

The Making of Software as a Service (SaaS) Pricing Policy: A Case Study in PT XYZ

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Abstract: Too high pricing will cause companies to lose customers, while too low one will cause companies to lose profits and threaten the company's long-term service commitment. The Target price method and the Life-Cycle Costing method are solutions in pricing that are in accordance with the ability of the customer as well as providing the expected benefits and covering costs during the life span of the product. This thesis is presented a case study research using the Life-Cycle Costing (LCC) method and target Pricing on the problems faced by PT XYZ in making SaaS product pricing policies. The current pricing policy has not used a cost method and a precise and measurable pricing technique. This will potentially disrupt the continuity of services and that of the company itself. This research uses qualitative methods with data collection techniques using in-depth interviews, understanding of documents and observation. The data are analysed to answer research questions and giving solution for the problems that is faced by PT XYZ. The research results are the price policy solutions for PT XYZ using the target pricing method by taking into account all costs during the life span of the product. Research related to the use of the Life-Cycle Costing and Target Pricing methods for SaaS products has not been done much, so it is expected that this research can contribute to the business world and the world of education when facing the same problems.

1 INTRODUCTION

One of the most difficult things in a company's activities is in determining the value of a product or service. Too low pricing will result in companies not making a profit, even suffering losses and too high pricing will reduce the number of buyers. (Lipovetsky, et al., 2011) (Horngren, et al., 2012) (Hansen & Mowen, 2015).

Target pricing is one of the methods of setting the product prices with a basic approach (Horngren, et al., 2012). The company provides prices based on the customer's ability to pay for the product or service (Hansen & Mowen, 2015) (Horngren, et al., 2012). Target pricing is used to increase market share, which eventually will increase company profits (Hongmin, et al., 2012). The determined target pricing must be able to meet profit expectations and target costs during the life cycle of the product, so that the pricing target is very closely related to the use of the Life-Cycle Costing method (Kadarova, et al., 2015).

PT XYZ, as a SaaS service provider, has never analysed and used the right techniques in determining the pricing policy of software products sold under the Software as a Service (SaaS) method. This causes management to not be able to determine whether the product provides benefits and can cover costs during the life-cycle period for the company to provide long-term commitment services (XYZ, 2017).

Life-Cycle Costing from the SaaS service provider side is divided into two, which are at the development stage and the operating support stage (Whitten & Bentley, 2007). Costs incurred during the development stage are the acquisition cost of information technology infrastructure and software development, while costs incurred during the operating support stage are maintenance, marketing and sales costs (Fichman & Kemerer, 2002).

The price of software products sold using the Software as a Service (SaaS) method is different from the software offered conventionally or on premise. Conventional software provides a one-time price that is quite expensive and users are required to

have an information technology infrastructure to store data and software itself. On the other hand, the software sold under the SaaS method offers very affordable software leases. Customers do not need to provide information technology infrastructure, because access to the system uses the internet network and has use flexibility (commitment is limited to the contract period) (Armbrust, et al., 2010) (Jalao, et al., 2012).

To ensure continuity of service, the SaaS price scheme must be done with the right technique, Zheng, et al., (2015), because the costs inherent are not only in the past costs, but also for cost commitments in the future (Fichman & Kemerer, 2002) (Whitten & Bentley, 2007).

The research will answer these questions: is the current pricing policy can achieve its target profit using Life-Cycle Costing Method? How to achieving target profit.

This research is useful for the management of PT XYZ and similar industries in the formulation of pricing policies for Software as a Service (SaaS) products, and can be used as literacy materials for written works in the future. The scope of this research is limited only to the making of price policies on SaaS products consisting of: SaaS - Human Resources System, SaaS - Asset Management, and SaaS-Helpdesk at PT XYZ. Thus, the costs covered in the cost calculation using the LCC method are only those related to the product mentioned above.

2 THEORETICAL FRAMEWORK

2.1 Prospect Theory

The philosophy of pricing policy in this research is based on the prospect theory used in studying decision-making behaviour in the context of risks developed by Kahneman and Tversky in 1979 (Wei, 2008). Example of the use of prospect theory is that pricing will determine customer behaviour in making purchasing decisions by assessing whether the purchase they make will add value to the value of their life or the wealth they have. (Shoemaker, 2005).

2.2 Life-Cycle Costing Method

Life-Cycle Costing (LCC) was first published in 1977 by the UK Department of Industry which was used for construction companies (Boussabaine & Kirkham, 2004). Definition of Life-cycle costing (LCC) was first issued by the British Ministry of Industry in 1977 which is the first definition of LCC, a concept that uses several techniques to calculate significant costs that arise during ownership of

assets (Boussabaine & Kirkham, 2004). British Standard BS 3843 in 1992 defined the LCC as the costs associated with acquisition, use, maintenance and final disposal, including feasibility studies, research and development, design, production, replacement, support and training (Boussabaine & Kirkham, 2004). Furthermore, ISO 2000 revised the definition into a technique that can compare the valuation of costs in a certain time period, considering all economic factors, including capital costs and operational costs in the future. (Boussabaine & Kirkham, 2004). Life-Cycle Costing (LCC) is the calculation of the cost of goods or services that cover all costs starting from research and development, to the support provided by the company for the product to end (Hornngren, et al., 2012) (Khrisnan, 1996). LCC is an approach in the field of cost management that focuses on the total costs that occur throughout the life span of the product (Lindholm & Suomala, 2007). Based on these definitions, it can be concluded that LCC is an approach to calculating the cost of goods or services, taking into account all costs that have occurred or will occur, during the life span of the product.

Traditional cost calculations emphasize the costs that have occurred and are attached to the product, without taking into account the costs after the product is made. As we know, there are still other costs after the product is released to the market, such as customer service costs, product repair costs, costs occurring after the product is not on the market (Kadarova, et al., 2015). LCC is oriented to the long-term performance of a product, starting before the product is produced until the end of the support provided by the manufacturer (Hornngren, et al., 2012) (Lindholm & Suomala, 2007) (Krishnan, et al., 2000). LCC is useful as a cost analysis tool during the life span of a product or service (Boussabaine & Kirkham, 2004) (Fabrycky & Blanchard, 1991), because the LCC does not only consider the costs that have occurred, but also all costs during the life span of the product or service (Boussabaine & Kirkham, 2004) (Fabrycky & Blanchard, 1991) (Hornngren, et al., 2012) (Jalao, et al., 2012). LC-Cost on software products consists of Dev-Cost (development costs) and LC-Cost (costs after the software is sent to customers). These costs include costs of initial software requirement analysis, costs of business process analysis, programming costs, testing costs, costs of delivering product information and product delivery to customers, training, up to product maintenance costs (Khrisnan, 1996), (Fichman & Kemerer, 2002) and (ISO/IEC/IEEE, 2015).

The life-cycle period of a product varies depending on technology and customer preferences. Then the time span used in the LCC varies following

the Life-Cycle of the product (Horngren, et al., 2012). Software life cycle will go through several life cycle stages, starting from the development stage (Prototype Phase, Development Phase), supporting stage (Evolution Phase, Maintenance Phase), final stage (Retirement Phase) (Sneed, 2004). Understanding the stages or processes is very important because it will be the basis of the category of costs during the life span of the product, starting from the development stage, to the final stage (Fabrycky & Blanchard, 1991).

The steps to determine the cost profile with the Life-Cycle Costing method are as follows (Fabrycky & Blanchard, 1991) (Kadarova, et al., 2015) :

1. Determine how long the product Life-Cycle estimates;
2. Identify all product activities until support for the product ends;
3. Connect activities that have been identified with a predetermined cost structure;
4. Determine the costs for each of the activities. Costs are calculated using purchasing power when a decision is made;
5. Enter these costs into activities at a predetermined cost structure. This results in costs over the life of the product, using current purchasing power;
6. Enter the factors of inflation, economic effects on learning curves, changes in price levels, and others. These costs reflect on more realistic costs to anticipate economic changes in the life span of a product
7. Combine each cost based on the life cycle stages of a product, then combine all of those costs.

2.3 Target Pricing

Target Pricing is the determination of the price of a product or service based on the amount of rupiah that the customer is willing to pay (Hansen & Mowen, 2015) (Horngren, et al., 2012). So, the company will determine in advance how much the value of goods or services is willing to be paid by the customer, after that, the company will design a product or service that can cover costs and provide the desired profit (Hansen & Mowen, 2015) (Horngren, et al., 2012). If the costs associated with the software have not reached the desired cost target, the company must review the product development techniques and all costs during the cycle period until it is based on the predetermined cost target. (Hansen & Mowen, 2015) (Horngren, et al., 2012) (Lipovetsky, et al., 2011). The price of Cloud Computing services can be seen from three perspectives, which are: Cloud Computing market perspective; producer/vendor perspective; and user perspective (Jianhui, 2013). Market perspective is

related to competition maps, where companies determine prices based on comparative surveys of similar products. The producer perspective is related to the costs attached to the product. The user perspective is related to what value the customer is willing to pay (Lipovetsky, et al., 2011).

In marketing research, the research method used to find out how much the customer wants to pay for the product or service produced is divided into three, which are first, the direct method (the customer is immediately asked about how much the replacement value is); second, Gabor-Granger Indirect Price Models (companies set the highest and lowest values range, then the customer is given the choice to bring up a product image that has the highest price, if the customer does not agree then the product image is returned with the lowest value, and it continues until the highest value that the customer is willing to pay is known; third, Van Westendorp Price Sensitivity Models (the company believes that there are differences in prices in each category of buyers depending on the quality provided) (Lipovetsky, et al., 2011). There are two price mechanisms in the cloud, namely Spot Pricing and Reserved Pricing. Spot pricing can be interpreted simply as the current price, where the customer pays one price for one time usage, while Reserved Pricing is the price for a certain period of time (Jianhui, 2013).

The steps in using Target Pricing and Target Cost, are (Horngren, et al., 2012):

1. Develop products that satisfy potential customers;
2. Determine the target price;
3. Get the target cost per unit through the target price minus the target profit per unit. The operating income target per unit is the operating income per unit of goods or services sold. The target cost per unit is the estimated long-term cost per unit when the company can achieve its operating income target per unit;
4. Perform a cost analysis;
5. Perform technical assessment of product manufacture until the cost target is reached.

3 RESEARCH METHOD AND A GENERAL DESCRIPTION OF THE COMPANY

3.1 Research Method

This research uses a case study method, because researchers answer in depth the research questions that arise and describe in depth the phenomena that occur at PT XYZ. The case study method is also very relevant in answering questions that require an

explanation of in-depth answers to the research questions.(Yin, 2009).

Data are collected through interviews conducted with PT XYZ employees related to pricing and system development. The interview aims to get a clear picture of software development activities and significant costs incurred. Interviews will use semi-structured techniques with several questionnaires and are developed according to the research objectives. Documentation techniques are used to obtain information on prices, costs, and other information related to activities during the lifetime of the software. Observation techniques are useful for comparing the results of documentation and interviews, so that the information received can be relied upon.

3.2 A General Description of the Company

PT XYZ is an information technology solutions company that was established and approved by the ministry of law and human rights in 2007 in South Jakarta. At the beginning of its establishment, PT XYZ was a reseller and distributor of software products that simulated the durability of the material used to make a product. In 2008, PT XYZ developed a network monitoring center (NMS) software product and obtained brand rights in 2010. In addition to selling software products, PT XYZ also provides software manufacturing services according to customer orders. Overall, the products sold are divided into several types, such as :

1. Product principals and PT XYZ acting as resellers and distributors in Indonesia. Products included in this category are software products that simulate the durability of the material used to make a product. PT XYZ acts as a reseller/distributor and earns a commission of a percentage of the price list issued by the principal and also gets income from the installation services of the product.
2. Software products on premise (installed on consumer information technology devices). Products included in this section are: Internet Network Monitoring System software; Electronic Mail Monitoring Software; Document Management System software; Consumer Service Center software.
3. Software products sold using the Software as a Service (SaaS) method. Software is not installed on consumer information technology devices (Server, Storage, PC and Portable PC). Consumers use software through internet network services (Web-Service).

4. Software development services are services provided to build software according to customer desires in which PT XYZ gets income from the experts used.

Consumers of PT XYZ were initially only large companies engaged in the manufacture of frame and car parts for software of material molds simulation techniques, as well as government offices for software manufacturing services and sales of Network Monitoring System software products. Eventually in 2016, the company began developing business software products for small and medium-sized companies using cloud computing technology. Based on the organizational structure of the company, parties involved in operational development, operational support and sales of software products sold using the Software as a Service method consist of two departments, which are the marketing and sales departments headed by the General Manager of Marketing and Sales and the technical department, headed by the technical general manager.

3.3 The Product of SaaS at PT XYZ

SaaS is one of the cloud computing technologies, which is a website-based software rental service, where companies access services using internet networks and data can be stored in the cloud or service user devices. (Jianhui, 2013).

Software sold using the SaaS method at PT XYZ is developed using the Opensource ERP Platform which is obtained for free. Open source ERP is used because it uses the Python programming language, Maria DB database, adopts Big Data technology and has been used in several prestigious projects abroad.

The SaaS service products offered by the company are: SaaS - Human Resource Information System (HRIS); SaaS - Asset Management; and SaaS – Helpdesk.

3.4 Product Prices for Software as a Service (SaaS) Services

As mentioned in the introduction, price is a very important thing for the company (Lipovetsky, et al., 2011) (Horngren, et al., 2012) (Hansen & Mowen, 2015). PT XYZ currently does not have a systematic and informative pricing policy (there are no company rules governing written pricing policies). The existing policy scheme is the price given at the time of request from customers who will use the service. The price submitted must be approved by the Technical GM, Marketing and Sales GM, and the Main Director. In a competitive market, late delivery of prices can cause sales failures, because

customers will request services from other manufacturers offering similar services.

3.5 The Product Life Cycle, Activities during the SaaS Life Cycle, and Significant Costs

As it is known that the purpose of life-cycle costing is to know the cost, lock costs, and is a cost control tool during the life cycle of a product (Boussabaine & Kirkham, 2004) (Fabrycky & Blanchard, 1991) (Horngren, et al., 2012) (Jalao, et al., 2012). PT XYZ has determined to provide support for SaaS products for up to 4 years because it considers changes in technological progress in the future. Life-Cycle Product starts from the development stage, the technical support and sales stages to the end of the support for the product.

The activities carried out by PT XYZ during the SaaS life cycle are as follows: analysis of customer needs, analysis of system requirements, procurement of software and installation development infrastructure, software development, initial testing, software installation on operational infrastructure, final testing, final documentation, marketing and sales activities, contracts, service preparation, After sales service/Operational support, End of Service, and Disposal.

Significant costs associated with providing software services with the SaaS method are employee costs in 2016 of Rp. 2,555,028,000, - and 2017 of Rp. 2,766,000,000, -. The acquisition cost of information technology was Rp. 1,773,971,540. The subscription cost for Infrastructure as a service (IaaS) in 2017 was Rp. 547,092,000, -. Marketing operational cost in 2016 was Rp. 245,350,000, - and in 2017 Rp. 273,250,000.

3.6 SaaS Customer Profile

PT XYZ SaaS customer profiles are small and medium-sized companies that have limited budgetary costs to build the infrastructure needed by the system and the availability of experts to develop and maintain the software and infrastructure built.

4 ANALYSIS

The steps in analysing the price policy that will be conducted are below:

1. Determine target price
2. Determine target cost per unit
3. Determine target sales
4. Doing cost analysis using Life-Cycle Costing Method.

For first analysis, we will using existing price exclude VAT. SaaS-HRIS is Rp. 4.545.455,- monthly rent per unit, SaaS-Asset Management is Rp. 13.636.364,- monthly rent per unit, and SaaS-Helpdesk is Rp 16.590.909,- monthly rent per unit. PT XYZ plans to gain profit Rp. 150.000.000,- per month for all SaaS Products and sells 2.400 unit monthly rent for SaaS-HRIS, 600 unit monthly rent for SaaS-Asset Management, 600 unit monthly rent for SaaS-Helpdesk. Life-Cycle Sales for all products is Rp. 29.045.454.545,- as shows in Table 1.

Table 1: Life-Cycle Sales for all products

Description	Unit Sold	Price Per Monthly Rent Per unit	Total
HRIS	2400	4.545.455	10.909.090.909
asset Managementt	600	13.636.364	8.181.818.182
Helpdesk	600	16.590.909	9.954.545.455
			29.045.454.545

The Life-Cycle Sales has to be compared with the cost through product life-cycle. After doing data gathering and observation, we found that the activities during product life-cycle are development activities, sales and support activities, and product end of life activities. The cost that related to activities then divided into two part, Fixed Cost and Variable Cost. The result shows that total cost during products life-cycle is Rp. 24.092.952.040,-, consist of Fixed Cost Rp. 9.392.112.040,- as shows at Table 2 and Variable Cost Rp. 14.115.840.000,-. As shows at Table 3.

Table 2. Fixed Cost during products life-cycle

No	Description	Total (Rp.)
1	Software Development Cost	773.306.500
2	IT Infrastructure for developing the software's	1.792.445.540
3	Internet	88.000.000
4	Customer Service	847.740.000
5	Software Update	2.409.732.000
6	Marketing Operation (Salary)	3.480.888.000
	Total	9.392.112.040

Table 3: Variable Cost during Products Life-Cycle

No	Description	Total (Rp.)
1	IaaS Rent	10.941.840.000
2	Sales Prospects	792.000.000
3	Service Set-Up	1.782.000.000
4	Customers visit	600.000.000
	Total	14.115.840.000

Variable cost for IaaS Rent Service is Rp. 3.039.400,- per month per customer. Variable Cost for Sales Prospect activities is Rp. 6.000.000,- per new customer. Variable cost for Service Set-Up is Rp. 13.500.000,- per new customer. Customers visit is Rp. 2.000.000 per customer per year.

At first analysis, PT XYZ has not achieve its target profit for SaaS Products. PT XYZ only gain profit Rp. 115.364.636, per month instead of its target Rp. 150.000.000,-. The result is PT XYZ has to increase its unit target sales per product by 16% to achieve its target profit.

After increasing the unit sales target by 16%, the total sales become Rp. 33.692.727.273,- and total cost is Rp. 26.445.086.440. Total cost is consist of Rp. 9.392.112.040,- fixed cost which is same with prior calculation and Rp. 16.374.374.400,- as shows at Table 4.

Table 4: Variable Cost during Products Life-Cycle, after increasing the total unit sold

No	Description	Total
1	IaaS Rent	12.692.534.400
2	Sales Prospects	918.720.000
3	Service Set-Up	2.067.120.000
4	Customers visit	696.000.000
	Total	16.374.374.400

The total of variable cost will increase because unit sales target is increased. The Sales Prospects Cost and Service Set-Up Cost have to be highlighted since is influenced by the quality of the product. Good quality product is easier to sell than bad quality product and tend to make loyal customer. Loyal customer will decrease the need of Sales Prospect Activity and Service Set-Up Activity for achieving the target profit. Bad quality product tends having difficulty in penetrating the market, so, it will growth slowly (Progress Selling). Good quality product will be easier to penetrating the market (One time selling)

Example, SaaS HRIS Total Life-Cycle Sales is Rp. 10.909.090.909 for 2400 unit sold (See Table 1). 2400 unit is target during product Life-Cycle (4 years). It can be achieved by progress selling as shows in table 5, or one time selling as shows in table 6. Progress selling indicate that the product need time to penetrate the market.

Table 5: Progress Selling

Description	Year				Total
	1	2	3	4	
Customer per year	4	32	88	76	200
monthly unit rented per year	48	384	1.056	912	2.400
Customer Growth	4	28	56		88

Table 6: One time selling

Description	Year				Total
	1	2	3	4	
Customer per year	50	50	50	50	200
monthly unit rented per year	600	600	600	600	2.400
Customer Growth	50	-	-		50

Table 5 and Table 6 shows the difference of customer growth. Table 5, PT XYZ has to sell to 88 customers to achieve 2400 unit monthly rented while Table 6 only need to sell to 50 customers. So, the total cost of sales prospect and Service Set-Up is different between two table, as shows in Table 7.

Table 7: The difference between progress selling and one time selling

Description	Total
Progress Selling	
Sales Prospects (Rp. 6.000.000,- x 88)	528.000.000
Service Set-Up (Rp. 13.500.000,- x 88)	1.188.000.000
Total	1.716.000.000
One Time Selling	
Sales Prospects (Rp. 6.000.000,- x 50)	300.000.000
Service Set-Up (Rp. 13.500.000,- x 50)	675.000.000
Total	975.000.000

The table 7 shows that PT XYZ will save Rp. 741.000.000,- when locking the cost by producing good quality since products development phase.

5 CONCLUSION

This research giving the pricing scheme for PT XYZ SaaS Product. The price for SaaS-HRIS is Rp. 4.545.455,- monthly rent per unit, SaaS-Asset Management is Rp. 13.636.364,- monthly rent per unit, and SaaS-Helpdesk is Rp 16.590.909,- monthly rent per unit.

PT XYZ has to increasing the unit target sold throughout product life-cycle to achieve monthly target profit Rp. 150.000.000,-. The unit target sells will be $2.400 \times 116\% = 2.784$ unit monthly rent for SaaS-HRIS, $600 \times 116\% = 696$ unit monthly rent for SaaS-asset Management, $600 \times 116\% = 696$ unit monthly rent for SaaS-Helpdesk.

The Cost that related to activities during Product Life-Cycle has to be considered as product cost. The product life-cycle cost, such as: Software Development Cost Rp. 773.306.500, IT Infrastructure cost for developing the software's Rp. 1.792.445.540, Internet Cost Rp. 88.000.000, Customer Service Cost Rp. 847.740.000, Software Update Cost Rp. 2.409.732.000, Marketing Operation Cost (Salary) Rp. 3.480.888.000, IaaS Rent Cost Rp. 12.692.534.400, Sales Prospects Cost Rp. 918.720.000, Service Set-Up Cost Rp. 2.067.120.000, Customers visit Cost Rp. 696.000.000

PT XYZ has to review the cost and price throughout product life-cycle, because future cost is influenced by learning curve, inflation, and market condition. Improving the quality of the product also important, since it can reduce Service Set-Up Cost and Sales Prospect Cost.

This combination of Target Pricing Method and Life-Cycle Costing (LCC) method can be used in making pricing decision for next SaaS product. Many cost has to be locked since development phase. Poor product quality only would result higher marketing cost, maintenance cost, and some other future cost.

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