

The Role of Technopreneur and Innovation System to Increase the Adoption of Marketplace: A Case Study PT ABC in Indonesia

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Abstract

There are many marketplace innovations that have been created and adopted by people in Indonesia. The marketplace property product is facilitating the transaction process from End to End in PT ABC. Unfortunately, studies on the study of the relationship between innovation systems and technopreneurs from a commercialization point of view are still very limited. This article provides a survey of technopreneur analysis and innovation systems that are suitable for a technology marketplace. This article highlights the common challenges and obstacles faced by companies, R&D, and product teams in developing technology entrepreneurship and the benefits for them. This article takes a case from the marketplace property application from PT ABC. The existing products of the company are carefully selected to examine the framework of the technopreneur approach and innovation systems. The analysis was carried out by referring to the technopreneur approach and innovation system to understand the process of innovation management and applied technopreneur analysis. This article uses scrapping data from user reviews as a basis for SWOT analysis to develop a two-matrix strategy. So, it becomes the basis for improvement to increase adoption from marketplace users. The results show that this marketplace technology has reached the adoption stage. However, as many as 31% of users are still dissatisfied with the use of existing applications, especially household services which still require a lot of improvement, such as the development of features in the application.

Keywords

Marketplace, Technopreneur, Innovation, Property, SWOT

1. Introduction

Based on data from Bank Indonesia (2022), the trend for house or residential property prices on the primary market has continued to increase in the third quarter of 2019. This is reflected in the Bank Indonesia Survey which stated the residential property price index in that period was 210.33. This figure shows a growth of 1.8% from the same period last year. Based on these figures, the property trend in Indonesia shows a significant increase compared to the growth rate in the previous quarter of 0.5%. According to Schreiber Reijs (2013), the Indonesian people's need for property is still very high. This is because the property is a fairly promising investment product, especially types of real estate properties such as houses, land, and other buildings. This is evidenced by the continued increase in asset values, rare price fluctuations, plus relatively low risk, making the property one of the public's investment products.

In 2020, Indonesia experienced an economic slowdown due to the COVID-19 pandemic (RI Ministry of Finance Data 2021). The slowdown harmed various sectors in Indonesia, one of which was the property sector. Most property prices, such as houses, apartments, and motorized vehicles, also experienced a significant decline. This was due to a decrease in demand for property which was driven by an increase in public caution in spending amid a pandemic. In addition, the existence of limited access and interaction between one party and another is also the cause of the decline in the property sector. Where the process of buying and selling the property itself requires access that is wide enough to carry out the survey process to interact with various parties.

As we know, the process of buying and selling a property or house is a large transaction and a very complicated process that takes quite a long time. Therefore, it requires steps that must be careful and pay attention to all stages in the process of buying and selling a house, because there will be many things that happen and many parties involved in it. The need for a property buying and selling process from start to finish (E2E Process) is behind the research and development process of an online marketplace from PT ABC that connects various parties in property buying and selling transactions. Starting from determining the property according to the budget, payment options made, the process of communicating with related agents, the process of visiting the property, determining the estimated price, submitting mortgages, starting transactions, and preparing important documents, for the handover process in one platform. In addition, the existing platform also provides access to household and lifestyle services to answer the community's need for cleaning and relaxation services.

To develop a model or design for this business product, PT ABC then began to collaborate with various related stakeholders, such as property agents, household service providers, banks and financial platforms, and property developers. Furthermore, prototype development begins with making applications as platforms that are equipped with various features. In addition, based on data from the 2023 Intellectual Property Database, PT ABC has also carried out 8 copyright registration processes, consisting of 4 platforms and 4 features of the services provided. PT ABC has carried out the platform launching process for the last three years. To encourage the branding of the application product to be widely known, various uses of online social media, mass media, to partnership systems with various property offices to collaborate in increasing sales. In addition, the ownership of this company is classified as venture capital which receives funding from several investors (Dealroom 2022). Thus, during the last three years, PT ABC has succeeded in going through all stages of Technological Entrepreneurship Development and has reached the adoption stage, as evidenced by the various types of transactions that have been recorded both through the website and application channels.

A company can't make a technological breakthrough or innovate or develop something new unless the new technology is used to make the business more competitive by increasing profits, lowering costs, and similar changes in its economic results (Caryannis et al. 2015). Like, there are many competitors with similar products from PT ABC which have been established and operating for a long time. Thus, it is a challenge for PT ABC to continue to innovate in developing processes and product technologies to provide added value compared to existing competitors. To remain a productive service, various innovations and creativity must be designed and developed to encourage this service to have competitiveness.

To remain productive on its platform, various value chains must be developed including various improvements to bring technopreneurs and system innovation so that technology can be present in the market and not fall into the value of death. There is a lot of research discussing the Technopreneurs and Innovation System problem, especially how to find strategies to drive technology-based businesses to increase people's prosperity. Selvarani and Venusamy (2015) increased the number of SME clients in India through an analysis of integrated platform development innovations, Aqidawati et al. (2019) organized and managed innovation activities with a technopreneur-ship model to overcome obstacles to the commercialization of battery technology innovations, and Zein et al. (2021) designed a strategy long term e-commerce and e-business through a combination of entrepreneurship and technopreneur.

Therefore, this article aims to analyze the problems of online marketplace technology, so that it can become a basis for designing strategies to increase the number of users to adopt marketplaces. So, this marketplace technology can survive in the market and not fall into the valley of death.

2. Literature Review

2.1 Innovation as Management Process

Innovation management is a highly collaborative process. This is a consequence of the continuous transfer of information between various parties, where each team member can play a major role in the outcome (Cooke et al. 2004). Innovation sometimes seems to work in the short term but not so much in the long term. The key factor is also the optimistic aspiration for future technological progress and the lack of insight into unexpected influences. The second point is that a scientific or technological problem is the basic obstacle in only a few cases. Organizational, financial, and operational problems are usually hampered.

Creativity management is difficult and dangerous. Among other issues, a study of business failures reveals that a

large number of creative companies have not turned their technical innovations into successful businesses. So the challenge is not only to build creativity but also to manage it well to generate profits in business. As it is known that the organizational position in innovation management is a mechanism that must be developed and used to achieve a healthy organization (Caryannis et al. 2015).

2.2 Innovation System

Innovation systems are seen as open, dynamic, and social (Lundvall 1992), which implies that innovation is created by social interactions between economic actors. This indicates that they are devices that communicate with their environment. In order, according to Carayannis and Campbell (2009), one must demonstrate that systems models must coexist with many other ideas, such as innovation networks and information clusters, to understand the value of systems (and systems theory). Interaction, synchronization, complementarity, and enhancement are the main areas of network focus. For example, a network can be thought of as the internal structure that unites and defines a cluster. The strategy for the innovation process is based on a systemic approach which implies that markets do not develop or function outside of their laws and institutions. The innovation program aims to develop, disseminate and utilize innovation.

2.3 Technological Entrepreneurship (Technopreneur)

The technology-oriented entrepreneur is a technically engaged process and development of a new company, which uses technological inventions by "technopreneurs". Techno-renovation is the process of investing in a project that brings together and activates professionals with various assets related to the promotion of scientific and technological knowledge to build and derive value for a particular company and also play an active role in driving this concept. in the social context in which the entrepreneur operates. Techno-partnership aims to market inventions created by academic scientists through patents, licensing, startups, and collaborations between universities and industry (Grimaldi et al. 2011).

The technological development cycle is primarily concerned with the technical developments in which technology can be used by businesses to create, produce, and provide their goods and services as a system of technical and practical knowledge and capabilities so that they can be defined and embedded in personnel. , facilities, equipment, and physical and operating procedures is the creative application, individually or in groups of individuals, of techniques and expertise that generates and manages a business and takes on financial risks for its purposes and views. In this way, engineers have strong technical qualifications but also lack business and strategic thinking skills (Prodan 2007).

2.4 SWOT Analysis

According to Carayannis et al. (2015), SWOT analysis is another tool for auditing an organization and its environment. This is the first stage of planning and helps the market to focus on key issues. Internal and external environmental scanning is an important part of the strategic planning process. The company's internal environmental factors can usually be classified as strengths (S) or weaknesses (W) and those external to the company can be classified as opportunities (O) and threats (T). Such a strategic environmental analysis is referred to as a SWOT analysis. A company can use SWOT analysis when developing a strategic plan or plotting a solution to a problem, developing a plan that takes many different internal and external factors into account, and maximizes the potential strengths and opportunities while minimizing the impact of weaknesses and threats. The SWOT template below includes sample questions, the answers to which are entered in the relevant sections of the SWOT grid. The questions are examples, or discussion points, and can be changed depending on the subject of the SWOT analysis.

Table 1. SWOT Question Grid (Carayannis et al. 2015)

Strengths	Weaknesses
Advantages of proposition? Capabilities? Competitive advantages? USP's (unique selling points)? Resources, Assets, People? Experience, knowledge, data? Financial reserves, likely returns? Marketing—reach, distribution, awareness? Innovative aspects? Location and geographical? Price, value, quality? Accreditations, qualifications, certifications? Processes, systems, IT, communications? Cultural, attitudinal, behavioral? Management cover, succession?	Disadvantages of proposition? Gaps in capabilities? Lack of competitive strength? Reputation, presence, and reach? Financials? Own known vulnerabilities? Timescales deadlines and pressures? Cash flow, start-up cash drain? Continuity, supply chain robustness? Effects on core activities, distraction? Reliability of data, plan predictability? Morale, commitment, leadership? Accreditations, etc.? Processes and systems, etc.? Management cover, succession?
Opportunities	Threats
Market developments? Competitors' vulnerabilities? Industry or lifestyle trends? Technology development and innovation? Global influences? New markets, vertical, horizontal? Niche target markets? Geographical, export, import? New USPs? Tactics—surprise, major contracts, etc.? Business and product development? Information and research? Partnerships, agencies, distribution? Volumes, production, economies? Seasonal, weather, and fashion influences?	Political effects? Legislative effects? Environmental effects? IT developments? Competitor intentions—various? Market demand? New technologies, services, ideas? Vital contracts and partners? Sustaining internal capabilities? Obstacles faced? Insurmountable weaknesses? Loss of key staff? Sustainable financial backing? Economy—home, abroad? Seasonality, weather effects?

3. Methods

This research was conducted on the e-commerce property platform from PT. ABC is engaged in buying and selling property, mortgage/KPA services, and household services. The data used in this study consisted of secondary data and primary data. Where secondary data comes from several articles using the Google search engine, while primary data is obtained based on product reviews as a result of user reviews on Google Play. The detailed research flow is explained in the image below.

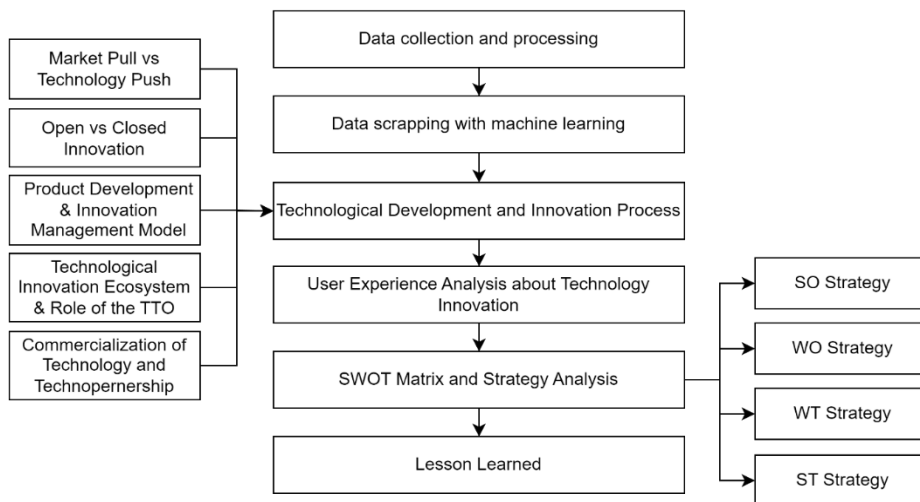
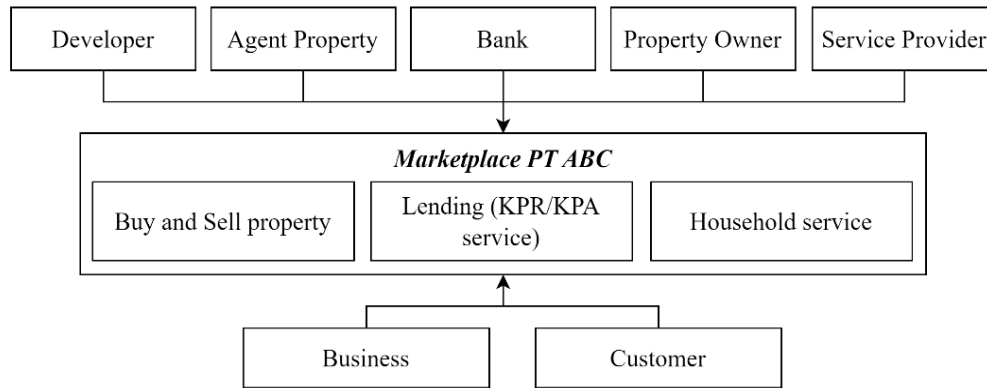


Figure 1. Research Flow

4. Data Collection

Based on literature studies and field studies, one of the products from PT. ABC, namely e-commerce applications have been in the adoption stage based on the analysis of technology innovation processes. Thus, for the product to survive in the market and not fall into the valley of death, an analysis of feedback from users is needed as a basis for improvement so that it can compete with competitors. The feedback or review data is taken from Google Play which is then processed using machine learning in the form of Google Collabs. Based on existing data, the application has been downloaded 500,000 times with around 2,000 reviews. The number of samples in this study uses the minimum sample size for survey research, which is 100 respondents (Sekaran 2006). The 100 reviews representing the 100 respondents were selected based on the most relevant keywords. The following is the business process of the PT ABC marketplace in general. Where 5 stakeholders become service facility providers, namely developers who provide various primary or new property units, property agents who assist in the process of selling new or second properties and accompany the survey process to transactions, banks that provide KPR/KPA loans for home loans, owners property, as well as service providers or household services. The five stakeholders provide services according to their functions in the marketplace, both buying and selling property, lending (KPR/KPA services), and household services. Then, this service is also not only provided for B2C but also B2B users who want to make transactions. Figure 2 below provides an overview of PT ABC's business process marketplace.



Downloaded marketplace application by playstore or appstore

Figure 2. Business Process Marketplace PT ABC

5. Results and Discussion

5.1 Technological Development and Innovation Process

PT ABC is a marketplace provider for buying and selling property, lending, and providing household needs. Until 2023, it has collaborated with 500 thousands of primary and secondary residences, 11 thousand property agents, tens of thousands of household service providers such as cleaning services and air conditioning services, 30 banks and financial platforms, and thousands of developers. PT ABC's marketplace can be accessed through websites or applications downloaded via Google Play (Play Store or Appstore). The process of technological development according to Parker and Mainelli (2001) is illustrated in Figure 3. There are usually two general ways to distinguish between innovation drivers, namely market pull and technology push (Boehme and Stehr 1986). Figure 3 below provides an technology development process.

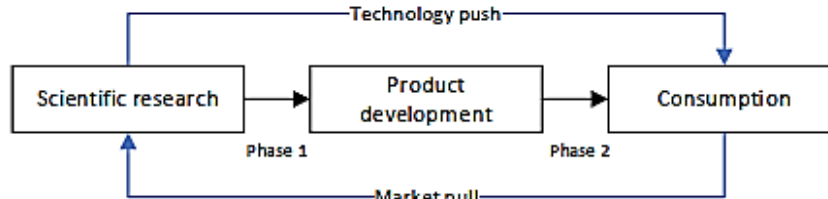


Figure 3. Technology development process (Parker and Mainelli, 2001)

PT ABC has 3 main service product types, namely buy and sell property, lending service, and household service.

Based on these three products, the average product from PT ABC has a technology development model with market pull. According to Lubik et al. (2012), Market Pull is a new product that is determined by the market based on customer needs. Product types are determined through market research and customer feedback. However, in the process of developing this marketplace technology system, the three service products are integrated into one application using a technology push model. This is because business processes in technology are driven through research and development functions, production, and sales to the market, without proper consideration of whether it helps meet customer needs or not.

Based on the innovation paradigm, PT ABC uses an open innovation system. According to Siti Fadhilah (2018), open innovation itself is a type of open innovation to help companies involve all parties, including employees, consumers, suppliers and researchers to develop new ideas to the satisfaction of all parties involved. The implementation process at PT ABC is described in the brainstorming process to design innovations and improvements based on some data and the results of discussions from employees regarding how the user experience of product use. In this case, of course, the process of technological innovation in the developed marketplace can be sourced from the input of existing users, employees, and investors.

According to Hindle and Yencken (2004), commercialization can be defined as the movement of ideas from research to market, starting when the idea is generated and ending when an application or platform is used by consumers to transact and create profits for the company. Meanwhile, the implementation of the innovation management model can be clearly described in the figure below. Where one example of implementation at ABC PT can be started from ideas or input from users based on existing problems that encourage the related team's brainstorming process to develop new features in the application. Then the feature testing process is carried out before the feature deployment process in existing applications. Figure 4 below provides an open innovation process of PT ABC with 5 stakeholders related.

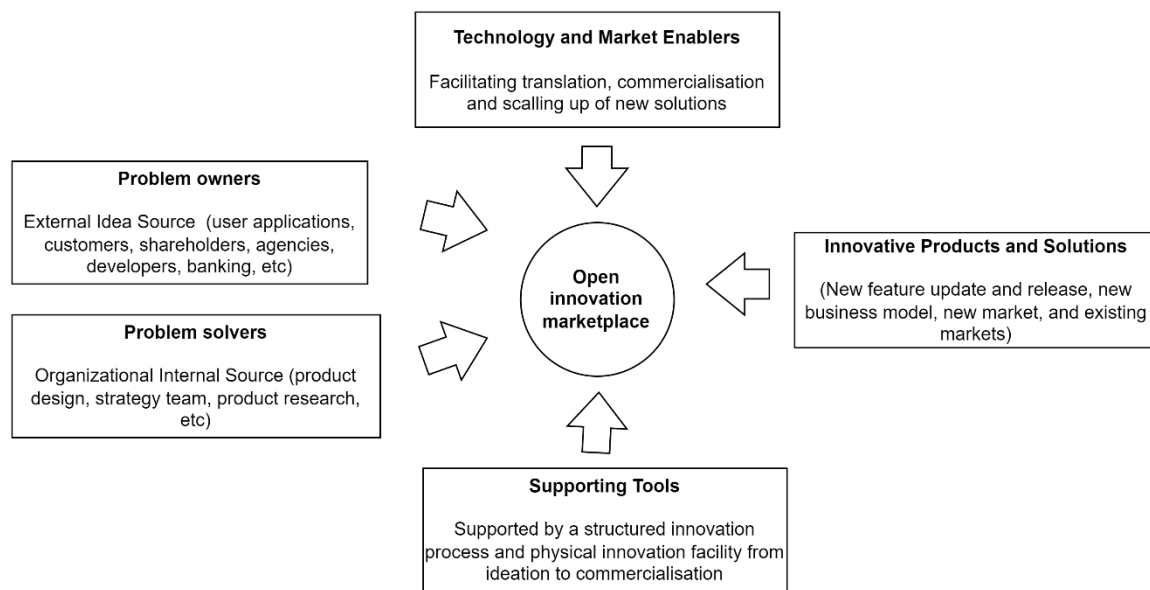


Figure 4. Open Innovation Process of PT ABC

Technology in the start-up industry continues to make improvements according to consumer needs so that start-ups can develop into existing companies and produce a wider range of services. The e-commerce platform from PT ABC is already at TRL 9 or has been launched and continues to be evaluated to produce better technology according to needs. Research that produces technology products will have a high market aspect, useful and marketable if it has a high level of technological readiness, innovation readiness, and manufacturing readiness. Without these three readiness processes, an innovation will fall into the valley of death and if it enters this valley, long and complex innovation products will be difficult and will never be able to revive (Prasetyono 2017). Death Valley is a common business term worldwide in connection with the major challenge of dealing with negatively affected cash flows in the initial phases of new ventures before real customers generate revenue from innovations (services or products) (Osawa

and Miyazaki 2006). Death Valley is often cited as a major innovation management challenge, which means that a gap between academia and industry persists (Bhushan 2015). Figure 5. represents the valley of death in the innovation process.

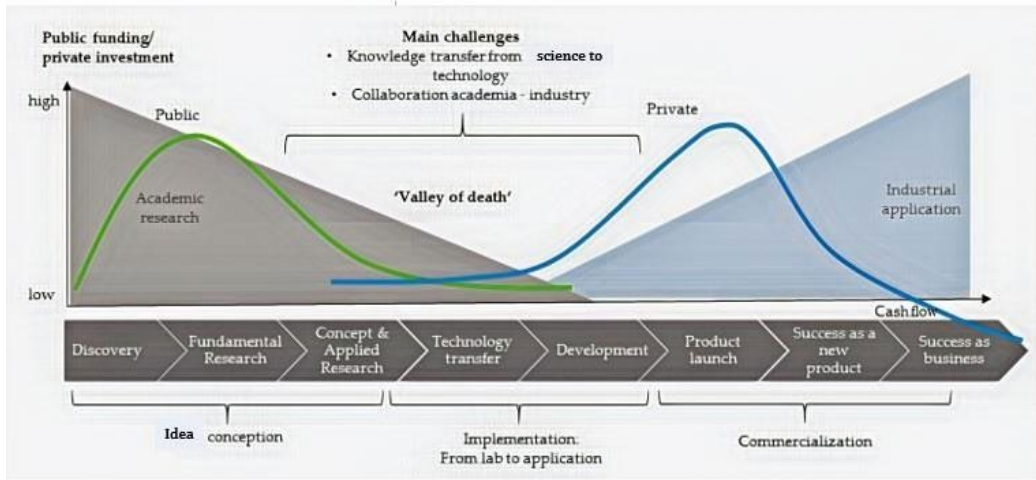


Figure 5. The Valley of Death in the innovation process (Chirazi et al. 2019)

5.2 User Experience Analysis of Technology Innovation

Based on existing data, this marketplace application has been downloaded 500 thousand times by users via Google Play. Then, based on the results of collecting sample data from 100 reviews, it shows in figure 6 that as many as 57% of users feel very satisfied, 7% feel satisfied, 5% feel neutral, 2% feel dissatisfied, and 29% feel very dissatisfied after adopting the marketplace from PT ABC. The dissatisfaction rate of 31% indicates that there are still many factors that require continuous improvement. The improvement of these service products is of course aimed at making customers loyal to the marketplace they have used and have the desire to recommend it to others. Thus, this service product can compete with products from competitors and can be accepted by the market.

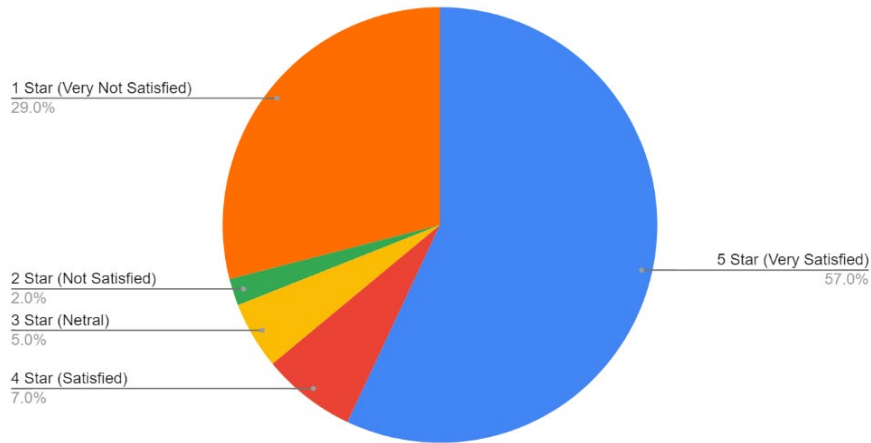


Figure 6. Number of Rating Marketplace Applications

Based on these 100 reviews, they are then grouped into several groups of reviews as shown in table 2 below. The 15 review groups are then mapped based on the type of service reviewed by users. When viewed based on the content of the reviews, there are 4 groups of positive reviews with a total of 55 reviews, 10 groups with negative reviews with a total of 44 reviews, and 1 group with neutral reviews with 1 review. As many as 44% of the 100 reviews turned out to have negative reviews containing criticism from users who needed some improvements, namely reviews with codes U4, U5, U6, U7, U8, U10, U11, U12, U13, and U14.

Most of these reviews provide criticism of household service services, both in terms of the features of the marketplace, the service process provided, and the availability of updated information. From this review, household service is the focus of service which forms the basis for preparing the SWOT analysis.

Table 2. List of User Reviews

Kode Ulasan	Rincian Ulasan	Jumlah	Persentase	Jenis Layanan
U1	The application is easy to use and meets consumer needs	22	22%	General
U2	Orders are served quickly, easily, and professionally	18	18%	HS
U3	Useful application to connect service providers with consumers	11	11%	HS
U4	The application often has errors and there are bugs	8	8%	General
U5	Transactions often fail and the refund process is quite long	8	8%	HS
U6	Service providers lack expertise in repair and cleaning services	6	6%	HS
U7	The need for expansion to wider cities	5	5%	HS
U8	The promo given is clickbait and quite limited	5	5%	HS
U9	Service providers are quite professional in fulfilling orders	4	4%	HS
U10	The availability of service providers is still limited	4	4%	HS
U11	Hard-to-use application	4	4%	General
U12	There are no features that facilitate communication with service partners	2	2%	HS
U13	One of the cost simulation features gives inaccurate results	1	1%	S&B
U14	Rarely update information regarding the number of stock units that are ready regularly	1	1%	S&B
U15	Other	1	1%	-

Notes: HS (Household service), S&B (Sell and Buy Property), General (represent three types of services)

5.3 SWOT Analysis

In general, the business processes of service providers are described as follows. The company has made improvements based on user experience and service provider feedback. Where this is one of the implementations of open innovation based on the problem of user feedback. Figure 7 below provides an business process household service of PT ABC with current and proposed process.

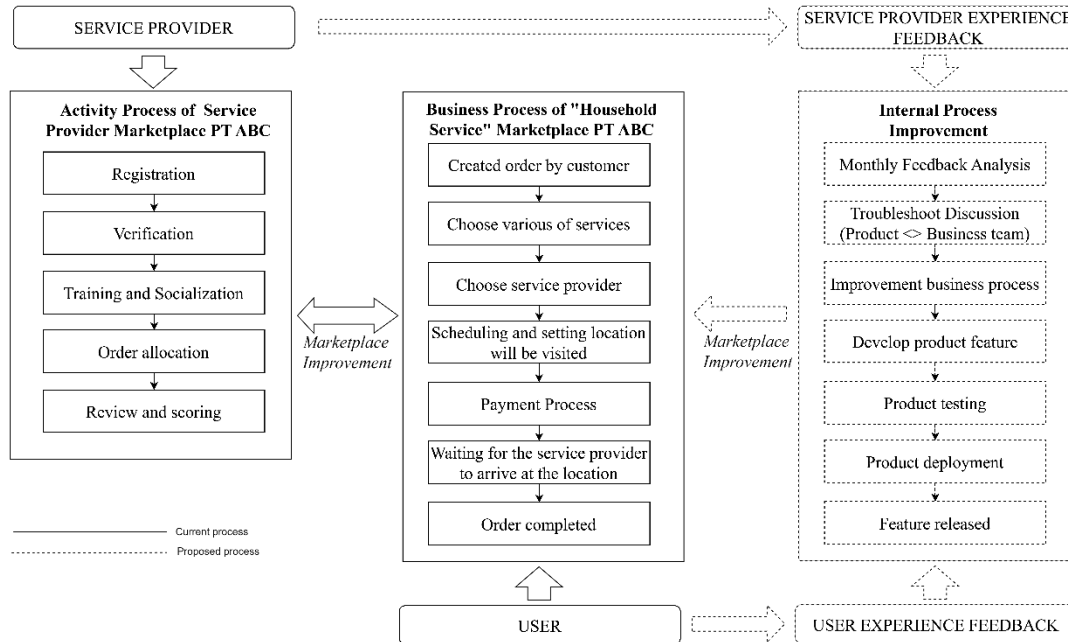


Figure 7. Business Process Household Service

Based on the analysis of the results of the review and description of the business processes above, the SWOT analysis of this study is described in Table 3.

Table 3. SWOT Analysis

STRENGTHS (S)		WEAKNESS (W)	
S1	The marketplace provides all property needs, such as buying and selling property, household service providers, lending providers, etc.	W1	The application has errors and there are bugs
S2	Ordering is quite easy by installing the application on an Android or iPhone cellphone	W2	Transactions often fail and the refund process is quite long
S3	A professional service provider to fulfill the orders Collaborate with various household service providers	W3	Unprofessional service providers
S4	It has a copyright to the features and applications	W4	Limited range of service providers
S5	User-friendly applications to fulfill customer needs Quickly, easily, and professionally order serving	W5	Limited and more clickbait promo
S6	Useful application to connect service providers with consumers	W6	Hard-to-use application
		W7	No features to facilitate communication with service partners
OPPORTUNITIES (O)		THREATS (T)	
O1	Investment in new ventures	T1	Geographic reach
O2	Various types of services	T2	Application usage
O3	Continuous improvement of features based on user needs	T3	Intense competition
O4	Various online and offline events to get more acquisitions and users	T4	Customer choice
O5	One of the leading services is a household service provider, to broaden the reach of consumers	T5	Data security

Based on the SWOT matrix, several strategies need to be designed by PT ABC to be able to compete and improve the quality of existing services. The company's strategy is generated based on the TWO matrixs, namely SO strategy, WO strategy, ST strategy, and WT strategy. SO (Strengths – Opportunities) strategies, namely:

1. Utilizing the ventures obtained to create a marketplace with more complete and professional services and features and in collaboration with more stakeholders, especially household service providers,
2. Continuously improve existing features so that the application is easier to use, easier, faster, and more professional when fulfilling orders.
3. Utilizing online and offline events to introduce PT ABC products and services and get more users to install applications, such as expos, and bazaars.
4. Improving marketing strategies for superior products, so that application users can increase and PT ABC is increasingly widely known.

Then, the WO Strategy (Weakness – Opportunities), namely:

1. Improving continuous improvement on features based on user needs, including:
 - a) Routinely monitor the application process to reduce the occurrence of errors and bugs in the system, thereby reducing the occurrence of failed transactions
 - b) Improve features for the system and refund process for customers
 - c) Improved the cost simulation feature to make it more accurate
2. Household service providers are one of the superior products of PT ABC to reach more potential customers. So, as a superior product, it is necessary to improve some of the services that are lacking, namely:
 - a) There is training for service providers to be more professional in completing orders to customers.
 - b) Prepare SOPs and guidelines for fulfilling customer orders.
 - c) Expanding consumer reach, not only in certain big cities
 - d) Expanding service provider members, you can use a referral or bonus system strategy if you invite other colleagues to join
 - e) Provide promotions that are more interesting and varied, and not too click-bait so users won't be disappointed

Then, the ST Strategy (Strengths – Threats), namely:

1. Using existing popular e-marketplaces as benchmarks so users don't have to adapt much in using new e-marketplaces
2. Inviting various property developers and agents to join so that there will be more property choices and a wider geographical reach, to meet customer needs and have the opportunity to increase transactions
3. Developing a marketplace by prioritizing data security and preparing special personnel to handle data security.
4. Increase the number of transactions by creating an attractive commission scheme so that the sales team is increasingly preparing sales strategies online and offline so that it becomes a strategy when there is an economic recession

Finally, the WT Strategy (Weakness – Threats), namely:

1. Increase ease of use of applications and services, due to the existence of various competing products that compete with each other

5.4 Lesson Learned

The lesson from the results of this research is that technopreneur analysis and innovation systems are very important to help companies analyze various problems they have from various aspects to become the basis for designing strategies to develop their products to suit market demands. Even though a product and service have reached the adoption stage, it continues to require improvement so that the benefits are truly felt by users according to their needs. Thus, these products and services can avoid the valley of death as mentioned in the previous figure. Thus, after a product successfully passes the product launch stage and is adopted by many users, various improvements are continuously provided so that the product is a success as a new product to success as a business. So, this encourages the importance of growing successful technology-based entrepreneurs to help provide solutions and strategies for existing problems. The results of this study are in line with research from Sakti et al. (2021), Pratiwi et al. (2021), and Arfanindita et al. (2021), that management and innovation systems are very important for growing successful technology-based entrepreneurs. With the development of the technological entrepreneurship framework, inventors can quickly formulate steps and strategies in developing innovative products, such as smart backpacks, wastewater treatment machines, and the innovation of the gsm internet.

With the development of technology entrepreneurship, it can quickly formulate steps and strategies for developing innovative products. By combining the SWOT matrix and the two-matrix strategy consisting of SO, ST, WT, and WO

matrices, companies can efficiently provide value to customers so that the resulting innovations can be successful in the market. First, analysis of technology development and innovation processes can be the basis for the process of developing and improving existing technology in companies. This becomes the basis for the direction of development, the basis for development, and the existing implementation process. Second, this SWOT matrix analysis can be used as a detailed step that discusses how companies develop product innovations that can generate profits. Third, based on the SWOT matrix that was developed later became the basis for designing the SO strategy matrix, ST strategy, WO strategy, and WT strategy as suggestions for companies to make improvements going forward.

6. Conclusion

Based on this research, the marketplace helps consumers needs easily make property buying and selling transactions in E2E. Not only in terms of buying and selling property, various additional superior products such as household services are also provided to help consumers' needs in their daily needs. This marketplace from PT ABC has reached the adoption stage and has been downloaded by thousands of users. This marketplace has an open innovation model in its technology development, so various reviews from users may become the basis for improving and developing existing applications. Through the results of data scrapping from the review sample, it was found that as many as 31% of users were still dissatisfied with using existing applications. In addition, out of 100 existing reviews, as many as 44% consisted of negative reviews. Thus, the reviews and results of the innovation analysis form the basis for preparing the SWOT matrix for designing corporate strategy. Where, one of them is still the need for various improvements to features according to the needs of users, starting from ensuring the feature does not have errors, providing C2C features so that service providers directly connect with customers, refund system features when orders are canceled, and features that are connected to Google maps to facilitate service providers to the location of consumers. The drawback of this research is that it has not examined how to determine the most priority strategy to be carried out in the development of this product. It is hoped that future research can do this with an approach that integrates SWOT with Multi-Criterion Decision Making (MDCM).

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*Proceedings of the 4th Asia Pacific Conference on Industrial Engineering and Operations Management
Ho Chi Minh City, Vietnam, September 12-14, 2023*

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