

# Competitive Analysis in Satellite Ground Segment Industry Case Study of PT PC

Anggha Dipa Pratama<sup>1)\*</sup>, Lorio Purnomo<sup>2)</sup>, Glory Aguzman<sup>3)</sup>

<sup>1)2)3)</sup> BINUS Entrepreneurship Center, Bina Nusantara University.

Jl. Kebon Jeruk Raya No. 27 Jakarta Barat, Indonesia

<sup>1)\*</sup> [anggha.dipa@binus.ac.id](mailto:anggha.dipa@binus.ac.id)

<sup>2)</sup> [lorio.purnomo@binus.ac.id](mailto:lorio.purnomo@binus.ac.id)

<sup>3)</sup> [gguzman@binus.edu](mailto:gguzman@binus.edu)

Article history:

Received 25 April 2024;  
Revised 26 April 2024;  
Accepted 27 April 2024;  
Available online 30 April 2024

Keywords:

Business Model Canvas  
Case Study  
Competitive Analysis  
Porter's Five Forces  
Satellite Ground Segment

**Abstract**

The industry of providing devices and system integrators satellite ground segment is currently starting to erode with more efficient replacement telecommunications technologies such as fiber optic, wireless, and so on. In addition, satellite companies have begun to enter systems integrators business as one stop solution for customers. So, it is necessary for the provider of satellite ground segment devices and systems to re-analyze and to adjust their business strategy, to be more competitive, grow, avoid stagnation and losses. This paper used description methodology with case studies. PT PC in this case study is one of the ground segment satellite devices and system integrator company in Indonesia. This paper analyzes and provides points of advice to be done related to the results of the company's conclusions on situations and conditions using Michael Porter's 5 competitive forces and Business Model Canvas. As a result of the analysis, PT PC should strengthen the company with its uniqueness and upgrade the expertise, get more buyers and suppliers, and do diversification products and services to offset the substitutes. This paper has limitations which could be further interesting topics for the next paper.

## I. INTRODUCTION

In technological era Indonesia needs qualified telecommunication facilities in accordance with its natural contours as an archipelagic country, the ideal solution is Satellite telecommunication because it can be implemented on various contours including archipelagic. The Indonesian Satellite Association (ASSI) released that demand of satellite communications will be grow 65% from 2021 to 2025.

Main driver should be from government, enterprise, backhaul, and consumer. Means the industry of providing devices and system integrators satellite ground segment also will be vastly growing[1]. Below is the graphic demand for satellite connectivity in Indonesia until 2025.

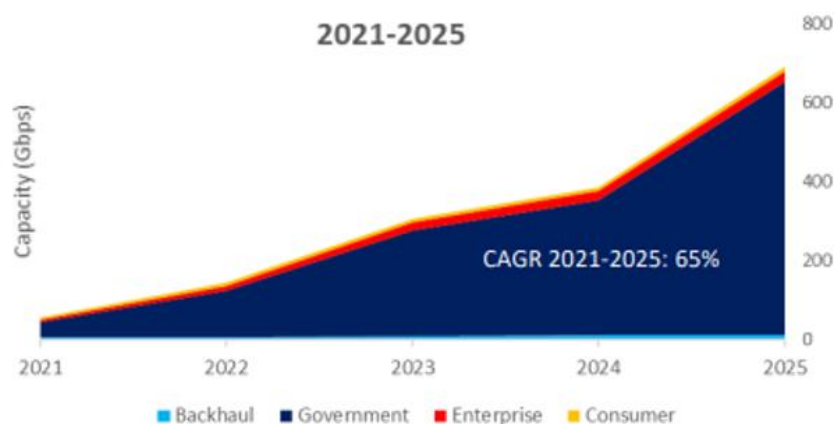


Fig.1 Demand Satellite Connectivity in Indonesia 2021 – 2025[1]

\* Corresponding author

Vertical line show the demand satellite connectivity in Indonesia per Gbps (Gigabit per second), which increase every year. Compound Annual Growth (CAGR) for demand satellite connectivity in Indonesia is 65% means very aggressive. The graphic also show that there are four sector which drive the demand. Satellite connectivity in Indonesia mostly implemented for phonecell celular backhaul, government services, enterprise, and consumer as the end user.

Refer to Figure 1 above, Indonesia has big demand for satellite connectivity compare with global satellite market which only 6.5% CAGR from 2021 to 2030 [2]. ASSI informed that satellite industry in Indonesia should have significant growth until 2025. For Indonesia market, ground segment satellite should be interesting business which can be growth significantly.

PT PC, in this case study as one of system integrator company for ground segment satellite in Indonesia should have strong competing forces to win market share. To analyze the competition forces, this paper use Michael Porter's 5 Competitive Forces as tool. Michael Porter's 5 Competitive Forces is proper tool for this case study, since it's described the 5 elements which drive the competition of satellite ground segment industry, especially in Indonesia.

PT PC in this case study should know very well about the profiling satellite use applications, so that PT PC products and services will be proper in line with customer requirements. Below is the profiling satellite uses in May 2021 graphic.

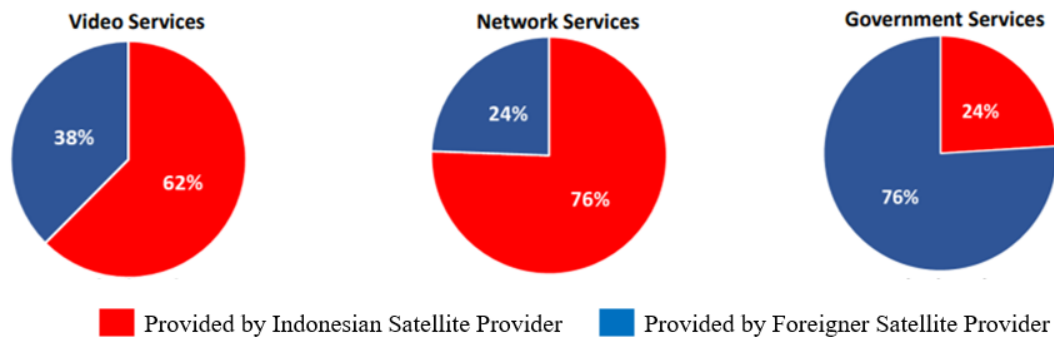


Fig. 2 Profiling Satellite Uses in May 2021 [1]

Figure 2 shows, satellite connectivity in Indonesia is used as video services, network services, and government services. Each pie chart shows that for Indonesian market there are more than 20% still using foreign services, especially in the Government sector 76% use foreign satellite services. This means so many chances and opportunities for local Indonesian companies to gain more market share. Business Model Canvas is proper tool to analyze what factor in the company should change, and it will change to another block of Business Model Canvas to follow the changes of the customer segment.

Business Model Canvas is proper comprehensive analysis tool for this study case as the changes of the target market will change the direction and focus of the company. Business Model Canvas will review whether the key activities proper for the new target segment, the key partner still relevant to the segment market, review for the value proposition, and so on. The changes of one block component will change other components of the company.

PT PC provided, delivered, installed, integrated, and doing commissioning equipment needed to build ground segment satellite communication. Establish 2008, PT PC located in Jakarta Indonesia and nowadays have several supplier ground equipment, trusted by the principal to be agent reseller in Indonesia. PT PC Provide satellite operator and mostly are Service Provider Satellite or VSAT operator as customer.



Fig. 3 Satellite Business Value Chain, the Players [1]

Figure 3 describes satellite business value chain. PT PC categories as downstream business in satellite value chain. PT PC key partner and supplier are ground equipment manufacturers, and PT PC customers mostly service provider or VSAT Operator, some satellite operator and government as end user.

Demand of satellite communications projections, profiling satellite uses, positions describe in the satellite business value chain above, and the tendency that satellite operator change their business become one stop solution for their customers, also the development of telecommunication technology which can cause many substitute solutions beside satellite can be elaborated and analyzed with Michael Porter's 5 competitive forces as a tool to assess the intensity of competition in this industry. Business Model Canvas as a tool to provide a brief model overview of how to formulate a good and correct business as continuation of Michael Porter's 5 competitive forces analysis in this case study.

## II. RELATED WORKS/LITERATURE REVIEW

### A. Michael Porter's 5 Competitive Forces

In this case study, Michael Porter's 5 Competitive Forces is used to map the weaknesses and strengths as comprehensive view to identify the structure and then to determine corporate strategy. Besides that, Michael Porter's 5 Competitive Forces applied to understand the level of competition within the industry and enhance a company's long-term profitability.

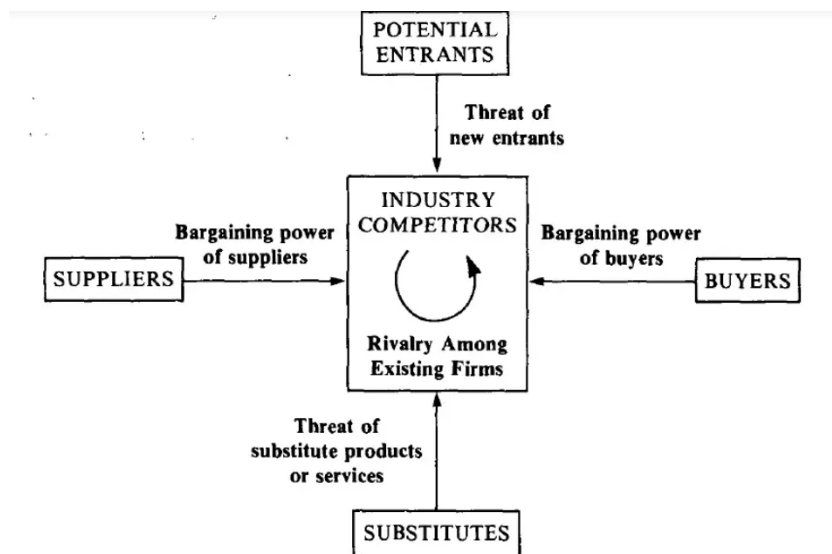


Fig.4 Forces Driving Industry Competition [3]

In Figure 4, Porter's 5 forces show competition in the industry, potential of new entrants into the industry, power of suppliers, power of customers, and threat of substitute products.

#### ***A.1. Rivalry among existing firms***

The first of the Five Forces refers to the number of competitors and their ability to undercut a company. The larger the number of competitors, along with the number of equivalent products and services they offer, the lesser the power of a company. In 2006 listed 55 Indonesian companies registered as satellite user. The 55 companies consist of VSAT Operator, system integrator, university, satellite provider, and Association [4]. The ecosystem of ground segment satellite industry consists of various business models, PT PC is one of system integrator in Indonesia. PT PC customer can be internet service providers, VSAT Operator, university, research and development division of Indonesia government, satellite operator, enterprise, and sometimes also other system integrator can be our partner at the same project.

#### ***A.2. Bargaining power of suppliers***

The next factor in the Porter model addresses how easily suppliers can drive up the cost of inputs. The fewer suppliers to an industry, the more a company would depend on a supplier. As a result, the supplier has more power and can drive up input costs and push for other advantages in trade. In the satellite ground segment, supplier for the devices is not much, as satellite ground segment is specific equipment, sometimes it even must be customized. Mostly the device is made in foreign country out of Indonesia.

#### ***A.3. Bargaining power of buyers***

The ability that customers must drive prices lower, or their level of power is one of the Five Forces. In the satellite ground segment, especially in Indonesia, the customer also not much. The satellite market growth significantly as show at figure 1, in this case PT PC is provider of the system and equipment for VSAT and satellite operator, which not very much company in Indonesia.

#### ***A.4. Threat of substitute products or services***

All firms in an industry are competing, in a broad sense, with industries producing substitute products. To connect and communicate customers can select other ways like fiber optic, cable, wireless radio link frequency, beside satellites. The substitute is usually cheaper than satellite, though some of site cannot replace satellite as they have specific landscape which cannot use other way, but mostly user avoid using satellite communications consider it's costly than other ways.

#### ***A.5. Threat of new entrants***

A company's power is also affected by the force of new entrants into its market. An industry with strong barriers to entry is ideal for existing companies within that industry since the company would be able to charge higher prices and negotiate better terms. To become new entrance of satellite ground segment, new company must complete legal documents refer to government regulation, also have permit to import and export the devices, beside support from factory or principal and have expertise in technical related to the satellite devices.

Porter's 5 strengths review external situations that show the company's position in the industry and in a broad sense replace products and services. Sometimes the external situation cannot be anticipated and controlled by the company. For example, the company cannot block the rapid change of technologies from replacing the old ones. Likewise, the market will turn to the latest and cheaper solutions day by day.

The company needs to be better in every area which can be controlled. The company can control their internal factor, then the questions are which internal factor need to be change related to the external situation to keep their goal? Need one more tool to review and analyze the internal changes related to Porter's 5 forces result.

Porter's Five Forces has been used in various research in many industries and still have high relevance in today's innovative and changing business environment [5] and industry 4.0 era [6]. Previous study shows that Porter's Five Competitive Forces was used to visualize direct and indirect threats and risks in aero-manufacturing business post COVID-19 pandemic. [7]. Other similar purpose study also conducted to assess the bargaining power and threat factor at retail minimart in Tasikmalaya City [8].

Porter's Five Forces also can be used to assess competitive environment of industries to ensure the viability of value proposition, which conducted by study in Batik Sasirangan industry in Kalimantan [9] and pre-service visual art teachers in Kazakhstan [10]. Companies' competitive positioning and strengths relative to the industries also can be captioned by using this tool, shown by study in Immunotherapy industries [11].

Application of Porter's Five Forces in satellite industries are shown in several studies such as telecommunication industry in the Sultanate of Oman [12] and US Telecom Industry [13].

## B. Business Model Canvas

Business Model Canvas has a clear view to describe the situation of the company and will be used to assess and change the business model as implementation of the analysis results[14]. Osterwalder’s original canvas includes nine elements, they represent vital aspects of business survival.

A strategic management framework for comprehending possible trade-offs in company is the business canvas model. Alexander Osterwalder is credited with proposing the nine-block concept. This makes it easier for businesses to think about business models as opposed to merely products. This portion covers potential revenue streams, network expenses, important partners, important resources, the network's value proposition, subscriber segments, and channels [15]. Below is the template:

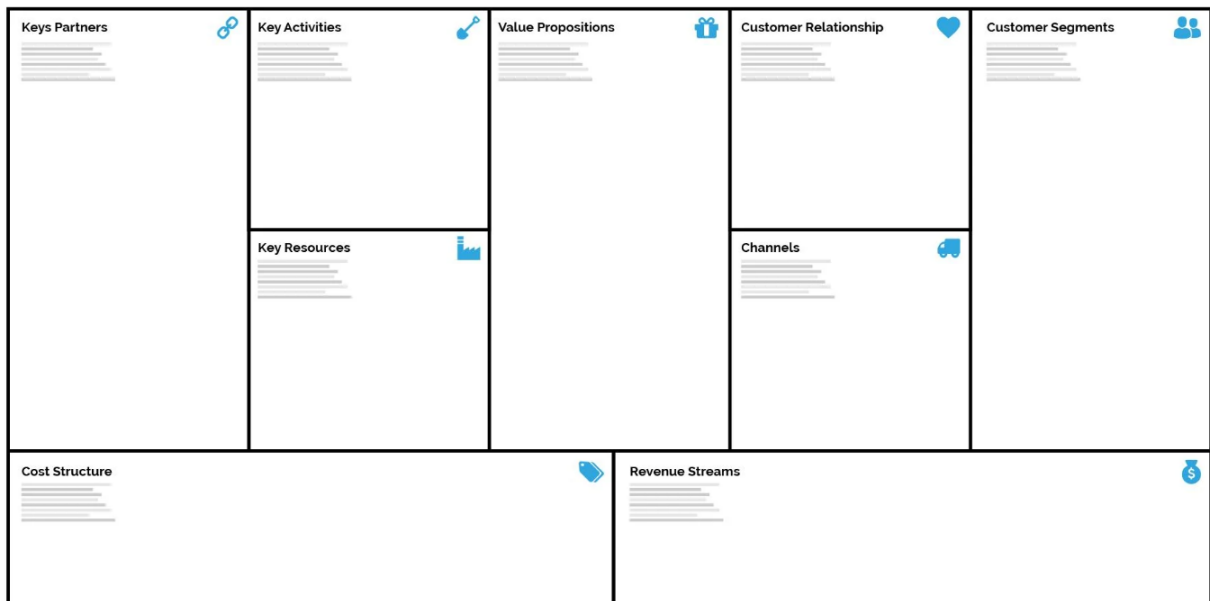


Fig. 5 Business Model Canvas Template Blocks [14]

### B.1. Customer Segments

The first element is Customer Segment, which describe the list of customers suitable to consume and obtain the benefit from the company.

### B.2. Value Proposition

The second element is value proposition. This block present the uniqueness of the product or services, the reason why customers should buy from the company. Ideally, it solves a problem or drives additional value for each customer segments.

Customer segments and Value proposition building block were derived from Value Proposition Canvas which giving deep insight of customer profile and unique value proposition as well as problem-solution fit described in both blocks [16], as shown in Figure 6.

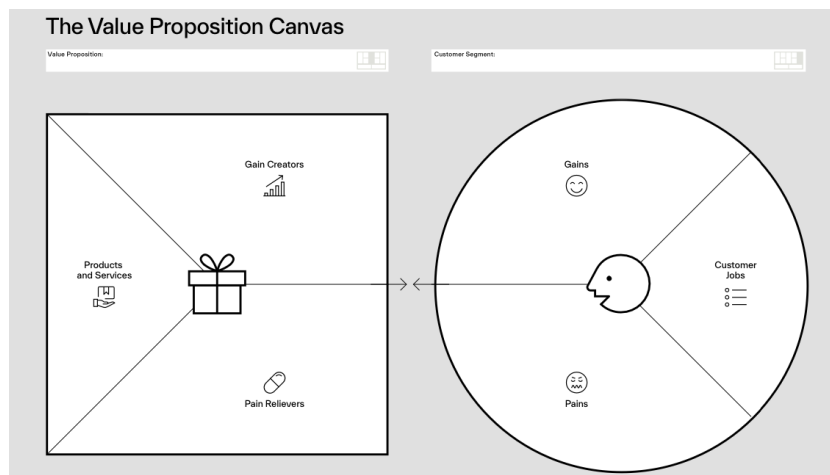


Fig. 6 Value Proposition Canvas [17]

### ***B.3. Channels***

The third block is Distribution Channels. The effort to build awareness of company's existence and various ways obtain proposed products or services.

### ***B.4. Customer Relationship***

The fourth block is Customer Relationship, how the company choose strategy to interact with the target customer. How the image is built and how the company treats the customer to get positioning and good brand image from customer.

### ***B.5. Revenue Streams***

The fifth block is revenue streams, is about determining where the revenue comes from, from each customer segments and from various ways of generating sales.

Those five blocks from the right side of business canvas covers the business to market insight of the company, which is also known as value side.

### ***B.6. Key Resources***

The Key Resources block describes all the critical resources needed to run the business well. Key resources can be physical, intellectual, human and funding.

### ***B.7. Key Activities***

The business activities are vital for work that the company should do in the daily process of the business to get the target and purpose of the company. It should cover the value chain of the company in delivering their value proposition.

### ***B.8. Key Partners***

To run the business well, a company has partners to perform collaboration and fulfil the supply chain, which describes in Key Partners building block. Parties like suppliers who are vital to flawless business operations are listed in Key Partners, a company might have difficulties in operating the business without them.

### ***B.9. Cost Structure***

All costs incurred to create the value through products or services are described in the ninth building block, Cost Structure. Startups and enterprises spend money on production and accompanying services. To set realistic revenue goals and products or services pricing, a company needs to estimate and control the costs.

The left side of the Business Model Canvas covers the company's effort to create value through products or services, which is also known as efficiency side.

Previous studies show the importance of using business models as a tool to efficiently build and maintain business sustainability especially in Digital Business Transformation [18]. Business model can be used as a visualization tool which support understanding, integrating, and developing flexible electric vehicle, creating valuable information for evaluating the initial and untapped potentials of commercial demand response in electricity markets [19]. Comparison of businesses in different countries can be benchmarked by using Business Model Canvas, shown by study in photovoltaic installers industries [20].

Other industries which also adopted Business Canvas are aircraft maintenance, repair, and overhaul companies. Business Model Canvas was used as a tool on shifting into manufacturing optimized spare part by adopting additive manufacturing as an activity to replace traditional maintenance, repair, and overhaul activities, which promotes more sustainable business models. [21]. Impact of Business Model on corporate sustainability also concluded by study of companies in Kosovo, Albania, and North Macedonia [22]. Business Model Canvas also can be used as a tool to increase company's competitiveness in industries, which is shown by study conducted in small medium enterprise in Bandung [23].

Business Model Canvas and 5 forces Porter will complement each other in describing competitive environment of the industry, maintain or upgrading competitive positioning of the company, and promoting better business environment for the company in order to sustain the competition. In satellite industries, Porter's Five Forces combined with Business Model Canvas was studied in Thuraya Satellite Telecommunication [24].

The formulation moves on to the Business Model Canvas framework after collecting the business model points. The Porter's Five Forces business model points are articulated in detail inside this framework. Its goal is to create a complete business model, including revenue streams and target market. The current business model serves as the foundation for the structure of the new one [25].

### III. METHODS

This paper uses a descriptive methodology with case studies. Two strategic based tools were used as an approach to explain the business competitive positioning, which are Porter's Five Forces analysis[3] and Business Model Canvas[14] on PT PC.

PT PC is one of system integrator company for ground segment satellite in Indonesia located in Jakarta, Indonesia. Established in 2008, PT PC provides hardware, solutions and services in ITC (Information and Communications Technology) and CME (Communications Media and Entertainment). The products are, among others, System Integration Services, Hardware/Software Provider and Solution Services, Industry Solution Services, System Consolidation Solution, Maintenance, System Support, Network Design & Implementation Services, Relocation Services & DRC (Disaster Recovery Centre) Services. PT PC also delivers, installs and perform maintenance of satellite communications products, earth station antenna, satellite modems, solid state power amplifiers (SSPA), Travelling Wave Tube Amplifiers (TWTAs), Low Noise Amplifiers (LNA), Low-noise Block Downconverter (LNB), Block Up Converters (BUC), RF Distributions, and associated redundancy subsystems.

Data Collection Methods in this research is using interviews with the president director of PT PC, documentation, and observations in 2023. Interviews provide us with the current situation of the company and industry. Products selection that the company offers including future products and services development also obtained in interview section. Documentation such as company profile and financial statement summary support us in understanding the milestone of the company, list of customers and potential customers, financial performance, revenue generator and cost allocation. Observations conducted give us a better understanding of the company in conducting their business process and activities.

Data obtained are inputted into two strategic based tools explained above to give us a clearer picture of PT PC strategic position in the industry competition, then analyses both of the tools to provide the company with suggestions and recommendations that may help them to cope with the industry competition and sustain in the business.

### IV. RESULTS AND DISCUSSIONS

#### A. Michael Porter's 5 Competitive Forces

From the interview conducted with PT PC's President Director, it can be presented that the Porter's Five Forces of PT PC as below:

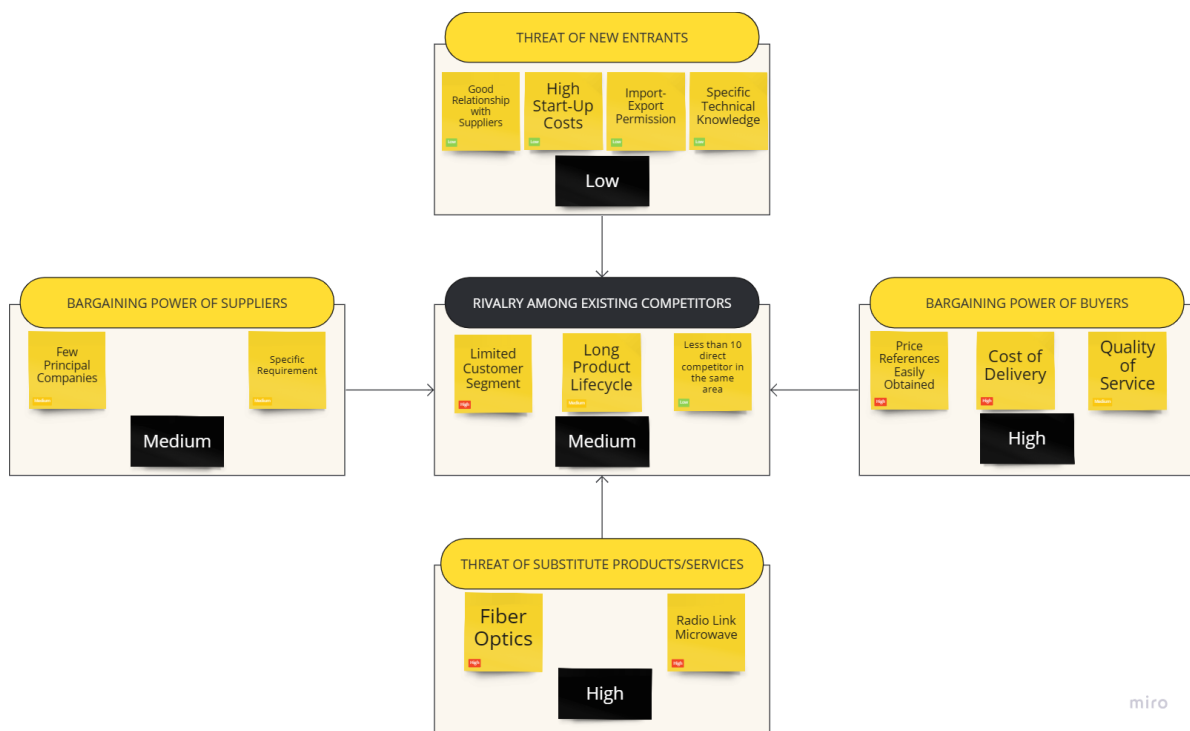


Fig. 7 Forces Driving Industry Competition PT PC



### ***A.1. Rivalry among existing competitors***

The competition of satellite ground industry is not very dense in Indonesia as shown in figure 7. Although, the competition shares the same limited customer segments that adopt satellite ground products. Long product lifecycle limited companies to gather recurring sales in the short period of time. Thus, upgraded service to create unique value proposition and competitive advantage is required for PT PC to ensure sustainability of business operation.

### ***A.2. Bargaining power of suppliers***

Limited number of principals and manufacturer of satellite products makes PT PC relatively struggle to select products to propose to their customers. Specific requirements and technological barrier also make an impact in combining system and support for customers. Custom-made equipment sometimes required to meet customers' demand. With the relatively medium threat from suppliers, PT PC must seek more principals and product differentiation to be added in their products and services portfolio.

### ***A.3. Bargaining Power of Buyers***

In the ground segment satellite industry, the customers are mostly VSAT operator, television broadcast, and satellite operator. Figure 7 shows that customers for satellite ground industry could easily obtain product specification variants, selection of brand, and prices of products from various references. With the knowledge and information that customers have, it means the players in the industry could not set high margin for offering the products in their quotation. High cost of delivery including installation makes profit margin reduced. High quality of service demand from buyers also contribute to additional cost the company has to cover which makes further reduction into profit margin.

High bargaining power from buyer makes it difficult for PT PC as one of the players in satellite ground industry to generate high profit margin for delivering their products and services, thus the company should be concern and give more attention in customer relationship in order to maintain their loyal customer and gaining trust from potential new customer.

### ***A.4. Threat of substitute products and services***

Fiber optics and radio link microwave might be the only product substitution for satellite ground in telecommunication business, yet the others required lower cost of maintenance. As stated before, satellite ground telecommunication has its advantage in rigorous contour and archipelagic character of Indonesian area as the whole region, but in urban and flat terrain area fiber optics is considered more appropriate choice for telecommunication industry.

Even though radio link microwave only has limited reach of coverage, it costs less for customer than satellite ground communication. PT PC should focus more effort to propose their products and services to potential customers that need high coverage and rural areas.

### ***A.5. Threat of New Entrants***

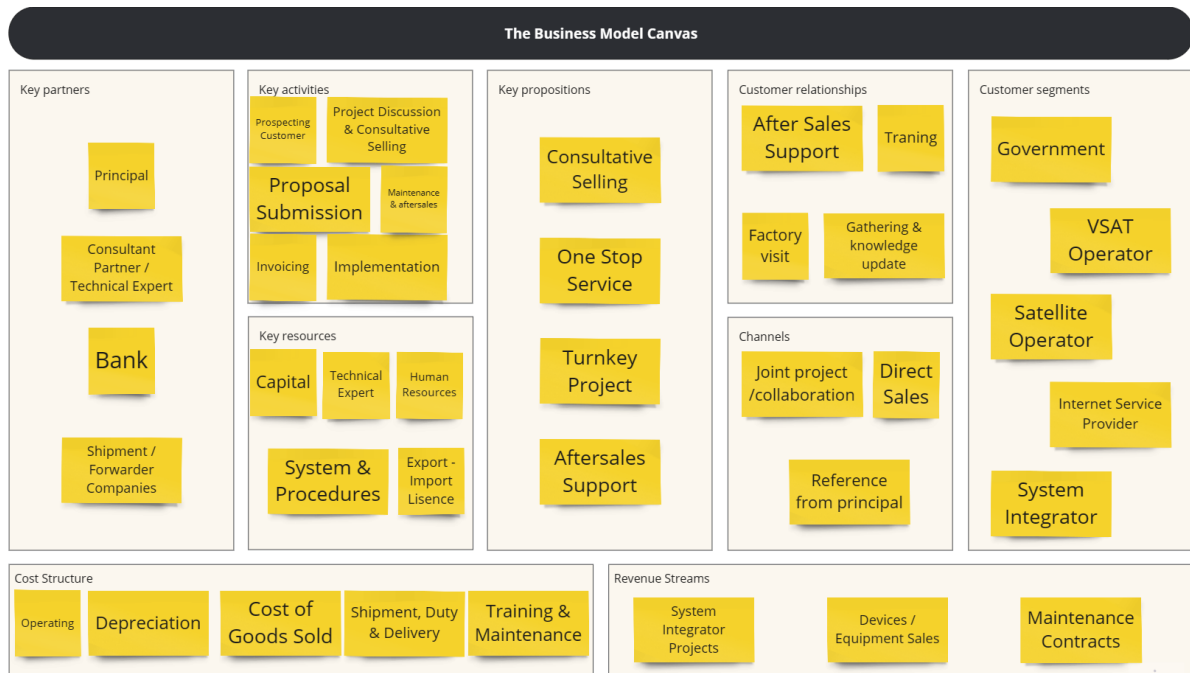
Satellite ground industry faces low threat of new entrants because it requires relatively high start-up cost for building new company as shown in figure 7. Besides the cost of permission to operate, it requires proper certification for the company itself as well as the human resources, especially in the technical area so the company can start proposing the products. A large amount of capital is also required since company needs to acquire various products as a demo product in order to approach new customer. It also requires adequate storage space to store products and tools the company needs in installation and maintenance.

Specific technical knowledge is also required for the company's employee in technical area, so proper and continuous costly training is a essential activity. Company also needed import and export permit which is a costly and complicated process that tough to obtain. Good relationship between existing companies with suppliers also makes new company face difficulties to approach in becoming the agent or distributor of products. Thus, the low potential entry of new competitors in satellite ground industry is highly unlikely to become a major threat to existing players in this industry.

## ***B. Business Model Canvas***

As a result of interview with PT PC president director, company's documentation, and observation, presented below is PT PC current Business Model Canvas.





Source: Strategyzer AG | License: CC-BY-SA 3.0

Fig. 8 Business Model Canvas PT PC

Figure 8 presents the PT PC Business Model until 2023. In this case study, PT PC is an Indonesian system integrator and one of the ground segment satellite devices. To facilitate understanding, the author will attempt to provide a full description of figure 8, beginning with the order of the nine Business Model Canvas blocks now in use.

### B.1. Customer Segment

Potential Customer segment

- Government,
- VSAT Operators,
- Satellite Operators,
- Internet Service Providers,
- and some of another system integrator like PT PC as subcontractor or project operator.

### B.2. Key Proposition

Potential Customers choose PT PC as their supplier or vendor because.

- PT PC can do Consultative Selling
- PT PC can do turnkey projects as their consultant.
- PT PC can become one stop services to deliver the project ready for service, the most important things are about aftersales respond support.
- Aftersales support

The customers come from principal as referral, directly approach by PT PC and some of projects are collaboration with other system integrator.

### B.3. Customer Relationship

- Aftersales support
- Training
- Factory visit
- Gathering Knowledge update

To engage customers, PT PC offers factory visits, product updates, training, and gathering events. For this reason, system integrator projects account for 69% of PT PC revenue, with the remaining 28% coming from sales of equipment or devices for customer operation and maintenance and the remaining 2% coming from recurring revenue from yearly contract maintenance.

#### **B.4. Channels**

- Join Project/Collaboration
- Direct Sales
- Reference form principal

#### **B.5. Revenue Stream**

- System Integrator Project
- Devices/Equipment sales
- Maintenance Contracts

#### **B.6. Key Activities**

To establish the business, PT PC must perform important daily tasks such as customer visits, consultative selling meetings and discussions, proposal submissions as solutions for customers, implementations, billing, and after-sales support. PT PC occasionally hosts factory inspections, customer events, and product updates to amuse patrons.

#### **B.7. Key Resources**

To run the company well, PT PC

- needs employees,
- technical experts,
- some licenses and permits,
- Capital

#### **B.8. Key Partners**

PT PC needs partners to support the business. To do main activities PT PC need supports.

- from banking as financial institutions to get financial services like loan,
- transfer payment, and other services.
- Principal as the owner of the product or brand is also the key partner for PT PC,
- protection from principal usually determined the winner of the competition.

The things mentioned above need cost.

#### **B.9. Cost Structure**

Depreciation of all assets, tools, equipment, and gadgets used to run the business accounts for 12% of the overall cost, whereas fixed costs include operating costs like salaries and other charges. 88% variable costs, mostly for the cost of the goods purchased, and 6% for the cost of delivery, which includes customs and import charge.

## V. CONCLUSIONS

Both Michael Porter's 5 competitive forces and Business Model Canvas give different views for PT PC, but both tools are complementary to each other. Referring to Michael Porter's 5 competitive forces overview and analysis, PT PC should strengthen the company with the uniqueness and upgrade the expertise, completed with some certifications which other newly entrance company found it difficult to be at the same level. Besides that, PT PC should seek more customer segment, acquire more suppliers, and do diversification of products and services to offset the substitutes.

Business model canvas shows that PT PC main business is only in satellite ground segment, satellite project and devices. PT PC depending on system integrator projects and selling satellite devices as its main revenue streams with maintenance contracts as supportive yet non-significant revenue generator. Both main revenue streams are one time charge to customers, means they are irregular incomes for PT PC, while PT PC has fixed cost to do the company. PT PC needs to get regular income to cover the fixed cost, so that needs to get the recurring earnings such as maintenance contracts, license extension for every year services, and other prospective business.

In the competitive business situations see that PT PC relatively do not have strong positions and have to change some of the strategic direction of the company. Mentioned above PT PC should be soon do diversification of business, not only doing main business in satellite ground segments but also should do others as concern of substitutes product and buyer's bargaining power.

This paper has several limitations which do not show the revised Business Model Canvas related to competitive review using Michael Porter's 5 competitive forces. The result should be revising the block of key activities, key partnership, and additional cost in Cost Structure block should be added with market research and development to penetrate new market for diversification. Value proposition canvas of the company also not one of the result and discussion in this paper that should be analyzed in another discussion. What factors most affect the

competitive strength in the Satellite Ground Segment Industry? How about the feedback and impact of strategy implementation in the industry? What is the success factor affecting the implementation of the strategy to this industry? Can be the next step paper to continue.

#### REFERENCES

- [1] ASSI, *Handbook Training*. Bandung: The Indonesian Satellite Association, 2021.
- [2] Facts and Factors, “Satellite Market Size, Share Global Analysis Report, 2022 – 2028.” Accessed: Apr. 25, 2024. [Online]. Available: <https://www.fnfresearch.com/satellite-market>
- [3] M. E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitor*. New Introduction. Free Press, 2008.
- [4] Rouzni, “55 Perusahaan Pengguna Satelit di Indonesia Terdata .” [Online]. Available: <https://inet.detik.com/telecommunication/d-599420/55-perusahaan-pengguna-satelit-di-indonesia-terdata>
- [5] G. H. Th. Bruijl, “The Relevance of Porter’s Five Forces in Today’s Innovative and Changing Business Environment,” *SSRN Electronic Journal*, 2018, doi: 10.2139/ssrn.3192207.
- [6] L. Kohnová and N. Salajová, “Re-Thinking Industry 4.0 Effect on Competitive Forces: Empirical Study on Innovation,” *Sustainability*, vol. 15, no. 3, p. 2637, Feb. 2023, doi: 10.3390/su15032637.
- [7] H. Hisan, N. A. Badruddin, and K. H. Yusof, “A Review of Malaysia’s Aerospace Manufacturing Post-COVID19 Pandemic Using Michael Porter’s Five Competitive Forces Model,” *E3S Web of Conferences*, vol. 477, p. 00048, Jan. 2024, doi: 10.1051/e3sconf/202447700048.
- [8] R. Wijaya, I. Yusuf, U. Pendidikan Indonesia, and C. Author, “Strategic Analysis Of Tasco Minimart In Tasikmalaya City By Porter Five Forces Analisis Strategi Pada Tasco Minimart Di Kota Tasikmalaya Dengan Porter Five Forces,” 2023. [Online]. Available: <http://journal.yrpiaku.com/index.php/msej>
- [9] A. Anggraeni and I. Yulia, “The Digital Marketing Strategy of Batik Sasirangan: An Overview,” in *2022 13th International Conference on E-business, Management and Economics*, New York, NY, USA: ACM, Jul. 2022, pp. 64–66. doi: 10.1145/3556089.3556104.
- [10] N. Koshkinbayeva, Z. Shagataeva, A. Utepova, K. Taukebayeva, and S. Kurmantayeva, “Exploring pre-service visual art teachers’ competitiveness through porter’s five forces model,” *J Educ Elearn Res*, vol. 10, no. 3, pp. 389–396, Jun. 2023, doi: 10.20448/jeelr.v10i3.4726.
- [11] J. Maartens and D. W. Hutmacher, “Porter’s Five Forces Analysis: Quo Vadis Immunotherapy Industry,” in *Novel Innovation Design for the Future of Health*, Cham: Springer International Publishing, 2022, pp. 391–408. doi: 10.1007/978-3-031-08191-0\_31.
- [12] J. Rajasekar and M. Al Raee, “An analysis of the telecommunication industry in the sultanate of oman using michael porter’s competitive strategy model,” *Competitiveness Review*, vol. 23, no. 3, pp. 234–259, 2013, doi: 10.1108/10595421311319825/FULL/XML.
- [13] A. Yameen, “Porter’s Five Forces on Us Telecom Industry.” [Online]. Available: [https://www.academia.edu/37058445/Porter\\_s\\_Five\\_Forces\\_on\\_Us\\_Telecom\\_Industry](https://www.academia.edu/37058445/Porter_s_Five_Forces_on_Us_Telecom_Industry)
- [14] A. Osterwalder and Y. Pigneur, *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Wiley, 2010.
- [15] S. K. A. Kumar, R. Stewart, D. Crawford, and S. Chaudhari, “Business model for rural connectivity using multi-tenancy 5G network slicing,” in *HONET 2020 - IEEE 17th International Conference on Smart Communities: Improving Quality of Life using ICT, IoT and AI*, Institute of Electrical and Electronics Engineers Inc., Dec. 2020, pp. 182–188. doi: 10.1109/HONET50430.2020.9322837.
- [16] A. Osterwalder, Y. Pigneur, G. Bernarda, and A. Smith, *Value Proposition Design*. New Jersey: Wiley, 2014.
- [17] Strategizer, “The Value Proposition Canvas.” [Online]. Available: <https://www.strategizer.com/library/the-value-proposition-canvas>
- [18] Sabri M. O., Al-Qawasmi K., Odeh M., and Aydin M.E., “Adoption of Business Model Canvas in Exploring Digital Business Transformation,” *Information Sciences Letters*, vol. 12, no. 2, pp. 845–854, Feb. 2023, doi: 10.18576/isl/120225.
- [19] M. Hamwi, I. Lizarralde, and J. Legardeur, “Demand response business model canvas: A tool for flexibility creation in the electricity markets,” *J Clean Prod*, vol. 282, p. 124539, Feb. 2021, doi: 10.1016/J.JCLEPRO.2020.124539.
- [20] P. D. Rigo, J. C. M. Siluk, D. P. Lacerda, and J. P. Spellmeier, “Competitive business model of photovoltaic solar energy installers in Brazil,” *Renew Energy*, vol. 181, pp. 39–50, Jan. 2022, doi: 10.1016/J.RENENE.2021.09.031.
- [21] G. Cardeal, K. Höse, I. Ribeiro, and U. Götze, “Sustainable Business Models–Canvas for Sustainability, Evaluation Method, and Their Application to Additive Manufacturing in Aircraft Maintenance,” *Sustainability 2020, Vol. 12, Page 9130*, vol. 12, no. 21, p. 9130, Nov. 2020, doi: 10.3390/SU12219130.
- [22] K. Kajtazi, G. Rexhepi, A. Sharif, and I. Ozturk, “Business model innovation and its impact on corporate sustainability,” *J Bus Res*, vol. 166, p. 114082, Nov. 2023, doi: 10.1016/J.JBUSRES.2023.114082.

- [23] S. D. Pratiwi, H. Mulyadi, and H. Hendrayati, "Analysis of business model canvas to increase competitiveness," *Advances in Business, Management and Entrepreneurship*, pp. 930–937, Jan. 2020, doi: 10.1201/9780429295348-197.
- [24] A. Morrison and R. Chung, "Thuraya Satellite Telecommunications Porter Five (5) Forces Analysis & Solution/ MBA Resources." [Online]. Available: <https://embapro.com/frontpage/porter5forcesanalysis/10901-thuraya-satellite>
- [25] K. N. P. Wicaksono and C. Apriono, "Literature review: visible light communication system business model scheme for telecommunication business in Indonesia," *MATRIX: Jurnal Manajemen Teknologi dan Informatika*, vol. 13, no. 2, pp. 80–93, Jul. 2023, doi: 10.31940/matrix.v13i2.80-93.