The design of information technology strategic plans in educational institutions

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ABSTRACT

Organizational sustainability without a strategic plan) will not be directed and guaranteed because there is no management guidance and system management to increase competition with other business actors. STMIK Bina Patria is a private university that does not have an IT strategic plan. Researchers develop IT Strategy for STMIK Bina Patria based on TOGAF Framework with Value Chain data analysis, Cririca Success Factor, and SWOT. The results of the analysis show that of the 4 existing applications, 3 of them do not require improvement that is SI-KEU, E-LEARNING AND E-JOURNAL. While the SI-AKAD application requires the addition of features. 5 application proposals to be built are SI-PMB, SI-ALUMNI, SI-MUTU, SI-PERPUST and SI-DASHBOARD. All application proposals are mapped to the application development roadmap in the next 5 years.

1. Introduction

IT Strategic Plan is an analysis used to formulate organizational goals and objectives and determine strategies that utilize the advantages of information systems with information technology support in supporting business strategies to provide long-term advantages in competing with other organizations. The plan is contained and documented in a book-shaped IT strategic plan that is validated by organizational officials. The preparation of the IT strategic plan aims to provide guidance to managers to meet short-term plans, maintain medium-term assets and determine changes to develop systems in accordance with long-term plans.

The benefits of implementing IT strategic planning include helping organizations to think strategically, clarifying conditions in the future, solving key organizational problems, improving and building employee performance, training wisdom to direct organizational members [1][2].

Organizational sustainability is not guaranteed and directed without the strategic plan. Organizations are accustomed to monotonous conditions without any change in management. There is no conflict of motivation to trigger competition in the organization.

Various types of development methods can be applied to the design of IT strategic plans such as Zachman, The Open Group Architecture Framework (TOGAF) Architection Development Method (ADM), The Federal Architecture Framework (FEAF), Department of Defense Architecture Framework (DoDAF)

TOGAF ADM is designed for individual organization adjustments where users can partially choose the part of the process that is needed or the application as a whole. TOGAF ADM is a guide to designing architecture can be integrated with the Zachman framework without having to force a method[3] [4]. The information system produces an overall process of improving the performance of academic information system services, with an integrated information system, the information needed can be obtained quickly, precisely and accurately [5][6].

STMIK Bina Patria is a Private Higher Education Institution (PTS) with accreditation from BAN PT for Informatics Management and Informatics Engineering study programs still C. Besides, it was found that there was a decrease in the number of new students since 2014-2017 Academic Year (TA). Facilities and infrastructure are still modest adding to the factor of decreasing levels of student satisfaction, as a result every new TA has absent students which further worsens the condition of education in STMIK Bina Patria.

Each bureau has the authority to carry out procedures that must be met repeatedly by students. New student registration, tuition payment, thesis registration, graduation registration, filling in the KRS are entirely the responsibility of the financial bureau, even though the academic bureau and PMB team should be involved in it. Submission of material to inputting values that are often late due to SAP GBPP Lecturers who have not been recorded properly by the Quality Assurance Unit (UPM). This affects service to students. The filling of KRS until the delay in inputting the value reflects that the utilization of IT has not been maximized. Such conditions which continue to cause student interest to continue their studies. If students feel comfortable with the campus environment, then it does not rule out the possibility to promote STMIK Bina Patria to prospective new students, because the highest rank of new students is from STMIK Bina Patria students themselves. Therefore, it is necessary to have an appropriate IT strategic plan to improve business processes that are then able to determine the policies needed to improve the quality of academic and non-academic services so that STMIK Bina Patria is growing. In addition, the Standard 6 Accreditation Form must include the IT program strategic plan

In STMIK Bina Patria the IT organizational structure has not been formed so that the use of IT does not function optimally. The application supporting the STMIK Bina Patria business process currently includes SIAkad, SIkeu, e-Learning, e-Journal. As a means of inputting KRS, print value transcripts, print KHS. SIkeu as a means to receive SPP payments every semester. The e-Learning applied is moodle. While the e-Journal published twice a year is Transformation. The four applications are centralized by 1

Therefore, STMIK Bina Patria requires an IT strategic plan that refers to the TOGAF framework because TOGAF is a common method that when applied in an organization can be tailored to specific needs. The IT Strategic Plan that will be prepared includes short-term plans, preparation of the IT organizational structure and improvement of existing applications, the medium term that includes the development of IT infrastructure and application design that is not yet available, as well as a long-term IT strategic plan that includes improvements to applications that are not yet available to maximize IT utilization to support services for students both academic and non-academic.

2. Related Research

The use of information technology is not just a complement to business processes, but has become a determining resource for the implementation of the organization's business strategy. Every business process must be planned precisely because the use of information technology requires planning, reviewing readiness from various aspects for the preparation of an integrated strategy [7][8][9].

The design of the IT strategic plan according is needed to prepare the organization in planning the use of technology and long-term information systems as well as to adjust the movement of the organization with the information system so that it is in tune with the development of the organization to meet information needs in the future [10][11].

IT strategic plan between increasing pressure on the use of technological assets and the nature of dynamic information systems. In addition, the preparation of the strategic plan is very useful for the organization to achieve organizational goals and determine the changes that must be made to achieve these goals .

3. Method

3.1. Data Collection Method

The data collection method applied consists of three parts, namely:

- Observation

  Observations are made by direct observation of business processes that run in STMIK Bina Patria.

- Interview

  Retrieval of data from face-to-face interviews with staff staff managers to obtain data on system development needs.

3.2. Data Analysis Methods

Data analysis using Value Chain, CSF and SWOT (Strange and Opportunities) methods to analyze the internal business environment, while to analyze the external environment using SWOT (Weakness and Threat) and Critical Success Factor methods.

3.3. Research Flow

The research flow will be shown in Figure 2 below:

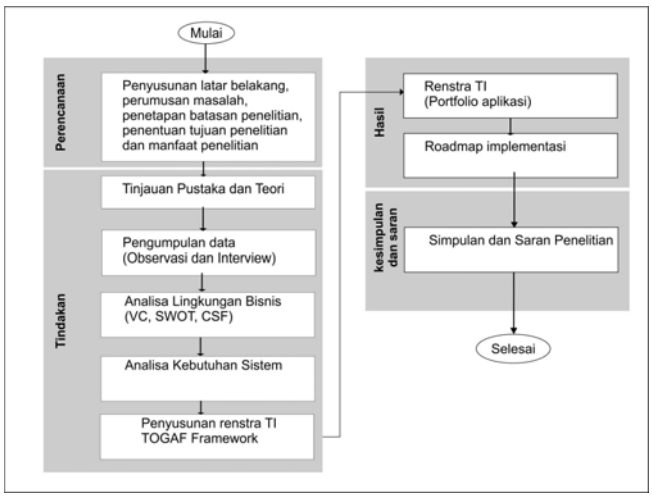

Fig. 1. Research Flow Process

- Planning

  The planning of this research begins with compiling a background that describes the current STMIK Bina Patria conditions and the solutions offered by researchers. Followed by the formulation of the problem based on the background of the problem, then set the boundaries of the study so that this research is directed. The next step is to elaborate on the purpose of this study which is continued by exploring the benefits gained from this study.

- Action

  The action phase begins by looking for a literature review of previous research to find out the position and authenticity of this research, then continued by describing the theories used in this study. The research data was obtained from observational observation process to STMIK Bina Patria directly and interviews with employees. The next step is to analyze the business

environment using the Value Chain, SWOT and CSF methods. The results of the business environment analysis are the basis for analyzing system requirements and designing the IT strategic plan using the TOGAF Framework.

- Result

  Strategic planning results are contained in application prototypes and mapped into short, medium and long term roadmaps over the next 10 years.

3.4. TOGAF ADM

TOGAF is designed for individual organization adjustments which users can partially choose the part of the process that is needed or the application as a whole. TOGAF ADM is a guide to designing architecture that can be integrated with the Zachman framework without having to force methods[12]. The information system produces an overall process of improving the performance of academic information system services, with an integrated information system, the information needed can be obtained quickly, precisely and accurately [13]. TOGAF ADM is a fairly complete methodology for planning a college information system [14].

The phases in the TOGAF Framework will be illustrated in Figure 1 below:

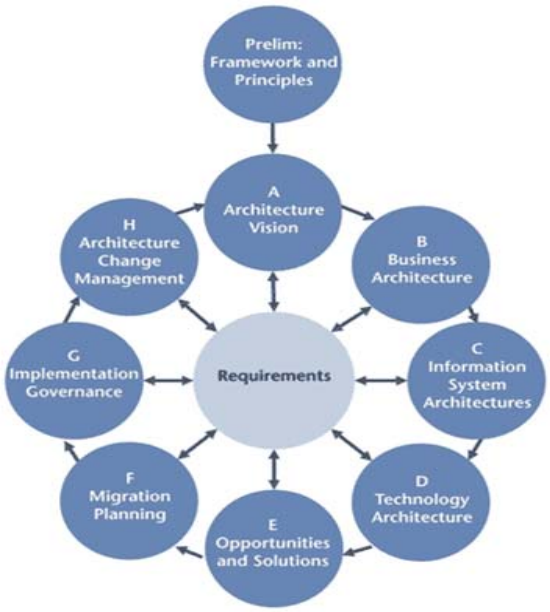

Fig. 2. TOGAF Method

- Fase Preliminary

  Framework and Principles is a preparatory phase that aims to confirm the commitment of stakeholders, the determination of the detailed framework and methodology that will be used.

- Fase A

  Architecture Vision aims to define the scope, business objectives, business objectives, organizational profile, organizational structure, identification of stakeholders, organizational vision and mission, and obtain goals, and map all the strategies that will be carried out.

- Fase B

  Business Architecture aims to describe the current business architecture, objectives, and determine gaps between business architecture and choose the right techniques and tools.

- Fase C

The information system architecture emphasizes how information systems architecture is built which includes data architecture and application architecture that will be used by the organization.

- Fase D

  Technology architecture, in this phase is defined the technology needs to process data. The first step taken is to determine the technology candidates that will be used to produce technology choices for the existing technology platforms in the application including software and hardware

4. Results and Discussion

STMIK Bina Patria does not have an IT Organization. So far the IS / IT needs and maintenance have been carried out by Laboran. Laboratory staff consists of 2 staff. Applications that are running at this time are:

- siKeu

  siKeu is a web-based application that is used to support the administrative process of paying tuition fees at STMIK Bina Patria.

- siAkad

  The event is a service that enables students to obtain information related to academic activities such as Semester Achievement Index, Academic Achievement Index, Lecture Schedule and Exams, Lecture Presence, and Tuition Fee Payment Information.

- eLearning

  eLearning used by STMIK Bina Patria is moodle. Moodle is an abbreviation of Modular Object-Oriented Ted Dynamic Learning Environment) which is a software package produced for internet-based learning activities and websites that use the social con- ctrationist pedagogy principle.

- eJournal

  eJournal STMIK Bina Patria is entitled Trans-formation which has been published twice a year. Until now there have been 7 volumes of the Transitional Journal that have been published.

4.1. Fase Preliminary

The template is designed so that author affiliations are not repeated each time for multiple authors of the same affiliation. Please keep your affiliations as succinct as possible (for example, do not differentiate among departments of the same organization). This template was designed for two affiliations.

4.2. Fase Architecture Vision

The scope of research analyzed is the design of information technology infrastructure including business analysis of data architecture, application architecture and business architecture. The vision of STMIK BIna Patria is "To be a vehicle for change and the development of Science and Technology in order to create a reliable and honest professional and scholar". While the mission of STMIK Bina Patria is:

- Organizing the best education in the field of information technology and computer science for students so that they aspire to be professional human resources in various fields of work
- Organizing research and development of science and technology, to improve the integrity of graduates' personalities
- Organizing services and cooperating with communities, institutions and institutions in the Tri Dharma Perguruan Tinggi, utilizing science and technology to improve the welfare of life and take advantage of challenges as opportunities.
-

4.3. Fase Architecture Bisnis

This phase aims to understand the internal and external business conditions of STMIK BIna Patria in order to determine the position of business competition so that a system improvement can be proposed. Steps taken to analyze internal and external conditions that refer to the Value Chain.

Value Chain primary activities in STMIK Bina Patria include new student admission (PMB), teaching and learning process (PBM), Semester Middle Examination (UTS), Semseter Final Examination (UAS), Field Work Lecture (KKL), Job Training (KP), Final Project (TA) and thesis, and Graduation. While the support activities at STMIK Bina Patria include Library, Student Affairs, Finance, Staffing, Senate. If mapped into the Value Chain scheme, it will look like Figure 3 below,

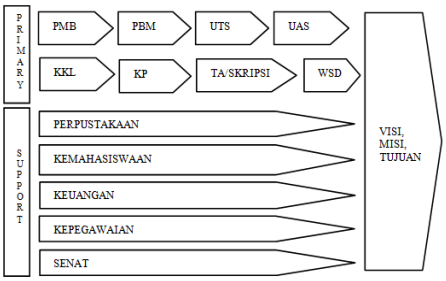

Fig. 3. Value Chain

While as an alternative business, SWOT analysis is needed which will be shown in Table 1.

Table 1. SWOT Analysis

Strength	Has 3 study programs namely Informatics Engineering (S1), Information System (S1), Information Management (D3) Accredited BAN PT for Information Systems study program B The process of building Campus II There are 2 classes, namely regular and employee classes (parallel)
Weakness	Lack of funding from the Foundation to support campus operations There is no IT organizational structure The information system used has not been integrated Lack of human resources to manage management Limited facilities and infrastructure 6. Accreditation of Informatics Engineering study program is still C Accreditation of Information Management Study Program is still C
Opportunity	There is 1 PTN namely Tidar University and (PTS), STMIK Bina Patria one of the PTS with a computer background. The number of human resources who control computers is still limited
Threat	Not yet accredited by Higher Education (APT) 2. A large investment is needed because the development of ICT is very rapid.

Fase Architecture Informasi in this phase, it discusses how information needs are needed and outlines some outputs. The results of information architecture are illustrated in table 2.

Table 2. Analisa Critical Succes Factor

No	Target	CSF
1	Increase acceptance of new students	Provided good facilities and services
		Acceptance of prospective new students with superior competencies
		Acceptance of the number of new students according to STMIK Bina Patria's capacity
2	Conditioning of Teaching and Learning	A conducive academic atmosphere
		Course material according to the latest curriculum
		Creative teaching methods
		Facilities and supporting facilities for PBM
3	Student Affairs	UKM activities both academic and non-academic
4	Research	Increase the number of lecturer research
		Involve students in lecturer research
5	Community service	Increase the number of community service lecturers
		Involving students in the service of the lecturer community
6	Quality assurance	Realizing quality assurance institutions
		Competent human resources in the field of quality assurance
7	Management	Improving leadership management
		Improving the quality of human resources

At this stage, the technology design will be applied to STMIK Bina Patria. The design is illustrated in Figure 4.

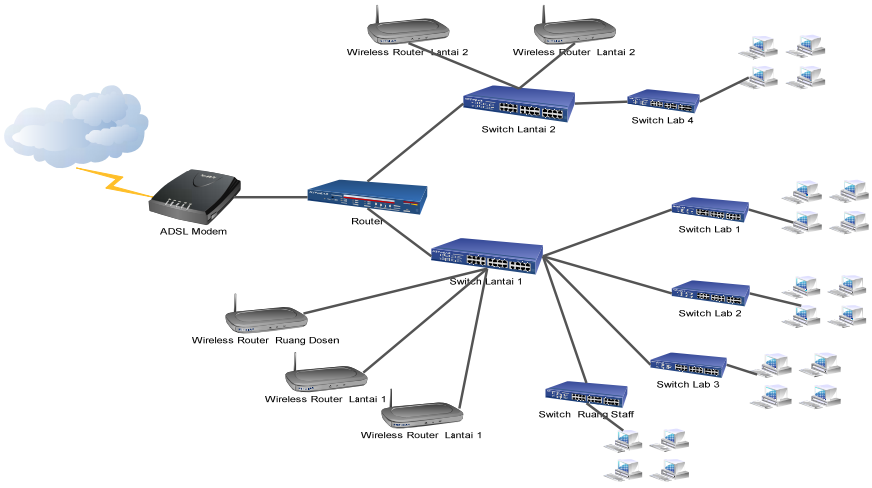

Fig. 4. Network Architecture

Based on the data analysis above the researchers concluded various information needs in table 3.

Table 3. List of information needs

No	Target	Information needs
1	Increase acceptance of new students	Data on prospective new students Current student data up to the past few years Information on the number of high school graduates equivalent Clear registration procedures Criticism and suggestions from alumni
2	Conditioning of Teaching and Learning	Information on curriculum updates as a basis for determining lecture material Current issues regarding technological development The latest books for libraries
3	Student Affairs	Procedure for submitting proposals for UKM
4	Research and Community service	Availability of research funding and community service Current information about the needs of the community Quality literature
5	Quality assurance	Lecturer track record Job description of lecturer Guidelines for standardizing the quality of high school education
6	Management	1. Ease of access to student dashboards as a means of academic services Suggestions and criticisms from all parties A place to deliver academic and non-academic problems Information on the presence of lecturers and staff Documentation of the minutes of the coordination meeting

IT Organizational Structure It takes a special unit that handles IT needs at STMIK Bina Patria. The organizational structure is illustrated in Figure 5.

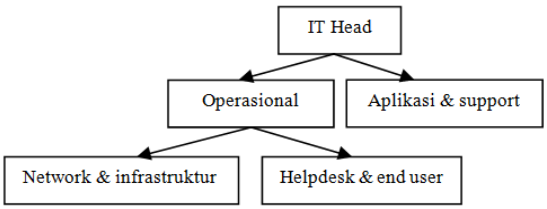

Fig. 5. Organizational structure

IT Head is tasked with analyzing and reviewing the developments and trends of information technology and their influence on STMIK BiPa, to become the basis for the establishment and preparation of corporate IT development recommendations, compiling the IT budget, and controlling the use and realization of the budget to ensure its effectiveness and efficiency. Operational duty is to coordinate the planning and implementation of information technology at STMIK Bina Patria and ensure that IT operations run well.Aplikasi & support. Application &

support is in charge of coordinating the planning and implementation of business application development projects in STMIK Bina Patria. Tasked with managing and maintaining the utilization of hardware and software owned by STMIK Bina Patria. Report on the condition of IT infrastructure in STMIK Bina Patria which will be used as a consideration for the replacement of devicesHelpdesk & end user. Proposed Application

No	Information Needs	Proposed Application
1	Data on prospective new students Current student data up to the past few years Information on the number of high school graduates equivalent Clear registration procedures Criticism and suggestions from alumni	Automation of web-based new student registration (SI-PMB) Information about alumni and job openings (SI-ALUMNI)
2	Information on curriculum updates as a basis for determining lecture material Current issues regarding technological development The latest books for libraries	Adding lecture material updates to SI-AKAD especially for student users Ease of access to availability of books in the Library (SI-PERPUST)
3	Procedure for submitting proposals for UKM	
4	Availability of research funding and community service Current information about needs comunity Quality literature	Ease of access to literature information in the library (SI-PERPUST) Providing news page features and contact us on the STMIK Bina Patria website (SI-BIPA)
5	Lecturer track record Job description of lecturer Guidelines for standardizing the quality of high school education	Accommodate lecturer information and education quality standards (SI-MUTU)
6	Ease of access to student dashboards as a means of academic services Suggestions and criticisms from all parties A place to deliver academic and non-academic problems Information on the presence of lecturers and staff Documentation of the minutes of the coordination meeting	SI-KEU E-Learning E-Journal Student Dashboard which includes lecturer information and academic services (SI-DASHBOARD)

Based on the results of the application proposal in table.4 the following will be presented the SI development roadmap which will be illustrated in table 5

Table 4. Roadmap for SI/TI development

No	Application	2018	2019	2020	2021	2022
1	SI-PMB	25%	50%	75%	100%	
2	SI-ALUMNI	30%	50%	80%	100%	
3	SI-AKAD	80%	100%			
4	SI-PERPUST	25%	75%	100%		
5	SI-BIPA	75%	100%			
6	SI-MUTU		25%	50%	75%	100%
7	SI-DASHBOARD			25%	75%	100%

5. Conclusion

Based on the discussion above, it can be concluded that STMIK Bina Patria needs to recruit human resources who will be placed in the IT section according to the organizational structure that has been prepared. 3 applications (SI-KEU, E_LEARNING, E-JOURNAL) that have been running do not require improvement, while SI_AKAD needs additional lecture material updates for student users. As well as the construction of 5 new applications namely SI-PMB, SI-ALUMNI, SI-PERPUST, SI-MUTU and SI-DASHBOARD. All applications have been mapped into the IS / IT development roadmap for the next 5 years. Based on the strategic plan, it is expected to have a positive impact on the sustainability of the organization in the future.

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