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Strategic Application of E-Business in A Pandemic World: A Study with Small and Medium Enterprises (SMEs) in Korea

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Abstract*: Recent development of information technology has brought dramatic increase of strategic use of information system in businesses all over the world. The Covid-19 pandemic has accelerated this movement for business in a massive scale and prompted all businesses especially small and medium enterprises (SMEs) to adopt technology as a solution to remain sustainable, competitive, and engaged with more customers for their satisfaction. In fact, SMEs need to develop new competitive tools or business models not only for survival but also for prosperity in and after the Covid-19 pandemic. Furthermore, it is timely and most appropriate in this unprecedented period especially for SMEs to re-exam and re-set their business models through digitalization as their core strategies. This paper is to examine e-business application through digitalization especially for SMEs in Korea to overcome those challenges brought by the crisis of Covid-19 pandemic, find out the roles of e-business within their business models, and then, identify major barriers that prevent Korean SMEs from entering e-business. Finally, this paper will propose an analytical framework for e-business application into SMEs through digitalization as a guideline of future applications in a pandemic or crisis.*

Keywords*: Covid-19 Pandemic, Digitalization, E-business, Korea, Small and Medium Enterprises (SMEs).*

I. Introduction

Since the emergence of the Covid-19 pandemic, the global economic outlook has been completely changed with many countries expected to suffer an economic recession. The economic situation in Korea is of no better and equally affected due to the fear and uncertainty caused by the pandemic. During the pandemic with the implementation of social distancing and other preventive measures, people are very cautious and careful by limiting their activities outside their home so that it impacts on virtually all businesses including SMEs in Korea, like most of other countries.

SMEs have been a very important part of its dynamic economy in Korea, however, after the Covid-19 pandemic, they are now most vulnerable compared to other business in Korea. It is because they are heavily dependent on the daily flow of money from their businesses, so that the decreased demand disturbs the company's cash flow significantly. It contrasts with online markets. So, in a pandemic, the use of technology seems to be one of the ultimate solutions to keep the sustainability of business, especially for SMEs.

The Covid-19 pandemic is obviously a threat to most businesses, but it could be an opportunity to upgrade their business models and develop new competitive strategies. In fact, the Covid-19 pandemic should become the right time for SMEs in Korea to improve the quality of their products or services and to develop various strategies for offering goods or services through a new business model. The crisis of Covid-19 should not be a barrier for SMEs to increase sales, and furthermore the SMEs can promote their business through digital marketing as a new business model (Winarsih, Indriastuti, and Fuad, 2020).

The digital approach should work well in a pandemic if SMEs have their business models digitally transformed so that they can compete intensively. The main theme behind this approach is to change their offline store to online operations for the sake of safety and convenience. During the pandemic, SMEs could intensify promotions through online applications both for sales and logistics. Since SMEs become part of the new digital economy, digitalization through transformation and innovation in digital skills is needed so that business should keep sustainability in and after the pandemic (Winarsih, Indriastuti, and Fuad, 2020).

II. Problem Statement and Issues for the Study

Most of earlier studies focused mainly on the potential of e-business and its general impact on business activities, but few of them studied effective models of e-business for companies different in size, nature, country specific location, and other characteristics (Lee, 2000). So, close observations of the real status of e-business in many different countries are needed to find out a reasonable way to improve effectiveness of e-business models. Some experts have talked much about the potential of e-business and its general impact on business activities, but they did not mention to an effective model for SMEs (Abiden, Barbetta, and Miao, 2020) Because SMEs face much more obstacles than large companies do, the model that is fit in and effective for SMEs may quite be different from ones for large enterprises. This study, to find effective business models of e-business for SMEs, will focus on clarifying the characteristics of small businesses in new digitalized economy and their business models especially for marketing channels for improved customer satisfaction through digitalization.

SMEs are very different from large ones in many areas, such as management style, production processes, available capital, purchasing practices, inventory systems, and negotiating power. However, the nature of e-business suggests that application of e-business to SMEs may work well as it does for large ones Akpan, Udoh, and Adebisi, 2020). In fact, some of the e-business elements and programs appear to be more compatible with SMEs. E-business elements can be classified into two groups: (1) those that are independent of the size of firm, and (2) those that relate to the size of firm and may be more difficult for small businesses to employ. Many SMEs all over the world have already implemented some of e-business elements in their daily operations of business. Some benefits from e-business may be relatively more significant to SMEs.

To benefit from e-business, firms need to understand the value that this technology offers to their customers. The ultimate question about e-business may be more a function of customers' belief and perception of the net value of the benefits and cost of both a product and the processes of finding, ordering, and receiving it. The value of e-business to the customers is an important construct for a business, especially a small business. However, there are few articles published on the applicability of e-business through digitalization and its practices among SMEs in Korea. Most of research studies focus on the major economies such as U.S., with little thought being given to their applicability to SMEs in other countries.

III. Digitalization Of Business Models for SMEs

E-business uses technology to create new value in business models, digital economic growth makes society easier and more familiar with digital service products that encourage companies to seek new advantages in the digital space. It creates a competitive advantage based on the extraordinary combination of digital and physical resources and builds comparative advantage. E-business is changing the way organizations in using and thinking about technology, innovation, revenue, and market growth (Aberdeen Group, 2000). Key resources need to be identified to make the business model works, which is in the form of physical resources, intellectual resources, human resources, and financial resources. Good value propositions are made so that SMEs can transfer intrinsic values and intangible values such as making products/services accessible, offering an innovation, improving products/services by adding relevant features, using brands for identity, reducing product/service prices, reducing risks associated with products/services, and improving product design (Alfonsius, 2020).

It is found that many SMEs simply interpret digitalization mean implementation of ICT to enhance the productivity of a company. No doubt productivity is important for any business any time especially during the COVID-19 pandemic. However, it is equally important for SMEs to look at not only the production side but also other key areas to protect and prosper their business in a pandemic (Priyono, Moin, and Putri, 2020).

It is obvious that digitalization is positively associated with SMEs' public crisis response strategies and performance, which indicates that SMEs with a higher degree of digitalization are more likely to adopt effective public crisis response strategies and achieve better performance during the crisis of COVID-19 outbreak. It is important to note the role digitalization activities play in firms' crisis responses. The more a firm is digitalized the faster they can overcome the crisis. As a solution, it needs a digital approach to make its business effectively competitive (Khai, Onn, Zulkifli, Kandasamy, and Ahmad, 2020).

The uncertainty and complexity of the business environment with disruptive changes caused by the Covid-19 pandemic should be major triggers that spark the transformation toward digital business models. Digital technologies can transform the core value that is offered to customers that make new business models more relevant to the emerging business environment. The characteristics of the digital business models differ from those of the traditional model in that many activities could be replicated at almost negligible costs. Another

fundamental difference is that almost all digital business models are basically customer-centric, and the target markets and the dimensions of value offered by the business models must be defined from the customers' perspective. Transforming a business model into a digital one can be categorized as successful if the newly developed business model changes fundamentally, particularly in the following three dimensions: value creation, value delivery, and value capture (Priyono, Moin, and Putri, 2020).

Furthermore, it needs functional use of the internet in design, manufacturing, marketing, and sales, etc. It also includes security, simulation, internet and cyber security and blockchain. Some of these definitions indicate that there is a comprehensive motivation, innovation and consequences when using digital transformation. Thus, SMEs can easily carry out digital design of business model choices, use of information technology and understanding, evaluation, digital value network design, also feedback from customers (Fitriasar, 2020).

Digital transformation is an effort to accelerate business by using technology tools and looking at opportunities that can help business processes. When businesses are forced to change because of a pandemic, the advantage is that they can intensify promotions through online applications. As the result, they can solve problems in sales and logistics channels. Digital transformation can work if there is a commitment of SMEs, such as in offering products through social media, giving discounts, and so on. There are four things that can be implemented for digital transformation: (1) ensuring business to remain competitive, (2) bringing efficiency in business processes. (3) Increasing customer satisfaction and (4) making it easier for businesspeople to make various strategic decisions (Khai, Onn, Zulkifli, Kandasamy, and Ahmad, 2020).

IV. Development of E-Business and Its Guidelines

For SMEs to be self-sustained and competitive for a pandemic or in a similar situation, there are several aspects needed to take for the development of E-business as guidelines (Khai, Onn, Zulkifli, Kandasamy, and Ahmad, 2020):

(1) Use social media to promote products or businesses:

It can be started by actively displaying products or businesses and giving promotions. Firms promote their brands more effectively through digital media, so they can build online communities in new ways to build customer loyalty, which is critical for SMEs' successful operations of business. Digital marketing provides new tools for the company to know customers effectively, on a large scale and proactively developing and enhancing customer experiences. In addition, the company can do a digital marketing analysis to find out a good performance.

(2) Observe and manage cash flow constantly:

Managing cash flow become one of the most critical aspects of business in a pandemic. Cash flow must be maintained to manage cash optimally. Without a digital or online system, the current situation especially in a pandemic causes delayed in billing and payment with business partners and customers. Therefore, using online or digitalized system can help in making billing and payment documents easily and promptly. This is critically important especially for SMEs to survive in a pandemic or crisis.

(3) Re-budget the business with the new priorities:

Re-budgeting by sorting out which budget items are the priorities and adjusting the budget to the current conditions should be made at the beginning of the process of digitalization or transformation into an online system. It is to keep the business running with the anticipated risk. The company makes income and expenditure budget items as a reference when recording sales and operational expenses, so that profit margins can be controlled. Furthermore, the company can conduct an analysis of income and expense reports, to make it easier in making decisions on items that cost heavily and need to be controlled for their expenses.

(4) Monitor all business transactions:

Monitor all business transactions, where the company can automatically reconcile banks on all cash and bank accounts. In addition, in term of cash and bank balances that have not been recorded and match transactions based on the same number, date, or description of transactions, to accelerate the reconciliation process. Digital systems could help SMES monitor and handle every transaction quickly and easily on a real-time basis.

(5) Check inventory as often as possible:

Check inventory periodically with constant real-time monitoring of inventories that aim to find out average buying and selling prices. It also informs the availability of goods stock, such as the stock of most demanded products so that the availability of goods is guaranteed. With this step, SMEs can minimize waste easily and, at the same time, maximize customer satisfaction at a minimum cost.

By following the above guidelines, digital transformation is very useful when businesses are forced to shift, suppose that online applications can solve two problems at once, namely sales and logistics. The supply chain can start relying on online platforms that can connect businesspeople with raw supply producers.

Digital transformation for SMEs must be supported by all stakeholders including governments and shareholders. It aims to change business models and company operations in a good way to classify themselves into digital maturity categories. These factors can be classified into company characteristics, lack of qualified personnel, limited knowledge of the technology needed, poor infrastructure, lack of marketing, wrong adoption of ICT, lack of technology road maps and ecosystems for digital transformation, ensuring the environment reliable (Fitriasar, 2020; Khai, Onn, Zulkifli, Kandasamy, and Ahmad, 2020).

V. E-Business Models and Their Development for Korean SMEs

Existing E-Business Models

Literature review shows that there are several categories of e-marketplace (Lee, 2000). It refers to the firm that operates an e-marketplace as the "intermediary", which may be a market participant, an independent third party of a multiform consortium. It further differentiates the market participant into a friendly participant, a hostile participant, a single-buyer participant, or a single-seller participant. It also classifies e-marketplaces into three categories: the e-broker model, the manufacturer model, and the auction model. It also investigates the success factors of an e-marketplace as strategic factors, technical factors, and functional factors. Strategies include first-to-market, brand establishment, customer focus, targeted marketing, outsourcing, and development of a customer or user community. Technical issues encompass quality-of-service items such as response time, throughput, and reliability. Functional factors include facilitation of product customization, support for negotiation, and access to a similar interest user community (Alfonsius, 2020).

E-business is now another channel to market or sell to customers and consumers. Websites, social media, and emails are the three main e-business applications that are still used together to promote and advance the selling process to closure. Grasping the knowledge and know-how of applying these powerful tools will help SMEs benefit from e-business (Jones, 2020).

There are several ways that websites can be used as a new sales channel for a business. They are websites sales models, sales support websites, e-catalogue, and e-marketplace. Beside website, another powerful application – social media and emails can be used for generating traffics to websites and supporting the sales process such as using periodic email, mailing list, mail attachment, and so on (Andrienko, 2020; Bhatti, Qurashi, and Shaheen, 2020).

SMEs may change their business models into one of models mentioned above of e-business distribution channels, based on the following five factors: (1) characteristics of the firm; (2) competitiveness and management strategies of the firm; (3) influences of internal or external parties on the adoption decision process; (4) characteristics of new model adopted; and (5) innovative attitude and knowledge about IT of the CEO. For SMEs, the adoption of e-business model may depend more on the fifth one, considered as the most important factor especially for SMEs (Andrienko, 2020; Fitriasar, 2020).

Korean SMEs and their Business Models

SMEs have contributed significantly to the economic growth in many countries all over the world. They have accounted for a large share of national employment in those countries. However, in Korea the success of large corporations, so called "Chaebols" or conglomerates, has been well acknowledged. During the last three decades Korea achieved prominence in every industry, especially in manufacturing, based mainly on large corporations. They played a vital role in promoting rapid growth during Korea's economic transition to a high-tech based economy. However, since the Asian financial crisis in 1997, Korean large corporations have been blamed as a major source of the economic crisis in Korea. The national strategy of economic development

based on large corporations had seemed to be successful until just before the 1997 crisis, but created lots of social, and economic problems behind the success stories (Lee, 2000).

The new economic environment after the 1997 crisis in Korea makes it increasingly difficult for Korea to continue economic development based on large corporations. With a high unemployment rate due to the recent economic crisis, SMEs have received more attention than ever in Korea to provide steady economic growth with employment opportunity as the Korean government adopts strong policies and programs for the promotion and development of SMEs. Fortunately, Korea now understands that SMEs can exert a strong influence on its economy, particularly in the fast-changing and increasingly competitive global markets. Korea believes that SMEs can be a major engine of sustainable growth and technological progress in the future. SMEs are often more fertile than larger firms in terms of innovation. The features of SMEs, such as flexibility, innovativeness, and problem-solving action orientation, are now being considered as vital for success in the Korean economy. To continue its economic growth, Korea should encourage and promote small businesses more and have a significant presence across a wide spectrum of products in the global markets (Lee, 2000).

With the new government policy for promoting and supporting SMEs' application of information technology in their operations of daily businesses in Korea, Korean SMEs may be more encouraged to adopt e-business through digitalization than SMEs in most of other advanced countries. However, one of the first factors that impulse SMEs into engaging e-business through digitalization is the way to reach customers' needs and wants and serve them in high level of satisfaction. This factor is now familiar with SMEs, especially in such a competitive market. Next parts will discover the distinctive characteristics of Korean distribution systems to clarify the way that SMEs use to adopt e-business in Korea (Song and Bae, 2020).

Most Korean businesses have multi-layered distribution systems which are quite complex and costly. It results in a supply chain in which most products change hands at least two or three times before reaching the retail outlet, consumer prices rise and the productivity of retail sector is quite low (Song and Bae, 2020).

Whereas benefits that the Korean distribution system brings to SMEs, such as overcoming the difficulties of capital shortages, protecting domestic manufacturers against foreign competitors, and easing customer relationship management (CRM), its impact on e-business in the system is not so clear. Maybe it becomes a tough barrier that prevents SMEs from engaging e-business through digitalization. Maybe it will strengthen advantages of enterprises including SMEs in the new competitive environment. (Lee, 2000)

VI. E-Business Solutions as a Competitive Tool for Korean SMEs

Even though the history of e-business in Korea is not long, more Korean businesses including SMEs have tried e-business in their operations recently. The characteristics of Korean e-business is that the major companies who enter e-business market are mostly huge or big companies which have large capital and enormous potential human resources to be mobilized for both delivery and information technology. There may thus be a particularly strong rationale for governments to address the problems that impede SMEs from adopting and using electronic commerce. And this is also the reason why the adoption and use of e-business raise special issues for SMEs in Korea.

Unlike small firms in the US, which tend to operate independently, Korean SMEs usually work for large corporations or engage in special relationships with large corporations, such as subcontracting. To adopt e-business as a new high-tech marketspace these business alliances still facilitate SMEs to acquire various knowledge of new technologies (Lee, 2000).

It is obviously that although the potential of e-business through digitalization is quite persuasive, however, number of companies, especially SMEs, which have engaged in e-marketplaces, is rather limited in Korea. Lack of access to bank loans and venture capital, shortage of skilled workers, and low level of business and technology skills are cited as reasons for the difficulties in adopting e-business by SMEs in Korea. Reasons are including the trustworthiness of on-line activities, lack of financial resource, and so on.

However, the emergence of intermediaries has contributed to the fast development of the B2B e-marketplaces in Korea. An intermediary usually is a company that provides the technical expertise to develop and/or set up a multi-buyer, multi-seller electronic market. An intermediary can also be a firm, which shares its TPN with other companies, and thereby facilitates and controls a B2B solution. Kannan, Chang, and Whinston (2020) describe five ways that an intermediary can add value to the market: (1) researching buyer information needs, (2) acquiring relevant information about products from suppliers, (3) managing intellectual properties and

copyright, (4) authenticating information suppliers, and (5) complementing, processing, and adding value to information products. They indicate that electronic communities are increasingly called upon to play the role of intermediaries. These e-communities consist of a critical mass of members whose needs are mainly commercial and who use the communities mainly for networking and building business relationships. Based on the basic infrastructure for e-communities, Korea is one of the most advanced countries, and, therefore, SMEs in Korea could take advantage of competitive edges from its well-developed infrastructure by considering the following e-business systems or solutions:

(1) Buyer-Driven Solutions

Buyer-driven solutions are systems that manage procurement by posting "Request for Quotes" (RFQ) and inviting bidding, or by allowing access to approved suppliers' products and services on the buyer's internal computer networks. Requisitioners of the buying company can make purchases from preferred suppliers on their company intranet, within limits of automatically enforced buying rules set by purchasing management. Bidding solutions are often in reverse auction format, where suppliers offer lower and lower bids until the lowest feasible price is reached.

Besides the generic benefits of e-procurement, automated order-entry eliminates errors and accelerates the approval process. The buyer-driven system also supports an on-line catalog that limits the range of suppliers to avoid "maverick purchases," the purchase of items that are not from authorized suppliers or items that are not offered at the negotiated price. The solutions also help capture purchasing data within the buying company for further analysis and review. For the vendor or intermediary who provides the B2B solutions, it is important to serve as a consultant to help the buying client develop RFQs, qualify suppliers, or set up and manage bidding events. To the sellers, there is no significant benefit other than that transaction costs can be lowered compared to paper-based procurement.

(2) Third-Party B2B Solutions

A third-party B2B solution can include a collection of electronic catalogs of multiple suppliers that can be accessed and searched through one site (portal) by multiple buyers. It can also host auctions and bid-quote exchanges. Third-party sites are also called electronic marketplaces, vertical portals, and electronic commerce hubs. Most of these third-party solutions focus on industry-specific vertical markets. These solutions offer a variety of applications for negotiation, bidding, payment, and display. Selected sellers and buyers can also form private networks based upon membership with a third-party solution. A third-party catalog can become a module in a buying firm's intranet system so that employees can access and process requisitions.

To a buyer, third-party solutions offer an economical way of accessing the most up-to-date catalogs while reducing website hopping search of suppliers. They are especially popular for commodity products and fragmented markets with well-defined buyers and sellers such as steel, chemical, plastic resins, and plastic and paper packaging products. To the sellers, third party solutions create market liquidity with a critical mass of buyers. The hubs may deliver industry-specific content, chat rooms, e-mail alerts, and other free services to entice buyers to use the hubs.

(3) Seller-Driven Solutions

A seller-driven solution is a sellers' web site or extranet that provides electronic catalogs and allows on-line ordering. It is another type of the multi-lateral IOIS, a Broadcast Sales System developed by a seller. The benefits are quite general, such as the ability to check order status, confirm pricing, confirm payment or delivery, access technical support, register for seminars, and so on. These benefits can also be found in the buyer-driven and third-party solutions. In this type of system, the seller has the highest control over product offering information and the trading process. This type of solution can often be developed more easily and quickly than the first two types of solutions because it can build upon pre-existing trading relationships. Though many larger supplier companies are developing their own seller-driven solutions, smaller companies can use purchased solutions to bypass complex and expensive EDI requirements to level the playing field.

(4) Value Chain Management Solutions

The above three types of B2B solutions are primarily designed for making the trade happen, that is, matching the buyer(s) with the sellers(s). Some degree of "integration" is possible between the IT systems of the trading

partners, and they vary across the three types of solutions. However, value chain management (VCM) solutions focus on the integration of business processes between trading partners after the purchase contract is signed. These business processes tend to involve the exchange of more frequent information over the life of the contract. They usually include order processing, manufacturing planning and scheduling, and logistical planning. Depending on the role of the hosting company who installs it, a VCM solution fosters collaboration between trading partners to improve the overall efficiency of the order-to-delivery cycle.

Some VCM solutions specialize in enhancing customer relationship management. These solutions integrate the sales, marketing, and service functions of the seller firm to unify their transactions to support a customer order. Such capabilities improve both customer satisfaction and efficiency and control for the supplier/seller. On the other hand, other VCM solutions strive to integrate a manufacturing firm with its suppliers. These kinds of solutions serve as decision support systems to help the manufacturing company optimize its production and logistics network configuration and synchronize day-to-day interactions with its suppliers.

VII. Summary and Conclusion

The Covid-19 pandemic has been a global issue where every entity in the world was badly impacted by it directly or indirectly. Many businesses, especially SMEs, are suffering from liquidity problems and severe deterioration in their business volume due to the negative economic effect arising from the spreading of the Covid-19 pandemic.

Digitalization have proven to be beneficial to SMEs as it can assists in avoiding a complete economic halt to the business during the Covid-19 crisis all over the world. Many SMEs which demonstrated their desire and ability to change their business model survived and even prospered. With witnessing all the benefits from digital transformations, many Korean SMEs have introduced various initiatives to digitalize their business models with the government support including the financial aid under the Economic Stimulus Package specifically targeted at SMEs (Fitriasar, 2020; Winarsih, Indriasturi, and Fuad, 2020).

This paper examines e-business application through digitalization especially for SMEs in Korea to overcome those challenges brought by the crisis of Covid-19 pandemic, finds out the roles of e-business within their business models and systems, and then, identifies major barriers that prevent Korean SMEs from entering e-business. Finally, this paper proposes an analytical framework for e-business application into SMEs through digitalization as a guideline of future applications in a similar crisis.

It is critically important for this study to determine and ascertain the importance of SMEs to adopt digitalization within their business during the pandemic period, identifying the barrier and challenges of digitalization process for SMEs. To intensify effectiveness of e-business for SMEs, this research suggests integration of some feasible e-business models that use websites, social media, and emails as practical e-business tools for Korean SMEs. Forming new business alliances will take positive effect for SMEs. These considerations lead to a research framework for analyzing e-business models by SMEs. However, this paper is bounded in pointing out a new model of e-business that may be an effective way to accelerate SMEs' business performance. From this knowledge of e-marketplace and the practical performance within Korean SMEs, the further research may explore potential productivity of e-business, and then design an effective e-business model for SMEs.

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