

Multiple Knowledge Networks and Innovative Behavior: A Study in Indonesia's Top Digital Start-up Companies

Stella Hardja¹, Oki Sunardi^{2,3*}, and Maria Widyarini⁴

¹Master of Business Administration Program, Parahyangan Catholic University

²Department of Industrial Engineering, Krida Wacana Christian University

³Center for Knowledge Management & Collaborative Innovation, Krida Wacana Christian University

⁴Faculty of Social and Political Sciences, Parahyangan Catholic University

Abstract. *Knowledge and innovation have become critical aspects of gaining competitive advantage and success in organizations. This study aims to uncover the role of multiple knowledge networks in the formation of innovative behavior and its relationship with supply chain collaboration in Indonesian startup companies. The survey involved 100 employees from the top five Indonesian digital startup companies as respondents. Model testing utilized SEM PLS, followed by triangulation through semi-structured interviews. The result showed that multiple knowledge networks and supply chain collaboration were positively related to innovative behavior. However, the work culture in Indonesian startups was somehow low in terms of exchanging knowledge and information. The lack of collaboration between the actors of the supply chain network has caused the knowledge network not to form correctly in Indonesian startup companies.*

Keywords: *Multiple knowledge networks, supply chain collaboration, innovative behavior, startups, Indonesia*

Abstrak. *Pengetahuan dan inovasi merupakan aspek-aspek penting dalam membentuk keunggulan kompetitif dan keberhasilan perusahaan. Penelitian ini bertujuan untuk memahami lebih dalam mengenai peran multiple knowledge networks terhadap pembentukan perilaku inovatif serta hubungannya dengan kolaborasi rantai pasok di perusahaan startup Indonesia. Survei dilakukan kepada 100 karyawan dari lima perusahaan startup terbesar di Indonesia sebagai responden. Uji model dilakukan dengan menggunakan SEM PLS, dilanjutkan dengan triangulasi melalui wawancara semi terstruktur. Penelitian ini menunjukkan bahwa multiple knowledge networks dan kolaborasi rantai pasok berhubungan positif terhadap perilaku inovatif. Namun demikian, budaya kerja di perusahaan startup Indonesia tergolong masih rendah dalam hal bertukar pengetahuan dan informasi. Rendahnya kolaborasi antar actor dalam jaringan rantai pasok turut berperan tidak terbentuknya jaringan pengetahuan yang baik di perusahaan startup Indonesia.*

Kata kunci: *Multiple knowledge networks, kolaborasi rantai pasok, perilaku inovatif, startups, Indonesia*

*Corresponding author. Email: oki.sunardi@ukrida.ac.id

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Introduction

Startups have shown to play a significant role in Indonesia's economy (Florida & Hathaway, 2018). Based on the Statistics Indonesia, Start-up's contribution reached 5.5% to Indonesia's Gross Domestic Product (GDP) (Daily Social, 2018). In 2018, they had created 4.5% new job opportunities (Eka, 2019), and contributed to Indonesia's economic growth around 5.17% annually (Daily Social, 2018; Setu, 2018). Indonesia's digital financial ecosystem has grown by 1230% over the last six years. However, rapid development did not guarantee the sustainability of startups. Only 1% of startups sustained. Moreover, around 13% of startups failed during the first year of their operations, and the rest followed after 2 - 5 years (Failory, 2019; Winosa, 2019).

A Startup is defined as a new business that aims to develop an innovative products/processes/or service to meet the market needs (Nadar, 2016). Startups also stated as a business with a few years of age that most likely fail because of various uncertainties, but not impossible to make exponential growth (Alberti & Pizzurno, 2017; Kohler, 2016). Thus, startups are a relatively new business (a few years) that faces various uncertainties, and depend on innovation and technology to survive and sustain.

Previous studies concluded that many startups fail due to their lack of innovation and originality (Figueiredo, 2013; Winosa, 2019), consistency of principle founders (Kohler, 2016), as well as limited internal and external knowledge networks in creating innovation (Alberti & Pizzurno, 2017; Battistella, De Toni, & Pessot, 2017). Collaboration and relationships have proven to support the forming of knowledge networks in order to create innovation (Figueiredo, 2013; Ikeda & Marshall, 2016; Kovačić & Rus, 2016).

In term of knowledge networks, prior studies were limited to discussing only on the existence of knowledge sharing practice, while the interaction of actors was hardly discussed

(Figueiredo, 2013; Phelps et al., 2012; Schonstrom, 2005; Utami, Indarti, Sitalaksmi, & Makodian, 2017). Companies need an extensive knowledge network to sustain the business, and multiple knowledge networks should be able to enhance companies to create innovation. Innovation can be in the form of the ability to respond to problems in the future, the ability to create an effective and efficient business process, or the ability to create new products/processes (Berry, 2018).

However, innovation is not the only way for companies to survive, but the most important thing is to foster a culture of innovative behavior (Agarwal, 2017). The company develop innovative behavior not only by integrating knowledge networks but also by creating supply chain collaboration among actors who connected with the company.

This study aims to understand and explain how multiple knowledge networks enhance innovative behavior in startup companies in Indonesia. This presentation of this study incorporated four sections: introduction, research methods, results and discussion, and conclusion.

The term 'multiple knowledge networks' is employed to get a better understanding while explaining the nature of the innovation process among various parties. Schonstrom (2005) argues that developing knowledge networks in an organization will impact on the improvement of competitive advantage through innovation.

Meanwhile, the company has to commit to creating a culture of knowledge networks that enable cross-fertilization of knowledge and experiences between individuals. Not only the culture of nurturing knowledge, but the company also has to empower the employees in terms of funding and infrastructure that fosters the intensity of knowledge transfer (Schonstrom, 2005; Utami et al., 2017).

Phelps et al. (2012) believes that knowledge networks are created by an individual for finding, transmitting, and creating a set of knowledge for innovation. Berry (2018) suggests that in creating innovation, any organization needs to develop multiple knowledge networks, instead of relying only upon a single knowledge network. Multiple knowledge networks can be defined as a combination of knowledge from various aspects to contribute in creating innovation. Nevertheless, it is not easy to encourage startup companies to be innovative (Battistella et al., 2017).

Further, organizations need to spread knowledge and create a culture of innovative behavior (Khaola & Coldwell, 2018). By developing the culture of innovative behavior, a startup improves its performance through innovations (Ikeda & Marshall, 2016). Utami et al. (2017) argue that creating innovation requires intensive actors' interactions (internal and external actors) by first developing knowledge networks. Further, previous studies reveal that multiple knowledge networks indicated by five dimensions: commitment, infrastructure, and funding, transfer knowledge culture, key actor, and intensity of knowledge transfer (Battistella et al., 2017; Berry, 2018; Phelps et al., 2012; Schonstrom, 2005; Utami et al., 2017). Thus, the following hypotheses developed as follows:

H1: Multiple knowledge networks have a significant positive impact on innovative behavior.

Moreover, the actors' interactions develop supply chain collaboration. In this context, supply chain collaboration (SCC) reflects a sequence of a business process carried out by members who collaborate with the same objectives (Kampstra, Ashayeri, & Gattorna, 2006; Hyland, 2017; Mandal 2017). Nevertheless, knowledge acts as the most critical factor in the supply chain collaboration process (Madenas, Tiwari, Turner, & Peachey, 2015; Mandal, 2017). Previous studies suggest three dimensions of supply chain collaboration: information sharing, decision

synchronization, and incentive alignment (Simatupang & Sridharan, 2005; Stefani & Sunardi, 2014). They indicate that SCC focuses more on actors' collaboration to create a competitive price on the market rather than managing good business relationships (Burgess, Gules, & Tekin, 1997; Fernie, 1995; Rich & Hines, 1997). With supply chain collaboration, organizations expedite the supply chain process from procurement to distribution through knowledge sharing (Stefani & Sunardi, 2014) and increase their performance, especially concerning innovation (Hyland, 2015; Simatupang & Sridharan, 2018).

Innovative behavior is one of the innovation forms. Previous research found that innovative behavior contributes to enhancing competency and company's performance, and increasing information richness during innovation process (Ikeda & Marshall, 2016; Knol & Van Linge, 2009; Xerri & Brunetto, 2011). Innovative behavior occurs when the needs of freedom, reward, justice, and meritocracy are aligned with their expectations and obligations to innovate (Ramamoorthy et al., 2005). Innovative behavior can also be seen as the motivation and cognitive processes of the employee to create a new product or process (Knol & Van Linge, 2009). Moreover, Sharma (2016) argues that technology enhances companies to be more innovative. Agarwal (2017) states that innovative behavior manifests into three dimensions: idea generation (the production of new and useful ideas), idea promotion, and idea realization (potential building teams, sponsors, and various parties who have power).

Further, our manifests to describe innovative behavior include recognition (ability to recognize or deal with problems), generation (ability to infer problems), mobilization (gather support to solve the problem), and resolution or challenge (ability to solve the problem) (Chang & Liu, 2008); Knol & Van Linge, 2009).

For the purpose of this study, innovative behavior is represented by four dimensions; idea recognition and generation (the ability to recognize or infer the problems and create new or useful ideas), mobilization (the ability of gather support to solve the problems by combining ideas), realization (the ability of applicate the ideas), and sharing (the ability of transfer knowledge and experience). The second and third hypothesis were stated as follows:

H2: Supply chain collaboration has a significant positive impact on multiple knowledge networks

H3: Supply chain collaboration has a significant positive impact on innovative behavior.

Many previous studies tend to overlook innovation and less in analyzing how companies utilize employees' talents in creating a culture of innovative behavior (Knol & Van Linge, 2009). Little explanation regarding companies' efforts to embed internal or external knowledge onto their employee so that the employees may increase their innovation skills (Berry, 2018; Figueiredo, 2013; Utami et al., 2017).

Previous studies put their focus limited to the service sectors (Kayser, Karnoe, Duminski, Somekh, & Vera-muñoz, 2019; Lethbridge, Andrusyszyn, Iwasiw, Laschinger, & Fernando, 2011) or multinational industries (Berry, 2018; Schonstrom, 2005). Though, in the process of creating a culture of multiple knowledge networks, supply chain collaboration should be also be examined (Cannella, Dominguez, Framinan, & Ponte, 2018; Hyland, 2015; Ku, 2013).

Research Methodology

Theoretical hypotheses are derived to explain the multiple knowledge networks towards innovative behavior. The three hypotheses represented as the interpretation of multiple knowledge networks in the innovative behavior of Indonesia's startups. The three hypotheses on the research model described in Figure 1.

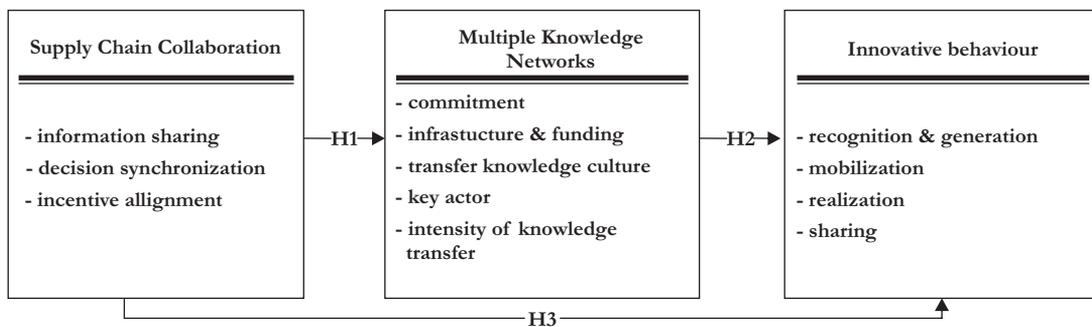


Figure 1.
Research Model

This research surveyed the employees of the top five Unicorn startup companies in Indonesia. Data gathered through a purposive sampling technique of 100 employees. One of the problems that make digital startups unable to grow fast and big is to impose all the problems that they faced on the founder (Younis, Desai, & Sigal, 2017).

However, in the development of digital startups that are growing bigger and involving various parties, innovation cannot be created solely by relying on the founder. In these terms, employees have an important role in developing the company because employees are the person who knows well about the activities of the company and moves directly with both of the consumers and partners.

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For statistical testing, the r table of 100 respondents was at 0.1353, with the level of confidence (α) is at 10%, and the Cronbach's Alpha was at 0.7. R and Cronbach's Alpha testing aims to figure out the validity and reliability of the instrument (Bewick, Cheek, & Ball, 2003; Snell, Montgomery, & Runger, 2003). Further, the analysis continued to test the hypotheses. The triangulation phase applied several semi-structured interviews involving four experts, three experts were business leaders, and one expert serves as a researcher in higher education with a specialization in digital business and startups.

Results and Discussion

The validity and reliability test showed that all indicators testing was valid. The SEM PLS model testing (Figure 2) indicated that three indicators of multiple knowledge networks (MKN1, MKN3, MKN15) and two indicators of supply chain collaboration (SCC4, SCC4) were invalid, and therefore excluded from further analysis. The test indicated a loading factor below 0.5. The construct reliability from the composite value is set above 0.7 (Bewick et al., 2003). Table 1 summarized the hypothesis test results.

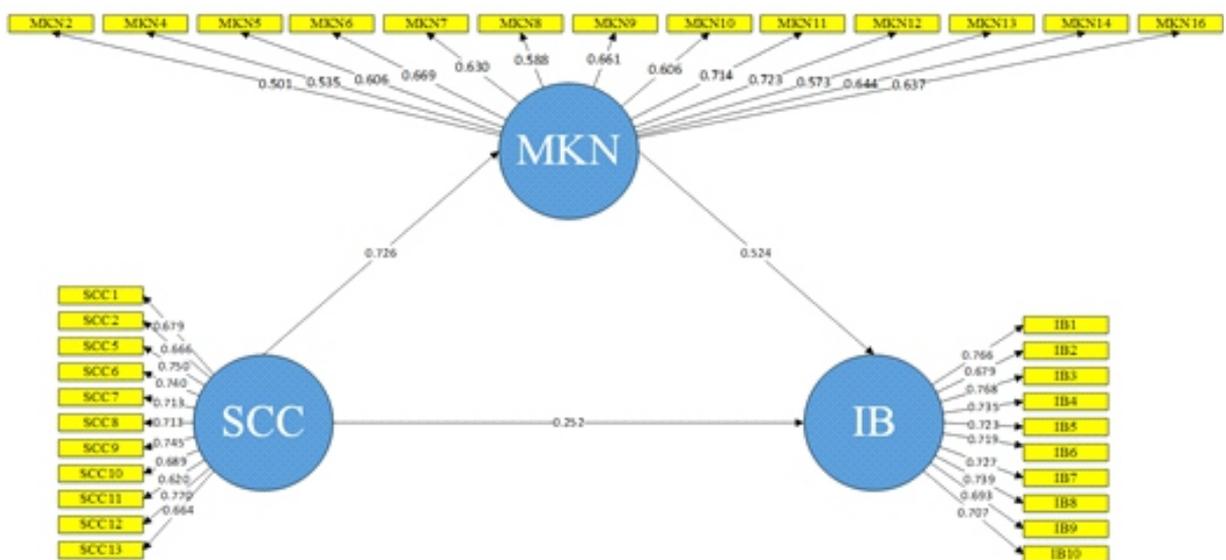


Figure 2. SEM PLS Analysis

Table 1.
Data Processing Results

	Hypothesis	IJ	Sig.	t table	t count	Cronbach's alpha	Result
H1	Multiple knowledge networks (MKN) have a significant positive impact on innovative behavior (IB)	0.10	0.01	1.292	3.582	0.855	Accepted
H2	Supply chain collaboration (SCC) has a significant positive impact on multiple knowledge networks (MKN)	0.10	0.25	1.292	1.157	0.885	Not accepted
H3	Supply chain collaboration (SCC) have a significant positive impact on innovative behavior (IB)	0.10	0.007	1.292	2.737	0.897	Accepted

However, the knowledge transfer culture dominantly occurs amongst internal actors within the same organization (42.25%), while knowledge transfer culture between organizations exists amongst 29.50% of respondents. On the contrary, higher supply chain collaboration occurred in external collaborations (41.47%) compared to internal (29.36%). Table 2 summarized the data pattern of each variable and indicator. Further, the triangulation explained that most employees were reluctant to sharing knowledge with external parties due to the perception that the knowledge sharing process is considered less critical. One expert in the startup business explained the finding:

"People play an important role in developing startup companies, especially superiors or leaders. They must be able to foster and lead their employees to have the sets of skills that needed and responsibility in creating a culture of innovative behavior as a competitive advantage of the companies."

Therefore, it takes the key actors who can move employees to do knowledge sharing in terms of creating a culture of innovative behavior. However, the employees hold the mindset that sharing knowledge or information with others will enhance the level of competition. This finding is in line with Djajendra (2012). The author reveals that the work culture in Indonesia is more individual rather than group-based (collaborative) and tends to be more competitive.

This explanation supports the finding of relatively low intensity of knowledge transfer at 43%.

Hypothesis 2 indicated that supply chain collaboration has not a significant positive impact on multiple knowledge networks. This situation occurs because employees do not feel the benefits of sharing knowledge with all parties involved in the supply chain, even feel burdened to share their knowledge. Further, two expert explain why SCC has less impact on MKN.

"I believe SCC is very important to the formation of MKN. However, it usually occurs in middle level manager, where negotiations, meetings, and coordinations are extensive. In staff level, they mostly coordinate with other supply chain members, but rarely they exchange operational strategy."

"There are several obstacle for staff level to spend more time to synchronize ideas. They tend to focus more on efficiency during collaborations. In other words, time become a barrier to intensify knowledge transfer."

This study showed that only 18.83% of respondents practiced knowledge sharing to external actors of the supply chain within the knowledge networks; the intensity of employees to collaborate in developing supply chains is also shown to be only 25.17%, while the effectiveness of technology usage of the startups is only at 20.50%.

This condition contradicted with previous research stating that external actors play an essential role in the innovation process (Battistella et al., 2017; Brata, 2009; Tobiassen & Pettersen, 2018). This statement was also conveyed in the interview session, deeming that communication was considered efficient enough by only using Telegram or WhatsApp messaging, without having felt the need for integrated communication with both internal and external actors.

In contrast, previous studies found that the use of technology is an essential enabler in creating effective supply chain collaboration (Alsaad, Yousif, & AlJedaiah, 2018; Wang & Hu, 2017). Moreover, cooperation during the decision-making process tends to be passive (33.28%). In terms of sharing risks and benefits, the level of trust and collaboration between employees and actors in the supply chain is good enough (39.75%). However, the implementation of company policy itself still needs improvement (30.50%).

Hypothesis 3 was accepted, as indicated by a significant positive relationship between supply chain collaboration and innovative behavior. The 83.3% of respondents who believed that when the ability of actors to recognize problems was supported by "trust" among related actors, it would enable the incorporation of creative ideas within the startup companies.

However, this study showed that innovative behavior occurs when actors in the organization participate and are willing to share information, sharing risks as well as sharing the outcomes. This study implied that the company has been quite successful in building an ecosystem of mutual trust and openness so that innovative behavior existed. The majority of 100 respondents agreed that there is a well-established collaboration between the company and the employees.

Table 2.
Data Pattern

Variable	Manifest	Indicator	Percentage		
	Commitment	External knowledge sharing	70,83%	41.47%	13.3%
		External collaboration		28.17%	
		Internal knowledge sharing	29.36%	14.18%	
		Internal collaboration		15.18%	
Multiple knowledge networks	Infrastructure		86.00%	86.00%	
	Transfer	External		29.50%	
	knowledge	Internal	71.75%	42.25%	
	culture		76.00%	76.00%	
	The intensity of knowledge transfer	External		24.50%	
		Internal	43.00%	18.50%	
	Information sharing	Culture		18.83%	
		Technology support	64.50%	20.50%	
Supply chain collaboration	Decision synchronization	The intensity of supply chain collaboration development		25.17%	
		Key actor collaboration	65.30%	32.02%	
	Incentive alignment	Intensity of collaboration		33.28%	
		Company policy	70.25%	30.50%	
Innovative behavior	Recognition & generation	Relationship		39.75%	
		Trust	83.30%	83.30%	
	Mobilization	Collaborative idea	85.25%	42.75%	
		Realization		42.50%	
	Sharing		82.00%	82.00%	
			78.50%	78.50%	

The collaboration encouraged them to think critically, which stimulates their ability to identify problems. The ability to identify critical problems has become the driving force in the realization of creative ideas and employee commitment to knowledge sharing, to foster innovative behavior.

Moreover, all experts believe that reward has a significant role in increasing the company's productivity, as an enabler for the employees to perform well. One example is through innovative works. This finding is in line with Ramamoorthy et al. (2005), who found that competitive rewards become companies' strategy to shape a culture of innovative works. However, the finding showed that managerial level employees were more interested in self-actualization than financial measures. On the contrary, at the staff level, financial value enhances employee encouragement more. Thus, financial rewards did not always have a direct impact on the creation of a knowledge-sharing culture.

This study has limitations in the number of respondents compared to the population of digital startups employees in Indonesia. Digital Startups also very heterogeneous; therefore, generalization is not the objective of this study. However, the results of this study should be utilized for further studies, examining different types of digital startups: marketplace, fin-tech, and entertainment. The study found that supply chain collaboration has not a significant positive impact on multiple knowledge networks. Further study should also examine the enablers and barriers in regards to this concern.

Conclusion

This study encourages innovation experts and researchers to consider multiple knowledge networks as a valuable tool to create innovation in startup companies. Innovation strengthens competitive startup advantage and enhances their productivity. Thus, multiple knowledge networks are essential for the startup to

understand the innovative behavior process among actors' interaction (roles and responsibility). It is also essential for startup companies to have a better understanding of knowing the characteristics of their employees and their education background, so the company can prepare the best actions in fostering their employees in creating a culture of innovative behavior.

This study also showed two important facts: multiple knowledge networks and supply chain collaboration have a positive impact on innovative behavior, and supply chain collaboration showed no impact on multiple knowledge networks. Supply chain collaboration in Indonesia's Star-ups is still underdeveloped, due to the employee culture to share knowledge among external and internal parties was limited to daily work communication only, instead of intensive brainstorming to create innovative ideas. In other words, technology acts as a communication device instead of a sharing and collaboration tool.

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