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## Unmanned Store, Retailtech and Digital Divide in South Korea\*

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### Abstract

**Purpose** - A work way of 'face to face' or a work way of 'unmanned' is very meaningful trend in contrast of robot as a worker. This paper explored some cases of unmanned terminal and kiosk which has been quickly adopted to fastfood industry in South Korea and researched whether any inconvenience or trouble exists in the level of 'the poor' and 'the aged' or not at the time of 'touching' screen in unmanned store.

**Research design, data, and methodology** -The authors examined a few previous studies in keywords of AmazonGo, kiosk, digital divide, information gap, deregulation, and analyzed some cases of 'unmanned terminal' defines restrictively as all kinds of unmanned device, terminal and equipment including kiosk regardless of any place and type.

**Results** - Promotion strategy of the unhandy and retailers needs to offer 'expansion of education and learning', readiness for the law aspect, reform of kiosk industry and priority of sufficient budge and politic assistance by government side.

**Conclusions** - This paper presented some strategies of eliminating 'digital divide' both for a 'the poor', 'the aged', and for a retailer, so that the former may easily purchase goods on unmanned terminal, and the latter may easily sell the more goods at unmanned store.

**Keywords:** AmazonGo, Untact, Kiosk, Digital Divide, Customer Utility.

**JEL Classifications:** L81, M10, M14, M31, P50.

### 1. Introduction

Production, distribution, logistics, sales and consumption are very affected from fast development of information technology these day. In distribution area on digital era, a work way of 'face to face' or a work way of 'unmanned' is very meaningful trend in contrast of robot as a worker. Recently consumers who like the way of easy and

comfortable disconnection towards peoples instead of uncomfortable communication have been increased, 'untact marketing' is now pretty emerging as a new trend of consumer (Kang & Namkung, 2018). While shopping, customers do not consider both a 'contact' and a 'connection' to others with the importance, and then they regard interaction of peoples as unlikable act (Kang & Namkung, 2018). By changing consumer behavior and fast advancing technology of 4th industrial revolution, 'self-service' is widely and swiftly expanded to service industry. Besides, restraint industry and distribution industry are willing to take 'self-service' or 'unmanned terminal' in large consideration of deduction of labour wage. From the rapid development of IT, various terminology of unmanned economy (Kim, 2017), unmanned distribution (Fadi, 2018) and unmanned store (An, 2018) has ever been used, but a unified terminology for the 'unmanned store' has not existed /appeared whilst appearing AmazonGo and unmanned convenience store (Seo, 2018).

Under the above circumstance, this paper explored some cases of unmanned terminal and/or kiosk which has been quickly and widely adopted to fastfood industry and convenience food in South Korea. This paper researched at the time of 'touching' screen in unmanned store, whether any inconvenience or trouble exists in the level of 'the poor'

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(information disadvantaged) and 'the aged' or not, and further presented some strategy of eliminating 'digital divide' both for a 'the poor', 'the aged', and for a retailer, so that the former may easily purchase goods on unmanned terminal, and the latter may easily sell the more goods. Gavett (2015) noted 'how self-service kiosks are changing customer behavior' and stressed that "It seems like sort of a win-win, both for companies that want to make more money and for customers who feel more comfortable without that social friction." The authors in order to carry out this research, examined a few previous studies in keywords of AmazonGo, Untact, Kiosk, Digital Divide, Information Gap, deregulation, and then proposed schemes of resolution for both parties, 'the poor'(information disadvantaged) and 'the aged', and for a retailer in South Korea.

In this paper, the authors make a definition of 'the unhandy' as those who have difficulties to handle, treat, touch phone, pc, monitor, screen and tools and have a fear of handling the tools and machine, irrespective of an age and gender in the digital era. Also, 'unmanned terminal' defines restrictively as all kinds of unmanned device, terminal and equipment including kiosk regardless of any place and type. To be more specific, we focused on those who have a trouble in touching and ordering menu in unmanned store and further those who go to unmanned store to buy thing they really want. So we explored unmaned terminal and 'the unhandy' so that we may propose any strategy of both for 'the unhandy' and for a retailer in South Korea.

## 2. Previous Studies

We made a perusal of several items of previous studies such as retailtech, retail store, AmazonGo, autonomous car, unmanned store, digital divide, deregulation, etc.

First of all, previous studies of the retailtech were observed : -

Regarding 'The top retail tech trends of 2017', Wolf (2017). predicted in his study that "According to Sterling Hawkins, there will be a growing number of in-store analytic tools move from testing to widespread implementation. Nick McLean notes that personalization will be the forefront of the strategies of retailers".

For the topic of retail store, Bahng, Kincade, and Rogers (2018), "The relationship between retail store operations and the success of assortment planning is strong and significant. Retail store operations affect firm performance, though at a weaker significance than it affects the success of assortment planning. The relationship between the success of assortment planning and firm performance, is the strongest relationship observed by this research." (Bahng et al., 2018). Lee, Hong, and Min (2018) about retail environment, they insist that "The potential use of cryptocurrencies in a retail

environment proposes a rapid shift from the traditional financial system." Lee and Lee (2018) emphasized in their study that "Such a general store environment is gradually changing into an 'unmanned market' as a result of the development and fusion of information and communication technology (ICT)". Wadhawan and Seth (2016) studied that This digital era retail will soon bridge the gap to come at par with the traditional physical retail in the next few years. Retailers in India need to get ready to keep up with use of technology or digitalization in retail. Digitalization in businesses or retail was a choice earlier, but now it has become a necessity (Wadhawan & Seth, 2016).

Secondly, some researches were found for the issue of AmazonGo as precedents studies. In terms of Amazon's distribution strategy and business practices, the following paper was very significant. Hahn, Kim, and Youn (2018) examined "Amazon's business strategies to demonstrate the importance of technologies to the success and sustainability of its organization. Their business strategies, including technology, distribution infrastructure, and customer service, are the most vital factor for the success and rise of Amazon, and these strategies have separated Amazon from its competitors in both e-tail and brick and mortar retail industries. The previous and current Amazon's business strategies demonstrate that Amazon will continue to focus on developing and implementing new and creative strategies to separate itself from the rest of the retail and e-businesses." (Hahn et al., 2018).

In point of 'no checkout', Polacco and Backes (2017) searched that "Amazon plans to introduce a sans-checkout grocery store in 2017. The experience is designed for those who do not like to stand in a checkout line. Amazon benefits by eliminating the cost of checkout personnel. Customers will use an Amazon Go app and scan their I-phones on entering the store. Sophisticated technology will track their purchases, allow them to exit the store without a physical checkout, and automatically charge their account (Polacco & Backes, 2017).

There were significant previous studies on unmanned terminal, for instances, Kiosk in South Korea in consideration of booming and emerging market. Kang and Namkung (2018) explained that "Recently, self-service technology has been widely adopted in the service industry including food service". They, Kang and Namkung (2018) embodied from the survey that "The results showed that among twenty service quality attributes of self-service kiosks, 'offering customized coupons and discounts' 'ease of use' 'simple search, ordering, and payment process' 'convenience for changing items in the shopping cart' etc' 'speed of ordering process' 'speed of payment transaction' 'error-free systems' ect' 'aesthetic screen layout' 'appropriate font size' 'attractive picture and video of menus' etc' There was a difference in the quality classification results according to the age of the customers." For the concerns of killing many jobs on AmazonGo, Rash (2016) highlighted that "While the idea of

a cashier-free store has its charms, the Amazon Go concept won't result in mass firings of supermarket employees anytime soon" (Rash, 2016). It has the potential to make grocery stores both more efficient and the shopping experience enjoyable, but the doom and gloom of mass unemployment are misplaced (Rash, 2016). Concerning customer behavior by self-service, "When a liquor store changed from face-to-face to self-service, the market share of difficult-to-pronounce items increased 8.4%. The researchers concluded that consumers might fear being misunderstood or appearing unsophisticated in front of the clerks. Changing to self-service removed the social friction (Gavett, 2015).

Thirdly, some studies of Autonomous Car were noted.

Concerning technology adopted by AmazonGo, Zhu and Zhang (2018) demonstrated that "reinforcement learning methodology can contribute to the development of human-like autonomous driving algorithms and traffic-flow models". Regarding auto detection/avoidance technology, Alpida, Stoica, and Vizitiu (2018), explained that "It consists in a RC/Autonomous car able to autonomously adapt to modern city issues, like Lane Keeping Assist, Traffic Sign Assist and Collision Detection/Avoidance." Zhu and Zhang, (2018), regarding human-driving and autonomous cars, investigated "The sensitivity of sensors and smooth factors play an important role in stabilizing the mixed traffic flow and suppressing the traffic jam" (Zhu & Zhang, 2018).

Fourthly, as for unmanned store, the following studies were showed.

Kang and Namkung (2018) examined Kiosk for ordering system that retailer make a use of kiosk in their store by keeping up with self-service technology. Today a lot of service firms have been taken technology-based self-service (TBSS, Jeon, Kim, & Kim, 2018), since that firms might have considered both for labour cost and for developed technology, that is to say customer use their own self-service in front of unmanned terminal (Seo, 2018). Lee and Lee (2018) studied that "The usage and prospects of unmanned market in China are growing very meaningfully. The present situation of the unmanned market is examined in the US and China markets, and the development prospects are described. It also describes the key milestones necessary for the unmanned market (Lee & Lee, 2018). On the other hand, Seo (2018) suggested that the consumers' innovativeness is an intrinsic motivation affecting the usage intention of unmanned fashion stores, and fashion innovativeness and technological innovativeness can affect this intention in different ways (Seo, 2018). Meanwhile, in view of high-tech chain, Bardaki, Pramatari, and Miliotis (2007), studied "The article discusses a five-phase experimental approach for integrating the demand-forecasting model with the high-tech chain's replenishment policy. It suggested that the high-tech chain stores should focus on keeping stores inventory level down instead of trying to be more responsive to customers' expectations."

Fifthly, in connection with digital divide, some papers were showed as under.

With regard to the concept of digital divide, Rowsell, Morrell, and Alvermann (2017) explained that "There is far more to the digital divide than meets the eye. The authors consolidate existing research on the digital divide to offer some tangible ways for educators to bridge the gap between the haves and have-nots, or the cans and cannots (Rowsell et al., 2017). Bezuidenhout, Leonelli, Kelly, and Rappert (2017) studied that "Poor provision of information and communication technologies in low/middle-income countries represents a concern for promoting open data. This is often framed as a 'digital divide' based in low-resourced environments, as well as the amount of resources freely accessible online" (Bezuidenhout et al., 2017). And, Huffman (2018) studied about The Digital Divide Revisited that "As soon as the Internet came into existence and the World Wide Web was introduced to make internet utilization much easier, leaders have been worried about the "digital divide." Szeles (2018) searched that "This paper contributes to the literature on digital divide by analysing regional- and country level determinants of the regional digital divide in the EU. The results indicate that only a mix of effective regional and national measures could mitigate the regional digital divide in the EU". Dilmaghani (2018) studied that "The digital divide refers to the differential patterns of Internet access adoption and usage across different segments of populations. Religiosity is found to negatively associate with Internet access and activity, controlling for a large set of characteristics such as age, ethnicity, education, and income (Dilmaghani, 2018). Gray, Gainous, and Wagner (2017), studied in Latin American countries that "The extent, degree, and implications of this gender digital divide are explored across countries with varying degrees of digital freedom." "The potential for the Internet to serve as a social and political equalizing force in Latin America is stymied in part by the gendered digital divide (Gray, Gainous, & Wagner, 2017). Drawing on Aldous Huxley's notion of a 'brave new world', the authors send out a call about the effect the widespread adoption of technologies has had on younger generations and the role of the digital on knowledge creation and on imagined futures (Rowsell et al., 2017). In Finland, the United Kingdom, and Greece, Lindblom and Räsänen (2017) examined that both access to and use of the Internet for cultural purposes are affected by a number of interdependent factors, whose effects and strengths vary significantly among the countries (Lindblom & Räsänen, 2017). Also, Moshe, Laor, and Friedkin (2017), they examined "recent years have witnessed a shift in the second level of the gendered digital divide. This shift is effectively captured by the notion of 'can't' transforming into a 'don't want to be bothered' mindset." (Moshe et al., 2017). Elliott and Earl (2018) studied that "we find that the digital divide in access does not exert a selection effect and that the digital divide in usage exerts minimal effects in models

predicting online petition-signing."

In view of ageism in digital era, the remarkable paper of Sheth (2014) was noted. Sheth (2014) obviously showed his opinion on "Tech ageism in retail stores, writing "A letter to the editor is presented about the view of young people that older people cannot adapt to new technologies." Schweik, Smith, and Meyer (2018) proposed the concept of 'World Librarians' for the sake of 'information gap' that "An estimated 53% of the world's population do not have Internet access. As a consequence, they lack information capital that could be key to bettering their lives." Schweik et al. (2018), they strongly pointed out "information technology specialists in information-privileged environments share educational content to information-disadvantaged communities" (Schweik et al., 2018). Towards bridging the digital divide, Nyahodza and Higgs (2017) presented the research that their historic disadvantage about South Africa's historically disadvantaged university libraries is compounded by two levels of the digital divide (the 'global divide'), and (the 'local divide', as a legacy of apartheid)". Toudert (2019) conducted a study on digital divide in Mexican localities that "the digital divide of frequent Internet users in the socioterritorial approach constitutes an unusual path". Seo (1998) also highlighted that the main concept of 'social inequality' is a strictly the 'digital information gap' and the such 'inequality or difference' on information society.

Lastly in relation to deregulation, some researches were found such as Zaring (2018) studied "The Federal Deregulation of Insurance"., Shelanski (2018) studied "Antitrust and Deregulation"., Sen (2016). studied "Is Retail Alcohol Deregulation Correlated with More Crime and Traffic Injuries? Evidence from Canadian Provinces." Mcdonnell (2015) studied "What Caused Airline Deregulation: Economists or Economics?"., and Ferreri and Sanyal (2018) studied "Platform economies and urban planning: Airbnb and

regulated deregulation in London".

Based on the above results of the previous studies, the authors found that a study on plans of the 'the unhandy' who really want to pay the price of the goods and service by use of unmanned terminal in unmanned store is lacked. In addition to this fact, no paper of the view of convenience for both 'the unhandy' and 'the retailer' on the basis of humanities field was found.

### 3. Challenging Distribution with Retailtech

#### 3.1. Retailtech Trends

Retailtech means a compound word of retail and technology, as it is a retailer or retail store takes measures of information, communication technologies to gain profit. To put it concretely, AmazonGo is a 'unmanned mart' on Day1 building of Amazon headquarter at Seattle, Washington State in USA, and this unique type of store was public opened on 22nd January 2018.

In particular, from Rohan (2017) in MarketsandMarkets., he predicted "Interactive Kiosk Market worth 30.53 Billion USD by 2023". According to the market research report "Interactive Kiosk Market by Type (Bank Kiosks, Self-Service Kiosks, and Vending Kiosks), Vertical (Retail, Healthcare, Banking & Financial Services, Government, Transportation, Hospitality, Entertainment), Offering, & Geography - Global Forecast to 2023", The interactive kiosk market was valued at USD 20.37 Billion in 2016 and is expected to be worth USD 30.53 Billion by 2023, at a CAGR of 5.69% between 2017 and 2023. The growth of this market is driven by the increasing interest of customers in self-service interactive kiosks and enhanced shopping experience of customers with the help of kiosks in the retail industry (Rohan, 2017).

**Table 1** : Types of unmanned store

| No | Nation      | Name  | Type   | Remarks   |
|----|-------------|---|--|---|
| 1  | USA         | Amazon<br>AmazonGo  | OQ code<br>second dimension barcode<br>Just Walk Out                                     | Facial recognition, autonomous driving and artificial intelligence base |
|    |             |   | autonomous car of computer vision, sensor fusion and deep learning algorism were adopted |   |
| 2  | China       | Jingdong<br>e-commerce firm in China                          | X unmanned super   | RFID base   |
| 3  | China       | Alibaba<br>the biggest e-commerce firm in China               | unmanned conveniences store<br>taocafe   | RFID, internet of things base   |
| 4  | South Korea | Koreaseven(seven eleven)<br>affiliated company of Lotte       | unmanned conveniences store<br>seven eleven signature                                    | bigdata and internet of things base                                     |
| 5  | South Korea | conveniences store Emart24<br>affiliated company of shinsegae | unmanned conveniences 4 store being operated   | bigdata and internet of things base                                     |
| 6  | South Korea | Lotte Department  | chatbot Rosa using artificial intelligence   | chatbot base  |
| 7  | South Korea | Korea Post (Office of postal service) in<br>November 2017     | parcel service by drone on November<br>2017  | drone base  |
| 8  | South Korea | delivering people<br>(woowayoungmens)                         | delivery robot 'dilly'   | robot base  |

Source : Author's analysis by relevant data.

Some of the major players operating in the interactive kiosk market are KIOSK Information Systems (US), NCR Corporation (US), SlabbKiosks (US), Source Technologies (US), Diebold Nixdorf (US), Embross (Canada), IER SAS (France), Meridian (US), REDYREF (US), Advantech Co. (Taiwan), NEXCOM International Co. (Taiwan), and KAL (UK) (Rohan, 2017).

### 3.2. Category of Retailtech

Category attaching retailtech is various such as machine learning, Facial Recognition, robotics, RFID(radio frequency identification), artificial intelligence, 3D printing, IOT(internet of things), autonomous driving, AR(augmented reality), VR(virtual reality), bigdata and drone.

In USA as a unmanned store, AmazonGo, Standard Market etc have been operating and as a delivery service, Octocopter by Amazon drone, Walmart, Tesco, CagoPod by Ocado etc have been operating. In China, as a unmanned store, Taocafe and BingoBox have been operating. In South Korea, Emart24, Seveeneleven Signature and CU have been operating and as a chatbot, 11st and Ebay have been operating. In summary, with regard to the environment of unmanned store, South Korea is being on the testbed, China is very fast activating and various types and technologies of unmanned store have been dynamically activated in USA.

Current status of chatbot and robot on distribution area are as follows : -

Firstly about chatbot, Ebay has a 'shopbot' that provides the function of virtual personal shopping assistant for the customer. Snap Travel can search any hotel and then recommend to the customer. Sephora furnishes with cosmetic, H&M recommends cloths, Trim chatbot analyzes customer's regular receipts and further does cancel the transaction. On the other hand, about robot on distribution area, LoweBot is a service robot that can assist searching

goods which customer wants to find. Tally of Simbe Robotics can check inventory status, passing and scanning hallway instead of clerk. Fetch Robotics is a delivery robot that can pick up the goods which is order by the customer from the shelf and further can carry it.

### 3.3. Kiosk in South Korea

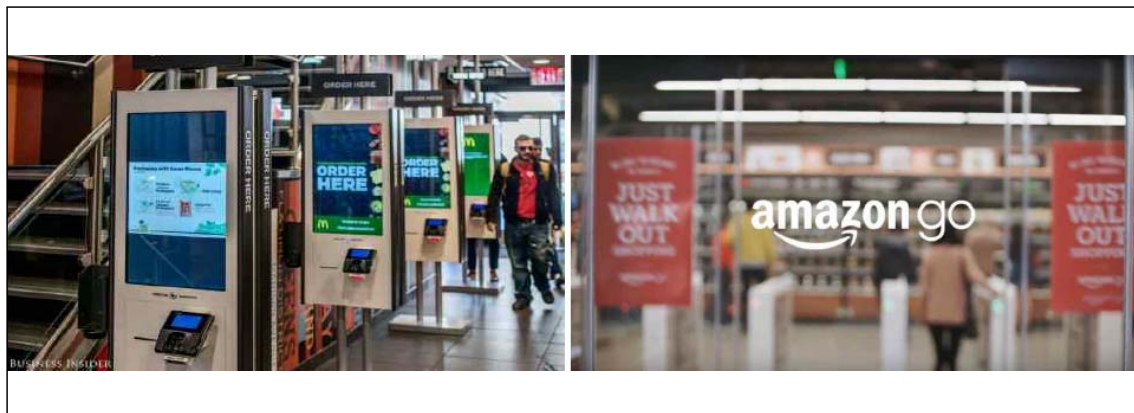
Based on study of Kim (2018), Kiosk works on public sector and private sector. Ticketing kiosk in domestic is working at main airport, rail station, subway station, express bus terminal, intercity bus terminal, multiplex theater and theme park etc with 3,400 units authority estimated.

### 3.4. In case of AmazonGo

Polacco and Backes, (2017) stressed in their research as under -

"Amazon Go plans to introduce its checkout-free grocery shopping concept in early 2017. The strategy is an evolution from the self-checkout version that is used in many grocery chains today. Advanced technology and computer integrated inventory management systems enable the customer to take products off the shelves, put them in their carts, and leave the store without going through a checkout line. Besides the convenience to the customer, Amazon evidently plans to benefit through a reduction of checkout clerks. The cost of implementing, maintaining, and sustaining the system may offset or exceed cost-savings through reduction of checkout clerks (Polacco & Backes, 2017).

In December 2016, AmazonGo initially opened with 167m<sup>2</sup>. Purchasing the goods is a procedure of entering after scanning QR cord, selection of goods, automatically checkout, respectively, but recognition of goods is through artificial intelligence base (Lee & Lee, 2018). AmazonGo has a unique nickname of "Just Walk out" as a meaning of "Grab and go". Also, AmazonGo boasts of 3 No policy, to



Source : adapted from KOTRA(2017), AmazonGo

Figure 1 : Kiosk and AmazonGo

be more specific, no lines, no checkouts and no registers for the sake of convenience and speed for the customer visited. As for nickname of "Just Walk out" as a meaning of "Grab and go", they make use of technologies affected to autonomous car of computer vision, sensor fusion and deep learning algorithm. But on the other hand, it is reported that NewYork Post mentioned AmazonGo as the next major job killer. Normally general mart has 80~90 staffs to work, on the contrary, AmazoGo has only 3~10 staffs, which can make a large profit, reducing regular labour cost (Kim, 2017). By statistics of Food Marketing Institute, expected business profit rate of the said company reaches to 22~40% by type and size of grocery chain, while net profit rate of the existed grocery chain in USA is just 1.7% (Kim, 2017). In the near future, unmanned store like AmazonGo will be widely expanded, it is very concerned that volume of cashier that is a part-time job as a representing low-wage will be rapidly decreased (Kim, 2017).

### 3.5. In case of Legislation

South Korea has two sort of law at present, namely, 'Official Announcement on improvement of access by persons with disabilities, aged persons, etc. and user convenience' enforced by 'Framework Act On National Informatization', and 'National Standard of Kiosk on official tasks with information procedures' legislated by Ministry of Public Administration and Security respectively.

That is, according to 'Framework Act On National Informatization' [Enforcement Date 15. Sep, 2017.] [Act No.14572, 14. Mar, 2017.] of Korea Ministry of Government Legislation

"Article 32 (Guaranteeing Access to and Use of Information by Persons with Disabilities, Aged Persons, etc.) (1) National agencies, etc. shall guarantee accessibility in providing information or services through the Internet so that persons with disabilities, aged persons, etc. may easily use a website."(Korea Ministry of Government Legislation) "(2) Providers of information communications services shall endeavor to improve access by persons with disabilities, aged persons, etc. and user convenience when providing such services." <Amended by Act No. 11764, May 22, 2013> (Korea Ministry of Government Legislation) "(3) In designing, manufacturing and fabricating information communications appliances and software (hereinafter referred to as "information communications products"), information communications-related manufacturers shall endeavor to ensure that persons with disabilities, aged persons, etc. can easily access and use the said appliances and software." (Korea Ministry of Government Legislation). "(4) In purchasing information communications products, national agencies, etc. shall endeavor to preferentially purchase information communications products which guarantee access to information by persons with disabilities, aged persons, etc. and the related user convenience." (Korea Ministry of

Government Legislation) "(5) The Minister of Science, ICT and Future Planning shall determine and announce the types, guidelines, etc. of information communications services, information communications products, etc. for the purpose of improving access to information by persons with disabilities, aged persons, etc. and the related user convenience." <Amended by Act No. 11688, Mar. 23, 2013> (Korea Ministry of Government Legislation)

## 4. Difficulties of unmanned terminal and Strategy of the one

It is inevitable for customers to purchase goods and service that they use the technology of self-service because owner of service industry tries to be a unmanned store on account of cost-saving (Kang & Namkung, 2018).

### 4.1. Difficulties of unmanned terminal at unmanned store

Kim (2017) conducted a survey to mature group who consists of the aged forty men, having Master degree or Doctor's degree, lived in Seoul and Kyunggi province, but this sample with findings has not both universality and generality as a general research.

#### 4.1.1. Survey on experience of kiosk

For the question of when and where do you touch unmanned terminal, these answers were the best use on 4th top ranked, 69% of the respondent multiply replied to use in places of airport, rail station, subway station, express bus terminal, intercity bus terminal to ticket and search, 67% use in self-service gas station to check out, 59% in multiplex theater and theme park to check out, and lastly 39% use in foodcourt, fast food and restaurant to check out (Kim, 2017).

#### 4.1.2. Survey on recognition of kiosk

In respect of the question of uncomfortable use in front of unmanned terminal, the respondent multiply replied to that question, such as 7.4% replied it took more time than clerk in ordering process, 70% replied it was far even difficult to understand instructions and interface, 35% personal preference of face to face base than machine base, 17% took more waiting time on account of lacking kiosk respectively (Kim, 2017).

#### 4.1.3. In case of banking industry

A large number of representative as a branch office of AB Federation in rural area, participate a conference to elect directors and to make a decision of banking issues. But the

unhandy attends to the meeting(conference) with no understanding contents of issues and agendas for the decision, when they are in there conference in correspondence with a request for the their office. Accordingly, the right to vote of the unhandy out of representative as a branch office of AB Federation does not deliver and distort for the significant decision, which however take place very frequently and widely everywhere. This is because that the unhandy has neither read any printout of conference sent to them nor noted banking affairs and articles of association as well-known generally.

#### 4.1.4. In case of traditional market

It is well noted that most owner of the traditional market is a older generation who has ever been operating their own store, and thus they have a tendency not to take a change of mind from the innovation, fearing technology. A lot of successor and younger generation may be physically mixed up, and more than likely to be satisfied with atmosphere in there with their parents generation. But, nonetheless, because every single owner theseday has a smartphone for life, they should catch up with information gap and should overcome hurdle of 'the unhandy' with a view to being survival and improving benefits, with aggressive change of consciousness, encountering with high wave of Artificial Intelligence caused by 4th industrial revolution.

#### 4.1.5. In case of information inequality

Huffman (2018) emphasized, as mentioned before, "The digital divide refers to the inequality of access to information services. There has been marked improvements over the last 20 years, however the poorest people, who would benefit the most from Internet and computer access, are often the least likely to have it. In addition, even if access is available, knowledge of appropriate use is alarming low. The new "digital divide" is not just about access but focus on how to use the Internet and computer technology efficiently and effectively (Huffman, 2018).

### 4.2. Promotion Schemes in terms of the unhandy and retailers

#### 4.2.1. Expansion of Education and Learning

"Stimulating regional economic growth, increasing the tertiary education attainments, boosting R&D expenditure, and discouraging early leaving from education are regional-and-national level policy measures that are found to successfully reduce the regional digital divide in the EU." (Szeles, 2018).

The UWC Library has emerged as a competent agent of democracy: most of the users perceive the e-services being offered as useful and meeting their needs, and the library

currently provides ICT infrastructure, internet access and information-related skills programmes to support the university community. However, challenges encountered include slow internet connection, security concerns, shortcomings in information literacy, problems of access and accessibility (including language), and reluctance to engage with unfamiliar technology (Nyahodza & Higgs, 2017).

In case of education for the kiosk

No doubt that all interested parties, manufacturer, distributor, private organization and non-profit organization should furnish 'the unhandy' with kind manual that gives a guide to touching and handling unmanned terminal, so that 'the unhandy' may touch and handle goods and service on screen of the monitor at moment of truth. Appearance of learning center in order to teach a manual for 'the unhandy' is sincerely required as quickly as possible. In particular, for the sake of potential customer and sales record, spreading manual and education for the unhandy is to cooperate with private organization and non-profit organization. This is because the faster time goes, the more increased 'the unhandy' of unmanned terminal is.

#### 4.2.2. Readiness for the law aspect

As mentioned before, South Korea has two sort of law at present, namely, 'Official Announcement on improvement of access by persons with disabilities, aged persons, etc. and user convenience' and 'National Standard of Kiosk on official tasks with information procedures'. In addition to the above, government should always screen how does the relevant laws go for 'the unhandy' in places. Private organization, non-profit organization and manufacturer's federation should also screen how does the unmanned terminal operate. Both results of the same must definitely share with all peoples.

#### 4.2.3. Reform of kiosk

From research finding of Kang and Namkung (2018), customer was more interested in correction as well as safety of self-service function rather than 'aesthetic screen layout', 'appropriate font size', 'attractive picture and video of menus' etc.

Customer should easily and fast handle screen through eliminating unnecessary function, advertisement, banner advertising rather than complicated multifunction (Kang & Namkung, 2018). If retailer consider to increase customer's satisfaction on unmanned ordering system, this system must precisely offer menu they need within proper second not to wait (Kang & Namkung, 2018).

In case of manufacturer

The authors strongly recommend that unmanned terminal should be manufactured with three types which are considered and adopted difference level of the unhandy and the younger. That is to say, 'average level or course' is a unmanned terminal for the younger, 'fast level or course' is a customer toward very busy men, and lastly 'simple level

or course' is for aged persons(the unhandy). Allocation and arrangement of the above three types of unmanned terminal for the younger, for busy men, and for aged persons(the unhandy) is just only the first action in order to provide customer satisfaction, together with gaining the business profit. Needless to say that with a view to troubleshooting any kind of trouble arising out of unmanned terminal at moment of truth, owner and clerk must learn, understand instruction, and further give solution to the customer visited in places. So all in all, the better rural areas away from the cities are the more severe digital divide and regional divide are. People lives in rural area do not want to change, do not care about change, and they are very afraid of machine, equipment and tools, accordingly they would rather a cash than credit card in an digital era.

For the most part, when they are on what is a conference agenda, how does results of conference affect to their living, income and a dividend, participating the conference may lead to abandonment of their rights and profits, in the most severe cases, they do not understand what they lost itself. If the unhandy want to live without assistance of others, they need to obtain right usage of unmanned terminal at unmanned store. No wonder government and customer's environment must assist hands to them for the satisfaction of the consumption.

#### 4.2.4. In view of information inequality

Government should continuously decrease areas of digital divide backward reign of the country with areas of digital divide need to get a great many assistance to improve expansion of internet, more fast wireless fidelity(wifi) speed, education through association and federation channel. After executing budget government should check up whether the budget made use of original purpose or not. Following-up control for the government budget is a essential for the unhandy in distribution areas. As to diminish information gap in particular distribution area towards 'the unhandy', government should only assist sufficient budge and only watch carefully relevant parties, manufacturer, retailer and private organization, association, federation etc. It is not necessary that government makes directly hardware as well as software to develop. At the same time, deregulation of the hardware, software and financial technology is evidently alleviated, manufacturer, retailer and start-up in fintech do not never discriminate unjustly in stark contrast to multinational enterprises in South Korea.

## 5. Concluding remarks

### 5.1. Summary

As mentioned before, "retail businesses in the most high-tech countries in the world, including Japan, Korea, and

Russia, may have to adopt business strategies that are similar to those of Amazon to maintain their competitiveness." (Hahn et al., 2018). AmazonGo was public opened on 22nd January 2018 as a milestone of unmanned store in the world in the era of Artificial Intelligence. Based on Polacco and Backes (2017), "besides the convenience to the customer, Amazon evidently plans to benefit through a reduction of checkout clerks. The cost of implementing, maintaining, and sustaining the system may offset or exceed cost-savings through reduction of checkout clerks. It is unclear as to whether the new concept will be embraced fully or partially by other grocery chains and similar industry applications." However knowhow of AmazonGo will be definitely and heavily shaken market trends to South Korea that the environment of labour is not pretty flexible, considering international standard. Kim (2017) also stressed if unmanned store like as AmazonGo in South Korea is more expanded, he forecasts that cashier that means an example of low-wage and part time job will largely disappear. Additionally, in view of ROI(return on investment), ROI of Kiosk would rather higher than AmazonGo which strongly demanded deep AI technology, therefore everybody can easily think that the potentiality of Kiosk in changing labour market is more larger than potential AmazonGo itself (Kim, 2017). With respect to the subject of How Self-Service Kiosks Are Changing Customer Behavior, Gavett (2015) said at Harvard Business Review(2015.3.) that it seems like sort of a win-win, both for companies that want to make more money and for customers who feel more comfortable without that social friction.

This paper proposed some strategies of growing turnover for a retailer and growing convenience for 'the unhandy' through case studies of unmanned store in South Korea, that is, eliminating 'digital divide' both for a 'the poor', 'the aged', and for a retailer, so that the former may easily purchase goods on unmanned terminal, and the latter may easily sell the more goods at unmanned store in South Korea.

### 5.2. Discussion

These day, South Korea has trouble with social issues of creating well jobs and minimum wage system. Firms and retailers have been always consider to cut down the cost of operation, at the same time it is very natural that they think about labour cost and then they take any type of unmaned terminal and manage any type of unmanned store. From the above reason, firms and retailer should be taken into consideration of wave of changing distribution industry, and further should endeavor to catch up with master plan or roadmap for unmanned store or unmanned terminal. Giving the tailor-made benefit for the customer is the important and effective marketing strategy to lead to quality difference and use of self-technology (Kang & Namkung, 2018).



### 5.2.1. Implication

Implication of this paper is ideal suggestion of the benefits for both retailer as seller and for 'the unhandy' as customer, while purchasing goods at the material time, in front of unmanned terminal. This paper will contribute to guide a direction of growing turnover for a retailer and growing convenience for 'the unhandy'.

### 5.2.2. Limitation and future study

Under numerous empirical studies rendered for just research only, the authors recall that the most important thing is just a practical adoption and execution by the officials, retailer and manufacturer. Limitation of this paper lack technical strategy of development of the unmanned terminal on their eyes of 'the unhandy'. Even though ideal suggestion of the benefits for both retailer as seller and for 'the unhandy' as customer are presented, technology development, design and production of unmanned terminal itself was not included as major of humanity. To solve this limitation, collaboration of humanity and engineering is definitely needed for the sake of 'the unhandy' for further research.

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