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# Determinants of Innovation Strategy in Indonesia Telecommunication Industry

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**Abstract.** On the last ten years, telecommunication industry in Indonesia has passed through several transformations on network and service convergence. In this digitally disrupted era, there is change of communication trends from voice and text message communication to data-based application communication (Over-the-Top communications) resulted decline of company revenue. However, telecommunication should have had big role, therefore company should adapt the strategy to catch that opportunity. The aim of this research is to investigate the determinants of innovation strategy in Indonesia telecommunication industry. This research is conducted qualitatively with semi-structured interviews. Strong evidences are shown that product innovation is done the most both in Indonesia and other developed countries. The results indicate that the criteria information technology infrastructure, digital customer experience, business process, profitability, and the quality of product/service are the determinants on the design of innovation strategy in Indonesia telecommunication industry.

## 1. Introduction

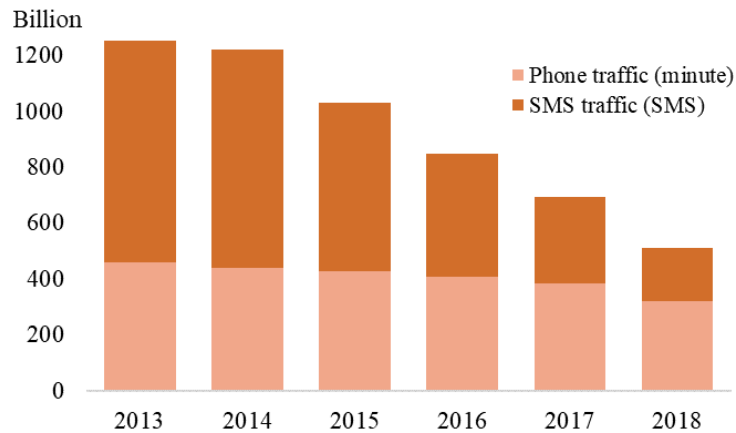
Telecommunication operations in Indonesia is controlled by government regulations listed in Law Number 39 Year 1999, wherein telecommunication is meant as every transmission, sent, and/or received from every information in the form of signs, signals, writings, images, sounds, and sounds from wires systems, optical, radio, or any other electromagnetic systems [1]. Nowadays, telecommunication is widely defined as information transmission through electromagnetic signal: over copper wires, coaxial cable, fiber-optic strands, or the airwaves [2].

Telecommunication industry has been experiencing rapid growth, and are the most often to confront transformation in network and service convergence [3]. In the 1990s there was a transition from analog to digital and the emergence of global standard (GSM). Entering the era of data and web service began in the 2000s with the presence of 3G networks. The development continue to occur in the 2010s with 4G network, which is capable of transmitting more information, and also digital service. However, now, most of developed country like Japan, South Korea, China, and United States already began to enhance their infrastructure, business models, and internal culture to meet the new demands of 5G networks [4].

Thus proved that on the worldwide including Indonesia, data consumption becomes a new paradigm. Telecommunication industry can no longer be able to enjoy large profit margins from the provision of traditional service in the form of voice and message communication [5], this can be seen in Figure 1 where there is periodically decline in the tradition service traffic. The decline in traditional telecommunication services are driven by the development of Over-the-Top (OTT) ecosystem, where

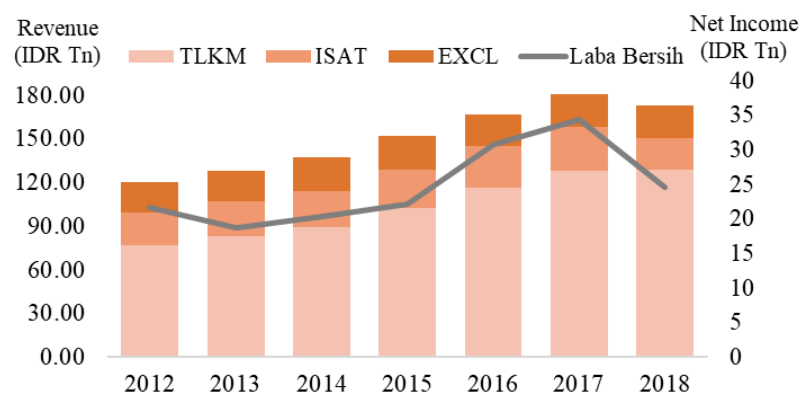


OTT is online service provider that can replace the functions of traditional media and telecommunication service [6]



**Figure 1.** The decline of traffic in telephone and SMS in Indonesia [6]

The decline can also be seen in the revenue and net income of three major telecommunication companies in Indonesia (Figure 2). The impact of OTT players on telecommunication has catalyzed the income of existing companies.



**Figure 2.** Revenue and net income of Indonesia telecommunication [5]

Innovation strategy is positively correlated with the improvement of telecommunication business performance [7][8]. Consequently, the aim of this research is to investigate the determinants criteria of innovation strategies in Indonesia telecommunication industry.

## 2. Literature review

### 2.1. Strategy

The core of strategy is choosing to do activities that are different from competitors [9]. A company can outperform its competitor only if it can create a defensible difference. Positioning is not only to ensure which activities to do by the company, but also how the activities relate to one another. In other words, strategy is about combining activities. Strategic position emerges from three different sources, which not exclusive and often overlap, such as: customer needs, customer accessibility, or variations company products/services.

The ultimate goal from competitive strategy is ideally to overcome and change the rules which could benefit the company. In any industry, whether domestic or international, producing products or services, competition rules are manifested in five competitive forces [10]: emergence of new competitors, threat of substitutions, buyers bargaining power, suppliers bargaining power, and competition among competitors.

### *2.2. Innovation strategy*

Innovation strategy is a plan to increase market share or profit through product and service innovation [11]. Innovation is not only through improvements in new product and services, including processes, new marketing methods, new organizational methods in business practices, organizational environments or external relations [7]. Based on those definitions, four types of innovations were identified, which is: product innovation, process innovation, marketing innovation, and organizational innovation [12].

### *2.3. Digital*

Digital era is generally associated as fourth industrial evolution, where it has the potential to change every aspect of everyday life, from reshaping the way people make decisions, improving customer experience, and creating new business models to optimizing value chain for unprecedented level of efficiency [13]. To capture opportunities in the digital era, governments and businessmen must innovate to create value through three dimensions which are (1) products and services, (2) business models, and (3) business process.

## **3. Research methodology**

This research is conducted qualitatively, that using qualitative data such as interview, documents, and observations to understand and explain social phenomenon that is happening. Choosing the method must be adjusted with research goal. Research about information technology is more than technology study or behavior, more recently researchers suggest that information technology research in-line with social phenomenon [14].

Based on previous literature on strategy to improve the overall performance of organization [3][15], the determinants are grouped into four, namely information technology infrastructure, digital customer experience, business process, profitability, and the quality of product/service. Additional data about telecommunication innovations that have been done in Indonesia and other developed countries is collected to benchmark the strategy, as shown in Table 1 and 2.

To validate the initial determinants, semi-structured one-on-one in-depth interviews were conducted. Two experts were chosen, which are directors of telecommunication companies in Indonesia. Examples of key questions to the respondents are: (i) how important do you think is profitability to the telecommunication innovation strategy?; (ii) what are the strategic factors that influenced you to make innovation strategy? The research used grounded theory to analyse qualitative data.

## **4. List of telecommunication innovations**

During the transformation time in the last ten years, telecommunication industry in Indonesia continues to make development efforts and various innovation strategies were carried out to follow the development of recent technology.

In terms of products which is improving product/new service [11], the innovation was carried out by increasing network to 3G, 4G, and starting the trial of 5G. In addition, other digital services are also developed in the form of free quota for social media access, digital payment, big data, B2B Solution which is Smart City, Smart Campus, Airport Management System, e-government, also IoT Solution.

In process which is implementation of new method or improvement in production process or delivery, including changes on technique, tools, and/or software [11], companies used ERP for their internal business process.

On new marketing method, companies offers triple play products bundling packages, and also leading brands' smartphone bundling packages, and cloud-based business applications. On implementing new organization method, merger and acquisition activities are carried out, such as, merger of fellow cellular network companies to strengthen the market, as well as the merger of fintech and e-commerce to expand the value chain. The full list of innovation can be seen in Table 1.

**Table 1.** List of innovations in Indonesia telecommunication industry [5][20][22][23]

Year	Innovation Strategies	Innovator
2006	3G Network Implementation	Telkomsel, Indosat, XL
2007	T-Cash Digital Payment	Telkomsel
2007	Hutchison (3) and Smart enters Indonesia Market	Hutchison (3) dan Smart
2008	Cooperation with partner operator for international roaming	Telkomsel
2009	Modernization of cellular network through application of single RAN SDR technology (Single RAN Radio) on BTS transmitter networks	Indosat
2009	Digital payment Dompotku	Indosat
2011	Merger Mobile-8 Telecom and Smart to form Smartfren	Mobile-8 Telecom dan Smart (Smartfren)
2012	Increasing frequensi 3G to 900 Mhz	Indosat
2014	International expansion to countries with many Indonesia citizen	Telkomsel
2014	Acquisition Axis of XL	XL
2015	Smart SMS and Call Pintar to prevent unwanted offer and calls	Indosat
2015	Bundling triple play package (home telephone, internet, and cable TV)	Telkom
2015	Video and live streaming services directly from phone	Indosat
2015	Improvement of high speed internet network through fiber optic cable	Telkom
2015	Phone credit-based application purchase service for BlackBerry, Nokia and Windows Phone users	XL
2015	Indosat is acquired by Ooredoo and become Indosat Ooredoo	Indosat
2015	Esia is acquired Smartfren	Smartfren
2016	Implementation of 4G Network	Telkomsel, Indosat, XL
2016	Complete Digital Solution Ecosystem such as layer device, connectivity, platform, to vertical apps	Indosat
2017	Merger and acquisition fintech company and e-Commerce	Telkom
2017	B2B Solution: Smart City, Smart Campus, Airport Management System, e-government	Telkom, Indosat
2017	Bundling smartphone of leading brands and cloud-based business application	Indosat

**Table 1.** List of innovation of Indonesia telecommunication industries (con't)

Year	Innovation Strategies	Innovator
2017	Stream on for music and movie streaming, social media access, communication media access, using bonus quota	XL
2018	Improvement in the digital payment method by using QR Code	Telkomsel
2018	Utilization of Geographic Information System (GIS) innovatively in processing big data	Telkom

2018	IoT Solution for business customers	Indosat
2018	Ministry of Communication implemented registration of SIM Cards	Ministry of Communication
2018	Trial 5G during Asian Games	Telkomsel, XL

As a benchmark, innovation strategies in developed countries were also collected, that can be a suggestion to Indonesia telecommunication company to do similar innovation. Those innovations then grouped based on the type of innovation on Table 2.

**Table 2.** Classification innovation type in telecommunication industry of developed countries [24]

Innovation Type	Innovation Strategy	Innovator
Product	1 Expanding digital portfolio: payment	Japan (NTT Docomo, Softbank)
	2 Expanding digital services: Smart Home	USA (AT&T)
	3 Building new offerings: cloud basis, security services	Germany (Deutsche Telekom)
	4 Investing in IOT/M2M technologies	USA (AT&T, Verizon)
	5 Investing and preparing for new services (5G Technology) aiming in 2019-2020	USA (AT&T), Japan (NTT Docomo), South Korea (SK Telecom)
	6 Launching NFV/SDN based services e.g. NFV-based VoLTE, SD-WAN	USA (AT&T, Verizon, Sprint), UK (British Telecom), China (China Mobile)
Process	1 Automating customer events e.g. 24x7 Live Chat & Mobile App	France (Free Mobile), Singapore (Singtel)
	2 Automating high volume, simple business processes (e.g. data entry, data validation, process conciliation)	Sweden (TeliaSonera), Spain (Telefonica), Canada (Rogers Telecom)
Organization	1 Media Integrations: acquiring traditional and OTT media	USA (AT&T, Verizon)
	2 Integrating fixed and mobile services	UK (British Telecom, Vodafone)
	3 Reshuffled the major telecom operators (from six to three operators)	China's Government

Based on collecting data result on Table 3, it can be concluded that innovation strategies that have been done in telecommunication industry is prioritizing more on products/services innovation. Product innovation is creating new product/service that give new additional value that follow the development of technology and customers demand.

## 5. Criteria for determining innovation strategies

From several initial criterias obtained that mentioned above, interviews were conducted to validate and have proper judgement from the experts. The results are validated five criterias and twenty three sub-criterias that must be considered in designing telecommunication innovation strategy (in Table 3).

### 5.1. Information Technology (IT) infrastructure

The criteria must absolutely be considered and carried out in order to meet customer needs for larger networks and data. IT infrastructure sub-criteria are the expansion of integrated networks, improved network technology, the ability to adopt new technologies, and investment cost.

### 5.2. Digital customer experience

The criteria is chosen to represent the increasing in customer needs for digital services. Sub-criteria considered are value-added content service, digital services, an privacy and security.

### 5.3. Business process

The criteria is important drivers for agility in organizations, especially when there are new product/services developments and implementations. Sub-criteria considered are partnership, government policy (regulations), cost efficiency, business re-engineering process, and digital business ecosystem.

### 5.4. Profitability

The criteria refers to the increase in profit margins obtained through the sale of products/services. Stabilization of profitability is influenced by revenue growth, increased of market share, growth in the amount of data/traffic, increased ROI, and increased ARPU.

### 5.5. Product/service quality

High-quality product/service to customers is one of the advantages that telecommunication company must offer. Sub-criteria that are considered the ability of innovation, digital product development, product customization, and speed of data access.

**Table 3.** Validated determinants of telecommunication innovation strategy [3, 15, 16, 17, 18, 19, 20]

Criteria		Sub-Criteria
K1 :	Information Technology (IT) Infrastructure	K11 : Expansion on integrated network K12 : Network technology improvement K13 : Adoption of new technology competence K14 : Investment cost
K2 :	Digital Customer Experience	K21 : Added-value content service K22 : Digital service K23 : Privacy and security K24 : Internet of Things (IoT) K25 : Increase in data capacity
K3 :	Business Process	K31 : Partnership K32 : Government policy (Regulation) K33 : Cost Efficiency K34 : Business process re-engineering K35 : Digital Business Ecosystem
K4 :	Profitability	K41 : Income growth K42 : Increase of market share K43 : Growth of data amount/traffic K44 : Increase of ROI (return of investment) K45 : Increase in Average Revenue Per User (ARPU)

**Table 3.** Determinants criteria of telecommunication innovation strategy (con't)

Criteria		Sub-Criteria
K5 :	Quality of Product/Service	K51 : Innovation ability K52 : Development of digital product K53 : Customization product K54 : Data access speed

## 6. Conclusion and future research

The literature analysis and interviews of expert judgment have been carried out to obtain defining determinants (criteria and sub-criteria) in designing telecommunication innovation strategy. The

results of the research indicates five criteria as follow: information technology infrastructure, digital customer experience, business processes, profitability, and product/service quality, and also twenty three sub-criteria. Thus directly proportional with the trend of innovation strategy that have been going in global telecommunication industry, which is product innovation. Since this research only identifies several determinants, calculation of innovation strategies should be done for future research based on criteria and sub-criteria that have been found.

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### References

- [1] Indonesia Government 1999 *Act No 36 Year 1999 about Telecommunication State Gazette Republic of Indonesia Year 1999 No 154* (Jakarta: Ministry of State Secretariat)
- [2] Berkman K. Center Telecommunications 2009 Available at <https://cyber.harvard.edu/commonsbasedresearch/sites/commonsbasedresearch/images/Telecommunications.pdf>
- [3] Krussel P 2019 *Future Telco: Successful Positioning of Network Operators in the Digital Age*. (Springer International Publishing)
- [4] Global Logic 2017 *Digital Transformation in the Telecommunications Industry* (San Jose: Global Logic)
- [5] Mirae Asset 2017 *Telecommunication Coming of Age* (Jakarta: Mirae Asset Sekuritas Indonesia)
- [6] Godlovitch I, Kotterink B, Marcus J S, Nooren P, Esmeijer J and Roosendaal A 2015 *Over-the-Top (OTTs) players: Market dynamics and policy challenges* (Brussels: European Parliament)
- [7] Abdi M A and Sheikh Ali A Y 2013 October *Innovation and Business Performance in Telecommunication Industry in Sub-saharan African Context: Case of Somalia* Asian Journal of Management Sciences & Education 53-67
- [8] Wasono L W and Furinto A 2018 The effect of digital leadership and innovation management for incumbent telecommunication company in the digital disruptive era International Journal of Engineering & Technology 7 125-130
- [9] Porter ME 1996 *What is strategy?* (Massachusetts: Harvard Business Review)
- [10] Porter ME 1985 *Competitive Advantage Creating and Sustaining Superior Performance* (New York: The Free Press)
- [11] Strategyn. Innovation Strategy 2017 Available at : <https://strategyn.com/innovation-strategy/>
- [12] Asikainen AL 2013 *Innovation modes and strategies in knowledge intensive business services*. (Luxembourg: Springer).
- [13] McKinsey 2016 *Unlocking Indonesia's digital opportunity* (New York: McKinsey & Company)
- [14] Perumal T 2014 *Research Methodology* (Kuala Lumpur: University Malaysia)
- [15] Gupta M, Narain R. A 2015 *fuzzy ANP based approach in the selection of the best E-Business strategy and to assess the impact of E-Procurement on organizational performance* Inform Technol Manag 339-349.
- [16] Matzler K, Eichen SF, Anschober M, Kohler T 2018 *Journal of Business Strategy* 13-20
- [17] Morabito V 2016 *The Future of Digital Business Innovation* (Switzerland: Springer International Publishing)
- [18] Bughin J, Zeebroeck N V 2018 *The Best Response to Digital Disruption* MIT Sloan Management Review 80-86
- [19] Bonnet D, Buvat J KVJ S 2015 *When Digital Disruption Strikes: How Can Incumbents Respond?.* (France: Capgemini Consulting).
- [20] Kasali R *Disruption* 2017 (Jakarta: Gramedia Pustaka Utama)
- [21] Sousaa M J, Rochaa Á 2017 *J Bus Res* 1-7.



- [22] GSMA 2018 *Accelerating Indonesia's digital economy: Assigning the 700 MHz band to mobile broadband* GSMA
- [23] Frost, Sullivan 2018 Digital Market Overview: Indonesia Frost & Sullivan
- [24] AT Kearney. AT Kearney Retrieved from The Future of the Telecom Industry 2018 Available at: <https://www.atkearney.com/communications-media-technology/the-future-of-the-telecom-industry>