Strategic Planning to Develop Education Information System in Almuslim University

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ABSTRACT

The development of information and communication technology is increasingly in the industrial revolution 4.0 era. Universities are competing to utilize information and communication technology in supporting the performance of higher education administration to obtain added value in the form of competitive advantage. As one of the private universities that organize academic, vocational and professional education, Almuslim University has attempted to use information systems in the provision of education. However, the use of educational information systems at Almuslim University has not been optimal. Therefore, it is necessary to strategically plan the educational information system of Almuslim University. Almuslim University education information system planning can be designed using the work of John Ward and John Peppard which combines value chain analysis and McFarland Strategic Grid analysis. The results of the value chain analysis divide Almuslim University's educational operational activities into two categories, namely main and supporting activities. The main activities of strategic planning of information systems at Almuslim University include PMB activities, academic activities, graduations, socialization and cooperation, and alumni. Meanwhile, supporting activities include financial administration, personnel administration, development of information and communication technology facilities and infrastructure, and procurement. The information systems that have been identified in the value chain analysis are mapped in the McFarland Strategic Grid quadrant which consists of strategic, high potential, key operations, and support.

Keywords: Strategic planning of system information, value chain analysis, McFarland Strategic Grid Analysis

1. Introduction

The development of science, information, and communication technology in the era of the Industrial Revolution 4.0 affects a number of aspects of human life, including education aspect which causes higher education institutions to compete in using information and communication technology to support higher education performance. Massive application in higher education causes a change in the role of information and communication technology from the role of efficiency, effectiveness to a strategic role.

The strategic planning of the accurate information system supports the planning and development of education that provide added value in the form of competitive advantage in the competition of world higher education. This is in accordance with the opinion expressed by Salisah and Syaifullah (2014) that the application of an information system in an educational institution will provide benefits if its application is in accordance with the vision, mission and goals of the institution. Furthermore, Indrajit (2000) suggests that the key to success of an educational institution is the integration of information and communication systems in processing data precisely, quickly and accurately. Therefore, educational institutions that master information systems will have a competitive advantage in the macro scope.

Almuslim University is one of the private universities organized by the Almuslim Peusangan Foundation, Bireuen Regency, Aceh Province. It has 28 (twenty-eight) study programs at Almuslim University which are managed by six faculties, one academy and one graduate school. Almuslim University has tried to integrate information and communication technology in the implementation of higher education. This is to be seen through the implementation of the Academic Information System (SIAKAD) at Almuslim University starting in 2011, eLearning at Almuslim University starting in 2016, financial information systems, graduation registration information systems and several other information systems starting in 2017.

However, the use of the information system applied by Almuslim University is not optimal. This is since not all academic and non-academic activities at Almuslim University use / are equipped with information systems. In addition, the various information systems used by Almuslim University have not been integrated into one comprehensive information system. Therefore, Almuslim University needs to plan an information system strategy according to its vision, mission and objectives in order to have added value in the form of competitive advantage.

Almuslim University information system strategic planning can be designed using the framework of John Ward and John Peppard (2002) which combines value chain analysis and McFarland Strategic Grid analysis. Through this analysis, Almuslim University can identify various educational information systems for the development of Almuslim University so that it can compete with other private universities.

2. Literature Review

Strategic planning of system information

Imtihan (2015) elucidates that strategic planning for information systems is a process of classifying a portfolio of use of information system applications based on information and communication technology that supports organizations in carrying out operational planning and realizing their goals. Therefore, Ward and Peppard (2002) suggest that information systems strategic planning describes various instruments, tools, techniques, and frameworks for management to adapt information systems strategy to business strategy, even to seek new opportunities for innovative information and communication technology integration. Furthermore, Anharudin (2015) explains that information strategy planning is useful for maximizing all aspects of organizational support in a structured and systematic manner that can be applied by organizations as a long-term program in carrying out business activities that have a competitive advantage.

Value Chain Analysis

Bolwig, et al. (2010) explained that value chain analysis is a structured and systematic framework to provide a description and assessment of the roles and relationships between individuals and organizations. Furthermore, value chain analysis involves various aspects such as aspects of organizational culture, economic aspects, and personal aspects of individuals in an organization (Wijaya, 2019).

Value chain analysis is carried out collaboratively from every dimension of the business process. Each dimension of the business process is interconnected with one another, including the dimensions of the internal and external environment. Therefore, value chain analysis can also be explained as a process in finding the costs needed to carry out activities in a business. The activities include the purchase of raw materials or inputs, production or processes, outputs,

and other activities. the process aims to obtain cost efficiency in a series of values (Wijaya, 2019)

Furthermore, Porter (2008) introduced a tool for conducting value chain analysis. These tools classify the company's activities into two categories, namely main activities and support activities. The main activities include inbound logistics, operations, outbound logistics, marketing and sales, and services. Meanwhile, supporting activities consist of infrastructure, human resources, technology and procurement (Figure 1).
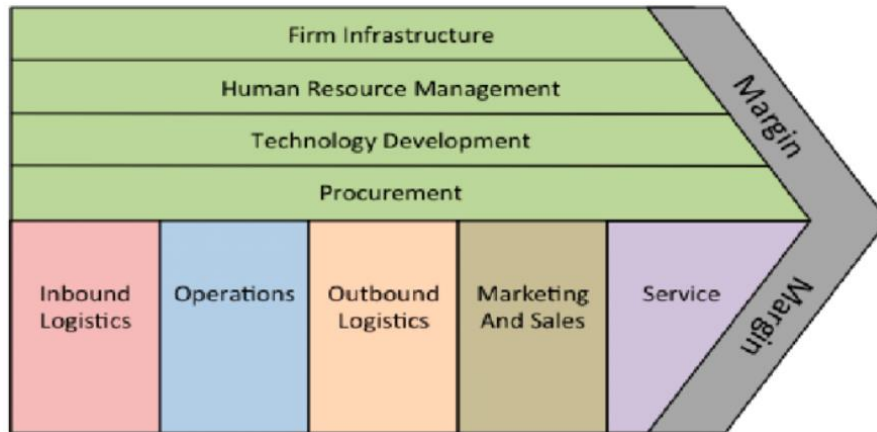

Figure 1. Porter's value chain analysis model
Source: Wijaya, 2019

McFarland Strategic Grid Analysis

McFarland Strategic Grid analysis is a strategy implemented to map an organization's information system applications based on their contribution. Through the McFarland Strategic Grid, information system applications are classified into four quadrants, namely strategic, key operational, high potential, and support (Ward and Peppard, 2002). Applications are very important and critical to maintaining business strategy lie in the strategic quadrant. Furthermore, the applications in which organizations depend on for success fall into the operational key quadrant. Furthermore, the high potential quadrant contains possible applications Important for the successfull of the company. Finally, applications that are valuable but not critical in achieving company success are included in the support quadrant (Figure 2).

Figure 2. McFarland Strategic Grid

Source: Ward and Peppard, 2002

3. Research Method

The strategic planning of information system development at Almuslim University applied the design of John Ward and John Peppard (Figure 3) which combines value chain analysis with McFarland Strategic Grid (Imtihan, 2015). The focus on strategic planning for the development of this information system was the analysis of the internal environment of information systems in educational operations at Almuslim University. Furthermore, data collection in this study used document analysis, semi-structured interviews and participatory observation (Kholis, et al., 2019). The respondents used in the interviews were the vice chancellor for academics, the vice chancellor for finance, the vice chancellor for student affairs, alumni and cooperation, the head of the academic bureau, the head of the general bureau, student representatives, lecturers, students and alumni.
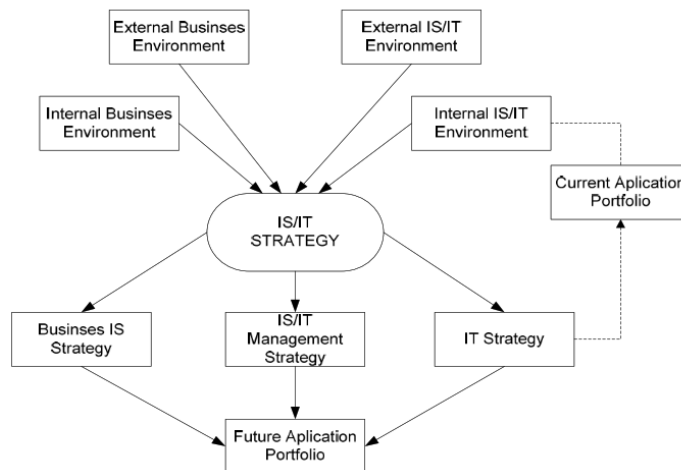

Figure 3. Information systems strategy model
Source: Ward and Peppard, 2002

4. Result
Result of Value Chain Analysis

Based on the results of the value chain analysis on the operational process of education at Almuslim University, two categories of activities were obtained, namely main activities and supporting activities. The main activity consists of five activities, namely New Student Admission (PMB), Academic Activities, Graduation, and Socialization and Collaboration, and Alumni. Meanwhile, the supporting activities consist of 4 activities, namely Financial Administration, Personnel Administration, Facilities and Infrastructure Development, and Procurement (Figure 4).
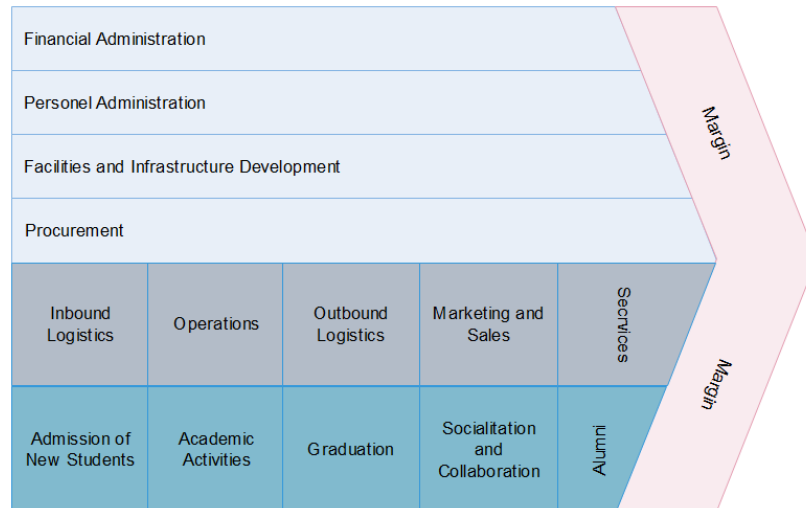
Figure 4. Value chain analysis of educational operational processes at Almulism University
Source: Ward and Peppard, 2002

Main Activities of Educational Operational Processes at Almuslim University

As previously described, the main activity in the value chain analysis of the educational process at Almuslim University consists of five activities. The five activities are New Student Admission (PMB), Academic Activities, Graduation, Socialization and Cooperation, and alumni (Table 1).

Table 1. Main activities in the value chain analysis of the educational processes at Almuslim University

Activities	Implementing Unit	Information System Needs
New Student Admission Activities (PMB) 1) Promotion and socialization 2) PMB Registration 3) Selection of prospective new students 4) Announcement of PMB selection 5) New Student Registration	1) Vice chancellor for academics 2) PMB Committee	1) New Student Admission Information System (PMB) Almuslim University 2) Almuslim University Website 3) Almuslim University social media
Academic Activities 1) Filling out the student's Study Plan Card (KRS). 2) Lecture scheduling 3) Lectures 4) Mid-Semester Examination (UTS) and Final Semester Examination (UAS) 5) Rating 6) Distribution of Student Study Result Cards (KHS)	1) Vice chancellor for academics 2) Head of Academic Bureau	1) Academic Information System (SIAKAD) Almuslim University 2) Almuslim University Learning Management System (LMS) (Almuslim University e-learning)
Graduation Activities 1) Graduation registration	Graduation committee	1) Graduation information system

2) Graduation ceremony		2) Almuslim University Website 3) Almuslim University social media
Socialization and Cooperation Activities	1) Vice Chancellor for Student Affairs, Alumni and Cooperation 2) Head of Public Relations	1) Student and alumni information system 2) Cooperation information system
Alumni Alumni	1) Vice Chancellor for Student Affairs, Alumni and Cooperation 2) Head of Public Relations	1) Tracer study information system 2) Almuslim University Website 3) Almuslim University social media

a. Admission of new students

New Student Admissions (PMB) is one of the entry logistics activities or inputs to the value chain analysis of management information system planning strategies at Almuslim University. Almuslim University's New Student Admission (PMB) activities consist of promotion and socialization, PMB registration, selection of new student candidates, announcement of PMB selection and PMB registration. Therefore, the information system needed for New Student Admission (PMB) activities at Almuslim University is the Student Admissions Information System.

b. Graduation

Furthermore, the activity after academic activities is graduation. Graduation activities consist of graduation registration and graduation ceremony. Therefore, the information systems needed in the graduation ceremony are the graduation information system, Almuslim University Website, and Almuslim University social media.

c. Socialization and Collaboration

Socialization and cooperation are sales and marketing activities in value chain analysis of management information system development at Almuslim University. Therefore, the information system needed is a student and alumni information system and a cooperation information system.

d. Alumni

The activity of providing services in the Almuslim University value chain analysis is alumni. The information systems needed for this activity are tracer study information systems, Almuslim University Website, and Almuslim University social media.

Supporting Activities of Educational Operational Processes at Almuslim University

There are four supporting activities in the value chain analysis of the educational process at Almuslim University. The four activities are Financial Administration, Personnel Administration (staff and lecturers), Development of information technology facilities and infrastructure, and Procurement (Table 2).

Table 2. Suppoerting activitiesin the value chain of the educational processes at Almuslim University

Activities	Implementing Unit	Information System Needs
Financial administration	1) Vice Chancellor for Finance 2) Head of general and finance bureau 3) Head of finance	Financial information system
Personnel Administration (staff and lecturers)	Vice Rector for Finance	Personnel information system
Development of information technology facilities and infrastructure	1) Chancellor 2) Vice Chancellor for Finance 3) Communication Center	Information system development of information and communication technology
Procurement	1) Chancellor 2) Vice Chancellor for Finance 3) Head of General Affairs and Finance Biro	Procurement information system (eProcurement)

a. Financial administration

Financial administration is a management effort that includes all activities that are closely related to all financial systems to achieve the goals of Almuslim University. In short, financial administration is an activity related to recording and spending to finance the activities of the educational process. Therefore, financial administration activities require a financial information system.

b. Personnel Administration (staff and lecturers)

Personnel administration is an activity with management or the use of lecturers and staff at Almuslim University in order to maximize the higher education process. Through personnel administration, universities can ensure that all lecturers and staff have an even workload.

c. Development of Information Technology Facilities and Infrastructure

In order to ensure a management information system in the implementation of higher education at Almuslim University, optimal information technology facilities and infrastructure are needed. Therefore, Almuslim University requires an information system for the development of information technology facilities and infrastructure.

d. Procurement

Procurement is an activity carried out by a company to buy goods, business equipment, production machines, or even building materials, repair equipment, and services that are currently needed by the company. Therefore, in the context of a good procurement process at Almuslim University, a procurement information system is needed or often called e-procurement.

McFarland Strategic Grid Analysis

Based on the results of value chain analysis (value chain analysis), it can be mapped the information system needs in the four quadrants of the McFarland Strategic Grid. The four quadrants are strategic, high potential, key operation, and support. The results of the McFarland Strategic Grid analysis can be seen in Figure 5.

The results of the McFarland Strategic Grid analysis show that there are six information systems in the strategic quadrant, namely tracer study information systems, student and alumni information systems, personnel information systems, financial information systems, cooperation information systems and graduation information systems. Furthermore, there is an information system in the key operational quadrant, namely an information system for new student admissions, academic information systems, and learning management systems (e-learning). Finally, there are only two information systems each for the high potential and support quadrants, namely the Almuslim University website and social media in the high potential quadrant and information systems for the development of information and communication technology, and e-procurement in the support quadrant.

Strategic	High Potensial
1) Tracer study information system 2) Student and alumni information system 3) Personnel information system 4) Financial information system 5) Cooperation information system 6) Graduation information system	1) Media social Universitas Almuslim 2) Almuslim University Website 3) Almuslim University social media
1) New Student Admission Information System (PMB) Almuslim University 2) Academic Information System (SIAKAD) Almuslim University 3) Almuslim University Learning Management System (LMS) (Almuslim University e-learning)	1) Information system development of information and communication technology 2) Procurement information system (eProcurement)
Key Operasional	Support

Figure 5. McFarland Strategic Grid analysis

5. Conclusion

Strategic planning of information systems is carried out to analyze the internal environment of management information systems at Almuslim University, to find out the needs of information systems in educational operations, and to get added value in terms of competitive advantage. Furthermore, in general, strategic planning of information systems is mapped into two categories, namely main and supporting activities. The main activities of strategic planning of information systems at Almuslim University include PMB activities, academic activities, graduations, socialization and cooperation, and alumni. Meanwhile, supporting activities include financial administration, personnel administration, development of information and communication technology facilities and infrastructure, and procurement. The information system identified in the value chain analysis is then mapped into the McFarland Strategic Grid quadrant which consists of strategic, high potential, key operations, and support.

6. References

Anharudin, A. (2015). Perencanaan Strategis Sistem Informasi Untuk Meningkatkan Pelayanan Menggunakan Metode Ward and Peppard (Studi Kasus: PT Pos Indonesia Cilegon-Banten). PROSISKO: Jurnal Pengembangan Riset dan Observasi Sistem Komputer, 2(2).

Bolwig, S., Ponte, S., (2010). Integrating poverty and environmental concern into value chain analysis: a conceptual framework.

Indrajit, R. E. (2000). Manajemen sistem informasi dan teknologi informasi. Jakarta: PT Elex Media Komputindo.

Imtihan, K. (2015). Perencanaan Strategi Sistem Informasi Pendidikan Pada Sekolah Tinggi Manajemen Informatika dan Komputer (STMIK) Lombok. Bianglala Informatika, 3(2).

Kholis, N., Wibawa, B., & Soeprijanto, S. (2019). Analisis Rantai Nilai Pendidikan Kejuruan dalam Mengembangkan Entrepreneurship: Studi Kasus pada SMK PGRI 20 Jakarta. JSHP: Jurnal Sosial Humaniora dan Pendidikan, 3(2), 124-135.

Porter, M.E., (2008). Competitive Advantage: creating and sustaining performance. Amazon Digital Services Incorporated.

Salisah, F. N., & Syaifullah, S. (2014). Analisis Perencanaan Strategi Sistem Informasi Pada Institusi Pendidikan. SITEKIN: Jurnal Sains, Teknologi dan Industri, 11(1), 19-29.

Ward, J., & Peppard, J. (2002). Strategic planning for information sistems. John Wiley & Sons, Inc.

Wijaya, M. (2019). Analisis Rantai Nilai dalam Meningkatkan Kinerja dan Keunggulan Kompetitif Perusahaan. Media Informatika, 18(3), 122-128.