

## Digital innovation affects Economics during the COVID-19 pandemic

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### ABSTRACT

During the Covid-19 pandemic, most businesses closed because they acted in traditional ways and ran away from being friends with the technology. People locked down during the pandemic decided to use more technology than in old times. Economy Also in Covid-19 pandemic faces a significant crisis due to remote work and a lack of business information. This article generally talked about digitalization and its effects on the economy. This article focuses on adopting digitalization during and after the pandemic.

## INTRODUCTION

Digitalization connects digitization and digital transformation and works as a bridge in this system. As a bridge, digitalization needs to have more innovation for more efficiency. Innovation is the most critical part of everything nowadays, and the simple process of having more efficiency needs innovation (Amiri, 2022). In the digital era, adoption plays the most critical role in digitalization. As these digital technologies develop very fast, it is better to use innovation for these technologies and let people adopt them. On the other hand, some people will have trouble with early adoption (Afonasova et al., 2019). Digital technologies helped the economy in the Covid-19 pandemic.

On the other hand, Covid-19 also helped accelerate digitalization. According to (McKinsey&Company, 2020) survey, Covid-19 accelerated companies' digitalization 5-7 years faster than before the pandemic. The companies started to enter digital technologies earlier to get better market leading. In contrast, the late digital adoption companies had loosened their call because they scare to enter and upgrade the digital technologies. Digitalization leads enterprises to reduce transaction costs while staying in the market to make the competitive

advantages to improve their business. Also, digitalization lets SMEs be more innovative in the market, and using IT technologies supports small innovative enterprises in infrastructure development (Gromova et al., 2020).

## DIGITALIZATION AND INNOVATION

As mentioned before, digitalization is the bridge between digitization and digital transformation to get the best result because digitization does not do anything about businesses and business models. Digitization is more about transforming from analog to digital to make it easy for data gathering. While in digitalization, this digitized data is the basis of knowledge that can help companies to invent or make new business models. The drive to digitalization and digital transformation can start as an innovation process and may help create a new business opportunity (Gobble, 2018). The effect of digitalization in the last decades is the most cited issue in economic discourse since technology has grown and people have more access to it (Surungan et al., 2021).

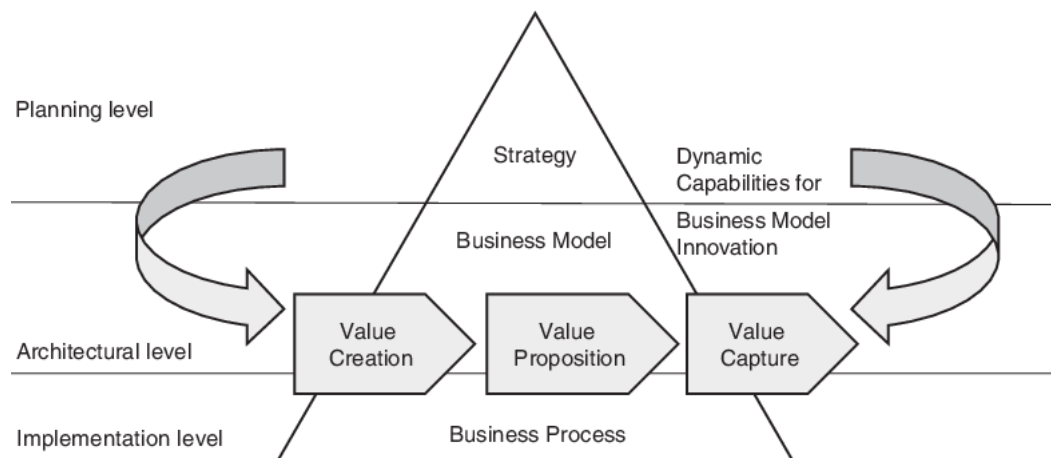


Figure 1 Digitalization on Business Model (Rachinger et al., 2019)

According to Figure 1, strategy is at the head of the pyramid, and without a strategy, at the planning level, all businesses and economies could fall and break. While the middle of the pyramid shows a business model that is entirely related to strategy, and these two are forever linked. The business model is at the architectural level, showing how the planning or strategy level relates to this. At the business model level, the value will be created and offered; on the other hand, it should have output. This value is mixing the digitalization and innovation that how these two cores can participate with each other tightly. The output of these two levels can change the way entirely in the business process and give some market advantages for the business. These advantages depend explicitly on the business team member, customers, and market needs.

Digitization and digitalization usually make terrible for businesses, and sometimes they act as enemies for them and challenge the firms with innovations. Digitalization reshapes the fundamental rate propositions that it consults for digital innovation. Over digitization of analog data, any writing of content material like audio, video, content, and image is stored and submitted utilizing the media (Yoo, 2010). Utilizing the technologies widely ensures forming competitive advantages and optimizes using economic and other

resources (Bykovskaya et al., 2018). During the Covid Epidemic, the world economy experienced a crisis due to the lockdown. However, the earth saw new sustainable multi-actor innovation hubs to support, connect, and allow commerce to recover and pivot over COVID-19. Innovation will focus on climate, digitization, digitalization, process, manufacturing, meal production, and security. Epidemics proved the significance and necessity of digital transformation (Serbulova et al., 2020).

Digitalizing is part of organizational and business models, and it helps them, with little changes, gain more profit. The first revolution in businesses was the automated document management system, which many businesses used to find their document fastest and most accurately. The new techs offer more efficient mechanisms for improving businesses. Also, companies find more opportunities for digitalization as it decreases the cost of communication and data storage. As examples of digitalization of the companies, we can mention remote working and remote operation in the Covid-19 pandemic as these technologies were invented years ago. However, the companies did not prefer to use them. Because using remote workers gives more control to workers, and this means losing companies' control over the worker (Amankwah-Amoah et al., 2021).

Fintech plays a critical role in improving financial addition, and these startups have the best potential in developing the technologies in the past few years. They have breakneck growth (Sahabuddin et al., 2019). To optimize the advantages of the digital revolution that favorable conditions need to be met. The initial step to compelling this is permission for inexpensive infrastructure and connections, without which an argument for digitalization could not be furious initially. A decent level of education and skill, which represents a pointer to considerable know-how in the means and use of the accessible digital channel, is the next significant factor or condition. Last, the need condition is trust—the assurance that end-users of digital platforms have no have got to wretchedness about the safety and security of their electronic transactions as the global interchange of information and info via the web increases. The adoption and use of info and intercommunication tech (ICT) to improve practices in the informal sector depend on the players' digital inclusiveness. (Olurinola et al., 2021).

We want to stop treating digitalization as a 'landscape' concern and, as a choice, deal with it as a situation of the empirical survey in its own right. We must sense digitalization as constitutive of transitions or even with several employers as a chauffeur of environmental innovation in transitions. This entails problematizing the impacts of digitalization with the intention of just, low-carbon futures, alongside searching for the concept that it holds for simple and rapid transformation (Sareen et al., 2021). The roles and talents desired on the squad assisting the income business enterprise are evolving with the shift in tech infrastructure. Traditionally, an income operations squad has given the sources for setting up and aiding income selections and processes—the full-size majority of large income agencies domestic the income operations squad inside the income function. With digitalization, the income operations function is becoming an issue of a broader industrial operations function. The scope develops further acquainted income pressure maintained to consist of omnichannel, advertising operations, and different functions. The squad stands in desires cross-functional

skills, containing analytics, technology, and income approach expertise. At the same time, a higher favor exists for sales, marketing, service, supply chain, and different customer-facing functioning to coordinate. Sales professionals who work with regular clients want to synchronize. Managers of various advertising and marketing gadgets want to coordinate. They are going through functioning to coordinate. Sales experts who work with regular clients want to synchronize. Managers of many advertising and marketing devices want to coordinate (Zoltners et al., 2021).

In this transformation, the valuable digital resource helps new bonds between actors. This digitalization is named "actor bonds-centered digitalization" because the critical influence of digital science is to create new bonds between actors via a new actor taking a function in the network. In that case, the digital structures used via a new actor enable connections between actors that were now not linked earlier or alter sufficiently adequate the nature of the bonding. Take their occasion a market that uses the valuable digital resource to permit promoting and shopping for corporations to meet (what they can also no longer have been capable of doing in the absence of the marketplace) (Pagani et al., 2017). Through digitalization, corporations can dramatically enhance their interplay with stakeholders to search, share, store, and analyze data and sources. For example, thru internal digitalization, companies can join intently with provide chain stakeholders and acquire real-time and correct data sharing, which will assist companies in perceiving redundant belongings and inefficient operation hyperlinks efficiently. Thus, inside and exterior digital enable declining companies to get admission to practical know-how and records on correct behavior retrenchment and strategic turnaround moves to attain profitable company turnaround (Wang et al., 2021). The transformational and strategic advantages of adopting digital technologies, such as massive data, can allow a faster response to change, supply higher offerings, set up beneficial hyperlinks with other organizations, create an aggressive advantage, increase capabilities, boost new commercial enterprise opportunities, and reduce working and conversation fees. One instance is TrusTrace, a business enterprise that affords outlets with precise facts on sustainability from the opening of the provide chain for every product to make the firm's sustainability efforts obvious to closing consumers (Mostaghel et al., 2022).

## **DIGITAL INNOVATION AND ECONOMY**

The improvement of a post-industrial society and its transformation into a data society has led to the improvement of a new economic system - a data-kind economy, in any other case, referred to as digital (Джурбаев, 2020). The digital economic system is now not honestly about transferring commercial enterprise transactions from face-to-face to online. However, it is about reworking the many sides of commercial enterprise interactions and transactions and enabling improvements, too (Kumar, 2019). The fourth industrial revolution (the starting of the XXI century – now) is characterized by the aid of cellular verbal exchange, the unfolding of the Internet, miniature manufacturing devices, the improvement and software of

synthetic talent in all fields of knowledge, digital technology, the improvement of organic engineering; bendy interplay at the world degree of digital and bodily structures of manufacturing forms(Salimyanova et al., 2019). Digital technological know-how is taking over the lives of everyday guys as properly as businesses. The digital enterprise is no longer solely helping different industrial sectors. However, itself is an entire world therein. With the growing digitalization, the ICT and ICT-enables offerings region is predicted to grow. The economic system of nations investing and promoting the digital merchandise and offerings inside their territory is sure to develop –directly thru ICTs, and not directly when ICTs aid different industries (Mentsiev et al., 2020).

Global developments of digitalization of the economic system exhibit that tremendously developed international locations have a pleasant degree of digitization of their economies due to the fact they are characterized through top-notch get right of entry to the Internet (broadband and cellular Internet), an excessive stage of improvement of scientific and technological possible and vast data access (Kravchenko, 2019). The essential social threats of digitalization for a country are ethical and religious degradation of society, reforming the economic system besides taking into account social priorities, structural unemployment growth, and extended cyber threats in the countrywide protection system (Khandii, 2019).

Digitalization in the financial system plays an imperative position in a country's monetary increase. Technological innovation is now not workable, barring digitalization, and performs a giant position in affecting element productivity. The first-rate overall performance of G7 international locations in attaining excessive financial increase is due to an increased diploma of technological innovation and different factors. In current years, the digitalization of economies in the structure of development in Information and Communication Technologies (ICTs) has modified the commercial enterprise dynamics of G7 countries. These digitalization developments have expanded G7 economies in phrases of improved productivity, social change, and industrial development. How much can the digital economy be more flexible and reach the highest quality? These excellent seven nations symbolize 58% of the world's internet wealth (Nañez Alonso et al., 2021).

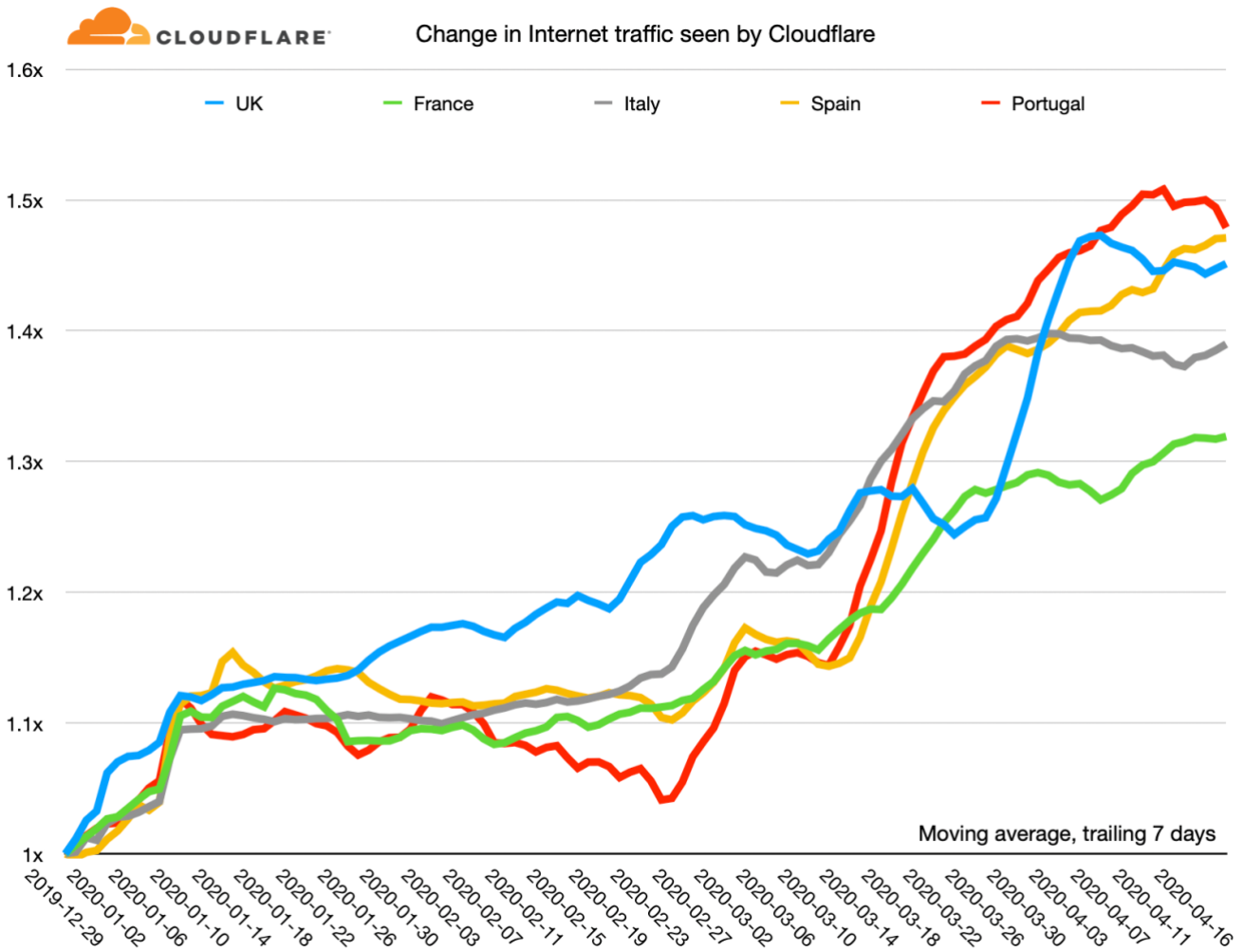


Figure 2 change in internet traffic seen by Cloudflare(Graham-Cumming, 2020)

According to Figure 2, internet traffic increased after the COVID-19 pandemic, and on the lockdown days, this traffic increased 1.5x more than normal days. According to this figure, it is easy to determine how digital devices and people dependent increased suddenly as everyone had to stay home and do remote work. Countries like the UK, with more active users, adapted to digital life and started their lockdown as soon as possible. The other countries officially cannot say this late traffic increase is because of the government infrastructure weakness, people's resistance or fewer digital devices, or fewer digital industries. According to Cloudflare ( the biggest network company in the world), the data's essential part is that in the COVID-19 pandemic, the users suddenly increased and just businesses with good infrastructure stayed this way.

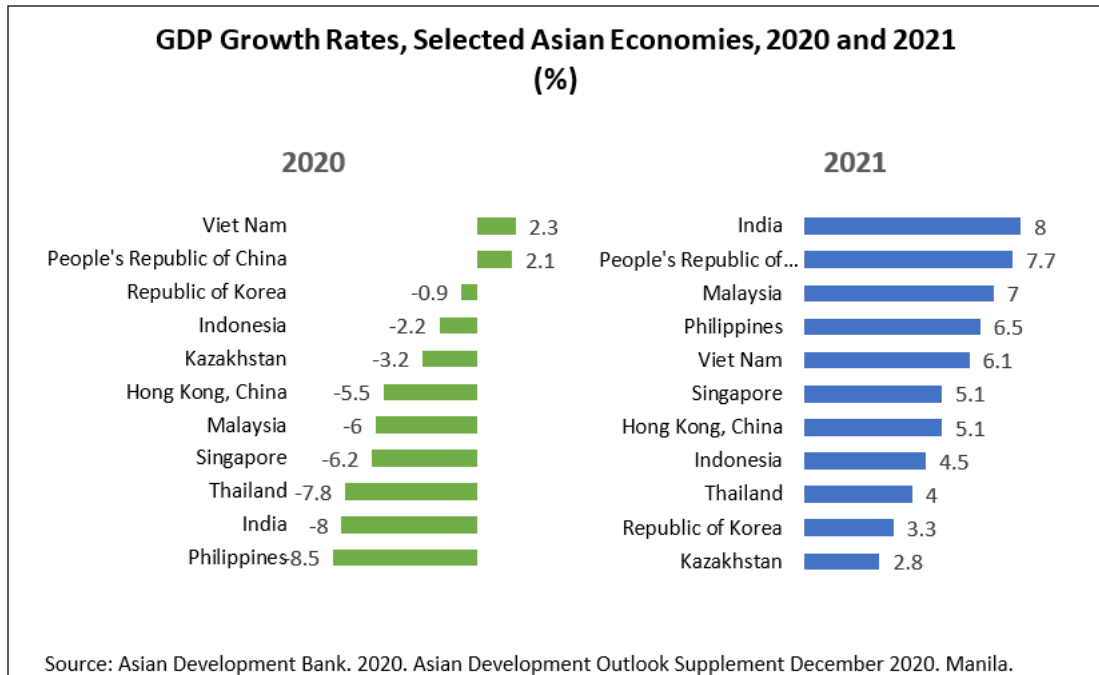


Figure 3 GDP Growth rate in COVID-19(Ginting, 2020)

As Cloudflare announced about traffic increasing in the COVID-19 pandemic, this digital transformation helped the country's economic growth. In contrast, in some situations, the countries grow up more than four times. India and China in this period had an incredible growth that India from -8% in 2020 grew up to 8% in 2021; the reason for this growth in these kinds of countries is that they are producers in most of the sectors and also they have a high population in the world that cause a high increase in the GDP (Figure 3).

### DIGITAL INNOVATION AND COVID-19

During Covid-19 Pandemic, digital innovation helped the people and government. In addition, to help the economy, it helped to find sick people. Digital technologies in the covid-19 grow up fast as the market needs them and let the economy grow more in the digital technology sector. In this era, smartphone application companies increased in the market as the market in lockdown needs more interaction with smartphones. It was also producing the electric devices increased very fast because some people who had never bought digital technologies like smartphones, notebooks, and wearable gadgets had to buy them for work as remote(McGuirk et al., 2020). Artificial intelligence was developed and used for detecting Covid-19 patients; Also, it was used for remote surgeries due to the lack of medical staff during the pandemic. People mostly did their shopping with social media and online stores, that amazon had 44% growth in the first quarter of the lockdown. Most health companies started to develop their digital technologies with artificial intelligence to make it an easy way to diagnose. Drones come to help the post for delivering packages and orders, and on the other hand, lets agriculture automate some features (Figure 4)

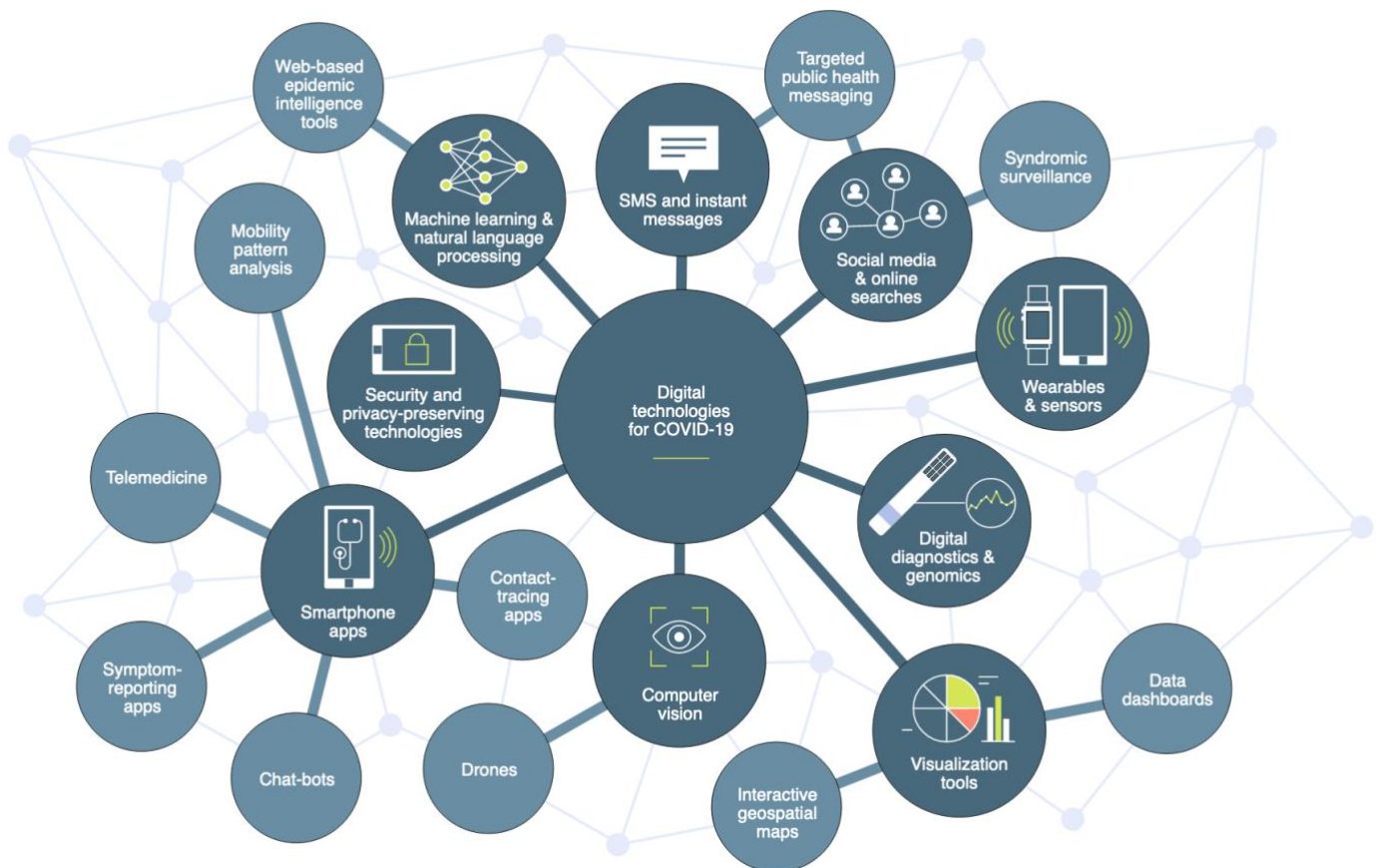


Figure 4 The interconnected digital technologies used in the public health response to COVID-19(Budd et al., 2020)

In digital innovation, value creation is the most critical part, while it should satisfy the customers, community, co-creation, government, and society. Each part of this market should study the market with some features in digital technology. The first and most important should fulfill customer needs; This will be done by each business's research and development(R&D) department, and collaborating more with customer needs can achieve the market's goal. On the other hand, in the customers part, Artificial Intelligence with analysis the customer behavior can be a significant help for the R&D. In all segments, digital innovation is the most significant support that Artificial Intelligence with machine learning collaborates with the co-creation, and government with autonomous systems can reduce the process of all government works and try to focus on the more important part. Furthermore, suppliers with the Internet of things can control the quality of all output and reduce the C&D (construction and demolition waste). It fits the Covid-19 pandemic that lets all parts of the world use digital technologies; on the other hand, it causes workers to lose their jobs (Figure 5).



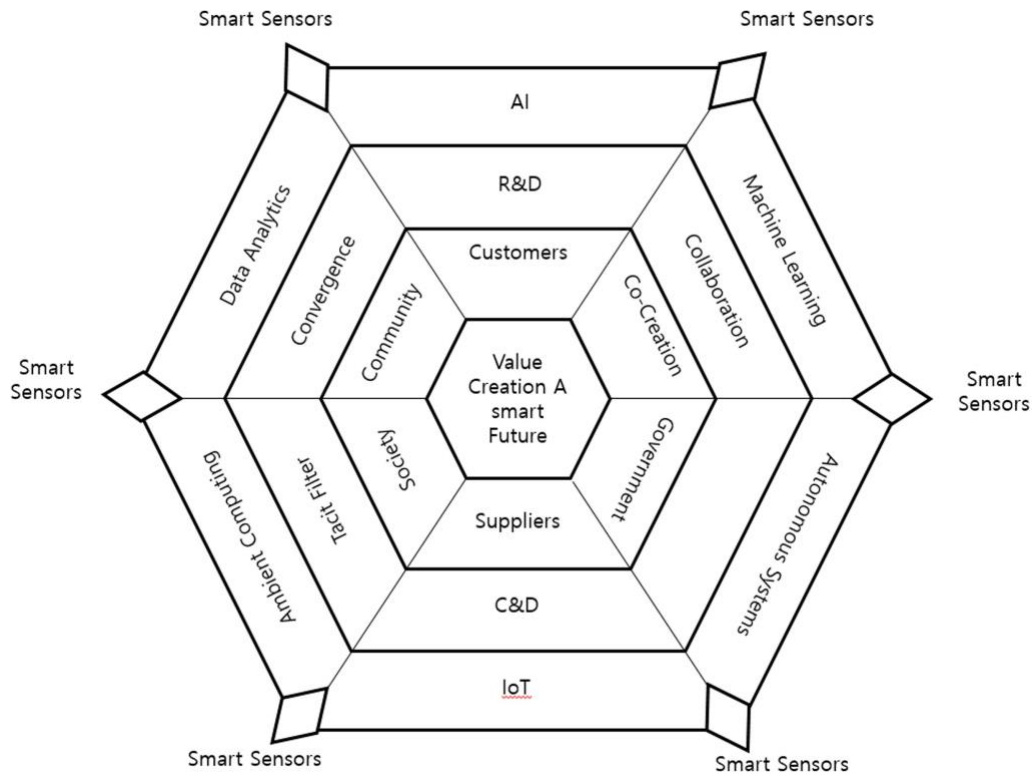


Figure 5 Convergence innovation ecosystem (Lee et al., 2021)

## CONCLUSION

Digitalization, innovation, and economy are three big titles for the world, and they work as watch gear, which means that without each other, they would be incomplete. The economy needs digitalization while digitalization needs innovation, and when the firms and government follow this critical, it will cause to improve the economy. Digitalization has too many aspects that the world can use, but on the other hand, it needs to be updated too. This update in digitalization can be done by innovation and help the digitalization to be accelerated by it. Digital innovation supports artificial intelligence, blockchain, organizational processes, products, and business models. In the Covid-19 Pandemic, these three gears worked perfectly together even though they had some problems as the crisis appeared suddenly. Digitalization before the Covid-19 pandemic was not essential, and also world did not see it as a priority for accelerating. However, in the pandemic and lockdown era, they tried to match digitalization to survive the world economy.

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