

Dynamic Capabilities Dimensions: A New Measurement for Digital Start-Up Companies

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Abstract. The purpose of this study is to find out the development of the concept of dynamic capabilities and the various dimensions that have been studied in previous research related to the existence of digital start-ups to provide new input related to measurement items that can be used to measure dynamic capabilities, especially in digital start-up companies. The methodologies used is reviewing quantitative study and do mapping to each dimension used in previous studies. Then we do quantitative approach by piloting items measurement on 89 respondents, namely digital start-ups in Indonesia to do factor analysis to find relevant new measurement statements. Testing conducted with Smart PLS 4 processing. The findings showed that the main dimensions often used in previous studies are sensing, seizing, reconfiguring capabilities, integrating capabilities and learning capabilities. This study found that items measurement on three selected dimensions, all of which have value that is feasible to use to measure the presence of dynamic capabilities in digital startup industries. In the context of the digital economy, the goal of this study is to provide new insights to subsequent researchers to use more relevant indicators to be tested in various empirical studies of the relationship between variables involving dynamic capabilities, especially in digital start-up companies that have grown rapidly in the past decade in various parts of the world.

Keywords: Digital Start-up, Dynamic Capabilities, Item Measurement, Dimensions

1. Introduction

In start-up companies the existence of limited resources, minimal assets, the process of organizations that are still changing looking for the right shape and cannot be said to be stable, the company's attributes are still premature, limited information and sober knowledge make it difficult to develop. The existence of actors and events behind the birth and growth of e-business start-ups in the form of business incubators, providers of co-working space, learning functions in the ministry formed by the government, angel investors and collaboration partners are considered important for the growth of start-ups. The ability of start-ups to networking with outside parties to get the additional resources they need is not good enough. With limited resources, it is quite difficult for start-ups to make the necessary developments to be able to increase their valuation (Amelia et al., 2021; Hughes et al., 2020).

Start-ups not only increase dynamics of the market but also contribute to the growth of the economy, creating and forming new markets (Choi et al., 2021), therefore e-business Start-ups are expected to be agile in managing various processes in their organization. All details per management movement refer to the business objectives that have been set by top management since the inception of the organization founded on a clear vision and a structured mission. Leadership in the organization is expected to be the main driver who can ensure that its members carry out all activities based on the same goal. (in Mamun et al., 2018)

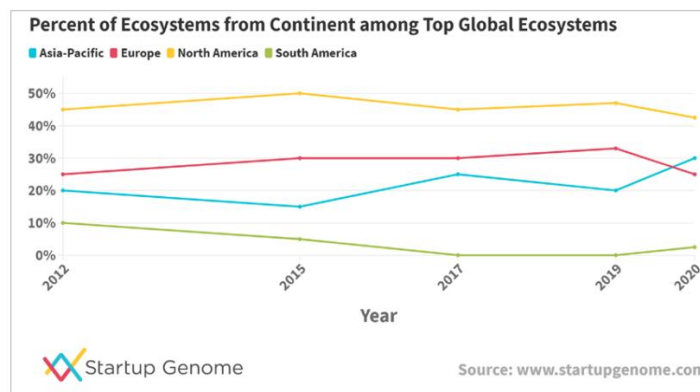


Fig 1. Percent of Ecosystems from continent among Top Global Ecosystems
Source: Global Start-up Ecosystem Report 2020

In figure 1, appears that the percentage of start-up ecosystems from 4 continents, South America tends to stagnate from 2012 to 2020. Europe and North America experienced a downward trend in 2019 to 2020 while Asia Pacific is on a good trend. Seven of the 10 Challenger Ecosystems recorded in 2019 to improve their ranking in 2020 are from Asia-Pacific countries. 30% Top Global Ecosystems are in the Asia-Pacific region (Global Startup Ecosystem Report 2020).

The global start-up economy is large in numbers worldwide, global start-ups created a value of nearly \$3 trillion in 2020. Seven of the 10 largest companies in the world are in the field of technology-based business. The highest concentration of any industry sector among the top global companies and recorded in 2019 was approximately \$300 billion in venture capital investments worldwide (Global Startup Ecosystem Report, 2020). The use of technology in various business processes makes e-business start-ups able to move faster and reach more people to form an ecosystem that allows them to dominate the market at a relatively young age. The surrounding business environment is also influential in supporting e-businesses to move to strengthen their steps in running their business. Various policies have been made and implemented by various countries to limit but also facilitate the running of start-up businesses, especially those engaged in

e-business (Peter et al., 2019) (Pergelova & Angulo-Ruiz, 2014; Zhu dkk., 2019)

Many traditional SMEs rely on the process of digitization by using applications that facilitate transactions that are usually offline to become online during the pandemic. More potential users bring diverse expectations make conditions become more dynamic in competing to create products that suit the needs of the market (Fauzi & Sheng, 2020; Kraus et al., 2020; Verhoef et al., 2021). For example, Tokopedia, one digital startup company from Indonesia was established to facilitate micro-entrepreneurs in offering goods and services online in one business container; or Gojek which facilitates job seekers with requests for inter- or delivery services. Many of the applications made are intended to answer the needs of the community whose process is done. This community needs-based application is required to be sensitive and able to update ideas based on user expectations and capture opportunities from these needs.

Studies with the topic of dynamic capabilities related with the existence of startups have been widely discussed and studied with various points of view and perspectives on various industries and types of businesses (Chao & Kang, 2022; Petrenko et al., 2019). However, literature studies on this topic have not been widely reviewed in the digital startup industry. Various dimensions have been developed and tested in many studies, but the development of appropriate indicators according to the nature and characteristics of digital startups was not encountered until this article was created. Adaptation of knowledge and previous studies combined with the opinions of experts in the field of digital startups is very necessary to create a measuring tool that is systematic, sharp and able to measure dynamic capabilities variables that are in accordance with the conditions of digital startups in various countries.

Research Question

1. How the development of studies on dynamic capability, especially in digital startup companies?
2. What dimensions affect digital business at each stage of its lifecycle?
3. How the configuration of dynamic capabilities item indicators special in the digital startup industry?

This study is limited to startups in Indonesia as a developing country with various conditions behind the development and business dynamics they must face. This study does not test the relationship of variable dynamic capabilities with other variables, but only provides views on measurement items that can be adopted by other researchers and supports research on the topic of dynamic capabilities, especially digital or tech startups in developing countries.

2. Literature Review

2.1 Resource-based view Theory

Resource-based view theory highlight the importance of organizing all resources owned by organization and improvising to maximize the resources owned so as to create efficiency and effectiveness to achieve competitive advantage and lead to sustained competitive advantage (J. Barney, 1991; J. Barney et al., 2001). In start-up companies the application of resource-based view is interesting to research, this is due to the limited capital available, physical capital resources (technology used, plant and equipment firms, geographic location, access to raw materials), financial capital resources (firm revenues, debt, equity, retained earnings), human capital resources (the training, experience, judgment, intelligence, relationship and leader-member insight), and Organizational Capital Resorts (firm's culture, formal reporting structure, formal and informal planning, controlling and coordinating systems, reputation in the market place, and informal relations of the group-firm-environment).

Limited capital resources owned by start-up companies have caused the start-up companies to have less competitive advantage or dynamic capabilities to withstand various changes quickly and not be able to have a sustainable advantage for the company's future development. (Guo et al., 2020; Hasani & O'Reilly, 2020; Randhawa et al., 2020)

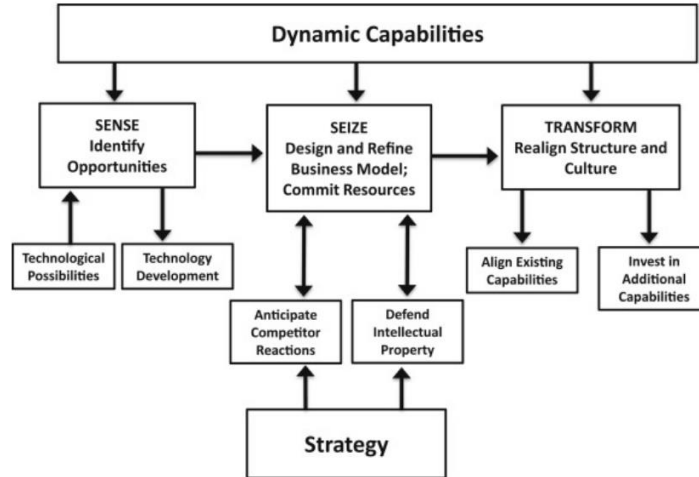


Fig. 2. Conceptualization of Teece's Dynamic Capabilities
Source: (D. J. Teece, 2018)

In his study, Teece (2018) wrote the development of the concept of sensing, seize and transform associated with business model innovation (Chao & Kang, 2022). In figure 2, the sense stage is preceded by technological possibilities, identify opportunities and producing technology development. While at the stage of seizing the existence of strategies needed to anticipate the reaction of competitors and efforts to maintain intellectual property. The transformation stage is an advanced stage that requires the company to make improvements to existing capabilities and also invest in other capabilities that make it possible to strengthen the structure and culture of the business.

Zollo (2002) explains about activity in the knowledge evolution cycle. Starting from external stimuli and feedback, start-up businesses can do scanning and recombination in generative variation, evaluate and legitimize in the internal selection process, conduct knowledge sharing, transfer adaptive problem-solving variations in the replication process and continue in enactment and routinization in the retention process (Zollo & Winter, 2002). In that cycle there is the importance of external stimuli and feedback to drive a dynamic and sustainable wheel of innovation. In technology-based start-ups, user input is very important to improve the value of the application created and increase customer engagement by meeting their needs and or solving problems with the existence of digital systems.

Based on James's (1993) thinking, Teece (2017) adopted the same erosion and lowered it in the theoretical concept of dynamic capabilities especially for digital platform. From previous research, Parker (2016) in Teece (2017) mention the bright definition about platform as a business based on enabling value-creating interactions between external producers and consumers. The purpose of platform is accomplished matches among users and facilitate transfer value creation for all participants. Still based on Parker (2016) idea, platform strategy has moved from controlling unique internal resources and develop competitive barriers to orchestrating external resources and engaging vibrant communities. Innovation is no longer charge of

internal expert through research and development team, but it produced through crowdsourcing and the original input from independent participants in the platform (D. J. Teece, 2017; D. J. Teece & Linden, 2017).

4.1 Startup Performance and Dynamic Capabilities

The study of business lifecycle has been widely conducted in various industries. In his studies in the last 5 years, Teece raised about the development of dynamic capability theory on digital (platform) and business ecosystem. Lifecycle start-up-related studies have also been developed in recent years (D. Teece et al., n.d.; D. J. Teece, 2017, 2018; D. J. Teece & Linden, 2017) (Gauger et al., 2021; Nanda & Rhodes-Kropf, 2013; Salamzadeh & Kesim, n.d.).

Adizes (2004) in (Čirjevskis, 2017) identified key management roles called PAEI that are crucial in each of the lifecycle stages: courtship, infancy, go-go and adolescence. 'P' stands for purposeful performance of management role. This role related capabilities enable effectiveness in the short run and the ability for functional actions to fulfil and satisfy client needs. 'A' stands for administrative behaviour role which enables efficiency in the short run. This role makes sure the ability to systemise the processes in the company. 'E' stands for entrepreneurial activity role which makes the company effective in the long run. This role makes the ability to be proactive in ecosystem. 'I' stands for integrative behaviour role which enables efficiency in the long run. This role organisation is becoming more dynamic and flexible.

Dynamic capabilities are positively related to performance, and this relationship is stronger in industries with higher levels of technological dynamism (Fainshmidt et al., 2016). Dynamic capabilities have evolved with the development of the times. Zollo (2002) relates to the role of dynamic capability in the role of learning mechanism accumulated experience, articulation of knowledge as well as the process of coding knowledge in dynamic evolution as well as adjustments in routine operations (Zollo & Winter, 2002). Teece (1997) defines the concept of dynamic capabilities as the company's ability to integrate, Building, and reorganizing its internal and external competencies to deal with rapid environmental changes (D. J. Teece et al., 2009) In technology-based organizations or businesses, the existence of competence and knowledge is invaluable. The rapid and dynamic change of information technology environment becomes one thing that forces the company to continue to move, adapt and adjust its competence to the novelty of the system. E-business Start-up Dynamic Capability is the result of the previous thinking of several researchers and is based on digital landscape's dramatic turbulence and continuous change (Pavlou & Sawy, 2011; D. J. Teece, 2017; Wu, 2010; Zhang et al., 2020). Neirrotti and Raguseo (2016) conceptualize dynamic capabilities as externally oriented IT-based capabilities because they support firms in managing their external environment, responding to market changes, and seizing opportunities.

3. Method

This study observes previous studies on the topic of Dynamic Capabilities. The selection of articles used in this study is selected based on the suitability of the concepts contained in the article, then abstracted in tabular form and analyzed considering the interrelationship of each section. This study is interesting because it takes selected article sources from reputable journals and is processed together in one integrated thought to be able to answer the research questions raised at the beginning of this paper.

The purpose of creating a new and sharp indicator related with dynamic capabilities special in digital startup, after doing mapping on many dimensions of DC, we conduct a focus group discussion with 3 experts in digital startup ecosystem and focus to review and adjust the previous general indicator to a systematic and related questionnaire that can be used to find the significance role of dynamic capabilities in many different

variables position and arrangements. This study also doing pilot test to 89 respondent which are digital startup leaders in Indonesia and found that all items indicator by confirmatory factor analysis using PLS 4 meet the requirement and can be used to measure dynamic capabilities for digital startup company.

4. Findings and Discussion

4.1 Stages of Business Ecosystem

In his study, James (1993) talked about four stages of business ecosystem named: birth, expansion, leadership, and self-renewal—or, if not self-renewal, death. In the first stage, entrepreneurs focus on the definition of what consumers want, which is why the value of products and services created and the most appropriate delivery process. Customer value proposition is the key to success in this stage.

Previous research on early-stage start-up lifecycles confirms the same challenges and difficulties for new start-ups to survive. Vesper (1990) argues that most start-ups fail in the very early stages and a third become companies that are in a state of "high rate of failure". This possible failure is due to many reasons, such as lack of financial models, internal problems and conflicts in the management team, lack of understanding of business knowledge, technological limitations, and other problems that make up "Start-up Problems" (Gauger et al., 2021; Salamzadeh & Kawamorita Kesim, 2015; D. J. Teece, 2017).

Salamzadeh (2015) classifies early start-up lifecycle into 3 stage levels. The first is the bootstrapping stage. In this early stage it can be said that the stage of the emergence of embryonic start-ups that display the entrepreneurial companies' way of life relies on their efforts and their own capital supported by those closest to them to carry out activities in creating business profits. High creativity is needed at this stage to face challenges as well as various resource limitations. At this stage the funding is carried out by angel investors. This stage is said to be successful if it obtains recognition of the existence of the venture, demonstration of product feasibility, financial management capabilities, team building, and acceptance from consumers (Damodaran, 2009; Salamzadeh & Kesim, n.d.).

The second stage is seed which is characterized by the ability of start-ups to conduct teamwork, prototyping, entry to market, valuation of venture, seek support from accelerators or incubators to grow start-ups. In most start-ups, the seed stage is the crucial stage. Many start-ups fail at this stage because they are unable to deal with the chaos and uncertainty. (Canovas-Saiz et al., 2021; Saiz et al., 2018) The success of this stage is very dependent on the existence of support mechanisms that make it profitable companies. Stage three is the creation stage which is characterized by the company's efforts to sell its products, enter the market, and develop its human resources by hiring employees (Salamzadeh & Cut, n.d.).

The most crucial dynamic capabilities are at the birth stage. At this stage the environment sensing to find and create new ideas that are acceptable to the market, the formulation of competitive business models and the ability to orchestrate resources becomes a focus in the company's activities. When platform-based business has been formed and expanded, new market segments are needed that demand the ability to replicate, learn and adapt that prioritizes execution activities. This study focuses on the first 2 stages of the business platform, because the dynamic capabilities demanded in this stage are the most important in producing business performance and new business sustainability.

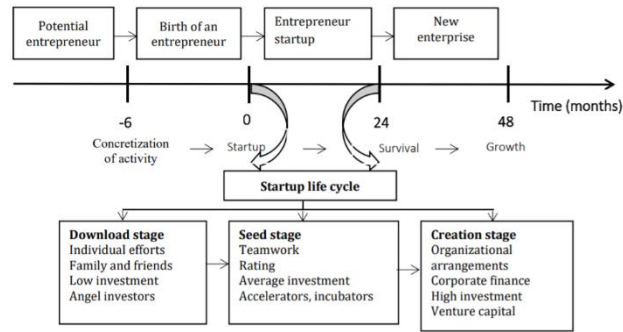


Fig. 3. Stages of Start-up Transformation
Source: (Kasych et al, 2020)

Figure 3 shows the development of the start-up lifecycle from the beginning to the end of creation stage based on Salamzadeh's idea, Kasych (2020) describes the stages of transformation of start-ups into enterprises in 4 stages, namely potential entrepreneurs, birth of entrepreneurs, start-up entrepreneurs, and new enterprises. Matched with the start-up life cycle, it appears that the theory of Entrepreneurship condensed coloring every stage of the start-up lifecycle.

4.2 Dynamic Capabilities to Drive Business Performance in Platform Business

The initial stage of the establishment of a startup full of challenges and uncertainties is reinforced by Teece (2017) who quoted James F Moore (1993) opinion on digital (platform) lifecycle consisting of 4 stages connecting performance each stage with dynamic capabilities theory that emphasizes responding to the anticipation of changes in the business environment, business model adjustment, adjustment efforts and alignment of business activities and capabilities continue to be done to improve business hold the continuity of the platform (D. J. Teece, 2017)

Table 1. Platform Lifecycle and Dynamic Capabilities
Source: Extracted from Teece (2017)

The Platform Lifecycle	Goals	Business model Focus	Most Relevant Dynamic Capabilities
Birth A value proposition is devised to capture value from an innovation	<ul style="list-style-type: none"> Profit through generative sensing Customer demand Validated various hypothesis 	<ul style="list-style-type: none"> Value Proposition Revenue Model Cost Model 	<ul style="list-style-type: none"> Generative sensing; business model selection; asset orchestration
Expansion Scale and refine the business while closing out rivals	<ul style="list-style-type: none"> seizing and transformation capabilities Business model implementation and relevancies Deciding platform governance (openness and/or control) Evaluation metrics chosen 	<ul style="list-style-type: none"> Fixed and adjust rapidly; Essential Speed of execution Capturing the value 	<ul style="list-style-type: none"> Seizing; Learning; transformation (execution)
Leadership Keep customers and partners engaged while maintaining a controlling position within the ecosystem	<ul style="list-style-type: none"> Strategizing is used counter moves by rivals targeting new market niches making product extensions transformation capabilities 	<ul style="list-style-type: none"> existing hardware and software capabilities bind users more tightly raising the efficiency 	<ul style="list-style-type: none"> Sensing for threats; Transformation (minor)
Self-Renewal Bring new ideas into the ecosystem	<ul style="list-style-type: none"> Fundamental renewal Facing technological change and major market shifts Platform renewal for the larger ecosystem 	<ul style="list-style-type: none"> New capabilities and alliances to build the new platform Key business relationship 	<ul style="list-style-type: none"> Generative sensing; ambidexterity; transformation (major)

To create This study using 3 dimensions from previous study by Lin et al (2014) which explored the role of dynamic capabilities in firm performance under the resource-based view framework contain 3 dimensions integration capabilities, learning capabilities, and reconfiguration capabilities (Lin & Wu, 2014). The basis of this dimension is taken looking at the lifecycle platform on expansion stages. The mapping results that have been carried out on 36 articles found 5 main dimensions that are widely used to measure the existence of dynamic capabilities, namely sensing, seizing, reconfiguration, integration and learning capabilities. The dimensions of integration capabilities, learning capabilities and reconfiguration capabilities were chosen because they represent the condition of the platform (digital business) that exists at the expansion stage which faced many obstacle and turbulence in their business.

Table 2. Dynamic Capabilities Dimensions

Author	Dimension
March, 1991	Exploration (sensing), exploitation (seizing)
(D. Teece & Pisano, n.d.) 1994	Coordinating, integrating, learning and configuring process
(D. J. Teece, 2007)	Sensing, seizing and transforming Process
(Wu, 2007)	Resource Integration, Learning Capability, Resource Reconfiguration Capability
(O'Reilly & Tushman, 2008)	Sensing, seizing and Reconfiguring
(Helfat & Peteraf, 2009)	Opportunity identification (sensing), Investment (seizing), Recombination/Reconfiguration
(Yu et al., 2010)	Organizational strategic capability, R&D innovative capability, Organizational management capability
(Pavlou & Sawy, 2011)	Sensing capability, learning capability, integrating capability, coordinating capability
(Chang, 2012)	Market-oriented sensitivity, the ability to absorb knowledge., Social-networking capability, The integrative ability to communicate and negotiate.
(Proterogerou et al., 2012)	Coordination capabilities, Learning, Competitive response
(Lin & Wu, 2014)	Integration capabilities, Learning capabilities, Reconfiguration capabilities
(Makkonen et al., 2014)	Sensing and seizing, knowledge creation, integration, reconfiguration, leveraging, learning
(Wang et al., 2015)	Absorptive capability, Transformative capability
(Parida et al., 2016)	Absorptive Capability, adaptive capability, innovation capability, network capability
(Kump et al., 2019)	Sensing, seizing and transforming
(Monteiro et al., 2019)	Resource integration capability; Resource reconfiguration capability; Learning capability; Ability to respond to the rapidly changing environment
(Pitelis & Wagner, 2019)	Sensing, seizing, transforming and re-configuring
(D. J. Teece, n.d.)2020	Sensing, organizing, value capturing & renewing
(Rashidirad & Salimian, 2020)	Sensing capability, learning capability, integrating capability, coordinating capability
(Chen et al., 2020)	Sensing, seizing, transforming
(Ali et al., 2020)	Sensing, seizing, reconfiguring
(Ilmudeen et al., 2020)	Sensing, coordinating, learning, integrating, reconfiguring
(Ferreira et al., 2020)	competence exploration and competence exploitation, suggested by Atuahene-Gima (2005)
(Erwin et al., 2020)	Sensing capabilities, learning capabilities, integrating capabilities

(Vu, 2020)	Integration capability, reconfiguration capability, adaptive capability.
(Farzaneh et al., 2020)	Learning capability, integration capability, reconfiguration capability
(Correia et al., 2020)	Strategic capabilities, R&D innovation capabilities, management capabilities
(Jiang et al., 2020)	Sensing, seizing and reconfiguring
(Shi et al., 2020)	Opportunity recognizing capability, Opportunity capitalizing capability,
(Valdez-Juárez & Castillo-Vergara, 2021)	Technological capability, Open innovation, Eco-Innovation
(Omeke et al., 2021)	Coordination capability, learning capability, competitive response capability
(Weiss & K. Kanbach, 2021)	Exploring (sensing), exploiting (seizing)
(Aldianto et al., 2021)	Sensing, seizing and transforming Process
(Teixeira et al., 2021)	Sensing user needs, sensing technological options, conceptualizing, scaling and stretching, co-producing and orchestrating
(Santa-Maria et al., 2022)	Sensing, seizing, reconfiguring
(Zahra et al., 2022)	Bundling, integration, diffusion, upgrading
(Chao & Kang, 2022)	Sensing, seizing and reconfiguring.

Source: Collect by authors (2023)

This study highlights various dimensions raised in previous studies used to measure dynamic capabilities in various industries. Based on the results of in-depth discussions through focus discussion groups with experts, it is proposed to adjust the statement to be an indicator in research with the topic of dynamic capabilities especially to measure digital startups area with 3 dimension which contain 13 indicators, as follows:

Table 3. Dynamic capabilities item indicators

Dimension	Indicator	Item Measurement	Outer loading
Integration Capabilities (4 items)	Customer information collection and potential market exploration	The e-business start-up we founded has a dashboard system of customer information sets that can support potential market exploration.	0.837
	Specialized organization to collect industry information for managerial decision.	The e-business start-up we founded has a dashboard of industry information sets that can be used for managerial decisions.	0.862
	Integrating industry related technologies to develop new products.	The e-business start-ups we founded can integrate industry-related technologies to develop new products.	0.759
	Recording and integrating historical methods and experiences in handling firm issues.	The e-business start-up we founded records and integrates historical methods and experience in dealing with company problems	0.891
Learning Capabilities (5 items)	Frequent anticipating industrial knowledge learning program	The e-business start-up we founded anticipates changes in knowledge in the industry through regular learning programs	0.790
	Frequent internal educational training	The e-business start-ups we set up conduct internal education training on a regular basis	0.897

		(e.g., once a week, once a month or every semester)	
	Knowledge sharing and learning groups establishment	The e-business start-up we founded conducts regular knowledge sharing through the formation of learning groups establishment	0.883
	Frequent internal cross department learning program	The e-business start-up we founded conducts internal cross-departmental learning programs on a regular basis	0.908
	Knowledge management database for access	The start-up e-business we founded has access to the knowledge management system (KMS) reference database	0.789
Reconfiguration Capabilities (4 items)	Clear human resource re-allocation procedure	The start-up e-business we founded has a clear human resource re-allocation procedure	0.836
	Rapid organizational response to market changes	The start-up e-business we founded has a rapid organizational response to market changes	0.888
	Rapid organizational response to competitor's actions.	The start-up e-business we founded has a rapid organizational response to the actions of competitors.	0.889
	Efficient and effective communication with cooperative organization	The e-business start-ups we founded have efficient and effective communication with partners.	0.831

Based on the test results of 89 respondents who filled out the questionnaire in this study, it appears that all indicators have outer loadings value above 0.6. Total effect shows that all three dimensions are have P-Values <0.001. R square for DIC is 0.853, DLC is 0.881 and DRC 0.811 (see appendix 2) which means that the statement items are appropriate and understood by respondents and can be used to measure the presence of dynamic capabilities in digital startup companies, especially in developing countries. The practical issues of this study to provide appropriate indicator items for research with digital startup analysis units, especially researchers who investigate the existence and effects of dynamic capabilities and its relation with other variables.

5. Conclusion

Based on the literature study conducted, variable dynamic capabilities are interesting to be used as one of the variables in research related to the existence of digital start-ups in various countries. Various dimensions that have been tested in previous research have undergone many developments so that science also develops following technological developments and various changes in the environment around the industry. Digital start-ups are a fragile, limited form of business but have great potential to develop rapidly. Dynamic capability that supports the performance of digital startups will continue to be tested with various other variables, becoming independent, mediation, moderation and dependent variables in research. The development of indicators and measurement items contained in this study is expected to help other researchers and can be used as relevant indicators tested with other variables.

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Appendix 1

Variable and Definition	Original Items		Adoption	Note (input from Expert)	Adjustment	
	Integration capabilities					
<p>Dynamic Capability</p> <p>Using the approach of Teece et al. (1997), this investigation defines firm dynamic capabilities as the capabilities of a firm to integrate, learn and reconfigure internal and external resources.</p> <p>In this study, the items measurement to be used is developed by Lin & Wu et al (2014) which contains 4 statements to measure integration capabilities, 5 statements to measure learning capabilities and 5 items statements to measure reconfiguration capabilities.</p>	DIC1.	Customer information collection and potential market exploration	My firm is having a system to collect customer information which can support potential market exploration		The e-business start-up we founded has a dashboard system of customer information sets that can support potential market exploration.	
	DIC2.	Specialized organization to collect industry information for managerial decision.	My firm is specialized organization to collect industry information for managerial decision.		The e-business start-up we founded has a dashboard of industry information sets that can be used for managerial decisions.	
	DIC3.	Integrating industry related technologies to develop new products.	My firm can integrate industry related technologies to develop new products.		e-business start-ups we founded can integrate industry-related technologies to develop new products.	
	DIC4.	Recording and integrating historical methods and experiences in handling firm issues.	My firm can record and integrate historical methods and experiences in handling firm issues		Need to clarify the dashboard	The e-business start-up we founded records and integrates historical methods and experience in dealing with company problems
	Learning capabilities					
	DLC1.	Frequent anticipating industrial knowledge learning program	My firm is frequently joining industrial knowledge learning program	Often--> qualitative. Replaced for example: educational training once a month (routine)E-business start-up that we established routinely conducts internal education training	Explore what the original items are like. To be adjusted to start-up	The e-business start-up we founded anticipates changes in knowledge in the industry through regular learning programs
	DLC2.	Frequent internal educational training	My firm is frequently doing internal educational training		The e-business start-ups we set up conduct internal education training on a regular basis (e.g., once a week, once a month or every semester)	
	DLC3.	Knowledge sharing and learning groups establishment	My firm is frequently doing knowledge sharing and learning groups establishment		The e-business start-up we founded conducts regular knowledge sharing through the formation of learning groups establishment	
	DLC4.	Frequent internal cross department learning program	My firm is frequently doing internal cross department learning program		The e-business start-up we founded conducts internal cross-departmental learning programs on a regular basis	

DLC5	Knowledge management database for access	My firm have access to knowledge management database	knowledge management database --> reference database (KMS-knowledge management system)	The start-up e-business we founded has access to the knowledge management system (KMS) reference database
Reconfiguration capabilities				
DRC1	Clear human resource re-allocation procedure	My firm have a clear human resource re-allocation procedure	clear	The start-up e-business we founded has a clear human resource re-allocation procedure
DRC2	Rapid organizational response to market changes	My firm have rapid organizational response to market changes	clear	The start-up e-business we founded has a rapid organizational response to market changes
DRC3	Rapid organizational response to competitor's actions.	My firm have rapid organizational response to competitor's actions.	clear	The start-up e-business we founded has a rapid organizational response to the actions of competitors.
DRC4	Efficient and effective communication with cooperative organization	My firm have efficient and effective communication with cooperative organization	Change to The e-business start-up that we established has efficient and effective communication with cooperation organizations or partners	The e-business start-ups we founded have efficient and effective communication with partners.

Appendix 2

