

Strategic Planning for IS/IT Using Ward and Peppard at Maman Elektronik Sokaraja

Perencanaan Strategis SI/IT Menggunakan Metode Ward dan Peppard pada Maman Elektronik Sokaraja

Received:

21 June 2020

Accepted:

28 July 2020

Published:

19 August 2020

¹Olivia Michelle, ^{2*}Agustinus Fritz Wijaya

*^{1,2}Sistem Informasi, Universitas Kristen Satya Wacana Salatiga
^{1,2}Salatiga, Indonesia*

E-mail: ¹682017072@student.uksw.edu,

²agustinus.wijaya@uksw.edu

*Corresponding Author

Abstract— Maman Elektronik Sokaraja has implemented SI / IT, but it is not evenly distributed in all fields. The uneven implementation of the business process is still not effective and efficient. The purpose of this research is to provide an IS / IT strategic plan so that it can assist in the implementation of the company's IS / IT so that it is more equitable. The method used in this research is the Ward and Peppard method which consists of a SWOT analysis, Value Chain, Five Force Model, McFarlan Strategic Grid. The results of the study that have been carried out have obtained a recommendation for the development of several applications such as SI Sale, SI Debt and Receivable, SI Purchase and SI Inventory. Some of the recommended apps, such as SI Sales Distributor, SI Accounting, SI Payroll, SI Attendance. The application is approved in stages over 4 (four) years according to company conditions. Developments in several SIs required several application plans to be implemented within four years.

Keyword— Ward and Peppard, SWOT, Value Chain, Five Force Model, McFarlan Strategic Grid

Abstrak— Maman Elektronik Sokaraja sudah menerapkan SI/IT akan tetapi belum merata disemua bidang. Penerapan yang belum merata mengakibatkan pelaksanaan proses bisnis yang masih belum efektif dan efisien. Tujuan dari dilakukan riset ini adalah untuk memberikan sebuah perencanaan strategis SI/IT sehingga dapat membantu dalam penerapan SI/IT perusahaan sehingga lebih merata. Metode yang akan digunakan dalam riset ini adalah metode Ward and Peppard yang terdiri dari analisis SWOT, Value Chain, Five Force Model, McFarlan Strategic Grid. Hasil analisis yang sudah dilakukan maka didapatkan sebuah rekomendasi untuk pengembangan beberapa aplikasi seperti SI Sale, SI Debt and Receivable, SI Purchase dan SI Inventory. Beberapa aplikasi yang direkomendasikan seperti SI Sales Distributor, SI Accounting, SI Payroll, SI Attendance. Aplikasi tersebut direkomendasikan secara bertahap selama 4 (empat) tahun disesuaikan dengan kondisi perusahaan. Pengembangan di beberapa SI diperlukan beberapa perencanaan aplikasi yang akan diimplementasikan dalam jangka waktu 4 tahun.

Kata Kunci— Ward and Peppard, SWOT, Value Chain, Five Force Model, McFarlan Strategic Grid



I. INTRODUCTION

The growth of Information Systems and Information Technology at this time can be categorized as very fast, which can be seen in many large and small companies that have started implementing IS / IT. With the current growth of IS / IT, it has an abundance of impacts such as all business processes that used manual work in the past so that it took more time then currently uses IS / IT so that the use of time is quite short, and there are many other impacts. From the current development of IS / IT. Seeing the impact or profit shared from the use of IS / IT, many companies have implemented IS / IT to help the company's business processes so that they can work effectively and efficiently. In implementing IS / IT in a company, an IS / IT strategic design is needed. IS / IT strategic design is a process of analyzing the application portfolio and analyzing most of it in setting goals and deciding on a plan that can be used for the implementation of IS / IT so that it can reach expectations. of these businesses [1][2][3]. The hope that is wanted to be reached through the use of strategic planning is to share suggestions that can be used for the progress of the company besides that it can also motivate every worker in the company [4]. An information system is a mixture consisting of people, technology and data that are arranged in such a way that it can provide increased performance in business processes [5]. Information technology is a design in the improvement of managing information technology [6].

Maman Elektronik Sokaraja is a profit organization engaged in electronic devices such as spare parts for TV and many others. Maman Elektronik has started his business since 2000, so you could say that he has been engaged in electronics for a long time. Besides that, Maman Elektronik is a reasonably large electronics shop in Central Java, due to through sales around cities in Central Java. This shop is located on Jalan Karang Duren No.25, Sokaraja. The vision of this company is to seek profit in the business to turn the family economy around.

In the results of interviews conducted with the owner of the electronic manager, it was found that this shop has implemented IS / IT in several business processes. So that in business processes that have not been implemented IS / IT can reduce the level of ability to work on business processes. The problem faced in the implementation of IS / IT is the lack of understanding in using the current computer system so that currently, companies are still using IS / IT from the 2000s. Also, the existing system is still not evenly applied. In the future, there will also be needed for the development of existing systems to make it easier in existing business processes and also follow IS / IT developments in the future. Therefore an IS / IT strategic planning is needed in planning a system that will be used in the future.

In the research that has been done, such as the following research [7][8][9] gives results, namely the existence of a strategy in IS / IT can help the implementation of IS / IT in the

company so that the performance in conducting business processes can be more effective and efficient. Also, IS / IT strategic design can also be used in the field of education so that business processes in education can run smoothly [10][11]. Also, the implementation of IS / IT strategic planning in science engineering can also provide results, which can describe the added value to the business and IS / IT that is in the company [12]. In previous research, IS / IT strategic planning can also be applied to hospitals [13][14], transportation services [15], education [16], hotels [17], manufacturing industry [18]. However, this research will be conducted at an electronics store where this electronics store sells goods to stores outside the city.

In the preparation of an IS / IT strategic plan at the Maman Elektronik Shop, it can have an impact on the implementation of IS / IT in the store such as starting from structured planning for IS / IT implementation and investment feasibility for IS / IT implementation to the evaluation and monitoring of IS / IT implementation. This research was conducted to help Maman Elektronik stores in the preparation of IS / IT strategic plans to optimize their IS / IT resources and encourage store management in planning a structured and optimal IS / IT implementation.

II. RESEARCH METHOD

The research method used in this research is qualitative. The use of qualitative methods aims to explain and examine social activities currently happening in the company. This method is obtained from problems that arise in the data when research is carried out in the field. In this study consists of stages that are interconnected with one another.

The use of the ward and Peppard method was chosen because it is a method capable of producing IS / IT strategic planning that can analyze the company from an external/internal business perspective as well as IS / IT in the company. Then the results can provide an answer to the IS / IT needs of a company that can support business processes that are carried out externally and internally.

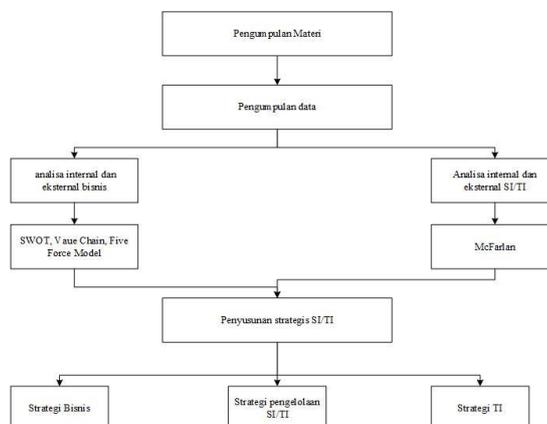


Figure 1. RESEARCH STAGES

Figure 1 describes the stages of the research carried out. The step in the first research is to collect various materials that can help study and be able to share adequate information. The next stage is the data collection process by conducting interviews and observing. In this case, the person who examines the object directly perceives. Then conducted interviews with business owners and also external people who are partners of the company. In this interview to find out the IS / IT implemented at this time, the condition of the company internally and externally.

The next stage after data collection is to analyze the business environment as well as the internal and external IS / IT environment. The analysis that will be used to analyze the business environment in this research is the analysis used is the SWOT analysis, the Value Chain Analysis, and the Five Force Model analysis. Result. The study that will be used to determine the internal and external IS / IT environment is the McFarlan Grid. SWOT analysis is used to understand the company's current situation and also the weaknesses, strengths, opportunities, and threats that exist in the company so that a design can be drawn up that can help in implementing IS / IT [19][20]. Then value chain analysis is the analysis used to analyze the activities of the company today [21]. The five force model analysis is an analysis to understand the external business environment. McFarlan's report is an analysis used to measure the IS / IT contribution and the effects felt by the company [22]. After the analyzes have been carried out, the results will be produced. From the results given, it can help in the preparation of IS / IT strategic, which consists of business strategy, IS / IT management strategy. Existing planning, the next step will be to get a portfolio application. The following is a sequence of stages that will be carried out during this research process.

III. RESULT AND DISCUSSION

A. Internal / External Business Environment Analysis

The initial stage of the analysis carried out is a SWOT analysis (Strength, Weaknesses, Opportunities and Threats). This analysis is conducted to understand the strengths, weaknesses, opportunities, and threats by knowing the business environment internally and externally at Maman Elektronik. The following results are given from Maman Electronic's SWOT analysis:

Table 1. SOKARAJA ELECTRONIC SWOT ANALYSIS

STRENGTH	WEAKNESS	OPPORTUNITY	THREAT
It is the largest electronics store in Central Java	Uneven application usage in every area	Already implemented IS / IT so that it can adapt to the development and procurement of IS / IT	Increasing sales of online electronics
Has a competitive selling price	There has been no IS / IT update since 2000	-	There are already many competitors in the field of electronics stores.
Some people are capable of operating IS / IT	-	-	

From the results of the SWOT analysis obtained, an IS / IT SWOT mapping was carried out at Maman Elektronik Sokaraja so that it could answer any shortcomings, threats with strengths and opportunities. The results can be seen as follows:

Table 2. SWOT MAPPING

STRATEGY S-O	STRATEGY W-O	STRATEGY S-T	STRATEGY W-T
With the existence of an opportunity that the company has, namely being able to adapt and also use existing systems so that it can provide support in the implementation and renewal of the company's IS / IT. Also, the development and regeneration of IS / IT also have an impact on company management so that it can become the largest electronics store in Central Java.	The application of IS / IT and also the ability to adapt to the existing system can be carried out an IS / IT application in parts. There is no use of IS / IT besides that for the old system systems can be updated to simplify the implementation of existing business processes.	Competitive selling prices, one of the largest electronics stores in Central Java and the presence of human resources. Can operate IS / IT can overcome existing threats by selling online, promoting goods online on websites and platforms that are often used like youtube.	With the implementation of IS / IT in all business processes, IS / IT discussions and sales marketing can be done online.

The subsequent analysis is the value chain analysis used to analyze the internal and external business environment of the company as well as to understand the business processes thoroughly. Those are taking place at Maman Elektronik Sokaraja so that there is unobstructed exposure to the information system strategic plan to complement every real need of the company. The tool used for this analysis is porter's value chain analysis. Where is used as a description of the primary and supporting business processes? Then the results will be used to identify the IS / IT needs in the company. Following are the results of value chain analysis at Maman Elektronik Sokaraja:

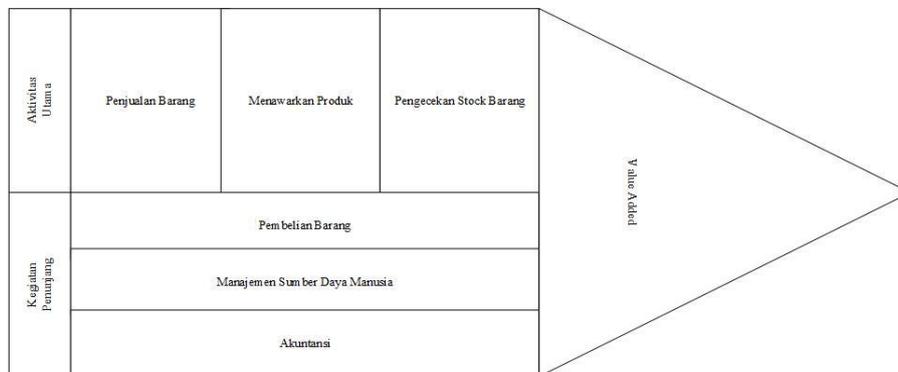


Figure 2. POTTER'S VALUE CHAIN ANALYSIS IN MAMAN ELECTRONIC SOKARAJA

The analysis that will be carried out next is the analysis of the five force model, which is used to understand the situation of the external business environment and determine the capabilities of competitors. Following are the results of the analysis of the five force model on Maman Elektronik Sokaraja :

1. The barrier of new arrivals

The existence of a product that is sold has a high level of power of sale besides that in sales it also has quite competitive selling prices because it is easy to make purchases directly from foreign suppliers through trusted importers. Besides, the Maman Elektronik Shop itself has a large enough capital so that it can make it difficult for newcomers.

2. Bargaining power of suppliers

It has the convenience of purchasing goods from suppliers outside the country and also getting a relatively low price compared to others due to the help of importers. Besides, it also has suppliers from suppliers who also have lower rates and quality goods.

3. Bargaining power of consumers

The sales made by the Maman Electronics Store to the small electronics stores have prompted the company to sell at a lower price.

4. The threat of substitute products

The Maman Elektronik store not only faces many competitors who are engaged in the electronic part but also faces competition in the goods sold because many competitors also sell the same products and even with rights that have lower prices.

5. Competitive competition in the industry

In this shop itself, it still lacks in sales innovation, it always carried out offline and by visiting existing stores to make offers to existing stores.

B. Internal / External IS / IT Environmental Analysis

Subsequent analysis is the McFarlan matrix analysis, which is the analysis used to see IS / IT assistance in the company's business processes. The following is a list of IS / IT used at Maman Elektronik Sokaraja based on current conditions:

Table 3. SOKARAJA ELECTRONIC IS / IT LIST

NO	INFORMATION SYSTEM NAME	USER	TYPE OF APPLICATION
1	SI Sale	Admin	Desktop
2	SI Inventory	Warehouse	Desktop
3	SI Purchase	Manager	Desktop
4	SI Debts and Receivables	Manager	Desktop

After seeing the IS / IT in the company, the next step is McFarlan's mathematical mapping. Here are the results of the mapping:

Table 4. CURRENT MCFARLAN PORTFOLIO

STRATEGIC	HIGH POTENTIAL	KEY OPERATIONAL	SUPPORT
-	SI Sale	SI Purchase	-
-	SI Debt and Receivable	SI Inventory	-

From the results obtained in the McFarlan matrix, a result is obtained that in quadrant one, namely support, which currently has no system implemented in this quadrant. Then in the second quadrant is the operational quadrant which has been applied, namely the SI purchasing and warehouse SI. The third quadrant is the high potential quadrant which the company has achieved is SI Sales, and also accounts payable. In the last quadrant or fourth quadrant is the strategic quadrant in this quadrant, any information system has not been implemented yet. At this time, the application that has been achieved is desktop-based. Seeing from the current increase in IS / IT, many companies want to improve their present performance.

C. SI/TI Business Strategy

Based on the results of the analysis that has been carried out, an input can be given that can be applied at Maman Elektronik Sokaraja. These suggestions can be used to improve the performance of the IS / IT business process. The results are shown below:

1. Renew desktop-based applications so that they can meet the current needs of the company.
2. Adding several information systems so that every business activity is carried out with the system so that it no longer consumes more energy.
3. Start selling and promoting online so that the sales area can be even more significant.
4. When there are additions and updates to the system, training is also carried out for each employee so that they use the latest technology.

D. SI/TI Management System

The results of the IS / IT analysis that have been carried out show that Maman Elektronik Sokaraj does not currently have an IT department. Therefore an IS / IT section is needed so that there are maintenance and development of existing information systems besides that it can also train every employee to be able to operate the system. It is surviving in the company.

E. TI Strategy

From the results obtained, when collecting data and also analyzing it requires development and addition of information systems so that every business process can be implemented IS / IT and will help in improving business performance.

F. Portfolio Application

From the results of McFarlan's analysis obtained, a suggestion can be obtained that can be applied to Maman Elektronik Sokaraja, which can be used to improve the performance of today's business processes. The following is a table of proposed application portfolios for the future:

Table 5. FUTURE MCFARLAN PORTFOLIO

STRATEGIC	HIGH POTENTIAL	KEY OPERATIONAL	SUPPORT
SI Sales Distribution	SI Sale	SI Purchase	SI Accounting
-	SI Debt and Receivable	SI Inventory	SI Payroll
-	-	-	SI Attendance

The first quadrant is the quadrant support, which is a system that is used to support the company's business processes but does not have a significant effect if there is a breakdown in the system condition. The second quadrant is the operational quadrant, which is a system that is used to provide convenience for the company's operational activities. The next quadrant or the third quadrant is the high potential quadrant. Quadrant high potential is a system used which is essential for the continuity of internal business activities as well as external business activities. Company Then for the last quadrant is the strategic quadrant. The strategic quadrant is a system that is considered sufficient to have a high enough impact on future business continuity.

The first quadrant is the quadrant support, which is a system that is used to support the company's business processes but does not have a significant effect if there is a breakdown in the system condition. The second quadrant is the operational quadrant, which is a system that is used to provide convenience for the company's operational activities. The next quadrant or the third quadrant is the high potential quadrant. Quadrant high potential is a system used which is essential for the continuity of internal business activities as well as external business activities. Then for the last quadrant is the strategic quadrant.

The strategic quadrant is a system that is considered sufficient to have a high enough impact on future business continuity:

Table 6. GAP APPLICATIONS

PROPOSED NAME OF INFORMATION SYSTEM	UPGRADE	PLANNING
SI Sales Distribution		V
SI Sale	V	
SI Debt and Receivable	V	
SI Purchase	V	
SI Inventory	V	
SI Accounting		V
SI Payroll		V
SI Attendance		V

From the results obtained through application gaps, it can be seen that there is a need for an update to improve existing applications so that they can function better such as Sales SI, Accounts Receivable, Purchasing SI and also Warehouse SI. Also, a plan is needed to build a new IS / IT in the company, namely Sales Distribution SI, Accounting SI, Payroll SI, Attendance SI. From the results that have been obtained, it is also got a plan for the application of IS / IT to Maman Elektronik carried out within the next four years. With details in 2021 the Sales SI, Pituang Debt will be implemented, then in 2022 the Purchasing SI, Warehouse SI will be applied. Then in 2023, implementation of SI for Distribution Sales will be carried out, then in 2024, implementation of SI Accounting, Payroll SI, and Attendance SI will be carried out.

Table 7. PLANNING OF SOKARAJA ELECTRONIC IS / IT IMPLEMENTATION

SOLUTION SI/TI	2021	2022	2023	2024
SI Sale	High Potential			
SI Debt and Receivable				
SI Purchase		Key Operational		
SI Inventory				
SI Sales Distribution			Strategic	
SI Accounting				Support
SI Payroll				
SI Attendance				

Table 7 shows the application mapping that has been proposed in the previous stage. Each application is grouped into each quadrant in the McFarlan Portfolio to differentiate the functionality of each submitted form. The High Potential quadrant shows that the claims in that quadrant can be developed to support business processes at Maman Elektronik Sokaraja. The Key Operational Quadrant is an application used in-store operations. Strategic Quadrant is an

application that can be used for a long time or in the future. Meanwhile, the Support quadrant is an application that supports applications in the Key Operational quadrant.

Based on the results of IS / IT strategic planning that is carried out at Maman Elektronik using the Ward and Peppard method, various IS / IT solutions, IS Strategies, IS Management Strategies. Implementation Plans can be obtained according to the conditions in Maman Elektronik based on the results of SWOT analysis, Value Chain Activity, Five Forces Analysis, and McFarlan Strategic Grid.

IV. CONCLUSION

The conclusion that can be obtained through this research is that it can provide some suggestions to Maman Elektronik that can help in offering advice. Designing an IS / IT strategy can help companies to achieve business goals and can also motivate employees to operate IS / IT. Based on the results of the SWOT analysis, Value Chain Activity, Five Forces Analysis, and McFarlan Strategic Grid, several system solutions that can be applied by Maman Elektronik, namely SI Sales Distribution, SI Accounting, SI Payroll, SI Attendance and for planning can be applied by companies in four the next year. The IT Division can also assist in updating and procuring SI, besides that the IT division can help to motivate and provide training to every employee in the use of IS / IT at Maman Elektronik.

REFERENCES

- [1] Anharudin, "Perencanaan Strategis Sistem Informasi Untuk Meningkatkan Pelayanan Menggunakan Metode Ward And Peppard (Studi Kasus : Pt Pos Indonesia Cilegon - Banten)," J. PROSISKO, vol. 2, no. 2, hal. 1–4, 2015, [Daring]. Tersedia pada: <http://ejournal.lppmunsera.org/index.php/PROSISKO/article/view/103/161>.
- [2] S. Vicarya Widagdo dan M. Kamisutara, "Perencanaan Strategis Sistem Informasi Untuk Meningkatkan Layanan Pendidikan Menggunakan Metode Ward And Peppard (Studi Kasus : SMK Swasta di Surabaya)," Semin. Nas. Apl. Teknol. Inf., hal. 11–2018, 2018.
- [3] A. Pranata dan R. Ilyasa, "DAN WARD AND PEPPARD MODEL (Studi Kasus : PT . Virgina Estetika (Farina Beauty Clinic))," vol. 10, no. 1, hal. 35–46, 2020.
- [4] P. Nainggolan, "No Title," Pentingnya Manaj. Strat. Bagi Organ. dan Perusah., 2014, [Daring]. Tersedia pada: www.kompasiana.com 09-09-2014.
- [5] D. Metro, "Perencanaan Strategis Sistem Informasi Dan Teknologi Informasi Si/ti Pendidik Dan Tenaga Kependidikan (Studi Kasus: Pada Disdikbudpora Metro)," vol. 2, no. 01, hal. 41–51, 2016.
- [6] H. P. C. Dedy, Prihanto Ngesti Basuki, "Perencanaan Strategi SI/TI Menggunakan Metode Ward and Peppard di BAREN LITBANGDA Kabupaten Semarang," vol. 08, no. 01, 2018.
- [7] D. Wandikbo dan M. N. N. Sitokdana, "Perencanaan Strategis Sistem Informasi Di Yayasan Binterbusih Semarang Menggunakan Ward And Peppard," no. 1, hal. 61–69, 2019.
- [8] D. G. Sunarti dan L. Suryadi, "ANALISA DAN PERANCANGAN SISTEM INFORMASI PENJUALAN DENGAN METODOLOGI BERORIENTASI OBYEK

- STUDI KASUS: TOKO BESI ARCO JAYA,” *J. Idealis*, vol. 2, no. 1, hal. 252–258, 2019.
- [9] M. Afriyano, M. Darwiyanto, eko, ST., dan G. A. A. Wisudawati, “Perencanaan Strategis Sistem Informasi Menggunakan Metode Ward and Peppard Pada PT. Grahacipta Bangko Jaya,” vol. 6, no. 1, hal. 1939, 2016.
- [10] Y. Irawan, “PERENCANAAN STRATEGIS SI / TI DENGAN MENGGUNAKAN FRAMEWORK WARD AND PEPPARD DI SEKOLAH TINGGI ILMU KESEHATAN (STIKes),” *J. Ilmu Komput.*, vol. 6, no. 1, hal. 25–32, 2017.
- [11] M. M. Hidayat, K. 2, dan H. Al Fatta, “Perencanaan Strategis Sistem Informasi Menggunakan Metode Ward and Peppard di SMK Syubbanul Wathon Muhamad,” *Aiti*, vol. 16, no. 1, hal. 18–30, 2019, doi: 10.24246/aiti.v16i1.18-30.
- [12] A. Setiawan, “Perencanaan Strategik Sistem Informasi pada Perusahaan Penerbitan dengan Metode Ward and Peppard: Studi Kasus pada Penerbit Rekayasa Sains Bandung,” *J. Manaj. Teknol.*, vol. 11, no. 3, 2012.
- [13] W. Nugroho, Hakim, “PERANCANGAN STRATEGIS SISTEM INFORMASI RUMAH SAKIT TYPE B MENGGUNAKAN METODE WARD DAN PEPPARD,” hal. 128–134, 2017, [Daring]. Tersedia pada: https://publikasiilmiah.unwahas.ac.id/index.php/PROSIDING_SNST_FT/article/view/1890.
- [14] C. P. N. Putri, “PERENCANAAN STRATEGIS SISTEM DAN TEKNOLOGI INFORMASI PADA RSIA PUTRI SURABAYA BERDASARKAN METODE WARD AND PEPPARD,” 2018.
- [15] R. Kurniawati, “Perencanaan Strategis Sistem Informasi di Dinas Perhubungan Dengan Menggunakan Metode Ward and Peppard,” *J. Algoritma*, vol. 15, no. 1, hal. 7–13, 2018, doi: 10.33364/algoritma/v.15-1.7.
- [16] Y. Pratomo dan G. Meneng, “Rencana Strategis Teknologi Informasi Menyongsong Transformasi Digital Di Dunia Pendidikan (Studi Kasus SMK Negeri 1 Sukadana Kabupaten Lampung Timur),” vol. 02, no. 03, hal. 74–81, 2019.
- [17] I. B. A. B. Paramartha, G. R. Dantes, dan I. M. Candiasa, “PERENCANAAN STRATEGIS SISTEM INFORMASI /TEKNOLOGI INFORMASI INNA GRAND BALI BEACH,” no. 2, 2018.
- [18] D. Gazella, E. Darwiyanto, dan A. A. W. Gede, “Perencanaan Strategis Sistem Informasi Pada Industri Manufaktur Menggunakan Metode Ward and Peppard (Studi Kasus : PT . Fin Komodo Teknologi) Information System Strategic Planning In Industrial Manufacturing using Ward and Peppard Method (Case Study :,” *e-Proceeding Eng. Vol.3*, vol. 3, no. 3, hal. 5230–5237, 2016.
- [19] I. D. M. P. W. Christina Deni Rumiartil, Bagas Ryant Setiawan, “KAJIAN PERENCANAAN STRATEGIS SISTEM INFORMASI PADA BISNIS RITEL BERBASIS METODOLOGI WARD & PEPPARD: STUDI KASUS PT. GRAMEDIA ASRI MEDIA Christina,” vol. 6, no. 3, 2019, doi: 10.25126/jtiik.20196926.
- [20] Y. Septiana, “PERENCANAAN STRATEGIS SISTEM INFORMASI DENGAN PENDEKATAN WARD AND PEPPARD MODEL (Studi Kasus : Klinik INTI Garut) PERENCANAAN STRATEGIS SISTEM INFORMASI DENGAN PENDEKATAN WARD AND PEPPARD MODEL (Studi Kasus : Klinik INTI Garut),” *Wawasan Ilm.*, vol. 8, no. May, hal. 8–24, 2017.
- [21] L. Hakim, W. W. Winarno, dan M. R. Arief, “Analisis Data Informasi Sebagai Penunjang Perencanaan Strategis Sistem Informasi (Studi Kasus : STIE Tenggara),” vol. XIV, no. November, hal. 9–17, 2019.
- [22] A. Aziz dan T. Darmizal, “Perencanaan Strategis Sistem Informasi dan Teknologi Informasi di Dinas Pendapatan, Pengelolaan Keuangan dan Aset Kabupaten Kampar (Model Strategis Ward and Peppard),” *J. CoreIT J. Has. Penelit. Ilmu Komput. dan Teknol. Inf.*, vol. 2, no. 2, hal. 1, 2016, doi: 10.24014/coreit.v2i2.2355.