

Smart Commerce Case Study Using 4th Industrial Revolution Technology-AI, VR

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Abstract

Recently, the online commerce market has shifted from web to mobile. Mobile commerce refers to all forms of commerce conducted through mobile terminals such as cell phones. Online shopping companies pay attention to the M-commerce generation, after the E-commerce generation. "Future shopping," which combines the 4th industrial revolution technologies such as artificial intelligence and machine learning, has begun to come into everyday life. In particular, virtual fittings and shopping services using AI technology are becoming a form of shopping suitable for the non-face-to-face era. Brands based on offline stores do not use virtual experience shopping technology but take virtual experience as the main business group from the beginning of the brand and offline serves to support it. This paper examines the current status of mobile commerce of existing retailers. Also it investigates and analyzes cases of designing new shopping methods using the latest technology.

Keyword : Mobile commerce, machine learning, AI technology, virtual experience shopping technology

Introduction

Korean online commerce market worth 40 trillion won. Recently, the online commerce market environment is moving from web to mobile. Currently, in the domestic mobile commerce market, more than 70% of social commerce sales are already generated by mobile. Mobile commerce refers to all forms of commerce conducted through mobile terminals such as cell phones [1].

Department stores, traditional markets, and TV home shopping are all getting closer to mobile commerce. Mobile commerce encompasses all forms of commerce conducted through mobile terminals such as cell phones. The mobile commerce market is already outpacing web commerce in the online commerce market. According to branding brands in the United States, a gathering of experts related to mobile commerce, the proportion of orders made via mobile in the total online commerce market has increased sharply from 24.6% in July 2013 to 73% in July 2014. It's a number that tells you how fast mobile phone-based shopping is growing, and how high returns it will show in the future [2].

Online shopping companies pay attention to the M-commerce generation, after the E-commerce

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Received(September 1, 2020), Review Result(1st: September 29, 2020), Accepted(December 7, 2020), Published(December 31, 2020)



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generation. “Future shopping”, which combines the 4th industrial revolution technologies such as artificial intelligence and machine learning, has begun to come into everyday life. In particular, virtual fittings and shopping services using AI technology are becoming a form of shopping suitable for the non-face-to-face era. Brands based on offline stores do not use virtual experience shopping technology, but take virtual experience as the main business group from the beginning of the brand and offline serves to support it. It was in 2016 that Amazon Go, which proceeds from store entry to shopping and payment, unattended, appeared. And ‘future shopping’ that combines artificial intelligence and machine learning began to come into our daily lives. In particular, virtual fittings and shopping services using AI technology have emerged like a burst for several years.

This is the same in general markets as well as in areas where the use experience (wearing experience) plays an important role in purchasing, such as fashion and beauty. This paper examines the current status of mobile commerce of existing retailers and investigates and analyzes cases of designing new shopping methods using the latest technology. Chapter 2 analyzes the latest online commerce technologies and trends. Chapter 3, which is the main topic, analyzes the current status of virtual fitting and shopping service technologies using AI technology, which is currently most widely used, and Chapter 4 describes the latest technology trends. Finally, Chapter 5 describes the conclusions and future studies.

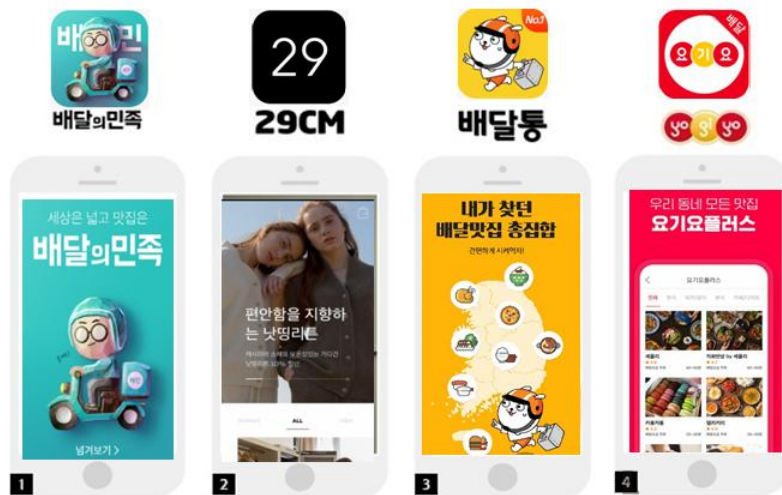
2. Existing research

Since 2014, Amazon has focused on mobile commerce so that consumers such as cell phones and tablet PC(Personal Computer)s can conveniently enjoy Amazon shopping regardless of which device they access. Currently, 29% of Amazon Shopping customers are mobile-only, no laptops or desktops. Amazon's mobile commerce sales amounted to \$16.8 billion in 2014 (approximately KRW 17.94 trillion), ranking first among mobile companies. The opening of the domestic mobile commerce market was an open market in which individuals or small businesses such as Gmarket and 11th Street directly register and sell products online. Unfortunately, most of the apps(automatic parts programming system) in the open market have moved the existing web page to mobile. Then, in 2011, several social commerce apps were launched simultaneously, and the era of mobile social commerce began in earnest.

Currently, 70-80% of social commerce sales come from mobile. If an open market or a general mall that collects tens of thousands of products is a structure in which users must search for products with a clear sense of purpose, social commerce is a curation concept that exposes good products to the front

so that users can shop easily. Social commerce, which presents selected products on mobile that can provide only short information on a limited screen, quickly caught customers. It was in effect that users could go in, browse and purchase whenever they have time [3].

The reason that mobile commerce was able to grow compressed in such a short period is because the time spent using PC in their 20s and 30s leading online shopping has decreased dramatically. Instead, the time spent using cell phones has increased sharply. In their 20s and 30s, called the mobile generation, they can check emails, search the Internet, and transfer accounts with their cell phones. Mobile commerce, which has no time and place constraints and not only shortens shopping time, but also offers benefits such as discounts and additional savings, is now one of the important ways of purchasing for us. Moreover, the shopping experience in the palm of your hand with a few touches is surprisingly simple and fast.



[Fig. 1] Mobile commerce design

[Fig. 1] shows an example of mobile commerce design. The people of delivery bring out the fun of B-class culture. The “People of Delivery” started to strengthen their competitiveness by introducing artificial intelligence(AI) services. The “People of Delivery” introduced an artificial intelligence recommendation dispatch system that automatically allocates the optimal rider and connector in consideration of the movement of the delivery person and the characteristics of the food ordered. In the meantime, delivery workers had to check their cell phones from time to time while driving in order to accept calls that keep popping up in real time, and this often leads to accidents. The AI recommended

dispatch function is expected to be of great help to the safety of delivery personnel by not only increasing the efficiency by automatically dispatching the next call that is most suitable for my current route, but also creating an environment where people can concentrate on driving.

“29CM” dreams of becoming a one-stop shopping journal through original content. Mobile commerce design is approaching consumers with various changes, such as a delivery box that is popular with a pleasant parody and “Yogiyo” that captivates users with a clean UI(User Interface).

People search for products on their cell phones, and if they like them, they ‘on the fly’ with just a touch. Web commerce users who turn on a computer and check a public certificate, enter a card number, and buy goods are gradually disappearing, and more than 80% of social commerce sales are on mobile. Now, to sell something, you need a curation strategy that carefully selects essential information on a small screen. This is why the design sensibility that drives consumers' desire to purchase as well as the technical elements that encompass the purchasing process have become more important. TV is a common device for families, but mobile is a personal device, so it can provide customized information or hold events to increase inflow. It is also good to design a reasonable system based on customer feedback.

The nation of delivery preoccupied the delivery app market through the fun of a B-class culture called kitsch, but with a convenient mobile payment system, it has been reborn as a mobile e-commerce platform. Online shopping mall “29CM”, which unveils products from a digital storytelling perspective, is a platform that encompasses commerce and media, and has built a sense of trust with a strategy that completely separates web and mobile to design and shoots all products by itself. Now, you must be aware of the mobile environment and build a shopping experience that can only be enjoyed on mobile to participate in mobile commerce.

“What is more important than a simple experience is the familiarity of the basic experience.” When paying on mobile, we may feel a sensibility similar to an old habit: taking cash or cards out of a wallet to pay. If technologically groundbreaking displays appear and create synergy, a market of explosive scale will arise. The answer is to understand the mobile environment and understand customer preferences to design UI(User Interface) and UX(User Experience), and to design to shop while consuming content.

3. New Shopping Mate AI-based Virtual Shopping Case

Gucci, which introduced a virtual fitting service in collaboration with Blueprint Lab, recently launched

a virtual shoe experience service in collaboration with Wannaby, an AR platform & tech company [4]. [Fig. 2] shows a Gucci's virtual shoe experience service. Wannabe's AR technology is not just a photo viewed in 2D(Dimensional), but just like applying multiple designs to the face in real time in the Snow app, you can immediately change your shoes while viewing your feet with video. Of course, you will have to try on the actual fit yourself, but it is clear that you can save time choosing the design and model you want in the store. [Fig. 2] is show Gucci's virtual shoe experience service where you can try on the shoes you want through the iOS(Operating System) apps [5].



[Fig. 2] Gucci's virtual shoe experience service

Deep Eye, a domestic online eyewear brand, has applied a commercialization technology for face recognition that can directly wear thousands of glasses through AI deep learning technology. It recognizes the face accurately at any angle or brightness, and recognizes the face precisely even when wearing glasses or a hat. The big advantage is that the user can easily adjust the face size, the height of the glasses, the length of the legs, and the angle, so that it is possible to make elaborate fittings by yourself. It also has a glass finder function to find celebrity glasses or similar models. Graphic experts, eyewear experts, and software & AI development experts collaborated in this process. Brands based on offline stores do not step into virtual experience shopping technology, but take virtual experience as the main business group from the beginning of the brand, and offline serves to support it [6]. [Fig. 3] shows a Rounds' face recognition commercialization technology case.

This is not just the same dimension as service efficiency or brand new technology strategy. Blockchain, AI, virtual reality, and real-time tracking technology are opening up a new market for

distribution. In other words, distribution is getting smarter by meeting advanced IT. The domestic distribution market has been an industry that has been relatively strong in traditional sales methods and systems, but in recent years, it is facing a new phase as cutting-edge technologies based on the Fourth Industrial Revolution are combined one by one. This trend is the same for leading distribution conglomerates such as Shinsegae, Lotte, and CU, as well as distribution startups. As it is a “distribution 4.0” era in which future competitiveness can be divided depending on how quickly new technologies that increase efficiency are accepted, there are many cases in which technology is applied to secure an edge with competitors. This is an example of mobile commerce by leading companies that lead distribution innovation with technology [7][8].



[Fig. 3] Rounds' face recognition commercialization technology case

4. Smart Shopping

4.1 Smart Shopping Using Virtual Reality

Last year, eBay, an open market in the US(United States), created the world's first VR (Virtual Reality) department store in Australia through a partnership with Australian department store Myer. Virtual reality department stores allow customers to purchase and experience products as if they were shopping while walking around the department store after wearing headsets such as Samsung Gear VR and Google Cardboard. These VR department stores are evaluated as providing new immersive

experiences to customers, expanding omni-channels, and suggesting innovative retail models in a new way.

In Korea, technologies such as VR, AR (augmented reality) as well as AI (artificial intelligence) shopping are rapidly being introduced by incorporating IT technology. Fashion and retail companies aim to verify new business models through new technologies and provide new shopping experiences to customers.

- Shinsegae Department Store, personalized marketing through 'S Mind'
- Lotte Department Store, 'Watson' and 'Silbot' AI shopping
- Hyundai Department Store, VR Department Store and "Heybot" introduced

From the 30th of last month, Shinsegae Department Store launched a personalized marketing system that targets the tastes of customers with different interests at 1:1. Breaking away from the method of delivering the same shopping information (sales, private bank companies, special products, etc.) to all customers through 'DM (Direct Mail)', which has been the representative communication method in the department store industry, it operates an artificial intelligence customer analysis system to customize customers. Start 1:1 communication. The personalization service developed by Shinsegae is through 'S Mind', an artificial intelligence program. 'S Mind' is a combination of 'S' for Shinsegae and 'Mind' for heart, and contains the meaning of 'reading the hearts of Shinsegae customers'. 'S Mind' is a method that analyzes each customer's taste, identifies a preferred brand, and delivers shopping information accordingly through a mobile application. To this end, it targets 5 million customers who frequently visit Shinsegae Department Store stores and purchase products, as well as recent online and offline purchase records, as well as gender, age, region, frequency of purchase, purchase cycle by genre, recent purchase, customer unit price, major store, It uses about 100 variables such as preferred genre, preferred purchase amount, monthly purchase date, and weekly purchase pattern to create vast big data every day. Through this, a total of 500 million favorite brands are calculated every day, each of 100 individual favorite brands.

When a preferred brand is determined, shopping information related to the customer's preferred brand is automatically matched in a "content management system" containing shopping information. In the content management system, not only Shinsegae employees, but also employees of partner companies (brands) responded to a vast amount of data of 500 million by posting events such as popular products, discount promotions, and special events. Shinsegae completed six big projects such as the extension of the Gangnam branch last year and the new opening of Shinsegae in Daegu, while introducing differentiated brands such as Sikor (cosmetic editing shop), Adir (own jewelry brand), and Delarana

(own cashmere brand). And has invested intensively in MD. In addition, it was determined that a differentiated software platform that helps customers' shopping convenience is needed, and developed the industry's first artificial intelligence personalization system completed with domestic technology.

The artificial intelligence customer analysis system developed by Shinsegae Department Store is a self-developed model based on domestic technology rather than collaboration with foreign companies already famous for artificial intelligence such as Google or IBM. Shinsegae is expected to increase marketing hit rate and increase sales of more than 100 billion won per year through the development of this personalized marketing system.

Lotte launched a TF (Task Force) team to introduce Watson solutions in Lotte Department Store. Watson Solution signed a business agreement with IBM Korea in December of last year with IBM's cloud-based cognitive computing technology, and provides customers with more personalized and customized services, reliable product information, and expert advice through data analysis using Watson. There are two major AI themes that Lotte and IBM will use Watson to develop: 'Intelligent Shopping Advisor' and 'Intelligent Decision Support Platform'. 'Intelligent Shopping Advisor' is a chatbot (software that automatically communicates with people based on artificial intelligence)-based apps (APP) that will be introduced to distribution-related affiliates such as department stores. It plans to build so that customers can receive product recommendations, store descriptions, and online pick-up service guidance through chatbots, rather than finding products through self-search. [Fig. 4] shows a Intelligent Shopping Advisor.



[Fig. 4] Intelligent Shopping Advisor

Based on the fact that customers who visit offline stores such as department stores are more likely to seek information on their own rather than help from store staff, department store information services will also be supported. The 'intelligent decision support platform' is used to establish strategies for the development of new products for confectionery and food affiliates. Watson helps in making decisions for new business development and launch based on the results of analyzing data from various external markets, sales of internal systems, and product information.

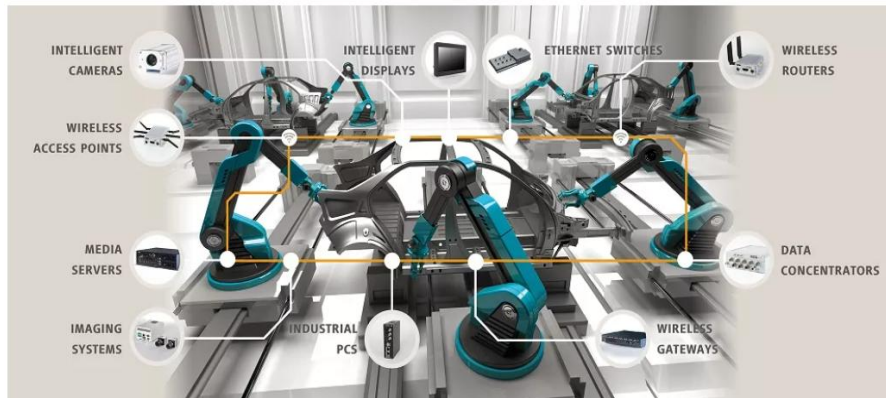
Watson is being evaluated as an AI that has built an unrivaled position among 'what people say', that is, natural language-based artificial intelligence. He also has the ability to grasp the overall context even if the sentence investigation or grammar is a little wrong. Along with this, Lotte Department Store will introduce a robot called 'Silbot' that enables autonomous driving with a navigation function at the pickup desk on the first basement floor of the main store as early as this month. Silbot will perform tasks such as welcoming department store customers, introducing restaurants, explaining 3D virtual fitting services, and serving foreign customers. Starting with Lotte Department Store, Lotte Group will expand related services to distribution affiliates within the group such as Lotte Mart, Lotte Super, and Lotte.com through AI technology internalization and big data convergence.

The Hyundai Department Store's online mall The Hyundai.com last year introduced a VR department store where you can shop while browsing the department store through virtual reality (VR) devices. As the first case of introducing VR technology to a domestic online shopping mall, VR Store is a store where you can experience shopping by moving actual offline stores as they are by applying VR technology to department stores. The Hyundai.com can shop through virtual reality devices at Nike and Adidas stores on the 5th floor of Hyundai Department Store Pangyo.

Consumers without VR devices can access the VR store through PC and mobile, browse the store as if they were actually browsing, register a shopping cart, and purchase products. In addition, a VR service that automatically recommends products that match the product along with product descriptions in 2018, and a VR department store in 2019. In addition, The Hyundai.com introduces 'Heybot', a chatbot, an interactive robot based on big data. [Fig. 5] shows a VR store through PC and mobile.

Products produced in smart factories now meet consumers through marketing and distribution. Artificial Intelligence (AI) and Virtual Reality (VR), one of the core technologies of the 4th industrial revolution, are technologies used in distribution and marketing in the fashion business area. In VR or AI, many fashion shows and retailers have already adopted this technology to maximize the convenience of shopping for consumers. Augmented Reality (AR) and Virtual Reality (VR) are similar in concept but are clearly different technologies. VR refers to virtual reality. Virtual reality is a technology that makes

you feel as if it is reality through vivid images, images, and audio.



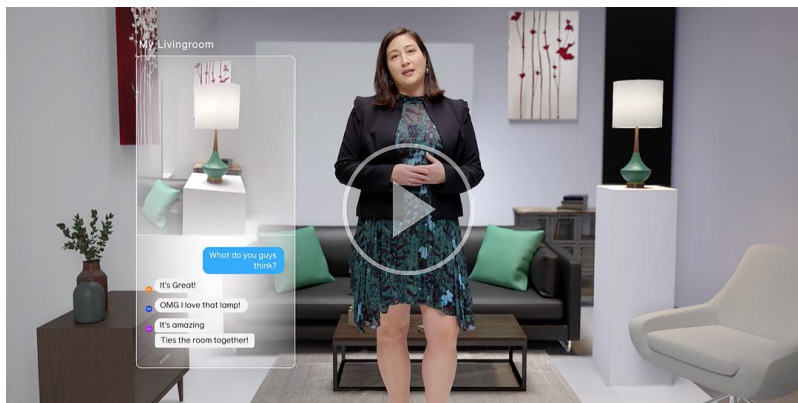
[Fig. 5] VR store through PC and mobile

'Virtual Reality (VR)' and 'Augmented Reality (AR)' are often confused. Virtual reality uses a virtual image that is not real, but augmented reality (AR).) Is a technology that displays a single image by superimposing a 3D virtual image on a real image or background. Augmented reality is also called mixed reality (MR), and augmented reality was first introduced to the world around 1990 when Boeing, an airplane manufacturer, added virtual images to the airplane assembly process. Virtual reality uses a virtual image that is not real, but both itself and the background and environment, whereas augmented reality is a technology that shows a single image by superimposing a 3D virtual image on a real image or background. Augmented reality and virtual reality are similar to each other, but they are clearly distinguished depending on whether the subject is a virtual image or a real image. The reason the fashion industry is interested in virtual and augmented reality technology is because of the unique advertising marketing that uses it. They even suggested tools.

4.2 Facebook: AI-based: Improve product understanding and build a new shopping experience

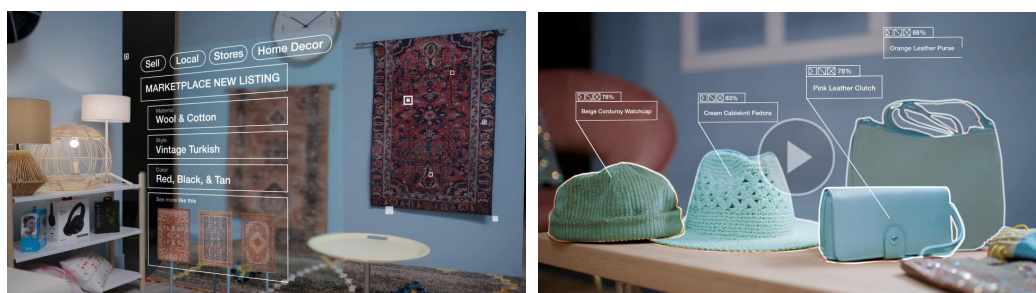
Besides offline distribution companies, online distribution companies are also increasing service value with technologies that add competitiveness. In particular, the activity of artificial intelligence (AI) technology stands out. Facebook built and deployed GrokNet, a general-purpose computer vision system designed for shopping. You can identify detailed product attributes from billions of photos in a variety of categories such as fashion, automotive, and home decor. The figure shows that Facebook's AI lifestyle assistant suggests the right shopping that suits the time and place. The AI lifestyle assistant of Facebook recommends furniture and lights to put in the new house, and it is recommended considering

the structure of the room and the color of the wallpaper. [Fig. 6] shows a Facebook's AI Lifestyle Assistant.



[Fig. 6] Facebook's AI Lifestyle Assistant

- GrokNet is offering a new Marketplace feature for buyers and sellers, and is testing automatic product tagging on Facebook pages so you can shop for photos.
- Introducing Rotating View, a state-of-the-art 3D-like photo feature that allows anyone with a camera on their smartphone to capture a multidimensional panoramic view of a listing on the Marketplace.
- Research was conducted by creating state-of-the-art technology that predicts obscured or overlapped objects (eg, shirts under jackets) in photos.
- Part of the foundation we are building to develop completely new ways to shop on the platform. It makes it easy for individuals and small businesses to present their products to billions of people and allows buyers to find their products exactly. [Fig. 7] shows a New Marketplace Features for Buyers and Sellers.



[Fig. 7] New Marketplace Features for Buyers and Sellers

5. Conclusion

The domestic mobile commerce market exploded in 2014 and showed endless possibilities, but it has not escaped from the level of crumpling web commerce into mobile. Recently, technologies such as VR, AR (augmented reality) as well as AI (artificial intelligence) shopping are rapidly being introduced by combining IT technology. Fashion and retail companies aim to verify new business models through new technologies and provide new shopping experiences to customers.

The smart store was implemented to help customers shop smartly while the shopping experience of offline stores is becoming increasingly important. In other words, it must be able to provide customers with an optimized shopping experience that applies artificial intelligence (AI) technology and virtual reality technology. Due to the nature of commerce, which lists products, the design is not differentiated and similar for each company. Technological development that processes such as sign-up and payment are handled in a flash when connected to mobile is also important, but a design experience that can sufficiently satisfy visually sensitive young people should be considered as well. This is not just pleasing to the eye, it should redesign the shopping experience.

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