A Case Study of Digital Transformation: Focusing on the Financial Sector in South Korea and Overseas

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A B S T R A C T

This study investigates the adoption and application of digital transformation in the financial sector and analyzes the process and outcomes of digitization and digitalization in the field of the finance industry of South Korea and overseas, in order to seek both managerial and strategic implications for successful implementation of digital transformation in the future. The findings show that, for successful digital transformation, it is necessary to maximize active and systematic use of advanced online and digital technologies that form the basis of business and create an open, horizontal organizational culture and communication system to equally share and distribute advanced technologies and competencies through the entire organization. Furthermore, this study also discovers the legitimacy to concentrate the organizational competencies and know-how in providing technical training for members, expanding customer experience, and improving customer satisfaction services to contribute to improving the quality of life for members of the organization and creating and improving social and public infrastructures, instead of using digital transformation only to improve productivity of organizations or firms. As such, it is necessary to concentrate corporate competencies in establishing and supplying digital transformation that is not just human-centered but also has productivity, innovativeness, and reliability at the same time.

Keywords: Industry 4.0, Strategies for Digital Transformation, Digital Transformation in Financial Sector, Advanced Digital Technologies

Ⅰ. Introduction

As the Fourth Industrial Revolution emerged as a key global trend of the present and the future, strategies for adequate utilization, generalization, and universalization of various new advanced technologies such as artificial intelligence (AI), big data, cloud services, Internet of Things (IoT), 3D printers, autonomous vehicles, and drones have become global issues and challenges (Kim, 2020; Song, 2021). In particular,

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core new technologies that form and drive the Fourth Industrial Revolution are all digital-based technologies that bring innovative changes to the quality of both individual and public life by overcoming the technical and physical limitations of the analog era (Oh, 2019; Yoon et al., 2019).

As the holistic innovation and microscopic transformation brought by digital technology that is the key foundation and basis of the Fourth Industrial Revolution to human life, society, environment, industries, systems, and policies have become more visualized and in full swing, the concept of "digital transformation" has recently also been receiving new attention (Kwon et al., 2018; Yoon, 2021).

Digital transformation refers to strategies to reform the analog systems and services from the past by adopting and applying digital technology to society, organizations, systems, and services, or technological and service trends related to them (Park, 2020). As political, industrial, and academic awareness and interest in digital transformation rapidly increased in the last 10 years, there have been various discussions and explorations accordingly (Majchrzak et al., 2016). Digital transformation will not only macroscopically bring fundamental transformations to the nation, society, and industry overall (Agarwal et al., 2010), but also microscopically have a remarkable impact on improving performance in large and small firms and organizations as well as quality of life and achievement of individuals (Hess et al., 2016). Thus, there is a need to seek and develop optimized implementation strategies and effective action plans for successful digital transformation at the national, social, and organizational levels as well as the individual level. In particular, companies that are bound to be sensitive to advanced technological innovation and social trends are adopting and implementing digital transformation at the corporate level, thereby competitively exploring effective and systematic strategies as well as possible action plans that can change their business models and even accelerate qualitative and structural innovation of businesses and industries (Mike, 2020; Noh, 2021; Singh and Hess, 2017).

Considering the recent prominent trend in which digital transformation is emerging as a major concern and a key future strategy for various organizations and firms as well as societies and nations, this study reviews and discusses strategic implications that help establish, spread, and disseminate digital transformation based on the case study of companies. Currently, digital transformation is emerging as a critical matter in terms of not only business strategies, service systems, leadership, and organizational management of various companies, institutions, and organizations (Fitzgerald et al., 2014; Hess et al., 2016; Westerman et al., 2011) but also government policies and systems, and many studies are conducted accordingly (Bharadwaj et al., 2013; Piccinini et al., 2015). Nonetheless, the academic and industrial circles still lack understanding of digital transformation (Warner and Wäger, 2019). For instance, there are no official academic and industrial definitions of digital transformation, and insufficient specific and empirical case studies on how much in progress digital transformation is in the entire industry as well as specific business fields and individual companies. Furthermore, there are insufficient authorized standards and indicators to objectively or self-evaluate the progress or achievement of digital transformation, which is why it is difficult to concretely establish strategic goals or set subdivided or specialized directions for each organization's or company's competencies and conditions when pushing ahead with digital transformation.

In Korea, there are very few companies, organizations, and institutions that have produced tangible

and successful outcomes in digital transformation thus far, while most small and mid-sized firms or institutions are unable to even make the attempt due to lack of human and material resources as well as absence of their own technologies, capabilities, and know-how to adopt and disseminate digital transformation. In other words, although it is agreed that digital transformation is the essential and legitimate development strategy for the present and the future, there is a significant gap in the attempts or processes in actually adopting and utilizing digital transformation among individual companies, organizations, and institutions, as well as in the awareness and understanding of digital transformation among individuals that are members. Compared to the younger generations that are familiar with digital media, the middle-aged and older people relatively lack understanding, utilization, and familiarity of digital transformation as well as individual digital technology and information that are the precondition and foundation for this. There may even be some gap within the same age group in understanding, utilization, and familiarity of digital technology overall as well as digital transformation. Considering this situation, when public institutions, organizations, and companies are attempting to implement digital transformation, they must sufficiently value and seek improvement in digital awareness and attitudes of individual members of the organization in addition to digitalization of the entire organization, thereby attempting and implementing not only external and systematic changes but also internal reform and substantial changes at the same time. In other words, it is necessary to aim for and establish digital transformation considering a balance in macroscopic (organizational, systematic) and microscopic (individual) aspects.

Based on this awareness, this study analyzes the cases of digital transformation in individual compa-nies in Korea to examine the general trend, strategic strengths, weaknesses, and deficiencies, thereby deriving desirable management guidelines and implications for the successful establishment of digital transformation. Since digital transformation is still at an early stage of adoption in the Korean society, it is difficult to find companies that have successfully and perfectly achieved digital transformation. Nonetheless, some have made certain accomplishments and built their own knowledge and practical skills. By analyzing and discussing cases of their implementation methods and frameworks on digital transformation, this study derives and provides theoretical and practical guidelines and future management strategies to establish and successfully secure more desirable and efficient digital transformation strategies.

Ⅱ. Theoretical Background

2.1. Concept and Characteristics of Digital Transformation

The Fourth Industrial Revolution has been at the center of attention among experts, hands-on workers, and researchers in relevant fields since it began to be mentioned in many research articles, books, and reports since 2015. It began to receive significant public interest when it was fully discussed at the World Economic Forum held in January 2016 (Kim and Nam, 2016). The World Economic Forum held in Davos, Switzerland on January 20, 2016 foreshowed the emergence of the "Fourth Industrial Revolution" in which automation and networking are maximized by simultaneous development of new advanced future technologies as well as technological convergence and revolution and officially discussed a desirable direc-

tion for development (WEF, 2016). The Fourth Industrial Revolution refers to holistic innovation in all aspects such as economy, society, and culture actualized by interconnecting and interlocking various new technologies in each field such as AI, big data, cloud computing, ubiquitous, IoT, 3D printing, virtual reality (VR), augmented reality (AR), autonomous vehicles, drones, robotics, nanotechnology, biotechnology, materials engineering, and energy storage technology (Lim et al., 2017). Time and space constraints can be overcome by diffusing and increasing devices that are closely connected through the digital network, and one-to-one technology that can provide customized services by accurately analyzing and building a database of individual characteristics and tastes is implemented. Accordingly, the industrial structure of "mass production and mass consumption" that had dominated the 20th century has transformed into that of "personalized/customized production and consumption," shifting from "low variety, high volume" to "high variety, low volume," and the total production that is the "sum of all low varieties" will surpass the total production under the "low variety, high volume" system (Lee, 2018). Thus, with the industrial paradigm quickly changing into one that is focused on digital data and digital network at this point, "digital transformation" is the key technological and system-

atic trend that can move up, visualize, and activate future innovation (Gurbaxani and Dunkle, 2019; Nadkarni and Prügl, 2021; Tabrizi et al., 2019). Previous studies provide definitions and explanations from various perspectives on digital transformation that has theoretical, strategic, and practical importance and values as the key trend of the Fourth Industrial Revolution, which can be summarized as shown in <Table 1>.

According to the table above, many previous studies define digital transformation as developing and releasing new products and services by extensively using advanced digital technologies, as well as promoting and fulfilling holistic and comprehensive change and innovation of the business model overall. In particular, MIT (2011) describes digital transformation in three aspects such as business model, customer's experience, and operational processes, defining digital transformation as efficient process change and innovation using digital technology in all three aspects. In other words, digital transformation must be carried forward from more multilateral and diversified views such as transforming operational processes, creating new business models, and expanding customer experiences, through which it must contribute to not only industrial and social changes but also improving the quality of individual life.

<Table 1> Definitions and Explanations of Digital Transformation

Literature	Definitions and Explanations
IBM (2011)	Future and continuous process that leads innovative market changes and meets higher customer demands by developing and creating new business and service models as well as new products, making most use of digital technologies and capabilities companies or organizations have such as AI, big data, cloud computing, IoT, ubiquitous, etc.
MIT (2011)	Innovative process of developing and creating new business models and setting a new direction for industry overall based on cohesive strategies that can integrate digital and physical elements. Holistic and systematic use of digital technology to remarkably improve firm performance or increase business scale
Mergel (2019)	Holistic process of changing and reforming business models, customer's experiences, and operational processes into digital

The key motives that enable digital transformation or "digital innovation" in that sense are digital-based advanced technologies that are also the core and leading technologies for the Fourth Industrial Revolution. For example, extensive important and advanced data can be collected from companies or industrial settings through IoT, which can be analyzed and forecast with integrated use of big data and cloud computing. Based on the results, AI technology can be applied to optimize and automatically control the production, manufacturing, and service processes. At the same time, ubiquitous technology can be used to provide and share related data and services with global customers without space and time constraints (Lee, 2018).

As such, digital transformation carried out in such integrated and systematic processes is described as the driving force of fundamental and holistic change in human life, which changes all procedures, orders, and customs that exist in the human world and even brings disruption to the global industries and markets, improving customer service and satisfaction as well as user experience, reforming organizational culture, and promoting social innovation beyond just development and use of digital technology or production and manufacturing (Kim et al., 2017).

For digital transformation, it is necessary to first achieve "digitization" that converts analog data into digital form, which must be followed by "digitalization" that evenly applies information and communications technology (ICT) to all business processes of firms and throughout industry (Lee, 2018). These two phases are complementary and systematic procedures and processes that are almost simultaneous and continuous in all business areas such as finance and other industries, instead of being sequential or mutually exclusive. Thus, through convergence of these two phases, digital transformation can be carried forward more substantially and in

balance. Some examples of stably achieving digital transformation through systematic accomplishment of digitization and digitalization include the industrial internet software platform Predix™ developed and released by General Electric Company (GE) and "Siren Order service" by Starbucks that improved the entire system for customers to order and pay on its mobile application (Kwon et al., 2018). This successful digital transformation will help realize the Fourth Industrial Revolution and improve the quality of individual and public life.

2.2. Digital Transformation in the Financial Sector

From the perspective of the financial sector, digital transformation is defined as the "process of innovating work processes, organizations, human resources, and culture and changing business methods based on digital technology to create desirable values focused on financial consumers" (Kim and Son, 2017). Regulations on digital transformation by major research and consulting firms show all emphasize companies as the main agent of digital transformation understanding it as an attempt or effort to secure competitiveness while adapting to the constantly changing domestic and international financial market environments by actively and autonomously using the latest and most advanced digital technologies (Korea Financial Investment Association, 2018).

With reference to these common discussions and explanations, this study defines digital transformation that can be applied to the financial sector as follows. Digital transformation in the financial sector can be referred to as "general activities or procedures that bring innovation to financial affairs overall and create or provide future-oriented business values, improved customer experience, and social contribution by col-

lecting, analyzing, sharing, and managing and controlling extensive digital data on a real-time basis in all areas of finance-related value chains such as R&D, planning/production, release/sales, customer marketing, and follow-up service of financial products/services, using all of advanced AI technology, big data, cloud, blockchain technology, and human resource management know-how." Digital transformation can bring two effects: "innovating corporate management to enhance market competitiveness of existing business items" and "improving and achieving goals for growth by creating new financial business models." Based on the operational definitions and understanding of digital transformation in the financial sector, this study examines the cases of digital transformation in financial companies in Korea and overseas in terms of specific technology domains and human resource management in the following section 4.

Ⅲ. Research Method

3.1. Research Questions and Procedures

With reference to the review and analysis of the theoretical background, this study identifies and verifies the actual cases and details of digital transformation carried forward by domestic and foreign finance companies empirically and in depth. This will help shed light on the promotion system and direction of digital transformation in a more field-oriented and contextual manner, while also exploring realistic and practical methods to develop, intensify, and expand digital transformation industrially and socially at the same time. To attain these research objectives, this study set up the following research questions.

Research question 1: What is the current status of technology usage and human resource management in the digital transformation process of domestic and foreign finance companies?

  1-1. What is the current status of AI technology usage?

  1-2. What is the current status of big data technology usage?

  1-3. What is the current status of cloud technology usage?

  1-4. What is the current status of blockchain technology usage?

Research question 2: What are the outcomes of digital transformation in domestic and foreign finance companies?

Research question 3: What are the strategic implications of digital transformation in domestic and foreign finance companies?

3.2. Methods of Data Collection and Analysis

This study analyzes and discusses the current status and implications of digital transformation in domestic and foreign finance companies through literature review and case study. The methods of data collection and analysis are as follows.

First, this study collects and summarizes the general trends and implementation details of digital transformation in domestic and foreign finance companies over the last 10 years in terms of specific technology domains (AI, big data, cloud, blockchain, human resource management, etc.).

Second, this study qualitatively analyzes the collected and summarized cases and discusses general implications.

The case study used as the key methodology is used to promote in-depth understanding of various phenomena of individuals, large and small groups,

organizations, and society and obtain empirical knowledge and information, and they have been commonly used in various disciplines from the past (Kim, 2014). According to Stake (1995), a case study is a qualitative research activity to observe and track complex correlations or effects between specificity and universality of a single case or between one case and another and to understand the methods, causes, and effects in which the case or phenomenon unfolds in important external conditions or situations (as cited in Ritchie et al., 2013). According to Seidman (2006), a case study is analytical and demonstrative research that traces and observes multiple variables that affect a single phenomenon, and it is described as a method that can be more useful when there are no clear lines between the phenomenon and circumstance. Yin (2009) explained that a case study is a "study to complexly identify the cause, pattern, development method, consequence, and cultural or social effect of a single or a small number of cases or phenomena" and that this can mobilize all methods of observation, tracking, survey, and analysis that are deemed useful and appropriate in solving a problem. In particular, when there are not enough samples for statistical and quantitative research in social sciences, there are limitations in proving the reliability and validity of research findings, in which case a small-scale case study can be designed and conducted as an effective alternative (Hong, 2019). While the basic purpose of quantitative analysis conducted with a certain population size is statistical generalization based on the population, a case study aims for analytical generalization or generalization of the theoretical model or proposition based on tracking of small-scale cases, participant observation, and in-depth interviews (Choi, 2012).

With such meaning and characteristics, the explanatory case study is used herein. Such a case study refers to a method that investigates the detailed development patterns of a latest phenomenon without sufficient data or a complicated phenomenon that is not easily discovered by quantitative research and explains the relevance between the causes and effects latent in the phenomenon (Yin, 2009). Digital transformation is a research topic with insufficient public and personal data. Thus, by conducting an explanatory case study, it is possible to analyze the detailed development patterns, trends, causes, consequences, and implications of the phenomenon.

Ⅳ. Case Study Results

4.1. Technology Usage Related to Digital Transformation

4.1.1. AI Technology Usage

Digital transformation in the financial sector is carried forward by finance companies in the form of comprehensively enhancing digital competencies in the process of developing and creating new financial products and innovative customer services based on new digital technologies, while also intensifying and specializing in each area of business. In other words, the key strategy is to achieve harmony and balance of macroscopic and general areas and detailed and individual areas. With regard to this, the Korean consulting firm "Digital Retail Consulting Group" defines digital transformation as a business strategy that fundamentally changes an entire company's strategies, organizational culture, manufacturing and operating processes, business and service models, internal and external communication, and corporate systems based on various changes made by "all things digital" (Chung, 2019). AI technology is at the heart of this

digital transformation.

AI is a technique in which the computer derives meaningful analysis and forecasting results by collecting, learning, and updating problem-solving methods and rules through automated machine learning, and extensive high-quality data is the key foundation for AI technology (Makridakis, 2017). The era of AI has fully begun with the development and adoption of deep learning using the artificial neural network, which is a form of statistical learning algorithm inspired by the biological neural network (LeCun et al., 2015; Lee, 2016). The use of AI technology has also developed and increased with the advancement in big data technology that extracts, processes, and stores unstructured data and various other forms of data such as images, voices, and videos from structured data (Cho and Yi, 2019).

Due to the rapid progress in AI technology based on deep learning, domestic and foreign finance companies have recently developed and adopted the robotic process automation (RPA) system to mechanize and automate work processes with repetitive and constant rules and patterns, which liberates their employees from simple tasks and encourages them to perform higher-value and creative tasks using the extra time (Hwang et al., 2019). A typical example is adopting and using AI technology in the robo-advisor system that creates customized product portfolios by integrating extensive customer data and product information. Recently, AI technology is more widely and evidently used throughout the financial sector, such as automation in financial services, customer credit rating and use, risk management by establishing and using the fraud detect system (FDS) to prevent frauds (illegal transactions, mis-selling, etc.), and adoption and use of RegTech for compliance with financial regulations. Finance companies can extract mechanized and automated patterns through AI technology developed and built differently depending on their capabilities and use them in learning/training for customer service staff or robots, while also using the collected and recorded conversation logs between customers and service staff as update data for customer service manuals. Through these elaborate procedures, the

<Table 2> Cases of AI Technology Use in the Financial Sector

Category	Application scope
Automation in Financial Services	☐ Improving productivity of the entire company by automating the general tasks based on machine learning, such as document analysis, data sharing, customer identification, and outlier or anomaly detection ☐ Promoting efficiency of human resources within the organization by making machines or systems perform simple, repetitive, and regular tasks through robotic process automation (RPA)
Customer Credit Rating	☐ Analyzing the average credit scores of loan applicants ☐ Forecasting the default probability of loan applicants
FDS	☐ Promoting the possibility of detecting potential bank frauds using machine learning
Recommendation of Financial Products	☐ Receiving customers' questions and requests using user-centered conversational interface (text, voice, etc.), analyzing them with machine learning technology, and developing and providing various financial and insurance services customers want
Compliance with Financial Regulations	☐ Adopting and activating RegTech using compliance monitoring technology based on machine learning that can save much time and effort for companies in checking and complying various regulations or laws

Note: Seo and Kim (2019), reconstructed by the authors.

<Figure 1> Customer Service Process using AI Technology

Note: Shim and Woo (2020), reconstructed by the authors.

customer service system can be gradually upgraded and automated. Details are summarized as follows.

AI technology can also establish extensive databases, customized solutions, and manuals by analyzing the compositions and meanings of customer conversations based on AI Engine as well as words, phrases, and sentences included, based on which the customer service staff and customers can exchange specific and detailed questions and answers through ARS or chats in the same way they can in face-to-face conversations. In this process, individual customers can be provided with automated and personalized services such as recommendation of optimized financial or insurance products. These procedures are summarized in <Figure 1>.

4.1.2. Big Data Technology Usage

Big data technology refers to a technique that extracts theoretically and practically valuable information or knowledge from massive structured or unstructured digital data, based on which it analyzes the social, collective, and individual dispositions, attitudes, and psychology related to certain topics or strategic goals to predict future changes (Korean Institute for Research in the Behavioral Sciences,

2019). The key to such technology is in creating and producing creative values through automated analytics with volume and variety on digitalized data that were generated and collected extensively from politics, economy, society, culture, arts, business, marketing, consumer behaviors, and so on (Lee et al., 2020). Unlike management information analysis that mostly handles structured and refined secondary data, big data analytics has great efficiency and utility that can produce improved results from processing massive primary data as equivalent to processing secondary data (Shim and Woo, 2020). Advanced technologies such as big data platform, machine learning, and deep learning are used to process massive information with such high value added (Kim, 2014).
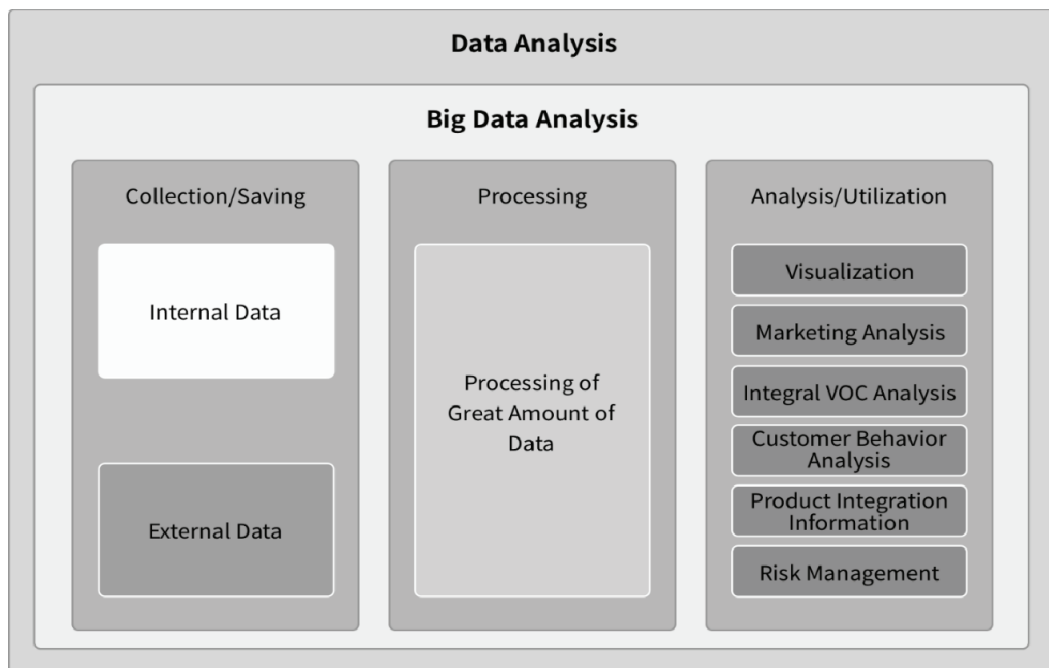
Recently, major domestic and foreign finance companies are concentrating their efforts in enhancing corporate competitiveness and their own digital capabilities by adopting and applying big data analytics technology to all online and offline financial data. Finance companies are using big data technology in various fields such as decision-making procedures that need timeliness, new product development, customer marketing process, fraud detection, and credit rating, and the details can be summarized as follows.

By collecting and building internal and external

<Table 3> Use of Big Data in the Financial Sector

Category	Case
Improving Target Marketing	☐ Predicting behavioral patterns, lifestyles, preferred products and events of many individual customers through big data analytics related to transactions ☐ Predicting decision-making patterns of corporate clients and supporting customized transaction models through big data analytics related to payments and settlements
Improving Risk Management	☐ Identifying and managing potential risks by analyzing big data collected from government agencies, public research institutes, domestic and foreign press, and personal SNS ☐ Structurally reducing risks as well as required time and human resources by using the results of big data analytics in tracking abnormal transactions and money laundering
Improving Customer Processes	☐ Identifying and predicting customer responses and demands related to domestic and foreign market issues (interest rates, exchange rates, etc.) through cross-analysis and integrated analysis of external financial data, internal performance data, and customer service data ☐ Developing and providing optimized counseling processes for general call centers and VIP services based on analysis of individual and corporate client data and counseling data
Providing New Services	☐ Developing and providing improved marketing in collaboration with marketing firms based on big data analytics related to payment and transactions of individual and corporate clients ☐ Collecting and analyzing massive structured/unstructured data collected on SNS on a real-time basis and using the data as the source of decision-making in fund management

Note: Kim et al. (2020), reconstructed by the authors.

<Figure 2> Big Data Platform Diagram in the Financial Sector
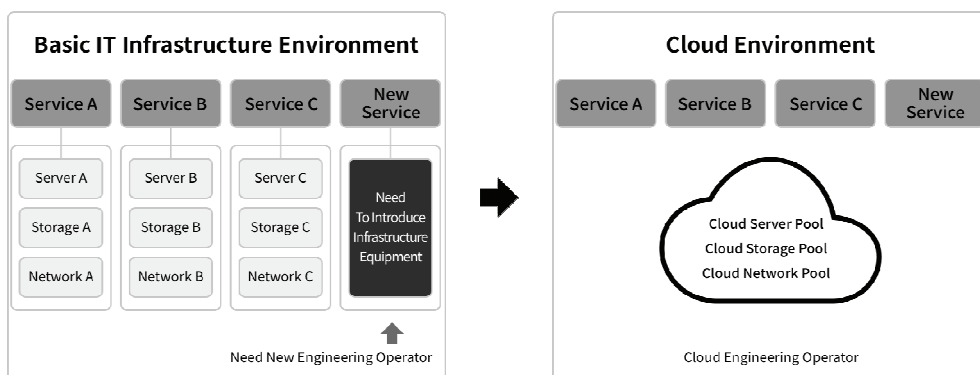
Note: National Information Society Agency (2018), reconstructed by the authors.

big data at the corporate level and performing massive automation, finance companies are constantly analyzing data visualization, business and marketing processes, customer service, and risk management and prevention strategies, through which a big data platform is built and used as shown in <Figure 2>. Although there are certain differences among companies, the big data platform generally develops new models for better work efficiency through the following general flow and procedures and provides an improved data environment that facilitates the establishment of a customized service system and development of new businesses. By building and using such a platform, companies can not only concretize their own independent financial innovation services but also make various attempts such as developing their own credit rating models, Insuretech, and robo-advisors.

4.1.3. Cloud Technology Usage

Cloud logically virtualizes IT-related physical resources and adopts the pay-per-use model through which individual or corporate clients can access the website to use IT resources as much as they need without having to create the resources themselves, which are charged based on their usage (Chun, 2021). A cloud system enables companies to secure market competitiveness by saving initial costs in system building, promptly launching new business, and increasing efficiency. Moreover, they can use and share various IT-related resources anytime and anywhere as much as they need through internet and mobile access. Using the cloud system, companies can quickly and flexibly secure and provide various infrastructures necessary in developing and expanding new businesses, developing and providing new products and services, and testing and releasing new technologies (Laszewski et al., 2018). By resolving issues of management costs or resources related to the infrastructures overall through cloud technology, individual companies can more quickly and creatively develop new items by focusing only on productive business and marketing development, while also quickly applying, using, and sharing various new advanced technologies on the cloud such as big data technology, AI, and IoT (Erl et al., 2013). In other words, as shown in <Figure 3>, by pooling external cloud resources without adopting or establishing new equipment or systems, companies can allocate and

<Figure 3> Cloud Operation Structure

Note: Park and Kang (2018), reconstructed by the authors.

recover resources easily and at a low cost, through which they can create a flexible IT infrastructure environment with high cost-efficiency and productivity (Kim, 2018).

Due to the rapid growth of fintech and fundamental changes in the finance industry in Korea and overseas over the last 10 years or so, the finance industry is also concentrating on establishing and applying the cloud environment to secure competitiveness and effectively use IT infrastructure and resources by quickly developing and releasing new financial services. Finance companies are applying cloud computing technology to corporate management and customer services by creating a private cloud within their data centers or renting the facilities of reliable cloud computing companies that comply with various regulations. Recently, companies are increasingly collecting, obtaining, and sharing data using a public cloud provided by external cloud computing companies (see <Table 4>) rather than building their own data centers that require high costs in management or operation, and then analyzing and applying that data based on their own competencies or know-how. In the past, finance companies could only handle insignificant information through the external cloud. However, with the amendment of the Regulations on Supervision of Electronic Financial Transactions

(changes in safety measures and usage procedures for cloud use) in January 2019, it has been legally permitted to use domestic clouds for significant information such as unique identifiers or personal credit information (Chung, 2020). Accordingly, domestic finance companies are expanding the scope of cloud usage in data linkage (big data, AI deep learning analysis, etc.) with external operators. This method has already been quickly activated overseas (Kim, 2018), and the major cases are summarized as follows.

As such, domestic finance companies plan on expanding the use of public clouds due to the amended regulations, while also considering adopting a hybrid multi-cloud system as a measure against cloud service accidents. To this end, large finance companies are establishing their own private clouds while considering various aspects such as handling security issues and regulations, building up technological capabilities, and integrating them with elements of infrastructures that are already established. Thus, they are aiming for a more extended system that uses both private and public clouds in a hybrid or multi-cloud method, which is expected to bring positive and powerful effects to customer service improvement and release of new financial products in the mid- to long-term view.

<Table 4> Cases of Adopting and using Public Clouds in Overseas Financial Institutions

Institution	Content	Effect
HSBC	Adopting and applying open API service using AWS API Gateway	Higher scalability: Establishing and securing the foundation for open API service flexible to API expansion and change
BBVA	Creating and applying a hybrid environment that uses not only private clouds but also public clouds such as Google and AWS	Higher flexibility: Securing system sensitivity and speed to sufficiently deal with the rapid increase in data usage by customers
Capital One	Building and operating a call center by adopting and using the AWS cloud infrastructure	Cost reduction: Switching the call center service with high usage fluctuations to the payment-per-use model

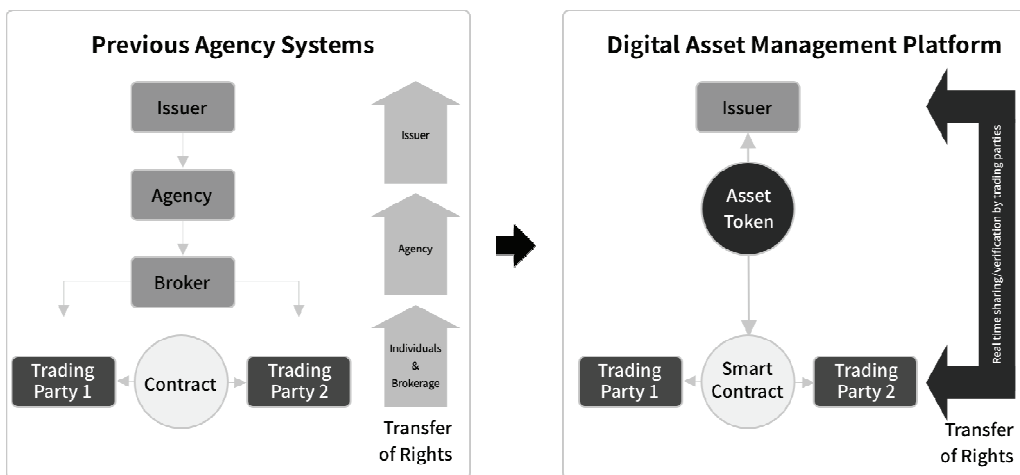Note: KB Financial Group Management Institute (2015), reconstructed by the authors.

4.1.4. Blockchain Technology Usage

Blockchain refers to the technology that secures reliability of transaction records without an authorized third party as all participants within the network jointly verify, record, and store transaction-related digital information (Seo et al., 2017). All participants involved in blockchain can freely conduct the transaction activities they want through the P2P digital network structure, consensus algorithms, and highly encrypted block generation and connection. In blockchain technology, all nodes store the digital ledgers containing all transactional data and equally update the information of the ledgers they have whenever there is a new transaction, thereby maintaining reliability, stability, and integrity. It has become rapidly activated and generalized with the advancements of the internet, mobile, and cryptographic techniques, which enables all nodes to easily verify and confirm the reliability of transactions (Arun et al., 2019).

In line with this trend, domestic and foreign finance companies are adopting and applying distributed ledger technology that guarantees the reliability of transaction records to financial services, attempting to actively use it in various fields that require transparency and stability that far exceed the conventional analog systems. Recently, as security and reliability are enhanced to the point where it is impossible to randomly modify or forge transaction records, smart contracts based on blockchain technology are used in not only digital asset transactions but also general contracts such as ownership transfers, inheritance, and bestowal.

According to <Figure 4>, the previous intermediation system required brokers and agencies to confirm and verify the general authentication procedures related to transactions between the issuer and purchaser, but in the smart contract platform that is a blockchain-based digital asset transaction platform, safe and convenient direct transactions can be made between the issuer and purchaser without a broker or an agency. The issuer can unify the right of decision and ownership transfer using the smart contract and electronic signature with tokens, which are the ownership certificate issued by the

<Figure 4> Smart Contract-based Asset Management Platform

Note: KB Financial Group Management Institute (2015); Park and Kang (2018), reconstructed by the authors.

issuer, thereby guaranteeing a reliable contract without an intermediary. Since changes in rights are shared on a real-time basis among the parties due to the blockchain, information discrepancy or forgery can be prevented. This also enables real-time contracting without paying brokerage fees. Blockchain technology can be widely used in various fields as shown in <Table 5>.

Up until a few years ago, blockchain technology had been devalued due to the negative perspective and evaluation of cryptocurrency like bitcoin as well as technological constraints. Recently, is has come to be considered an advanced new technology that can fundamentally innovate the conventional financial processes as it provides an innovative technical methodology that clearly guarantees and confirms efficiency and security of transactions without the need for an authorized third party (Arun et al., 2019). Accordingly, domestic and foreign finance companies are all expanding the application scope of block-

chain technology.

Moreover, a blockchain-based network enables partnerships with other financial institutions or fintech companies and infinite network expansion through the open network system in which resources and information are shared among participants with absolute equality and all nodes fairly participate in decision-making. Blockchain technology provides the effect of eliminating the role of an authorized third party that had been played by the commercial banks. Thus, it requires an effort to maximize and use technological advantages from the perspective and environment completely different from the financial system of the past. Finance companies will be able to significantly improve and innovate convenience, safety, and accessibility in transactions with financial consumers, promote ease and utility of asset management, and improve the quality of life through safe financial technology. Such diverse utility and value become the decisive factors that encourage do-

<Table 5> Cases of Blockchain Technology Application by Domestic and Foreign Finance Companies

Field	Application case
Transaction Authentication	☐ Providing and using safe and convenient alternative authentication methods without a separate authorized certification body ☐ Applying alternative certification technology and biometric authentication solution based on FIDO (Fast Identity Online)
Payment and Remittance	☐ Improving security of micropayment and foreign remittance service and reducing commission costs ☐ Launching and using a global remittance service to replace the Society for Worldwide Interbank Financial Telecommunication (SWIFT)
Smart Contract	☐ Preventing fraud and forgery of middle managers by automatically establishing transactions by contract terms ☐ Adopting extended contract service such as taxation and real estate contract
Loan and Investment	☐ Enabling petty cash fund and investment through crowdfunding and non-face-to-face P2P lending service without intermediaries ☐ Expanding the use of the P2P financial service platform
Business Connection	☐ Guaranteeing and recommending new business connections to secure new business opportunities ☐ Expanding and supplying a financial alliance based on alliance and collaboration among companies and institutions ☐ Exchanging and constantly and conveniently using digital assets by building a global loyalty network (GLN)

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

mestic and foreign finance companies to expand the use of blockchain and commit themselves to digital transformation.

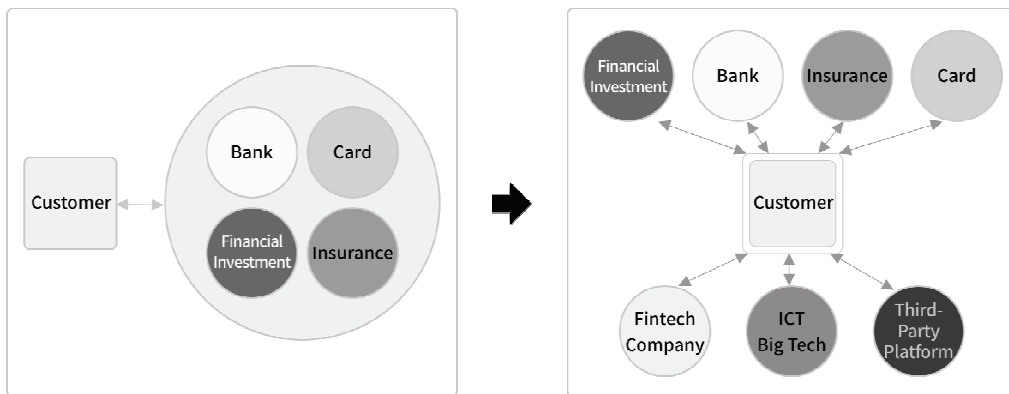### 4.1.5. Human Resource Management Related to Digital Transformation

Korea launched the "open banking" service in October 2019 to improve the usability and service of financial data. This system allows non-financial third-party providers (TPPs) to access financial information possessed by banks. Through open banking, fintech companies can now provide their services for customers with just a new idea without having to depend on financial institutions, which will give them more chance to grow (Chung, 2019). Fintech companies can now more freely expand into the financial service business, and banks will have weaker monopoly power over customer touch points. Like the case of open banking, financial institutions are considering digital transformation not a choice but a must for survival to seek innovation in business and internal competencies, using digital technology such as cloud computing, AI, and blockchain. Financial institutions are concentrating on differentiating customer services using new IT technologies and seeking various strategic changes in their current business models and working methods to actively cope with the changing digital environment.

4.2. Outcomes of Digital Transformation in the Finance Industry

As examined thus far, various advanced digital technologies such as AI, big data, cloud, and blockchain are adopted and have become essential in not only the financial sector but also other industries such as manufacturing, service, and IT. They have

brought powerful results beyond imagination such as a clear industrial reform and social innovation that fundamentally change the concepts of business, production, and distribution, thereby exerting a profound impact on all areas of human life. In particular, with the Fourth Industrial Revolution blurring the lines between industries today, many innovative companies that maximized the use of various digital technologies are developing new alternative markets in the financial sector and creating improved customer experience, thereby significantly improving convenience, utility, and accessibility of financial life and asset management for global citizens. In line with this trend, many countries are gradually abolishing unnecessary financial regulations in the finance industry to increase domestic values and employment and also contribute to qualitatively improving the financial life of individuals.

With the intensified digital transformation in each area of the finance industry, the industry is being significantly expanded and open beyond the existing business scope as shown in <Figure 5>. Beyond the typical corporate models of banks, credit card companies, financial investment companies, and insurance companies that were the core of the finance industry in the past, there are now new business models such as fintech, ICT Big Tech, and third-party platform that use AI, big data, cloud, and blockchain technology in all aspects. This leads the global finance industry to the general trend of limitless competition, interconnection, and convergence between existing finance companies and fintech companies armed with various financial services (Korea Fintech Trend Report, 2019). This is also a macroscopic and structural outcome of digital transformation in the financial sector. Therefore, this study reviews the outcomes of digital transformation in the finance industry expanded from fintech companies.

<Figure 5> Changes in Financial Services Due to Digital Transformation

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

As the cases of comprehensive financial expansion of global fintech companies through foundations and M&As in have increased sharply over the last 10 years or so, the investment size in the global fintech market rapidly grew from 22 trillion KRW in 2013 to 150 trillion KRW in 2018. As shown in <Table 6>, China's number one company Alibaba is quickly expanding into not only payment and online loans but also online asset management and joint online insurance company. Google is also providing P2P lending and global payment services. As such, Big Tech companies such as Google, Amazon, and Apple are dominating the global finance and fintech market, and their relationship with traditional finance companies are now turning into close collaboration beyond competition. Accordingly, digital transformation of these companies as well as the entire financial sector has become more important, producing actual tangible outcomes.

Major domestic and foreign fintech companies are already expanding their market dominance by

<Table 6> Financial Services Provided by Global Fintech Companies

Company	Payment	Online loan	Insurance
Alibaba	Ali Pay: China's No. 1 mobile payment platform	My Bank: Loans for local companies, small/mid-sized firms, and small online stores	Joint foundation of online insurance company and Zhong An Insurance
Tencent	Ten Pay: China's No. 2 mobile payment platform	Webank: Mostly individual microloans	
Baidu	Baidu Wallet	Baixin Bank: Financial products, microloans	Foundation of a joint venture
Google	Google Pay	Partnership with LendingClub	-
Amazon	Amazon Pay	Amazon lending: Loans for small/mid-sized firms, logistics companies, and delivery businesses	Establishment and operation of a website comparing insurance prices
Facebook	Messenger Pay	Ad costs charged later	-

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

modifying their payment, loan, and insurance sales system that can generate profits based on economy of scale, while also strengthening their influence and cooperative relations in new businesses such as P2P lending and asset management (robo-advisors). The details are summarized as follows.

While traditional fintech merely used IT as a supplementary and technical tool to help the operations in the finance industry, recent global fintech companies are transforming the service delivery system itself to a digital system in various fields (see <Table 7>), thereby showing innovative and creative attributes in fundamentally changing the structure of the traditional finance industry, business models, customer experience, and behavior. This is an indicator that directly shows the future direction as well as the macroscopic outcome of digital transformation.

Furthermore, as Generation MZ, who grew up in a digital environment and have high digital familiarity and proficiency, emerged as a major client base of digital finance, their tendency to prefer digitalized financial service of IT companies over traditional finance companies has a remarkable impact on the global finance industry. According to a McKinsey report, the assets owned by the rich have increased by 54% in 5 years from $62.5 trillion in 2015 to $96.3 trillion in 2020, and 20-30% of these people are expected to use digital asset management solutions in the future (Arun et al., 2019). Such clear behavior and attitude of the younger generation are expected to accelerate and intensify digital financial service and transformation of IT companies that they prefer, along with the digital transformation of the finance industry overall. Accordingly, innovation in the financial paradigm based on digital transformation will become a more evident trend. With

<Table 7> Types of Fintech Companies

Field	Description
Easy transfer and payment	☐ Easy transfer: Promptly and conveniently assisting funds transfer such as account transfer using a mobile device ☐ Payment: Providing an easy payment solution using a mobile device when purchasing goods or services online and offline
Robo-advisors	☐ Providing an asset management service by a robot ☐ An investment platform applying AI based on robotics
Asset management	☐ Providing digitalized asset management for customers
Foreign remittance	☐ Small-amount cross-border remittance service
P2P finance	☐ Online transaction in which investments are collected from unspecified investors and lent to those who want a loan, and investors receive the principal and interest during the stipulated time
Crowdfunding	☐ Collecting business funds from unspecified investors and investing in new startup firms
Blockchain, virtual currency	☐ Blockchain: Decentralized data storage technology that guarantees transparency in transaction management as all nodes individually store the digital ledgers containing transactional data and updating them on a real-time basis ☐ Virtual currency: Virtual currency system made using blockchain
Online financial platform	☐ Fintech-based infrastructure service business
Security/authentication	☐ Fintech-based security/authentication technology
Others	☐ RegTech, Insuretech

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

focus on this flow, this study examined the cases of digital transformation that has become not a choice but a must in the financial sector as well as its strategic direction and outcomes.

Meanwhile, along with IT companies that entered the industry with digital finance, traditional finance companies such as banks, credit card, investment, and insurance companies are also renovating their territories in the global financial market that has evolved into a near limitless competition system by customizing and developing digital transformation that is the latest general trend, while also striving to establish more efficient business models. First, banks that represent the traditional finance companies are in charge of leading digital transformation in the financial sector, playing a role worthy of their status. As shown in <Table 8>, major banks in Korea are collecting and digitalizing data related to transactions at the customer touchpoints, based on which they are building customer journey maps to improve customer experience, switch to contactless digital banks, expand the internal and external ecosystem through open API, adopt various new technologies to automate financial services, and expand the scope of application. On behalf of affiliates of the financial holding company, they are also preparing to integrate digital data scattered around the affiliates, while also establishing and operating big data centers and digital

R&D centers to effectively serve as a link in establishing financial strategies and providing services (Chung and Kim, 2020). The basic tasks of R&D centers are to constantly explore the global trends of new technologies such as AI and blockchain technology, analyze how to apply them to financial services, review the applicability of advanced new technologies to finances, reflect them on in-house projects, and seek business expansion based on collaboration and alliance with domestic and foreign fintech companies. In fact, many banks in Korea are slowly producing outcomes in these specific fields.

Next, the insurance industry is receiving attention as a sector in which the largest and most innovative change is taking place in line with the Fourth Industrial Revolution, such as acceleration of industrial convergence due to digital transformation, advanced digital data analytics, and increased social interest in healthcare services by extensively connecting with other industries such as healthcare and automotive industry along with finance and credit business (Seo and Kim, 2019). In fact, the insurance industry is undergoing change throughout the entire value chain from development of customer-centered insurance products to payment of insurance (see <Table 9>).

Keeping up with this trend, major insurance companies in Korea have been focusing on digital trans-

<Table 8> Direction and Outcomes of Digital Transformation in Banks

Direction	Key contents
Building an open digital platform	☐ Expanding the digital financial ecosystem using open API ☐ Providing innovative services through active external connection
Automating tasks and securing efficiency	☐ Adopting and using robotics throughout the general loan process ☐ Adopting automatic prevention of money laundering and automation of information collection
Enhancing security and saving costs	☐ Adopting and using a blockchain-based personal authentication system ☐ Developing and establishing a blockchain-based financial business model

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

formation earlier to develop and apply new models for digital insurance business, enhance customer service competencies, and optimize the business operation model. They are planning and providing various original insurance services based on the customer journey maps they had made. Recently, they are also providing personalized healthcare programs or services for risk management, thereby expanding services that manage the financial and lifestyle risks throughout the entire lifecycle of customers.

This expanded digital transformation is a meaningful strategy that can contribute to improving the quality of public and individual life. Moreover, digitalized business support information and contents are provided to simplify insurance sales activities, and digital media channels such as SNS are used to support two-way communication between life planners and customers. Based on the data obtained and collected at the touchpoints, insurance compa-

nies are conducting optimized customer management activities such as providing specific services or recommending new products based on customer characteristics and experiences. Furthermore, they are providing more diversified and multilayered customer experiences by opening and operating an omni-channel platform that enables customers to freely navigate between offline face-to-face channels and online non-face-to-face channels.

Recently, credit card companies in Korea have been facing difficulties such as increased sales risks due to the slowdown of growth in the market, constant demand for lower commissions from affiliated stores and civic groups, decreased profit rates due to preference for loans from digital banks, aggressive payment service of fintech companies, and potential churn of existing customers (Song, 2020). Credit card companies are concentrating their competencies in digital transformation to overcome these crises and are ac-

<Table 9> Changes in the Value Chain of the Insurance Industry

Phase	Product development	Distribution/sales	Contract/screening	Contract management	Claim (payment management)
Key	Customer-centered	Two-way communication/ sharing	Data-based	Process automation	Non-face-to-face
Digital change	□ Releasing customized products for customer characteristics by using and analyzing big data technology □ Developing new products using IoT devices and health data	□ Increasing customer touchpoints through alliance networks □ Expanding two-way communication with customer participation □ Connecting face-to-face and non-face-to-face channels through O2O strategies	□ Setting the insurance prices for each customer by elaborating data analysis and resolving the issue of information asymmetry □ Upgrading hazard prediction through machine learning and optimizing product design	□ Maximizing work efficiency through AI-based automation and standardization □ Handling tasks quickly and easily and improving convenience related to document submissions	□ Improving customer convenience through mobile and digital claims □ One-stop payment application and handling

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

tually showing some progress. The details are summarized in <Table 11>. Such companies are reducing the ratio of passive assessment by establishing a customer credit scoring system using AI technology for more prompt and accurate assessment. At the same time, they are seeking digital transformation by securing and increasing new customers through differentiated customer services, expanding specialized services and platforms for customer experience analysis based on partnerships with external financial institutions, and maximizing customer satisfaction via synergy among affiliates. To promote awareness or the distinct values of credit cards that are the symbol of these companies, they are also developing and providing specialized services for customers with buying power by maximizing big data analytics competencies and platform management strategies to secure market leadership with a lifestyle ecosystem, non-face-to-face authentication, and easy payment, while also focusing on discovering new business models. These details

are summarized as follows.

Along with the aforementioned use of digital technology as well as digitization and digitalization, human resource management within the organization is also a key strategy. In particular, major domestic finance companies and credit finance institutions are developing and actively implementing contactless work-from-home strategies to deal with the COVID-19 pandemic that hit the world in the last 2-3 years. Activating and generalizing the work-from-home system based on the digital network is one of the key elements of future digital transformation, and the COVID-19 pandemic has significantly accelerated the fulfillment of this system (Kudyba, 2020; Kutnjak, 2021). However, by improving the quality and productivity of working from home, it is necessary to develop work ideas and know-how to enhance the efficiency of human resource management and competitive advantages over competitors beyond just adopting the work-from-home system.

<Table 10> Direction and Outcomes of Digital Transformation in Insurance Companies

Direction	Major outcomes
Innovation of business models	☐ Using domestic and foreign fintech companies and operating an exclusive organization ☐ Expanding into the medical service industry focused on healthcare
Innovation of digital management	☐ Establishing and operating digital insurance companies and AI-based customer credit analysis ☐ Expanding customer service by adopting and using robotics
Innovation of digital data	☐ Developing online products by analyzing customer behavior ☐ Applying big data to nurturing and coaching professional life planners

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

<Table 11> Direction and Outcomes of Digital Transformation in Credit Card Companies

Direction	Major outcomes
Credit care service platform	☐ Building a consumer life partnership using membership points ☐ Building a platform based on life stages and communities
Enhanced competencies in big data usage	☐ Adopting a credit rating system based on non-financial data ☐ Developing and establishing integrated service to support affiliated stores based on structure or unstructured big data ☐ Developing and establishing a customer credit scoring system to grant approval for credit card issuance

Note: Korea Financial Services Commission (2019), reconstructed by the authors.

4.3. Strategic Implications Related to Digital Transformation

This study reviewed the direction and outcomes of digital transformation by finance companies thus far in each specific technology domain. Implications related to digital transformation in the finance industry can be summarized as follows. The financial

<Table 12> Adoption and Activation of Work-from-home Strategies by Major Domestic Finance Companies and Institutions

Institution	Adoption and activation of work-from-home strategies
Citibank	☐ Inspecting alternative worksite facilities and applying for authority in remote working in case of emergency ☐ Actively using homes and alternative workplaces
KB Kookmin Bank	☐ Currently adopting dualized operation of the computing system (Yeouido, Gimpo) ☐ Expanding the scope of separated work in the IT sector and capital market sector
Shinhan Bank	☐ Distributing key personnel for each ICT task to 11 alternative workplaces (Jung-gu, Gangnam-gu, Yeongdeungpo-gu in Seoul, Ilsan, Jukjeon, Gwanggyo, etc.)
Woori Bank	☐ Establishing and operating alternative workplaces divided into Namsan Seoul Tower, Seoul Education Training Institute, etc. ☐ Expanding the scope of alternative workplaces by adapting to the worsening situation
Hana Bank	☐ Establishing and operating alternative workplaces in Seosomun-dong, Jung-gu of Seoul and Cheongna-dong of Incheon ☐ Currently considering addition of new alternative workplaces
Kakao Bank	☐ Initiated alternative workplaces on February 24, 2020 and is expanding the scope ☐ Flexibly applying and operating the system of working on site
Kbank	☐ Making alternative human resource management plans and operating alternative workplaces in case of emergency
Mirae Asset	☐ Securing over 150 essential human resources in departments related to money settlement and IT to prepare for emergency
NH Investment & Securities	☐ Securing over 150 essential human resources in departments related to money settlement and IT to prepare for emergency
KB Investment & Securities	☐ Using a distributed working method in departments related to money settlement and IT
Korea Investment Management	☐ Assigning 16% of employees at the headquarters as workers on emergency duty ☐ Working in alternative workplaces and at home
Korea Financial Telecommunications and Clearings Institute	☐ Providing all employees with preventive behavior guidelines ☐ Distributed work system for system operations, etc. ☐ Using alternative workplaces and activating the work-from-home system through remote access in case of emergency
KOSCOM	☐ Assigning employees on emergency duty at the corporate level ☐ Creating a work-from-home environment based on remote access ☐ Establishing an emergency control system such as the computer room or situation room
Financial Security Institute	☐ Enable round-the-clock security and control even at a remote place (Yeouido training center, etc.) aside from the main building of Financial Security Institute
Korea Securities Depository	☐ Work-from-home training to prepare for emergency

Note: Korea Financial Services Commission (2020), reconstructed by the authors.

sector has made considerable achievements in digital banking, credit business, insurance business, financial investment, and fintech using technologies such as AI, big data, cloud, and blockchain in the digital transformation process.

Specific examples include automating financial services, automating customer credit rating, establishing a hazard detection system, recommending financial products, and automating compliance with financial regulations.

Second, the financial sector has made considerable achievements in digital banking, credit business, insurance business, financial investment, and fintech using big data technology in the digital transformation process. Specific examples include improving target marketing, improving risk management, improving customer processes, and providing new services.

Third, cloud technology has also made significant achievements in the digital transformation process of the financial sector. Specific examples include adopting and applying open API service, creating and applying a hybrid cloud environment that connects private and public clouds, building and managing a call center using AWS cloud infrastructure, and improving scalability and flexibility and reducing costs in financial services overall.

Fourth, blockchain technology also contributed to making achievements in the digital transformation process of the financial sector. Specific examples include transaction authentication, payment and remittance, smart contract, loan and investment, and stronger business connections.

Digital transformation has shown progress throughout the detailed areas of the financial sector using various digital technologies based on the Fourth Industrial Revolution, such as easy transfer and payment system through digitization and digitalization, robo-advisors, asset management system, overseas digital remittance, P2P lending, crowdfunding, virtual currency, online financial platform, and security and authentication technology. However, since there is a considerable gap in this process among individual companies depending on competencies, know-how, and financial resources, it is necessary to reduce this gap and find public support plans for the entire society to achieve digital transformation in the financial sector evenly and harmoniously.

Fifth, change in the human resource management and employee training within the organization are essential for successful and advanced digital transformation. In particular, due to the COVID-19 pandemic, building and effectively managing an online work-from-home system will be an important challenge for the future society. Companies must make efforts to increase productivity of working from home and improve the quality of life for individual members of the organization, providing individual care to achieve work-life balance.

Ⅴ. Conclusion

This study investigated the adoption and application of digital transformation in the financial sector and analyzed the process and outcomes of digitization and digitalization in each field of the finance industry, thereby seeking strategic implications for successful implementation of digital transformation in the future. The results proved that, for successful digital transformation, it is necessary to maximize active and systematic use of advanced online and digital technologies that form the basis of business today and create an open, horizontal organizational culture and communication system to equally share and distribute advanced technologies and competencies throughout the entire organization. Furthermore, this

study also discovered the legitimacy to concentrate the organizational competencies and know-how in providing technical training for members, expanding customer experience, and improving customer satisfaction services to contribute to improving the quality of life for members of the organization and creating and improving social and public infrastructures, instead of using digital transformation only to improve productivity of organizations or firms. As such, it is necessary to concentrate corporate competencies in establishing and supplying digital transformation that is not just human-centered but also has productivity, innovativeness, and reliability at the same time.

Meanwhile, from the perspective of finance companies, the top priority goal in the process of digital transformation is to increase productivity while increasing the utility of digital data possessed by the company using advanced new technologies such as AI and big data. The next goal is to create new sales items in new business and seek expansion into segmented markets. If finance companies secure strategic flexibility and openness in this process instead of being stuck in a rut or bound to the traditional industrial structure, they will be able to show qualitative and fundamental changes and progress to become innovative and creative companies. Moreover, if they can secure and use big data in other industries by successfully creating new businesses, technologies, and services by themselves or even seek convergence of financial data and data from other fields based on active collaboration and connection with other companies, they will be able to provide greater values for not only customers but also the entire society.

This study examined digital transformation in the financial sector through literature review and case analysis to obtain strategic implications and comprehensive insight. This study has limitations in that it failed to conduct a quantitative review that can verify the progress and effect of digital transformation adequately since the scope of research was limited to the financial sector and digital transformation is still at an early stage in Korea. Despite these limitations, this study built a basic theoretical foundation to intensify and improve the desirable trend of digital transformation in the finance industry that has a significant impact on the stability of individual life by comprehensively examining the general status of digital transformation in the financial sectors of Korea and overseas discovered thus far in each element of technology. The results are expected to be used as references for theoretical and practical guidelines that will help develop digital transformation in various industries in the future.

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