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Digital Transformation: Digital Leadership Role in Developing Business Model Innovation Mediated by Co-Creation Strategy for Telecommunication Incumbent Firms

Leonardus Wahyu Wasono Mihardjo and Sasmoko Sasmoko

Abstract

Incumbents have a challenge to sustain their business due to new attractive business model offered by new entrants. Incumbent firms are required to transform their existing business to a new paradigm of business which is digital business through developing new capability in business model. In developing innovation in the business model, there is a challenge for incumbents due to existing legacy business and routine process. The fastest way in developing new capabilities through collaboration is called co-creation strategy. In driving co-creation strong culture and visioning of digital leader is required. The study of the digital leadership role in developing business model innovation and co-creation strategy was limited; hence this study has an objective to assess the role of digital leadership, whether it will direct or indirect through co-creation strategy in developing business model innovation. The study was conducted on 88 senior leader respondents. The statistical data analysis used SmartPLS application. The result explained that digital leadership impacts indirectly through co-creation strategy on developing business model innovation. Co-creation strategy plays a mediating role in the relationship between business model innovation and digital leadership.

Keywords: digital transformation, digital leadership, co-creation strategy, business model innovation

1. Introduction

The impact of digital technology through the Internet and cloud brings the new paradigm in terms of structure in all industries. The Internet creates a borderless economy and new whole mind and results in the information era changes into the conceptual age era [1]. The change is not only in the customer but also in the market; the incumbent has to transform their process to be more fast, simple, and effective and has an ability to personalize their products by digitizing and providing the process learning [2]. Digital technology creates a certain paradox between

the opportunity and efficiency. In terms of opportunity, it will generate revenue through innovation in business model and in terms of efficiency will be created through digitization process [3]. In the digital era, there are four factors in the driving of change that are key success factors of the firms which are innovation, collaboration, integration, and interoperability [4, 5].

New entries come into the market with an attractive business model, while the incumbent firms still rely on the existing business model based on their existing assets that may not be able to fulfill customer and market needs. Hence, incumbent firms are required to develop new capabilities within their business model to anticipate the changes in customers and market. Co-creation is defined as joins co-values between the firms and partners in order to produce a mutually valued outcome and fastest way in developing business model capability. Co-creation will also accelerate and enable incumbent firms to transform the business to be able to be more innovative, standardized, modular, interoperable, decentralized, and service oriented [6]. The more innovative the firms are, the more value the co-creation model can bring. The need for co-creation is for the development of business model innovations since the combination of strong capabilities between firms and partners to provide a complete supply chain could create valuable business model innovations [7, 8]. A strong business model innovation would bring sustainability with a combination of focus on customers and could create sustainable competitiveness for incumbent firms in the disruptive era [9]. Telecommunication is the main sector where the incumbent firms are significantly disrupted by new entries [10]. Meanwhile, the telecommunication industry in Indonesia is special, since the digital development is still at an early stage, but the growth of innovation through the creativity industry and startups are growing rapidly. This creates an opportunity and challenge for incumbent firms to build its digital infrastructure [11]. The new entries are able to offer customer solutions through over-the-top (OTT) applications that disrupt the incumbent firms. These startups have developed new products and services through economy sharing and co-creation with communities, which have become a disruption to the existing firms. There have been studies and research on this trend of disruption that are conducted worldwide. International business machines (IBM) has also conducted empirical studies on the role of co-creation. According to their 2015 survey on CEOs, 69% of CEOs strongly believe that the role of the CEO is important in order to earn the highest achievements in innovation through collaboration and co-creation with customers and partners. This supports another study on the significance of the role of company leaders and collaboration especially in digital leadership [12].

Digital leadership is a combination between digital culture and digital competence. The study of digital leadership is the part of the study about leadership based upon the upper echelon theory developed by Hambrick and Mason [13] where organization output can be predicted by manager characters. In terms of digital leadership, Pearl Zhu [14] defines the criteria of digital leadership which consist of five characteristics:

1. Thought leader, the capability to be tough in facing the market and competition change
2. Creative leader, a digital leader that has creativity and innovation mindset to formulate the idea into reality
3. Global visionary leader, a digital leader that has the ability to provide direction and to become an orchestra in transforming the digital business transformation

4. Inquisitive leader, with the complex and dynamic ecosystem due to volatility, uncertainty, complexity, and ambiguity (VUCA) factors, a digital leader that has to have the learning capability
5. Profound Leader, a style of digital leadership capability to lead in complex times with has in depth knowledge and understanding, to use their knowledge in interpretation, assumption and synthesizing the information to take the decision making

This study is important for digital transformation since it will bring the new transformation path model for incumbent firm by developing the digital leader to enhance the culture and digital competence. On the other hand, this study is also supporting the new construct of co-creation strategy before it was constructed from the marketing theory; with this study it will extend the new paradigm of co-creation to become a part of the strategy to grow. It will strengthen in developing of strategic management theory in facing market dynamic due to digital technology; the co-creation and collaboration strategy is the proper strategy to accelerate the transformation. Since the role of digital leadership is important to drive business model and collaboration through co-creation, and also limitation study on the role of digital leadership in relation with business model innovation and co-creation strategy [15], hence this chapter is going to discuss the role of digital leadership in developing co-creation strategy and business model innovation. The analysis path of effectiveness is important whether digital leadership has direct or indirect relationship to business model innovation. Co-creation strategy has played a mediating role in the relationship between business model innovation and digital leadership. The essence of this study to contribute more knowledge and add priority transformation actions for management in managing digital transformation and for scholar could contribute in finding the proper path analysis in transforming into digital service for established company. The chapter will start with introduction, thus exploring the theoretical background of the study by describing past research and construct variables. It will then continue with the methodology used in the study including the research model and hypotheses. The findings section covers the management analysis and opportunities for further research. Last, it will also cover the conclusion, implications, and suggestions for future study.

2. Literature review

2.1 Digital transformation in Indonesia telecommunication industry

Digital transformation is the hot topic in telecommunication industry. The concept of digital transformation has been discussed in the early 2000s called as Telco 2.0 [16]. The concept of Telco 2.0 focuses on customer-centric and innovative organization as the key success factors. Value migration consists of a combination of collaboration and business model innovation that leads to co-creation strategies of digital businesses.

There are a variety of types of digital transformation in the ICT industry. Based on the innovation framework, the transformation can be done through the following innovations [17]. There are four types of digital transformation in ICT industry as follows:

1. Transformation by products and services innovations (named inventors). This model is suitable to fulfill the untapped needs of customers, either partially or

completely, to create innovative digital products and services, that is, Apple, Google, GO-JEK with GO-FOOD, GO-CLEAN, etc.

2. Business models/innovation paradigms (named disruption) rely on customer experience, delivery model, and value propositions through digital technologies. Some examples include Uber, Amazon.com, Tokopedia, and GO-JEK. According to Das et al. [11], this disruptive scheme is believed to be the most successful scheme.
3. Business processes (named lean champion) increase the value by leveraging the value chain through digital technologies to increase efficiency and productivity, such as Walmart and Matahari Mall.
4. All round positioning innovation. Its transformation is done through a combination of products, processes, and business models supported by digital technology to strengthen the position of the products and services, such as Tesla.

According to the value mapping contribution and the nature of ICT firms in general, heavy investment is made in connectivity. The World Economic Forum [18] identifies four models of ICT firms with intensive investment to transform into a digital telecommunications firm, namely:

1. Connectivity provider for the future of the network. It has focused on the development of ICT infrastructure to enable other enterprises and OTTs across the industry, by investing and virtualizing the network. This includes investment on software-defined network, cyber security, and extended connectivity. This model is believed to have the highest contribution in the next 5–8 years based on its relevance with the nature and core competence of ICT firms. It requires an expansion of distinctive capabilities and organization of digital capability.
2. Beyond pipe. It integrates IOT and digital services to fulfill customer needs and businesses, to expand the business into becoming a digital player by adding value-added services. Capability in business model innovations is also required to generate new revenue on top existing infrastructure.
3. Redefining customer engagement. It is done to win customer loyalty and mindshare by providing features and tools to create better customer experience and to improve the service to match other industries. This requires capability on telecommunications to enhance customer relation, loyalty, and experience.
4. Bridging the gap in innovation. It is done by transforming the capability of innovation model and by increasing talent capability to work in digital and collaborate to co-create value with stakeholders. This requires the capability of collaboration and co-creation partnership strategy to accelerate and leverage existing assets.

Khanagha et al. [19] formulates the key evaluation of the succeed in digital transformation:

1. First, aligning internal activities with external rate and direction of change to develop strategy formulation and implementation. When the firm responds to the change, the proper time to do action is required to be exact, not too early or too late.

2. Second, retaining resources and capabilities to create distinctive organization capability to adapt to change. ICT firms have a large extent of capabilities and complementary assets; hence, the transformation should integrate with existing core and resource capability through new technology and business models.
3. Last, generating new revenue for product diversification and minimizing cost of change. It can be done by creating business model innovations and co-creation partnership strategies.

2.2 Business model innovation

Business model innovation describes how an organization could create, deliver, and capture value. The construct and modification of a business model is called business model innovation. Business models are broadly used in the value chain of businesses, including the process and integration with existing business processes [20]. Business models are also part of the implementation strategy in the context of sustainability for the incumbent firms [21]. Business model innovation plays a significant role in digital economy [22]. In the digital ecosystem, business model innovation is emerged as an alternative to process and product innovation [23]. In addition, business model innovation has an objective to create value, and the implementation of business model is dependent on the capability of managers and top leaders [8, 24]. Business model innovation is a part of digital transformation through rearranging business activities with greater value than before through the optimization of new digital technology [25–27]. Business model's innovation is a new holistic, integrated, and systematic way for organizations to provide the operation of innovations in order to create value in a dynamical environment through collaboration with their internal and external stakeholders [28].

In this study, we refer the concept of business from Amit and Zott [24] with the dimension of content innovation, structure innovation, and governance innovation.

2.3 Co-creation strategy

Co-creation is customer value chain collaboration activities start from design activities into promotion called as co-design, co-develop, co-deliver, and co-promotion [29]. In relation with innovation, co-creation strategy will strengthen innovation [30–33] including radical innovation [34]; in addition the concept of co-creation has an objective to develop value creation [35–37]. The new concept of customer has changed. In traditional management view, the consumers or partners are outside the value chain, while in modern company the consumer is an integral part of the system. The new paradigm changes the customers not as an object but a subject involving of value chain business activities. Traditional management views the consumers or partners to be outside of the value chain, while modern companies view consumers as an integral part of the system. The new paradigm also views the customers not as an object but as a subject involved in the value chain of business activities. Co-creation in innovation with external partners including customers has been an intense topic and called as an open innovation ([32]; Romero and Molina, 2009).

In a strategic level, co-creation can be utilized as a strategy to transform value propositions, working closely with customers and related party. In this paper, the extended concept of value creation is driven from marketing the co-creation concept based on the new 7S McKinsey framework [38] and value chain to put co-creation as part of the business strategy. In the new 7S McKinsey framework, the strategy is divided into three categories: strategy, capability, and tactical. Hence, the construction of co-creation strategy is defined as a co-creation vision

and direction, co-creation capability, and co-creation tactics. Co-creation vision focuses on the direction from a senior leader. Co-creation capability focuses on the development of people and process and technology to support implementation of vision. Co-creation tactics range from co-design, co-production, co-delivery, to co-promotion.

Based on the literature review, this study assesses co-creation strategy by the dimensions of co-creation strategy, co-creation capability, and co-creation tactical.

2.4 Digital leadership

In digital transformation, the role of leader is central in driving fast decision-making process and propelling the change [39, 40]. Digital leadership is a combination of leadership style of transformation leadership and the uses of digital technology. Digital leadership is defined as the combination of culture and competence of a leader in optimizing the use of digital technology to create value to the firms [41].

There are five characteristics: creative leader, tough leader, global visionary leader, inquisitive leader, and profound leader [14]. Since the competition becomes tight, hyper, and complex dynamic of the ecosystem due to VUCA (volatility, uncertainty, complexity, and ambiguity) factors, hence the leader is required to be creative and innovative through in-build capability or collaboration [42]. The global visionary leader is required to provide direction and to become an orchestra in transforming the digital business transformation. The internet and cloud technology as a main driver for fourth Industrial Revolution is heavily knowledge-based and requires overwhelmingly new competencies and capabilities, hence the leader has to have ability Inquisitive learning and has profound ability in knowledge and understand in depth in learning and change. Hence based on the literature review, the dimension uses for this study are creative, deep knowledge, global vision and collaboration, thinker, inquisitive.

In a disruptive era, the role of digital leadership to innovation has been discussed intensely [12, 43]. The previous study found that there is an impact of digital leadership on innovation including developing a business model; hence we develop the hypothesis as follows:

Hypothesis 1: Digital leadership has a direct impact to business model innovation in the Indonesian telecommunication industry.

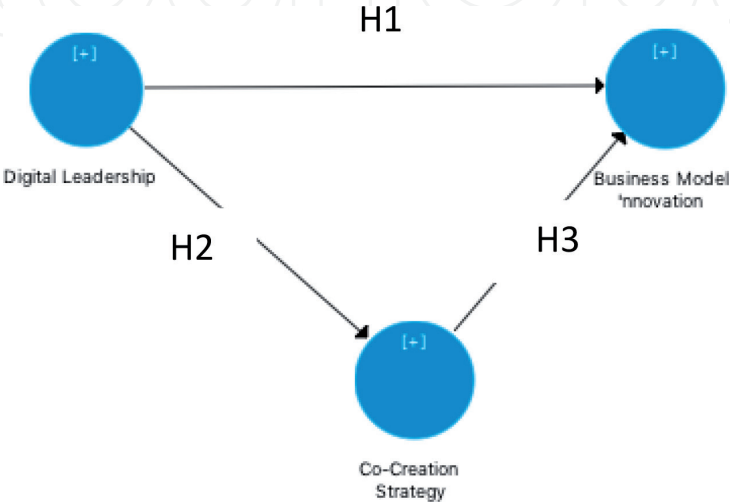


Figure 1.
Research model.

The relation of digital leadership and collaboration including co-creation has been discussed in a previous study [25, 44]. The previous study found that there was positive correlation between leadership in this case digital leadership and collaboration or co-creation study; hence, the hypothesis is formulated as follows:

Hypothesis 2: Digital leadership has a positive impact on co-creation strategy in the Indonesian telecommunication industry.

The strong impact of co-creation on innovation has been discussed in a previous study [31, 45, 46]. It was a strong impact of co-creation strategy on innovation including business model innovation. According to these studies, the hypothesis is formulated as follows:

Hypothesis 3: Co-creation strategy has a significant impact on business model innovation in the telecommunication industry.

Hence, **Figure 1** demonstrates the current research model.

3. Methodology

This study uses a quantitative research design. The units of analysis in this study are telecommunication firms in Indonesia with the management of these firms as the observed unit. The sampling method used is purposive sampling. The sample size is made up of 88 respondents where 75% of them is represented by general manager and manager leaders and 25% by VP and board leader. According to Hair, Hult, Ringle, and Sarstedt [47], the recommended sample size is 52 respondents for the model with an endogenous construct that has two arrows directed, 0.05 significance level, 80% statistical power, and minimum $R^2 = 0.25$. The sample size of this research is 88 respondents. That is more than the recommended sample size. About 88% of the respondents are men and 12% are women. About 83% of the respondents come from the network provider, while 17% from service providers. Data were collected via self-assessment through an online questionnaire and distributed through messenger, WhatsApp, Telegram, and email. Since there is a limitation of the data sample, the statistical tool of analysis is SmartPLS.

4. Result

The result of statistical tool has been tested through outer, inner, and hypothesis testing. The analysis of the outer model specifies the relationship between latent variables and their indicators. Tests performed on outer models include:

1. Convergent validity. The value of convergent validity is the value of loading factor on the latent variable with its indicators. The expected value is above 0.7.
2. Discriminant validity. The value of cross loading factor that is useful to assess whether the constructs have adequate discriminant by comparing the loading value on the intended construct which is greater than the loading value with other constructs.
3. Composite reliability. Data that has a composite reliability over 0.7 which is considered as highly reliable.
4. Average variance extracted (AVE). Expected to be more than 0.5.

5. Cronbach's alpha. Reliability test reinforced with Cronbach's alpha. The result is expected to have a value of more than 0.6 for all constructs.

In testing the construct validity and reliability, the result showed that the result for AVE value is >0.5 , Cronbach's alpha is >0.6 , and composite reliability is >0.7 . It means that research variables have good reliability for all variable and dimension. In discriminant validity, the result showed that the diagonal numbers indicate the square root of AVE is higher compared with the left row number. It means that the dimension has a good discriminant validity. The testing of convergent validity showed that all values of the loading factor of outer path analysis for t value are >1.96 and p-value is <0.05 which means each indicator is a valid measurement tool in measuring latent variables; a similar result for outer path analysis has shown that all constructs have a path coefficient score with t-statistics of more than 1.96 and p-value = $0.000 < 0.05$, which means that all constructs have a significant association with their dimensions.

The second testing is inner test or structural model testing. The testing is using a blindfolding score. The result showed that the score of blindfolding, Q2, was obtained for co-creation strategy = 0.277 and business model innovation = 0.486. If Q2 is >0 , it indicates that the structural model has adequate predictive

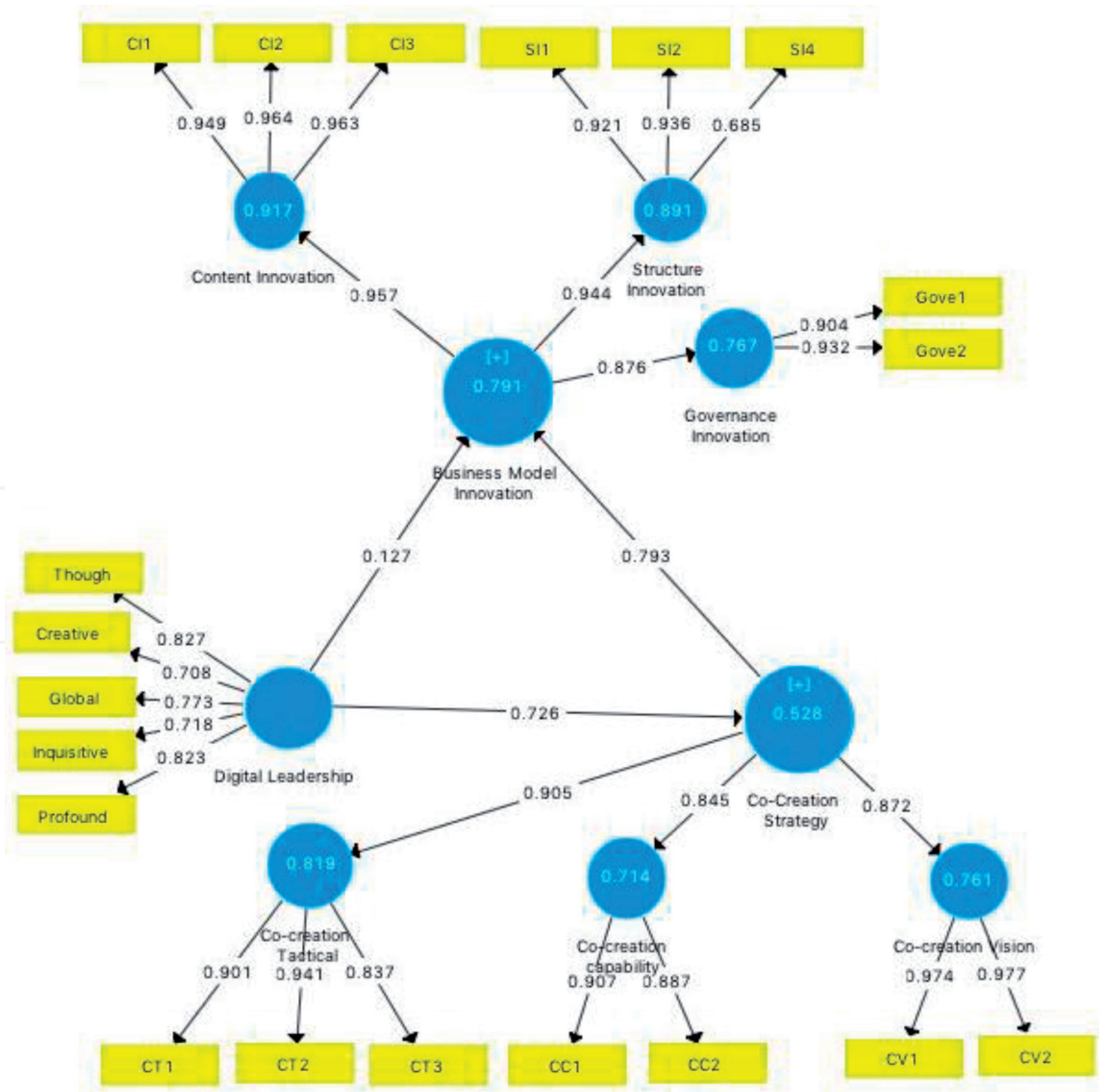


Figure 2.
Path analysis result.

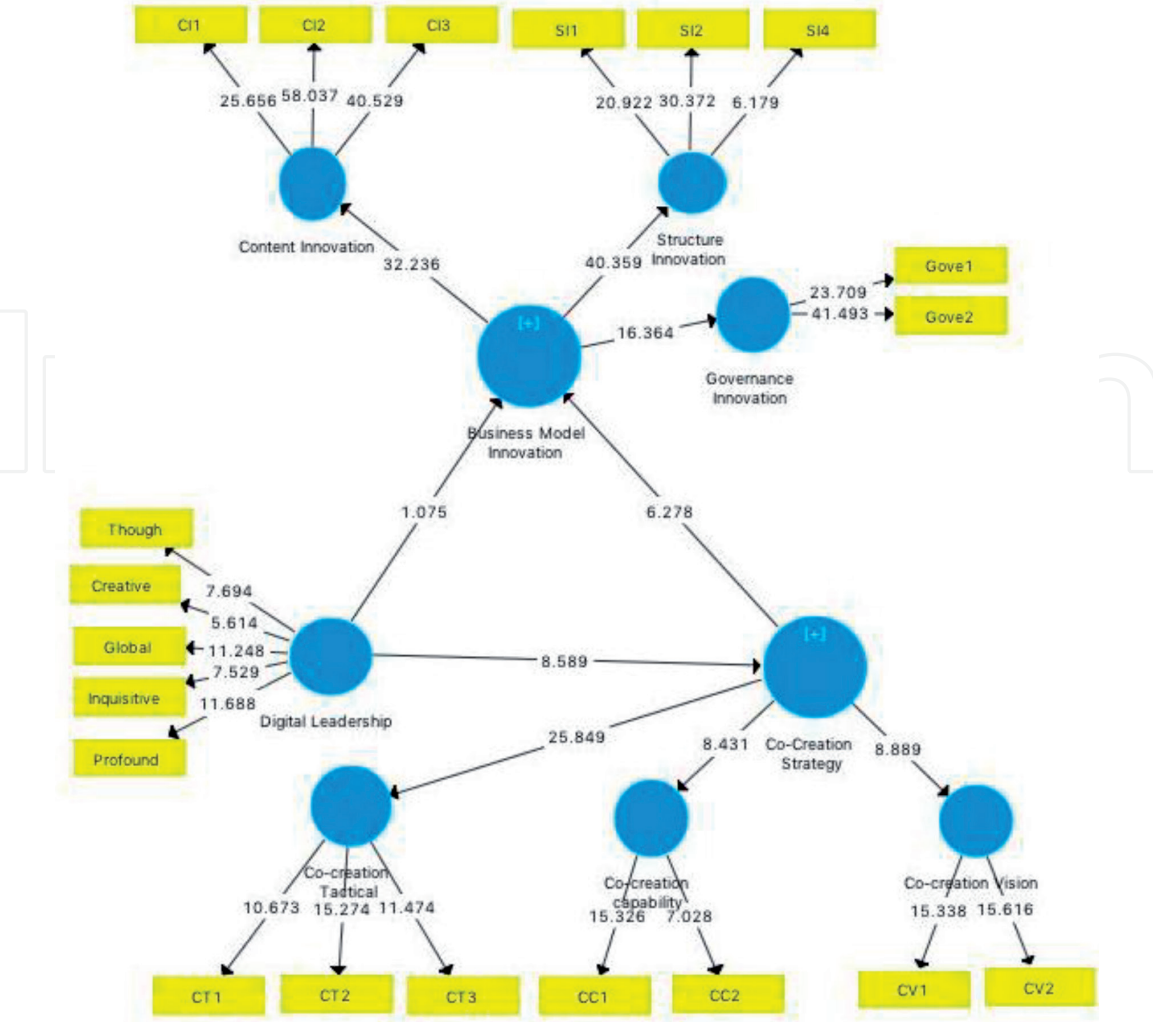


Figure 3.
Research Finding.

Hypothesis	Path analysis	Path	Standard deviation	T statistics	P values	Result
Direct effect test						
H1	Digital leadership > Business model innovation	0.127	0.116	1.075	0.274	Not significant
H2	Digital leadership > co-creation strategy	0.728	0.082	8.589	0.000	Significant
H3	Co-creation strategy > Business model innovation	0.793	0.129	6.278	0.000	Significant
Indirect effect test						
	Digital leadership > co-creation strategy-business model innovation	0.576	0.126	4.569	0.000	Significant

Table 1.
Hypothesis testing result.

relevance. It is seen that the model formed is robust. Hence the next step is to conduct hypothesis testing.

The result is shown in Figures 2 and 3. In Figure 3, it can be seen that if t value is >1.96, it means that the independent variable has a significant influence on the dependent variable. The result in Figure 3 shows that digital leadership has a

significant influence on co-creation strategy but not a significant influence on the business model innovation; and co-creation strategy has a significant influence on business model innovation.

The direct effect test shows that the relationship between digital leadership and business model innovation has a path coefficient score of 0.127 with t-statistics = 1.075 and p-value = 0.274 > 0.05. This means that H0 is accepted and H1 is rejected. This indicates that digital leadership has no significant impact on business model innovation. The second assessment is the relationship between digital leadership and co-creation strategy has a path coefficient score of 0.728 with t-statistics = 8.589 and p-value = 0.000 < 0.05. This means that H0 is rejected and H1 is accepted. This proves that digital leadership has a significant impact on co-creation strategy, while the relation between co-creation strategy with business model innovation has a path coefficient score of 0.793 with t-statistics = 6.278 and p-value = 0.000 < 0.05. This means that H0 is rejected, while H1 is accepted. The co-creation strategy plays significant role in relationship between digital leadership and business Model innovation (**Table 1**).

The indirect effect test shows that the mediating role of co-creation strategy has a path coefficient score = 0.576 with t-statistics = 4.589 and p-value = 0.000. This means that H0 is rejected, and H1 is accepted. This proves that co-creation has a supportive impact as a mediating role on relationship between business model innovation and digital leadership.

5. Discussion and implication

5.1 Discussion

The results are aligned with the study on disruption technology and innovation conducted by Christensen [9, 48] where the incumbent firm should adapt the changing of market through creating innovation business model by driving digital transformation. The path analysis showed that digital leadership has an indirect path in developing business model innovation. This is aligned with study on agility where the firms have to have agility learning to sustain their business [49]. This also aligns with the transformation stage of digital leadership where the incumbent requires to gradually transform from digital savvy where digital is used for personally and coloration purpose into digital agility where digital is used for business model innovation, and the ultimate of digital leadership is to become a disruptive innovation where the digital is part of radical innovation in exploring the new market [50]. Hence, the collaboration is the fastest way in developing business model innovation due to the gap of incumbent capability. The dimension of digital leadership is derived from Global and profound leader where the leader always thinking global the new way in doing business and they have deep and profound knowledge in taking risk and decision making. This finding supports Rudito and Sinaga (2017) where the digital leadership is becoming a part of culture and competence of the leader in optimizing the use of technology. This finding brings the implication for incumbent firms to use digital leadership to establish business model through co-creation strategy driving for open innovation [32, 51].

Co-creation strategy puts the external parties to be involved in the value chain to develop business model innovations. With a strong reputation, firms can control and attract valuable customers and stakeholders to create more value in a series of activities. From a customer or stakeholder point of view, they will be able to see the benefits of the part of the system for value creation. Customers or other parties can bring influence in the creation of value together with the firm. In this study, we found that in the developing of co-creation strategy, what is important is the

factor of implementation which is co-creation tactical. It means that the execution of co-creation concept is important to support the developing of business model innovation. The finding supports the strong influence of co-creation on business model innovation [31, 45, 46].

Business model innovation is mostly supported by context and content innovation due to the relation with co-creation strategy. When the firm has to deal with the collaboration with partners, the structure of collaboration or co-creation and the content of innovation are significant factors to drive and control the co-creation value chain. The finding demonstrated that the governance is still important, but less priority compare with content and structure of innovation.

In an indirect test, it shows that co-creation is a mediating role in the relationship between business model innovation and digital leadership. Co-creation strategy plays a significant role on relationship between business model innovation and digital leadership. Co-creation strategy is developed from vision and direction from digital leadership and combining with external co-creation will impact in strengthen business model innovation. This path is more valuable than using customer experience directly to form business model innovation. This finding supports the findings in previous studies where the leadership through collaboration will strengthen innovation in the business model ([32]; Romero and Molina, 2009).

5.2 Implication

The implication to managerial practice, study has revealed the important of digital leadership in digital transformation to anticipate the digital disruption. The digital transformation is essential started from the vision and mission of the digital company to provide direction of the desired future position of the company. Weill and Woerner [52] define the vision and ambition into four matrices based on the matrix of end customer knowledge and business design. There will be four possibilities of the digital company: (1) when the business design is the value chain and the knowledge of the end customer is partial, the company vision is to become a supplier company such as a manufacture company that part of supply chain business in providing good and commodities without in-depth knowledge of customers. (2) when company has the complete supported ecosystem business but partially recognize knowledge of end customers, the company is characterized as a modular business firm such as payment company, that provide service as plug and play and be likely more innovative due to rapid changing of ecosystem; (3) when the company has the knowledge of end customer completely and business design is based on value chain, the company vision is to become a multichannel business such as a bank company that provides the customer experience over value chain; and (4) the vision company is distinguished as ecosystem drivers when ecosystem business design and the knowledge of end customer are completely accomplished. A digital telco company and Internet service provider are example companies that provide a great customer experience with lean organization and optimize the digital technology to drive ecosystem enabler (**Figure 4**).

The transformation brings the telco company to enabler ecosystem driver. In anticipated the disruption from new entries due to diminishing on innovation and customer experiences, incumbent telco should focus on customer experience and digital innovation while at the same time build the digital ecosystem to support the vision and ambition toward digital company.

The foundation of digital transformation is operational excellence. Incumbent telco shall focus on developing lean process and organization through digitalization process and developing people capability in digital competence and culture.

Strategic implementation shall be cascaded from vision and mission derived from digital leadership, thus, to build distinctive capability and customer

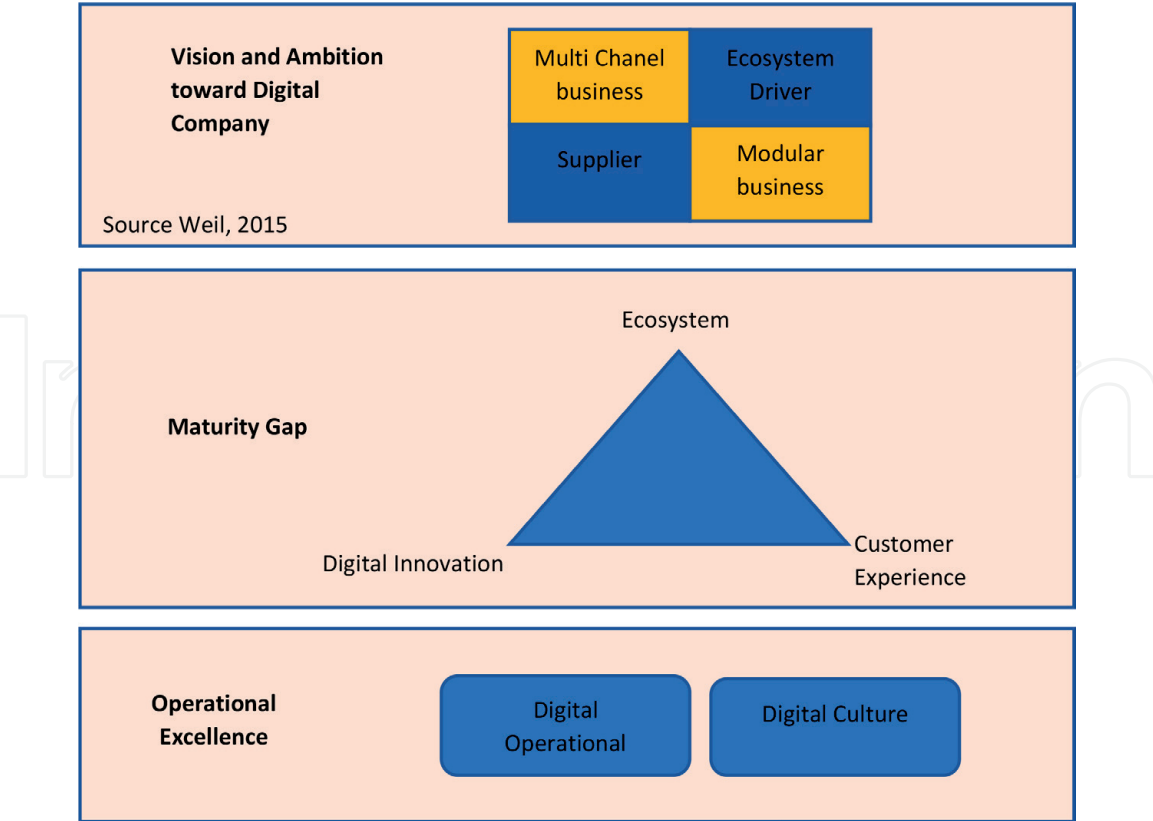


Figure 4.
The framework of telco digital transformation.

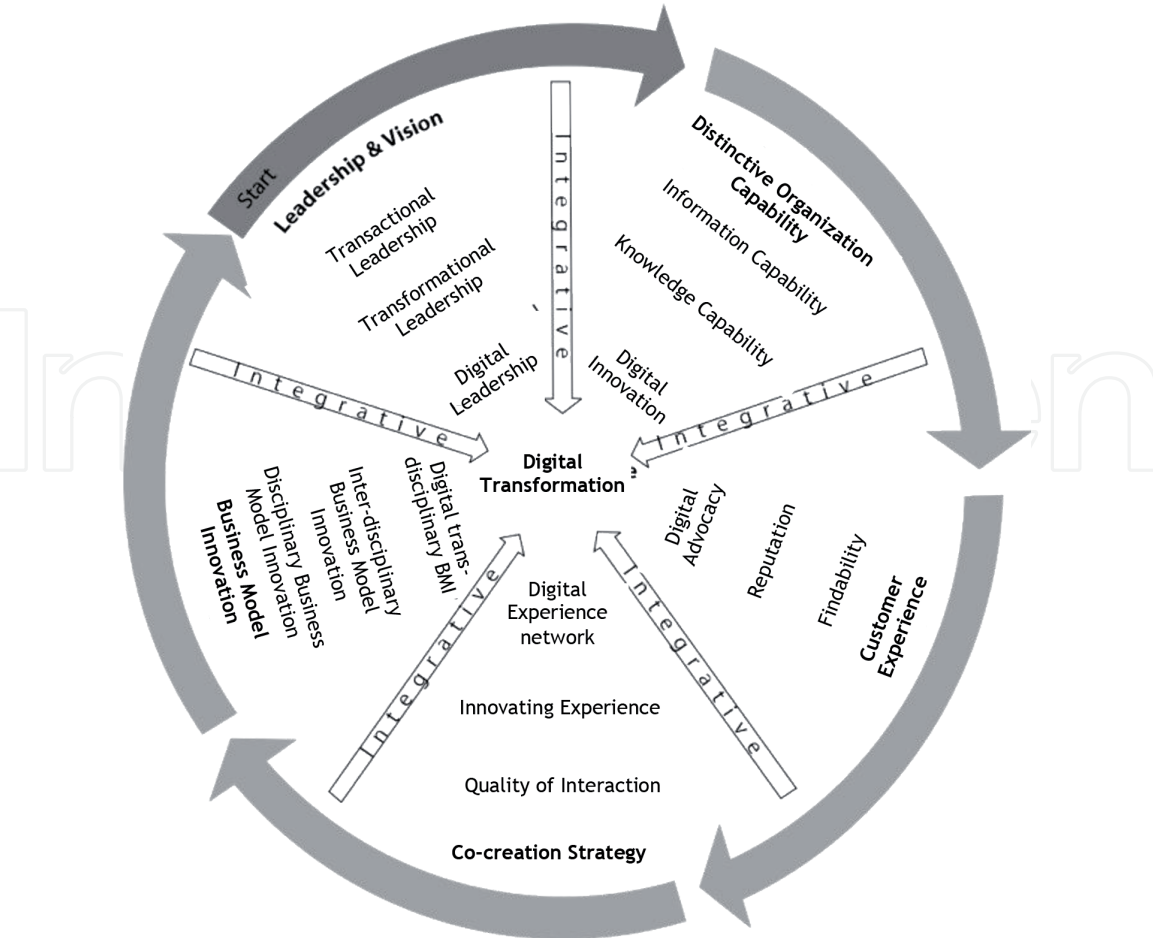


Figure 5.
Digital transformation model based on Mader's framework (2012).

experience orientation, then collaborate with co-creators in developing co-creation value and to build business model innovation. The implementation strategy is a continuous learning as part of developing dynamic capability start from sensing of market, seizing co-design and transform capability. We configure the model of digital transformation for Indonesia incumbent firms based on a framework study conducted by [53] as shown in **Figure 5**.

These findings have practical implications for the management in facing digital transformation. Digital transformation reflects management leadership and vision in transforming leadership from transactional leadership to a more transformational and digital-lead leadership. The leadership and vision will drive the development of distinctive organizational capabilities, from capabilities in the information age to digital innovation capabilities. Co-creation strategy based on distinct organizational capability and customer experience at a customer advocacy level could drive the business model innovation up to the level of digital transdisciplinary business model innovation where the business model is developed based on co-creation value across disciplines.

5.3 Limitation and future research

This study is an exploratory research that aims to explore but not to confirm the theory. This research just wants to make prediction about the structural model of Business model innovation, and co-creation strategy in relationship with digital leadership. For the future research, this study suggests some recommendation, such as (1) using a larger size of sample for larger telecommunication companies in Indonesia, and it may be better for modeling and statistical analysis to utilize covariance-based better statistical application, (2) using probabilistic sampling methods such as stratified random or cluster sampling so that the result of study could be more relevant to make a generalized conclusion, and (3) longitudinal research should also be done to ensure in assure the role of co-creation strategy in relationship of business model innovation and digital leadership.

6. Conclusion

Based on the results of hypotheses testing, it can be concluded that digital leadership has indirect impact to business model innovation, where co-creation strategy has a mediating role on the relationship between business model innovation and digital leadership.

Further study can be explored using a more extended sampling, with industry, and with consideration of markets outside of Indonesia. A longitudinal research design should also be done to assess a direct and indirect impact of digital leadership into the business model innovation to provide value to the firms.

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