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# Analysis of information systems strategic planning using ward and peppard framework case e-commerce company

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**ABSTRACT**

The e-commerce industry which is developing significantly is always required to be able to adapt well to technological developments where information systems/information technologies (IS/IT) strategic planning must be further developed to support the company's business processes. In this research, the authors focus on analyzing how the information systems strategic planning is currently underway at an e-commerce company. The author uses the ward and peppard framework to analyze the business environment and IS/IT environment internally and externally. Many methods have been developed within the framework such as strengths, weaknesses, opportunities and threats (SWOT) analysis which focus on exposure the company's internal and external conditions, McFarlan strategic grid focus on assessing the overall contribution of IS/IT, and its impact on business success, from both a strategic, and operational perspective, value chain focus on optimizing technology, and business applications, political, economic, social, and technological (PEST) analysis focus on considerations of legal, political, economic, social, and technological developments, critical success factor (CSF) analysis focus on product quality priorities, customer service, product prices, company resources, and technology used. The results of the analysis of these methods are the results of this study, namely the results of portfolio application recommendations for the next four years which can be used as a reference for companies to develop their business strategic planning systems.



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## 1. INTRODUCTION

Every year, significant advances in technology are made. People are competing to develop technological innovations that will make their lives easier. Communities and organizations that do not understand technology will be swallowed up by the times and fall behind. Information systems (IS) and information technologies (IT) have become critical for organizational survival in today's rapidly changing and dynamic business environment [1]. E-commerce is a current business trend that is emerging around IT innovation-based companies [2]. It has been noted that the online shopping trend will increase in 2020 because of the COVID-19 pandemic. The increase in mobile phone users accompanied by increased internet use, as well as the increasing development of companies, is what is driving the upward trend in online shopping. The company presents an e-commerce business that is in demand by the Indonesian people, which is one of the e-commerce sites in Indonesia with the concept of online shopping like at a mall, with the

tagline big choices big deals, offering more than 1.5 million products from trusted brands and merchants to ensure quality [3].

Because every company uses IS/IT as a medium to support the company, strategic planning of IS/IT is also important for companies as the times progress. A good IS strategic plan has an impact on the development of IS and IT in an organization. Implementing IS/IT in an organization can boost efficiency in almost every area, including resources, business processes, markets, and management. The advancement of information technology in all areas encourages universities to take strategic steps in order to maintain their competitive advantage [4]. The advancement of information technology in all areas encourages universities to take strategic steps to maintain their competitive advantage. Companies are being asked to adapt to the current state of information technology developments in business processes [5], [6].

Strategic planning assists organizations in meeting their long-term goals. If a company organization implements a poor strategic planning system, the company's performance will suffer because of the ongoing failure of IS/IT-supported business projects. This study is based on this description and focuses on developing portfolio applications using the Ward and Peppard frameworks. Many methods have been developed within that framework, and these must be fully understood before developing an IS/IT strategic plan so that the strategic planning has an impact on the company [7]. The Ward and Peppard framework will be used to analyze information system planning in this study. This framework was chosen to identify and assess the current state of the company's business and IS/IT, as well as to investigate the internal and external conditions of the business and information systems environments [5], [8], [9].

McFarlan strategic grid, value chain analysis, political, economic, social, and technological (PEST), and critical success factor (CSF) analysis are strengths, weaknesses, opportunities and threats (SWOT) used in the Ward and Peppard method to analyze the company's internal and external business environment, such as developing application portfolios using the McFarlan strategic grid [10], [11]. According to the preceding explanation, the authors must conduct IS/IT strategic planning in accordance with IT goals based on the company's vision and mission [12], [13]. As a result, it is hoped that in the future, a form of analysis using the Ward and Peppard framework to make application portfolio recommendations can be developed [14].

## 2. RESEARCH METHOD

The research methodology used in this study is shown in Figure 1 [15].

a) Literature study

The research approach taken by the author to collect various materials and references that can support the research objectives and are able to provide adequate information.

b) Data collection

Collect data related to research objectives such as by conducting interviews, observations, and documents such as journals, papers, books.

c) Internal and external business analysis

Analyze the business from internal and external sides by using SWOT, value chain, PEST, and CSF analysis.

d) Internal and external IS/IT analysis

Analysis of the IS/IT internal and external environment uses McFarlan analysis to analyze current IS/IT trends.

e) Develop strategic planning

The process of formulating strategic planning after the previous analyzes have been carried out.

f) IS/IT business strategy

Implement IS/IT to achieve the organization's business goals.

g) IS/IT management

What general elements an organization can implement that are used to determine the appropriateness in the implementing the required IS/IT policies.

h) Strategic IT

How the company's policies and strategies to manage technology and human resources.

i) Portfolio applications

Software applications and services based on organizational software generated from the results of previous planning.

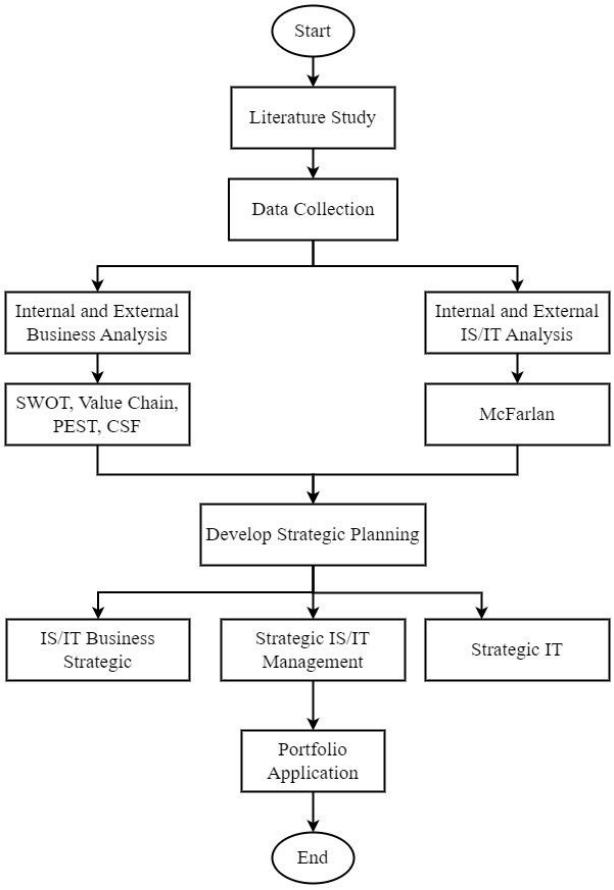


Figure 1. Research method

## 3. RESULTS AND DISCUSSION

### 3.1. Literature study

Strategic management is the decisions and actions that are determined by managers in supporting the long-term performance of the organization. This includes observing the external and internal environment, strategy formulation involving long-term strategic planning, strategy implementation, evaluation, and monitoring [16]. After the organization completes the scan of the environmental, the next step is to develop a strategy. It is the development of a long-term plan to manage opportunities and threats effectively, from the environment considering the company's SWOT. This step is also known as strategic planning. One form of corporate strategic planning that can be done is IS/IT strategic planning which can measure the needs of IS in the future. IS/IT strategic planning influences IS/IT in business operations and its contribution to the organization in choosing strategic steps. The most important factors in IS/IT strategic planning is the use of the methodology to minimize the risk of failure, ensure the involvement of all interested parties, and emphasize the desired goals [17]. Furthermore, IS/IT strategic planning also describes different tools, techniques, and management frameworks to align IS/IT strategy with business strategy and explore new opportunities through the application of innovative technologies.

### 3.2. Data collection

Data is a fact that describes an event and in its raw form that can’t say much, so it needs to be further processed through the model to generate insights. The author's main data source is qualitative research data. Qualitative research is a method consisting of the process of collecting and analyzing data in the form of words. Calculations are obtained and not analyzed in the form of numbers [18]. Based on this understanding, the data that the authors get is operational data and other supporting data from the company. The data collection process was carried out by conducting interview with the author's resource person, namely Yosefine Naradiska as the company's data analyst, the results of the observations that the authors made related to the problems that the authors discussed in this study from Journals, articles, books, and other supporting scientific papers.

### 3.3. Internal and external business analysis

#### 3.3.1. Strengths, weaknesses, opportunities and threats analysis (SWOT)

SWOT analysis used for measuring the company's strengths and weaknesses. Identifying strengths helps to identify strengths and maintain and even increase competitive capital, weakness identification serves to discover which weaknesses exist so that company can change weaknesses with finding solutions to cover them up for the welfare of the company [15]. By knowing current or future opportunities, the company can identify opportunities, and prepare a well-planned early strategy so that the identified opportunities can become reality. Furthermore, when recognizing opportunities to maintain business continuity, the company will inevitably face a variety of threats that need to be identified so that solutions can be mitigated.

The following is an overview of the company's SWOT analysis and strategic planning:

a) Strengths
- Offer quality products.
- Using a certified information security management system from verisign.
- Good operation of e-commerce business.
- Have competitive product prices.
- Has a variety of payment methods to choose from.

b) Weaknesses
- The goods received by the customer sometimes do not match what is displayed on the e-commerce application/website.
- Payment mechanisms that tend to be complicated.
- The use of e-commerce websites that require access to the internet causes the market to be limited for internet users.

c) Opportunities
- The shopping trend is increasing.
- High opportunity to develop new business strategy.
- Transaction opportunities from customers are high because of the large number of merchant members.
- The high demand is in line with the times that move completely online.
- Become an online store that can reach all of Indonesia.

d) Threats
- There are still many people who are hesitant to shop online.
- Many competitors with a similar type of business strategy emerged in the world.
- The threat of hackers who can break into users' personal data and e-commerce itself.
- The culture of people who still tend to choose conventional (traditional) markets.

So that the formulation of the use of Information Systems Strategic Planning can be formulated, namely:

a) Strengths–opportunities (S-O)
- Adding new promotions every month.
- Improve the performance of one of the e-commerce programs, namely membership.
- More and more new brands at low prices can attract users

b) Strengths–threats (S-T)
- Increase market share.
- Further improve the security management system.
- Many cooperate with other companies.

c) Weaknesses–opportunities (W-O)
- Create alerts for sellers/account owners on e-commerce websites to pay more attention to the quality of the products sold and the delivery process.
- Develop e-commerce towards superstore channels. Improving the steps in the payment process so that they can be better. Create alerts for sellers/account owners on e-commerce websites to pay more attention to the quality of the products sold and the delivery process.
- Develop e-commerce towards superstore channels. Improved the steps in the payment process to make it easier to understand.

d) Weaknesses–threats (W-T)
- Updating the look of the website to be new and creative compared to other e-commerce.
- Improve security both internal company and website.

#### 3.3.2. Value chain analysis

Value chain analysis is used to determine the main activities and activities supporting the company’s internal business environment, by looking at business processes so that application requirements can be identified to support main business activities, so that business processes are more effective and efficient [19].

The results of the value chain analysis: i) Inbound logistics is the activity of purchasing, storing, and managing raw materials in the production process. In its business activities there are also delivery planning, warehouse control of goods; ii) Operations is the activity of producing and packaging products to be distributed to consumers. This activity consists of the process of receiving orders from the buyer then the order is forwarded to the seller whose products will be sent by the seller. Quality control which will control all product ordering processes so that they can run according to existing procedures and ensure that the products sent by the seller are of good quality; iii) Outbound logistics is an activity to distribute goods to consumers. In the company, Outbound logistics activities consist of having warehouses in various areas, making deliveries by courier and printing receipts automatically; iv) Marketing sales is an activity to introduce products offered to consumers to increase sales. In the company, Marketing Sales activities consist of providing promotions with cashback, providing promotions with free shipping, and providing 100% original product guarantees; and v) Services, is a post-purchase activity that serves to receive criticism and suggestions from buyers for self-improvement. In the company's services, activities consist of guarantees and services, criticism, and advice on the quality of e-commerce and products purchased.

### 3.3.3. Political, economic, social, and technological analysis (PEST)

PEST analysis is an analysis that used to analyse the external business environment, either by analyzing political, economic, social, and technological conditions that have a direct influence on business strategy on current and future conditions. This analysis can be described as follows.

a) Political
- It is governed by sections 65 and 66 of chapter VIII of the commerce Act regarding commerce through electronic systems.
- Law No. 19 of 2016 amending Law No. 11 of 2016 on information and electronic transactions.
- Consumer Protection Act No. 8 of 1999.

b) Economic
- The outlook for this industry is quite promising and can support Indonesia's digital economy.
- The growth of e-commerce that is increasingly spreading in Indonesia.
- The trend of online shopping is increasing due to the wider reach of e-commerce.

c) Social
- Increased environmental issues such as the level of waste that is increasing due to waste from shopping packages.
- Several influencers to K-Pop artists can influence business strategies.
- Increasing consumer purchase intention.

d) Technological
- The development of the internet is getting faster.
- Challenges in optimizing digital technology/strengthening digital infrastructure to achieve a more modern business approach.
- Development of application/website architecture evolution.

### 3.3.4. Critical success factor (CSF) analysis

CSF analysis is an analysis that used to help managers analyze the factors that influence the success of a strategy in achieving company goals where the success or failure of a company and its environemnet is influenced by the provisions of the CSF analysis itself [20]. Table 1 shows the CSF analysis of e-commerce.

Table 1. CSF analysis

| Main process | Critical success factor |
|---|---|
| Quality of e-commerce application service | Review all the features and menus of e-commerce applications. The company must ensure that all features and menus work properly. |
| Quality of products sold in e-commerce | It is very important to check the quality of goods sold by sellers through e-commerce. The company can verify the goods sold by paying attention to the rating or reviews that have been given by the buyer. |
| Marketing and promotion | Marketing and promotion are very important, so that buyers don't switch to other platforms. Periodic promotions such as cashback vouchers and free shipping can attract more potential buyers. |
| Customer service | Customer service that is ready to serve customers 24 hours per day will be very helpful for users who are experiencing difficulties. It is easy to get help when users experience difficulties or complaints and will provide positive feedback on the company's performance. |
| Cutting-edge technology | Basically, e-commerce is a digital marketplace platform that uses technology as its main business process. Therefore, the use of the most up-to-date technology is mandatory, because it will make it easier for users to use e-commerce. |

### 3.4. Analysis information systems/information technologies (IS/IT) internal and external

#### 3.4.1. McFarlan strategic grid

McFarlan strategic grid describes the relationship between business strategy, IT strategy and business operations. This analysis is used to map information system based on their contribution to the company. In particular, the McFarlan model describes how a project involving an IT investment will perform because of investment [14], [21]. Based on the results of the presentation of the IS/IT needs analysis matrix, the mapping of the IS/IT needs of the company in the future is classified into 4 quadrants of the McFarlan strategic grid. Table 2 shows the mapping of the McFarlan strategic grid.

Table 2. McFarlan strategic grid

| Strategic | Key operational | High potential | Support |
|---|---|---|---|
| E-commerce website<br>Track and tracing<br><br>Online customer service | Development<br>Monitoring features | New feature innovation<br>Collaborating with other companies or organizations | Training<br>Cross analysis/cross reporting |

a) Strategic

In the first quadrant is the strategic which is an important application to maintain future business strategies. They make or enable changes in the way an organization does its business with a purpose to provide a competitive advantage. In the results of author's analysis related to the first quadrant, we get the results that e-commerce and tracking websites are included in the strategic quadrant because e-commerce is an e-commerce website where the e-commerce website itself is used as a medium of competition with other e-commerce websites. Meanwhile, track and tracing are used to search for specific items on the website. Customer service is needed so that complaints, problems, and conversations can be conveyed quickly.

b) High potential

In the second quadrant is the high potential where applications can be important in future realizations but have not been demonstrated in terms of the benefits they generate or the technology's capabilities and performance, or both. If the application is less relevant to the strategic needs at that time, but still needed by the company to achieve success. Examples are the results of our analysis, namely collaborating with other organizations or companies and innovating new features that may be important to the company's future.

c) Key operational

The third quadrant is the key operational which is an application that is relied on in achieving success. The main operational applications and investments support existing business operations, help avoid any loss, and can be called the core of the company. In the results of author's analysis, we get examples like feature monitoring, which is implemented by the company to monitor new features so that the company knows if newly released features help the company in finding customers or not. For other examples, such as the development section which develops websites and applications from companies.

d) Support

Valuable app but not essential to the company's success. The support department also helps the company's operational effectiveness and efficiency but does not have a competitive advantage. For example, cross analysis which allows the use of analysis results from other divisions and Training which is training on the use of applications related to data analysis, and the training is aimed at IT/IS workers in the company.

### 3.5. Develop strategic planning

In the analysis that has been carried out, during the preparation of strategic planning, it is possible to identify strategic IS/IT business, strategic IS/IT management, and strategic IT in e-commerce companies. The results of this strategic planning analysis will form the portfolio application that the author proposes.

#### 3.5.1. IS/IT business strategic

From the results of the previous analysis, it produces an input that can be applied in the e-commerce business where the input can be used to improve the IS/IT business performance. The results are i) updated e-commerce applications that can continue to meet consumer needs and meet business goals, ii) organize more rigorous training for each employee to conduct UX research to meet the target needs of consumers and company, iii) added several information systems features so that every business activity carried out by the system no longer consumes a lot of energy, iv) needed to strengthen information systems security such as regular data backup because e-commerce applications are very sensitive to consumer's personal data,

v) additional qualified IS/IT human resources, and vi) improve the promotion aspect of e-commerce applications that the product sales area can be larger.

#### 3.5.2. Strategic IS/IT management

From the results of the previous analysis, the current management conditions are obtained with the proposed IS/IT management strategy: i) Maximizing system availability related to increasing system capabilities in e-commerce companies so that it can be accessed 24/7 by users by reducing the potential for single point of failure of all systems; ii) Maximize parts and job descriptions in the IS/IT domain; and iii) Regularly improve the quality of information systems and e-commerce applications in IS/IT development to avoid logical errors during IS/IT application development.

#### 3.5.3. Strategic IT

From the results of the previous analysis, it can be found that an IT strategies can be produced, namely i) maximize the management of technology used to espouse the business activities, ii) increased use of resources in the form of hardware and software suitable for application development, and iii) perform regular maintenance to prevent potential failure of the application when used by users.

### 3.6. Portfolio application

IS applications on current and future enterprise business processes are mapped in the portfolio application. In the results of the interviews with the company's data analysts, we map the interview results into 4 (four) grids, namely, strategy, high potential, key operational and support as shown in Table 3. Based on the results of the portfolio above, an implementation plan is made for the next 4 years as shown in Table 4.

Table 3. McFarlan strategic grid (Application portfolio)

| Strategic | High potential | Support | Key Operational |
|---|---|---|---|
| * E-commerce website | * Collaborating with other companies | * Cross analyst | * Monitoring features |
| * Track and Tracing | * New feature innovation | * Training | * Development |
| ! Online customer service | ! Shipping Notification | | ! Payment verification |
| ? Automatic payment system | | | |

Note: (*) Already perfect, (?) System required, (!) Need refinement.

Table 4. E-commerce company implementation plan

| IS/IT solution | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|
| New feature innovation | | | | |
| Shipping notification | High potential | | | |
| Collaborating | | | | |
| Monitoring feature | | | | |
| Development | | Key operational | | |
| Payment verification | | | | |
| Website ecommerce | | | | |
| Track adn tracing | | | | |
| Online customer service | | | Strategic | |
| Automatic payment system | | | | |
| Cross analyst | | | | Support |
| Training | | | | |

## 4. CONCLUSION

According to the findings of the previous analysis, the company still has many gaps in the development of IS/IT strategies, including application maintenance issues, information system quality, and resource issues (human and technology). We were able to determine what needs to be improved and developed by conducting IS/IT strategic planning research in the company using Ward and Peppard methodology, including SWOT analysis, McFarlan strategic grid, value chain analysis, PEST, and CSF analysis. The study's findings are the result of a SWOT analysis that focuses on the company's internal and external conditions. By analyzing the company's current value chain, the vision section enables companies to optimize technology and business applications. Companies must consider the application of political law, economic growth, social conditions, and technological developments when conducting a PEST analysis. The results of the CSF analysis show that the company must prioritize the quality of its products, customer service, the price of the products marketed, the company's resources, and the technology used. According to the McFarlan Strategic Grid analysis, companies should focus on assessing the overall contribution of IS/IT

and its influence on business success, both from strategic and operational perspectives. The combined results of these various analyses can be used to make portfolio recommendations that are appropriate for e-commerce companies' needs and conditions, as well as to forecast future business processes for the company. If the company is able and successful in implementing it, it can aid in overcoming internal and external issues with the technology's implementation.

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