Digital Entrepreneurship and Business Innovation: A Simplified Model to Understand On-Demand Service Innovation

Yong Jin Kim
Sogang University
yongjin.ykim@gmail.com

Katia Passerini
Seton Hall University
pkatia@gmail.com

Bo Seong Yun
Soft Policy and Research Institute
bsyun@spri.kr

Ahyun Kim
Doyang Marae University
gradualrise@naver.com

Abstract

As digital technologies continue to accelerate the complexity and diversity of customer demands to an unprecedented degree, companies small and large are pursuing business innovation strategies to cope with the challenge. This empirical study focuses on understanding the factors that contribute to business improvement, and specifically on-demand service innovation. The study results show that digital entrepreneurship, a precursor of digital transformation, plays a key role in on-demand service innovation through variables such as entrepreneurial orientation and digital orientation. While a larger number of complex independent and control variables may also impact on-demand service innovation, herein, we focus on a simplified model. The goal of this study is to understand if digital entrepreneurship impacts business innovation through on-demand service innovation. In the analysis of the control variables, we find that the existence of a person in charge of the digital transformation (a digital entrepreneur or a chief digital officer) influences service innovation and, ultimately, and indirectly through annual sales growth, it influences firm performance.

Keywords: *business innovation, entrepreneurial orientation, digital orientation, digital entrepreneurship, on-demand service innovation.*

1. Introduction

Large or small companies can now increase their value while reducing costs through digital transformation. In the broadest sense, *digital transformation* is a fundamental change in operations that, in conjunction with the pervasive adoption of digital technology, seeks growth and ameliorated business models (Berman, 2012). This transformation is encouraged by the transition to an on-demand economy where customers get exactly the product and services they want, at the time they want them, and with the configuration they prefer. An on-demand economy is one in which production, distribution, and consumption take consumers' "*needs and wants*" to the next level. Digital technologies are among the biggest opportunities, and challenges, facing companies today, and there is no organization that is not affected by digital transformation (Hess et al., 2016).

New theories of innovation management are emerging because the innovation process itself is subject to digitalization and traditional innovation theories can no longer be applied (Nambisan et al., 2017). Moreover, the definition of digitalization concepts centered generally on case-based qualitative research, a small number of empirical studies, or popular management books. This study contributes to exploring how digitalization impacts on-demand service innovation based on frameworks from entrepreneurship. Previous research has discussed entrepreneurship from an organizational or cultural perspective, proposing it as a key factor in a company's capabilities, innovation, and performance (Jantunen et al., 2005; Li et al., 2009; Rhee et al., 2010). Such studies have often focused on entrepreneurial orientation at the individual or at the organizational level. This approach appears to have limitations due to the lack of concrete explanations of how digital technology changes the competition in the digital age and the direction of an appropriate response. Digital technology is no longer a simple technical tool to improve the efficiency of internal processes, but it plays a transformative role as a new source of competitive advantage and customer value creation (Lusch & Nambisan, 2015). Therefore, we need to expand our understanding of entrepreneurship orientation to include other technical constructs such as, for example, digital orientation.

This study proposes an expanded concept of entrepreneurship by adding digital orientation [DO] to the existing entrepreneurial orientation [EO] and

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considers them together as proxies for digital entrepreneurship [DE]. Although the two orientations [EO+DO] have differences in background, characteristics, and achievement methods, they share commonalities and connections in that they accept uncertainty while acquiring and creating business opportunities. Research on entrepreneurial orientation focuses primarily on understanding the nature and peculiarity of the uncertainty as the basis of entrepreneurial action under traditional industrial structures and economic conditions. It reviews how entrepreneurial behavior develops under uncertainty (McKelvie et al., 2011; Nambisan, 2017; Schumpeter, 1934). Digital orientation also deals with the uncertainty of both implementation and outcomes. Digital entrepreneurs are finding it more and more difficult to keep pace with rapid technological advances (Srinivasan & Venkatraman, 2018). They need to secure the necessary resources and related competencies at the organizational level by understanding and embracing digital technology (Kraus et al., 2019).

We treat these two concepts as components of digital entrepreneurship as they encompass a fundamental shift in an organization that aims to focus the business on solving customer problems and to successfully drive that business innovation digitally. By designing a research model that directly studies how digital entrepreneurship, measured by the [EO] and [DO] constructs, can push a firm's strategic orientation to on-demand service innovation, we can move the needle forward in fostering digital transformation. The research questions are summarized as follows (RQs):

- *RQ1. How can digital entrepreneurship and on-demand service innovation be defined from an organizational perspective?*
- *RQ2. What is the relationship between an organization's digital entrepreneurship and on-demand service innovation?*

In order to answer the research questions, we looked at previous theories and defined each concept more clearly from the perspective of both the information systems and entrepreneurial literature. After designing a simplified research model and presenting the hypotheses, a sample of 160 companies located in Korea was secured and a (larger) empirical analysis was performed through SPSS. The results confirm the importance of digital entrepreneurship in driving business service innovation (on-demand) and propose an expanded future research agenda.

2. Theory and hypotheses

2.1. On-demand service innovation [OSI]

The success of business innovation depends on effectively aligning organizations, processes, and technologies to create systems that meet ever-changing customer needs (Ganguly, 2015). Resources and processes must support innovation in an on-demand manner, since customers want what they want, when they want it, and where it is most convenient to them (Kim et al., 2012).

In other words, a company should effectively produce and deliver a solution based on the ability to better understand and solve a customer's problem. Therefore, on-demand service innovation [OSI] can be understood as a creative entrepreneurial activity that provides products and services in a desired form, at a desired time, at a desired place, and at a time desired by the customer.

Digital technologies are fundamentally changing the core interrelationships of business and business processes, company capabilities, products, and services, and extend business networks. The value generated through digital innovation is dynamic, experiential, and contextual, not the unit of output or the inherent characteristics of products and services (Bharadwaj et al., 2013). Therefore, on-demand service innovation requires understanding and insight into digital technologies, and agile change, in a way that enables it to thrive under uncertainty. In a nutshell, it requires digital entrepreneurs.

2.2 Digital entrepreneurship

Digital entrepreneurship is a concept that extends existing entrepreneurship theory from the digital technology perspective, which means that the scope of entrepreneurial process generation has expanded (Sahut et al., 2021). Nambisan (Nambisan, 2017) explicitly theorizes the formation of entrepreneurial opportunities, decisions, actions, and outcomes. Digital entrepreneurship was explained by integrating the digital technology perspective with existing theories and concepts of entrepreneurship. Nambisan introduced three elements of digital technology, each of which is unique but relevant: digital artifacts, digital platforms, and digital infrastructure. First, *digital artifacts* refer to digital components, digital applications, or media content that are part of a new products or services and provide a specific function or value to the end user (Kallinikos et al., 2013). Second, *digital platforms* are a common set of shared services and architectures used to host complementary services

including digital artifacts (Parker et al., 2016). Finally, *digital infrastructure* is a technology-driven tool and system that provides communication, collaboration and computing capabilities to support innovation and entrepreneurship (Nambisan et al., 2017).

These three form a unique part of the entrepreneurial opportunity, not only in terms of outcomes but also in terms of processes. Digital artifacts, and platforms, serve primarily as idea support, and digital infrastructure serves as process support. Since the core of traditional entrepreneurship is to seek opportunities without being tied to controllable resources (Stevenson, 1983), it is important to extend this concept to understand the entrepreneurial opportunities that these three elements uniquely shape. This is because the concept of digital entrepreneurship, which extends traditional entrepreneurship, is only meaningful when it creates a unique opportunity to be reshaped. Table 1 presents summary definitions and conceptualizations of digital entrepreneurship in the literature.

Table 1. Definitions of Digital Entrepreneurship

Authors	Definition/concept summary
(Hull et al., 2007)	A subcategory of entrepreneurship, where some or all of the physical things are digitized in traditional organizations
(Davidson & Vaast, 2010)	Pursuing opportunities based on the use of digital media and other information and communication technologies
(Hair et al., 2012)	Entrepreneurship in which some or all of the entrepreneurial ventures are done digitally rather than traditionally
(Rashidi et al., 2013)	A field of entrepreneurship where new technology tools such as the Internet and ICT have been utilized in business
(Guthrie, 2014)	Ventures monetizing digital goods through electronic networks
(Bogdanowicz, 2014)	An enterprising corporate activity that seeks to create value through the creation or expansion of economic activities by identifying and utilizing new ICT or ICT-capable products, processes and corresponding markets
(Le Dinh et al., 2018)	Combining traditional entrepreneurship with new ways of creating and conducting business in the digital age
(Sahut et al., 2021)	The process of entrepreneurial creation of digital value through the use of various socio-technical digital enablers to support the effective acquisition, processing, distribution, and consumption of digital information

Since IT is its foundational infrastructure, digital entrepreneurship exists at the core of two domains: Entrepreneurship Management (EM) and Information Systems (IS) (Hull et al., 2007). Digital entrepreneurship includes not only traditional entrepreneurship, but also the pursuit of unique opportunities generated by digital technology, so that the *entrepreneurial orientation* (Anderson et al., 2015) is now paired with *digital orientation*, which characterizes the business from the IS perspective. Based on this interaction, we study digital entrepreneurship as an organization's propensity for business innovation and value creation through entrepreneurial and digital orientation, as defined below.

2.2.1. Entrepreneurial orientation [EO]. Organizational-level entrepreneurship theory describes the mechanism by which entrepreneurial orientation drives business results through value-creating activities related to the pursuit of business opportunities. Firms with high entrepreneurial orientation have the ability to discover and exploit new market opportunities (Lee et al., 2001) and respond to competitive and uncertain environments. Dess and Lumpkin (Dess & Lumpkin, 2005) describe entrepreneurial orientation through five aspects of entrepreneurship, including corporate autonomy, innovativeness, proactivity, competitive aggressiveness and risk taking. In addition to the five dimensions, other entrepreneurship studies have suggested various elements of entrepreneurial orientation, including the ability to pursue profits, allocate productive resources, create new value, and exploit opportunities.

In summary, entrepreneurial orientation can be reduced to three common denominators: *1) proactiveness* is the propensity to strive for market dominance (Lyon et al., 2000), *2) risk-taking* is the tendency to take all risks to seize new opportunities (Miller & Friesen, 1978), and *3) innovativeness* is the tendency to be creative and to solve problems in new ways (Quinn & Cameron, 1983). In this study, entrepreneurial orientation is defined as the strategic focus of an organization to find new business opportunities and create competitive advantage through proactivity, innovativeness, and risk-taking (see the [EO] construct questions presented in Table 2).

2.2.2. Digital orientation [DO]. Since the diffusion of digital technologies can change rapidly, the underlying

assumptions of digital transformation strategies are also generally highly uncertain. In this context, companies not only try to find new opportunities while taking the risk of high potential losses, but also accept future uncertainties. Digital enterprises use new digital technologies to improve their business operations and develop new business models, as well as to enhance business intelligence and collaborate with customers and stakeholders (Matt et al., 2015).

Digital orientation is the strategic poise of an enterprise to push business innovation through digital technology. Its conceptualization consists of three components: *1) digital responsiveness*, 2) *digital attitude* and *3) digital cooperation*.

First, *digital responsiveness* is the tendency to respond quickly and flexibly by being sensitive to changes and demands brought about by digital technologies inside and outside the company. The ability to conceptualize how digital technologies may impact the business is a capability that many organizations lack in the early stages of digital maturity, and the ability to adapt quickly to change is also important to them (Kane et al., 2015).

Second, *digital attitude* is the natural mindset that supports technology in an organization. Giones and Brem (Giones & Brem, 2017) describe digital attitude as a prerequisite to achieving high growth goals, such as being technologically ahead of competitors and becoming the dominant player within the category. Digital technology empowers the digital economy by introducing a new range of opportunities with significant potential business value and allowing companies to drastically reduce costs. Therefore, a digital attitude embraces that digital technologies are naturally integrated into organizational activities, and that companies prioritize actively learning digital technologies and applying them to the business in order to turn opportunities into value.

Finally, *digital collaboration* is the will to develop and expand external relationships with openness and inclusiveness. Acquiring various forms of external knowledge contributes to innovation outcomes in different ways. New digital technologies such as social media, Big Data, mobile, and cloud solution technologies provide new opportunities for collaboration such as designing, developing, and distributing resources, products and services through open standards and shared technologies (Markus & Loebbecke, 2013). In addition, digital technology is converging and connecting stakeholders from different social and economic sectors, with collaboration becoming the driving force enabling new value creation. Digitally mature firms are not only able to realize the benefits of collaboration, but they are much more likely to implement digital initiatives through cross-functional teams (Kane et al., 2015) (see the [DO] construct questions presented in Table 2).

3. Research Model

3.1 A simplified research model

The basic framework of the simplified research model is the study of the relationship between digital entrepreneurship and on-demand service innovation. The intrinsic link between resources and entrepreneurship stems from Penrose's (Penrose, 1959). Penrose argues that the growth of a firm through the expansion of productive opportunities depends on entrepreneurial services available in the form of organizational activities related to the introduction of new ideas and changes in products, technologies, and organization. To bridge the gap between opportunity realization and asset composition, companies have since adopted entrepreneurial services and introduced dynamic organizational reconfiguration capabilities such as the ability to restructure the asset base to meet the requirements of a changing environment (Wang, 2008), including the introduction and widespread use of digital technologies to drive innovation. Figure 1 represents our simplified research model and lists the control variables.

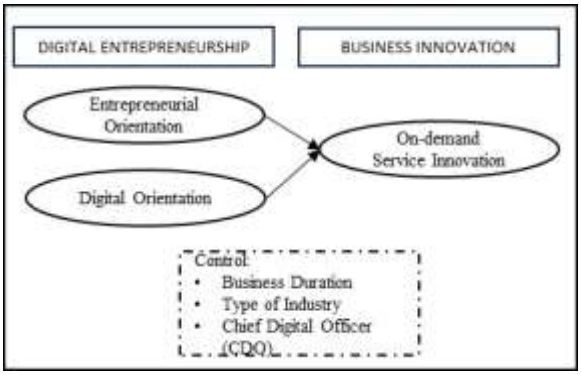

Figure 1. Research Model

3.2 Hypotheses

Although entrepreneurial orientation is a key element of organizational success, the existing studies only prove the relationship with performance, and the related studies are insufficient (Wang, 2008). This implies that there are different modes of action and influences between entrepreneurial orientation and performance. Entrepreneurship at the organizational level acts as a driver of change for innovation. More specifically, it is a motivating factor for the

organization's efforts to improve value to customers by providing superior products and services. Service orientation is the unique capability of an organization to accumulate, utilize, integrate, and redeploy internal and external resources and processes to understand and solve customer problems. The solution is achieved in a differentiated manner (Teece, 1998). Therefore, entrepreneurial orientation, which is an organizational level entrepreneurship, can be considered as a prerequisite for service orientation. Based on the above argument, the following hypothesis is proposed:

Hypothesis 1. Entrepreneurial orientation [EO] positively influences on-demand service orientation [OSI].

The concepts of entrepreneurial orientation and digital orientation differ in the source of the presented opportunity and the way it is realized, but they both seek to discover business opportunities and create customer value, and they have a core common denominator in that such propensity becomes a driver of organizational change. We expect digital orientation to also be a prerequisite for improved service orientation. This is consistent with the dynamic capability model, which is a view of service orientation that can be most useful when the external environment changes rapidly or unpredictably (Zahra et al., 2006). Changes in the business environment appear as changes in market and customer demands. By sensing and analyzing customer situations through digital technology, companies can gain in-depth insight into customer motivations and create personalized customer value. Because digital orientation is the strategic action of organizations seeking to discover opportunities from digital and create value using digital methods, the company's resources and processes are reorganized so that customers' problems can be captured more quickly and widely and solved through technology. For example, as Big Data connects businesses and customers to facilitate co-creation of value (Xie et al., 2016), insights can be gained to help companies strengthen their dynamic capabilities through Big Data Analytics Capabilities (BDAC) (Mikalef et al., 2020). Based on the above, the following hypothesis is proposed:

Hypothesis 2. Digital Orientation [DO] positively influences on-demand service orientation [OSI].

4. Methodology

4.1 Sample and data collection

This study used a survey method. In order to ensure the accuracy and representativeness of responses, the survey subjects were sources from employees who were at least at the middle management level of the organization and had been working for at least 3 years. The questionnaire was developed on a 5-point Likert scale and a pilot test was conducted prior to this study. The preliminary survey was conducted by administering a questionnaire to three ICT field and three other field staff working above middle management level in the organization and then collecting and revising the measurement items and additions to the questionnaire through face-to-face and telephone interviews. A total of 54 valid data were used in the pilot test, and one item that had a reliability problem among the measures of entrepreneurial orientation metrics was removed through statistical confirmation. After the removal, the questionnaire items and references used in the field test are presented in Table 2. The measurement items in the scale were developed through reflective measurement from the previous study. Based on the measurement items presented in the existing similar empirical studies, modifications were made to adjust the subject, context, and purpose of this study.

Table 2. Variables Questions

[EO] Entrepreneurial Orientation (Dess & Lumpkin, 2005; Li et al., 2009)
1. Our company continuously innovates in technology, products, markets and processes.
2. Our company invested in R&D even when management was difficult.
3. Our company strives to become a pioneer even though we are well aware of the shortcomings of industry pioneers.
4. Our company actively introduces and uses new products and technologies.
5. Our company carefully manages risks through adequate preliminary reviews and planning.
[DO] Digital Orientation (Hervé et al., 2021; Kane et al., 2015; Nambisan, 2017; Quinton et al., 2018)
1. Our company of top management team captures the digital transformation of our customers, technologies and ecosystems.
2. Our company actively seeks to understand digital change in order to realize opportunities.

3. Our company shares a clear vision for the future of digital transformation across the enterprise.
4. Our company prioritizes using digital technology to solve problems.
5. Our company is digital to solve problems Our company actively cooperates with customers through digital technology.
6. Our company actively cooperates with other organizations and individuals to find opportunities.
[OSI] On-demand Service Innovation (Kim et al., 2012)
1. Our company can provide products and services at any time the customer wants.
2. Our company can provide products and services that customers want faster than competitors.
3. Our company can provide products and services anywhere customers want.
4. Our company can provide products and services that customers want in more places than competitors.
5. Our company can provide products and services in whatever form customers want.
6. Our company can provide products and services that customers want in more diverse forms than competitors.

The companies that participated in the study included Korean firms of various sizes that applied for start-up funding in the past 5 years from the various lists such as: the list of members of the Federation of Middle Market Enterprises of Korea and Korean Women Entrepreneurs Association as of 2020, the list of suppliers of Korean Federation of SMEs, the list of suppliers of the Korean Federation of SMEs, and the Fair Trade Commission list in 2020. The survey population was formed through stratified random sampling based on the corporate type after collecting the list of large companies subject to disclosure announced in January and the list of public institutions registered in the public institution management information disclosure system. Among them, small and medium-sized enterprises (SMEs) and start-ups that account for more than 99% of domestic enterprises are expected to have low interest (propensity) and capacity for digital transformation and on-demand service innovation in the case of companies with fewer than 10 employees. The ratio was about 50%.

The survey was distributed to a total of 981 employees in the survey population through email, social media, and paper. It received 266 responses, indicating a response rate of 27.1%. Among them, a total of 195 valid responses were counted by removing dubious responses, missing values, and similar. Finally, 160 responses were used for the analysis. The organization type consisted of startups (22, 13%), SMEs (104, 65%), large corporations (21, 13.1%), and government and public institutions (13, 8.1%). Industries are manufacturing (25, 15.6%), service (94, 58.8%), and manufacturing and service integration (41, 25.6%). The sample used for the analysis was composed of small companies with a slightly lower proportion of the population, which is generally suitable for research intent, but the proportion of companies with operating periods of 20 years or more and less than 50 years was somewhat higher than that of small and medium-sized enterprises (SMEs). Considering that the survival period of SMEs is very low compared to large companies, etc., the bias of the sample seems to be a peculiar issue. However, the organizational operation period is less than 3 years (21, 13.1%), 3 years or more to less than 5 years (17, 10.6%), 5 years or more to less than 10 years (28, 17.5%), 10 years or more They consisted of less than 20 years (38, 23.8%), more than 20 years and less than 50 years (46, 28.8%), and more than 50 years (10, 6.3%). Therefore, it is judged that the bias of the SME sample is not a matter of great concern.

Respondents were mostly at the manager/manager level (54.4%), followed by CEO/owner (27.5%) and executive level (18.1%). We conducted a one-way ANOVA for on-demand service innovation responses by position to determine whether there is a difference between response groups in terms of sample selection bias that may be caused by a nonresponse bias (Sheikh and Mattingly, 1981; Whitehead et al., 1993). The test results ($F=2.179$, $p=0.117$), indicated that there was no statistically significant difference in the level of recognition for on-demand service innovation by job level.

In summary, the size of the organization's workforce was highest with less than 10 people (53, 33.1%), followed by more than 10 to less than 100 (47, 29.4%), and more than 100 to less than 1000 (33, 20.6%), 1,000 or more to less than 5000 (15, 9.4%), and 5000 or more (12, 7.55). Organizational sales accounted for 39, 24.4% of more than 100 million to less than 1 billion won, and more than 1 billion to less than 10 billion won (36, 22.5%), more than 10 billion to less than 100 billion won (30, 18.8%), over 100 billion won to less than 500 billion won (22, 13.8%), over 500 billion won (19, 11.9%), and less than 100 billion won (14, 8.8%). In addition, in 23.7% of the cases, digital transformation officers (chief digital officers) were present.

4.2 Control variables

As described earlier, we controlled for the duration and the size of the company's business. These two factors are related to business performance and survival maturity, and the higher the business performance of a firm, the more knowledge is accumulated. In addition, because companies with shorter operating periods are more likely to engage in risky innovation than mature firms, differences in innovation activity may occur as a function of business duration (Coad et al., 2016). Second, because differences across industries can lead to differences in corporate performance, service firms in certain industries should pay more attention to innovation than other industries. In this study, the control variables for on-demand service innovation were established by classifying industry types into manufacturing, service, and convergence industries. Finally, the presence or absence of the top manager was established as a control variable. The ability to digitally restructure businesses for business innovation is largely determined by digital strategies by leaders who create conditions for inventing (Kane et al., 2015). Therefore, it is necessary to consider and control differences in the degree of digital transformation based on the existence of a chief executive officer in the digital sector.

5. Data Analysis & Limitations

5.1 Direct effects

While we collected more variables to elaborate a parametric model, this study centers on checking the significance of the direct effect of the independent variable and the dependent variable. Figure 2 and Table 3 show that the direct effects of both the independent variable and the dependent variable were significant.

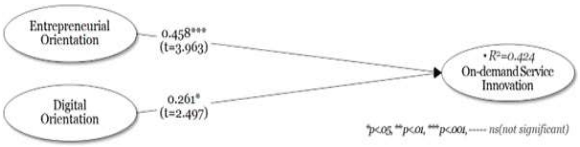

Figure 2. Direct Effects of independent variables

Table 3. Summary of hypothesis testing

	Hypothesis	Support	Sig.Lev
H1	Entrepreneurial orientation positively influences Service orientation.	Yes	p.<0.001
H2	Digital orientation positively influences Service orientation.	Yes	p.<0.05

Among the control variables, organization type and industry were found to have no significant effect on on-demand service innovation. Interpreting this result more broadly, it can be argued that on-demand service innovation does not change regardless of organization type and industry type, all organization types are affected by digital transformation.

On the other hand, among the control variables, the presence of a digital transformation officer was found to have a significant impact. This result is consistent with Kane et al.'s (Kane et al., 2015) argument that the ability of firms to digitally reorganize is largely determined by digital strategies of leaders who create conditions for inventing new things. Although the influence of this control variable alone cannot directly prove that on-demand service innovation increases when a digital strategy is in place, the role of CDOs has undoubtedly emerged as leading to business-oriented digital strategy and digital leadership (Haffke et al., 2016). Given the reality of the high level of responsibility for digital transformation, it can be inferred that the existence of a digital transformation officer has a positive impact on on-demand service innovation, possibly by reinforcing the digital strategy.

5.2 On-demand service innovation and firm performance

As an additional analysis, we examined the correlation between on-demand service innovation and the average annual sales growth rate of a company over the past three years, and, therefore, the implications of on-demand service innovation for a company's financial performance. To this end, an additional analysis was conducted for companies for which we could secure sales data (if the participants disclosed the company name in the responses). In the case of companies obligated to disclose financial statements, data was obtained from the electronic disclosure system of the Financial Supervisory Service in Korea, and in the case of companies that did not, the annual sales data of the company from 2016 to 2019 were obtained from the website or recruitment website. Data from a total of 63 companies (40% of the 160 samples used in the research model demonstration) were obtained and used for the final analysis, from among 102 companies that disclosed their company names. Among them, 12 companies had one missing value corresponding to 2016 or 2019,

which was calculated as the annual average sales growth rate for two years and reflected in the analysis.

Since each data unit is different, a correlation analysis was performed after converting the log value based on the highest value among the data for each variable. First, 5 outliers were removed through the scatter diagram, and the correlation was analyzed with the data of a total of 58 companies. The scatter plot after removing the outlier is shown in Figure 3.

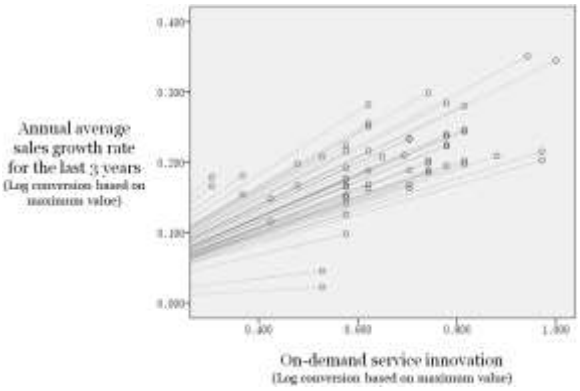

Figure 3. Scatter plot of relationship with on-demand service innovation and annual average sales growth rate.

As a result of the Kolmogorov-Smirnov (KS) normality test, the on-demand service innovation ($p=0.049$) did not satisfy the normality, but the annual average sales growth rate ($p=0.200$*) satisfies the normality (at least one variable must satisfy the normality) and the condition was found to be met. Pearson's correlation coefficient was significant as 0.578** ($p<0.01$), suggesting that on-demand service innovation has a moderate correlation with the annual average sales growth rate. Therefore, the dependent variable, on-demand service innovation, has important implications for the adoption of a company's growth strategy.

5.3 Limitations

This study has multiple limitations that affect its generalizability. First, there is a limitation in obtaining objective data to measure the dependent variable, on-demand service innovation [OSI] other than survey data, and a method of measuring respondents' perception was used rather than objective metrics on innovation. However, by confirming that an important growth indicator of a company (annual sales) is correlated with on-demand service innovation, the significance of the dependent variable may be partially inferred. Second, the number of samples of subgroups for organization type, industry type, and the presence or absence of a digital transformation manager is insufficient to conduct a multi-group analysis, so there is a limitation in conducting a more comprehensive analysis. Furthermore, there is a limitation in explaining only part of the intended concept as the digital orientation component was partially omitted from the statistical verification step. Based on previous studies, digital orientation was defined and measured based on perceptions of digital responsiveness, digital attitude, and digital collaboration. More research on the conceptualization of digital orientation and measurement tools may improve the reliability of the results in the future.

6. Conclusions

In relation to the key research questions, the findings are summarized as follows. First, we defined digital entrepreneurship and on-demand service innovation from an organizational perspective. On-demand service innovation has not been studied for a long time, but based on the existing service governance logic, it focuses on the method of providing services for the diversified and detailed customer needs in the digital age. It has been defined as "providing products and services in a desired form in one place". Moreover, by analyzing the correlation with the increase in the average annual revenue of the company, the results of this study were found to be positively correlated with the growth of the company.

Second, as a result of the analysis, we found that digital entrepreneurship has a positive and significant impact on on-demand service innovation. Therefore, digital transformation of enterprises in the digital era starts with the entrepreneurial and digital orientation of firms, particularly their leaders whose attitudes or actions drive on-demand service innovation. The importance of digital entrepreneurship in which innovation is created through the realization of entrepreneurial and digital opportunities as argued by Nambisan (Nambisan, 2017) and Kindström et al. (Kindström et al., 2013) is reaffirmed. The analysis of the control variables shows that the presence of the person responsible for digital transformation has a direct and significant. The person in charge of digital transformation is responsible for setting the strategic direction and promoting it. It is desirable to give appropriate responsibility and authority to the person in charge of the organization so that higher levels of digitization, and therefore higher sales, may take place.

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