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Research paper

The effect of digital leadership and innovation management for incumbent telecommunication company in the digital disruptive era

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Abstract

Digital technology drives the changing more exponential across all industry. Telecommunication is one of industries that having significant impact of digital disruption. Thus, it become the issue for incumbent telecommunication company to sustain their future business. The incumbents require to re-inventing its strategy to anticipate the rapid changing in digital disruption. Two big challenges for incumbents are how to take the opportunity in digital disruption through innovation management? and how to accelerate internal digital transformation lead by digital leadership capability. This study aims to examine the effect of digital leadership and innovation management for incumbent telecommunication company in Indonesia in facing the digital disruption and transform into digital telco. This study uses quantitative method in incumbent telecommunication company in Indonesia with sample of 100 respondents. The statistical test used is Partial Least Square (PLS). The result of hypothesis testing found that both digital leadership and innovation management effect to sustainable competitive advantage, where the digital leadership have a greater influence in driving innovation management. This research has implication for incumbent telecommunication company in Indonesia in its effort to transform into digital telco and increase sustainable competitive advantage in disruptive era through strengthening the digital leadership and innovation management.

Keywords: *Digital Leadership; Innovation Management; Digital Disruptive*.

1. Introduction

The change in digital era drive the exponential changing across industry. Telecommunication is one of impacted industry due to the digital disruption. Christensen (1997) in his book "Innovator Dilemma" had studied the phenomenon of incumbent companies that fail to maintain business sustainability because of the emergence of new players that bring new innovations with cheaper, simple and efficient technology. This phenomenon by Christensen hereinafter referred to as Disruptive Innovation. Digital Disruptive Innovation is an impact from the influence of digital technological growing that radically innovates in configuring leadership positions for incumbent companies in an industry. New entrants with new technology and business model innovations are able to create new markets and newcomers against the existence of incumbent Company.

In Telecommunication industry, Incumbent firm in responding the digital disruption is planning to transform their business by reinventing their strategy and position to become a digital telco company. The incumbent need to adapt the changing by looking for the new ways of doing the similar ways of new entrance in optimizing the operating model to drive engagement and efficiency. The incumbent firm requires to digitize the internal process to provide end user centricity, digital interaction, agility and quality of infrastructure. Thus, the incumbent firm required to find the new value poll in sustaining their competitive advantage through continuous innovation by means of internal development and technology partnership or investment in digital infrastructure.

However, in the literature study shown that the incumbent firm was resistant in the response of the changing in digital disruption due to their legacy business was still dominant as a market leader (Berner & Tushman, 2003, Christensen & Bower, 1996). The key factors of the driving of changing in digital business are how the leader based on the cognitive decision could organize the resources to achieve the firm objective (Tripsas & Gavetti, 2000). In the response of change in digital disruptive, the incumbent firm reinventing the strategy and action such as collaboration strategy (Sandstrom et.al, 2009), upstream and downstream innovation (Adner and Kapoor, 2010), and application set capabilities (Sosa, ` as the paradigm innovation, changing the mental model that frames what the organization does. Incumbent company is still experiencing difficulties in its efforts to launch new products compare to new players. As regard with the digital innovation, Joe Weinman (2015) use the digital framework to response the changing in digital business through digitize product and business process and transform into digital business through investing in digital business to create new market and improve performance. In other hand the research result showed that innovation management were positive and significant influence into business performance and Hubbard and Beamish (2011) argue that resources based is a source of competitive advantage as mention also by Thompson et al. (2014). The resource based of firm is representing the competitiveness of asset and the source of competitive advantage and the key factors in succeeded in market. Based upon Upper Echelon

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theory stated by Hambrick and Mason (1986), the output of organization is influenced by the decision of managerial leadership based upon the interpretation and cognitive of the actor of business. Hence the leadership is the important key in organizing the resources to sustain business in the future. In anticipating of Digital disruptive, the incumbent firm is required to develop the digital leadership capability. Rudito & Sinaga (2017) define the digital leadership capability is combining the leadership skill that consists of visionary leadership and transformational leadership with the digital attitude capabilities that consist of digital knowledge and digital experiences. Pearl Zhu defines the concept of digital leader as the leader with the characteristic of creativity, visionary, profound thought and inquisitive leader. Zhu has defined the digital leadership is the capability and capacity to manage the volatility, uncertainty, complexity, and ambiguity (VUCA) in order to create the common and dynamic challenging in digital transformation. The object of transformation is influenced by the digital leadership to transform the business.

The Recent research of digital leadership has been conducted by Rudito and Mardi (2017) shown that the digital leadership is the key in investment decision to sustain the business in the technology firm. The technology is the tool to achieve objective but the important things was the development of digital leader to drive the transformation into digital company through investment in digital technology to create new market and leverage the firm performance. However, the study of the effect the digital leadership and innovation to sustain the competitive in digital disruptive has not been conducted, especially in unit analysis of telecommunication network company.

This study aims to examine the effect of digital leadership and innovation management on sustainable competitive advantage in anticipating digital disruptive in telecommunication network industry in Indonesia. The result found that both digital leadership and innovation management effect on sustainable competitive advantage and digital disruptive, where digital leadership have greater influence than innovation management. The implication of this study is expected to be implemented for today's telecommunication network companies in transforming into the digital business and also for scholar and researches to explore the important of development in digital leadership. The discussion of framework in transforming into digital telecommunication will be presented.

2. Literature Study

2.1. Digital Leadership

The study of digital leadership is the part of the study about leadership based upon the upper echelon theory developed by Hambrick and Mason (1986), where the output of organization is influenced by the leader decision based on the interpretation and cognitive from the actors. In terms of the digital leadership, the concept is created by combining the leadership skill and the digital capability to optimize the benefit of digital technology in order to increase the business performance. Rudito (2017) defines the characteristics of digital leadership consists of technology leadership, digital visioning and digital execution. Pearl Zhu (2015) defines the criteria of digital leadership consist of 5 characteristics: (1) thought leader, since the competition become tight and hyper due to new competitor coming that disrupt the incumbent business, hence it require the leader who has tough capability. (2) creative leader, digital technology brings new business model and provide borderless impact to the innovation. Innovation become the key of competitive advantage, hence the digital leader has to have creativity and innovation mindset that could formulate the idea of the future into reality of business (3) Global Visionary Leader, a digital leader 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 VUCA factors, the digital leader hast to have the learning capability and has the capability to implementing the learning and digital capability. (5). Profound Leader, the digital leader has the knowledge and understand in depth in terms of policy since in internet and digital era, the information is becoming open and everybody has the capability to access and analyse information comprehensively, by using their interpretation, assumption and synthesizing the information could profound the knowledge to take the decision making.

Sandel (2013) define the digital leadership as the capabilities and capacities that could provide the creativity environment by optimizing the technology and digital capability. The digital characteristic are the creativity leader, inspiring leader, credibility leader, wider knowledge leader, collaborative and interactive leader and trust the subordinates.

2.2. Innovation Management

Scholten & Scholten (2012) put forward the concept of innovation management that refers to a process of planning, implementing, organizing and controlling organizational innovation activities systematically for the purpose of realizing innovative ideas efficiently and effectively. According to Trott (2008), innovation is critical for organizations to identify the kind of innovation needed in new product development and continuous improvement. Tidd and Bessant (2013) argue that innovation is generally driven by the ability to see relationships, opportunities and take advantage of those opportunities. Companies that get their market share and increase their profitability are innovative. Innovation includes:

1. Product innovation: changes in the things (products/services) that an organization offers.
2. Process innovation: changes in the ways in which product/service are created and delivered.
3. Position innovation: changes in the context in which the products/services are introduced.
4. Paradigm innovation: changes in the underlying mental models which frame what the organization does.

In disruptive era, Christensen and Bower (1996) argue that although incumbents have innovative capabilities, they fail to sustain their business due to resource allocation and organization, and the process of innovation is not appropriately allocated to target customers. Based on the analysis of the comparation of the concept and the dimensions of innovation management as mentioned above, the innovation management variables in this study is measured by the dimensions of product innovation, process innovation, position innovation, and paradigm innovation.

2.3. Digital Disruptive

Digital disruptive is the impact of digital technology development that radically configures the position of incumbent leadership in their industry. In this case, Christensen dan Bower (1996) states that although the incumbent has innovative capabilities, incumbents fail to maintain business continuity when disruptive technologies emerge due to resource allocation and organization, and the process of the innovation is not appropriately allocated to the target customers.

Terminology of disruptive technology is widespread because not only technology that influences market changes but also related to service and business model. Therefore, Christensen and Rayor (2003) in his book "Innovation Solution", state that disruptive technology terminology has developed into disruptive innovation, which extends the scope of application theory. Innovation is divided into two mainstream: (1) revolutionary innovation: radical change and (2) evolutionary innovation: gradual change in which taken continuously. A previous statement from Christensen which stated that when disruptive technology developed in the market, incumbent failed to maintain its position, refuted by another statement from Christensen himself in 2003 because there are some incumbent who can successfully maintain its business continuity by doing breakthrough innovation that can change company's competitive competence by implementing new architecture.

Govindarajan (2006) defines disruptive innovation criteria as : (1) inferior attribute to customer value (cheaper. faster) (2) offers new value propositions to attract new customer segments. (3) sold at lower prices and (4) market penetration from the niche to the mainstream. The impact of these criteria facilitates the emergence of new business models. Govindarajan (2006) defines disruptive innovation criteria as: (1) inferior attribute to customer value (cheaper, faster) (2) offers new value propositions to attract new customer segments. (3) selling at lower prices and (4) market penetration from the niche to the mainstream. The impact of these criteria facilitates the emergence of new business models. Meanwhile, Sandstroms (2014) found that the fall of the incumbent caused by two things: (1). In the case of resource allocation, the incumbent cannot anticipate some heterogenization that occurs in the organizational system and leadership that is mainly related to incentives and competencies (2) incumbent unable to anticipate changes occurring in the environment. In order to anticipate those situations, Sandstroms (2009) suggests the incumbent to survive in disruptive environment through collaboration and acquisition or by partnering.

King and Baatartogtokh (2015) state thate the theory of disruptive innovation explains the failure of leading businesses. time after time and industry after industry. Four Key Elements of the Theory of Disruptive Innovation: (1) Incumbents are improving along a trajectory of innovation, (2) The pace of sustaining innovation overshoots customer needs, (3) Incumbents have the capability to respond but fail to exploit it, (4) Incumbents flounder as a result of the disruption.

John Hagel et al. (Deloltte University) profound the Nine patterns of disruption:

1. Expand marketplace reach: Connecting fragmented buyers and sellers—whenever. wherever
2. Unlock adjacent assets : Cultivating opportunities on the edge
3. Turn products into platforms : Providing a foundation for others to build upon
4. Connect peers: Fostering direct. peer-to-peer connections
5. Distribute product development : Mobilizing many to create one
6. Unbundle products and services: Giving you just what you want. nothing more
7. Shorten the value chain : Transforming fewer inputs into greater value outputs
8. Align price with use : Reducing upfront barriers to use
9. Converge products : Making 1 + 1 > 2

The concept of competitive advantage can be defined into resources based competitive according to Barney (1991) and industrial organization, outside environment based on Porter (1980, 1985). In term of resources base view, the competitive advantage can be built by strengthening internal capabilities and building weaknesses (Hofer and Schender 1978), and the capability of core competences as a bundle of skill and technological capabilities (Prahalad and Hamel,1994). Barney (1991) defines sustainable competitive advantage as the implementation of value creation strategies that are not simultaneously implemented with competitors, and competitors are not able to imitate in the long run.

Based on the analysis of the dimensions of digital disruptive as mentioned above, this variable is measured by the dimensions of expand marketplace, connect peers, shorten the value chain, align price and converge products.

Based on the study above, the hypothesis is arranged as follows:

H: Digital leadership and innovation management have an effect on digital disruptive of incumbent telecommunication company in Indonesia either simultaneously or partially.

2. Research Methodology

This research is conducted by a quantitative method through collecting data in the field using survey research method where the observation done in a time horizon which is cross section / one shot, meaning that information or data obtained is the result of research conducted at one particular time. The unit of analysis is the telecommunication network industry in Indonesia. Based on the documentation study from the Ministry of Communication and Informatics (2016), it is known that the population of telecommunication network companies in Indonesia amounted to 412 companies, then sample is taken as many as 100 companies. Where to perform statistical tests used Partial Least Square (PLS) method.

4. Result and findings

4.1. Results of Model Analysis Using P LS

4.1.1. Evaluation of Measurement Model (Outer Model)

The evaluation of PLS measurement model is done by using SmartPLS program. The analysis of outer model specifies the relationship betw`een latent variables and their indicators or defines how each indicator relates to its latent variables. 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 of convergent validity is above 0.7.
2. Discriminant Validity. Is a 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 is greater than the loading value with other constructs.
3. Composite Reliability. Data that has composite reliability over 0.7 considered as highly reliable.
4. Average Variance Extracted (AVE), expected to be more than 0.5.
5. Cronbach Alpha. Reliability test reinforced with Cronbach Alpha. The result is expected to have value of more than 0.6 for all constructs.

Table 1: AVE, Composite Reliability dan Cronbach Alpha

Konstruk	AVE	Composite Reliability	Cronbachs Alpha
Digital Disruptive	0,730	0,931	0,908
Digital Leadership	0,654	0,973	0,970
Innovation Management	0,779	0,966	0,959

As the Table 1 shown that AVE value > 0.5, Cronbach Alpha > 0.6 and Composite Reliability > 0.7, then the research variables are considered to have good reliability.

Table 2: Convergent Validity Dimension-Indicator (1st order)

	Original Sample (O)	Standard Error (STERR)	T Statistics (|O/STERR|)	Kesimpulan
X11 <- Creative	0,779	0,037	20,895	Valid
X12 <- Creative	0,870	0,026	33,784	Valid
X13 <- Creative	0,851	0,038	22,282	Valid
X14 <- Creative	0,795	0,059	13,491	Valid
X21 <- Deep Knowledge	0,851	0,033	25,504	Valid
X22 <- Deep Knowledge	0,881	0,028	31,476	Valid
X23 <- Deep Knowledge	0,865	0,025	35,269	Valid
X24 <- Deep Knowledge	0,877	0,028	31,371	Valid
X31 <- Global Vision and Collaboration	0,899	0,026	35,146	Valid

	Original Sample (O)	Standard Error (STERR)	T Statistics (|O/STERR|)	Kesimpulan
X32 <- Global Vision and Collaboration	0,892	0,026	34,265	Valid
X33 <- Global Vision and Collaboration	0,826	0,049	16,733	Valid
X34 <- Global Vision and Collaboration	0,895	0,018	48,721	Valid
X41 <- Thinker	0,890	0,026	34,055	Valid
X42 <- Thinker	0,927	0,014	64,613	Valid
X43 <- Thinker	0,922	0,015	60,712	Valid
X51 <- Inquisitive	0,903	0,021	43,618	Valid
X52 <- Inquisitive	0,896	0,025	36,216	Valid
X53 <- Inquisitive	0,878	0,022	40,044	Valid
X54 <- Inquisitive	0,864	0,039	22,188	Valid
X61 <- Product Innovation	0,962	0,010	96,415	Valid
X62 <- Product Innovation	0,961	0,011	89,013	Valid
X71 <- Process Innovation	0,934	0,014	67,773	Valid
X72 <- Process Innovation	0,932	0,014	65,328	Valid
X81 <- Position Innovation	0,935	0,016	59,660	Valid
X82 <- Position Innovation	0,934	0,015	61,771	Valid
X91 <- Paradigm Innovation	0,927	0,016	56,855	Valid
X92 <- Paradigm Innovation	0,900	0,028	31,802	Valid
Y1 <- Digital Disruptive	0,862	0,033	26,141	Valid
Y2 <- Digital Disruptive	0,844	0,035	24,451	Valid
Y3 <- Digital Disruptive	0,828	0,047	17,654	Valid
Y4 <- Digital Disruptive	0,877	0,024	36,838	Valid
Y5 <- Digital Disruptive	0,861	0,027	32,370	Valid

The value of convergent validity is the value of the loading factor in the latent variable with its indicators. The value of loading factors greater than 0.7, means each indicator is a valid measuring tool in measuring latent variables in first order.

Tabel 3: Convergent Validity Latent Variable – Dimension (2nd order)

	Original Sample (O)	Standard Error (STERR)	T Statistics (|O/STERR|)	Kesimpulan
Digital Leadership -> Inquisitive	0,951	0,009	108,791	Valid
Digital Leadership -> Creative	0,823	0,050	16,412	**Valid**
Digital Leadership -> Thinker	0,935	0,013	74,161	**Valid**
Digital Leadership -> Deep Knowledge	0,950	0,011	87,884	**Valid**
Digital Leadership -> Global Vision and Collaboration	0,963	0,009	110,585	**Valid**
Innovation Management -> Paradigm Innovation	0,906	0,019	47,821	**Valid**
Innovation Management -> Position Innovation	0,955	0,010	94,357	**Valid**
Innovation Management -> Process Innovation	0,969	0,007	135,103	**Valid**
Innovation Management -> Product Innovation	0,942	0,014	67,181	**Valid**

Similar with the first order, with the same method, it can be assessed that the value of loading factors are more than 0.7, then it is shown that each indicator is a valid measuring tool in measuring latent variables in second order.

4.1.2. Evaluation of Structural Model (Inner Model)

The evaluation of inner model can be done through three ways, by assessing the value of R2, Q2 and GoF.

Table 4: Inner Model Evaluation

	R Square	Q2	GOF
Digital Disruptive	0,385	0,385	0,527
Digital Leadership			
Innovation Management			

There are three criteria for GoF (Tenenhau, 2004), which are: (1) small, when the value is below 0.1, (2) medium, when the value is between 0.1 to 0.25, and (3) large, when the value is greater than 0.38. As presented in the Table 4, it is shown that all the values are greater than 0.38, therefore it is indicated that model formed is robust, so it can be continued to the hypothesis testing.

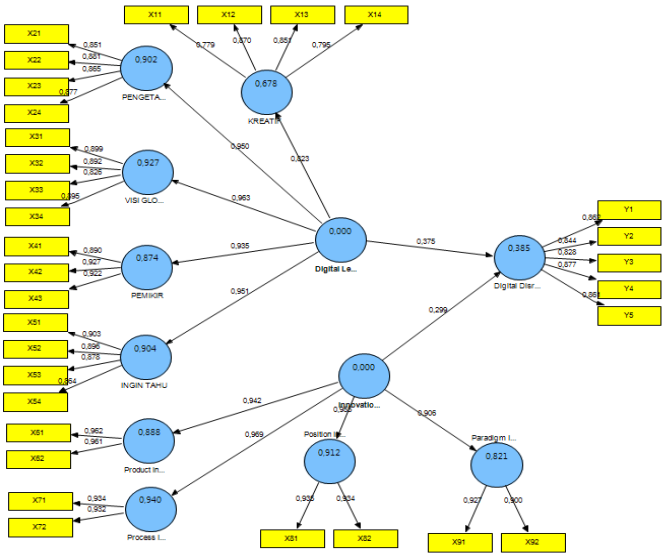


Fig. 1: Complete Path Diagram of Research Model

Based on the research framework, then obtained a structural model:

$\eta = 0.375\xi_1 + 0.299\xi_2 + \zeta_1$

Where: η =Digital Disruptive, ξ_1= Digital Leadership , ξ_2 = Innovation management, ζ_1 =Residual

4.2. Hypothesis Testing

Below is the result of hypothesis testing both simultaneously and partially.

Table 5: Simultaneous Testing of Hypothesis

Hypothesis	R^2	F	Conclusion
Digital Leadership and Innovation Management -> Digital Disruptive	0.385	11,483*	Hypothesis accepted

* significant at α=0.05 (F table =3,09)

Based on the Table 3, it is known that within the degree of confidence of 95% (α=0.05), simultaneously there is the influence of **Digital Leadership and Innovation Management** to **Digital Disruptive** amounted to 38,5%, while the rest of 61,5% is affected by other factor did not examined.

Table 6: Partial Testing of Hypothesis

Hypothesis	γ	SE(γ)	t	R^2	Conclusion
Digital Leadership -> Digital Disruptive	0,375	0,130	2,880*	0,218	Hypothesis accepted
Innovation Management -> Digital Disruptive	0,299	0,121	2,480*	0,167	Hypothesis accepted

* significant at α=0.05 (t table =1.985)

The Table 5 show that partially, **Digital Leadership and Innovation Management** influential significantly to **Digital Disruptive**, which is **Digital Leadership** has a greater influence (R2=21,89%). Based on the results of hypothesis testing, can be described a research finding as follow:

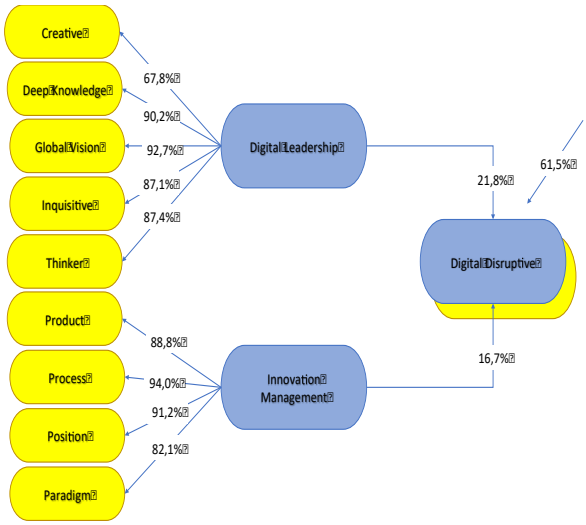


Fig 2: Research Finding

The research findings show that digital leadership and innovation management significantly influence digital disruptive either simultaneously or partially. In partial, digital leadership has greater influence (21.8%) than innovation management (16.7%) to digital disruptive. So the finding of this study illustrates the dominant role of digital leadership over the innovation management for incumbent telecommunication companies in facing the current digital disruptive era.

Global vision is an aspect of digital leadership that has the highest role in influencing the company's efforts to face the current digital disriptive era. While in the management of innovation found that process innovation plays a higher role than position innovation, product innovation, and paradigm innovation in handling digital disruptive. So these findings support Petrick et al. (1999) who explains the framework for practical management in maintaining sustainable competitive advantage with global leadership capability, executive responsibility for global reputation, and global awards that positively impact sustainable competitive advantage.

Each company intends to maintain its sustainability, where innovation proves to be influential in facing digital disruptive, so the findings are in line with Bharadwaj's (1993) that explains the framework for examining organizational resources and organizational differences in the context of sustainable competitive advantage in the service industry and moderating the impact of service characteristics, service industries and companies which is innovation has a positive and significant impact on sustainable competitive advantage.

4.3. Implication

The implication of the importance of Digital leadership in the digital telco transformation, hence this study develop the framework in term of digital transformation for the firm in anticipating the digital disruptive characteristic and the important of digital leadership. Starting from the vision and mission of the digital company where the digital company want to be. Weil (2015) define the Vision and ambition into 4 matric based on the matrix of end customer knowledge and business design. It will be 4 possibilities of the digital company: (1) when the business design is value chain and the knowledge of the end customer is partial, the company vision is to become a supplier company such as manufacture company that selling offering to distributors and subject to become commodities, (2) when company has the business design to support ecosystem and the knowledge of end customer partial, the company vision is to become modular product such as payment company, that provide service as plug and play and more innovative due to rapid changing of ecosystem, (3) when company has the knowledge of end customer completely and business design is based on value chain, the company vision is to become multichannel business such as bank company that provide the customer experience over value chain, (4) when the design business based on ecosystem and the knowledge of end customer completely the company vision is to become an ecosystem driver, such as digital telco company, Internet service provider that provide a great customer experience with lean organization and optimize the digital technology.

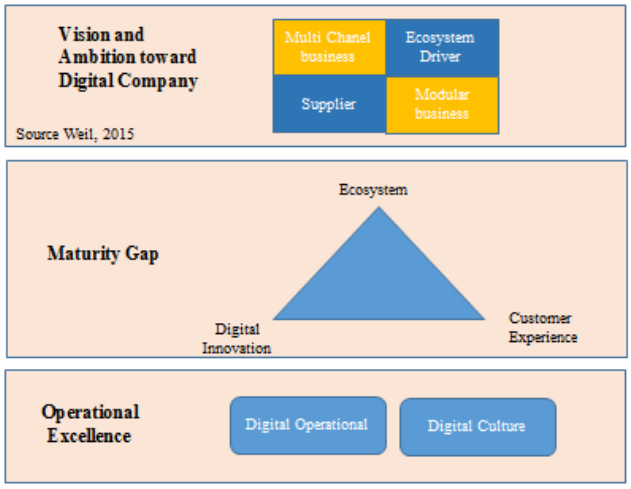


Fig 3: The Framework of Telco Digital Transformation

Since the vision for the telco company the mediation layer is to provide the ecosystem driver and also Christensen (1996) argue that the incumbent was fail in maintain the competitive advantages due to less focus on the exploration innovation and the customer experience, hence in maturity gap of telco operator as impact of digital disruptive 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 last layer which is a fundamental of the whole digital transformation is operational excellence where focus on developing lean process and organization through digitalization process and developing people capability in digital competence and culture.

5. Conclusion and recommendation

5.1. Conclusion

The findings of the research support the hypothesis that digital leadership and innovation management have an effect on the incumbent telecommunication companies in Indonesia in facing digital disruptive, which is digital leadership has a greater role than innovation management. This illustrates that in facing digital disruptive era, the incumbent telecommunication network companies today must put some effort on the development of digital

leadership, supported by the development of innovation management.

5.2. Recommendation

The results of this study are expected to be beneficial for telecommunication network companies in this digital disruptive era that the development of digital leadership is an important aspect to be developed, supported by the development of innovation management. In addition, the findings of this research are expected to be a reference for further research on aspects related to digital disruptive phenomenon and how the company to be able to maintain its business continuity, especially in companies engaged in the telecommunication network providers industry, as well as in other companies dealing with high technology industry.

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