

# The Effect of Disruption Technology, Opportunities and Challenges of Telecommunication Industry 4.0 in Indonesia

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**Abstract:** *Digitizing and disruption technology has transformed society on an unprecedented scale and speed. The telecommunications industry 4.0 is undergoing transformational development to deal with disruptive technological challenges. The telecommunications industry in Indonesia shown by a decline in voice and SMS revenues, increased regulation, technological progress, and changes in consumer needs. This study aims to comprehensively understand how telecommunications companies in Indonesia can survive from disruptive technology in digital transformations and open new opportunities for growth through the Business Model Innovation (BMI) in Industry 4.0?*

*Exploratory case studies and literature reviews are used to test the antecedents of business model innovation. Traditional business models no longer function and adopt a new approach, traditional telecommunications business models will not succeed in facing new competition. The study identifies that in disruption technology services offer opportunities for business development and technology orientation to encourage the use of Internet-based services, increasing demand for cheaper and faster internet, and data, which results in tremendous benefits for consumers. Challenges to achieving competitive advantage the organizations are required to be influenced by business model innovations with the ability to improve market orientation and organize organizations with technological orientation capabilities, which are agile and flexible in providing sustainable customer-oriented and solutions. From a managerial perspective, this research provides a comprehensive view of what is impact by business model innovation with organizations, how to achieve it, what important variables contribute to it and how it relates to the company's business performance.*

*The authenticity of this research lies in the description of how management emerges with a practical oriented framework of how organizations must be formed to be innovative and competitive through general arrangements of antecedents of business model innovation. This study, however, has limitations because of its qualitative nature and conceptual framework needed to further examine through large-scale surveys.*

**Index terms—** *Business Model Innovation, Technology Orientation, Market Orientation, Disruption Technology, Competitive Advantage.*

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## I. INTRODUCTION

The modern global economy is on the verge of a new industrial revolution, as evidenced by many actual trends. In accordance with modern provisions of economic theory (economic cycle theory, crisis theory, innovation theoretic), to overcome the global crisis is needed to start a wave of new innovations which Industry 4.0 will become a new global industrial landmark and standard of development of the real sector of economy of the whole global economic system [1].

The telecommunications industry 4.0 is undergoing a phase of transformational development to adopt new technologies and face the challenges of disruptive technology. Industry 4.0 creates a new paradigm for the new market landscape and competition [2]. The use of digital technology in the Industry 4.0 generation has had a fundamental influence on the way enterprise has conducted. Recently, the telecommunications view has changed faster than before, ranging from infrastructure and aspects to the attain of operators and customers, to technology and new players [3]. Increasing competition challenges, fast changes in demand, technology, and regulation require companies to respond and adapt very quickly [4]. The purpose of this study is to verify the hypothesis offered, to determine the potential of telecommunication Industry 4.0 in starting the new Industrial Revolution in the 21st century, and to develop practical recommendations for managing this process [1]. Definitions for Industry 4.0 abound, but the change it portends at its core is the marriage of physical and digital technologies such as analytics, artificial intelligence, cognitive technologies and the internet of things (IoT). This marriage of the physical with the digital allows for the creation of a digital enterprise that is not only interconnected but also capable of more holistic, informed decision making [5]–[7].

As reported by "The Global Competitiveness Report 2017-2018" [8], the interruption and disruptiveness of technological change are creating extraordinary possibilities and challenges that are set to be amplified using the convergence of digital, physical, and organic technologies that are characterizing the rising Fourth Industrial Revolution.

By observing the current state of the industry telecommunication companies have not succeeded in efforts to monetize the data flowing through the network and become more commodities and data revenues are rapidly becoming a key driver of Telco's revenue in Indonesia [9], [10]. Stay agile in an ever-changing telecommunication environment becomes a mandatory [11][12].

According to El-Darwiche Bahjat, Rupp Christine, and Lin [13]–[16], the situation in the telecommunications industry is very critical, but the company can survive by smart and innovative companies who dare to fund significant modernization and hypocrisy to embrace a new strategic identity that suits the abilities, markets, cultures, and to a large extent. Telecom companies have not succeeded to monetize the flood of data running through existing networks, the services innovation have become more commoditized, ability to reinvest in network upgrades, rapid technological developments, changes, and, diffusion has transformed the telecommunications industry into a significant economic growth generator. Digital advances that severely constrained invulnerable to competition, it should convert end to end the business model, this is the only way to deal with competitive situations, as competition gets closer and globalization accelerates and innovation is often a significant source of competitive performance growth [17].

In line with Deloitte and Izago [18][19] in the era of digital interference industry 4.0, Telecommunications companies face increasing pressure to increase the time to market focus and ensure the best in class offerings. Telecommunications companies have shown a positive influence on several vital pillars from access to business operations to markets, reducing the costs of doing business, e-financial services and access to business information, thus making telecommunications prominent for the country's economic and social development [20], [21]. The buy, build, partner model, M & A (Merger and acquisition), Business Model Innovation (BMI) strategy can help companies gain a competitive advantage, in growth areas such as cloud, IoT, cognitive computing, and data analytics. Traditional business models (definition: structure the businesses according to the core value offering like only product or service no improvement, and only after profits have made [22]) no longer function and adopt a new approach, telco's old guards will not succeed in facing new competition [23], [24] [25]–[28]. Opportunities created by the Internet of Thing can lead to changes from communication service providers to digital service providers [29], [30]

The transformation process and shifting focus on innovation in business models are increasingly gaining attention from academic and managerial practices. Nevertheless, empirical studies and a basic understanding of the underlying processes and strategic decisions associated with reconfiguring business models are lacking [25], [31]–[34]. The critical situation when the telecommunications industry is not motivated to improve the model business, and telecommunications companies (Telco) are not ready to face enormous opportunities, challenges in a significantly technology disrupted industry, market-driven, and can sustain the competitive advantage. Business Model Innovation (BMI) strategy can help companies gain a competitive advantage, in growth areas such as cloud, IoT,

cognitive computing, and data analytics. The old business models no longer function and adopt a new approach, Telco's old guards will not succeed in facing new competition [23]–[25], [27], [28], [35]–[39]

Further, Telecommunication 4.0 also brings up new challenges for the players to address integrated open system, and digitalization issues [40]. Business Model innovation as one of the most critical organization competencies to survive and sustain in the competitive market is getting more interest recently [41]–[43]. Although some studies report that when leaders are currently innovating, increasing price competitiveness will further enhance the benefits associated with technical leadership and hence will improve the value of innovation for the company. Therefore, the relationship between competitive prices and innovation resilience will be inversely proportional [44].

Previous studies examined cloud and digital computing as disruptive innovations. Building this reflection, to better understand business model innovation as a result of accepting cloud benefit models [45]. However [46] argues that business has become a global and global market that increasingly encourages the need for an Innovation Business Model because companies must overcome global challenges. The general objectives of all business model innovation frameworks refer to the previous literature [45], [47]–[49] demonstrate, showing, developing and testing measurements of business model consistency, and investigating relationships with innovation and performance business models that have a positive impact on company performance through competitive advantage.

Further, top management place less emphasis on the level of uncertainty surrounding the project (technology and demand) and more emphasis on the strategic context (the project relative to competitors' offerings and other products in the firm's portfolio). According to Jonas et al. [50] conceptualized and empirically validate management quality—a multidimensional construct consisting of information quality, allocation quality, and cooperation quality—on project portfolio success. This study discusses business model innovation strategies and the consequent competitive advantages that emanate from the formulation and implementation of such strategies. A review of past studies and established theories about competitive advantages, Business Model Innovation (BMI), Market Orientation and Technology Orientation will also have discussed. The chapter entails technical review; dimensions of Technology/innovation orientation, Market Orientation to the relationship between Business Model Innovation and competitive advantage; the conceptual framework; empirical literature review and the summary of the literature. The theories in competitive advantage include Porters' theory of competitive advantage [51]–[55]; Resource-Based View theory [55]–[60] and Disruptive Technology Theory and diffusion of innovation theory [61]–[67]. All components positively influence portfolio business model innovation, which in turn positively affects competitive advantage.

This objective of this study is to describe the main opportunities and challenges for telecommunications operators in this new digital era with the impact of disruptive technology. The purpose of this research is to seek to accomplish and evaluate the effects of technology (TO) and market orientation (MO) through business model innovation (BMI) to lead a competitive advantage (CA) in the communication service provider industry. This study is based on exploratory case studies and literature review to investigate the relationship between antecedents of BMI and MO and to TO that can be further tested using a quantitative survey. The conceptualization and investigation of the independent and joint effect of business model innovation, technology orientation, and market orientation structure on organizational agility highlight the importance of complementarities between antecedents and add to the cumulative body of knowledge in this research area.

## II. CONCEPTUAL DEVELOPMENT

### A. Business Model Innovation on Competitive Advantage

Every organization interested in competing in a dynamic market must create unique benefits that enable it to gain a competitive advantage compared to competitors. The way to get an edge over competitors is through innovation. Innovation as a strategy involves creating new ideas, processes, and methods in doing things that enhance current goods and services or bringing them into new products and services. Innovations in companies are needed to maintain existing competitive positions and competitive advantages that have obtained. Most research concludes that business model innovation is significant in increasing competitive advantage and making some significant contributions [42] [43].

Although some studies report that when leaders are currently innovating, increasing price competitiveness will further enhance the benefits associated with technical leadership and hence will improve the value of innovation for the company. Therefore, the relationship between competitive prices and innovation resilience will be inversely proportional [44].

Previous studies examined cloud and digital computing as disruptive innovations. Building this reflection, to better understand business model innovation as a result of accepting cloud benefit models [45]. However, S. K. Rao and R. Prasad [46] argues that business has become a global and global market that increasingly encourages the need for a Business Model Innovation because companies must overcome global challenges. Therefore, companies must innovate business models to stay competitive and drive growth in this highly competitive global market. Business model innovation is about rethinking business fundamentally around customer needs, then re-aligning company resources, processes, and profit formulas with this new value proposition. Business model innovation does not require a new technology market, but a unique and innovative way to produce existing products that have sent to the market and which are very difficult for competitors to emulate and replicate. The general objectives of all business model innovation frameworks refer to the previous literature [48], [49], [68]–[70] demonstrate, showing, developing and testing measurements of business model consistency, and investigating relationships with innovation

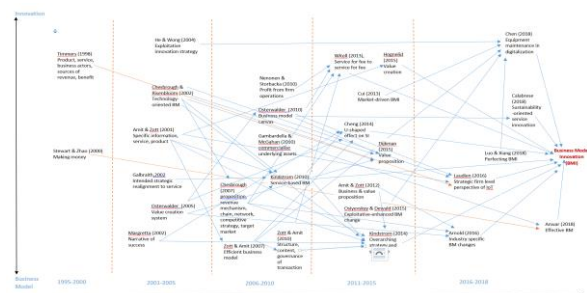
and performance business models that have a positive impact on company performance through competitive advantage. Organizations that are more innovative grow and succeed in implementing new strategies to anticipate adverse fluctuations from market competition.

Several studies have confirmed to examine the relationship between the company's business model innovation and performance. Then indicating the three frameworks succeed in competitive advantage, develop, and test the measurement of consistency of business models, investigate relationships with innovation, business model performance, and mediate the role of competitive advantage. To show that there is a relationship and the results of several studies that business model innovation has a positive effect on the competitive advantage it stated by [45], [47]–[49].

This study concluded with the definition of *Competitive Advantage* for the Telecommunications Industry. The organization's capacity to influence business higher than competitors, through optimizing business models and systems which are updated in line with business demands, to get maximum value, preserve organization sustainability, and survive within the face of competitive environment dynamics, technological disruptions, and agility in innovation.

However, this study concludes with the definition of Business Model Innovation in the Telecommunications industry. The description is the company's ability, to develop different business models that support starting from financial feasibility (to obtaining new revenue models, increasing the value of product service innovations that suit the needs of customers and markets) and reinforced by innovative technologies including internal missions and processes. To presented the theoretical foundation of Business Model Innovation from the previous literature, this research has shown in Figure 1 as below

Figure 1. Theoretical Foundation Of BMI



Source: This research 2019

### B. Market Orientation Capability

Market-oriented in general is the right way to improve competitive advantage and organizational performance [71]. However, the antecedents of behavioral market orientation are the subject of several debates, especially external marketing [72].

Also, current marketing policies state that customer orientation gives the company a better understanding of its customers, which then leads to increased customer satisfaction and company performance [73][74]. To increase competitive advantage, recognize market opportunities, and the generation of intelligence. The market orientation component adopted in this construction describes the main flow of information acquisition, absorption, and reaction. Therefore, the better the knowledge produced by the organization (taking new ideas), the better the information has disseminated (the implementation of new ideas, processes, or products) and the better the response (qualification as success) [39], [75].

In other results, it has shown that building a stream of market orientation research, which consists of three alternative orientations, namely strategic customer orientation, competitor orientation, and product orientation [76]–[78][79]. The multidimensional strategic orientation examined in this study extends market-oriented research and responds to recent calls to test market orientation towards other focuses [80]–[82]. Several studies have identified that market orientation is a reliable source of sustainable competitive advantage [83]–[85].

However, market-oriented businesses generate intelligence about current and future customer needs, and around competitor's capabilities and strategies; Share this intelligence with the whole organization; and take coordinated action to create customer values [86]–[88]. Market-oriented businesses identify opportunities to develop and maintain the most efficient cost for every prospective customer and customer today. Through market and competitor orientation, market-oriented vendors can always (a) find an excellent base for segmenting and targeting markets (b) Discovering and tracking desires expressed or latent from target customers. (c) Recognize who is considered by the customer as a satisfying fundamental choice with strengths, weaknesses, and intentions. (d) The best positions for products, brands, and offers for customers. (e) Providing additional benefits for clients and businesses [89]–[91]

This study concluded with the definition of *Market Orientation* for the Telecommunications Industry. “The company's ability to influence business with a market-focused strategy by doing something new or different, innovative in products and services, and the ability to develop value-added services behaviors to customers as an effective, efficient by optimizing expertise in analyzing strengths, weaknesses, strategic competitor's capabilities, and responsive to dynamic market conditions that focus on customers and companies

### C. Technology Orientation Capability

Technology orientation has become a significant development feature in the field of innovation; it is not surprising that researchers must compete to investigate modern income technology in service delivery and new learning for the application of information and communication technology in the service industry [92]. Technology has defined as a procedure or how to do work that most often consists of information or machines. Information technology has contributed to increasing the likelihood of online marketing success, by increasing the possibility of advertising new and up-to-date services

anytime and anywhere [93]. It has proposed in the entrepreneurial literature that business produces value and growth by actively taking entrepreneurial activities and technological developments [94]. Such as determination and manipulation of business opportunities by being innovative, proactive, and making bold and risky decisions [94], [95].

Proactive technology-oriented companies can acquire new technologies and use advanced technology in developing new products. Therefore, excelling in technical skills and flexibility are significant drivers for market-based innovation and breakthroughs. Thus, innovation can contribute significantly to the growth of the company [96], [97]. The dimensions that have an impact on Technology Orientation are Constant, Market Growth, Competition Intensity, and Demand Uncertainty. However, technology orientation has characterized by a level of commitment to R & D, the acquisition of new technology and the latest applications where strategic orientation has defined as the behavior of creative companies that are expected to create competitive advantage in the long run [98].

Technology orientation as a strategic orientation is culture-based, company-specific and consists of many capabilities that are in line with the value of enterprise-based resources [81], [99], [100]. Therefore, the combination of abilities and skills was decided to be considered a dimension of technological orientation. Analysis of technology orientation factors has continued with three remaining aspects, namely technological capabilities, management capabilities and unlearning [101][102]. Highlighted by Sigauw, Simpson, and Enz [103] innovation orientation directly determines the choice of technology made by the company and how it is used to produce high-quality innovations that lead to the company's performance as a model.

Technology competency is a significant advantage that helps improve a company's competitiveness. Using the right new technology can dramatically accelerate innovation, reduce product development cycle times, and increase the level of new product recognition [93]. In addition, he explores the relationship between competitive advantage (customer satisfaction, brand reputation, new product introduction, and market share), competing for priorities (cost, price, quality, flexibility and time), and technology orientation (product technology, process technology, technology management) with the aim of maximizing company performance [104], [105].

Technology-oriented companies seek new and sophisticated technologies to develop new processes, products, and services, even though the level of technological change in the industry can affect the performance of adoption or technology development [105], [106]. However, the relationship between technology focus and business performance is less attention in the literature [107].

According to Gary Hamel Prahalad [108] argues that high-tech-oriented companies achieve better business performance and when the dynamic technology changes because companies can introduce new processes, products, and services to meet growing customer needs and to benefit from more competitors.

Technology-oriented companies that combine innovation, customer value with technological innovation have better opportunities to maintain profits and high performance [78], [109].

According to G. S. Schiavi and A. Behr [110] the process and technological innovations has determined after gathering information such as technical characteristics, disruptive innovations products, services that more accessible, comfortable, and affordable, value propositions, lower costs, product profit margins, product services, changes in business structure, disruptive effects of technology and innovation on the market.

In this study, the definition of *Technology Orientation* in the Telecom industry concluded is; The company's ability to develop technology-based on company behavior proactively, responsively (to manage changes from consumers or competitors by using proactive technical), and technological capabilities (to acquire technology and build technical solutions to respond and to fulfill customer needs).

In this study, Competitive Advantage in BMI, Market orientation, and technology orientation has developed, and the relationship between antecedents has elaborated. The dimensions and indicators of all constructs used in the framework have presented in Table 1.

TABLE I. VARIABLE, DEFINITION, AND DIMENSION

Variable	Definition This Study	Dimensions	Dimension References
Competitive Advantage (CA)	The company's ability to influence business to be better than competitors by optimizing the updated business model and system according to business demands, and to get the maximum value, maintain the sustainability of the company in the face of a competitive environment dynamic, technological disruption and agility in innovation	Price	Adapted from (Al-Bostanji, 2015; H. I. Ansoff, 1965; I. Ansoff, 1979)
		Quality	Adapted from (M.a Porter & Siggelkow, 2008)
		Product Innovation	Adapted from (Diab, 2014; Ercegović & Talaja, 2013; Zhang & Sharifi, 2000)
		Time To Market (TTM)	Adapted from (Cotteleer & Sniderman, 2017; Deloitte, 2017).
Business Model Innovation (BMI)	The company's ability to develop a distinctive business model which supports from financial feasibility to obtaining new revenue model, increasing the value of innovation of products services according to the customer and market needs, and reinforce by innovative technology including mission and internal processes.	Value creation innovation	Adapted from (Claus 2016)
		Value proposition innovation	Adapted from (Stampfl, 2016)
		Value capture innovation	Adapted from (Claus 2016)

Variable	Definition This Study	Dimension	Dimension References
Market Orientation (MO)	The company's ability to influence business with a market-focused strategy by doing something new or different, innovative in products and services, and the ability to develop value-added services behaviors to customers as an effective, efficient by optimizing expertise in analyzing strengths, weaknesses, strategic competitor's capabilities, and responsive to dynamic market conditions that focus on customers and companies	Customer Focus	Adapted from (Speece & Khamwon, 2014)
		Competitor Focus	Adapted from (Slater, Mohr, & Sengupta, 2010) (Narver & Slater, 1990)
		Interfunctional Coordination	Adapted from (Johnson & Huizenga, 2014)
Technology Orientation (TO)	The company's ability to develop technology-based on company behavior proactively, responsively (to manage changes from consumers or competitors by using proactive technical), and technological capabilities (to acquire technology and build technical solutions to respond and to fulfill customer needs).	Technology Capability	Adapted from (Halac, 2015)
		Management Capability	(Dagman & Ghadeer, 2018; Halac, 2015)
		Commitment to Learning	(Gatignon & Xuereb, 1997; Halac, 2015)
		Commitment to Change	Adapted from (Halac, 2015)

Source: This Research 2019

### III. RESEARCH STUDY AND DEVELOPMENT OF CONCEPTUAL FRAMEWORK

#### A. Research Design

Exploratory case studies have conducted in the early phase of conceptual framework development to obtain the state-of-the-art insight from practitioners of important antecedents influencing BMI and CA, especially recent antecedents which are not extensively discussed in the literature yet. Second, it will help to clarify the relationship between various BMI antecedents, and their relationship with CA. Therefore, the framework in this study has developed from both existing literature and contextual field data from exploratory case studies [111].

Four large telecommunication providers organizations in Indonesia has selected for the semi-structured interview. These groups are national companies from Indonesia. These companies have chosen from APJII (Indonesian Internet Service Providers Association) and due to the fact they have categorized enterprise as large agencies having more than one product provider and a couple of project groups that permit us to explore how they manage telecommunication business. Large employer definition follows Indonesia

Central Bureau of Statistics (BPS Indonesia) classification for the size of the business where a large



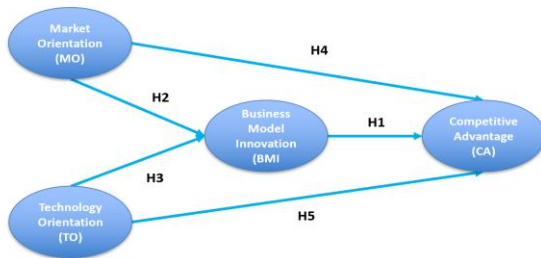
company has described as an organization with more than 100 labor (Source: [www.bps.co.id](http://www.bps.co.id)).

The exploratory case studies have based on half an hour to one hour semi-structured interviews with members of senior leadership in each company. The respondents are management level of the company, such as CEO, CTO, Sales or Marketing Head or Director of the selected companies who are believed to have sufficient knowledge on both company strategy as well as the business process of the company.

**B. Developing the Conceptual Framework**

The selection of variables for the conceptual framework is guided by the extensive literature review, by identifying dominant antecedents that have considered should be in place in shaping BMI and CA and were developed through the exploratory case studies. The relationship among variables has examined in detail in this part, and the conceptual research model developed as shown in Figure 2.

**Figure 2. Conceptual Model**



Source: This research 2019

**C. Business Model Innovation and Competitive Advantage**

The study by Jacques W. Brook and Vincent Feltkamp [45] provides empirical evidence that a high understand business model innovation as a result of accepting that business has become a global market that increasingly encourages the need for an Innovation Business Model because companies must overcome global challenges. However, Rao and Prasad stated [46] companies must innovate business models to stay competitive and drive growth in this highly competitive global market.

Then indicating the three frameworks succeed in competitive advantage, develop, and test the measurement of consistency of business models, market orientation, technology orientation to investigate relationships with business model innovation, and mediate the role of competitive advantage. To show that there is a relationship and the results of several studies that business model innovation has a positive effect on the competitive advantage it stated by [45], [47]–[49]. The high quality of organization able to provide the right solution with a good business model innovation strategy that can provide added value to the organization, high-level innovation will appear better in the face of competitive advantages in the telecommunications industry.

It has therefore proposed that:

**H1:** *Business Model Innovation Strategy* will influence

positively relationship and a direct impact on *competitive advantage*

**D. Market Orientation and Business Model Innovation**

For achieve sustainable value creation, companies must adapt to a business model that is running to deal with changes in a highly competitive environment or risk failure to enter the market [112]. According to many study business models are not static but a dynamic concept that requires the establishment, adaptation, and renewal of business model companies regularly [113]–[115]. In business models and market, involvement affects the success of a company.

This dynamic approach to the business model means reconfiguring elements of a business model in a new way and allowing interactions between company resources, competencies, organizations, and value propositions to get value from technological innovation [116], [117]. According to M. Rosi, D. Tuček, V. Potočan, and M. Jurše [118] market-oriented organizations collect data regularly about customers, competition, and markets were to operate to plan and provide better value to the customers and to maintain a competitive advantage in an increasingly competitive environment. Besides, the extent to which changes in business models and market involvement affect the success of a company. This paper reports an exploratory study that identifies the dimensions of developing a market-driven business model and proposes a framework for developing business models at various stages of business development.

This paper reports an exploratory study that identifies the dimensions of developing a market-driven business model and proposes a framework for developing business models at various stages of business development [119], [120]. Many studies that affirming from some study state Market Orientation & business model innovation influenced both competitive advantages [119], [121]–[125]. It has therefore proposed that:

**H2:** *Market Orientation* has a direct and positive impact on *Business Model Innovation*

**E. Technology Orientation and Business Model Innovation**

The organization's focal point on rising technologies affords to provide new products, services, and processes, which influence business constructions and markets [126]. Then, it used to have identified that organizational transformation has benefited from the agility of new technologies, offering the development of new approaches to create value for markets via an innovation process, which broadens organizational boundaries and contributes to the technology of new business models [127], [128].

Various researches affirming from some study state Technology has a direct and positive impact on Business Model innovation [32], [110], [126], [127], [129], [130]. The empirical results also indicate that firms' sufficient networking capability to manage network dynamics is the important variable that positively moderates market



orientation and entrepreneurial orientation with NPD performance [131].

As the Director of the company in Indonesia, one a member of FTTH Council Asia Pacific stated:

To be able to face a dynamic market, the organization needs to become innovative and agile by having a customer-centric vision. The organization must be able to capture customer pain points and requirements, disseminate this intelligence within the organization and perform coordinated action to come up with the solution that fit the criteria a suitable price and features. The solution can be developed in-house or collaborating with other solution providers.

Disruptive business models emerge at the stage where emerging technologies and innovations are critical, requiring new organizational buildings for the products and services offered, which emphasize unique value propositions to the market and change current business models [61], [62], [132][65], [133], [134]. It has therefore proposed that:

**H3:** *Technology Orientation* has a direct and positive impact on *Business Model Innovation*

#### F. Market Orientation and Competitive advantage

To explore mutually beneficial strategic and conditional relationships between Market Orientation and competitive advantage, then to examine how competitive advantage is reachable through Market Orientation. Recently many companies face a market dynamic, fast-changing and erratic environment, and intense competition. Market orientation promotes organizational competencies such as innovation, collaboration, creativity, leadership, and adaptability [90]. According to F. H. Liu and T. L. Huang [135], several empirical studies discuss the role of Market Orientation at the factory development of competitive advantage. While access and competition in the mobile telecommunications sector is rising, customer satisfaction, service quality and revenue are declining [136], also state that in the technology of globalization, which has added unprecedented changes in the service economy, organizations of all sizes and structures ought to look for strategies to improve performance besides sacrificing quality. Market-oriented innovation policy encourages the creation of sustainable competitive advantages for the creative industry [73] [86], [137].

As stated by the CEO of an operator company from Indonesia:

Organizations need to be innovative and agile by having a customer-centered vision to win an agile market and a dynamic environment. Organizations ought to be able to capture customer pain points and requirements, disseminate this intelligence within the organization to analyze competitors' weaknesses and strengths. Focus on competitors, market, and internal organizations.

This solution can be developed in an inside organization improvement and collaborated with other solution providers.

To show that there are a relationship and the results of several studies *Market Orientation* and competitive advantage and it has a direct impact [72], [73], [90], [91], [129], [136], [138]–[141]. Market-oriented organizations collect data regularly about customers, competition, and markets were to operate to plan and provide better value to the customers and to maintain a competitive advantage in an increasingly competitive environment [118]. It has therefore proposed that.

**H4:** *Market Orientation* has a direct and positive impact on *Competitive advantage*

#### G. Technology Orientation and Competitive Advantage

Technological orientation has an extra effect on reaching a sustainable competitive advantage as a substitute than market orientation. In short, market orientation and technology orientation complement each different and enhance the success of sustainable competitive advantage. Also, mass customization and profitable of products and consequences expose from the competitor's focus, has the best effect on sustainable competitive advantage by the managerial stage of the company [142].

The stage of the company's technological competence is management technology, method technology, and product technology that related with two operational measurement bundles and for two strategic building competitive advantages customer satisfaction, brand reputation, new product introduction, market share, company competitive priority, cost, price, quality, flexibility, and time. So, the determination of excellent technology helps companies to produce greater competitive services and products, increase more efficient processes and typically provide greater effective solutions to customers [143], [144].

As the Network Director of telecommunication operator company in Indonesia, stated:

Telecommunication operators' requirements are becoming greater complex and greater dynamic. They demand service in telecommunication companies provide an end-to-end solution and attempt to avoid being involved with the complexity to has engaged with multiple solution suppliers. Therefore, telecommunication operator businesses are required to have the capacity to leverage a partner's precise capability to attain the advantage of having fast and comprehensive in technology innovation.

Today's information technology is the most important in the success or failure of any institution to occupy at all stages and fields of business because facts turn into the institution's primary resource. Information technology has contributed to growing the likelihood of online marketing success by using increasing the possibility of new and contemporary service commercials anytime and anywhere [93], [145].

As stated by the CEO of a submarine deployer company from Indonesia :

We need to understand technology trends, nowadays and shortly, and customer plans and requirements. By harmonizing with both, organizations will be able to make the correct innovation strategy. When adaptation in product development is needed, our organization shares a group of technical experts and organizes collaboration between different product lines in an integrated communication platform to support a technology orientation process that has aligned with customer needs.

Another research showed empirically that intensive study about sense, technology orientation positively influenced to competitive advantage [73], [92], [93], [101], [129], [142], [144]–[146]. It has therefore proposed that:

**H5:** *Technology Orientation* has a direct and positive impact on *Competitive Advantage*.

#### IV. DISCUSSION

In this study, we theorized that closely coordinated BMI could increase Competitive Advantage and will enhance organizational responsiveness in satisfying market orientation demand. Successful technology innovation has produced by intensive internal and external information processing, coordination, and collaboration of resources under business model innovation review [147]

However, this study also emphasizes that as the customer requirement complexity increases in today open innovation era, the capability of organizations to collaborate with partners [131], [148] and to exploit internal organizational structural flexibility [149] become more critical for the success of product development and organization responsiveness in offering solutions to customers. This study provides an integrated perspective, centered on business model innovation capability that influences positively on competitive advantage and business performance, and collaborative ability between business partners involved [31]. This study adds to research that aims to understand the mechanisms through which the three antecedents influence competitive advantage and further enhance business performance.

#### V. CONCLUSION

exploratory case studies and systematic literature review evidenced that Business Model Innovation and Competitive Advantage is decisive for business success when an organization is facing intense market pressure [42] [43] [46]. Market Orientation and competitive Advantage determined by appropriate investment in ongoing product renewal and technology extensions, as well as investing in products for the new market opportunity [150].

Therefore, the quality of the innovative business model portfolio is central for strategic decision-making capability especially when the innovation complexity increases [151], [152].

This study conceptually develops a framework that linked technology orientation, market orientation, business model innovation and examines their effect on competitive

advantage. This study employs an information processing theory to propose and analyze the antecedents and consequences of business model innovation. The study diverges from prior studies on BMI by investigating technology orientation in leveraging external capability and organization structure flexibility to enable organizations to achieve high-quality business model innovation capability and competitive advantage, thereby adding to the cumulative body of knowledge in this research area. The conceptualization and investigation of the independent and joint effect of market-orientation, technology orientation of BMI, and on competitive advantage highlight the importance of complementarities between antecedents and set standing for future research.

#### A. Future Research

This research has limitations that only done in telecommunications internet service providers in Indonesia. As an antecedent of the Business Model Innovation has identified, and its relationship has presented, large-scale quantitative surveys can then be carried out to test the conceptual framework and further explore the role of each variable. Furthermore, future research can be expanded to consider the international implications of research and the broader scope of the industry.

#### B. Management Implications

From a managerial perspective, this research gives organization management a comprehensive view of how to enhance Business model innovation effectiveness and consecutively responsiveness in providing a solution to customers, what important factors influence it and their relationships. This Study will give the benefit to the telecommunications companies that want to move to 5G which is still an expensive and lengthy process, by using strengthening monetization of customer data flow, perfecting internal monetization, but especially overcoming external monetization to leap forward and will become an essential part of the strategy. Portfolio managers are suggested to intensify the use of the information system as it positively impacts an organization's innovation program performance by deepening information exchange with internal and external stakeholders.

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