Analysis of the Information System with Ward & Peppard Method for the Strategic Business Plan of the College

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Abstract: Every university has a vision of the mission to be achieved, one of the achievements of the vision is to produce graduates in accordance with the vision and slogan of the college itself. The vision's benchmark performance reflects the development strategy of information systems and information technology that applies to the college itself. The development of information technology is based on the vision STMIK Cipta Darma Surakarta. The basic idea that requires an analysis of information systems that can later be used for the development of information systems STMIK Cipta Darma Surakarta. The methods used to analyze strategic information systems in this study are Ward & Peppard methods, SWOT analysis, value chain analysis, PEST analysis and five-force model analysis. The results of the review will show strategic business planning, information system and information technology strategy. Management strategy as one of the components that support the achievement of the STMIK Cipta Darma Surakarta..

1 INTRODUCTION

The role of information technology in education today plays a very important role. The rapid development of this technology requires that the world of education always adapts to the evolution of information technology to improve the quality and the realization of the vision of every educational world in college. Today, information technology has changed the paradigm of society through the use of information technology to easily perform all activities anytime, anywhere, This is with the support of both hardware and software tools and the proliferation of providers or providers of Internet services are becoming increasingly prevalent with low costs.

The information system is now a part that cannot be separated from the life of modern people. In the current age of globalization, information systems play an important role in various aspects of life. Information systems have very positive effects on many things, including: Assistance in decision-making, increasing efficiency and productivity, supporting work and learning activities, and even improving people's quality of life. The role of information systems will increase with the development of the era and become the fundamental element in life.

The role of information and communication technology in the educational world is also huge, especially in terms of supporting the teaching and learning process and the efficiency of academic and administrative jobs (Rahmawati, 2013). Universities as one of the educational institutions should be able to use information systems to support various activities. The introduction of information systems at universities will have a very positive impact and is expected to result in high efficiency and productivity in academic and administrative areas. In addition, with the implementation and adaptation of information systems, it is also expected that the university will be able to continue to compete in the arena of competition in the educational (Jogiyanto, 2006).

Information and communication technology (ICT) has grown in line with the evolution of human civilization, which works in all areas. STMIK Cipta Darma Surakarta is one of the private universities in the city of Surakarta. College Computer in JL Veterans Notosuman Singopuran Kartasura has played an active role in the use of information systems and information technology for lectures and learning activities and management of campus operations. The STMIK Cipta Darma Surakarta in

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the development of information technology has not achieved its goals optimally, system strategy of IS / IT, personnel and budget problem. This is reflected in the non-integrated information system in each academic service.

2 STRATEGIC PLANNING IS/IT VERSION WARD & PEPPARD 2002

In this study, there are several phases of input, analysis of the internal business environment, analysis of the external business environment, analysis of the internal IS / IT environment, analysis of the external IS / IT environment. For the phases IT Business Strategy, IT Strategy and Management Strategy IS / IT uses different techniques / analysis methods such as value chain analysis, SWOT analysis, PEST analysis model, five-forces model analysis and McFarlan Strategic Grid Analysis.

To conduct this study in need of data collection through technology (observation, interview and questionnaire), analysis of the business environment, environment of IS / IT and IT / planning, and end result, the information system is planned (Septiana, 2017; Setiawan and Ilman, 2012; Wedhasmara, 2009; Riyanto, 2007).

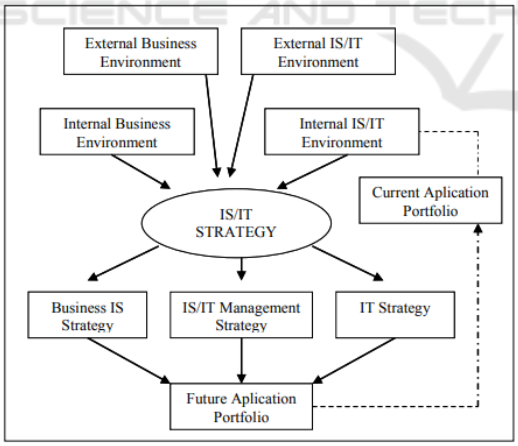

Figure 1: Strategic Planning SI/TI Version Ward&Peppard 2002 (Septiana, 2017)

3 ANALYSIS

In order to formulate the strategy of the information system, one has to use an analysis method whose subsequent result of the analysis will be used as a basic reference of the determination of the strategy of the information system strategy at STMIK Cipta Darma Surakarta after some step analysis.

3.1 Internal Business Environment Analysis: Using SWOT

The feasibility analysis uses a SWOT analysis. There are four aspects to consider: strength, weakness, opportunities and risks (Johnson and Scholes, 1984).

3.1.1 Strength

In carrying out the feasibility study, the strength element used by STMIK Cipta Darma Surakarta in the development of the information and technology system is described as follows:

a. Support from the leadership, which is with the policy and willingness to develop the information system, while the leadership policy in the form of commitment leader STMIK Cipta Darma Surakarta, support, develop information and communication technology as a means of supporting campus activities.
b. Availability of Information Technology Infrastructure in the Form of Internet Network with Fiber Optic Fiber Main Backbone.
c. The availability of human resources included in the UPT work item, supported by the subunit portion of the information system, the Administration, Technical Support, and Network Scope sections.
d. The geographic location of the STMIK Cipta Darma Surakarta campus is strategically supported by the availability of multiple ISPs that deploy fiber backbones.
e. The level of user request of student services, faculty and information technology service employees is quite high.

3.1.2 Weakness

Some weaknesses in the process of developing information systems are as follows:

a. The lack of a standard reference in the development and application of information technology in the future, which is sustainable.
b. The organizational structure of information and communication technology is still not synergistic, which in its subunit is often turned into other subunits.

c. The lack of clear recruitment / recruitment for the continuous support of information technology.
d. The possibilities for the development of information and communication technology are still very limited.
e. The lack of HR skills development / rarely is included in education in information technology.
f. Not yet comparable number of institutions that support information technology to both faculty, staff and students.

3.1.3 Opportunity

a. The extent of development in the field of technology and communication, especially in education and government.
b. The growing demand for information technology in various fields, both because of the trend and the need for rapid data access and the era of disclosure of information.
c. The lack of educational institutions, which include the certification of information technology at international and national level.
d. The existence of open source, which can be used and developed cost-effectively

3.1.4 Threat

a. The increasingly intense university competition in Surakarta in the development of information technology.
b. The rapid development of technology has a rapid impact on the depth of a technology.

3.1.5 Strategic Formula STMIK Cipta Darma Surakarta:

a. Developing strengths and optimizing opportunities (S-O):
Increasing budget allocations for ICT development in supporting academic activities, working with senior high school to provide STMIK Cipta Darma Surakarta with new undergraduates, creating qualified graduates through computer literacy, and improving university quality to obtain / enhance accreditation of the study program.
b. Development of Power to Overcome Threats (S-T):
Recruitment prospective scholar with rigorous selection, so that the needs of trained personnel in the market can be met with competence in various skills, improve the quality of facilities and infrastructure, to create qualified graduates who can reduce the competition for new admissions, and regular evaluation of the Syllabus tailored to the needs of the market.
c. Minimize vulnerabilities to take advantage of opportunities (W-O):
Increase the competence of human resources through training, recruitment lecturer with expertise in the IT field, improving the competence of teachers with training at home and abroad through the state scholarship program and cooperation with related institutions to improve the performance, facilities and infrastructure.
d. Minimize weaknesses to avoid threats (W-T):
Collaborate with other institutions or universities to share knowledge on the development of ICT applications, establish collaborations with government agencies and other institutions in conducting personnel research, and collaborate with related institutions on scholarship programs for faculty and scholar.

3.2 Internal Enterprise Environmental Analysis: Using the Value Chain

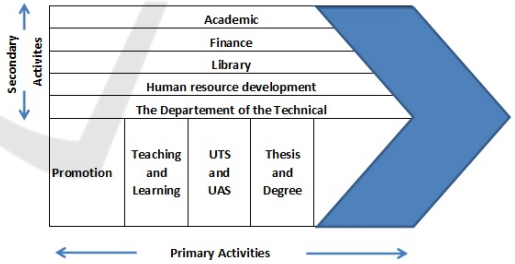

Figure 2. Framework value chain

3.2.1 Secondary Activities

Academic activities in universities meant here are academic and student administration activities. All academic and student activities must be managed in a good administration.

a. Finance

Financial activities cover all activities of the finance department in ensuring the smooth operation of higher education because all operational activities generate substantial funding needs. The finance

department realizes the budget based on the priority scale.

b. Library

Library activities are activities in order to ensure the provision and provision of information services to support education. The library section must guarantee the availability of libraries that support the teaching and learning process. The library is provided in the form of physical and library libraries that can be accessed online.

c. d. Human Resource Development

Human resource development activities are human resource management activities. This activity includes the procurement and development of lecturers and education personnel. The Human Resources Development Section must be able to primarily guarantee the ratio of the number of lecturers and students in accordance with government regulations. The number of education personnel must be sufficient for the smooth operation of higher education. Development of lecturer and education staff competencies to improve the quality of education services provided by students. Finally, it is hoped that graduates will be increasingly qualified in the future.

d. The Department of The Technical

The activities of the technical department are the activities of managing the infrastructure and facilities of universities. The activities of the technical department include, among other things, managing inventory items, supplying electricity and internet as well as college communication equipment. The department is also responsible for preparing classes and laboratories used for teaching and learning. This is important in order to ensure the comfort of students in studying.

3.2.2 Primary Activities

STMIK Cipta Darma Surakarta has an annual agenda that includes promotion and acceptance of new students, teaching and learning processes, UTS and UAS, theses and degrees. The explanation is as follows:

a. Promotion

Promotional activities become the main activity every year. The goal is to get prospective new students. Promotional activities carried out included socialization to schools and cooperating, promotion of using billboards in strategic streets, and brochure printing.

b. Admission of new students

The new student admission activity is an objective selection of prospective students who will study in college. A number of assessment instruments are made in order to ensure objectivity of valuation. Students are input that will later be processed in the college to be output or graduates. The hope is that with good input, it will produce good output as well.

c. Teaching and learning process

The activity of the teaching and learning process is the activity of processing students into graduates who have the competencies needed by the world of work. The curriculum must always be updated to suit the needs of the workforce.

d. UTS and UAS

UTS means the Mid-Semester Examination and UAS means the Final Semester Examination. The two activities were carried out in order to test the competence of students after taking courses in the curriculum of each study program. The form of UAS and UTS can be in the form of written and unwritten exams according to the subject competency requirements.

e. Thesis and degree

The thesis activity is an activity to do the final project while studying in college. After students pass the thesis examination, each graduate will get a degree according to the level of education. Currently STMIK Cipta Darma Surakarta provides three diploma and undergraduate education programs.

3.3 External Business Environment Analysis: Using PEST

a. **Politic**

The Indonesian government policy in the form of the Law on the National Education System and the Minister of Research and Technology Regulations has a direct impact, one of which is the formation of the curriculum. STMIK Cipta Darma Surakarta must adjust to these regulations and harmonize with its vision and mission. The education budget which reaches 30% of the total state budget and expenditure shows that education has a strategic position in improving the nation's progress.

b. Economies

Indonesia's economy has always grown from year to year. This shows an increase in demand for goods and services both nationally and locally. Universities as education service providers must be able to take advantage of these opportunities, including STMIK Cipta Darma Surakarta. Public interest in continuing his education at the University is getting bigger. The existence of scholarships from the government and national companies will also increase interest in continuing education in universities.

c. Social Cultural

STMIK Cipta Darma Surakarta has become a "brand" in the community and has become one of the universities that have basic expertise in multimedia. People prefer products or services that are recognized for their reliability. STMIK Cipta Darma Surakarta must improve its multi-media "brand" among the community so that it is always the choice of the people. In this case STMIK Cipta Darma Surakarta has formed a brand to become "STMIK CDS".

d. Technology

Technological developments, especially information and communication technology (ICT) have been so rapid. Today's technology is the backbone of the university. Universities can be considered as the main institutions, so that good design must be in place to ensure that ICT facilities can be used to their full potential. The government in this case always encourages increased use of ICT facilities in universities.

3.4 External Business Environment Analysis: Use *Five Force Model*

a. **Thread new Competitor**

The growth of similar universities on a local scale may not always occur every year, but on a national scale it is possible. STMIK Cipta Darma Surakarta must always be careful and pay attention to the growth of similar new universities.

b. **Thread Product or Subtitution Service**

Currently there are around 68 products that are the same as the products produced by STMIK Cipta Darma Surakarta at a regional scale. Therefore, the STMIK Cipta Darma Surakarta product in terms of its study program must be completely different from its competitors so that it can be the choice of the community. This is a challenge for study program managers in the STMIK Cipta Darma Surakarta environment. In line with the development of ICT the use of e-learning and various ICT facilities can also support STMIK Cipta Darma Surakarta products.

c. **Strength Customers**

STMIK Cipta Darma Surakarta acknowledges that to get student satisfaction requires a very expensive investment for the sake of its future sustainability. Good service and a pleasant learning process are expected to be a living and continuous advertisement. Besides that the timeliness of graduation and the waiting period of graduates in getting a short job is a benchmark for student satisfaction.

d. **Strength Supplier**

In the Surakarta Residency, there are about 200 high school or vocational school prospects to continue their studies, this is reflected in the participation of graduates who enroll in state university entrance exams reaching more than 25,000 participants. This opportunity must be utilized as much as possible by STMIK Cipta Darma Surakarta. This amount from year to year is relatively always experiencing an increase although not too much.

e. **College of one kind Competition**

Currently, STMIK Cipta Darma Surakarta has approximately 40 competitors who provide similar education at the regional scale and 10 competitors at the local scale of Surakarta. The value of higher education accreditation must be increased continuously in order to win the competition with similar universities at the local and regional levels.

Future competitors of STMIK Cipta Darma Surakarta can be mapped with the Analysis of the Five Model Strengths of STMIK Cipta Darma Surakarta can be seen in the following figure:

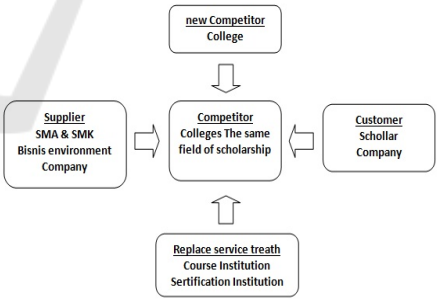

Figure 3: Five Force Model Analysis

3.5 Current State IS / IT STMIK Cipta Darma Surakarta with McFarlan Grid

Based on the results of the internal IS / IT analysis, applications existing today in STMIK Cipta Darma Surakarta using McFarlan Matrix can then be mapped as follows:

Table 1: Mcfarland Grid

Strategic :	***High Potential :***
SI Database PT (PDPT) SI *Support System*	Lecturer Website Lecturer Email dan employe College student Email
STMIK Cipta Darma Surakarta Website SIMPEG SIAKAD SIMKEU SIMASET SIMPUS	Internet Office Aplication
Operational:	***Support:***

The strategic column contains information systems that are highly susceptible to the sustainability of institutional business processes. Key operational, ie systems that are currently running.

3.5.1 Internal Environmental Analysis IS/IT STMIK Cipta Darma Surakarta

a. **Hardware Technology and Specifications** used to support learning, management, and decision-support in STMIK Cipta Darma Surakarta are as follows: The existing network infrastructure consists of server, router, client, switch, and access point. Media transmission for data communication wired and radio. Networks (LAN) that exist on each floor are connected online through the ISP's Internet network.

b. **Software** , Software is an element that is important because almost every line of college services use device software ditetu especially college with the field of information technology. As technology advances rapidly, it will affect the changing needs of the software.

c. **Operating System Technology** In order to support the system of teaching and learning of legal operating system software, STMIK strives to collaborate with certain operating system vendors, and for some software needs that are supported by open source software, such as LINUX.

d. **Infrastructure technology** to integrate data services STMIK Cipta Darma Surakarta, which is divided into four floors with the architecture Local Area Network (LAN). For client connections that use wireless (wireless) LAN technology with Dynamic Host Configuration Protocol (DHCP). In view of the greater distance, integrated information system solutions use a technology architecture often called Wide Area Network (WAN). Some things to consider when choosing infrastructure solutions include: bandwidth, technology, IP-based support, easy configuration and maintenance, low cost, and security. The network architecture for four floors, executed as shown below.

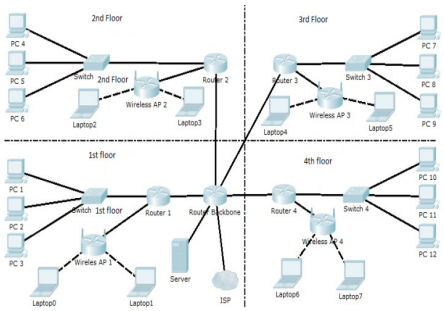

Figure 4 Network Architecture

Based on the analyzes carried out with some of the above analyzes, some strategies in the field of information systems can be introduced. These strategies include business strategy, information technology strategy, and information systems management strategy. Here are the details of the strategies that result from data collection and analysis.

3.6 Business Strategy

Business system strategy is a strategy of using information system to achieve STMIK Cipta Darma Surakarta vision. This business strategy should support the use of information systems in the environment STMIK Cipta Darma Surakarta. Strategies based on the conditions in STMIK Cipta Darma Surakarta and the analyzes performed. Strategies for realizing an effective and efficient information system, which refers to some of the analyzes performed, are shown in the following table.

Table 2: Business Strategy

NO	Business Strategy
1	Maximize the use of existing information systems for administration and teaching.
2	The use of information systems in accordance with the task of each section.
3	Provision of information systems that can support the work and business processes STMIK Cipta Darma Surakarta.
4	Providing a user-friendly information system..

3.7 Information Technology Strategy

Information technology strategy is a strategy in the management of the IT infrastructure to support the information system. Good infrastructure

management is expected to support maximum existing information systems.

Strategies for implementing an effective and efficient information system that points to an analysis performed are shown in the following table.

Tabel 3: Information Technology strategy

NO	INFORMATION TECHNOLOGY STRATEGY
1	Procurement of hardware or other devices that support the STMIK Cipta Darma Surakarta business process.
2	Perform routine checks on existing equipment or information systems.
3	Make improvements if faults in the device or information system occur.
4	The presence of maintenance documents.
5	Discontinuation of the use of Internet or hosting in the area STMIK Cipta Darma Surakarta.

3.8 Management Strategy IS/IT

Management Strategy IS / IT is a strategy to support IS / IT applied in the environment STMIK Cipta Darma Surakarta. This strategy is applied when information systems / information technology already exists or is in use.

Strategies that can be implemented to realize the management of IS / IT are effective and efficient, referring to some of the analyzes performed, which are presented below.

Table 4: Management Strategy IS/IT

NO	MANAGEMENT STRATEGY IS/IT
1	Disseminating information systems that are new or existing.
2	Conducting training for information systems in related fields.
3	Create instructions for using the information system.
4	Generate reports on the use and development of information systems.
5	Perform the task distribution or users of information systems precisely and clearly.
6	Always update the evolution of information technology.
7	Create an information system development team
8	Cooperation with IT companies

4 CONCLUSION

Based on the discussion that has been described, a study results from several aspects with the following conclusions:

This analysis uses SWOT analysis techniques, PEST, Five Force Model. The analysis of the external side of the company is used to see the state of the universities in the face of the college competition. The approach using the SWOT analysis technique led to a pro-factor analysis of S-W-O-T and then some of these factors to a SWOT college matrix analysis with 4 strategies, ie SO-ST-WO-WT strategy. Approach using PEST analysis, looking at results in terms of political conditions, economic conditions, social conditions and technological developments. The five-force model analysis examines universities with multiple component factors, namely, newcomer components, suppliers, customers, replacement services, and competitors

Analysis of the internal college business using the approach with Value Chain Analysis to map the entire process of work occurring within the organization into two categories of activities, the primary activity and secondary activities. Analysis describing the activities of the college business with value-chain technique, which includes primary activities and supporting activities of the universities STMIK Cipta Darma Surakarta

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