

STRATEGIC INFORMATION SYSTEM PLANNING AND INFORMATION TECHNOLOGY

Agus Susilo Nugroho^{1*}, Wing Wahyu Winarno¹, Hanif Al Fatta¹

^{*1} Teknik Informatika, Universitas Amikom Yogyakarta, Yogyakarta, Indonesia

* agus.nugroho@students.amikom.ac.id, wing@stieykpn.ac.id, hanif.a@amikom.ac.id

DOI: <https://doi.org/10.21107/literasinusantara.v1n2.128140>

Received: January 11, 2021

Revised: February 13, 2021

Accepted: March 25, 2021

Abstract

For private vocational schools such as SMK At-Thoat Toroh, the acquisition of new students is very important. Because the number of students has a direct effect on the sustainability of the school. In obtaining new students, SMK At-Thoat Toroh not only competes with fellow private SMK / SMA / MA, but also public SMK / SMA / MA. There needs to be an increase in competitiveness in acquiring new students at SMK At-Thoat Toroh. Because the trend of new student admissions at SMK At-Thoat Toroh has decreased, especially during the Covid-19 pandemic. The solution offered in this study for this problem is to formulate a strategic information system design and information technology using the Ward and Peppard method. Ward and Peppard's method is able to produce IS / IT strategies that are in line with business strategies. The first stage in applying this method in this research is the analysis of current conditions, both the organization as a whole and the IS / IT aspect. The next stage is an analysis of IS / IT needs in the future. The final stage is the preparation of IS / IT strategic steps. To analyze each of these stages, analysis tools are needed, namely: SWOT, critical success factor, Mc Farlan Strategic, PEST, IS / IT trends and value chains. The implementation of the Ward and Peppard method and their analysis tools, is able to identify and recommend IS / IT needs at SMK At-Thoat Toroh for the next 3 years. However, the resulting recommendations must be adjusted to the school budget.

Keywords– Planning, Information system, Information technology, Strategic information system, Ward and peppard

1. Introduction

In this competitive era, every organization is required to increase productivity and have a competitive advantage according to organizational goals. To fulfill it, it is necessary to create an integrated Information System (SI) and Information Technology (IT). In order for the IS / IT to be integrated and in accordance with the needs, it is necessary to design a Strategic Information System (SIS) and Information Technology (IT). SIS design includes a very complex and integrated system. SIS design is also supported by adequate IT, so that competitive advantage is easily achieved. The same design requirements are also required for SMK At-Thoat Toroh. Supriyantoko (2018) explains that in business competition, a strategic information system is needed so that it can provide advantages in business activities. According to Anharudin (2015), the same thing happened to PT. Pos Indonesia Cilegon - Banten. This State-Owned Enterprise requires the right business strategy to improve performance and competitiveness. According to Suwirno and Noviadi (2015), although many companies have implemented IS / IT, there are still many gaps due to the inaccurate implementation of IS / IT in supporting the company's business activities. Therefore it is necessary to plan a strategic information system that is right and in tune with the company's business development, so that it can provide a competitive advantage.

Irfan and Abdi (2016) explain that in order for information to be managed properly, it is necessary to have an adequate ICT-based system. According to Yunita, Adi and Agustinus (2018), the success of an organization is influenced by information systems and information technology (IS / IT). Even though there is IS / IT, if it is not used optimally, then the business processes that are running will not be optimal. This can be overcome by making an IS / IT strategic plan. According to Purnomo and Febriliyan (2017), when the ongoing IT management is deemed insufficient, it is necessary to have an information system and information technology strategic plan that is in line with the business strategy.

SMK At-Thoat Toroh is one of the private vocational schools located in Grobogan Regency, Central Java. As a vocational school, SMK At-Thoat Toroh

has three study programs (prodi). The three study programs are: TKJ (Computer and Network Engineering), TBSM (Motorcycle Engineering and Business), and OTKP (Office Automation and Management). Like other institutions and organizations, SMK At-Thoat Toroh also has a vision and mission that are its operational objectives.

This vision and mission can be realized properly when there are basic things that make it happen, namely students. Without students, the vision and mission will only be in writing. The more students there are, the easier the vision and mission of SMK At-Thoat Toroh will be realized. The number of students greatly affects the sustainability of SMK At-Thoat Toroh. The gateway to getting new students is through PPDB (New Student Registration). Therefore, it is necessary to increase competitive advantage in obtaining new students through PPDB. Moreover, the trend of the number of new students at SMK At-Thoat Toroh has decreased, especially during the Covid-19 pandemic. SMK At-Thoat Toroh implements PPDB by coming directly to school (offline) and online. The rapid use of technology and the covid-19 pandemic have made PPDB online a solution in dealing with it. It was proven when other SMKs had difficulty getting new students during the pandemic, there were schools that easily got new students.

PPDB is an annual routine activity at SMK At-Thoat Toroh. Apart from dealing with the internal environment, this activity is also closely related to the external environment. In addition, online PPDB can also improve the school's reputation. For private SMK, a good school reputation is very important for the sustainability of the school. Private SMK directly compete with public SMK in acquiring new students. So that a truly effective and efficient system must be made to increase competitiveness in getting new students. SMK At-Thoat Toroh serves PPDB online through a website that is integrated with the google form application. With this online PPDB model, At-Thoat Vocational High School cannot apply for new student registration which is a one-day service.

On the basis of these weaknesses, it is necessary to have an Information System (SI) and Information Technology (IT) at SMK At-Thoat. In order for the

IS / IT to run effectively, efficiently and according to the needs of At-Thoat Vocational High School, it is necessary to make an IS / IT strategic design. The existence of IS / IT strategic design makes SMK At-Thoat able to determine the right strategy and decisions, in planning and managing IS / IT, in accordance with the vision and mission of SMK At-Thoat Toroh.

To obtain valid and comprehensive research, researchers will communicate intensively with the Principal of SMK At-Thoat Toroh. This will make it easier for researchers to provide a design according to the needs of SMK At-Thoat Toroh. Then the researchers conducted an analysis of the impact of political, economic, social and technological (PEST) factors on SMK At-Thoat Toroh. This will help provide an overview in analyzing SMK At-Thoat Toroh from external factors. Next are the main activities and supporting activities at SMK At-Thoat Toroh. From this, the researcher can formulate what things have been used to assess the competitive advantage of SMK At-Thoat Toroh. The last thing that needs to be understood is the information technology that has been used for operations at SMK At-Thoat Toroh. And last but not least, researchers also need an information system that has been used to support activities at SMK At-Thoat Toroh. This is used by researchers to decide what kind of information technology and information systems can be run at SMK At-Thoat Toroh. The results of the research are IS / IT portfolios that are in line with SMK At-Thoat Toroh, to increase competitive advantage. The purpose of this research is to make a strategic design of IS / IT at SMK At-Thoat Toroh to increase competitiveness in acquiring new students.

2. Method

In order for research to be well structured, researchers use the Ward and Peppard framework. In addition, additional analytical methods are needed to help sharpen research. The analysis methods are: SWOT, PEST, value chain, critical success factor, strategic grid planning and IS / IT trend analysis.

The Ward and Peppard methodology was chosen by researchers because this method has a comprehensive analytical framework. The first is an analysis of the

internal business environment which includes current business strategies, resources, goals, and organizational values. The second is an analysis of the external business environment whose scope includes economic, social to political aspects. The third is an analysis of the internal IS / IT environment whose scope is about the condition of IS / IT from the current business point of view, to how it contributes to business processes. The fourth is an analysis of the external IS / IT environment that includes technology trends and opportunities for utilization, as well as the use of IS / IT by competitors. The four stages are the input stages in Ward and Peppard. After the input stage, this methodological framework is followed by an output stage consisting of an information system business strategy, an information technology strategy and a management strategy. After the output stage has been completed, the next stage is the application stage which contains the IS / IT portfolio.

The first analytical tool used for the Ward and Peppard methodology is PEST. PEST analysis was chosen because it can evaluate the impact of external factors that affect business processes. These factors include: political, economic, social and technological. Political factors include government regulations on education which indirectly have an impact on the business process of At-Thoat Toroh Vocational School. Economic factors include economic problems that affect business processes at SMK At-Thoat Toroh. Meanwhile, the coverage of social factors includes demographics, culture, lifestyle, and educational background. Finally, the scope of the technology factor is the positive and negative impact of the use of technology on business processes at SMK At-Thoat Toroh.

Furthermore, the value chain analysis method was chosen because it was able to analyze the business processes of SMK At-Thoat from the internal side. The internal aspects that are analyzed are the main activities and supporting activities, where these two activities become a formula to increase the competitive advantage of SMK At-Thoat Toroh.

In collecting data, researchers used three methods, namely interviews, observation, document study and literature study. The interview was conducted

with the principal of SMK At-Thoat Toroh, as the leader at SMK At-Thoat Toroh. The interview result data is qualitative. In observation, researchers made direct observations at SMK At-Thoat Toroh. Observations were made on what activities are in At-Thoat Toroh Vocational School, what things are needed in these various activities and other conditions at At-Thoat Toroh Vocational Schools. Document studies are carried out by looking at student administrative documents, PPDB documents and other supporting documents. The data obtained were both qualitative and quantitative. Literature studies are carried out by examining other studies with the same topic. In addition, by reviewing books on IS / IT strategic design.

3. Result and Discussion

At the stage of understanding the current situation, an internal and external analysis is carried out. The fields analyzed were business and IS / IT. For the analysis of the internal business environment using the value chain method. Meanwhile, the analysis of the external business environment uses the PEST method. For the analysis of the internal IS / IT aspects, the analytical method used is the McFarlan Strategic Grid which is combined with the currently developing IS / IT trend. Everything is reviewed to produce a SWOT mapping.

Value chain analysis is outlined in a picture that contains supporting activities as well as main activities, which then generate margins / benefits. Following are the results of value chain analysis at SMK At-Thoat Toroh.

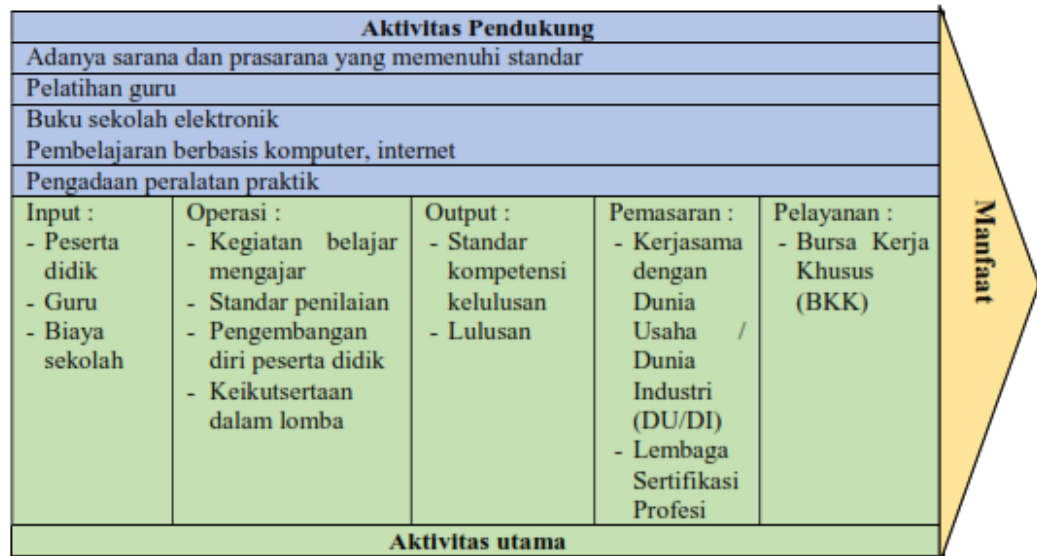


Figure 1. Value chain analysis of At-Thoat Toroh Vocational School

- a. Input. Input activities at SMK At-Thoat Toroh start from the acceptance of students. This acceptance is known as the New Student Registration (PPDB). Prospective students who will study at SMK At-Thoat Toroh must go through a registration process, administrative selection and registration payment. New Student Registration is the main thing that greatly influences the sustainability of SMK At-Thoat Toroh. If PPDB as input cannot be maximized, then the main activities starting from operations, output, marketing and services will also not be optimal. From the results of observations and interviews, it was found that PPDB at SMK At-Thoat Toroh was carried out online and offline. The waiting time for PPDB SMK At-Thoat Toroh services is included in the fast category with a waiting time of 2-4 days. The fast category is not the best category. Because there is still one category on it, which is very fast, with a waiting time of 1 day. This is evidenced by giving a questionnaire to students of SMK At-Thoat Toroh and alumni, with a total of 122 respondents. Although included in the fast category in the PPDB process, in the last three years starting from the 2018/2019 academic year, the number of new students at SMK At-Thoat Toroh has decreased, especially at the beginning of the 2020 pandemic. In addition to PPDB, teacher admission is also carried out in input. Teachers

are the spearhead in teaching and learning activities at SMK At-Thoat Toroh. Teachers who have an educator certificate according to their competence will increase public trust in At-Thoat Toroh Vocational School. Teacher certification also affects the accreditation of SMK At-Thoat Toroh. In addition, with certification, the ability of teachers to teach and their knowledge of the world of education will also increase. Currently, not all teachers at SMK At-Thoat Toroh have educator certificates according to their competence. Of the 30 teachers, only 3 have educator certificates. Obtaining this certificate goes through a series of processes, where the information will be notified through the teacher's account whose data is linked in the Basic Education Data (Dapodik). Dapodik is controlled by the school operator. So that school operators must be diligent in updating information and dapodik applications. The next input is the cost of education. The cost of education includes BOS funds and educational contributions from the parents of students. His monthly education contribution is Rp. 75,000. This amount is affordable for the monthly fee for SMK in Grobogan Regency. In addition to school operations, education funds are also used as facilities and infrastructure, as well as the development of the quality of learning.

- b. Operation. In this activity, teaching and learning activities, assessment standards, student self-development and participation in competitions are carried out. In teaching and learning activities, a dual system education model is carried out. This means that the learning process is carried out internally and externally. Internal learning is in SMK At-Thoat Toroh. External learning is carried out with Industrial Work Practices (Prakerin) in the Business World / Industrial World (DU / DI). As for the assessment standards at SMK At-Thoat Toroh, there are several assessments that are applied, ranging from attitude assessment, knowledge and skills assessment and industrial work practice assessment. Students' self-development is carried out through various extracurricular activities, including scouts, paskibra, volleyball games, to music. The participation of students in

competitions to represent the school can improve the quality of the school. Especially if students are able to make achievements in the competitions they are participating in. For now, SMK At-Thoat Toroh has made more achievements in scout competitions. At-Thoat Toroh Vocational High School is still minimal in its participation in academic competitions. So that achievement in the academic field is still minimal.

- c. Output. Activities in the output are in the form of graduation competency standards and the graduates themselves. Competency standards for graduation are competencies that must be achieved by students of SMK At-Thoat Toroh in order to pass. These competencies are in the form of knowledge, skills and attitudes. Graduates are expected to have competencies according to their fields and be ready to work in the industrial world.
- d. Marketing. Activities at this stage are in the form of collaboration with DU / DI and professional certification bodies. Collaboration with DU / DI as a form of external learning in the form of industrial work practices. So that the students of SMK At-Thoat Toroh will know directly what kind of work industry is in the world. That way, At-Thoat Toroh Vocational School graduates are truly ready to be deployed to the world of work later. Professional certification bodies as quality assurance of the quality of graduates of At-Thoat Toroh Vocational Schools. This institution ensures that the graduates of SMK At-Thoat Toroh have competencies that are really needed by the industrial work world. Certificates from this institution are very helpful for increasing the competence of graduates. The impact is that graduates of SMK At-Thoat Toroh will be more easily and quickly absorbed into the industrial world. Currently certificates from professional institutions are only obtained by students once, namely when students pass the National Vocational Competency Examination. There are no facilities from the school so that students get other competency certificates according to their competence.

- e. Service. Activities in the services of SMK At-Thoat Toroh are in the form of a Special Job Exchange (BKK). BKK is the distributor for At-Thoat Toroh Vocational High School graduates to the industrial world. So that the At-Thoat Toroh Vocational High School graduates are quickly absorbed into the industrial world according to their competencies.
- f. Facilities and infrastructure according to standards. This process is part of supporting activities in the infrastructure sector. Standard facilities and infrastructure must be available properly at SMK At-Thoat Toroh. This is related to the feasibility of study rooms, libraries, places of worship, laboratories to sports venues. All of these things must be in accordance with the standards, so as to provide comfort for the students of SMK At-Thoat Toroh, which ultimately facilitates the teaching and learning process. The laboratory owned by At-Thoat Vocational High School is already in accordance with the standards for UNBK (Computer-Based National Examination) and Vocational Competency Examination (UKK). So that students of SMK At-Thoat Toroh do not need to stay at another school when the exam arrives.
- g. Teacher training. Teacher training is part of supporting activities in human resource management. Training conducted to strengthen field competence. The training that is currently being attended by teachers at SMK At-Thoat Toroh comes mainly from training organized by the central government. So that the teacher must adjust to the training being held. In other words, if the TKJ study program teachers have never attended training, but the existing training is intended for OTKP teachers, TKJ teachers still have to wait. Training for At-Thoat Toroh Vocational School teachers is very useful so that the teachers really have quality competencies maximum. This can increase self-confidence to encourage school participation in various academic competitions.
- h. Computer based learning. The next supporting activity is in the field of technology development. There are two activities at SMK At-Thoat Toroh in this field, the first is the distribution of Electronic School Books (BSE)

and the use of computers for teaching and learning. BSE makes it easier for children to gain knowledge from trusted sources. Especially during the Covid-19 pandemic which began in early 2020. Learning with the internet is a solution when students have to stay at home. Distributing BSE to students online is one form of learning.

4. Conclusion

Based on the research conducted, it can be concluded that, to formulate a strategic IS / IT design, in order to increase competitiveness in the acquisition of new students at SMK At-Thoat Toroh, the Ward and Peppard method is needed with the help of six analysis tools: value chain, PEST, Mc Farlan strategic. grid, IS / IT trends, SWOT and critical success factors. Value chain and PEST are used to analyze internal and external business activities. Internal and external business analysis is part of the Ward and Peppard method. Value chain as an internal analysis tool identifies the main activities and supporting activities in the business process at SMK At-Thoat Toroh, in order to realize its goals based on the vision and mission of SMK At-Thoat Toroh. PEST analysis has successfully identified activities from outside SMK At-Thoat Toroh (external), which affect the business processes of SMK At-Thoat Toroh. In Ward and Peppard, tools are also needed to analyze internal and external IS / IT. Mc. Farlan Strategic Grid as an internal IS / IT analysis tool has succeeded in mapping out what IS / IT is being used at SMK At-Thoat Toroh. Mc. Farlan Strategic Grid categorizes IS / IT into Strategic, Operational, High potential and Support. External IS / IT analysis is carried out by analyzing the latest IS / IT trends that can help improve business processes at SMK At-Thoat Toroh. The four analysis tools are combined and mapped in a SWOT analysis to determine strengths, weaknesses, opportunities and threats. The results of the SWOT analysis are formulated in designing the Critical Success Factor analysis as a determinant of future needs, which helps formulate strategies according to the Ward and Peppard method.

To determine the suitability of the resulting IS / IT strategic design, the researcher conducted a Focus Group Discussion (FGD) with school management.

Basically, all IS / IT strategic designs have the support of school management. However, there are three plans that require budget adjustments. Then there is an IS / IT design that requires special treatment.

References

- Agus Mulyanto, 2009, *Sistem Informasi Konsep dan Aplikasi*, Pustaka Pelajar, Yogyakarta
- Alter, S., 1992, *Information system: A Management Perspective*, The Benjamin/Cummings Publishing Company, Inc
- Anharudin, 2015, Perencanaan Strategis Sistem Informasi Untuk Meningkatkan Pelayanan Menggunakan Metode Ward and Peppard (Studi Kasus : PT Pos Indonesia Cilegon - Banten), *Jurnal Prosiko Vol. 2*, Universitas Serang Jaya, Serang
- Arifani, N.I. dan Darmawan, A., 2016, Perencanaan Strategis Sistem Informasi dan Teknologi Informasi SI/TI Pendidik dan Tenaga Kependidikan, *Jurnal Teknologi Informasi Magister 2 (1)*, 41-45, IIB Darmajaya Bandar Lampung, Lampung
- David, Fred R. 2010. *Manajemen Strategis; Konsep*. Jakarta: Gramedia
- Haris, W., 2002, *Penyusunan Metodologi Perencanaan Strategis Sistem Informasi Berbasis Value Bisnis (Be Vissta Planning) dalam rangka Meningkatkan Peran Strategis Sistem Informasi pada Suatu Organisasi*, Universitas Indonesia, Jakarta
- Irfan, N, A., Abdi, D., 2016, Perencanaan Strategis Sistem Informasi dan Teknologi Informasi SI/TI Pendidik dan Tenaga Kependidikan (Studi Kasus: Pada Disdikbudpora Metro), *Jurnal TIM Darmajaya*, IIB Darmajaya Bandar Lampung, Lampung
- Irmayani, W., 2016, Perancangan Strategis Sistem dan Teknologi Informasi pada Dinas Cipta Karya, Tata Ruang, dan Kebersihan Kabupaten Kubu Raya, Kalimantan Barat, *Jurnal Informatika dan Sistem Informasi 2(1)*, 16-25, Amik BSI Pontianak, Pontianak
- Iwan, S., 2018, Perancangan Strategis Sistem Informasi di SMK Diponegoro 1 Jakarta, *Elinvo November 2018; 3(2):10-18*, Fakultas Teknik Universitas Negeri Jakarta, Jakarta

- Jogiyanto, 2006, *Sistem Informasi Strategi untuk Keunggulan Kompetitif*, Andi, Yogyakarta
- Laudon, J., dan Laudon, K. C. 1998. *Essential of Management Information System*. New Jersey: Prentice Hall.
- Purnomo, Y. D., Febriliyan, S., 2017, *Perencanaan Strategis Sistem Informasi / Teknologi Informasi di Balai Riset dan Standardisasi Industri Surabaya, Jurnal Teknologi Proses dan Inovasi Industri, Vol. 2*, Institut Teknologi Sepuluh Nopember, Surabaya
- Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Bandung: Alfabeta.CV
- Suwirno, M., Noviadi, 2015 *Perencanaan Strategis Sistem Informasi / Teknologi Informasi Pada Perusahaan Penjualan Mobil Dengan Pendekatan John Ward And Joe Peppard Studi Kasus : PT Topcars Cabang Palembang, STMIK GI MDP, Palembang*
- Ward, John & Peppard, Joe., 2002, *Strategic Planning For Information System*. John Wiley & Sons, LTD, Cranfield, Berthfordshie, United Kingdom
- Wardoyo, Paulus, 2011, *Enam Alat Analisis Manajemen*, Semarang University Press, Semarang
- Yunita, U., Adi, N., Agustinus, F. W., 2017, *Perencanaan Strategis Sistem Informasi dan Teknologi Informasi Pada Dinas Perindustrian dan Tenaga Kerja Kota Salatiga, Jurnal Teknologi Informasi dan Ilmu Komputer*, Universitas Kristen Satya Wacana, Salatiga

