Compared with e-commerce shopping, it has the advantages of real-time shopping and real-time enjoyment, and customers can directly contact products for the experience. Compared with traditional supermarkets, it has the advantages of unlimited business hours, lower labor costs, reduced floor space, reduced business land lease costs, and reduced waiting time for settlement. Compared with self-service vending machines, it has the advantages of a wide variety of products and an immersive shopping experience for users. (Anil, M 2013.)

With the continuous update and iteration of technology, "no one" has integrated into more industries. At present, unmanned retail is a relatively mature field in the unmanned economy. Commercial forms such as unmanned convenience stores, unmanned supermarkets, and unmanned shelves have emerged one after another. In addition, the unmanned economy
continues to penetrate into industries such as manufacturing, logistics, and transportation. In the future, more application scenarios such as unmanned driving, unmanned banking, and unmanned factories will be completer and more mature. (ShuLing, L 2009.)

An unmanned supermarket, to be precise, is an unmanned convenience store. It is a current emerging model. It is a model between specialty stores and self-service vending machines. It is a sale designed to cope with higher labor costs mode. At the same time, it also saves time queuing for checkout, so it attracted much attention and was sought after at the beginning of its launch. (Yali, W 2020.)

In recent years, new shopping modes such as unmanned supermarkets and open shelves have continued to emerge around the world and have achieved rapid development. In foreign countries, Sweden once had unmanned convenience stores where mobile phones scanned QR codes into supermarkets and then were bound to pay; Japan also launched something similar.

The design and planning of “unmanned convenience store” have been introduced and used by several convenience stores; Amazon of the United States has developed more advanced intelligent technology for unmanned convenience stores. (Gudio, M 2018.)

Unmanned retail first appeared in the form of vending machines. With the advancement of technology, unmanned retail has developed rapidly, covering more and more categories, showing a trend of blooming flowers. Among them, unmanned supermarkets/convenience stores, unmanned shelves/containers, and self-service vending machines are currently the main manifestations. Unmanned supermarkets all use advanced technology, so it is convenient to count consumers' preferences, for example, which products are viewed more often and which products are loved by customers. This kind of data statistics can deeply analyze consumer behavior and send preference data to the distribution terminal, thereby optimizing the distribution of materials and reducing the inventory of goods. At the same time, it can also provide customers with precise services and make the service more quality. (Tredre, R 2018.)

With the development of science and technology, the concept of "Internet +" has developed rapidly, successfully promoting the development of e-commerce. However, the current market is gradually saturated, causing the cost of e-commerce to continue to rise and profits to be
compressed. Therefore, various e-commerce platforms have begun to integrate online and offline and move to “unmanned supermarkets.”

First of all, due to the slowdown of the real global economy in recent years and the stagnation of production efficiency, countries are generally worried about the coming of recession, and many companies are eager to obtain growth through their own changes. Due to the irrational industrial structure, the low efficiency of the real economy, the investment pull rate has repeatedly hit new lows, exports are severely affected by the international environment, the overall situation is not optimistic, and consumption growth is weak. How to stimulate consumption growth has become the hope of saving the real economy, and the retail industry has become the core key to consumption growth. (Yanlong, G 2020.)

Secondly, as various costs continue to rise, the profitability of the traditional retail industry is declining year by year. Retailers are eager to improve this situation. At this time, the unmanned store enters the retailer’s field of vision. For the unmanned store, the labor cost (the labor cost is only the out-of-store cost such as the delivery of the goods) and the real estate-related cost (turning the rental property into the venue lease), and the geographical In terms of convenience (easy to layout and convenient to open a store) and time (open 24 hours a day), it has great advantages in certain specific situations, so it is not surprising that it is sought after. (Sunisa, J 2020.)

Third, the convenience and diversification of payment methods, especially the widespread application of mobile payment, has solved the payment problem for unmanned retail stores. At present, mobile payment and card swiping have become the norm, and more and more cities and regions are promoting new types of payment. Whether in Finland or elsewhere, the voice of a cashless society is growing.

In addition, the popularization of new technologies such as artificial intelligence, big data, and cloud services has made fully automated and intelligent operations possible. The key to the success of unmanned stores is actually mostly in operations, including customer acquisition, site selection, product selection, daily replenishment, stocking and shelf maintenance, product loss management, loss prevention, safety management, food safety issues. At present, intelligent
unmanned stores have been able to do well in terms of customer positioning, new store selection, product selection, and daily replenishment, stocking, and shelf maintenance. (Xiangyu, L 2019.)

Finally, due to the gradual increase and saturation of online traffic, capital investment (hot money) began to focus on offline. With the development of society and the improvement of productivity, consumers' income has been greatly improved, and pocket money consumption has become “pickier.” Convenient and fast shopping processes have become more and more popular with consumers. Moreover, as the main consumer is slowly turning to a younger and "small family" consumption pattern, compared with large-scale formats such as hypermarkets and supermarkets, the flexible layout of unmanned stores is more in line with the future trend. After all, there are many types of subdivisions in the store format, and the layout can be adapted to local conditions to make up for the shortcomings of many retailers. At present, unmanned retail stores can provide consumer services conveniently and quickly. Capital investors generally believe that the future is bright, and the market is huge. Investment and financing cases are everywhere. It is regarded as a new business format and has become a new trend. It is a natural result. (Mwanyota, J 2004.)

1.1 Analysis of new technologies applied in unmanned supermarkets

Just as the development of e-commerce cannot do without the support of enterprise informatization, the emergence and development of unmanned supermarkets cannot do without the support of new technologies. Analyzing the unmanned supermarkets that have emerged, according to the way of product identification, they can be divided into semi-self-service based on the barcode, based on RFID technology, and based on Internet of Things technology. According to the identification method of identity authentication, it can be divided into scanning code (two-dimensional code or barcode) identification, biometric identification, and so on. For the payment method of unmanned supermarkets, on the basis of ensuring the safety of funds and considering the convenience of payment, the operators of various unmanned supermarkets collectively chose the cashless payment method. Summarizing the current application status of unmanned supermarkets, the new technologies that affect the development of unmanned supermarkets mainly include Internet of Things technology, biometric recognition technology, big data analysis, cloud computing, etc. (Peili, M 2004.)
Internet of Things technology: The Internet of Things is mainly composed of a perception layer, a network layer, and an application layer. Among them, the application of the perception layer in unmanned supermarkets: through the microchips attached to the commodities to realize the "things-things connection," solves the problem of automatic identification of commodities in unmanned supermarkets from the hardware level. Automatic identification and pricing are carried out when commodities are purchased and passed through the settlement area (some unmanned supermarket commodities are identified and recorded when they are removed from the shelves). In the existing unmanned supermarket's application of the Internet of Things technology, users can also use the positioning function of the Internet of Things technology to obtain the accurate location of the target product through the smart shopping cart so as to quickly complete the shopping behavior. Through the intelligent settlement channel system (that is, the settlement area), users use the perception technology of the Internet of Things to shorten the waiting time for shopping statistics and settlement of accounts payable to almost negligible, effectively improving the efficiency of shopping settlement and reducing the waiting time in the queue. The manager of the unmanned supermarket can use the perception technology of the Internet of Things to quickly complete the inventory and statistics of the goods in the store through the smart shelf, so as to know the sales situation of the goods and decide whether to add the goods on the shelf or purchase supplementary goods, which greatly reduces Manage the time and manpower requirements of the supermarket. (Maarten, S 2013.)

Biometric identification technology: By identifying unforgeable biometrics, it completes the verification function of the user's personal identity and completes activities such as bookkeeping and payment. Biometric identification technology effectively solves the security problem of unmanned supermarkets in the user payment link. In the shopping payment link, from the traditional supermarket to the unmanned supermarket, it has experienced the development process of "cash payment → bank card payment with password confirmation → mobile payment with mobile phone → biometric payment." With the development of technology, the waiting time required by users in the payment process is getting shorter and shorter, and the security of payment is getting higher and higher. As a result, it can boldly imagine that with the support of biometric technology, future offline shopping does not need to carry cash, credit cards, or even mobile phones, and no passwords are required, and shopping settlement can be completed with just one finger. (Sunisa, J 2020.)
Big data and cloud computing: Big data and cloud computing are like the pros and cons of the same coin, and the two complement each other. Big data and cloud computing use the analysis of huge amounts of data to find out the correlation between the data, especially the collection and analysis of the consumption habits, consumption tendency, consumption frequency, and other data of the target population and jointly provide data support for unmanned supermarkets. Make the location of the unmanned supermarket more reasonable, the composition and arrangement of the goods in the store are more reasonable, and the price of the goods is more in line with the consumption habits of the target users so that the unmanned supermarket can achieve a higher turnover in a smaller business site, thereby allowing unmanned Supermarkets can develop faster and more stable. (Yali, W 2020.)

1.2 New technologies trigger changes in development trends

Through the unmanned supermarket, it shows the development that new technologies are continuously affecting, and the main development trends are as follows:

- Scene experiential development trend. The goods people buy must be used in a certain scene. For a long time, the operation of e-commerce only paid attention to the sales volume of goods and ignored the personalized experience of people using the goods. With the support of AR/VR technology, the future shopping process will easily realize the experience of commodity application scenarios. In the future, people will decide whether to buy or not through scene experience more in the process of product purchase. Scene experiential shopping will become a trend. (Peili, M 2004.)

- Accurate development trend. With the support of big data and cloud computing technology, it accurately depicts people's shopping needs and makes e-commerce shopping guidance more accurate. In the future, people will spend less time choosing and get more products that are more in line with their hearts. Precision shopping will become a trend. (Maktoba, O 2009.)

- Intelligent development trend. With the support of the Internet of Things technology, the e-commerce shopping process will be more intelligent. Especially the intelligent purchase of consumable goods will greatly shorten the time people spend dealing with daily chores. The intelligent logistics and distribution brought by distributed inventory and smart logistics
greatly shorten people's waiting time after shopping and enhance the shopping experience. Intelligent transactions, intelligent logistics and distribution, and intelligent shopping experience make intelligence a trend in the development of e-commerce. (Gerbecks, W 2014.)

- Social shopping trend. With the continuous development of network technology, people will no longer form circles around shopping platforms but will form social shopping with distinctive personalities around content. People pay attention to and integrate into the social circle that uses interest as the bridge to connect, exchange information in the circle, obtain the cognition of the product, and then determine the purchase choice of the product. Social shopping will become the trend of e-commerce development. (KWAK, Y 2019.)

- Content-centric development trend. Looking to the future, basic e-commerce services such as data management, cloud computing, Internet of Things equipment, logistics infrastructure, and payment platforms will become complete and more open. The majority of e-commerce entrepreneurs can quickly build a complete set of e-commerce service systems through the developed e-commerce infrastructure to minimize the cost of time and human resources, thereby focusing on the content of the transaction. In future development, content is the focus of attention, and content can bring more business opportunities. (KWAK, Y 2019.)

- Information security development trend. In the process of economic development, people's information is constantly being collected, analyzed, and used. Purposeful data analysis brings huge business opportunities and also brings people's concerns about personal privacy. In the future, personal information will be more closely protected. Information development can only develop better when it finds a balance between information security and data sharing. (KWAK, Y 2019.)

1.3 Research Question

The unmanned vending supermarket project may make people's daily life convenient and bring people a good experience. Through the analysis of unmanned vending supermarkets, it can have a fuller understanding and prediction of the current situation and future trends of the unmanned retail market. In order to make more accurate decisions. Because of this research question for this thesis is as follows: Is there a potential market in Helsinki for unmanned supermarkets?
2 THEORY

2.1 SWOT analysis

2.1.1 Strengths unmanned supermarkets

Convenience

The biggest feature of unmanned supermarkets is that they are convenient and fast. After consumers see their favorite products, they don’t need to queue to the cashier to check out. They only need to go to the cash register to complete the payment according to the payment process. This way not only saves consumers the time to queue up has also greatly reduced the labor cost. From the perspective of consumer demand, it is also the biggest advantage: convenience (Tredre, R 2018.)

Security

With the emergence of the unmanned supermarket APP, many users worry about the complete problem. And the platform has set up searches in every supermarket.

Application scenarios of supermarkets

it can be replicated on a large scale with strong capabilities and the coexistence of various forms. Advertising); unmanned convenience stores + consumer finance, etc., in the future, it can achieve N +. (Eva, D 2018.)

Operational view

it mainly simplifies the process of supermarket operations. The division of unmanned convenience stores from the same supermarkets and retail convenience stores saves consumers time, greatly improves the efficiency of purchase, and lowers the total cost, and this is also a number of outstanding advantages. (Tredre, R 2018.)

Labor cost
According to the survey, after eliminating labor costs, the operating cost of an unmanned supermarket is only equivalent to a quarter of that of a traditional convenience store. The most important difference between an unmanned supermarket and a traditional convenience store is that it does not require staff to be on duty. This means that the unmanned supermarket does not require a shopping guide, and the customer completes the purchase of goods; the unmanned supermarket also does not require a cashier, and the customer passes directly through the checkout channel, without queuing, is scanned and settled by artificial intelligence, and the transaction can be completed. This allows customers to enjoy a convenient and fast shopping experience without queuing to check out or paying cash during the shopping process. (Eva, D 2018.)

Intelligent uninterrupted operation

The unmanned supermarket does not require staff to be on duty, but the entire process of operation and management is completed by the computer network. This means that unmanned supermarkets can operate 24 hours a day, can provide customers with shopping services throughout the day, and always meet consumers' needs for supermarket products, eliminate the trouble that customers cannot do shopping in a specific period, and bring consumers a new shopping experience. The application of the Internet of Things technology enables unmanned supermarkets to grasp the sales status of products in a timely manner, replenish the best-selling products in time, and increase product sales. (Tredre, R 2018.)

Master consumer information and analyze consumer preferences

Unmanned supermarkets can record and analyze consumers' behavior during shopping through the application of artificial intelligence technologies such as biometric autonomous perception and learning systems, biometric recognition, curling neural networks, machine vision, and deep learning. These consumer behavior-related data will be uploaded to the data terminal of the unmanned supermarket, and after analysis by the operator, consumer preferences can be obtained, which is conducive to the unmanned supermarket to carry out precise marketing and provide better services. (Tredre, R 2018.)

Unmanned convenience stores are the trend of the times and the inevitable law of society. This is a general trend, a change of the times, and the transformation of the convenience store industry.
The future market will shift from the traditional retail department store to the intelligent technology automatic unmanned system retail, which will greatly reduce the labor cost and labor risk of the enterprise. The unified supply chain procurement provides better safety and convenience for the public. 24-hour unmanned convenience stores provide sales and services so that you can buy the goods you want at any time. In the case of reduced labor costs, the company’s shops at the gates of major communities, department stores, office buildings, schools, commercial areas, street shops, pedestrian streets, etc., can be embodied in a better position to embed in the store, unified management, and unified merchandise. Really reach the convenience of a small helper for each household. (Xiangyu, L 2019.)

2.1.2 Disadvantage unmanned supermarkets

The user experience is reduced. In general, the retail industry, as the most terminal sales, mainly relies on the service value brand + emotional value + product price to develop a sales model. Most consumers are more sensitive to sales prices. If the sales prices are relatively similar and want consumers to be moved, the main factor that generates purchase intentions is the on-site service value brand + emotional value, and this part is the convenience of no one. The missing part of the store. (Tredre, R 2018.)

Realize the product transition. Unmanned convenience stores must rely on the entire sales of goods and the application scenarios of the store to impress consumers. From this point of view, it will force the settled suppliers to make new changes and expand the development trend of new products. The one-tier model has risen to a new level to attract consumers' attention. (Tredre, R 2018.)

The variety is relatively single. Constrained by space, the types of goods displayed inside convenience stores are relatively simple, with fewer goods than traditional convenience stores, mainly food, beverages, yogurt, and general daily necessities with a long shelf life. (Yanlong, G 2020.)

Artificial intelligence technology is not yet mature. The unmanned supermarket is based on artificial intelligence technology to achieve de-artificial operations. However, there are still many shortcomings in the development of artificial intelligence technology. For example, in biometrics...
and machine vision, the recognition of consumer behavior by machines is not very good. To be accurate, take the Amazon Go convenience store launched by Amazon as an example. Amazon Go can only support 30 people at the same time for checkout payment. Once the number of people exceeds the limit of 30, the machine will be confused when scanning and identifying products. Moreover, unmanned supermarkets still have a long way to go in preventing commodity theft and commodity damage. (Yali, W 2020.)

Lack of actual demand. The unmanned supermarket is a new-style convenience store for consumers. There is no need to queue to check out and leave when you get it. It is also a unique shopping experience for unmanned supermarkets.

Different from traditional convenience stores. As for how to arouse consumers' demand for unmanned supermarkets, it will be an urgent problem for unmanned supermarkets to solve. (Tredre, R 2018.)

From the perspective of technology and consumption, unmanned convenience stores have accelerated the pace of experimentation. From the perspective of investment and operation mode and industry competition, traditional retail stores are also in urgent need of transformation. The huge intelligent sales system of unmanned convenience stores is operated by the Internet. Since it is intelligent, there will be BUGs. In order to be better and smoother, it needs to gradually evolve and upgrade and develop rapidly through trial and error to become the leader in the new field. Most of the current unmanned supermarket models are imperfect. Unmanned retail is a new format, but it is still unable to set off a disruptive innovation in the retail industry. (Yali, W 2020.)

2.1.3 Opportunities of unmanned supermarkets

The unmanned retail industry has huge development potential. The entire market is large in scale, clear in business models, sufficient in talent and technology reserves, and highly recognized by the capital market, leading the development in the unmanned retail industry. With the gradual improvement of technology and business model, unmanned retail will inevitably become the main force of new retail in the future. The market demand for vending machines will be released in the next few years. Current consumers are increasingly demanding convenience for shopping and the popularization of Internet of Things technology and mobile payment. Vending machines are the
most flexible and densest retail channel, close to users. The speed of development in the future will certainly achieve explosive growth. (Huili, Z 2018.)

Although the development of the unmanned retail industry is facing many difficulties, the layout of giants is particularly cautious, and the emergence of entrepreneurs is even rarer, but with the aging of the population and the increase of labor costs, intelligent and unmanned services must be a trend. It’s just that what kind of technical route to use in this process is still to be explored. At the same time, as embedded chips mature, low-cost unmanned solutions will become more feasible. (KWAK, Y 2019.)

In the future, with the increase in the number of unmanned retail users, unmanned retail store technology and operation will continue to improve and upgrade, unmanned retail stores will become a new entrance for user data collection, and the collection of user purchase behavior will help stores carry out precision marketing, thereby Give back to users and further improve the shopping experience. (Eva, D 2018.)

Artificial intelligence technology has become a hot spot of the times

In recent years, artificial intelligence has always been popular in social development. The reason for this is that artificial intelligence will become another key technology that has a huge driving force for social development after Internet technology. Countries around the world have also joined the artificial intelligence research camp. After continuous capital investment and talent introduction, artificial intelligence technology (Tredre, R 2018.)

Constantly moving forward, and artificial intelligence technology is the basis for the development of unmanned supermarkets. As artificial intelligence technology obtains new breakthroughs, it will drive the development of unmanned supermarkets. (Mwanyota, J 2004.)

2.1.4 Challenges of unmanned supermarkets

Compared with traditional supermarkets, unmanned supermarkets are not cheap in commodity prices, but the shopping experience is different. When people’s curiosity is satisfied, the advantage of unmanned supermarkets no longer exists. Since people are not getting benefits, the freshness of experience alone cannot sustain supermarket operations for a long time. (Maarten, S 2013.)
Without the management of the salesperson, the quality and shelf life of the goods cannot be guaranteed. Commodities will be damaged, misplaced, and other problems, causing a lot of consumption. Moreover, there is a lack of supervision over products with a short shelf life, and consumer rights cannot be guaranteed. (Anil, M 2013.)

The technology is not yet mature. RFID technology has many limitations, such as high cost, manual pasting, errors in the settlement, and unrecognizable products with some materials. Anti-theft technology, settlement systems, smart shelves, and face recognition are also more or less flawed.

The registration process is cumbersome, and different unmanned supermarkets need to register different accounts, which invisibly hinders customers from accepting unmanned supermarkets and is not conducive to widespread promotion in the market. (Peili, M 2004.)

Compared with traditional supermarkets with fewer types of goods, consumers will be more inclined to traditional supermarkets. Unmanned supermarkets blindly increasing the types and quantities of goods will bring about management deficiencies.

Serious homogeneity of unmanned supermarkets. Although the unmanned supermarket is a new type of convenience store, more and more Internet companies are committed to the field of unmanned supermarkets using their own artificial intelligence technology. Different brands of unmanned supermarkets use different artificial intelligence technologies, but the shopping experience given to consumers is similar. In this case, it is difficult for unmanned supermarkets of different brands to stand out and win the love of consumers. (Gerbecks, W 2014.)

The competition of traditional convenience store experiential marketing. Traditional convenience stores provide customers with experience services that are not available in unmanned supermarkets, and experience services are what people seek in a modern, fast-paced life. For the experiential service marketing of traditional convenience stores, unmanned supermarkets will face tremendous competitive pressure. (Huili, Z 2018.)

Unmanned supermarkets in the new retail era should have used today’s advanced technology and equipment to combine online convenience and offline consumer experience so as to achieve the goal of saving labor costs and middlemen’s costs and providing consumers Bring benefits and
convenience. In the current situation, the level of technological development is not enough to meet the profitability conditions of unmanned supermarkets. The cost of supporting equipment for unmanned supermarkets is higher than or equal to the labor cost. People may try unmanned supermarkets for the sake of freshness, but if the cost remains long, Because of the exorbitant situation, merchants cannot obtain the expected profits, and customers will still choose ordinary supermarkets with lower prices. (Sunisa, J 2020.)

In addition, unmanned supermarkets also have more severe customer quality and product quality supervision issues than traditional supermarkets, which will become uncontrollable factors in the cost of unmanned supermarkets. Therefore, the future development of unmanned supermarkets must consider not only technological feasibility but also commercial feasibility.

2.2 Unmanned supermarket marketing strategy

Solve the technical problems of unmanned supermarkets and realize the rapid development of unmanned supermarkets. Artificial intelligence technology is the basis for the development of unmanned supermarkets. However, there are still many problems in the application of artificial intelligence technology in unmanned supermarkets. If the technical problems of unmanned supermarkets are not resolved, they will not be able to replace traditional convenience stores at all. Even survival in the market will be a problem. Unmanned supermarkets can enter into strategic cooperation with artificial intelligence research institutions to provide technical support for unmanned supermarkets. (Sunisa, J 2020.)

Stimulate consumers' actual demand for unmanned supermarkets. The passenger flow of unmanned supermarkets is determined by consumers' actual demand for unmanned supermarkets. At present, you can often see relevant reports of unmanned supermarkets on the Internet, and people are also very concerned about unmanned supermarkets, but these people may not agree with the business model of unmanned supermarkets. Only when consumers truly recognize the business model of unmanned supermarkets can the actual needs of unmanned supermarkets be realized, and sales will increase significantly. Unmanned supermarkets need
certain shopping scenarios to achieve the purpose of stimulating actual demand, such as commercial office buildings. (Gudio, M 2018.)

Provide intelligent voice shopping guide service. Because unmanned supermarkets lack experiential services, and the voice shopping guide service provided by robots will make up for this deficiency. With the development of artificial intelligence, robots will do better in communicating with people. After the introduction of shopping guide robots, unmanned supermarkets will be able to provide consumers with voice input to find products and recommend products, which will further enhance unmanned The competitiveness of supermarkets in the field of convenience stores. (KWAK, Y 2019.)

The fast-paced life of people in the new era requires more convenient and faster shopping services. Unmanned supermarkets with features that do not need to line up to check out and leave when you get them are just in line with the trend of market development. With the increasing maturity of artificial intelligence technology, unmanned supermarkets will be more in line with consumers' expectations and become a supplement to traditional convenience stores in the retail format. (Eva, D 2018.)

2.2.1 Promotion strategy of unmanned supermarket

Reduce commodity prices. The main profit point and attractiveness of unmanned supermarkets should be the low prices of commodities. Instead of an infinite long-term plan, under the replacement of quality assurance, the focus is more on the price of the product. In the case of consistency in many aspects, the reduction of commodity prices can better attract customers so as to achieve the effect of small profits but quick turnover. The most direct way to reduce commodity prices is to reduce costs. In the era of big data, operators of unmanned supermarkets can use big data to research best-selling products and unsellable products, make reasonable purchases, and make full use of the profitable merchants to better Promote the development of the industry so as to realize the promotion of unmanned supermarkets. (Gudio, M 2018.)

2.2.2 Promoting the development of unmanned supermarkets strategy suggestions

It is mainly launched from three perspectives: developers, operators, and relevant government departments of the unmanned supermarket. The specific content is as follows.
Analysis from the perspective of developers, First, enhance the accuracy of the unmanned supermarket payment system. For developers of unmanned supermarkets, it is necessary to strengthen face recognition, electronic payment, etc. The research and development of technology enhance its sensitivity and accuracy and improves the payment efficiency and accuracy of self-service shopping. (Yanlong, G 2020.) Second, improve the effectiveness of the anti-theft system for unmanned supermarkets. Developers should comprehensively consider various possible situations, update and upgrade the anti-theft system of the unmanned supermarket, eliminate potential loopholes, reduce the risk of supermarket theft, and improve the performance of the supermarket anti-theft system. Third, upgrade the commodity storage and preservation system of the unmanned supermarket. Because some commodities, especially food, are susceptible to deterioration due to factors such as temperature, humidity, light, and pressure, developers need to develop more advanced commodity storage and preservation systems, reasonably arrange the placement of commodities, and regularly check the position of commodities. (Mwanyota, J 2004.) Fourth, rationally arrange the layout of supermarket shelves and increase the types of commodities. (Xiangyu, L 2019.) At present, there are not many varieties of commodities that can be sold in unmanned supermarkets, mainly food and daily necessities. Developers can increase the types of goods on the shelves by arranging and combining the shelves reasonably. In addition, it is also possible to develop new multi-functional shelves through technological transformation to accommodate more commodities at the same time to meet consumers' diversified commodity needs. (KWAK, Y 2019.)

Analysis from the perspective of operators, First, pay attention to the price and quality of goods. Because unmanned supermarkets mainly sell products that meet the basic needs of consumers, consumers will pay much attention to the quality and price of the products; therefore, if the operators can strengthen the control of the quality of the products and appropriately reduce the prices of the products, they can obtain better results. Great competitive advantage (Anil, M 2013.) Second, adopt differentiated marketing strategies. If the marketing strategy of an unmanned supermarket is the same as that of a traditional supermarket, consumers will not appreciate the unmanned supermarket’s Innovative. places naturally lack the interest in further understanding; therefore, operators should pay attention to using the characteristics of unmanned supermarkets, combining consumer shopping habits and personalized needs to formulate marketing strategies, such as mobile Internet, social networks, etc. (Yanlong, G 2020.) Ways to attract consumers and promote sales by recommending rewards and scanning codes to pay for discounts. Third, pay
attention to the location and decoration of the supermarket. For operators, unmanned supermarkets should be opened in places with high traffic such as streets, communities, parks, and commercial areas to ensure the passenger flow of unmanned supermarkets; in addition, operators should also deal with the decoration, environment, and hygiene of the supermarket. Control, create a relaxed and harmonious shopping atmosphere and enhance user experience.

Fourth, set up a manual customer service hotline. (Sunisa, J 2020.) The unmanned supermarket does not have staff on duty, and customers shop in a self-service manner. If customers encounter problems during the shopping process, the shopping experience will be affected. Operators can set up manual customer service hotlines to help consumers solve some shopping problems online. Of course, if the problem encountered by the customer cannot be solved online, the operator needs to arrive at the scene to solve the problem in time. In addition, through the service hotline, operators can better understand the demands of consumers, correspondingly change the types, quantities, and facilities of supermarkets, and enhance the humanization of services. (Sunisa, J 2020.)

Analysis from the perspective of relevant government departments, First, improve industry laws and regulations and consumer credit systems. Because there are many brands of unmanned supermarkets, many purchase channels, and the different qualities of practitioners, it is necessary to regulate and supervise the operation of unmanned supermarkets. In this regard, relevant government departments should formulate relevant operating norms and systems to regulate the operation of unmanned supermarkets and make them operate in an orderly manner. (Sunisa, J 2020.) At the same time, consumer shopping behavior can be incorporated into the personal credit system if consumers have bad purchases. You can record this behavior in your personal credit file. Second, strengthen support for unmanned supermarkets. As an emerging retail format, the unmanned supermarket has changed the traditional consumer shopping model, provided consumers with a brand-new shopping experience, and promoted the development of the retail model. Relevant government departments should increase policy and financial support for unmanned supermarkets. Support, promote the improvement and upgrading of unmanned supermarkets in terms of technology, operation mode, service methods, etc., (Anil, M 2013.) so that they can better adapt to market needs. Third, implement preferential policies for practitioners. In order to allow more consumers to enjoy the convenience and speed of unmanned supermarkets, relevant government departments can appropriately increase subsidies to commercial enterprises or individuals operating unmanned supermarkets, reduce or exempt some
taxes, and encourage unmanned supermarket brands to be used nationwide. Layout stores and promote unmanned supermarkets to more small and medium-sized cities so that more consumers can feel the new shopping experience brought by technological development and business innovation. (KWAK, Y 2019.)

2.3 An unmanned supermarket sales determination method based on inventory big data

Many supermarkets nowadays use manual cashiers and staff shopping guides, so as to provide customers with the experience and purpose of supermarket shopping. Because the development of the times has made lives fast-paced, the current shopping methods cannot satisfy modern life. Accelerating the pace of the demand for faster service, and at the same time caused the waste of supermarket labor costs, affecting the quality of the merchant’s service. For this reason, there is an unmanned supermarket based on the inventory big data sales determination method, which can make the unmanned supermarket cloud Data center docking with multiple unmanned supermarkets can make data sharing easier and simpler. (Guohao, Z. 2018)

The specific method is to enter the identity information of the goods stored in the database in the database system, including the type, quantity, warehousing time, and identification number information to ensure that each product is confirmed, and then paste the ID card identification code representing the product on the product Or QR code, and then put the product with identification into the warehouse. When the product needs to be taken out of the warehouse, directly scan the barcode or the two-dimensional code that needs to be out of the warehouse. The information of the product out of the warehouse will be automatically calculated, and the sale of the product will be calculated. It can clearly calculate the inventory cloud data of the unmanned supermarket by obtaining the number of goods out of the warehouse during the sales cycle. By calculating the number of goods in and out of the warehouse, the sales during the sales cycle can be calculated. It also has statistics on daily sales and monthly sales. The sales volume, annual sales volume, and the sales volume of the unmanned supermarket are clear at a glance. (Guohao, Z. 2018)
2.4 **Unmanned supermarket management method and system**

With the development of science and technology and people’s diversified needs, unmanned supermarkets have emerged. When customers enter the unmanned supermarket, the door of the unmanned supermarket senses that someone is approaching and will automatically open the door for customers to enter. Good products and payment vouchers need to be provided after the payment is completed. After verification, the unmanned supermarket will open the door for the customer to allow the customer to leave the unmanned supermarket. However, this method largely relies on the consciousness of the customer to restrain the customer's behavior. Therefore, this kind of management method and system of the unmanned supermarket, on the one hand, is convenient for customers to shop and save time for queuing and settlement, on the other hand, it facilitates the management of the supermarket and avoids the loss of unmanned supermarket due to human factors. (Li, Luo, Hong, Li, Zeng & Zhong. 2018)

Connect each server through the intelligent terminal, and then each unmanned supermarket server is connected, the inventory management subsystem, the payment management subsystem, the access control management subsystem, the monitoring management subsystem, the security management subsystem, and the service evaluation management sub-system The system and shelf management subsystem are integrated to better monitor the status of the unmanned supermarket, giving customers a perfect shopping experience, making it easier for customers to shop, saving time for queuing and settlement, and making the management of the unmanned supermarket easier. (Li, Luo, Hong, Li, Zeng & Zhong. 2018)

2.5 **Mobile home for unmanned supermarket point-of-sale terminal.**

The smart supermarket is in the experimental stage, but the smart supermarket needs a house when it is opened. The house is a building where people or things are stored. However, the existing houses are inconvenient to move, and it is quite inconvenient to move in the community, subway station, street, and exhibition hall. It takes too long to set up and is expensive. At the same time, it takes a lot of time to decorate and display the goods in the house. This mobile house for the sales terminal of an unmanned supermarket is transformed with recyclable second-hand containers, which greatly reduces production costs, and is equipped with a commodity storage model that distinguishes goods and a display module for goods so that people can Entering it for
independent shopping reduces the consumption of labor. The external structure has a uniform size and can be mass-produced. The internal decoration, product placement, and product storage are all modularized, which is convenient for unified deployment and quick and easy to lay outlets. (Guoliang, S. 2018)

2.6 The impact of unmanned supermarkets on traditional retail

In the traditional retail industry, there are various forms of retail, so it is difficult to make a comprehensive analysis. Analyses the two aspects of the supply side and the demand side, and from a macro perspective, explore the different effects of unmanned supermarkets on the traditional retail supply and demand sides, thereby forming the impact of unmanned supermarkets on the retail industry. (Anil, M 2013.)

Impact on the supply side. In the traditional retail industry, the suppliers are often manufacturers, and the prices of goods are low, but because of the convenience and comfort, there are a large number of consumer groups. However, unmanned supermarkets are mostly set up in communities or close to office areas, because they are close to consumers and have price advantages and consumer experience advantages. These have brought challenges and threats to traditional convenience stores. (Eva, D 2018.)

Impact on the demand side. The impact of unmanned supermarkets on consumers is related to their characteristics. Unmanned supermarkets have their convenience and experience characteristics. Most of them are set up in residential areas or office areas, which are closest to consumers. As a result, consumers can shop easily, and there is no need for queuing to check out without a shop assistant. In addition, unmanned supermarkets have applied a number of black technologies to bring consumers a shopping experience that traditional retailers cannot compare. (ShuLing, L 2009.)

The countermeasures of the traditional retail industry to unmanned supermarkets, Currently, unmanned supermarkets have achieved unprecedented development, which has become an unstoppable trend. However, there are also various drawbacks in the development of unmanned supermarkets, such as high capital investment, slow delivery speed, and immature technology. In a short period of time, it cannot shake the position and mode of the traditional retail industry.
Therefore, in future development, it will coexist with the traditional retail industry. So, in today’s rapid technological advancement, how to promote the development of the traditional retail industry has become a topic that everyone cannot avoid. Promoting the traditional retail industry to be more in line with the development requirements of the times requires the joint efforts of society and consumers to create an orderly and efficient shopping environment. (Tredre, R 2018.)

Strengthen communication with customers. The radiation range of traditional convenience stores is usually the entire residential area or office area, and the consumer group is dominated by old customers. Therefore, customers should continue to provide considerate service and a good attitude when shopping. For old customers, it is necessary to communicate frequently and ask questions. For new customers, it must provide them with the products they need, do a good job of explaining the functions of the products, and inform the store of discounts in time, and strive to develop new customers into regular customers. You can prepare small gifts for customers during special periods such as festivals, which can quickly increase the goodwill of customers and enhance emotional communication with them. (Eva, D 2018.)

Precise positioning and provide more humane services. At present, the types of products in retail stores are roughly the same. If they want to develop for a long time, they need to reposition their customers, strengthen the pertinence of products, and cultivate a group of loyal customers. Traditional retail stores should not only provide commodities but also provide more humane services. For example, home delivery, free maintenance, and so on. When repositioning traditional retail stores, you can use the following methods: 1 In-depth examination of the level of consumers in the region, positioning of product varieties and grades, so that you can focus on the business process. 2 Form a humanized characteristic service. Retail stores must improve service quality and service attitudes. Unique services are very important for retail companies. (Yali, W 2020.)

Introduce some artificial intelligence. Unmanned supermarkets rely on the integration of modern technology to deepen the operators’ understanding of their own stores and at the same time quickly understand their customers. If traditional convenience stores can adjust their products in a timely manner and put the things that customers like in the most conspicuous position, it can improve the operating effectiveness of the store. Operators can also properly introduce some artificial intelligence in the store. For example, in terms of settlement and management, the use of
artificial intelligence can reduce costs and make the development of supermarkets more modern. (Sunisa, J 2020.)

Storefront + network integration development, the transformation of business models, Traditional retail and online sales each have their own strengths. Under certain conditions, these two types of business are different. Traditional retail can effectively compensate for the shortcomings of online shopping, with a higher degree of brand awareness, better reputation, stable customer sources, rich product structure, long-term stable supply channels, and mature after-sales service. Online camps can be highly tied to consumers' online shopping habits through the advantages of traditional retailers. This can avoid the loss of customers, break through the shackles of traditional business circles, and achieve an organic combination of online and offline sales. The huge development space has promoted more traditional retailers to actively develop online sales and become a new retail channel. (Peili, M 2004.)

Carry out experiential consumption. On-site experience that is not available in online shopping improves customer shopping experience to retain customers. Retail stores should strengthen promotion creativity, continuously introduce new brands, and implant cultural marketing. Traditional retail companies should bring consumers the practical experience of integrating design, decoration, venue, and hardware and truly tangible interactions between people and things. In online shopping, consumers cannot meet the needs of people in the real world and only experience the product itself. In stores, the customer's experience is emphasized, and the promoters in the store invite customers to try and taste on the spot in order to achieve the purpose of attracting consumers. (Anil, M 2013.)

3 CASE STUDY

Amazon GO

On December 05, 2016, Amazon launched a revolutionary offline physical store, Amazon Go. According to Amazon's official introduction, the largest consumers of Amazon GO and traditional retail stores only need to open the Amazon GO App when entering the store and scan the QR code in the store to start shopping (the mobile phone will no longer be needed). (Andria, C 2019.)
Consumers can get the goods they want from the shelves at will. If they encounter that kind of goods they don't want, they can just put them back. It is operated by AI, deep learning, and other high-tech technologies. Consumers' virtual shopping carts will change through changes in the products they take. (Andria, C 2019.)

After the consumer completes the purchase, no personal settlement is required. Yes, there is no checkout counter here, you only need to carry the goods and go out. Since the App is bound to payment methods such as credit cards, after the consumer leaves the store, the app will complete the settlement "without the consumer's attention." (Andria, C 2019.)

At present, this new concept store called Amazon GO officially opened in Seattle on December 5, 2016 (currently only open to Amazon employees), but it is still worth looking forward to. (Andria, C 2019.)

First of all, from the perspective of the entire industry definition and strategic prospects, Amazon Go is like a benchmark, creating a new model and new business format for all-smart unmanned stores, making the image of Amazon's industry leader deeply rooted in the hearts of the people. As a result, from the perspective of consumer experience, the "take and go" shopping method greatly facilitates consumers, and the queuing and checkout of storing users will be ended, which greatly improves users' goodwill. Consumers can complete consumption with their mobile phones, and the cash society will be thoroughly warned in the future. Amazon Go has made a perfect interpretation of the electronic payment era. (Andria, C 2019.)

Thirdly, from the perspective of technical realization, "recognizing the interaction and movement of objects", "the transfer of items from storage devices" and other advanced shopping patent layouts and extensive replacement of new technologies such as computer vision, sensor fusion, and deep learning algorithms, Go In the store, Amazon named the technology "Just Walk Out", which can monitor when the products on the shelf are taken away and when they are put back, and then track the specified products in the virtual shopping cart. When consumers currently have Amazon leading the global smart retail technology at the technical level, the advantage in terms of time when the technology is most lacking in particular is obvious. (Andria, C 2019.)
In addition, in the long run, the widespread application and large-scale use of new technologies will continue to share R&D and deployment costs. Amazon Go will no longer set up the cashier and other employee positions. In the long run, it will greatly reduce operating costs. In the short term, it is impossible to promote its use. (Andria, C 2019.)

2. Nraffr

Nraffr is Swedish, meaning "Shop Nearby" is mainly aimed at Swedish consumers living in "rural areas" (due to European labour protection policies, there are no common so-called 24-hour convenience store. Many Europeans National stores may not open on weekends). When Swedish consumers urgently need to buy a certain product, they often encounter the situation that nearby shops are closed, and the nearest place of purchase may be tens of kilometers away. (Haloo 2020.)

Nraffr is a convenience store with no clerk that truly realizes 24*7 service. Consumers use the mobile App called Nraffar to open the door of the convenience store by scanning the QR code and then directly scan the code for what they want to buy. It is important to note here that all final payments are settled on a monthly basis! (Haloo 2020.)

Then there is the issue of commodity theft, which is of great concern. Generally speaking, unsupervised stores like this should have serious theft problems under unsupervised circumstances, but this is not the case. First of all, the overall quality of consumers in western developed countries is relatively high. The high welfare means that they do not need to do something disdainful for petty gains. Secondly, the absence of staff in an unmanned store does not mean the cancellation of the supervision mechanism, on the contrary. There are several cameras in the store for real-time monitoring. From the final result, the tracking and monitoring of consumers are actually closer. Finally, the App is bound to the user. If there is a problem that affects personal credit, then he will encounter a lot of trouble (the second is the failure to enter Nraffr's door. In developed countries that emphasize the spirit of the contract, credit problems will seriously affect people's social status, moral public opinion, and actual life). Regrettably, the only problem with Nraffr is that the scale is too small. It is reported that there are currently only two, all of which are located in "remote" villages in southern Sweden... (Haloo 2020.)
First of all, from the perspective of business positioning, the main consumer group is rural consumers, and the lack of flow of people and lack of consumer goods may restrict the development of Nraffr. Secondly, from the perspective of scale, the small number of stores means that public amortizable expenses such as research and development remain high, and the cost issue remains to be considered. Third, Sweden is a developed country with a relatively high level of credit system and consumer education and has inherent advantages in terms of security. In addition, as far as the popularity of mobile payment is concerned, payment security may have advantages, but the convenience of shopping is more concerned and needs to be improved. (Tredre, R 2018.)

Perspective of an unmanned supermarket

The achievements and development brought about by the economic application, but also its existing problems and deficiencies cannot be ignored. To solve these problems and defects, it need to start from the following points. (Anil, M 2013.)

From a micro-scale perspective, operators can reduce their own land rent costs by acquiring and merging existing large supermarkets or traditional small convenience stores. In addition, unmanned supermarkets should regularly maintain and clean merchandise and goods to provide consumers with a good shopping experience. In the service process, unmanned supermarkets can give consumers the right to choose whether they need services and provide consumers in need with a good service experience so as to create a large number of repeat customers and build a good reputation. (Eva, D 2018.)

From a macro perspective, the development of smart retail requires more national policy branches, and the government needs to use artificial intelligence as the new engine of economic development and the core driving force of the new generation of industrial changes, thus leading to the era of smart economy. In addition, the improvement of the quality of the whole people also depends on the expansion of basic education and the establishment of evaluation, thereby increasing the participation of the smart economy, the beneficiaries and reducing the emergence of moral hazard and adverse selection. (Mwanyota, J 2004.)
The development of the smart economy is an important direction for our future economic development, and all industries will be greatly affected by artificial intelligence.

4 RESEARCH METHOD

Research methods are strategies, processes, or techniques used to collect data or evidence for analysis to discover new information or better understand the subject. There are different types of research methods that use different tools for data collection.

The research method used in this thesis is a survey, which is a purposeful, planned, and systematic method of collecting materials about the actual or historical conditions of the research object. It is a research method that collects data by asking questions in writing. The survey items in a form, distribute or mails them to relevant personnel, asks for instructions and fills in the answers, and then collects, organizes, counts and researches.

4.1 Survey

In order to investigate consumers’ impressions of unmanned supermarkets, their shopping intentions, and the possibility of recommending to others, relevant questionnaires were designed, and some consumers living in Helsinki were surveyed through online questionnaires. A total of 18 valid questionnaires were collected in this survey.

![Pie chart showing gender distribution with 50% Male, 44.4% Female, and 5.6% Prefer not to say]
Figure 1. What is your gender?

Figure 1 shows that half of the people are women, 44.4% are men, and the remaining 5.6% choose to prefer not to say.

Figure 2. How old are you?

Figure 2 shows that between the ages of 18 and 25, the age of the respondents accounted for 44.4% of all respondents; between the ages of 26 and 35, they accounted for half of all respondents, and the rest were over 35 years old. The proportion of respondents to all respondents was 5.6%. Statistics show that the majority of respondents living in Helsinki are between 26 and 35 years old.

Figure 3. Where are you from?

3. Where are you from?

18 responses
Figure 3 shows that 83.3 % of people are from Finland, and 16.7 % are from other countries. According to the results, most people in this survey are from Finland.

Figure 4 shows that 66.7 percent of people live in Helsinki, and the remaining 33.3 percent do not live in Helsinki. According to the results, more than half of the people in this survey live in Helsinki.

Figure 5 shows that compared to unmanned supermarkets, 61.1 % of people prefer traditional supermarkets, and the remaining 38.9 % prefer unmanned supermarkets. According to the results, most people living in Helsinki still like traditional supermarkets.
Figure 6. Are you interested in unmanned supermarket sales

Figure 6 shows that 77.8% of people are interested in unmanned supermarkets, and the remaining 22.2% are not interested in unmanned supermarkets. According to the results, most people are interested in the unmanned supermarket.

Figure 7. Do you think unmanned supermarkets will be popular in Finland in the future

Figure 7 shows that 33.3% of people believe that unmanned supermarkets will prevail in Helsinki in the future, and 16.7% believe that unmanned supermarkets will no longer be popular in Helsinki in the future. 50% of people chose maybe, holding a conservative opinion.
8. If you are shopping in an unmanned supermarket, what you care about most is.

Figure 8 shows that 16.7% choose the price, 44.4% choose convenience, 16.7% choose commodity richness, and 22.2% choose the distance. According to the results, it is the largest among unmanned supermarkets. Most people prefer the convenience of an unmanned supermarket. Secondly, they prefer the proximity of an unmanned supermarket. The price is the same as that of commodity richness.

9. What do you like about the unmanned supermarket?

Figure 9 shows that 5.5% choose to save costs, 11.1% choose to save time, 16.7% choose to enjoy shopping alone, and 66.7% choose flexibility and convenience. According to the results, Most
people like the flexibility and convenience of unmanned supermarkets. Secondly, they like to enjoy the feeling of shopping alone. Thirdly, they choose to save time and cost.

Figure 10. What are the challenges of unmanned supermarkets? (Have experience in unmanned supermarket shopping)

Figure 10 shows that most people think that the challenge of unmanned supermarkets is technical problems, which account for 50%. Commodity storage problems account for 16.7%, and commodity category issues account for 11.1%. User experience issues accounted for 22.2%. According to the results, most believe that the challenge of unmanned supermarkets will be technical issues, followed by user experience issues, and then commodity storage problems and commodity category issues.

Figure 11. If Helsinki had an unmanned supermarket, would you consume it?

Figure 11 shows the responses to the question. 38.9% of people said yes, it is full of freshness; 16.7% said yes, I believe I will go often; 44.4% said no, I don’t trust the unmanned supermarket.
Figure 11 shows that if there is an unmanned supermarket in Helsinki, 16.7% of people choose not to trust the unmanned supermarket and choose not to go and 44.4% choose to go, because of the freshness of the unmanned supermarket. They are curious and willing to try this new shopping method. 38.9% of people choose they believe that unmanned supermarkets will choose to go often. The statistical results show that most consumers in Helsinki are interested in the novel retail of unmanned supermarkets. The business operation model is fresh and curious. Self-service shopping has a certain appeal to consumers. For a certain potential consumer group, the operation mode of the unmanned supermarket caters to the needs of some consumers to a certain extent and has a certain potential for market development.

Figure 12. Do you think the existing unmanned vending machines around you are convenient to your life?

Figure 12 shows that most people think that unmanned vending machines are convenient for their lives, of which 61.1%, The remaining 38.9% think that the surrounding vending machines are inconvenient for their lives. According to the results, most people still like the convenience of life brought by unmanned vending machines, and a small number of people do not like unmanned vending machines.
Figure 13. With the rapid development of artificial intelligence, are you worried that the popularity of unmanned convenience stores will cause a group of sales staff to lose their jobs?

Figure 13 shows that with the rapid development of artificial intelligence, 16.7% of people worry that the popularization of unmanned vending stores will cause a group of sales staff to lose their jobs, while 22.2% are not worried that the popularization of unmanned vending stores will cause sales staff to lose their jobs. Most people are not worried that the popularity of unmanned stores will cause the sales staff to lose their jobs. They believe that the maintenance and operation of unmanned stores still require sales personnel, which account for 61.1%. According to the results, most people are not worried that the popularity of unmanned stores will cause a group of sales staff to lose their jobs.
Figure 14. Do you think that the existing supermarket (with sales staff) will be replaced by an unmanned supermarket?

Figure 14 shows that 88.9% of people believe that the existing unmanned supermarket will not be replaced by an unmanned supermarket, while 11.1% believe that the unmanned supermarket will replace the existing supermarket. Based on the results, most people believe that the existing unmanned supermarkets will not be replaced by unmanned supermarkets, and their existence is still needed.

Figure 15. Would you recommend the unmanned supermarket to your family or friends

Figure 15 shows that 61.6 percent of people would recommend an unsold supermarket to their family and friends, 5.6% would not recommend an unsold supermarket to their family and friends, and the remaining 33.3% had Maybe recommended unmanned supermarkets to friends and family. According to the results, most people are still friendly to unmanned supermarkets. They are more curious about unmanned supermarkets and recommend unmanned supermarkets to friends and family.
37

Figure 16. Do you have any comments or questions

<table>
<thead>
<tr>
<th>16. Do you have any comments or questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 responses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sometimes I still think traditional shops with staff are convenient. You just go in and ask for a thing and pay immediately. Plus, I think 'unmanned' markets might dominate, for example, the convenient stores, in the future. Complicated stores that sells products like electronics, tehnology, services, etc. still need human staffs their as the main workforce.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don't like unmanned stores mainly because it is lack of human connections. For example, if I have a question of a product, I would like to ask staff in physical supermarkets. In unmanned supermarket, I don't know if I am able to talk to customer service in time. Besides, there are many unmanned stores in China now. Most of them are pretty small with limit amount of commodity, which makes it less attractive.</td>
</tr>
</tbody>
</table>

Figure 16 shows, Some people don't like unmanned shops, mainly because unmanned supermarkets lack the connection between people. For example, if they have questions about the product, they want to ask the staff of a physical supermarket. In the unmanned supermarket, they do not know whether they can contact the customer service department in time. In addition, China now has many unmanned stores. Most of them are small and the number of goods is limited, so they are not very attractive. Still have to continue to study technical issues and actual customer buying experience, and after-sales issues.

5 RESULTS

Figures 5, 6, and 7 show that most people have only heard of unmanned supermarkets, but they don't know them well. The statistical results show that at this stage, most consumers in Helsinki are not very familiar with unmanned supermarkets. Many people's understanding of unmanned supermarkets is still in the conceptual stage, and they have not personally experienced the consumption. This may be similar to the current unmanned supermarkets. There is a relationship between the number of layouts and the unmanned supermarkets.
It can be seen from Figures 8 and 9 that the main reasons why Helsinki consumers choose unmanned supermarkets are as follows: they believe that unmanned supermarkets are convenient and quick to check out; those who do not have shopping guides are freer to follow the shopping; unmanned supermarkets are affordable; Good product quality; choose unmanned supermarket for other reasons. This statistical result shows that self-service shopping is the main difference between unmanned supermarkets and traditional supermarkets, and it is also its competitive advantage.

It can be seen from Figure 11 that most people are curious about unmanned supermarkets and are willing to try this new shopping method; 44.4% of the people choose to choose according to the situation. It does not exclude unmanned supermarkets; 16.7% of people do not approve of unmanned supermarkets and are unwilling to try. The statistical results show that most Helsinki consumers are fresh and curious about the novel retail operation model of unmanned supermarkets. Self-service shopping is attractive to consumers and has a certain potential consumer group. The operation of unmanned supermarkets The model caters to the needs of some consumers to a certain extent and has certain market development potential.

It can be seen from Figure 10 that the reason why consumers are reluctant to choose unmanned supermarkets is that among all possible reasons, unmanned supermarkets have technical problems; unmanned supermarkets have too few product varieties; worry about the quality of goods; think that unmanned supermarkets cannot be sold. Gives a warm feeling; not used to self-service shopping. This statistical result shows that: firstly, the type of goods is a factor that consumers value when shopping; secondly, the quality of goods is also a reason why consumers are unwilling to choose unmanned supermarkets; thirdly, because unmanned supermarkets use no clerk on duty Consumers cannot get help and guidance from shop assistants during the shopping process, and they feel that the shopping process lacks a warm feeling. This has also become a factor for consumers not to choose unmanned supermarkets.

The development of unmanned supermarkets is inseparable from consumer support and publicity, and word-of-mouth communication is crucial to the promotion of unmanned supermarkets.

As can be seen from Figures 12 and 15, the possibility of consumers recommending unmanned supermarkets to relatives and friends has been investigated. Survey data shows that 61.1% of
people are willing to talk to their family members, relatives, and friends. Friends recommend an unmanned supermarket; 33.3% of people think it depends on the situation; 5.6% of people expressly do not want to recommend it. This shows that unmanned supermarkets have a certain degree of recognition among Helsinki consumers. Many people are willing to experience the fresh shopping model of unattended and self-service shopping, and they are also willing to share the convenience of life brought by technology and retail model innovations with people around them.

6 CONCLUSION

In the future, more participants in more fields will participate in unmanned retail, such as fast-moving consumer goods brands, traditional operators, logistics service providers, technology companies, property operators, traditional retailers, and coffee industry chain companies.

At present, the unmanned retail industry as a whole is still under pressure, especially for SMEs. Collaborative warehouses, centralized distribution, centralized procurement, and entrusted operations are becoming more and more common. In the future, the trend of "clusters for heating" is obvious. The unmanned retail business involves continuously enriching business fields and content. Through the development of future technology, the range of products that unmanned retail companies can sell in the surrounding areas will continue to expand.

Since the rise of unmanned stores, various areas of unmanned retail have rapidly increased, and various unmanned commercial forms have flourished across the country. Through the advancement of technology and the growth of consumer demand, the scale of the unmanned retail market will continue to expand. Supervision continues to standardize the combination of "unmanned" and individualized.

It is expected that regulations and standards for unmanned retail have increased significantly. In the future, it is expected that unmanned retail will continue to carry out standardization, standardization, and certification.

Although unmanned retail has problems such as high costs, incomplete technology, and imperfect anti-theft systems, it is undeniable that automation and intelligence will be the future development trend of the retail industry. It is possible to temporarily adopt the artificial and
intelligent dual business model to enhance user experience and brand influence and gradually transition to an unmanned operation state. At the same time, combined with the online guidance advantage, unmanned retail can achieve a virtuous circle in future development.
REFERENCES


Sunisa, J (2020) Willingness to Use Self-Service Technologies Similar to Amazon Go at Supermarkets in Thailand. Retrieved 07 April 2021 from https://dl.acm.org/doi/pdf/10.1145/3396743.3396785?casa_token=2wyySsceaaYAAAAA%3ATmvS2IP9fu-u-bx_-CfuqYnpEic0iT2NOu2MXsvLjq0ZG-L5Um8GxSLBPfleDV7gWopt4mZvyShvVOQ


