CHALMERS
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Succeeding in the Age of Mobile Data

A Study of the Indonesian Telecom Industry

Master's Thesis in Management and Economics of Innovation

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Abstract

Mobile network operators (MNOs) in Indonesia are currently facing some major challenges as consumer preferences are changing. Revenue streams from legacy services such as mobile voice and SMS are on a downward trajectory, while the demand for data is soaring. The Indonesian MNOs have experienced challenges when trying to shift focus to monetize mobile data instead of legacy services, making data less profitable. This study maps out the Indonesian telecom industry and explores options for how the MNOs can innovate their business models to monetize mobile data better.

The competitive situation is different depending on what geographical area you consider. Outside Java there is mainly one dominant player, while Java is characterized by intense competition, making the average profitability lower. The lower profitability is explained by the five forces framework. Three out of five forces are strong on the Indonesian market: rivalry among incumbent firms, bargaining power of buyers, and threat of substitutes. For the average profitability to increase, consolidation is necessary. However, the high customer churn rates and the spectrum policy, lowers the incentives for consolidation.

To monetize mobile data better the MNOs need to circumvent some country specific factors while elaborating on others. The Indonesian population is very price sensitive, wherewith it is hard to make them pay a sufficient amount for data. It is therefore necessary for the MNOs to redefine the customer to include others than the end consumer to collect the potential value on the market. This can be done by elaborating on the country's liberate regulations concerning net neutrality. Moreover, the Indonesian MNOs need to find ways to differentiate; either by being a provider of connectivity, using the quality of the network as the main selling point, or by being a provider of a digital ecosystem, where connectivity serves as means to an end rather than the end itself. The biggest difference between the strategies is that the MNOs choosing the latter would need to pursue two business models simultaneously, relying on ambidexterity within the organization.

Keywords: ***Mobile network operator, Indonesia, Telecom, Business model innovation, Industry analysis.***

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Therese Blum and Robert Kajsjö

Abbreviations

ARPU	Average revenue per user
BOP	Base of the pyramid, the world's population living on under $2 per day.
BRTI	Badan Regulasi Telekomunikasi Indonesia, Indonesian Telecommunications Regulatory Body.
BTS	Base transceiver station, a fixed-location transceiver that provides the cell in a cellular network with its network coverage.
ICT	Information and communication technology
IoT	Internet of Things
ITB	Institut Teknologi Bandung, University in Bandung, Indonesia.
MNC	Multinational corporation
MNO	Mobile network operator
MOCN	Multi operator core network
OTT	Over-the-top content, the delivery of media, such as audio and video, over the internet without the involvement of a mobile network operator.
QoE	Quality of experience
QoS	Quality of service
VAS	Value-added services
VoIP	Voice over internet protocol

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1. Background

Mobile network operators (MNOs) are currently facing major challenges around the world as their legacy revenues from fixed-line telephony, mobile voice, and SMS are on a downward trajectory. Since the advent of the smartphone, these services are gradually being replaced by instant messaging and voice over IP (VoIP) services offered by OTT (over-the-top content) providers. Smartphone adoption has also fueled a massive increase in mobile data. This poses a significant opportunity for MNOs, as the demand for their networks is higher than ever before and keeps on growing. Unfortunately, MNO revenues have not seen a corresponding increase, as mobile data has proved significantly harder to monetize well. At the same time, investment costs for network upgrades are high to meet demand. Many regard the current business models of MNOs as outdated; that is has to be adapted to better suit this new data centric environment.

Indonesia is the fourth biggest telecom market in the world and is an interesting market due to its special geographical situation with 17,000 islands, which makes investments in infrastructure challenging (Fife, 2015). It is expensive to provide fixed broadband connections to great parts of the country. Thus, the fixed broadband infrastructure is highly underdeveloped and as of 2015, there were only 11 million fixed lines in Indonesia. An implication of this is that mobile internet has become significantly more important than in other countries and today the great majority of internet access is achieved through mobile subscriptions. However, even if mobile internet plays an important role in the Indonesian society, almost all MNOs in the country are having trouble with their profitability. Without improved profitability and sustainable business models, it will be hard for MNOs to make the necessary investments to provide Indonesia's 250 million inhabitants with connectivity.

The Indonesian MNOs are faced with substantial challenges related to data consumption, of which one is the average revenue per user (ARPU), which is among the lowest in the world (Fife, 2015). As a market with many players and low customer loyalty, MNOs have historically been pushing prices down to attract and retain customers. However, when doing so, they have at the same time managed to create a problematic situation for themselves, where they have impaired their opportunities to reach profitability on data. As the legacy business decreases, Indonesian MNOs will need to change the way they operate and adapt their business models to make it possible to monetize the increased data usage. How this can be done will be examined in this study.

1.2 Purpose and Research Questions

The purpose of this study is to shed light on how MNOs in Indonesia can improve their profitability on mobile data. The study aims to map out the Indonesian mobile telecom industry and to explore how Indonesian MNOs can monetize mobile data better by improving their business models. The purpose is fulfilled by answering the following research questions:

RQ1: How is the competitive situation structured in the Indonesian mobile telecom industry?

RQ2: How can the business model of Indonesian MNOs be improved to monetize data better?

RQ3: What are the implications and challenges with those business models?

1.3 Delimitations

Even if the study provides suggestions for how the MNOs can alter their business models, it does not give advice on how this can be pursued practically.

The study does not aim to find opportunities to increase profitability that do not relate to mobile internet, even if there exist promising areas in other industries.

The study is not looking into specifics within the different MNOs and the report is therefore written on a very general level. Thus, the suggestions given are not directed towards one MNO even though some things might be better suited for specific actors.

1.4 Report Outline

Chapter 2 presents the theoretical framework used to structure the industry analysis. The chapter presents the five forces framework, macro-environmental factors, the base of the pyramid, and business model innovation.

Chapter 3 describes the method used to conduct the study. It introduces the research process and data collection, and evaluates the research quality.

Chapter 4 gives the unacquainted telecom reader an introduction to the telecom industry in general. The reader gets to know the different actors, the basics of the technology, and challenges currently present in the industry.

Chapter 5 presents the Indonesian telecom industry. Structured by the framework presented in Chapter 2, the macro-environmental factors influencing the industry are presented together with the competitive situation and current business model of the MNOs.

Chapter 6 describes current strategies employed by the Indonesian MNOs to monetize mobile data. The strategies are divided into core business, pricing strategies, and value-added services.

Chapter 7 gives alternatives to how the business model of the Indonesian MNOs can be constructed and discusses challenges and implications with such alterations.

Chapter 8 summarizes the findings by answering the research questions.

2. Theoretical Framework

This chapter introduces the theoretical frameworks that will be used to analyze the Indonesian telecom market. It includes the five forces framework, macro-environmental factors, base of the pyramid, and business model innovation.

2.1 The Five Forces Framework

Introduced by Porter in 1980, the five forces framework is a tool for analyzing the external environment that a company operates in. More specifically, it describes the prevailing competitive situation of an industry, by considering how the created economic value in the industry is appropriated between different actors. The framework claims to explain why the average profitability varies between different industries. The five forces that make up the framework are: rivalry among existing competitors, threat of new entrants, threat of substitutes products or services, bargaining power of suppliers, and bargaining power of buyers. If one or more of the forces are strong, that will imply that industry profitability is lower than it would have been otherwise. According to Porter (1998), companies should try to attain a competitive advantage by finding an optimal market position that considers the five forces and make them work to their favor. The five forces framework is illustrated in figure 1.

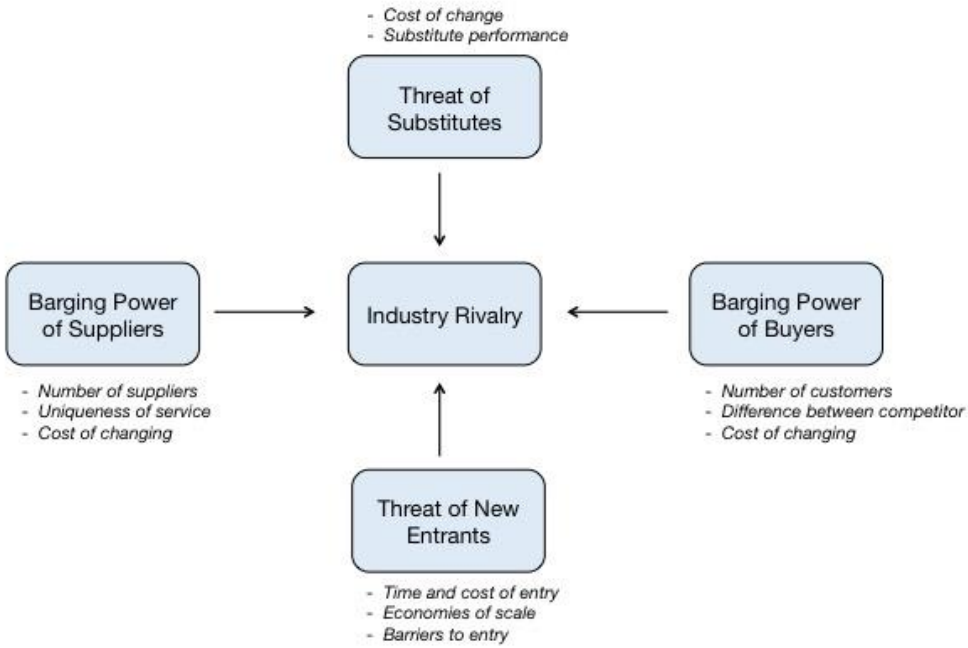

Figure 1. *The five forces framework presented by Porter (1980).*

2.1.1 Rivalry Among Existing Competitors

Porter (1998) argues that the strength of industry rivalry is a result of both the intensity of competition and the basis of competition. A high intensity of competition occurs when:

- There are many companies in the industry, which are equal in size and power.
- The industry is mature, which results in companies trying to steal market share from each other.
- There are high barriers to exit the industry. This means that poor performing companies remain in the competition with the implication that the overall industry has more capacity than needed.
- The competitors have aspirations of becoming industry leaders.

The industry rivalry can also be said to be high if the competition is based mainly on price, or if the competitive dimension is the same between the actors. If the primary dimension of competition is based on price, it will make industry profitability suffer the most. A higher probability of price competition happens when:

- The industry companies have similar products and the switching costs between them are low.
- Fixed costs are high relative to variable costs.
- Efficiency can only be achieved when the capacity must be increased in big incremental steps.
- The offered products decrease fast in value when not sold.

Competition based on other dimensions than price is not as likely to be harmful to profitability since it increases the value for customers and allows companies to charge a higher price. However, if companies do not compete on price, but instead compete on the same other dimensions, profitability will suffer. Thus, profitability is likely to be highest when companies compete on different dimensions and serve different markets segments with different needs.

2.1.2 Threat of New Entrants

If it is easy for new companies to enter an industry, it is likely that incumbent firms will have to lower their prices to prevent this from happening. They might also have to increase their investments to make it more difficult to compete. According to Porter (2008), the threat of new entrants depends on how high the entry barriers are and the expected retaliation from incumbent firms. He identified seven major entry barriers:

1. *Supply-side economies of scale*. If a company produces high volumes of their product, they will be able to spread their fixed costs over a larger number of units, resulting in a lower unit cost. They might also be able to arrange better terms with their suppliers. In this case, new

entrants must either enter with a cost disadvantage or enter the industry with high volumes immediately.

2. *Demand-side benefits of scale*. This occurs when a product becomes more valuable to customers as larger volumes are sold, something also known as network effects. Customers will thus have a lower willingness to pay for new entrant products compared to those of incumbent firms.

3. *Customer switching costs*. These are the costs that customers incur when changing supplier.

4. *Capital requirements*. In some industries, a lot of capital is necessary to enter.

5. *Incumbency advantages independent of size*. These advantages can be proprietary technology, access to the best sources of raw material, best geographic locations, high brand equity, or experience.

6. *Unequal access to distribution channels*. If existing distribution channels are limited or already occupied by incumbents, access will be hard and the new entrant might have to establish new distribution channels.

7. *Restrictive government policy*. This can enhance the other entry barriers and also make it harder for new entrants through industry regulations.

2.1.3 Threat of Substitute Products or Services

Substitute products are those that satisfy a similar need for the customers as that of the industry product. Porter (1998) states that the threat of substitutes is high if:

- It has a high price-performance ratio in relation to the industry product.
- It has low switching costs for the customer.

2.1.4 Bargaining Power of Suppliers

If the suppliers of an industry have bargaining power, they can decrease industry profitability by charging higher prices, providing lower quality products, or transferring costs to incumbent firms. This is likely to happen if:

- There are fewer supplier firms than incumbent firms.
- The industry is only one of many industries that the suppliers serve and they do not get the majority of their profit or income from it.
- The incumbent firms of the industry have high switching costs related to changing suppliers.
- The supplier sells unique products or services.
- The supplier products cannot be substituted.
- The supplier can threaten to integrate vertically.

2.1.5 Bargaining Power of Buyers

Buyer bargaining power is in many ways similar to the bargaining power of suppliers. If customers are powerful, they can demand lower prices, higher quality products and better service. Customers have high bargaining power if:

- There are few customers buying from the incumbent firms.
- The industry products are undifferentiated.
- They have low switching costs.
- They can threaten to integrate vertically.

2.1.6 Critic and Implications

One underlying assumption in the five forces framework is that the external environment can be predicted and planned for. Therefore, it is best suited to use in an industry that is mature with a low degree of change, and hence loses some of its relevance when applied on a dynamic and fast changing industry. A mature industry can be said to be an industry where the basis of competition is rather stable, and where the immediate risk of disruption is relatively low (Reeves et al., 2015). Moreover, such an industry is often characterized by high returns to scale, homogeneous business models, and infrequent changes in the size ranking among the leading players. Acting in such a mature industry often implicates finding a sustainable competitive advantage, i.e. what Porter (1980) means with optimal positioning. Such competitive advantages are generally found and maintained by a process including analyzing the environment and industry, planning for one's position, and executing the plan (Reeves et al., 2015). If the industry is not mature, but rather characterized by fast change, other qualities such as adaptability and continuous experimentation becomes more important. Another issue with the five forces framework is that it is quite good at finding problems, but does not provide any solutions for these.

2.2 Macro-environmental Factors and the PEST Framework

Proper identification and handling of external opportunities are essential to competitive positioning (Hambrick, 1982; Costa, 2008; Osterwalder & Pigneur, 2011). According to Aguilar (1967), one way to understand one's external opportunities is by the use of environmental scanning, where you try to map the external environment of a company. The external environment of an organization can be explained as external forces that directly or indirectly affect the business (Costa, 2008). The external factors influencing a business can be put under the acronym PEST; political, economic, social, and technological factors, known as the PEST framework. The output of a PEST analysis is an understanding and mapping of what current and potential changes are taking place in the environment (Costa & Teare, 2000).

The factors in the PEST framework are hard for companies to influence; instead companies should be aware of the macro-environmental factors and how they are likely to change, and based on that align their strategy to best match these conditions (Costa, 2008). Macro-

environmental factors usually differ between countries, meaning that a PEST analysis ought to be conducted on a specific country. As these factors are subject to continuous change, a PEST analysis is only valid for a given point in time since it might quickly become outdated.

Political factors in the PEST framework include policies and regulations set by the government, which hinder or enable the companies to act (Arline, 2014). This can include things like tax, trade, and safety regulations, copyright and property law enforcement, and employment laws, but also the general political stability in the country. Economic factors are elements in the economy that can influence how companies operate. Such elements could be economic growth and GDP, inflation, interest rates, rate of unemployment, number of consumers, and the general poverty level of the country (Arline, 2014). Social factors are the demographics and opinions of the population, while technological factors concern technological advancements and the lifecycles of technology. A summary of the PEST factors is shown in figure 2.

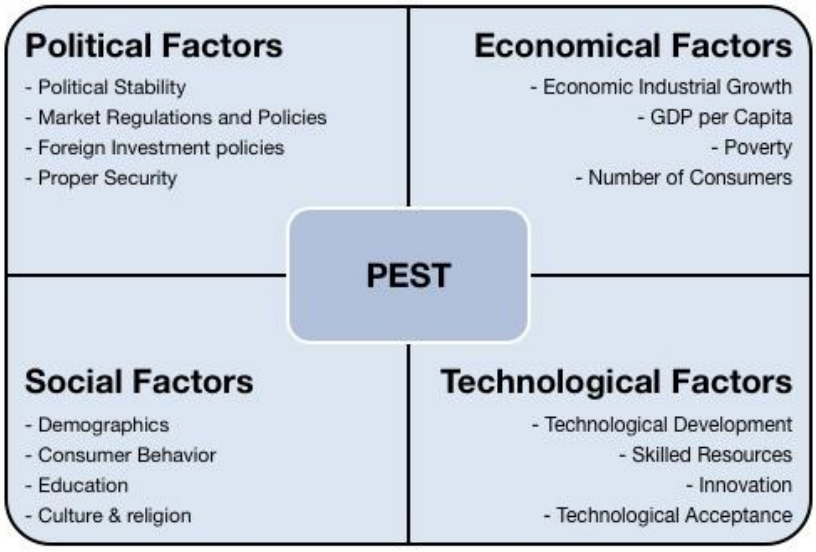

Figure 2. *The PEST framework, used to analyze macro-environmental factors influencing an industry.*

2.3 The Base of the Pyramid

The concept of the base of the pyramid (BOP) was defined by Prahalad and Hart in 1998 as the billions of people living on less than $2 a day. This socio-economical group is said to be short on resources, power, and status, and has therefore traditionally been neglected by multinational companies (MNCs) (Prahalad & Hammond, 2002; Nakata & Weidner, 2012). However, as sales start to stagnate and competition intensifies in the traditional mid to high-income segments, MNCs have started to look into ways of serving the unexplored BOP segment. Companies such as Procter & Gamble Co., Unilever PLC, General Electrics, Indian Tata Motors Ltd., and Coca-Cola have all developed strategies to profitably serve the BOP (Anderson & Markides, 2007; Nakata & Weidner, 2012). However, to address the BOP it is

recognized that companies must adopt strategies that suit this unique segment; offering a lower quality, cheaper product is not enough to attract buyers and diffuse the technology (Prahalad & Hammond, 2002; Anderson & Markides, 2007; Nakata & Weidner, 2012).

To develop successful business opportunities and business strategies in the BOP segment, Nakata and Weidner (2012) mean that managers need to understand the segment and the unique conditions surrounding it. Building upon Rogers' diffusion theories from 1962 and Sen's theories on poverty from 1999, Nakata and Weidner (2012) developed a conceptual framework of how the BOP segment accepts new products.

Rogers (2003) theories try to explain why and how innovations are adopted in a social system. He finds that there is four main elements influencing the adoption of an innovation: the innovation itself, communication channels, time, and social system. When looking at the product or innovation itself, there are five characteristics affecting the adoption: if the innovation has a relative advantage compared to existing solutions; if it is compatible with the norms and values of the social system; if it has a low degree of complexity; if it is easy to try before adoption; and if the benefits are observable to potential adopters. Information about the innovation is spread through communication channels, which can be both mass media and personal relationships (Rogers, 2003). Mass media communication channels are said to be more effective when trying to increase the awareness of a product, while personal relationships are more effective in changing predominant attitudes. Rogers (2003) states that the majority of actors in a social system will not adopt an innovation based on the information from experts, but instead based on recommendations from their near peers. The social context is made up by the norms shared by individuals and can affect the diffusion of an innovation by either encouraging or dissuading it (Rogers, 2003). In their model, Nakata and Weidner (2012) choose to look at factors such as the collective need for a product, the social capital in a community, and the assimilationist culture, as social context variables that influence adoption behaviors of the poor. Moreover, they alter the characteristics of the product itself to also include affordability.

Sen (2001) argues that poverty is not necessarily the lack of money, but the lack of any of the determinants giving human freedom. Examples of such determinants are social and economic arrangements, such as health care and education, and political and civil rights, such as liberty to take part in public discussions (Sen, 2001). Nakata and Weidner (2012) develops Sen's (2001) theories and characterize poverty as economic, physical, psychosocial, and knowledge deprivations. Economic deprivation is probably the most obvious poverty parameter and means the lack of economical means. Physical deprivation can often be derived from the economic deprivation since the lack of money makes it hard to pay for health care, proper housing, food, etc. Psychosocial deprivation includes the constant stress and anxiety of poor people living in a continuous fear of their health or losing a job. Knowledge deprivation comes from the lack of education, which can influence mindsets and the possibility to take part in the society (Nakata & Weidner, 2012).

Nakata and Weidner (2012) combine the theories by treating Rogers diffusion parameters as enablers to adoption while seeing the poverty parameters as barriers to adoption (see figure 3). Hence, economic, physical, psychosocial, and knowledge deprivation are all factors that reduce the likelihood of adoption, slow the diffusion process, and make the individual stop the adoption process before they actually acquire the product. I.e. the poverty variables put products outside the reach by making them less important compared to issues such as eating.

The factors put forward by Rogers (2003) are said to weaken or moderate the negative relationship between poverty and adoption (Nakata & Weidner, 2012). If a product is affordable the likelihood of adoption goes up (Anderson & Markides, 2007). Affordability does not necessarily have to be bottom-of-the-barrel pricing as the BOP segment often are requiring good quality, however it still has to be lower than for mid and high end consumers. The visual comprehensibility of a product and its packaging assists product identification, the selection process, and understanding, and gets especially important for the adoption where the ability to read is low. If a product is adapted and well-functioning in the areas and environment where the BOP lives, the likelihood of adoption, and thus product diffusion, goes up. The relative advantage is one of the most important factors to enhance adoption (Rogers, 2003) and in the case of poverty it especially refers to how well the product help the BOP segment overcome the identified deprivations (Nakata & Weidner, 2012). The compatibility factor explains, in the context of poverty, that if a product is compatible with existing consumption behaviors of the BOP, the chance of adoption is increased.

The social context can influence adoption behavior in the way societies organize and interact. A society with a high social capital, i.e. norms, networks, and trust that can increase efficiency by facilitating coordinated actions, are more likely to learn from each other and influence each other's purchase behaviors (Nakata & Weidner, 2012). Ireland (2008) observed that poor families in Venezuela chose to subscribe to expensive TV subscription services as a collective. By sharing one subscription between many families they managed to afford a service otherwise outside their reach. This is an example of how a collective need can enhance the adoption among BOP consumers (Nakata & Weidner, 2012).

Closely connected to the social context lies the marketing environment. It has been shown in research by Shih and Venkatesh (2004), that interpersonal communications and ties affect the adoption behavior. Moreover, traditional promotional channels such as the web and TV often have low reach among the BOP segment, thus it gets important with interpersonal promotion to spur adoption (Nakata & Weidner, 2012). Another issue with the BOP segment is that it is many times geographically dispersed, reaching over large areas. To physically access the whole segment, Nakata and Weidner (2012) advocate the use of atomized distribution, which brings the product close to the customers and is often done by using many small or individual distributors. The suggested model does not indicate that you have to focus on all enabling factors to reach adoption among the BOP, but rather suggests ways to go (Nakata & Weidner, 2012).

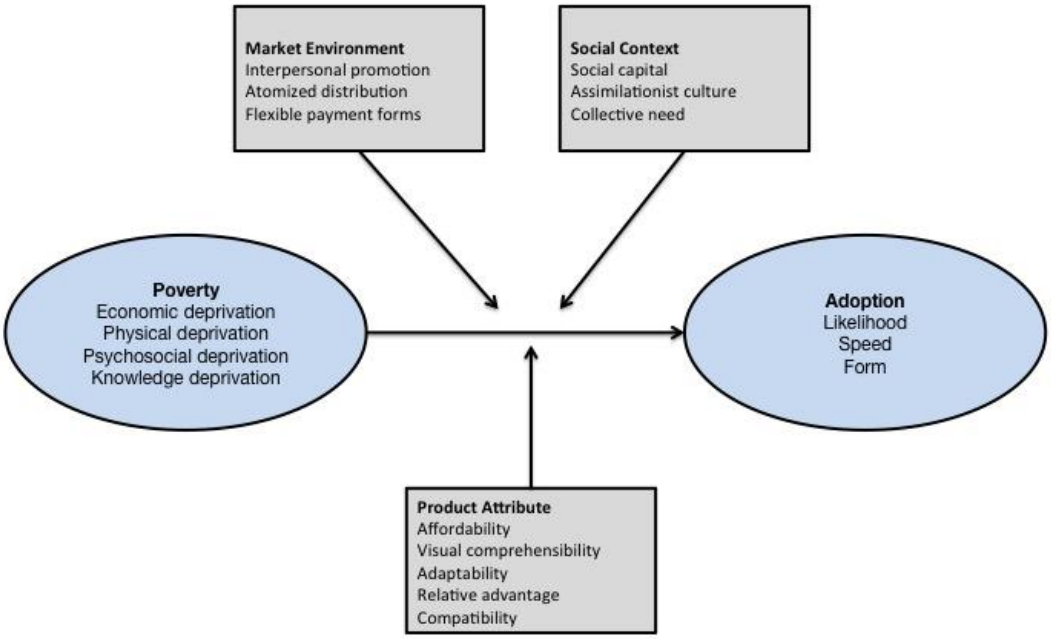

Figure 3. *The model presented by Nakata & Weidner (2012). Poverty deprivations hinder the likelihood of adoption while the factors presented by Rogers (2003) enable adoption of a technology.*

2.4 Business Model Innovation

A greater frequency of disruptions within industries and intensified global competition are shortening business model lifecycles (Lindgardt et al., 2009). Hence a need is created among companies to re-innovate existing business models in order to stay in business. The business model canvas is a strategic management tool for developing new, or mapping existing, business models. It was first developed by Osterwalder (2004) to form a shared language when talking about business models and business model innovation. The business model canvas consists of nine blocks, which in turn cover the four main areas of business: customer, offer, infrastructure, and financial viability (Osterwalder & Pigneur, 2011). The different parts of the model are described in figure 4.

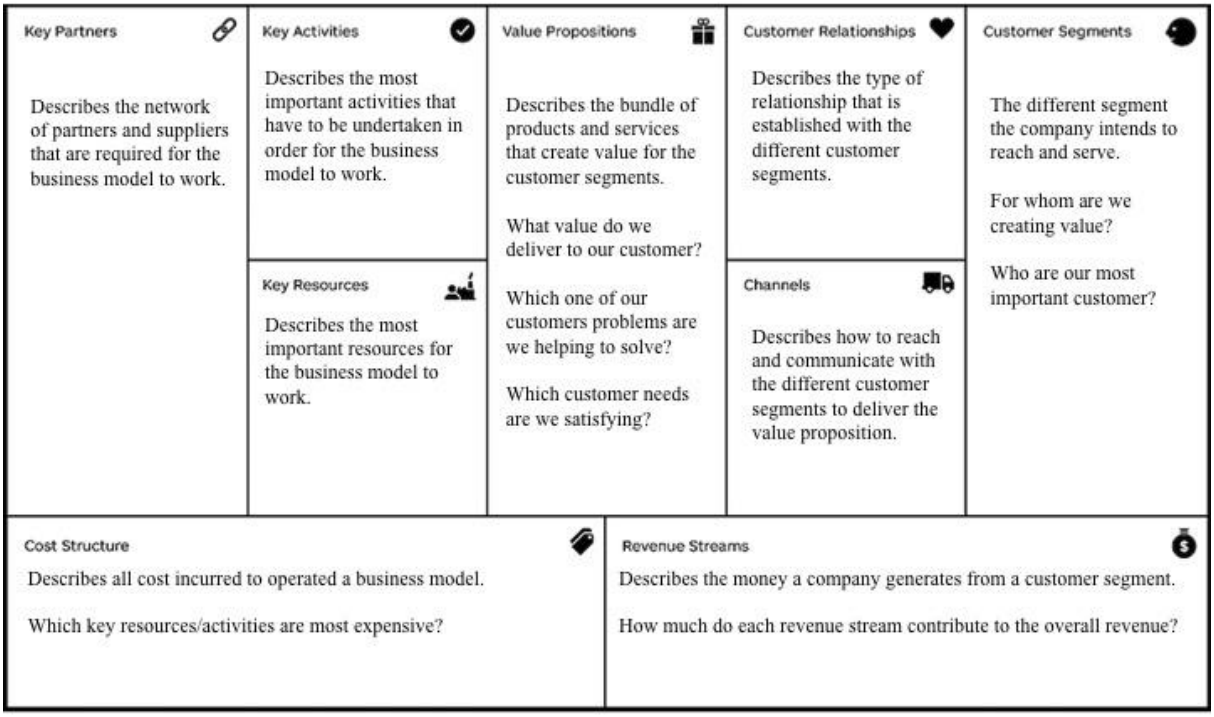

Figure 4. *Pictures the different parts of the Business Model Canvas as described by Osterwalder (2004).*

Lindgardt et al. (2009) mean that business model innovation is taking place when two or more blocks are innovated in the business model of a company. How a company develops or innovate their business model is dependent on both the circumstances and the industry wherein they operate. However, Lindgardt et al. (2009) came up with a couple of general approaches to business model innovation. Firstly, to successfully renew a business model it is of importance to understand the existing one and how that is giving the company competitive advantages or disadvantages and how it is aligning with industry trends and customer preferences. When a company understands where it is standing today, it is easier to exploit new opportunities. Moreover, Osterwalder and Pigneur (2011) mean that scanning the external environment and understanding your position in it, is more important today than ever, due to the greater uncertainties and severe market disruptions. Secondly, Lindgardt et al. (2009) show that companies that are the first to come up with an idea not necessarily have to be the ones succeeding with the business model innovation. Instead it is the one who first manage to successfully scale the opportunity who is going to be the winner. Hence, it is the scaling process that is most critical (Lindgardt et al., 2009). Lastly, business model innovation requires the organization to acquire the skills to change. Drastically changing a business model can incur resistance within the organization, making transformation difficult. Therefore, the company needs capabilities and processes that can help the organization overcome its short-term focus to instead see the long-term opportunities.

3. Method

This chapter presents the research process, the research design that has been used, and why this specific design was chosen. Moreover, the data collection process is presented along with a discussion about the research quality.

3.1 Research Process

This study was executed in three main phases: (1) preparatory work, (2) field trip to Indonesia for collection of data, and (3) analysis and conclusion. The goal of the first phase was to prepare for the data collection by reviewing literature related to the global and Indonesian telecom industry. In connection to that, a theoretical framework for the industry analysis was created. The second phase was carried out in Indonesia in collaboration with Ericsson Indonesia and the Institut Teknologi Bandung (ITB). Data were gathered both through semi-structured interviews and by reviewing secondary textual material such as annual reports and consultancy reports. During the third phase the empirical findings were mapped out in accordance with the theoretical framework and MNO initiatives were categorized after what part of the business it concerned. Thereafter, the current actions of the MNOs were analyzed on the basis of the industry analysis. Despite being separated into three sequential phases, the research process was iterative and the study thus went back and forth between those phases.

The purpose of this study was formulated in collaboration with Ericsson, ITB, and Chalmers. The research questions have been subject to change during the process to better reflect the aim of the study. Saunders et al. (2016) describe an inductive approach as a research approach where you are data driven; you build theories upon gathered data, rather than theory driven; you test your pre-set theories with collected data, where the latter would be a deductive research approach. Since the purpose of the study was to explore opportunities for Indonesian MNOs, rather than test hypotheses, an inductive approach was considered adequate.

A qualitative approach was chosen since the aim of the study was to gain in-depth understanding about the market rather than just examining relationships between variables, for which a quantitative approach would have been more appropriate (Saunders et al., 2016). The study tries to both explore and describe factors influencing the Indonesian telecom industry, as well as evaluating existing business models. Consequently, the research design contains elements of what Saunders et al. (2016) call an exploratory, a descriptive and an evaluative study. In a descriptive study you try to make an accurate profile of the situation. It requires that you already know what phenomena you would like to explore, wherewith it is often preceded by exploratory work (Saunders et al., 2016). An evaluative study tries to find out how well something works and is quite common in business and management research where you try to find out how efficient a strategy, policy, campaign etc. have been. The first phase in the conducted study can be said to correspond to the exploratory research design, where new information is gathered in order to create frameworks that can be used in the descriptive phase. The second phase would thus correspond to the descriptive phase; data was collected to try to describe crucial factors in the Indonesian market. However, the second

phase also contained elements from an exploratory and evaluative study. Even if some of the interviews were done strictly to gain descriptive information, others were done to explore what initiatives were taken. Moreover, some parts of the interviews meant to evaluate the initiatives. The third phase aimed to evaluate how Indonesian market conditions affect what kind of initiatives that can be successfully adopted.

3.2 Data collection

Data collection has taken place using interviews to get access to primary data and literature reviews to complement and extend the primary data with secondary information. According to Easterby-Smith et al. (2015: 134), interviews enable: "*[...] researchers to access information in context, and to learn about phenomena otherwise difficult or impossible to observe*". Interviews thus enable a more extensive and correct picture of the situation than by studying textual data alone. Nevertheless, textual data in the form of company and consultancy reports have proven to provide useful information about the market situation, wherewith it has been a good complement to the interviews.

When using interviews as a knowledge base, a great deal of the study relies on the willingness and collaboration from people with a scarcity of time. As Easterby-Smith et al. (2015: 175) describe it: "*Negotiating access to the field can be one of the biggest challenges of the research project*". Nevertheless, Saunders et al. (2016) suggest that it is much easier to get access where you know people or already have some contacts. This has been proven to be correct during the time of the research; by elaborating on contacts from stakeholders in the projects, interviewees have been cooperative. However, where the knowledge has been considered too scarce, the primary data has been complemented with secondary data.

3.2.1 Literature Review

A literature review was conducted for multiple purposes. Firstly, the literature review helped create a framework to use when analyzing the market situation and business model innovations (see Chapter 2). Secondly, a review of news articles, web sites, market, analyst, and consultancy reports, made it possible to map out how the telecom industry works, how players interact, and what factors influence the industry. Thirdly, a review of annual reports from Indonesian MNOs complemented the primary data gathered during interviews. The literature was sampled using Chalmers Library, Google search, and provided by contacts at ITB, Ericsson, and Chalmers.

3.2.2 Semi-structured Interviews

Semi-structured interviews are guided open interviews, i.e. interviews based on question that can be addressed in a flexible manner (Easterby-Smith et al., 2015). Semi-structured interviews allow the interviewer more freedom, compared to highly structured interviews, to explore other paths if the interviewee provides new interesting information. This means that the interviewer does not have to follow the topic guide to the letter, but can change order of the topics, skip or adjust questions, or add new questions that arise during the discussion

(Saunders et al., 2016). This study relies exclusively on semi-structured interviews for the primary data, however the degree of structure varied between interviews. By using semi-structured interviews, it was possible to get insight in, and follow up on, what the interviewees thought were most important, rather than just follow an on-beforehand set questionnaire. Moreover, the use of semi-structured interviews instead of unstructured interviews, made the interviews stay on track and provided the interviewers with clues on how to proceed at times when the discussion stalled.

The interviews were mostly conducted face-to-face, however in two cases the interviewees were traveling or living too far away for a face-to-face interview to be possible. In those cases the interviews were conducted using Skype and telephone. By interviewing someone using an intermediate instead of face-to-face can come with complications such as a lack of engagement or trust (Saunders et al., 2016). Since the interviewees interviewed using an intermediate were all close contacts to one of the stakeholders to the project, trust had to some degree already been established. This somewhat compensated for the lack of face-to-face contact. Nevertheless, it is not possible to judge whether the interviews would have taken a different direction if made face-to-face. A full list of interviewees, and how they were interviewed, can be found in Appendix I.

Both of the authors were present during all interviews. This allowed for one to take notes while the other one was responsible for the proceeding of the interview. However, both were engaged during the discussions and allowed to ask follow-up questions or for clarifications. All interviews were recorded and transcribed, and it allowed for comparisons between interviews and worked as a memory tool when analyzing the interviews afterwards.

Beside the authors, one of the stakeholders were present during a majority of the interviews. Since the interviewers and the interviewees most of the time were of different nationality and did not speak the same language, there occasionally arose situations of misunderstandings. In such situation the third person helped with translation or clarification. One interview was conducted entirely with the use of a translator. The interviewee did not feel comfortable answering questions in English even though he understood the language, wherewith the answers, and partly the questions, had to be translated from Indonesian to English. Since there is no way to be sure that the questions and answers were correctly interpreted by the translator or interviewee, the interview could be biased and therefore all the information used have been backed up with a second source.

Selection of Interviewees

After it had been mapped out what knowledge was needed for the study, the interviewees were selected using the professional and personal networks of contacts at ITB and Ericsson Indonesia. Subsequently the sampling strategy took the approach of snowball sampling. Snowball sampling is described by Saunders et al. (2016) as a sampling method where the researches take initial contact with a small group of people relevant to the research, and then let them introduce new contacts, which they think can be valuable to talk to. The use of snowball sampling made it possible to get in touch with people who could contribute

significantly with their knowledge but who would otherwise have been outside the reach of the study. The complete list of interviewees can be found in Appendix I.

Creation of Topic Guide

A topic guide is an informal list of question and topics that can be addressed in a flexible manner during an interview (Easterby-Smith et al., 2015). A topic guide should be constructed with the interviewee in mind, i.e. it is necessary to reflect over how the interviewee will feel about and understand the different questions. This gets particularly important in research such as this, since it is located in a different geographical and cultural setting than our own. To create a topic guide that relates both to the interest of the respondents as well as the interest of the research is therefore essential to the success of a project (Easterby-Smith et al., 2015).

In order to get suitable topic guides, both representatives from Ericsson Indonesia and ITB were consulted. By doing so, the risk of cultural misunderstandings was decreased. Moreover, such consultation regarding the topic guides helped to create clear and understandable questions/topics and to avoid abstract theoretical concepts, something Easterby-Smith et al. (2015) mean is desirable. The topic guides were organized, as recommended by Easterby-Smith et al. (2015), by three sections: opening questions, key topic questions, and closing questions. The key topic questions were created by revisiting the research questions, the purpose, and the theoretical framework. The topic guides can be found in Appendix II.

3.3 Research Quality

When working with semi-structured interviews it is, according to Saunders et al. (2016), important to consider the reliability of the study, i.e. if other research would reveal the same information. Semi-structured interviews are not always easily repeatable since they often reveal time-specific opinions or information. However, since semi-structured interviews are used to gain in-depth insight in complex and dynamic issues, it would not be realistic to sacrifice parts of the benefit with this type of data collection method just to ensure that the research could be replicated. This would just weaken the method used for this kind of study. By instead being transparent with what has been done during the interviews, how they have been set up, and what topics have been covered, we aim to provide the reader with the motivation to why this less replicable kind of approach has been chosen.

The use of interviews as the main source of data is related to multiple risks of bias and thus influences the reliability of the study. One such bias is the participation bias. The participation bias is described by Saunders et al. (2016) as any factor that induces a false response from the interviewee. Such factors can relate to who is listening, if the interviewee believes that certain responses are expected of him, or if the interviewee feels that he will be judged by his answers. By starting the interviews off by explaining the background to the project, the background of the authors, and how the data would be used, we have tried to create an atmosphere of trust and minimize participation bias.

A bias closely related to how the interviews are conducted is the interviewer bias. The interviewer bias is any behavior, verbal or nonverbal, that can influence how the interviewee responds to or understands the asked questions (Saunders et al., 2016). In the case of this study, the interviewer bias is also influenced by the cultural differences between the interviewer and the interviewee. One such factor might be that the interviewers and the interviewee think differently about what topics that are suitable to discuss during an interview. A wrongly done interpretations about this from the interviewer's side, can lead to the interviewee feeling uncomfortable (Saunders et al., 2016). By letting both Ericsson Indonesia and ITB go through the topic guides before the interviews, the risk of this kind of bias was reduced. However, since the authors became more experienced along the way, it is realistic to assume that the interviews done in the beginning of the study was under a greater interviewer bias than the ones done towards the end.

The difference in culture and language might be the biggest concern with this type of research. Not only can it lead to issues as the one discussed above, it can also contribute to how the interviewers understand the meaning of what is being said, it can affect what questions are asked, and influence what the interviewee is willing to respond to (Saunders et al., 2016). This kind of bias can sincerely affect the reliability and thus the quality of the research. To reduce the influence of the cultural and linguistic differences, reflection is needed. Court and Abbas (2013) explain cultural reflexivity as the action when you reflect upon the relationship between you and the intended interviewee and how differences and similarities in customs and cultures might influence the interaction between you. Since the study has taken place in collaboration with Indonesian stakeholders, we have had the opportunity to engage with them before the interviews took place. This allowed us to get familiar with how things are done in Indonesia, but it also provided us with valid feedback on how we could change our behavior as interviewers to suit the cultural setting better. Moreover, a main issue with cultural differences lies in the trust between the different parties. As mentioned above the interviews were organized with close contacts to the different stakeholders of the project. Thus, some trust was already established before the conduction of the interviews. However, the reader should bear in mind that even if we worked to minimize the disturbance of the cultural differences it is not possible to completely erase them, wherewith they might have influenced the result.

Another kind of bias that might be present is the researcher bias. The researcher bias is anything that causes a bias in the researcher's recording of the responses (Saunders et al., 2016). An example of such a factor is letting one's subjective view influence how the responses are interpreted. By first individually doing the interpretations and then discuss it with each other, we have tried to reduce this kind of error. Moreover, when we have been of different opinions or where we have been unsure about the meaning of a response, they have been double-checked with the interviewee.

Parts of the study rely on material coming from different kind of consultancy reports. There is an imminent risk that this material is biased to promote the respective consultancy firm (Saunders et al., 2016). To minimize the risk that this kind of bias would influence the study,

all such information was cross-checked between firms or with more firm-independent sources.

When discussing research quality one should consider the generalizability of the research, i.e. to what degree are the findings of the research applicable to another setting or time (Saunders et al., 2016). Generalizability in qualitative research differs from the one commonly used in quantitative research, since the conducted study often is done with few participants. Guba and Lincoln (1985) meant that the researcher should provide complete descriptions of what has been done, research questions used, findings, in what setting the study took place, interpretation etc. Then the reader can judge by herself if the study is transferable to the setting she would like to study (Saunders et al., 2016). This would mean that it partly lies upon the reader to assess what changes would be necessary in order to transfer the study to another setting. One could argue that the results coming from this study could be applicable in geographical markets with similar conditions; nevertheless it would still have to be adapted to market-specific conditions. Finally, one should remember that this kind of study, based on a few in-depth interviews, chosen with a non-probability sampling method, never can be enough to draw statistically significant conclusions about a whole population.

4. Introducing the Telecom Industry

To give the unacquainted telecom reader an introduction to the industry, this chapter provides the basics. The ICT ecosystem will be introduced, together with its actors, and the relationships between them. Moreover, the very basics of a cellular network are explained, as well as the challenge around the scarcity of spectrum, transition to data, and the concept of net neutrality.

4.1 The ICT Ecosystem

MNOs are part of a value chain consisting of multiple actors that integrate, compete, and collaborate with each other. Fransman (2010) calls this the ICT ecosystem and describes it as a four-layered structure. The first layer, the *networked elements*, consists of players like Ericsson, Cisco, ZTE etc. that produce network elements and infrastructure such as routers, servers, semiconductors, computers, and consumer electronics. The network elements from the first layer are integrated into information and communication networks through the second layer, the *network operators*. Here are all the MNOs: AT&T, Vodafone, Hi3G, Orange etc., i.e. the players that create interconnections between networks. The third layer consists of *platform, content, and application providers*. Here OTTs such as Facebook and Youtube can be found, as well as platforms such as Apple's and Google's app stores. Those players are creating the content to be used by the *end consumer*, which can be found in the fourth layer. A schematic figure explaining the ecosystem is shown in figure 5.

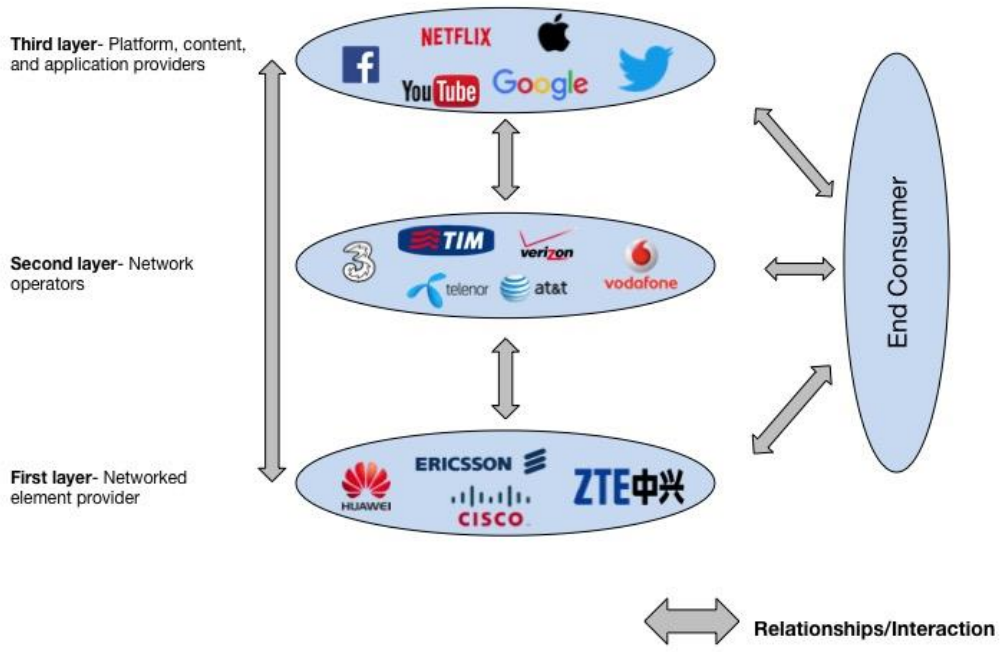

Figure 5. *A schematic picture of the ICT ecosystem as described by Fransman (2010).*

There exists intermediate demand and supply both between layers and within layers (Fransman, 2010). For instance, system manufacturers (computers, consumer electronics etc.) are demanding semiconductors from component producers, which are in the same layer (*within*). Network operators in layer two are in turn demanding network elements from players in layer one (*between*). According to Fransman (2010) there are six different relationships and interactions between the different layers (see figure 5). The interactions that take place indicate different flows: financial flows (purchase-sale), material flows (input-output), information flows, and/or input flows to the innovation process. Such interactions would e.g. be the one between MNOs and end consumers; MNOs sell mobile services and access to internet to the end consumers, the one between platform, content, and application providers and the end consumer; end consumers act as co-innovators with the players in the second layer. Moreover, network operators have interactions both with the first and third layer; network operators are dependent on the products and services supplied by the first layer - the networked element players provide the network operators with the means to reach their customer. The network operators in turn provide the platform, content, and application players with a platform for innovation and means to reach their customers (Fransman, 2010). Hence, the players in the ICT ecosystem are all dependent on each other for their own existence.

4.2 Cellular Technology

The cellular network is a communication network where the last link is wireless. A cellular network is distributed over overlapping land areas called cells, where each cell contains one base station (BTS). The base station is a fixed-location transceiver and provides the cell with its network coverage (ITU, 2011). The network coverage can in turn be used for transmission of voice and data. When those cells are connected with each other they can provide coverage to a wide area, allowing transceivers, such as phones, to communicate with each other over the whole network via the BTS. This is possible even when the transceivers are moving between the cells while transmitting.

All mobile phones contain a low-power transmitter as well as a receiver. Mobile phones connect to the cellular network via the BTS of a corresponding cell. The link from the mobile phone to the BTS is called uplink, while the link in the opposite direction is called downlink. The BTS then connects to a mobile switching center (MSC). The assignment of the MSC is to direct callers from one BTS to another. The MSC also provides a connection to the public switched telephone network (PSTN), which makes it possible to connect mobile calls to landlines (ITU, 2011). The basics of the system are pictured in figure 6.

In order for the cells to not interfere with each other's signal, the cells use different frequencies than their neighboring cells. Consequently, multiple cells can use a frequency as long as they are not adjacent. The reuse of frequencies makes it possible to increase capacity and coverage of the mobile network. There are many factors affecting what cell size is used: the type of terrain, the type of base station, location of installation, population density etc. Due to the limitations in transmission capacity, each cell is only able to handle a certain

amount of calls and data connection, wherefore cells are often placed tightly together in densely populated areas (ITU, 2011). Thus, in order to increase the ability of the network to carry voice or data, investments in BTS have to be made.

Mobile communication relies on the transmission of information through electromagnetic waves. Each device contains a transmitter that encodes data at a certain frequency, which is then sent out from the device through an antenna and picked up by the closest base station of the used MNO (GSMA, 2014b). The frequencies ranging from about 10 kHz to 100 GHz constitutes the radio spectrum, wherein 300 MHz to 5 GHz are considered optimal ranges for mobile communication. The radio spectrum is divided into frequency bands, and the broader they are, the more data they can carry. These bands are further divided into individual channels that are used for broadcasting. When considering radio frequencies for mobile communication, there is a trade-off between capacity and coverage. As there exists more high frequency spectrum than low, the frequency bands can be wider, thus supporting the transmission of more data. However, the problem with high frequency bands is that the signals have short reach as they cannot easily penetrate buildings and other obstacles, since they become severely weakened. The opposite is true for low frequency bands; they can easily pass through objects and therefore have a long range, but the frequency bands are usually narrower, thus supporting lower capacity. An implication of the trade-off between capacity and coverage is that MNOs usually use lower frequency bands in rural areas, making it possible to provide wide coverage with only few base stations. In cities, higher frequency bands are utilized, due to higher demand of capacity. In order for an MNO to operate, access to spectrum is a necessity.

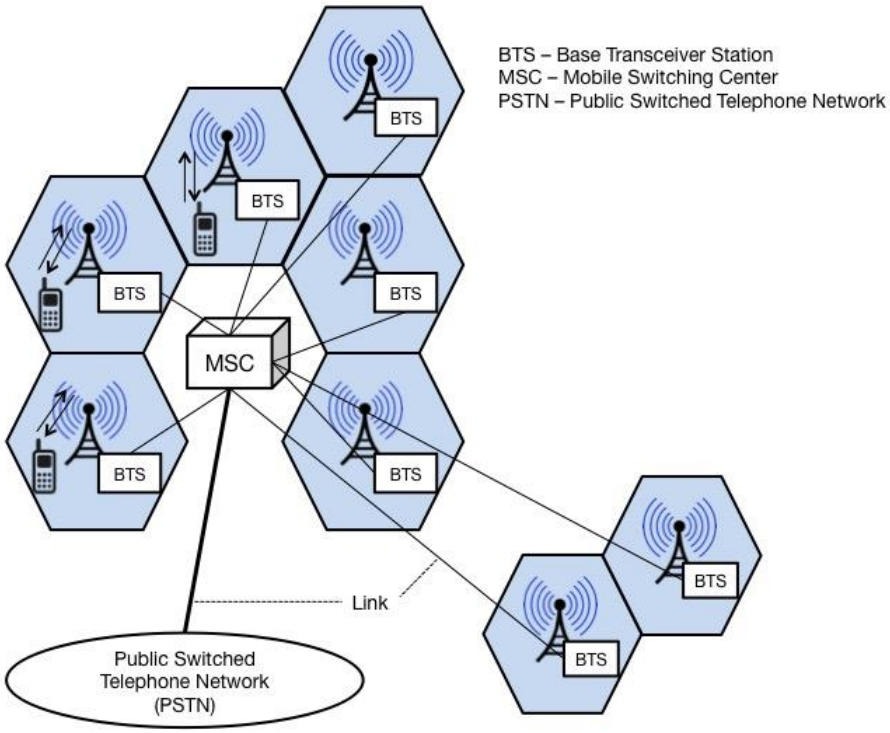

Figure 6. *A schematic picture showing the basics of a cellular network (ITU, 2011).*

4.3 The State of the Global Telecom Industry

The size of the global MNO industry was $1.1 trillion in 2015 (GSMA, 2016a). In the last five to ten years, there have been significant differences in revenue growth between the developed and developing world. Since the financial crisis in 2008-2009, the developed world has experienced consistent slow growth, whereas the developing world has gone from double to single digit growth, thus experiencing a substantial decline in growth. Hence, the differences in growth between developed and developing countries are now far less pronounced than previously. The European market has been subject to increasing consolidation, something that is expected to happen in the most competitive developing markets. Looking ahead, the growth of the global market is expected to continue to be low, growing 1.9 percent annually until 2020 (GSMA, 2016a). Developing markets are expected to outperform developed markets, with annual growth rates of 2.8 percent compared to 1.2 percent.

In 2015, 63 percent of the global population had a mobile subscription (GSMA, 2016a). Subscriber growth rates has been 7.7 percent annually in the last five years, but are expected to decline to 3.9 percent annually in the upcoming five years. Especially in the developed world the subscriber growth will be slow, due to the high maturity of the market. The market is predicted to grow with 1 billion subscribers until 2020, and of these, over 90 percent will be in developing countries. In contrast to the slow growth in subscribers, the number of smartphones is increasing rapidly in the world, predicted to almost double by 2020 (GSMA, 2016a). Of this increase, people living in developing countries are expected to account for over 90 percent.

4.3.1 The Shift to Mobile Data

Mobile data consumption is growing massively, and in 2009, the volume of data traffic overtook the volume of voice traffic carried over the world's mobile network for the first time, marking a significant milestone for global mobile communications (Ericsson, 2014). GSMA (2016a) expects a 49 percent annual growth in data traffic between 2015-2020, while Ericsson (2015) predicts this number to be 45 percent between 2015-2021. The growth is fueled by the increasing number of smartphone users, high-speed connections, extended coverage, and consumers using higher volumes of data. People are watching more videos on their devices, and that alone will contribute substantially to the growth in data (McKinsey, 2016). According to estimates, 70 percent of all mobile data will come from video in 2021 (Ericsson, 2015).

During the last 10 years, the telecom industry has been subject to massive changes, and the speed of transformation is continuing at high pace. It is not all players that have managed to successfully turn the transfer toward data into a valid business opportunity. Price wars have occurred between MNOs and have come to be an expensive consequence of competing for market shares only by price. The price wars have resulted in compromises when it comes to user experience and profitability among MNOs (Ericsson, 2014). MNOs are facing significant pressure and overall return on invested capital has been declining in recent years (EY, 2015).

This can be attributed to several factors such as: OTTs cannibalizing on legacy revenues, price wars or price regulations, and higher capital expenditures to improve network performance. The performance of MNOs varies a lot, with pronounced differences between different regions. MNOs in North America and Asia are generally doing considerably better than MNOs in other regions.

The number one challenge cited by senior executives of MNOs in a EY (2015) study is the threat from disruptive competitors. OTTs are cited as the industry actors that are most likely to alter customer demands in the future. Free instant messaging services from OTTs, such as WhatsApp, Facebook Messenger, and Apple's iMessage, are cannibalizing on MNOs' legacy services. In 2015, MNOs lost 8 percent of their voice minutes to OTTs. As MNOs are investing heavily in their networks and at the same time trying to compete with OTT players, their margins have been suffering.

4.3.2 The Net Neutrality Debate

The influence of OTTs is increasing and one way for MNOs to regain some power would be to differentiate the QoS depending on which OTT that is driving the traffic. However, the ability to take such measures is severely stalled by the global net neutrality debate. The term "net neutrality" was coined by Tim Wu in 2003 and means that all data is treated indifferently on the internet, and that regulators and internet service providers should not be allowed to discriminate or charge differently depending on content, user, website, platform, equipment, etc. If net neutrality should be enforced or not is highly debated, and the opinions vary greatly between nations and individuals. The first country to amend its laws to include net neutrality was Chile in 2010, followed by the Netherlands in 2012 (The Guardian, 2011). In 2015, the Federal Communications Commission in the U.S. decided to regulate broadband internet service as a public utility, placing mobile data services for e.g. smartphones under new regulations. The new rules intend to "protect innovators and consumers" and to "preserve the internet's role as a core of free expression and democratic principles" (Lohr & Ruiz, 2015). However, opinions have been raised against enforcing net neutrality since opponents mean that it can deter investments from broadband improvements (tiaonline, 2014).

5. The Indonesian Mobile Telecom Landscape

By using the frameworks presented in Chapter 2, this chapter describes and analyses the current situation in the Indonesian telecom market by looking at the macro and competitive environment. The chapter builds both upon information from interviews with different industry experts and secondary source information in the form of industry reports.

5.1 The Indonesian Telecom Industry

The Indonesian telecom market has gone from being a duopoly between two MNOs: Telkom and Indosat, to its present state of eight competing companies. However, the three biggest MNOs: Telkomsel, Indosat, and XL, make up over 75 percent of the subscriptions. Figure 7 shows how the subscriptions in Indonesia have been divided between those players over time. As seen in the graph, Telkomsel have been largely dominant in the Indonesian market the last five years when it comes to the number of subscriptions. A more detailed description of the three MNOs can be found in Appendix III.

As seen in figure 7, the Indonesian mobile telecom industry is reaching saturation in terms of subscriptions, with a penetration rate of 129 percent in 2015 (Ericsson, 2016c). There are multiple explanations behind the fact that the penetration lies above 100 percent: some subscriptions are inactive, many people are having multiple devices (tablets, phones etc.) or separated devices for home and work, and people want to use different MNOs for different activities - maximizing their price advantage.

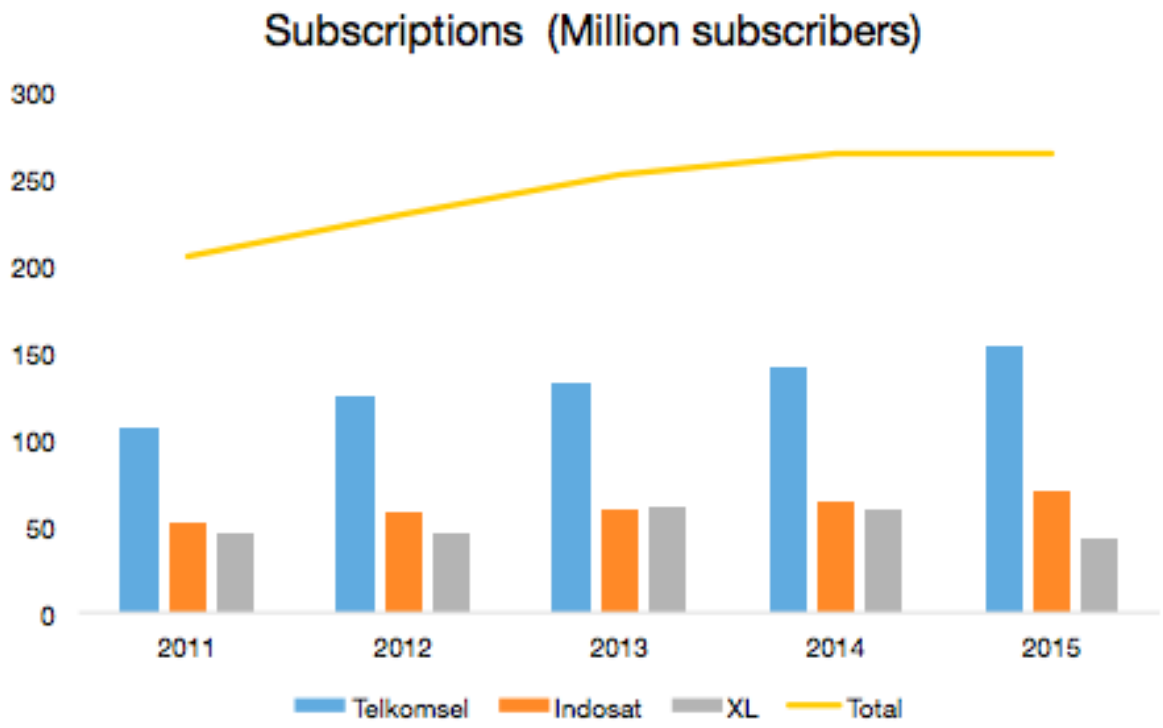

Figure 7. *Number of subscribers in Indonesia divided on the three largest MNOs.*

It is possible for the Indonesian consumers to use multiple SIM-cards simultaneously partly because of the fact that Indonesia is greatly dominated by prepaid subscriptions. This can be contrasted to the western world, where postpaid subscriptions are more widespread. Figure 8 pictures how the number of postpaid subscriptions has developed for the three main MNOs in the Indonesian market since 2011. Noticeable is that the number has not exceeded 2.5 percent for any of the MNOs.

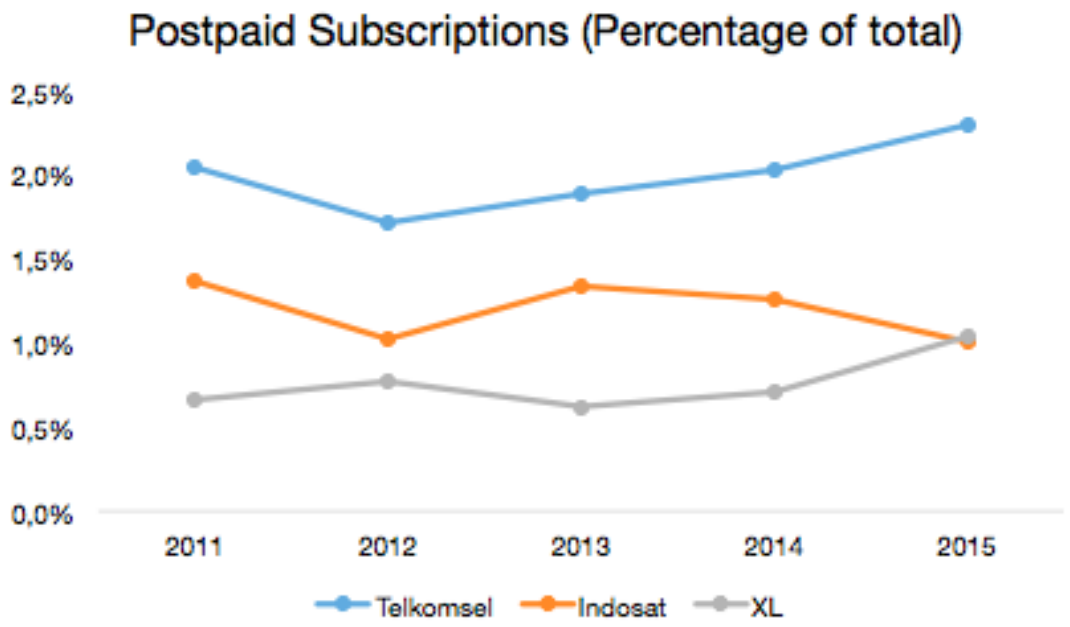

Figure 8. *The percentage of postpaid subscription at the three largest Indonesian MNOs.*

A significant problem for Indonesian MNOs, which partly can be derived from the domination of prepaid subscriptions, is that the ARPU is among the lowest in the world (Fife, 2015). As seen in figure 9, the average blended ARPU has been below 2.5 USD per month the last years. This number is expected to decline even further in the upcoming five years, when revenue from legacy services continues to decrease. Since telecom services already amount for a significant portion of disposable income for many Indonesians, it is challenging to increase prices substantially. The blended ARPU is made up by three components: SMS, voice, and mobile data. Both voice and SMS revenue are expected to decline in the coming years as a consequence of increasing use of services via internet (Fife, 2015).

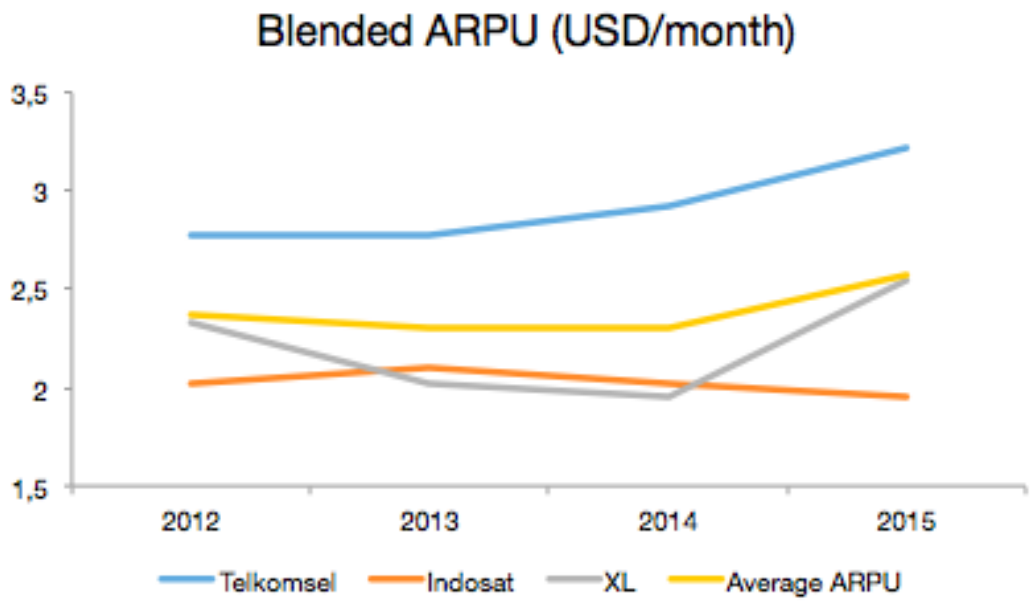

Figure 9. *The blended ARPU of the three largest Indonesian MNOs.*

Due to an increased price war on voice and text services, little profit has been left for the MNOs to invest in improving data services and expanding network coverage. However, Laili Aidi (2016), strategy manager at Ericsson Indonesia, means that after many years of competing only on price, the trend seems to go in another direction. The MNOs have come to realize that the price war has been hurting them more than they have gained from it in user base. Figure 10 pictures how the EBIT margins have changed for the three main MNOs in Indonesia since 2011.

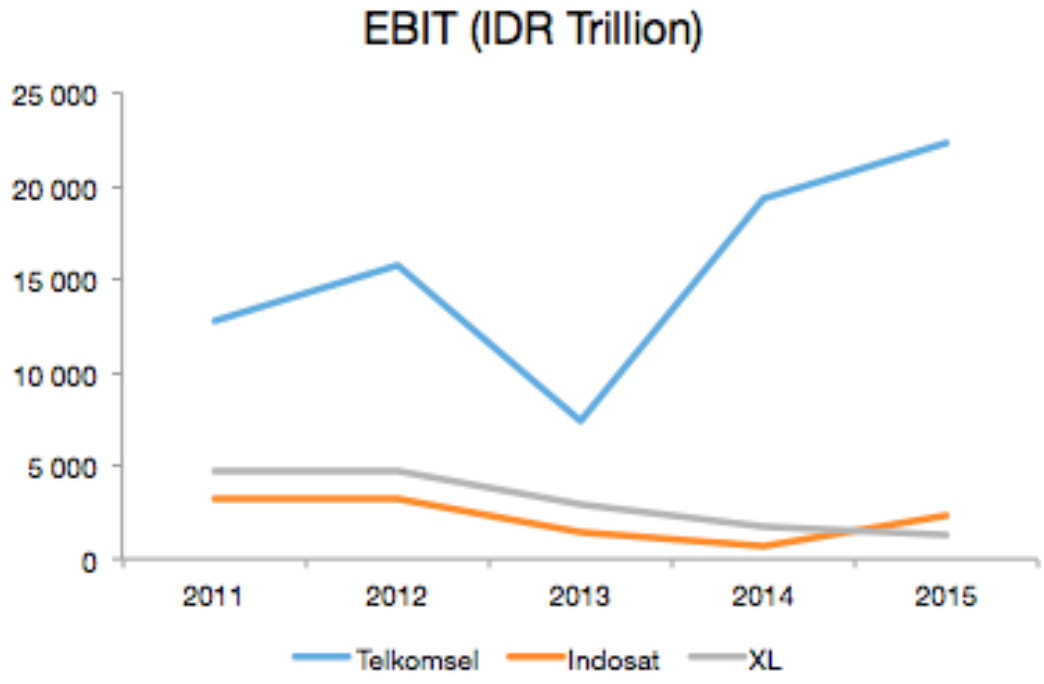

Figure 10. *EBIT of the three largest Indonesian MNOs.*

5.1 Macro-environmental Context

The external environment influencing the Indonesian MNOs is fast changing, making it important for the players to keep track of the development. Since the industry shifted towards increased data traffic, regulators have had problems to keep up with the change. Hence, the regulatory environment is not always clear, which makes it hard for the MNOs to take fast decision on where to go. Moreover, economical factors such as poverty limit in what direction the MNOs can go, making expensive services hard to implement among the masses. However, a young, urbanizing population drives the demand for new technology and alternative technologies to bring 4G to the home of subscribers might bring new possibilities in the future. For a summary of the PEST analysis, see figure 11.

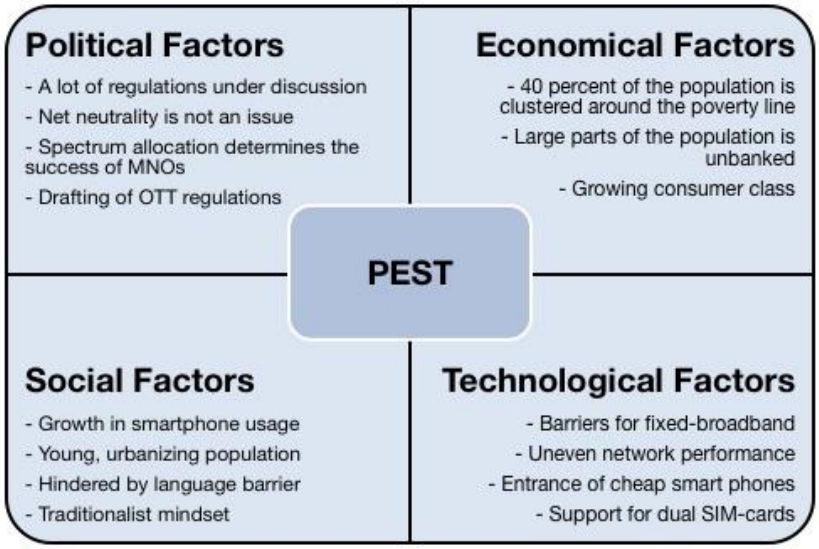

Figure 11. *A summary of the PEST factors influencing the Indonesian telecom market.*

5.1.1 Political Factors

The telecom industry in Indonesia is supervised by the Ministry of Communication and Information Technology (MOCIT), which acts as the issuer of policies and regulations (ATSI, 2016). In addition, the regulatory environment of the telecom industry is the responsibility of the BRTI - Badan Regulasi Telekomunikasi Indonesia. BRTI has according to I Ketut Prihadi and Dr. Rony Bishry (2016), two of the commissioners at BRTI, as assignment to regulate, monitor, and supervise, telecommunication regulations in Indonesia. BRTI prepares draft regulations for everything from spectrum licensing to competitive dynamics, which is then issued by the MOCIT. The goal of the regulations is to create an efficient and a sustainable telecom industry (Prihadi & Bishry, 2016).

Indonesia features weak institutions. Weak institutions lead to confusing regulations, which in turn deter investors from conducting business in the country (Fife, 2015). However, according to the Global Competitiveness Report 2016, the efforts undertaken by the former and current administrations to tackle corruption have payed off; Indonesia is improving in almost all measurements related to ethics and bribery (WEF, 2016).

Dr. Huhammad Ridwan Effendi (2016), former commissioner at BRTI, means that the fast changing pace of the telecom industry has caused a problematic situation for the regulators, where the regulations do not manage to keep up with the change in the technology and market. According to an interview with Dr. Sigit Haryadi, who has more than 20 years of experience within the field of telecom policies, regulations, and economics, the regulatory environment for telecom in Indonesia can be described as unpredictable. Contrary to many developed countries there are seldom regulations controlling the actions of the MNOs on beforehand. Regulations are rather set after the actions of the MNOs have taken place, i.e. post-practice (Haryadi, 2016). This can create action barriers for the MNOs since they do not know what upcoming regulations will look like. Consequently, initiatives can be abandoned or postponed (Effendi, 2016).

It seems like the regulatory environment in Indonesia has lagged behind the transition to data, resulting in a rather unpredictable situation. The fact that the government seems to have economic incentives in the development of the industry has made them draft and discuss a variety of regulation concerning the MNOs and other actors in the industry. However, it is difficult to know which ones are going to be ratified and implemented, and which ones are going to be stopped along the way. Consequently, it creates a difficult situation for the MNOs, where it is not obvious what actions will be allowed in the future, thereby making investment decisions more difficult.

The fact that international OTTs are getting an increased amount of power in the Indonesian telecom market has led the BRTI to start to draft OTT regulations. However, the discussions circulating the regulation are timely and interfered by the international community, such as the U.S. and European council, who oppose the regulations (Prihadi & Bishry, 2016). The Indonesian government sees a problem in that the OTTs are active in Indonesia and use the Indonesian telecom infrastructure without being obligated to pay for it. Initiatives have already been taken to force the larger OTTs to put at least one of their servers in Indonesia, which would make it possible for the government to tax them based on their income (Prihadi & Bishry, 2016; Effendi, 2016). However, this has also met a lot of resistance, especially from the international OTTs themselves who try to find different ways to circumvent the regulation. Moreover, the regulatory authority of Indonesia advocates cooperation between the local MNOs and the larger OTTs. This would mean that if e.g. Netflix would like to conduct business in Indonesia they would need to have cooperation with at least one of the MNOs (Prihadi & Bishry, 2016). This would allow the MNOs to charge the OTTs for the use of their bandwidth. However, this is not yet enforced but rather an alternative discussed.

The use of smartphones and internet has given significant contributions to the Indonesian economy (Fife, 2015). Thus the Indonesian government has incentives to enhance the use even further. Since the 4G smartphones currently on the market in Indonesia are expensive, the government wants to take measure to push the prices down (Effendi, 2016). Right now, there are discussions going on about whether or not it would be possible to force smartphone vendors to produce low-cost smartphones for the Indonesian market. However, as with the

OTT regulations, international vendors are opposing such a regulation, which have brought the issue to WTO (Effendi, 2016).

It is uncertain how much influence international society can have over the regulatory environment in Indonesia. The International Telecommunication Union (ITU) is an agency under the UN responsible for issues associated with information and communication technology (ITU, 2016), and the main global association influencing regulations in Indonesia (Effendi, 2016). ITU is among other things involved in the development and coordination of worldwide technical standards. Such standards are not enforced upon the ITU member countries, however Dr. Effendi (2016) means that it would be too expensive not to follow the technical standards set. For a country to develop its own technical standard it requires that it has vendors that are ready to develop devices for that standard, something Indonesia does not have (Effendi, 2016). However, each and every country does always have the choice not to follow. This gets important since discussions concerning net neutrality are currently taking place on an ITU level. Net neutrality is defined by ITU (2015) as: "*the principle that all data traffic should be treated equally, without discrimination, restriction or interference, independent of the sender, receiver, type, content, device, service or application".* This would have implications for MNOs since they would not be allowed to differentiate the quality of service (QoS) of their network depending on what content provider is using it. Indonesia, together with many other countries in Asia and Europe, is an opponent of net neutrality (Effendi, 2016; Prihadi & Bishry, 2016; Haryadi, 2016). Even if the ITU community finally arrives to a decision in favor of net neutrality, Indonesia would not have to follow it.

Another regulation under discussion in Indonesia is the one regarding network sharing between MNOs. Anthony Houlahan (2016), the Ericsson VP of strategy for Southeast Asia, means that one of the main barriers for an increased coverage of the networks is the huge investment cost associated with the expansion. Today, if the MNOs want to increase their area of operations, they have to build the active part of the infrastructure themselves, i.e. the BTS (Effendi, 2016). However, it is now under discussion whether it should be allowed for the MNOs to collaborate, i.e. to build a multi operator core network (MOCN), which would allow them to share not only the passive part of the network but also the active parts. This would make the investment necessary smaller for the collaborating MNOs than if the MNOs had to do it each by themselves, allowing them to reach outside of Java (Prihadi & Bishry, 2016). However, such a regulation is not without obstacles since it can be considered as unjust for Telkomsel, who has already expanded their network by themselves (Effendi, 2016; Prihadi & Bishry, 2016), or for smaller players who would have no one to collaborate with. Right now there are two opposing sides in the discussion; XL and Indosat who see network sharing as their best opportunity to be competitive with Telkomsel outside of the main cities, and Telkomsel who oppose since they want to stay the sole MNO in those areas.

One of the most important assignments of BRTI is considered to be the allocation of the spectrum. The spectrum is allocated to the MNOs by auction. If an MNO is allocated spectrum, they do not own the spectrum themselves, but have the right to use it. Thus they are not allowed to trade the spectrum rights with others. If the spectrum is not utilized, the

government takes it back and allocates the right to use it to someone else (Prihadi & Bishry, 2016). During the spectrum allocation auction the regulators consider both the price the MNO is willing to pay and the past performance of the MNO (Haryadi, 2016). Additionally, the MNOs who get the spectrum have to obey with certain criteria set by the government. Such a criterion could for example be that the MNO becomes obligated to build their network in specified areas (Prihadi & Bishry, 2016). The spectrum is allocated on a national basis, i.e. the MNOs get the right for the spectrum throughout the whole of Indonesia. This has the implication that the spectrum is not used in the areas where the MNO with the spectrum rights does not operate.

ICT development is seen as important by the Indonesian government and it is an essential part of the National Development Plan 2015-2019 (Fife, 2015). In 2014, the 2014-2019 Indonesia Broadband Plan (IBP) was released, which contains some specific goals related to mobile broadband (Rohman, 2013). It aims to increase overall connection speeds and penetration levels, targeting a mobile broadband penetration rate of 100 percent in urban areas and 52 percent in rural areas at 1Mbps to be reached by 2019. However, the IBP does not state how these goals should be achieved.

5.1.2 Economical Factors

With its 250 million people, Indonesia is the fourth largest country in the world (Fife, 2015). The country is characterized by a young population; nearly 60 percent of the population is under 30 years old, a fast urbanization rate; over half the population lives in cities (Oberman et al., 2012), and a high domestic consumption; about 60 percent of GDP is coming from Indonesian consumer spending (Rohit et al., 2013).

Since overcoming the Asian financial crisis in late 1990s, the Indonesian economy has been growing quickly (The World Bank, 2016a), averaging a growth rate of 6.3 percent annually 2011-2014. As of 2015, Indonesia was one of the fastest growing developing economies in the world (Fife, 2015). A large extent of the economic growth taking place can be derived from the size of the population; Indonesia has a large labor pool and consumer population to continuously fuel growth in diversified sectors (Fife, 2015).

Despite the growing economy, Indonesia still have problems connected to inequality and poverty (Fife, 2015). According to The World Bank (2016a), Indonesia had a poverty rate of 11.2 percent in 2015, a cut of more than 50 percent since 1999. However, since 2012 the poverty rate has fallen by less than 0.3 percentage points annually. Moreover, The World Bank (2016a) estimates that about 40 percent of the population remains clustered around the national poverty line of $22.60 a month, well under the BOP limit defined by Prahalad and Hart (1998). This has an impact on the relative cost and thus the affordability of mobile internet. In spite of the fact that Indonesia has one of the lowest rates for mobile internet airtime in the world, 46 percent of the respondents in a survey conducted by GSMA (2016) considered the affordability to be the largest barrier to accessing the internet. This number can be compared to 25 percent on average in Asia (GSMA, 2016c).

The fact that large part of the Indonesian population is living close to the poverty line also influences how many people are banked. According to The World Bank's Global Financial Inclusion database of 2014, 35.9 percent of the Indonesian population over 15 years has an account at a financial institution, whilst among the poor this number reaches only 21.9 percent. The amount of the total population having debit cards during the same year was 25.9 percent, the same number amongst the poor was 10.4 percent (The World Bank, 2016b). Many people live on a day-to-day basis and do not have savings to put on a bank account (Houlahan 2016). According to John M. Thompson, CTO at Indosat, this makes Indonesia a cash market; a great majority of all purchases made are done using cash.

While poverty can be seen as one of the bottlenecks for the MNOs operating in Indonesia, the rising middle class is one of the enablers. The Indonesian middle-class has been rising ever since the economic boom in the country during the 80s and 90s (Ansori, 2009). However, the estimation of the size of the current middle-class varies between analysts. According to estimates by Oberman et al. (2012) the Indonesian consumer class will reach 135 millions in 2030, an increase from about 45 millions in 2012. The Boston Consulting group on the other hand, estimated that Indonesia was home to 74 million middle-class consumers in 2013, reaching 141 million people in 2020 (Rastogi et al., 2013). Despite the differences in estimations, it seems to be an agreement on a rise in the middle-class spending, giving companies opportunities to explore.

In 2014 the telecom industry contributed with approximately 3.17 percent of the Indonesian GDP, which is quite far below the number of the manufacturing sector at 26 percent and the mining sector at 10 percent. However, the growth of the telecom industry the same year was 10.36 percent, which was well above the national GDP growth of 5.06 percent (ASTI, 2016). The telecom industry can be seen as an important contributor to the future growth of the Indonesian economy (Effendi, 2016).

5.1.3 Social Factors

Indonesia is facing a growth in smartphone ownership driven by its young, urbanizing population (Fife, 2015) and falling smartphone prices (Ericsson, 2016b). Dr. Effendi (2016) means that the smartphone has become a lifestyle for many people; the high segment users have come to change their phones close to every eighth month. The increase in smartphone ownership has led to an increased demand for social media services such as Facebook and Twitter; Indonesia has the world's fourth largest Facebook user base (Fife, 2015). According to a survey conducted by Rohit et al. (2013), social media is the main usage area for internet among Indonesian consumers - about 70 percent of the internet users engage in some kind of social media. Moreover, with its 29 million Twitter accounts, Jakarta was in 2013 the most active Twitter city in the world. Online shopping and online banking are on the other hand activities that are not as common; in the same survey, only 7 percent stated that they were shopping online in Indonesia, compared to 32 percent in China. The reason seemed to be that Indonesian consumers do not trust online shopping and online payment systems.

When trying to segment the Indonesian population, Telkomsel found that there is a large customer segment that opposes the use of any technology coming from the west. Foo (2016), general manager for strategy and market insights at Telkomsel, means that about 50 percent of the Indonesian population can be classified as traditionalists, meaning that they are skeptical or hateful towards new technology and social media. This group can further be divided into people that are open-minded; they are open to technology but do not see the benefit of using it and do not know how to acquire it, and people that are hard-core traditionalists; they believe technology has a bad influence and will ruin traditions, religion, and culture. The first segment is slowly converted into data users, as they see the relative advantage rise. However, the latter segment is not easily converted and has during the last 18 months remained the same in number (Foo, 2016). The traditionalists are predominantly found in rural areas, nevertheless there are still clusters of traditionalists within all main cities.

The Indonesian population is described by Shafi (2015) to be content-hungry when it comes to internet, however somewhat hindered by a language barrier. Even though almost all education and national communication in Indonesia is done in the official language "Bahasa", only one percent of the content on Google was available in Bahasa in 2013 (Grazella, 2014). This number has increased since (Shafi, 2015) but it is still low. The language barrier lowers the relative advantage of the internet for many people, and thus stalling the adoption. The barrier gets even higher where the educational level is low, as is the case within the rural population. As put forward in the model by Nakata & Weidner (2012), the relative advantage is one of the most important factors for enhancing adoption where poverty barriers, such as economic or knowledge deprivation, are present. If the need for content in Bahasa was addressed, the relative advantage of using internet would increase. Hence, more people would feel that access to internet is worth paying for, increasing the demand. To cater for the need of content in Bahasa would be beneficial for the Indonesian MNOs. However, they cannot take care of it alone as it requires the involvement of many parts of the ecosystem.

Contrary to many of the developed countries, Indonesian MNOs face the challenge of prepaid mobile plans. As about 99 percent of the Indonesian consumers with a mobile devices use prepaid, non-contract phone plans, MNOs are subject to a lower ARPU compared to MNOs that can sign their customers up to contract plans, i.e. postpaid subscriptions (Dobberstein et al., 2013). Jhon Welly (2016), former director at Telkom, means that the preference of prepaid mobile plans is highly associated with the uncertainty of affordability; the amount of money you can spend on mobile services each month might vary quite a bit. People normally have SIM-cards from multiple MNOs. According to Dr. Bishry (2016) people experience that the rates differ significantly if you call across the MNOs' networks, wherewith it is beneficial to use the same MNO as the receiver of the call. Hence, people change SIM-card depending on whom they are calling or what offers are in place at a given time. Moreover, Foo (2016) means that since MNOs in Indonesia do not offer subsidies for phones in postpaid offers, the customers do not really see the value of having a postpaid plan over having a prepaid subscription. Consequently, even if the customers are high-value customers and would afford a postpaid subscription, they choose to stay with a prepaid subscription anyway.

The transit to data usage over voice and SMS has decreased customer loyalty; people are no longer bound to a certain phone number and can thus change SIM-card even more freely than before (Thompson, 2016). According to Gunnar Borg (2016), Ericsson's technical responsible towards Indosat, and Thompson (2016), the low degree of loyalty among the end-users results in that people buy new SIM-cards instead of topping up their existing ones. Additionally, the end-users have high knowledge about the offers coming from different MNOs and they are continuously comparing them between each other to find the best suited for their momentary needs (Borg, 2016). This makes the end-users even more unlikely to reload or recharge their SIM-cards.

The educational situation of Indonesia has improved a lot since the financial crisis in the 90's (World Bank, 2014). As of 2014, the enrollment in primary schools was below 60 percent in poorer district, while reaching 100 percent in the wealthier districts. The enrollment rate in secondary education has steadily increased, reaching 66 percent as of 2014. However, it is still below the levels in countries nearby (World Bank, 2014). Education has been one of the main issues in the Indonesian development plan and is continuing to be one of the main focus areas of the government (Fife, 2015). A rise in education level would lower what Nakata and Weidner (2012) explained as knowledge deprivation among the BOP segment, which would increase the ability to use new technology (Fife, 2015), including telecom equipment such as smartphones (Dobberstein et al., 2013). This would in turn drive an increased adoption of mobile data. According to Ameet Suri (2016), former partnership manager at Facebook and internet.org, internet and technology can play an important role in bringing education to the more rural areas, which are too far away to have teachers travel there. However, in what form such services could be delivered is not clear.

5.1.4 Technological Factors

Indonesia is a country with geographical difficulties. It is an archipelago nation with approximately 17.000 islands, of which 6.000 are inhabited, scattered over an area of 9.8 million sq. km, of which 80 percent is sea. The dispersed geographic of the country has contributed to poor infrastructure (Fife, 2015). The poor infrastructure was rated by executives as one of the most cumbersome aspects of doing business in Indonesia (WEF, 2016). According to Fife (2015) and WEF (2016), there are needs that are not met both when it comes to roads, electricity, and telephony.

Mobile internet is largely dominating in Indonesia due to the geographical situation (Fife, 2015). The highest levels of internet penetration can be found in the western islands such as Java, Bali, and Sumatra, where the internet backbone has been developed to a higher degree compared to the eastern parts of the country, where the access to the backbone is very limited. Today, most of the existing cable network in Indonesia is owned by Telkom, who tries to push the ownership further through investments in the Palapa Ring Project (Fife, 2015). The Palapa Ring Project is an initiative to extend the existing cable infrastructure to cover the eastern parts of the country, which is executed by the government together with the MNOs.

According to Statistics Indonesia, 68 percent of the Indonesian population had access to a cellular signal in 2014, while 23 percent had access to a weak signal (ATSI, 2016). The remaining 9 percent do not yet have coverage since there is no BTS infrastructure where they live. There are significant differences in average mobile download speed between the different parts of Indonesia. The best network performance is found in Java, with average download speeds at 7.0 Mbps in Jakarta and 3.5 Mbps in the rest of the island. All parts of Indonesia have an average download speed above 1 Mbps apart from Maluku and Papua.

The number of mobile subscriptions is very high in Indonesia, exceeding the number of inhabitants. The mobile penetration is expected to be 134 percent in 2016, thus making it very saturated, and only slow growth in this area is expected in the future (Ericsson, 2016c). While the number of subscription is becoming saturated, the proportion that is subscriptions utilizing a smartphone is increasing rapidly. In 2013, both Samsung and Chinese manufacturers of smartphones entered the Indonesian market, which made cheaper smartphones more available and triggered a massive expansion of smartphone ownership in the country (Fife, 2015). Ericsson (2016c) forecasts that the smartphone penetration rate will pass 50 percent in 2016 and reach 88 percent by 2020. A key feature of low to mid end smartphones in Indonesia is the support of more than one SIM-card simultaneously, allowing the user to carry SIM-cards from multiple MNOs in their phones (Borg, 2016).

The Indonesian market has long been dominated by 2G technologies in the form of GSM-EDGE, which accounted for around 75 percent in 2015 (Fife, 2015). However, 3G technologies is expected to surpass in popularity in 2016 and stay rather constant until 2020. The big growth is seen in 4G subscriptions, which is forecasted to grow from a 10 percent penetration rate in 2016 to 58 percent in 2020 (Ericsson, 2016c).

Because of the geographical situation of the country, it is expensive and difficult to install fiber optics for fixed broadband (Fife, 2015). Consequently, mobile internet seems to be the dominant way to access the internet also in the future. Thus, in order to get internet into the homes, technological solutions building on mobile technologies have to be used (Houlahan, 2016; Wijaya, 2016). However, Borg means that to reach the same performance with LTE that you can get from cable or fiber, huge bandwidth consumption is needed. Consequently, such solutions do not have much potential in city areas but can be utilized among the rural population where cable solutions are not possible.

5.2 Competitive Environment

It seems like the unique geographical situation of Indonesia has given rise to a quite challenging situation for the MNOs, where there is a significant difference in profitability between Java and the rest of Indonesia (Aidi, 2016). Since Telkomsel is the only player that has had the ability to make the necessary infrastructure investments outside the island of Java, they have managed to build a monopoly situation for themselves. In these areas, Telkomsel has created a wide range of micro zones that allow them to uses cluster-based pricing and thus

charge differently depending on the situation (Telkomsel, 2015). As other MNOs are barely present, it has provided Telkomsel with an opportunity to charge 2-3 times higher prices (Ericsson, 2016c), contributing to a higher profitability.

Since Telkomsel is the only player in many areas, the industry rivalry there is low. Consequently, the customers living in these parts of the country do not have the possibility to choose between multiple MNOs and the distributors do not have the possibility to play MNOs against each other, wherewith the bargaining power of buyers can be seen as low as well. The only one of Porter's five forces that still might have an influence outside of Java would thus be the threat of substitutes. However, many of the people living there still use 2G phones and are unlikely to change in the near future due to a traditionalist type of mindset (Foo, 2016). The ones using data enabled handsets are still bound to use data from Telkomsel. Consequently, the threat of substitutes is not yet a major issue here. In accordance with Porter (1998), Telkomsel seems to have found an optimal market position where they have managed to minimize the influence of competitive forces.

Regulations that make it possible for other MNOs to invest in network infrastructure jointly, may come in place in a not so distant future. If such regulations went through, it would threaten the monopoly situation of Telkomsel since Indosat and XL are currently expressing intentions to extend their presence outside of Java. However, speculating about whether or not this will happen lies outside the scope of this report, wherewith the analysis from now on will come to focus to a greater extent on the currently more competitive situation of Java.

The situation on Java is somewhat the opposite of the situation outside of Java. Even if the industry is, to a great extent, dominated by three large MNOs, there are multiple MNOs beside these. This has contributed to an average industry profitability that is much lower. The low profitability can be explained by looking at the five forces framework. As Porter (1998) argued: if one of the five forces is strong, the profitability of an industry will go down. The forces on the Indonesian telecom market are summarized in table 1.

Competitive Force Present	Degree in Indonesia	Reason
Rivalry among existing firms	High	- The competition is primarily based on price - MNOs' offers are homogeneous, resulting in low switching costs between products for the consumer - The costs of infrastructure investments (fixed costs) are high in relation to the variable costs - Low incentives for consolidation since spectrum needs to be given back to the regulatory authorities if consolidation takes place
Threat of new entrants	Low	- Incumbent MNOs can spread their costs over a large pool of users, thus having supply-side economies of scale - The customers rather use the services of incumbent firms since they are favored by a network effect - Limited access to spectrum - High investment costs
Barging power of suppliers	Low	- The MNOs can use several suppliers simultaneously - Good information regarding prices, thus they can play the suppliers against each other
Barging power of buyers (distributors)	High	- Low loyalty towards a specific MNO, the sell the offers that gives them the highest profits - MNOs reliant on cash payments from independent outlets, thus the MNOs cannot circumvent the distributors
Barging power of buyers (end-consumers)	High	- Price sensitive, they choose the cheapest offer - Undifferentiated products among the MNOs - Low switching costs between the offers since they use prepaid subscriptions and have the possibility to use multiple SIM cards simultaniously
Threat of substitute	Moderate - High	- High price-performance ratio in relation to the MNOs' products - Low switching cost for the consumers

Table 1. *A summary of how the competitive forces influence the Indonesian telecom industry.*

5.2.1 High Rivalry Among Incumbent Firms

The rivalry among existing players in the Indonesian market for mobile telecommunication can be considered very strong. The presence of a vast number of MNOs is a main contributor to the extremely competitive situation that can be observed in the country. The telecom industry in Indonesia was privatized and opened up for competition in 1999 with the passing of the Telecommunications Law (Fife, 2015). This resulted in many new MNOs entering the market and today there are eight more or less active MNOs. Telkomsel is the biggest player by far and they hold 44.4 percent of total subscriptions, which can be contrasted with 20.2 percent for Indosat and 12.1 percent for XL (Ericsson, 2016c). Thus, the three biggest MNOs together hold 76.5 percent of all subscriptions.

Starting in 2000, the market has experienced extensive price wars, which have forced the ARPU and EBITDA to decline among MNOs (Fife, 2015; Wijaya, 2016). However, the price wars started to slow down around 2013, when the MNOs realized that they were just hurting themselves (Aidi, 2016). The industry is reaching saturation in terms of subscriptions, with a penetration rate of 129 percent in 2015, and slow growth in subscription additions is expected in the future (Ericsson, 2016c). MNOs in Indonesia spent significant resources in the 2000s on acquiring customers from each other. According to the five forces framework, the intensity of competition is high in a market when it is mature and incumbents are trying to improve their market share. Porter (1980) stated that if the basis of competition is primarily based on

price, it will likely have the most detrimental effect on industry profitability. Further, he identified some factors that usually result in price competition, and of those, two can be said to be present in the Indonesian market.

Firstly, the MNOs have similar products and the switching costs between them are low. To a large extent, the MNOs are basically offering the same service, connectivity, which makes it hard to differentiate (Thompson, 2016). Since prepaid subscriptions dominate the market, accounting for 97-98 percent, many Indonesian customers hold subscriptions from several MNOs, hence they can easily switch between offerings depending on the situation (Effendi, 2016). This is the major reason behind why the subscriber penetration rate is far above 100 percent.

Secondly, fixed costs are high in relation to variable costs. Mobile telecom is a capital-intensive industry; MNOs must invest in their networks to increase their capacity and coverage. Exploding demands for data and new technologies make the capital expenditures remain relatively constant at high levels. However, once the network is built, the marginal cost of new subscribes is very low (Houlahan, 2016). This has been a main contributor to why there, historically, have been extensive price wars on the Indonesian market; the MNOs have tried to lower their prices to steal customers from each other. Thus, revenues could grow with low additional costs. Today, MNOs are making efforts to differentiate themselves on other dimensions than price, realizing the destructiveness of the price competition. Telkomsel is practically the only player that is profitable, as the others have been operating with losses, so the question is: why are there so few players exiting the industry? It seems like there are two important factors to why this have not occurred to a greater extent than what is the case right now.

Firstly, many of the small MNOs have foreign owners that possess personal commitment to their companies (Houlahan, 2016); they do not necessarily care about the rationality of remaining in business even if their companies are subject to poor performance. Many foreign owners have plenty of cash from other successful businesses and can afford to put it into not so successful projects to keep them alive.

Secondly, the prevailing spectrum policy does not allow MNOs to buy or trade spectrum, as they do not possess the ownership rights to it but merely holds the right to use it. In the case of a merger or acquisition between MNOs, additional spectrum gained from this endeavor would have to be released and given back to the government that in turn would redistribute it to another MNO that they consider being worthy of it. As spectrum ought to be considered as one of the most valuable assets held by an MNO, an implication of a merger or acquisition could be a substantial destruction of value. Thus, the incentives for consolidation have been lowered through the functioning of the Indonesian spectrum policy.

Another factor that makes consolidation less attractive is the anomalous churn rates seen in the Indonesian market. Usually a merger or acquisition would be advantageous, as it would imply a number of additional subscribers. This might also be true to some extent in the

Indonesian market, but due to the disloyalty of consumers, and the vast number of reacquisitions of customers that MNOs have to do each month, the value of gaining access to another MNOs customer base might be of limited value. Taking these factors into consideration, it seems like the low incentives for consolidation can help explain why the high intensity of rivalry has sustained over a long period of time. However, since the main basis of competition in the industry is scale, future consolidations seem probable.

5.2.2 Low Threat of New Entrants

The threat of new entrants in the Indonesian market should be considered low, as there are significant entry barriers present. The industry is subject to high supply-side economies of scale. Building a network is expensive, and the more customers that a MNO have, the lower the fixed cost per user will be. This presents incumbent firms with a cost advantage compared to new firms. Also demand-side economies of scale are present. Due to interconnection fees, it is cheaper to make calls within the network of a single MNO. If more consumers have a specific MNO, a higher percentage of their calls will be to that MNO, reducing their costs. Thus, the service becomes more valuable, and a new entrant has a disadvantage. However, this network effect is somewhat lowered when using voice over the internet instead of the legacy services.

There is one very important incumbency advantage that is independent of size; access to radio spectrum. Spectrum is a scarce resource that is necessary to possess for MNOs in order to operate. The frequency bands are owned by the government in Indonesia, who sells the right to use them to the MNOs for a specific time (Prihadi & Bishry, 2016). To obtain spectrum, the right to use it must be bought in a spectrum auction held by the government. How the government chooses to allocate the spectrum thus becomes important for the market dynamics. This is especially relevant in Indonesia since there is an allocation coming up in 2018 with only two spectrum slots. Past performance, together with price and the possibility to meet the set requirements, will decide which MNOs get the bandwidth. Hence, good performance today will positively influence the future possibilities for an MNO. The governmental broadband plan in Indonesia requires that specific areas are provided with broadband. Upcoming spectrum allocation auctions will require the winner of spectrum to provide their services in those areas of the country (Prihadi & Bishry, 2016). An implication of this is that higher capital expenditures will become necessary to obtain spectrum than what is currently needed. Apart from acquiring spectrum, a new firm would also have to invest extensively to build a network or buy a company that already has one.

5.2.3 Low Bargaining Power of Suppliers

The bargaining power of suppliers is low. The main suppliers of MNOs are the providers of base transmission stations (BTS) and SIM-cards. In Indonesia, there are three big vendors that together have over 95 percent of the BTS market: Ericsson, Huawei, and Nokia (Aidi, 2016). The MNOs are using several BTS providers simultaneously, choosing different vendors for different geographical regions. The uniqueness of the products from the BTS providers is not significant, the benefit of buying more expensive high quality BTSs is that they can handle

more users in each cell before the network gets overloaded (Borg, 2016). Borg (2016) considers the MNOs to be in a more powerful position in terms of bargaining power, since they are very informed and can play the BTS suppliers against each other. Moreover, BTS suppliers are reliant on the MNOs as their customers, meaning that they cannot afford to ignore them as a customer group. Thus the suppliers cannot be seen to have a beneficial position even though they are fewer in to the number in comparison to the MNOs, wherewith their bargaining power becomes low. Additionally, the BTS suppliers cannot credibly threaten to integrate vertically, since there is no available spectrum for them.

Regarding the supplier of SIM-cards, they have low bargaining power. Even if the Indonesian market is extreme in the sense that it consumes half of the produced SIM-cards in the world, the SIM-card is a commodity, there are multiple vendors, and the cost of it is relatively low (Thompson, 2016).

5.2.4 High Bargaining Power of Buyers

The bargaining power of buyers can be divided into the bargaining power of the distributors and the bargaining power of the end consumer. The bargaining power of both these groups is considered to be strong. For the distributors, the main problem for the Indonesian MNOs is that they are highly dependent upon a great number of small independent outlets that sell their offerings. These have no loyalty toward the MNOs and are playing them against each other (Thompson, 2016). The individual distributors are not exclusive and have substantial bargaining power since they will try to sell the packages that provide them with the highest margins.

This situation can to a great extent be attributed to one important characteristics of the Indonesian market: people are extremely price-sensitive. The price sensitivity manifests itself in churn rates that are far higher than what is normal in more developed countries. Prepaid plans dominate the Indonesian market, which makes the switching costs between MNOs low. Customers are well aware of different offerings and are switching all the time to get better deals (Thompson, 2016). A high prevalence of mobile phones that support dual SIM-cards makes switching costs almost nonexistent. As data consumption increases, consumer loyalty decreases even more; many young consumers are not using legacy services anymore as they mainly use OTT services. Thus they are not bound to a specific phone number, and can use their profile on OTT services irrespective of the MNO used for the provision of data.

The constant buying of new starter packages means that few people reload their SIM-cards; instead they are disposed after usage. Thus, there is a constant demand for new SIM-cards benefitting the distributors (Thompson, 2016). The small outlets selling the offerings are not exclusive to a specific MNO, which is providing them with high bargaining power when selling the SIM-cards. Since there is a low degree of differentiation between the offerings from different MNOs, it becomes easy for the outlets to sell more of the offerings they prefer, and they are thus incentivized to sell the ones providing them with the highest margins. Hence, MNOs have competed with each other to give the most favorable conditions to the

outlets so that their offerings will be promoted over other players'. However, the problem is that everyone has been doing the same, resulting in a big share of the sold goods going to the distributors.

The bargaining power of the end consumers has to a great extent to do with the issues of affordability and the low switching costs between the MNOs. Since a large proportion of the Indonesian population lives close to the national poverty line, people are not eager to spend money on mobile data. Consequently, people are incentivized to constantly look for the cheapest offer. As cheap offers often come in the form of starter packages, people tend to throw the old SIM-card away, buying a new starter package instead. This, together with the fact that there are no barriers to switch between MNOs, makes the loyalty towards the MNOs very low. Hence, customers buy the offer they find cheapest or best suited for their momentary needs, pushing the prices of mobile data down.

5.2.5 High Threat of Substituting Services

The total threat of substituting services for MNOs should be considered significant. Porter (1998) argued that the threat of substitutes is strong if the price-performance ratio of the substitute is high and there is a low switching cost for the consumer. As of today, the Indonesian MNOs derive their revenues mainly from voice, SMS, and data. With this in mind, there are two major substitutes for those revenues: fixed broadband and OTT services.

The threat coming from fixed broadband is rather low in Indonesia. Fixed broadband services should be considered a substitute, since it also provides the consumers with internet access. If more consumers used fixed broadband services, parts of the consumed mobile data would be on these services instead. However, fixed broadband have very low penetration in Indonesia, and the infrastructure is severely underdeveloped (Fife, 2015). When considering the price-performance ratio of fixed versus mobile broadband, it is clear that they are competing on different performance parameters. Fixed broadband can never hope to fully substitute mobile broadband, since it can never compete on the mobility parameter. This also means that the switching costs for consumers would be high. Therefore, the best providers of fixed broadband can hope for is that a higher share of the total consumed data would be provided through fixed lines.

The threat stemming from competing OTT services is very high. The emergence of instant messaging and voice over IP (VoIP) services offered by various OTTs are cannibalizing the legacy revenues of MNOs. This problem is not specifically tied to the Indonesian market, but is affecting MNOs worldwide. However, it may become even more pronounced in the Indonesian market compared to other developing countries due to the very young demographic, which is likely to adopt new technologies faster. This force has been set in motion by the increasing adoption rate of smartphones, allowing consumers to circumvent the traditional voice and SMS services offered by MNOs. Looking at the price-performance ratio, these OTT services often have the same features and quality, but they are free to use, apart from the small amounts of data that they consume. Moreover, the switching costs for

consumers are low. Usually all that needs to be done is downloading an app and setting up an account for the specific service. These services also have an advantage when communicating across borders or abroad since they are free, whereas legacy services will usually charge well above their ordinary tariffs in these situations.

Even if OTT services can be considered a threat for the legacy services of the MNOs, they are also a major driver of data usage. Consequently, they are eating away one revenue source while giving rise to another. The MNOs seem to be aware that sooner or later the revenues stemming from legacy services will diminish (Foo, 2016, XL, 2015, Indosat, 2015); the question is rather how long it will take for this cannibalization process to reach full maturity. However, even though this threat is imminent, the core business of providing connectivity is not in danger. The challenge facing MNOs is rather to not be reduced to a marginal player with difficulties in appropriating the value from their offerings. Thus, in order to avoid this undesirable position, data monetization must improve.

5.3 Current Business Model

Figure 12 gives an overview of the current overall situation of Indonesian MNOs.

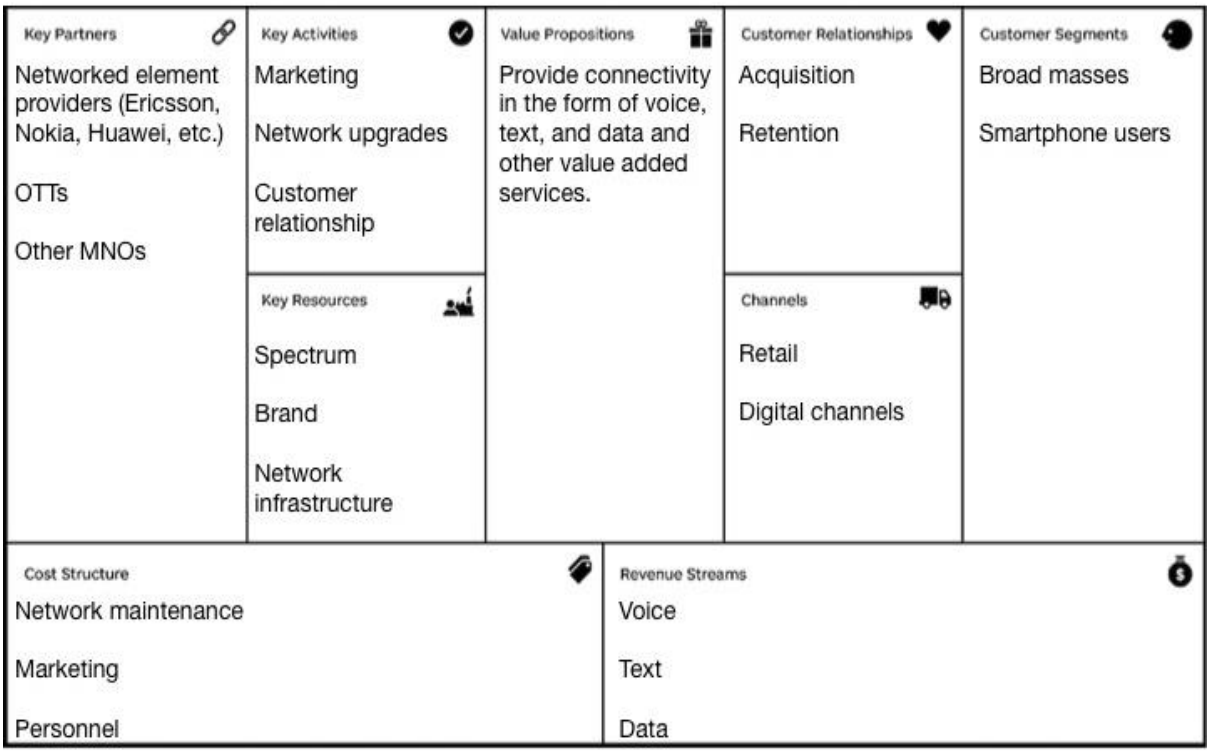

Figure 12. *The current business model of the Indonesian MNOs.*

5.3.1 Key competencies/ Success factors

Historically, the Indonesian MNOs have seen as their assignment to deliver the infrastructure and network over which their end-users can connect to each other as well as third party services. The network has been able to carry both legacy services, such as voice and SMS, but in later years also data traffic. As the amount of data traffic has grown, the MNOs have increased the emphasis on not only provide customers with connectivity but also enable a mobile digital lifestyle (Telkomsel, 2015; Indosat, 2015; XL, 2015; Wijaya, 2016).

To have good network coverage and strong network performance have traditionally been factors crucial for the success of MNOs (Houlahan, 2016). The network performance is often valued way above price, making it the most important factor for end-user (Ericsson, 2013; Houlahan, 2016). A good network performance and coverage require the MNOs to invest capital in the infrastructure, making the industry capital heavy and thus reliant on the scale of the MNOs (Welly, 2016; Bishry & Prihadi, 2016; Houlahan, 2016). As end-users are attracted by a good network performance, investments in the infrastructure give rise to new customers, which in turn give rise to increased scale. Thus the process can be seen as a continuous circle, beneficial for the MNOs who manage to get into it (see figure 13).

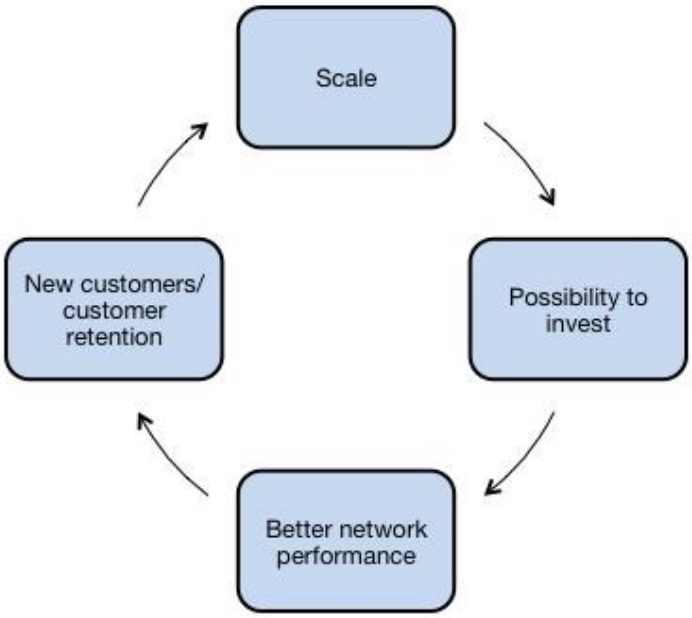

Figure 13. *How scale influences the performance of MNOs.*

However, even though customers are attracted to the MNO with the best network performance, the price is more or less set by the market. Since affordability is still a big issue in Indonesia, customers are good at comparing offers of different MNOs, resulting in people having multiple SIM-cards and choosing to use the one that has the best offer at every moment (Bishry & Prihadi, 2016). Hence, in order for the MNOs to be profitable it has traditionally been important to keep costs down and make efficient investments (Houlahan, 2016). The importance of cost efficiency has increased further with the entrance of data

traffic, since the price for each gigabyte is decreasing (Ericsson, 2016a). Thus, when a shift in technology generation has taken place, it has been important to attract users to the new technology in the cities it has been employed. E.g. more users on 4G without exceeding the capacity would mean that the investment and maintenance costs get spread out over more users that still pays the same price, resulting in a lower cost per user and hence increased profitability (Houlahan, 2016).

5.3.2 Value Creation

The revenue streams of the Indonesian MNOs come mainly from the retail of voice, text, and data to the end-users. Such mobile service revenue account for over 90 percent of the total revenue of the MNOs. In the first quarter of 2016, the revenue coming from voice ranged between 33-44 percent for the three largest Indonesian MNOs (Ericsson, 2016a).

The value proposition provided by the Indonesian MNOs today is very much directed towards the broad masses of end-users, even though smartphone users gain more attention due to their possibility to drive the data revenue. Beside smartphone users and non-smartphone users, the customers can be divided into different technology groups: 2G-users, 3G-users, and 4G-users. The 2G-users still amount for the largest installed base today even though the adoption of smartphones has increased the number of 3G and 4G users significantly (Ericsson, 2016a). 2G users are especially common outside of Java, where the telecom infrastructure is less developed (Aidi, 2016), however they can be found throughout the whole country.

Since mobile subscriptions in Indonesia almost exclusively are prepaid, it is important with marketing in order to reach customer retention. Special offerings to attract new customers and retain old ones are therefore common.

5.3.3 Operations Efficiency

The main cost of the MNOs is by far the network maintenance, followed by the costs of distribution, personnel, and marketing (Ericsson, 2016a). As stated earlier, it is necessary for the MNOs to make large investments in the infrastructure in order to stay competitive. Moreover, the situation with the distribution outlets makes the cost associated with distribution high.

Traditionally the Indonesian MNOs have been partnering with networked element providers such as Ericsson, Huawei, and Nokia. However, during the last years collaborations and partnerships with OTTs and other MNOs have come to play a more crucial role for the MNOs' operations (Aidi, 2016). Bundling offerings together with OTTs have helped the MNOs to offer more attractive services to the end-users, which have been important when attracting new data customers (Wijaya, 2016). To collaborate with other MNOs have been of importance for the smaller players in order to reach a better operational efficiency (XL, 2015).

The key resources of the Indonesian MNOs include their allocated spectrum. The spectrum is a scarce resource and one thing limiting the operations of the MNOs. To be regranted the

spectrum by the government and gain access to new spectrum in the allocation procedure are thus crucial for the MNOs continued operation (Effendi, 2016). Beside the spectrum, trust is important for the MNOs. It is upon trust they can build the customer relationship, which in turn is the basis of customer retention. Trust is built upon the brand name and the brand of each of the MNOs can therefore be regarded as a key resource. To keep the brand name and trust with the help of marketing and customer relationship is thus a key activity. Moreover, the network infrastructure can be regarded as a key resource since it is through the network the MNOs can provide their services.

5.3.4 Organizational Context

Houlahan (2016) states that in order to run a successful network, MNOs need high engineering capabilities and capital, something that they possess today. The organizations are built up in divisions, allowing the employees to gather expertise within specific fields. However, even if a clear organizational structure has helped the MNOs to aggregate the knowledge needed, it has also made it possible for internal division barriers to occur. Houlahan (2016) means that the Indonesian MNOs have the knowledge within their respective organization to take better investment decisions than they do today. However, the necessary knowledge is divided between different departments and flaws in the communication and collaboration between those departments make it hard to access the full spectrum.

MNOs base their investment decisions on careful analysis and planning in order to optimize the allocation of capital. These big capital investments that have to be successful have resulted in a culture that is not tolerant with failure. Houlahan (2016) says that if you study the most successful providers of digital services, they are constantly experimenting and do not mind that many of the initiatives fail. Further, he thinks that many senior executives in MNOs regard their culture as their biggest problem, as it is not suited for providing new innovative digital solutions.

Another problem faced by MNOs is that they have a hard time attracting young talents. Many new graduates have the desire to work in a company with a culture where experimentation and taking own initiatives are encouraged, and where things proceed quickly. As of today, the situation does not look like that within the Indonesian MNOs.

6. Data Monetization Strategies

Several strategies are currently being employed by Indonesian MNOs to adapt their business models to become more relevant in a data centric world. The MNOs have launched initiatives that focus on different aspects of their operations, and a single winning strategy cannot yet be seen. After going through written material from MNOs and stakeholders, and conducting interviews with a number of them, it could be concluded that the initiatives taken so far can be categorized into three main areas: core services, pricing strategies, and value-added services. Under the category of core services initiatives related to the core business of connectivity are found. The category of pricing strategies includes things like customer segmentation and alternative customer definitions. Those initiatives were found to somehow change the way the MNOs charge for their products or services. All the big Indonesian MNOs are today trying to extend outside their core business of connectivity to be what they call "digicos" (Indosat, 2015; Telkomsel, 2015). Initiatives taken to support this shift were categorized under value-added services. Partnerships were thought to be important for all of the categorized initiatives, wherewith it was put above all of them. The initiatives taken by Indonesian MNOs are summarized in table 2.

Even though Indonesian MNOs have undertaken a lot of initiatives to try to find ways to monetize on mobile data, there are still many more to explore. By drawing from the knowledge about the Indonesian market compiled in Chapter 5, some of those initiatives are discussed below together with the ones already taken.

Partnerships

Strategies to adapt business models to mobile data	Core Services	Pricing Strategies	Value-Added Services
Initiatives taken by Indonesian MNOs	- Network investments - Big Data & Analytics - Digitization	- Starter Packages - Unlimited Data - Differentiation among offerings - Sponsored Data & Zero-rating - Mobile Advertising	- Mobile Commerce - Video Content

Table 2. *A summary of the initiatives taken by Indonesian MNOs.*

6.1 Partnerships

The Indonesian MNOs are seeing a value in engaging in collaborations and partnerships with third party players such as OTTs, other MNOs, device manufacturers, and infrastructure providers (Foo, 2016; Indosat, 2015; XL, 2015). Partnerships with key players are identified by Ericsson (2014) as an important aspect of MNOs' strategies. MNOs who have a short-term

approach to their relationships, focusing on getting the best price and playing suppliers against each other, run the risk of steering away from the creation of new solutions and instead spend unnecessary efforts on negotiations. Top performing MNOs develop and maintain intelligent collaborations with relevant partners (Ericsson, 2014).

Today, many of the Indonesian MNOs partner with OTTs around offer bundling; they see a value in offering the services of chosen OTTs together with their own connectivity to end consumers (Foo, 2016; Indosat, 2015; XL, 2015). As an example, Telkomsel is bundling with HOOQ to allow its subscribers to access HOOQ TV content without the use of a credit card (Ericsson, 2016d). But OTTs are not the only type of collaboration partner for the Indonesian MNOs; device manufacturers, other MNOs, and infrastructure providers are also seen as valuable partners. Some examples of this is the Indosat-IBM partnership to develop cloud solutions (Ericsson, 2016c), the XL-Indosat collaboration to do active network sharing outside of Java (Indosat, 2015), the Smartfren-LG Innotek Indonesia collaboration to launch Mifi devices (Smartfren, 2105), and the Telkomsel-Xiomi partnership to offer high specification smartphones to affordable prices (Telkomsel, 2015).

Thus, Indonesian MNOs are in the phase of building and engaging in ecosystems by collaborating, investing in joint ventures, and undertaking acquisitions. This kind of ecosystem building can give the MNOs the possibility to exploit new revenue sources as well as give them the opportunity to become more effective in network investments. Nevertheless, Thompson (2016) means that the big OTTs do not stand knocking on the doors of the MNOs; it is still a fight to drive those potential high-value collaborations for the MNOs.

6.2 Core Services

The initiatives below have to do with the core business of the MNOs: providing connectivity. By using their network assets and capabilities, the Indonesian MNOs are looking into how they can improve the user experience. Today, end-users are the main source of revenue for MNOs, wherewith it is of high importance how they perceive the quality of the network.

6.2.1 Network Investments

Houlahan (2016) stresses the importance of MNOs' network performance as an important determinant for success. Those MNOs that provide the best application performance, which is driven by the underlying network performance, have been the winners on today's market. He further states that in consumer surveys, they consistently see that consumers value network performance above everything else.

The network has traditionally been the most valuable asset for all MNOs and will continue to be so when data drives growth. Foo (2016) means that network performance will probably become even more important as people get less tolerant with network failure when using data compared to e.g. SMS. At the same time as investments in the network become more important than ever in order to keep customers, the money is not always easily accessible. To

build a good quality network over large areas is costly and the investments therefore require planning to be done as accurate and effective as possible.

Thompson (2016) means that the big difference when trying to optimize the network performance for data instead of voice is the difference in congestion. When people use voice, the network reaches a point where it very rapidly gets congested. However, with data this is not the case. Instead the available bandwidth is divided between all the users on a BTS; the more users there are in an area, the less bandwidth they get. As the number of users on the same BTS increases, the performance gets worse. The difficult question then becomes to decide when the performance is too bad, i.e. when do they need to upgrade that cell. To handle this, Thomson (2016) explains that Indosat has started to set targets for the capacity users should get in the different cells. In the past the investments in the network were made more reactively; when the network was overloaded someone tried to do something about it. However, Borg (2016) means that it is easier to motivate the reactive investment than the proactive ones; when customer care gets complains it is very direct feedback, but to base the investments on logical forecasts is probably a better use of the money.

Another way to optimize investments in the network is by trying to identify the high-value customers and optimize the network after them. Houlahan (2016) means that since MNOs often get the majority of their revenues from a small customer base, an effective way to invest would be to make the network experience superior for the high-value customers while only making it decent for the rest. One Indonesian MNO employing such a strategy is Telkomsel. Telkomsel has launched an initiative that gives their postpaid, high-value customers, priority in their network. However, Foo (2016) explains that even if this was a differentiator in the beginning, the postpaid customers have during the last 18 months started to take this for granted. So instead of making customers happier, it has actually increased the customers' expectations on the network quality, making them more difficult to meet. Indosat are also trying to look at those kind of value-based investments. Their marketing team has created subgroups of customers, trying to find out where they use their phones and from that create suggestions for investments (Thompson, 2016). To optimize the network for high-value customers, Houlahan (2016) further means that it requires close collaboration between the marketing team; who has the customer insights, and the network planning team; who makes the actual investments, something he means is not always the case.

According to Thompson (2016) they also see a problem that when they increase the capacity in the network they almost immediately get higher volumes of data traffic. However, the increase in revenue is not proportional; if the traffic goes up with 33 percent, the revenue might only increase with 5 percent. He further means that this probably has to do with the investments being made in areas where people do not fully utilize their existing data packages, i.e. if they use 5 out of 10 GB before the investments in the network; they start using 8 GB afterwards instead. This means that the revenue is not increasing. Instead MNOs need to find out where the utilization of the data packages is high so when they add capacity the users buy an additional package. To do so might mean further collaborations between marketing department and network planning team.

Another challenge with network investments for dealing with increased data volumes is the accuracy of the forecasts. The investments in BTS and other network components are commonly done based on forecasts done one year in advance. However, as the data usage in Indonesia is rising very quickly, and the MNOs are engaged in large promotion campaigns where they are giving away data cheaply to increase usage even further, the forecasts are often wrong (Thompson, 2016). An additional implication of the quick and unpredictable rise in data traffic is that the MNOs somehow lose control over the network performance. According to Thompson (2016) this has the effect that it gets hard to do very precise things like optimizing QoS to certain applications or high-value groups; to do so would mean to claim to be more precise and organized in terms of network than what they actually are. Consequently, when the market growth stabilized it will be easier to make such prioritizations.

6.2.2 Big Data and Analytics

One tool that can help MNOs is analytics of big data. Today, the massive amount of existing data combined with cheap computing power and new algorithms make it possible for MNOs to use analytics to improve their businesses (McKinsey, 2016). According to McKinsey (2016), advanced analytics will provide a big change in the organizations of MNOs, and can be utilized to improve the entire value chain. By gathering data about the customer experience, the MNOs know when and where they need to improve the network (Ericsson, 2014). If MNOs manage to use advanced analytics on their continuously collected data it would be possible to predict customer behaviors and enable a more accurate prediction of churn, facilitating a decrease of capital expenditures (McKinsey, 2016). Customer churn is problematic for MNOs and their efforts are often expensive and inefficient. Through the use of analytics, the costs for customer retention efforts can be reduced. An MNO can find those customers that show the highest likelihood to churn and target their efforts on them, instead of using retention resources proactively on all their customers.

However, according to Houlahan (2016) the Indonesian market do not necessarily need to analyze big data per se to improve the performance and customer experience. He means that big data is more a tool for fine-tuning. But even if big data might be a tool for fine tuning when it comes to network performance, it can be used as a knowledge base in other situations. Telkomsel is right now looking into how the can further monetize on their tremendous amount of customer data (Foo, 2016).

6.2.3 Digitization

Customer relationships are one of the key assets of the MNOs (Osterwalder & Pigneur, 2011), and something they have learned to master for years. However, with the digital age comes the opportunity to fully digitize their approach to customer relationships in order to meet the demands on customer service and to reduce operating expenditures (McKinsey, 2016). The big challenge is to actually get people to use the digital channels rather than continue to rely on traditional call centers and in-store help desks. MNOs often lag behind top performing

brands when it comes to the digital experience and digital customer service (Ericsson, 2016a). According to research conducted by McKinsey (2016), customers often think that the MNOs' digital customer service channels are too complicated and complex, leading to customers getting stuck in the process and eventually turning to call centers or in-store services anyway. Ericsson (2016a) found that in order for MNOs to be able to monetize the benefits derived from digital customer service, the digital experience needs to be intuitive for the customers.

Telkomsel is one of the Indonesian MNOs that have taken a leap forward in digitizing the customer experience. In early 2016 they launched their customer relationship application myTelkomsel, something Foo (2016) means will help them improve the entire customer journey. Since launching the app, Telkomsel has seen an increase both in transactions done using the phone, but also customer engagement in general. They further see myTelkomsel as an important part in customer experience, something they mean can help both overcome customer disloyalty and to increase the ARPU.

6.3 Pricing Strategies

Pricing strategies are among the most powerful tools MNOs have to regulate the revenue (Cisco, 2014). How MNOs choose to price a service will decide what function that service will have for the MNOs' business models. Pricing strategies can differ depending on what service it concerns or to what customer segment they are directed towards.

Traditionally, MNOs have utilized a strategy where they have been charging customers for voice while selling data cheaply. However, ever since the data consumption started to increase rapidly, many MNOs are undergoing a transition to instead charge for data, selling voice more cheaply to the customers buying data. This transition has already taken place in the Western world, but Indonesian MNOs are just starting to feel the necessity to change (Thompson, 2016; Borg, 2016). However, as long as customers are not bound to a specific MNO, it is hard for a single MNO to alone drive such a change.

6.3.1 Starter packages & Unlimited Data

The change in pricing strategy is partly stalled by the historical price war between the MNOs and the resulting tradition of marketing very cheap starter packages (Thompson, 2016). Since the churn rate of customers is very high in Indonesia, customer acquisition takes up a lot of the MNOs resources. Starter packages have been one way to attract customers (Telkomsel, 2015). However, as the customers are not guaranteed to continue with the same MNO after the starter packages have run out, they are never turned into more valuable customers. Instead of topping up their data package when it is used up, customers just switch to their second or third SIM-card (Borg, 2016).

Moreover, to attract users to their 4G network some MNOs have launched offers of unlimited data plans (Indosat, 2015; Smartfren, 2015). With unlimited data people are allowed to buy a package that allows them to download an unlimited amount of data. However, since this has

led to congestion in the networks of many MNOs and low monetization on the data traffic (Borg, 2016; Thompson, 2016), it is today not widely implemented.

6.3.2 Differentiation Among Offerings

A strategy pursued by Indonesian MNOs is the provision of different brands targeted to different customer segments (Telkomsel, 2015; Indosat, 2015; XL, 2015). Each brand package tries to adapt to the way of life of the targeted segment. Factors such as data allowance, speed of connection, number of devices, and extra services, are combined differently in offerings, thus ensuring a more tailored alternative for specific customer segments. By trying to optimize revenues from different customer segments, instead of relying on "one-size-fits-all", the MNOs can earn more revenue from those segments less price sensitive, willing to pay for great service and customer experience (Strategy&, 2015).

Shared data plans are one way in which additional value is provided through differentiation of offerings. One example of such a plan is Telkomsel's LOOP Sharing-an that allows users of the Telkomsel brand Loop to buy mobile data that they can share with 3-5 friends (Telkomsel, 2015).

6.3.3 Sponsored Data & Zero-rating

Other pricing strategies that are appearing in Indonesia are the ones of zero-rating and sponsored data. The former is when MNOs do not charge for data used in specific applications. This means that the MNOs bear this cost, but can benefit from attracting new subscribers or improving the loyalty among existing customers (GSMA, 2016). Zero-rating is employed by e.g. Telkomsel in their product Halo Fit for the postpaid brand kartuHalo where they allow users to get free access to certain OTT apps (Telkomsel, 2016a). Sponsored data is when a third party, i.e. a sponsor, pays for the data traffic to e.g. certain sites or when watching a specific video. Hence, sponsored data would allow developers, OTTs, and other content providers, to subsidize data usage of subscribers. The difference in this case, compared to zero-rating, is that the MNOs are not giving away anything for free, they just let a third party pay for it. According to Thompson (2016) discussions are taking place between the MNOs and suppliers to solve the issue of sponsored data technically. However, the problem of implementation does not lie in the technical aspect but in the interest from the OTTs. Thompson (2016) further means that the OTTs are not eager to pay for an increased QoS to their sites or apps. He means that it partly lies in the interest of the OTTs to reduce MNOs to marginal players, giving a larger share of the pie to the OTTs themselves.

A large part of the Indonesian population lives in, or close to, poverty. This has led to that the Indonesian MNOs have had to rethink how to access this part of the market. Indonesian MNOs are today offering micro packages of data and voice to cater for this segment (Houlahan, 2016). However, according to Suri (2016), it is not enough that the MNOs offers data packages in smaller sizes to engage the poorer segment of the market in data usage. Even if data is sold in smaller and thus cheaper packages, the applications will still require the same amount of data, hindering people to use them. Instead the whole ecosystem has to be

rethought. Indosat-Ooredoo has started to work together with Facebook with their initiative Free Basics (Indosat, 2015), a platform which offers very basic versions of applications or sites (internet.org, 2016). By offering lightweight versions of applications such as Facebook, users can visit the site without using any of their data. Thus, consumers without a data plan can access it. However, Suri (2016) means that even though this kind of service is a good start, for it to be sustainable it has to be profitable for the MNOs; they have to find a business model that helps them grow.

6.3.4 Mobile Advertising

With an increased amount of time spent on mobile devices instead of traditional devices such as TVs, the mobile advertising market is facing continuous growth (GSMA, 2016b). The broadcasting and media industry have successfully managed to incorporate, if not fully build, their business models on advertising; tapping into other revenue streams than subscriptions by searching for new ecosystem opportunities (KPMG, 2011). MNOs have multiple assets that can help them monetize the mobile advertising opportunity. As discussed earlier, MNOs have access to vast amounts of customer data, both primary data given away when the customers sign up to the MNOs as well as location data, whenever the device is connected to the network. However, Foo (2016) means that the primary data received when the customers buy a SIM-card is not necessarily correct, since it is never double-checked against any database. If the MNOs could get access to correct data they would be able to, by combining location, direction, and demographical data, send out targeted coupons to customers that meet specific criteria (GSMA, 2014a). By selling their knowledge about the customers to third party companies, the MNOs can gain complementary sources of revenue (Cisco, 2014).

Houlahan (2016) states that today, MNOs get almost none of their revenues from advertising. Although he sees potential for improvement in this area, he also stresses that they have a disadvantage compared to OTTs such as Google and Apple. The OTTs will have access to most of the information that the MNO have plus additional information stemming from the usage of their services. Moreover, Foo (2016) points out that the OTTs often require the users to sign up using confirmed personal information, which the MNOs do not have access to. Thus, they can offer a more accurate picture of consumer preferences to advertiser than MNOs possibly could. Another problem is that the total spend on advertising in Indonesia is only a fraction of the total spend on mobile data. According to estimates by Google the Indonesian digital advertising market was $300 million in 2015 (Reuters, 2016).

6.4 Value-Added Services

Value add-ons are another thing that is used by the Indonesian MNOs to try to increase the value of their offerings (Telkomsel, 2015; Indosat, 2015). These value add-ons come in many forms, and could be e.g. media services, mobile commerce, or cloud storage.

6.4.1 Mobile Commerce

Services related to mobile commerce have been launched by many MNOs in the world (GSMA, 2014), and provide a way for them to create a focal role in a new ecosystem and leverage their key capabilities (KPMG, 2011). MNOs can use their status as a trusted party to provide security in transactions through the phone or other devices. The MNOs can provide authentication and a secure connectivity between a customer and a merchant, ensuring that all personal information is encrypted (GSMA, 2014). MNOs can also facilitate effective loyalty schemes and couponing for merchants.

Houlahan (2016) sees a major problem in Indonesia today when consumers want to make purchases online. Since only a small proportion of the population owns a credit card, people have no means to pay for their goods. Buying something online without a credit card today is very complicated, where the consumer must first buy a code and then go to a bank to make it happen.

Houlahan (2016) believes that the process of buying something online could be simplified considerably and identifies payments as one of few areas where MNOs could actually have an advantage compared to OTTs. According to Foo (2016), MNOs have the advantage of their billing relationship with the end customer, something the OTTs lack. The payment solutions provided by Apple and Google are based on credit cards, which means that they could only be used by a small percentage of the Indonesian population. If MNOs find a good solution, they could possibly charge a few cents per transaction, and as the volume increases over time, this could result in a new source of revenue. However, even though Houlahan (2016) thinks there is potential to get additional revenue from this area, he do not believe that payments are the future of Indonesian MNOs, but rather that it could increase their revenues by 2-3 percent.

On the issue of MNOs offering mobile banking services, Houlahan (2016) says that it has been done successfully in certain markets, with Bangladesh being most prominent. The MNOs in Indonesia started a collaboration with Bank Indonesia, the central bank of the country, a few years ago. However, the MNOs have been very quiet about this initiative recently so little is known about how it is proceeding. Houlahan (2016) also questions the potential for mobile banking, since the assumption that unbanked people want to become banked is not necessarily true; a large portion of the population is living on their daily salaries, meaning that they have no need for storage of their money.

6.4.2 Video and Content

Historically, MNOs have made several efforts to monetize different types of content, by selling ringtones, games, and music. With video accounting for 54 percent of global data traffic in 2015, it is becoming an increasingly important source of revenue (GSMA, 2016). There are two major pathways that can be followed by an MNO that wishes to monetize on this growing trend (GSMA, 2016b). The first one would be to bundle their offerings with various kinds of content, where the MNO only serves as the provider of connectivity. This approach has the potential to increase the data consumed by customers, while also improving

brand and attracting new subscribers through new competitive offerings. At the same time OTT players can leverage the close customer relationship and billing services of operators to reach new customers or enter new markets. The benefits of this approach are that it is a relatively low risk associated with it and it does not require any substantial additional investments. As discussed earlier in the chapter, Indonesian MNOs are already bundling offers together with OTTs.

The second path would be to integrate vertically by creating a proprietary platform for content delivery (GSMA, 2016). A platform that manages to attract users would provide the MNO with the benefit of increased data consumptions, just as the bundling strategy, but also enable it to monetize on the actual usage of the platform by their customers. These cash flows could stem from subscriptions, pay-per-view fees, or from advertisers.

7. Business Models for Mobile Data

This chapter analyzes the MNO business model and offers suggestions for how different parts can be improved. Further, it discusses two possible ways forward with different implications; should MNOs remain a provider of connectivity or become a provider of a digital ecosystem?

7.1 Improving the Business Model

Realizing that the shift from voice to data is inevitable, the Indonesian MNOs are facing the question of who they should become in the new data centric world. A major decision that needs to be made is if the MNOs should be only a provider of connectivity, or if they should alter their business model and also become a provider of a digital ecosystem. It seems like Indonesian MNOs, in their communication to stakeholders, have intentions to become leading "digicos", even if it is unclear what that they actually mean with that. Today, all the big MNOs have launched various VAS, but they still only account for an insignificant part of their revenues.

Irrespective of if Indonesian MNOs choose to become a sole provider of connectivity or providing additional VAS, it seems like there are areas in the business models that can be changed or improved. As discussed in Chapter 2, Lindgardt et al. (2009) mean that an innovation of the business model takes place when two or more blocks of the business model are innovated. To focus on the core business, abandon VAS, and become a provider of connectivity would not imply a business model innovation for the Indonesian MNOs. They would withdraw from some of their initiatives and instead focus on their core: connectivity. Instead of a total business model innovation, the suggestion is that the Indonesian MNOs act even more effective and efficient in their doings, trying to streamline the planning and actions taken. However, engaging in VAS in addition to connectivity would require the MNOs to reinvent some parts of their business models to fit the additional services. Moreover, it implies the persuasion of multiple business models simultaneously.

What the choice really means for the Indonesian MNOs is to decide what to differentiate on. As of today, the low degree of differentiation among their offerings is leading to disloyal customers and consequently hurting their profitability. In the next section, suggestions for how different parts of the business models could be changed are presented. Further down the chapter, implications and challenges with the different choices are presented.

7.1.1 Value Proposition

Instead of providing voice, SMS, and data, as MNOs do today; the future will most certainly be centered on the provision of data. Even though the decline of voice and SMS revenues is painful to the MNOs, it is in the long run inevitable. Monetizing data better could mean smarter offerings that differentiate the service in various ways, e.g. data allowance, speed, QoS, support for multiple devices, etc. If an MNO choose to be a provider of a digital ecosystem, there is also potential for MNOs to provide VAS of different kinds and thus create

new revenue sources. When considering the Indonesian context, two areas look particularly promising: mobile payments and content platforms.

The current situation in Indonesia makes mobile payments an attractive opportunity for MNOs. When considering mobile payments for physical stores, there is likely few benefits compared to paying with cash or credit cards. Instead, the opportunity lies in mobile payments for digital and physical goods online. The big problem in Indonesia is that it is very difficult for people to buy things online, as the majority does not have a credit card (Houlahan, 2016). So even if there is a demand to buy things online, the process is complex and involves many steps, where customers would have to visit a bank each time they want to make a purchase. Thus, there is considerable potential to simplify this process. There are already mobile payment solutions offered by some of the big OTTs. However, these have a great disadvantage since they are all card based, meaning that without a credit card they become useless. Therefore, there is a potential for MNOs to provide their own payment service. This has already been done by some of the MNOs, and they have the advantage that people can load their SIM-card with credits, which can further be used to purchase goods online. A problem with MNOs providing mobile payments would be the local scale of it; it might only be compatible in Indonesia and might only be used to buy goods from local companies. A possible solution to this problem would be for MNOs to collaborate with selected OTTs and allow the MNOs customers to pay for OTT services with their mobile credits.

Another possible VAS is to provide some kind of content platform. As there is intense competition in this domain, MNOs would likely have to differentiate their own platform in a meaningful way to be able to compete with other solutions successfully. As net neutrality is not enforced in Indonesia, it could be possible for MNOs to provide their own platform with better QoS. This would give them an advantage compared to OTTs. It would also be possible to apply zero-rating for their own platform. This would allow their customers to use their platform without consuming their data, and revenue could be derived from subscription fees or more likely advertising. Since most consumers in the market are very price sensitive, this could help to increase the adoption of the platform. There is probably higher potential for MNOs to offer a platform with content that is not user generated since it would be hard to compete with global platforms that have a larger user base. Thus, it would be a significant disadvantage since less content would be available. One possible focus and differentiator could be for the MNOs to offer content in Indonesian; something that would address the current problem that little material on the internet is available in Indonesian languages.

7.1.2 Customers & Revenue

A problem seen in the Indonesian market today is that MNOs are monetizing voice and SMS rather well, but have not yet managed to do the same with data. Instead data has been given away very cheaply to attract customers to the new networks, helping to decrease the high fixed costs associated with network upgrades. Converting customers to modern networks is good business for the MNOs, since the cost per megabyte is lower on these (Houlahan, 2016). However, many MNOs have been too eager converting their customers to these networks,

offering packages with unlimited or close to unlimited amounts of data. As a result, their next generation networks have already become congested, while additional revenues remain low (Thompson, 2016). Thus, more rational pricing strategies seem like an important solution to mitigate this problem.

Traditionally, the MNOs have been very focused on the end-users for revenue. As long as the number of people using data is increasing, revenues from end-users will continue to increase. However, as large parts of the end-users are very price sensitive it can be cumbersome to increase the revenues substantially from this group when the market saturates. Consequently, the Indonesian MNOs need to abandon the view that the end-user is the sole customer and look beyond them to find new sources of revenue. If the MNOs choose to only be a provider of connectivity, OTTs could become valuable partners, since they will be the ones providing large parts of the value of the connectivity. Additionally, OTTs could become paying customers. From a technical perspective it is possible to differentiate the QoS dependent on the application or website used (Thompson, 2016; Borg, 2016). Since Indonesia is a country where net neutrality is not enforced, and it does not seem to change in the near future, there are no regulatory issues of doing so. The challenge would be to convince the OTTs that differentiation based on network quality is a good idea, as they do not seem too eager to collaborate on that right now.

An alternative would be that the MNOs take parts of the increased advertising revenue from the OTTs as payment for improving the QoS to their sites, something Indonesian MNOs are already discussing. Another way to engage OTTs as customer would be through sponsored data. As sponsored data is not a new phenomenon it might be easier to start with. By letting the OTTs pay for the data carried to their sites it would allow the end-users, which are the customers of both the OTTs and the MNOs, to use the OTTs' sites more frequently, increasing the revenue for the OTTs. This would be especially applicable in Indonesia as the end-users are very concerned with the affordability of data.

As the consumer class in Indonesia is growing rapidly, the market for advertising is likely to also expand. Potential customers would be companies that want to buy advertising or consumer data. The MNOs have access to information about what kind of phone, location, and apps are used by their customers, which can be valuable information. By selling consumer data, MNOs will compete directly with OTTs such as Google and Facebook. Even though the MNOs have valuable information, the problem is that the OTTs usually have access to the same data plus even more; data obtained from the usage of their apps. This provides them with a more comprehensive picture of consumer behavior and preferences, and their offers then become more valuable to advertisers. Another problem that is tied more specifically to the Indonesian market is that the MNOs do not have personal details about their customers, since this is not given as the customer buys a new SIM-card. However, there is an upcoming regulation that will make it necessary to provide accurate personal information in order for the SIM-card to work (Bishry & Prihadi, 2016). One advantage that MNOs have compared to OTTs is that they can send promotions to all their customers by SMS, there is no need to have a specific app installed as is the case for the OTTs.

One way to increase the revenue coming from the existing user base is by transferring the ones categorized as high-end customers from prepaid to postpaid data plans. As shown in previous chapters, postpaid customers are often more loyal and have a higher willingness to pay. However, the mindset among the people makes it hard to convert prepaid, disloyal, customers to postpaid, loyal, ones. Thus, the relative advantage of changing to postpaid needs to be very high in order for the MNOs to persuade customers to change. As of today MNOs fail to do so, resulting in that potential high-value customers stay with prepaid solutions. To offer discounts on smartphones when signing up for a postpaid contract is one way this has been handled in the U.S. and Europe (Foo, 2016). Looking into the possibilities of offering Indonesian customers similar incentives could be an alternative way to go. A shift to postpaid would mean a reduced bargaining power among the end-users, since they become more loyal. However, it would also mean a reduced bargaining power of distributors, as the number of disposable SIM-cards would decrease.

7.1.3 Channels & Customer Relationship

As seen in Chapter 5, the customer churn rate and distribution of SIM-cards are big costs for the Indonesian MNOs. To enhance the user interaction is one way to make customer more loyal, and thus bring down costs of distribution. This is something that the MNOs have already started doing by improving their digital channels, as seen in Chapter 6. Bringing customers from the traditional behavior of buying new SIM-cards whenever they expire, to actually filling them up or extending their packages, have the possibility to both decrease the distribution costs and increase the ARPU. In order to make people use the digital channels, these have to be seamless, interactive, and intuitive. Continuing the improvement of digital channels and being reactive to the thoughts of customers will be important for the future. However, many people in Indonesia are unbanked, which raises questions about how to pay for services bought on digital channels. In contrast to international OTTs, Indonesian MNOs have a system for customer billing to elaborate on, which they can use to allow customers to increase their balances also on the digital channels.

Even though end-users seem to have good knowledge about existing offers, the competition among Indonesian MNOs is fierce and it is therefore important to be clear in the communication to the customers. One way to make sure customers are only getting those offers that are most relevant to them is to use the customer data already available to the MNOs. This is not something that is new to Indonesian MNOs; initiatives in those areas are already taken. However, as data has lowered the switching costs of consumers even further compared to legacy services, it is important that the MNOs make it as easy as possible for the end-users to choose their particular offer.

7.1.4 Key Partners

There are several types of partnerships that MNOs could benefit from. One of the most discussed and debated issues in Indonesia today is if the government will allow MNOs to share the active part of the BTS, which would lower the cost of expanding the network, thus

also lowering the entry barriers for areas outside of Java. Moreover, there are potential partnerships that could help increase MNO revenue. By collaborating with device manufacturers, MNOs could lower the barriers for their consumers to buy a smartphone or a more modern smartphone, something that is likely to increase data consumption. As MNOs currently do not offer postpaid subscriptions with discounted smartphones, there is room for improvement. A major problem today is that there are few benefits associated with buying a postpaid subscription, which can be observed since even many high value subscribers that can afford postpaid subscriptions still choose to use prepaid subscriptions. Collaborations with OTTs have the potential to improve the value proposition of MNOs, and bundles can be created to increase data consumption and decrease administrative costs.

There is also an opportunity for collaboration with OTTs to provide better QoS. Net neutrality is not enforced in Indonesia today, and since regulations have a history of succeeding the actual business practice, there is potential for MNOs to experiment with this. If an OTT is given better quality of service than other OTTs, and they increase their revenues from this, the MNO could either charge the OTT directly for prioritizing their data or they could share the increased revenues that stem from the collaboration. For instance, additional advertising revenues could be shared between the partners. Moreover, MNOs have an asset that is valuable to the OTTs, namely their distribution channels. A collaboration that allows OTTs to use the existing distribution channels would provide a way for OTTs to charge for their services; something that is very hard for them today. As the regulatory authority in Indonesia is drafting suggestions for regulations forcing the international OTTs in to collaborations with the Indonesian MNOs, this kind of collaboration can be considered timely.

If Indonesian MNOs choose to provide VAS in addition to connectivity they are faced with the challenge of deciding which services should be done in-house, which should be outsourced, and what can be acquired. As some services might be best provided by third parties while others could be supplied by the MNOs themselves, the MNOs will end up in a situation where they need to collaborate and compete with OTTs simultaneously. This situation can even arise with the same OTT, as partnerships in some areas do not exclude that they can be competitors in other. Such relationships are however not exclusive for the telecom sector but rather something that exists within all ecosystems. However, to be aware of the situation and have strategies for how it should be managed is essential for engaging in successful partnerships.

7.1.5 Key Activities & Key Resources

The network will continue to be the main asset of the Indonesian MNOs, and having a good network coverage and strong network performance will be factors crucial for success. As the volume of data traffic is increasing rapidly, investments in the network will be a key activity in order to meet customer expectations and remain competitive. Continuing the search for ways to optimize network investments will therefore be a key activity in times to come. To monetize on the increased data consumption, it is most likely going to be necessary to optimize the network after the high-value consumers. It might be required to allow network

performance KPIs in certain areas to be poor while improving already good ones to become great. In order to do so, the Indonesian MNOs need to build a culture of strong collaboration between the marketing and the network planning departments of the business. Such a collaboration would not only provide the ones making the network planning with valuable information of where the paying customers are, but also make it possible to coordinate the actions of the marketing team with the actual capacity of the network, avoiding congestions caused by marketing initiatives.

Trust will continue to be a key resource to Indonesian MNOs because of the same reasons as it is today; it creates loyal customers. Likewise, the brand will be an important asset to attract and retain customers. However, many initiatives created to attract customers and build the brand have centered around cheap starter packages which have led to price wars to various degrees. To monetize the increased data volumes, MNOs need to be smart about their marketing campaigns so that they can avoid the current situation where they are adding more data traffic without seeing the same increase in revenue. Conducting smart marketing further implicates that the marketing team needs to run close collaborations with the network planning function. Both to ensure that the investments are made where the data packages are already fully utilized, as discussed in Chapter 6, but also to make sure that they are not adding customers where the network cannot handle it.

Since there are still a lot of uncertainties surrounding VAS, the development of VAS requires MNOs to be adaptive in their approach. As it does not seem to be one VAS that will make up a majority of the MNOs revenue, but rather many smaller initiatives, MNOs are forced to be sensitive to what is happening around them: what competitors are doing, what technical possibilities there are, and customer preferences. I.e. they have to continuously adjust themselves to new opportunities and conditions. Hence, in order to be successful with VAS the Indonesian MNOs cannot be afraid of experimenting and exploring new services and ideas, wherewith these become key activities.

However, as Lindgardt et al. (2009) point out; it is not the companies that are the first to come up with an idea that necessarily have to be the ones succeeding with it. In order to be successful with VAS the Indonesian MNOs have to find effective processes of scaling lucrative initiatives. This includes to be able to, in a flexible manner, reallocate resources to the projects needing them at the moment. The fact that the MNOs are not going to be successful with every launched initiative does also implicate that they have to be good at sensing when it is time to abandon an initiative. To linger with an unfruitful VAS can mean that a lot of money is being lost without the initiative ever taking off. Thus, the MNOs must create a culture where experimentation is encouraged and failure is not punished.

As the MNOs try to monitor the external environment to capture industry trends, the customer relationship gets even more important. The customer preferences will be the one thing deciding if a VAS initiative is going to be successful or not, hence to incorporate the customers into the innovation and evaluation process will be important.

7.2 Differentiation

Porter (2008) meant that profitability is likely to be highest when companies compete on different dimensions and serve different markets segments with different needs. One challenge the Indonesian MNOs are faced with today is the low degree of differentiation among their offerings. As seen, this has led to disloyal customers and succeeding price wars. The shift to data offers the MNOs two fundamental ways to differentiate; either they can work on their network performance and use this as a differentiator, or they can alter their digital service offering to provide customer with outstanding VAS and become a digital ecosystem provider. Even if both scenarios would require the MNOs to engage in the building of networks, the approaches require different views on what the network actually means. If differentiating on network performance the network will be the end in itself, while differentiating on VAS would imply that the network would serve as a means to an end rather than be the end itself. Hence, depending on what the MNOs choose to do, they will face different implications and challenges.

7.2.1 Differentiating on Network Performance

An MNO deciding to put their main focus on network performance would primarily become a provider of connectivity. Connectivity should not be regarded as a commodity today in Indonesia, as there is a high variance in QoS between MNOs, and consumers currently seem to value network performance above much else. In the Western world, connectivity and network performance are less powerful differentiators and it is likely that this will eventually become the case in Indonesia as well. The implication is that in order to be profitable, the MNO must leverage the five forces to their favor or differentiate their offering in a meaningful way. The forces identified as strong in the Indonesian market are the rivalry of incumbent firms, the bargaining power of buyers, and the threat of substitutes. If considering only the provision of data, the latter becomes irrelevant. The key to superior performance would then, as is the case today, be closely tied to scale. The bigger an MNO is, the easier it becomes to tackle the rivalry among incumbents and obtain higher bargaining power toward distributors. However, only one MNO can be the biggest. If considering the mobile telecom industry in general, to improve average profitability, consolidations must happen since there are too many active MNOs for the industry to experience healthy profits. Also, in order to reduce the bargaining power of the distributors, it is essential that people get access to digital money, which would make it possible to circumvent to the highly inefficient distribution through outlets that is the reality today.

Being a provider of connectivity would thus mean taking a very classical approach to strategy, where you position yourself in the industry and try to find a sustainable competitive advantage. Being big and leveraging on the scale would then be the big competitive advantage. Since scale issues more scale, as seen in Chapter 5, it can somewhat be seen as a sustainable competitive advantage as long as the industry stays the same. Reeves et al. (2015) mean that this kind of strategy is best conducted by analyzing the industry, plan how to go forward, and then execute the plan. By analyzing the current situation of the firm, the MNOs can get a picture of what is their current competitive advantage - why do customers choose

them? - and by that understand where they have to put effort in the future to sustain that advantage. The analysis is then the basis for the plan, which tells the MNOs what has to be done. It is important to have a long term plan to work on since the classical approach is a lot about optimization of activities. If the plan changes too frequently, the MNO might lose some of the advantages they have already built up. This thus leads up to the execution of the plan, where every part of the organization should be focused on achieving the set goals efficiently.

As this type of strategy very much builds on the five forces framework it is adapted to an environment and an industry that is relatively stable and predictive. The big challenge when trying to apply such a strategy in the Indonesian telecom industry is that the usage of data is increasing substantially, as more and more people get access to a smartphone. As Thompson (2016) mentioned in Chapter 6, it is very hard to plan the network in beforehand when you do not really know what the demand will look like in the future. However, even if the industry faces a change in required data volumes, the demanded "service" is still the same: connectivity. As the Indonesian market is characterized by low penetration of fixed broadband, the MNOs will still be the main provider of connectivity in the future, meaning that the competitive dynamics around connectivity will not change considerably. I.e. there will not come any disruptive players offering ways for the users to circumvent the MNOs, there will continue to be a demand for the Indonesian MNOs to provide connectivity. Hence, even if it is difficult for the MNOs to make accurate predictions about future demands, the environment and industry itself is relatively stable and predictable.

Since the presented business model is very similar to the ones traditionally employed by the Indonesian MNOs the culture and processes are to a large degree already there. As this kind of strategic approach relies on quite a static source of advantage, it is possible to build up very specialized capabilities; if you do the same thing over and over you are going to build your capabilities within that field. Hence, Reeves et al. (2015) mean that organizations taking the five forces approach to strategy often have a high degree of specialization so that employees have the possibility to accumulate expertise over time. This is a tradition that has been employed among the MNOs as well, as different divisions have been able to acquire expertise within their respective field. The challenge when doing so is that it sometimes creates barriers for collaboration between the departments, as everyone is very focused on what they are doing. Such barriers can make the MNOs miss out on opportunities to make the business run even better, which can somehow be seen among the Indonesian MNOs today.

Another challenge with this approach is that it is hard to differentiate between actors. The player that manages to accumulate the most scale will probably be the one that can offer the best network nationwide. If smaller players want to compete on the same premises their only option is to focus their efforts to a specific geographical area or a specific customer segment. However, since this kind of business very much depends on scale to accumulate capital for investments, the biggest player might be able to react and outcompete smaller players even if the attempts are made regionally instead of nationwide. Thus, the market might only have few spots for MNOs to compete only as a provider of connectivity.

7.2.2 Differentiating on Value-added Services

If an MNO chooses to go beyond the traditional scope of being a sole provider of connectivity and aim to become a provider of a digital ecosystem, this would implicate that it would pursue two business models simultaneously. The model for how to grow the digital VAS services are very different from the model of the core, wherewith substantial innovations take place here.

While also offering value-added services, the MNO must decide which services that should be done in-house and which that should be offered through a collaborating company. If it should be rationalized for an MNO to engage in in-house development of VAS, then there ought to be synergies with the resources and capabilities of its core business. Usually, one of the most important resources of MNOs is their customer relationship, which could be leveraged to improve the performance of VAS. However, there is limited potential for this in Indonesia, since the great majority of customers buys new subscriptions every time.

Another synergy would be to offer higher quality for proprietary VAS, helping to improve the user experience. There is limited potential in most of the Western world for this option, as it violates net neutrality, but it looks considerably more attractive in the Indonesian context. A great advantage for MNOs compared to OTTs, is that OTTs virtually have to get their revenue from advertising; people have no means to pay for digital subscriptions. The MNOs on the other hand can allow users to pay for a VAS subscription by using the remaining balance on a prepaid account. However, there are also disadvantages for the MNOs; most large OTTs are global while the MNOs are regional. Thus, the OTTs will have more subscribers and higher economies of scale, providing them with a cost advantage.

Currently, the big three MNOs in Indonesia all have many ongoing digital VAS initiatives. Thus, the situation right now is characterized by experimentation to see what works and what is not. Due to the high uncertainties involved in this market, it is naturally hard to predict the long-term potential of different initiatives.

Being a provider of both connectivity and VAS means that the Indonesian MNOs would have to manage multiple business models simultaneously. The classical business model of connectivity differs quite a bit from the adaptive one that would be needed to provide VAS. Thus the MNOs would be faced with the challenge of how to be both fast changing and experimental whilst at the same time being planning and efficient. To explore new opportunities while at the same time exploit old certainties is a trade-off relationship that can create conflicts within the organization (March, 1991). As discussed in Chapter 5, there is quite a big cultural difference of being a connectivity provider and a provider of digital services; the “don’t fail” culture present in the classic approach is very different from the experimental culture that needs to be present in the adaptive approach.

In order for Indonesian MNOs to succeed within VAS it might therefore be more substantial challenges coming from within the organization than from the outside. Govindarajan and

Trimble (2005) mean that in order for a firm to go into new areas they have to manage three things: to forget about the things hindering them, to borrow the things that will enable them, and to learn quickly. For the Indonesian MNOs this can be translated into forgetting about old cultural habits such as the "don't fail" attitude and the segregated organization. To borrow things like brand name, customer relationship, and billing possibilities. And to learn from failed and successful initiatives quickly, as it will enable the MNOs to improve their processes. However, the big challenge of engaging in such a behavior is how to do it within the same organization that will continue with the business model of connectivity. According to O'Reilly and Tushman (2004) this is best done by being ambidextrous.

O'Reilly and Tushman (2004) showed in their research that firms most successful at exploiting the old business while exploring the new, share some characteristics. Those firms manage to separate their traditional business units from the new experimenting ones, allowing the new units to have their own processes, culture, and structures. However, they still maintain strong links with the traditional business at a senior executive level. They called this the ambidextrous organization, i.e. where you manage organizational separation through a deeply integrated senior team (see figure 14).

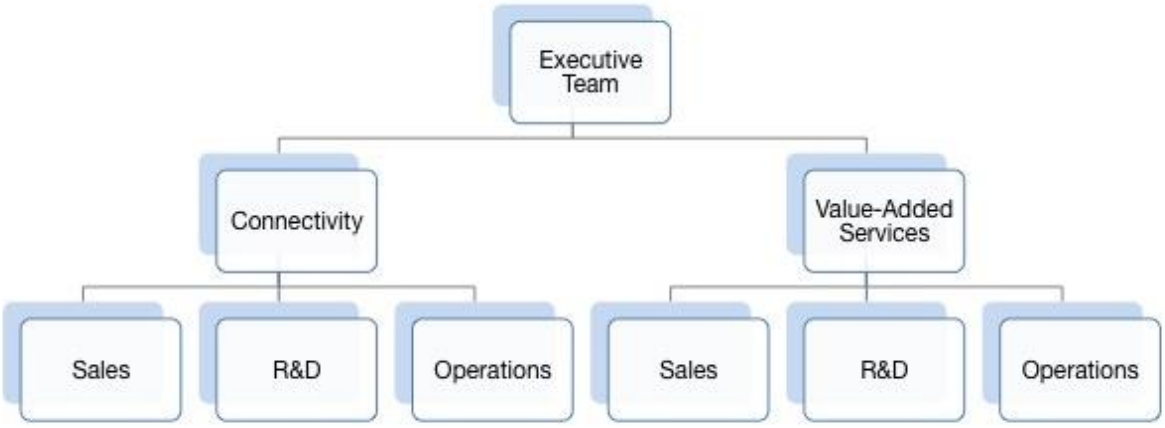

Figure 14. *An example of an ambidextrous division of the organization.*

For the Indonesian MNOs this would imply that the VAS business units are allowed to create the necessary change in culture and processes, but still have the so important support from the senior executives. Since the role of the management team becomes very important in this approach, it is important to have the full support of those, even if they are not all operating ambidextrous (O'Reilly & Tushman, 2004). Table 3 pictures the scope of the different business units as described by O'Reilly and Tushman (2004).

Alignment of:	Exploitative Business:	Exploratory Business:
Strategic Intent	Cost, profit	Innovation, growth
Critical Tasks	Operations, efficiency, incremental innovations	Adaptability, new products, breakthrough innovation
Competencies	Operational	Entrepreneurial
Structure	Formal, mechanistic	Adaptive, loose
Controls, Rewards	Margins, productivity	Milestones, growth
Culture	Efficiency, low risk, quality, customers	Risk taking, speed, flexibility, experimentation
Leadership Role	Authoritative, top-down	Visionary, involved

Table 3. *Picture the scope of the different business units as described by O'Reilly and Tushman (2004).*

To make a change in the organization is probably easier said than done. In times of market stability, Hannan and Freeman (1984) argued that organizations are generally favored if they are building structures that is difficult to change. Incumbent firms consequently tend to have a high structural inertia, which makes it more cumbersome to alter the organizational structure in time of change. Hannan and Freeman (1984) further mean that such structural inertia can be derived from internal politics, sunk cost in personnel, legal issues, or information barriers, which all make it hard to exit or enter certain behaviors. Even if it might be an exaggeration to say that the Indonesian telecom market has ever been stable, it has still been favorably for the MNOs to act in certain ways, leading them to build inertia within the companies. As discussed above, in order for the MNOs to be successful in their attempts to launch VAS it would require them to break charted behaviors and reorganize some parts of the business. However, as the change would not imply destruction of the existing business of connectivity, but rather provide complements to it, it does not seem impossible to do.

As of today, Indonesian MNOs are trying to manage both business models simultaneously, however the smaller business of VAS seems to often be marginalized compared to the main business of connectivity. VAS are only contributing with very small parts of the total revenue of the MNOs, which have made it more difficult to motivate investments in front of shareholders. When going into VAS, the MNOs must engage in experimentation despite the risk of failure, making investments riskier compared to the traditional connectivity. Predictions of return for new investments will be subject to high uncertainties, in contrast to when investing in the traditional business. As shareholders traditionally invest in MNOs as a low-risk, steady return business, the uncertainty associated with investments in VAS is not easily motivated. The fundamental question thus becomes if the endeavors in VAS are a productive use of invested capital? Thus, it can be speculated that the MNOs are somewhat hindered by their shareholders from going fully in this direction.

Even if the internal barriers are fierce to overcome when going into VAS, there is one very important external factor to consider as well: poverty. As mentioned so many times before, great parts of the Indonesian population are hindered by lack of means to pay. A big question then arises: how can you make people who have a hard time affording data, pay for additional services?

7.3 Tapping into the BOP Segment

The factor influencing the Indonesian telecom industry by far the most is the poverty of the people living there. The poverty is the underlying reason to the low customer loyalty, the low penetration of bank accounts, the expensive distribution, the somewhat negative mindset towards technology, and thus to a large extent responsible for the difficulties of monetizing mobile data. As mentioned in the theory chapter, poverty does not exclusively mean the lack of money, but rather the lack of any determinants giving human freedom (Sen, 2001). The economic deprivation is noticeable as about 40 percent of the Indonesian population lives close to the nationally set poverty line, well under the BOP classification defined by Prahalad and Hart (1999). The economic difficulties influence the standard of living of many people in Indonesia and therewith also the financial means possible to put on mobile data consumption. Besides the economic deprivation, the traditionalist mindset of many people can be seen as one major disturbance to mobile data adoption. This mindset might be derived from a poorer educational situation in rural areas. Thus, the educational deprivation mentioned by Nakata and Weidner (2012) can also be seen as a poverty variable stalling the diffusion.

Right now the Indonesian MNOs seem to accept that this segment is outside their reach, wherewith not much attention is directed here. As of today, the solution put forward by the MNOs to address this segment is just to offer smaller packages of data. Such a solution might appear enough from the outside, however the cost of using each application still remains the same independent of how much data one have access to. Hence, the result of selling smaller packages of data is not to enable the BOP segment; that data will not cover more for them than for anybody else. I.e. the product offered by the MNOs today is not adapted at all to the BOP segment. Many large MNCs have shown that it is possible to address this segment profitable if only the company manage to adapt its strategy to the unique circumstances surrounding the segment (Prahalad & Hammond, 2002).

In order to successfully cater to the need of the BOP segment the Indonesian MNOs need to pay attention to at least some of the enablers defined by Rogers (2003) and put forward in a BOP context by Nakata and Weidner (2012): product attribute, market environment, and social context. As brought up in Chapter 5, Telkomsel has found that about 50 percent of the Indonesian population can be categorized as traditionalists, having trouble to see the benefits of new technology. To reach this part of the population the relative advantage of the product presented by the MNOs needs to be very high compared to existing solutions. Since the relative advantage of small data packages is very low this part of the population does not see a need to buy the product. According to an interview with Suri (2016) the MNOs alone cannot provide the BOP with a relative advantage big enough for adoption. Instead he means that the

whole ecosystem has to change in order to cater for this customer group. Application developers need to change the way apps are constructed in order for them to require less data, MNOs need to change how they charge for data for this segment, and the network suppliers need to find technical solutions to how data can be classified and filtered.

Something that is already in place for the Indonesian MNOs is the atomized distribution networks. As mentioned before, the distribution of SIM-cards is done through many small outlets run by third parties. This enables the MNOs to get closer to the BOP customers. Another enabler brought up by Nakata and Weidner (2012) under market environment is flexible payment methods. As discussed earlier, the Indonesian MNOs have quite good possibilities to bring alternative payment solutions to people who lack bank accounts. To elaborate on this would be one way to get easier access to the BOP segment. Moreover, the MNOs might need to change how they charge for the services totally. One possibility would be to allow free access to low-data consuming apps if agreeing to receive advertisement. This would correspond to a form of sponsored data, as brought up earlier in this report.

One could argue that since the Indonesian MNOs are still experiencing a healthy growth in subscriber additions in the higher value segment they do not need to turn to the less profitable BOP segment yet. However, if the creation of a new ecosystem is what is needed in order to address this segment, the creation of such an ecosystem will take time. Some initiatives, such as collaboration around the Free Basics, is done today to help this segment get access to internet for free. However, for the Indonesian MNOs to build a sustainable business here they need to find a way to be profitable, to do it out of goodwill and social responsibility is not enough. When the growth in the high-value segments slow it might take too long time to start thinking about how to attract the BOP customers, wherewith the MNOs should bear those thoughts in mind already now.

8. Conclusion

The purpose of this study was to map out the Indonesian mobile telecom industry and to explore how Indonesian MNOs can better monetize mobile data by improving their business models. Each of the research questions will be answered below.

RQ1: How is the competitive situation structured in the Indonesian mobile telecom industry?

The competitive situation differs significantly within Indonesia. Outside of Java, the biggest MNO Telkomsel has a monopoly in most areas, providing them with the ability to charge higher prices. Thus, they are highly profitable here. On Java, the competitive situation is intense and the average profitability is low. This can be explained by the presence of three strong competitive forces: the rivalry among incumbent firms, the bargaining power of buyers, and the threat of substituting services.

The rivalry among incumbent firms is strong due to a mature market with many active MNOs, where the MNOs have been trying to steal market share from each other through extensive price wars. Industry profitability would benefit from an increased degree of consolidation, something that has happened to a limited extent until today. A likely reason for this is that the incentives for consolidation are low, since the prevailing spectrum policy requires MNOs to give back extra spectrum to the government when consolidating. Thus, this valuable asset would not only lose its value but would also be given to a competing MNO.

The bargaining power of buyers is high as the MNO offers are undifferentiated and both distributors and end-users have low switching costs. This has resulted in disloyal distributors playing MNOs against each other, only promoting those providing them with the highest margins. Most end-users do not have access to digital money, which means that they cannot refill their SIM-cards digitally and have to buy new ones through the expensive distribution channels. End-users are very price sensitive and use multiple SIM cards simultaneously to push down their expenses.

The threat of substituting services in the form of voice and messaging services from OTTs is high. These services have a high performance-price ratio compared to the MNO legacy services, as they do not cost anything apart from the data they consume. They have made the switching costs for end-users lower, as the same account on an OTT service can be used irrespective of the MNO providing the data.

RQ2: How can the business model of Indonesian MNOs be improved to monetize data better?

Indonesian MNOs ought to redefine whom they see as a customer. Today, the majority of the revenue is derived from end-users. In addition to see the end-user as the customer, there is potential to offer services to OTTs, retailers, and other businesses. OTTs could either be charged to improve the QoS in their apps, or MNOs and OTTs could partner and share

additional revenues that could be derived from improved QoS; consumer data could be sold to companies or used for targeted advertising.

Indonesian MNOs should focus on increasing the currently low loyalty among their high-end customers. One way of doing so would be to convert more customers to postpaid subscriptions. As there are few benefits associated with using them today, these must be improved to provide additional value.

Indonesian MNOs should alter how they work with network planning and investments. They need to find ways to adapt the network to high-value customers. There seems to be potential to improve the collaboration between the marketing and network planning functions to make network investments that results in the most extra revenue.

Indonesian MNOs should improve their digital distribution channel experience. It is important to convert the part of the population that have access to digital money to actually start using the digital channels instead of the inefficient and expensive physical distribution channels.

Lastly, Indonesian MNOs should find a way to differentiate their offers to avoid having price as the main dimension of competition. There are two fundamentally different approaches for how this can be achieved; either the MNO could define itself as a provider of connectivity or it could define itself as provider of a digital ecosystem. The main difference becomes the perspective on connectivity; should it serve as a means to an end, or as an end in itself?

RQ3: What are the challenges and implications with those business models?

Today, Indonesian MNOs give away data very cheaply compared to legacy services, so a major challenge will be to successfully change the revenue streams to monetize data better, while at the same time exploiting legacy revenues as long as possible.

An MNO deciding to put their main focus on network performance would primarily become a provider of connectivity. Connectivity should not be regarded as a commodity today in Indonesia, as there is a high variance in QoS between MNOs, and consumers currently seem to value network performance above everything else. In the Western world, connectivity and network performance is a less powerful differentiator and it is likely that this will eventually become the case in Indonesia. When this happens, a provider of connectivity will have to leverage the competitive forces to their favor to be successful. This is closely tied to scale, as this will provide a cost advantage and higher bargaining power. To improve profitability, it is also important that people get access to digital money so that the high margin individual outlets can be circumvented. This is probably hard in the short run, so the primary focus ought to be to make customers who already have digital money to actually use the digital distribution channels.

For an MNO deciding to put their main focus on value-added services, they would essentially hope to become a provider of a digital ecosystem. It needs to decide if it should do the value-

added services in-house or rely on third parties to supply them. A significant challenge facing the MNOs choosing to offer in-house VAS is that they would have to pursue two business models simultaneously. The one that is needed to bring forth successful VAS is very different from the one that is needed to provide connectivity. The latter usually needs operational efficiency and a hierarchical organization while the former needs risk taking, speed, experimentation, and flexibility. Thus, there is likely a mismatch between the optimal cultures and mindsets for the two business models. MNOs might also have a hard time with talent acquisitions, since they are not highly regarded by many who want to work in innovative and experimental environments.

With the digital ecosystem approach important decisions need to be made about resource allocation: how much of the capital should be invested in exploiting the core business and how much should be assigned to exploring new revenue streams? The ultimate question MNOs must ask themselves is if endeavors in VAS are a productive use of invested capital. MNOs typically pay a steady stream of dividends to their shareholders; investing the capital in high-risk projects might not be appreciated by investors who could have invested the capital themselves.

Another challenge facing the Indonesian MNOs independent on the chosen business model is the one of the poverty of the people. When the growth in the high-value segments stall, the MNOs need to have a plan for how to build sustainable business opportunities among the BOP segment. This would possibly require the MNOs to rebuild the whole ecosystem surrounding them, providing the people with a greater value of adoption.

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Appendix I - Interviewees

Name	Company/Institution Role	Language	Intermediate	Date (Length)
Prof. Sigit Haryadi	**ITB** Professor Government consultant for telecom Policies	Indonesia (Translator)	No	30th of June (60 minutes)
Laili Aidi	**Ericsson** Strategy Manager RASO	English	No	3rd of August (60 minutes)
Dr. Rony Bishry & I Ketut Prihadi	**BRTI** Commissioners	English	No	5th of August (90 minutes)
Dr. Huhammad Ridwan Effendi	**ITB** professor Former **BRTI** commissioner (2009-2015)	English & Indonesia (Translator)	No	8th of August (120 minutes)
Jhon Welly, M.Sc.	**ITB** Lecturer Ex-director **Telkom**	English	No	8th of August (30 minutes)
Anthony Houlahan	**Ericsson** VP strategy for South East Asia	English	No	17th of August (60 minutes)
Hadi Wijaya	**Smartfren** Corporate strategy Consultant	English	Telephone	24th of August (30 minutes)
Ameet Suri	Former **Facebook** Employee Partnership manager Mobile & Internet.org	English	Skype	24th of August (45 minutes)
John M. Thompson	**Indosat Ooredoo** CTO	English	No	30th of August (60 minutes)
Gunnar Borg	**Ericsson** Ericsson CTO towards Indosat	Swedish	No	31st of August (60 minutes)
Michael Foo	**PT Telkomsel** General Manager Strategy & Market Insights	English	No	8th of September (45 minutes)

Appendix II - Topic guides

Below are a summary of the different topic guides used. During the interviews those where not followed to the letter but varied depending on the expertise of the interviewee, what topics naturally came up, and what understanding we needed at the time.

Topic Guide - Representatives BRTI

Purpose of the Interviews

The interviews are done to gain knowledge and understanding of the current situation on the Indonesian telecom market. The interview is done to gain understanding of the technological and regulatory development, and the more general market/industry setting.

- Can you start with telling us a bit about your background?
- What role does BRTI have in the Indonesian telecommunication market?

Political Factors

- What is the overall goal when setting the regulations?
- Is the regulatory environment changing fast or would you say that it's rather stable?
- What do you believe is special about the Indonesian telecom market and how does that influence the regulatory situation?
- How much can players like OTTs and MNOs influence the regulations?
- How much power does the international community have over regulations in Indonesia?
- How has the telecom regulatory environment been influenced by the shift towards data usage?
- What attitude do regulatory authorities have toward the fact that OTTs are taking large portions of revenue away from Indonesian operators?
- What are the opinions/regulations concerning net neutrality?
- How is the spectrum allocation regulated?
- What do you recognize as the biggest problems with the existing regulatory environment?

Topic Guide – Operators

Purpose of the Interviews

The interviews are conducted to gain knowledge and understanding of the current situation of the operators. We want to gain insight into what initiative operators are currently taking to tackle the challenge of decrease in legacy services, ARPU, and rise in data. Moreover, we hope to find out how the operators believe they will proceed from here on and what their main barriers are thought to be.

Today - Market

- What factors do you think have been important for XX success so far?
    - Why do customer choose you as of today?

- What have been the main obstacles?

Digital business

- What synergies do you see between your core business of providing connectivity and the business of providing digital services?
    - Do you believe that you're taking advantage of such synergies optimally?

- Do you see a trade-off between exploiting your core business with providing connectivity and exploring new alternative revenue streams such as digital solutions?

Future

- What do you consider the main challenges today when operating in the Indonesian telecom market?
- Do you believe that the future will require different competencies/success factors?
    - If yes, what will be more/less important?
- Are you spending much effort on converting prepaid customers into postpaid, or do you believe that there is too little potential?
- What role do you think that digital services will play in the future?

Network Performance

- How do you go about investments in the network? What are the most important factors you consider when deciding where to extend it? How to make sure the investments are efficient?
- Collaborations with OTTs to differentiate on QoS/QoE among the users of different sites?
- When considering network performance, where do you the highest potential of improvement?

Topic guide - OTTs

Purpose of the Interviews

The interview is conducted to gain understanding about OTTs attitude towards MNOs and collaborations as well as how international players look at the Indonesian market.

Collaborations with MNOs

- Are you collaborating much with MNOs? What is the main purpose?
- What did Facebook have to gain on such collaborations/involvement?
    - What is the main contribution from the MNOs in such collaborations?
    - What is the main contribution from the OTT?
- What role will such collaborations have in the future?
    - Do you think they will be more important?
- What are your thought on the future of MNOs?

    - Do you believe that they will be able to grow in new areas or will they just become a provider of connectivity?
- Do you see any difficulties in both competing and collaborating at the same time with the MNOs?

The Indonesian market

- What do you think is special about the Indonesian market?
- Are there difficulties acting on emerging market?
    - How can that be handled?
    - What kind of initiatives are you taking?

Finishing Questions

- Do you have anything to add that you believe would be valuable for us to know?
- Do you know anyone you believe we should contact in order to learn more?
- Would it be ok to contact you if we have any further considerations?
- Do you want us to email you the finished report/ a summary?

Appendix III - Indonesian Mobile Operators

Telkomsel

Telkomsel is owned to 65 percent of Telkom Indonesia, majority owned by the Indonesian government, and to 35 percent by SingTel Mobile of Singapore Telecommunication. With its market share of about 44.2 percent as of March 2016, Telkomsel is the dominant player in the cellular market. To enhance growth, Telkomsel has made a transition of focus into digital business and increased number of data users. Data was, in 2015, contributing to about 34 percent of Telkomsel's revenue, making it one of the priorities of the company. This has lead the company to invest in 3G and 4G expansions, as well as launching initiatives related to digital services. As of march 2016, Telkomsel had 3.1 million 4G subscribers (Ericsson, 2016c). During the first quarter of 2016, XL had a revenue of IDR 20.2 tr.

XL Axiata

XL Axiata is with its 12.1 percent market share one of the largest cellular service provider in Indonesia in terms of subscriptions (Ericsson, 2016c). The company is to 66.5 percent owned by the Malaysian telecommunication company Axiata Group. The company are focusing on urban areas such as Jakarta, Bali, Lombok, and Java. As for many others, data is seen as the major growth opportunity by XL Axiata. The company tries to boost data usage by offering special bundled options for data users, e.g. starter packages. Moreover, XL Axiata is making investments in fiber optic cables and base transceiver stations (BTS), to increase quality and speed of data services. Moreover, XL Axiata are focusing on customers that are able to pay more for data usage, and offer solutions that encourage consumption in this customer group. During the first quarter of 2016, XL had a revenue of IDR 5.6 tr.

Indosat-Ooredoo

With a market share of 20.2 percent Indosat counts as the second largest cellular provider in Indonesia (Ericsson, 2016c). Indosat is owned to 65 percent of Qatar's Ooredoo and to 15 percent of the Indonesian government. In order to increase the capacity and speed of their network Indosat has been making investments to modernize the network infrastructure. During the first quarter of 2016, Indosat had a revenue of IDR 6.8 tr.