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Architecture in Institutional Management Systems using Odoo Enterprise Resource Planning at UIN Maulana Malik Ibrahim Malang

Supriyono

Department of Informatics, Faculty of Science and Technology
Universitas Islam Negeri (UIN) Maulana Malik Ibrahim, Malang, Indonesia

priyono@ti.uin-malang.ac.id

Abstract

Rapidly evolving information systems and technology have compelled organizations, particularly educational institutions, to adapt their institutional evolution. The researcher's goal is to build an Odoo ERP-based institutional management system architecture at UIN Maulana Malik Ibrahim Malang in order to gain a competitive advantage in realizing the university's vision, mission, and goals, as well as in the future implementation phase of the recommended application portfolio. Information systems strategic planning is a significant transformation for a company, and it is based on user needs that are aligned with business strategy. The impact and alignment categories are used to categorize the information systems strategic planning technique. The impact category methodology is useful for creating and justifying the use of new information technologies. While the alignment methodology (alignment) serves to align the objectives of the information system with the goals of the organization. The Star UML was used to design the system architecture.

Keywords: *Odoo ERP; Impact; Alignment; UML*

1. Introduction

An information system is a crucial instrument for achieving corporate objectives. Every business must carefully define information needs and examine the vision, goal, and functions carried out, as well as who executes them and what data and information are required to carry out the many functions and processes most important to the information structure [1]. Without a structured plan for the growth of information systems, the organization will lack a priority scale and appear uneven [2]. Without a structured plan for the growth of information systems, the organization will lack a priority scale and appear uneven [3].The risks involved with making decisions concerning information systems and information technology can almost certainly be decreased if a university or higher education institution has a sound strategic plan. However, many colleges and higher education institutions overlook this and disregard strategic planning as a non-essential component [4]. Implementing information systems and information technology in an organization, including educational institutions, has three main goals: (1) increasing work efficiency by automating various information management processes, (2) increasing management effectiveness by satisfying decision makers' information needs, and (3) improving competitiveness or increasing the university's competitive advantage by changing the style and way of conducting its main business. If there is a guarantee of alignment between the information systems strategy and information technology with the organization's business plan, the three goals can be met to their full potential.

Islamic State University of Maulana Malik Ibrahim Malang (UIN Malang) is one of Indonesia's largest Islamic universities. The Center for Information Technology and Databases is responsible for the operation and management of information technology at

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UIN Maulana Malik Ibrahim Malang (PTIPD). PTIPD's major responsibility is to administer and improve the University's information technology systems and databases (Ortaker, Article 80). According to the results of a user satisfaction survey (2021) on the University's administration and development of information systems and information technology, 90% of respondents felt that the development of information systems and information technology was not directed and unplanned. The argument is that the development of information systems and information technology has failed to meet needs and has failed to consider the university's future business procedures.

By paying attention to the problems that UIN Maulana Malik Ibrahim Malang is facing, it is impossible to deny that good and strategic planning of information systems and information technology can serve as a guide in developing information systems and information technology in the future to achieve the university's goals, namely the realization of superior Islamic higher education and international reputation. As a result, research at UIN Maulana Malik Ibrahim Malang on strategic planning of information systems and information technology has a place and is necessary. Several universities in Indonesia have adopted research-based information systems. The Strategic Management of Information Technology (SMIT) established by Flodstrom is based on related research [5]. The strategic design for adopting information technology is done in conjunction with the business plan and takes into account the strategic environment. However, features of institutional development based on Odoo Enterprise Resource Planning were not included in this development research (ERP). Odoo ERP is a multi-platform information system development framework [6]. Its design offers for a great deal of versatility when it comes to integrating with other apps. Similarly, Odoo ERP provides a high level of security to make it easy for users to store data virtually.

This study analyzes developing strategic plans based on the state of information systems and information technology at the time the research was conducted, in order to align them with the university's development path. The talk will center on information systems and technology planning for business processes associated to the Tri Dharma of Higher Education. This study's ultimate product is a blueprint for information systems and information technology strategic planning.

2. Research Methodology

The data collection method used is a combination of survey and case study approaches. Analysis of strategic planning documents was carried out to investigate the influence of strategic planning on policy and regulation of management and information strategies. The sample of this research is academic staff in Indonesia who are studying in Australia. Twenty-six respondents were system users, not information providers or system administrators.

Research questions [7] using a questionnaire method with the Likert Scale method. Questionnaire method to determine the perception of what an information system is, how it functions in the institution, and to investigate the perceived usefulness. The technique of testing the questionnaire sample aims to clarify the ambiguity of the questionnaire. Data processing is carried out based on findings from document analysis. Data processing uses the Mann-Whitney Test (U test) statistical method, and Spearman Rank Order Correlation Test (Rho test), and content analysis [7].

2.1. Information Systems (IS) and Information Technology (IT) Strategy

The process of making IS/IT strategy should not only focus on technology analysis. The most effective way that can be taken is to analyze existing business problems, changes in the environment, and realize that IS/IT is only one of the solutions offered. Earl also suggested that the IS strategy concentrate on identifying the information systems needs of the organization. While the IT strategy concentrates on identifying information technology needs and supporting infrastructure [8].

To determine the IS/IT strategy that can support the achievement of the organization's vision and mission, it is necessary to understand the organization's business strategy. This understanding includes an explanation of the following: why a business is run, where is the goal and direction of the business, when the goal is achieved, how to achieve the goal and are there any changes that must be made. So in building an IS/IT strategy, the central issue is the alignment (alignment) of the IS/IT strategy with the organization's business strategy.

2.2. Information Systems and Information Technology Strategic Planning Methodology

Information systems strategic planning methodology is grouped into two categories, namely impact and alignment [9]. The impact category methodology is useful for creating and justifying the use of new information technologies. While the alignment methodology (alignment) serves to align the goals of information systems with organizational goals.

2.2.1. Analysis of Critical Success Factors

Analysis of Critical Success Factors (CSFs) can have a good impact on methodological alignment. CSFs in the context of strategic information systems planning are used to clearly interpret objectives, tactics, and operational activities in terms of key information needs of managers and the strengths and weaknesses of existing organizational systems. CSFs can be defined if organizational objectives have been identified. The goal of CSFs is to interpret the objectives more clearly to determine what activities should be performed and what information is needed. The role of CSFs in strategic planning is as a liaison between the organization's business strategy and its information system strategy, focusing the information system strategic planning process on strategic areas, prioritizing proposed information system applications and evaluating information system strategies.

2.2.2. Analysis of Critical Success Factors

Value chain analysis (value chain) was proposed by Michael Porter in 1984. According to Porter, every company is a collection of activities carried out for production, marketing, delivery and support of products. All of these activities can be represented using a value chain. Porter also explains that information technology is one of the main supporters of the value chain.

3. Results and Discussion

3.1. Business Process Mapping Results

Table 1. Level 1 Sub-Satker Business Process (Sub-Process)

Code Subsatker	Subsatker	Sub-Process Code	Description Subprocess
1	Faculty	1.1	Carry out education and teaching
		1.2	Carry out research and development of science and technology
		1.3	Carry out community service
		1.4	Carrying out the development of the academic community
		1.5	Carry out general administration, academic, student affairs, planning, finance and reporting services
2	Postgraduate	2.1	Carry out education and teaching
			Carry out research and development of science and technology
		2.2	Carry out research and development of science and technology
		2.3	Carry out community service
		2.4	Carrying out the development of the academic community
		2.5	Carry out general administration services, academic, student affairs, planning, finance and reporting
3	General	3.1	Carry out organizational arrangements, financial administration, laws

Code Subsatker	Subsatker	Sub-Process Code	Description Subprocess
	Affair		and regulations, administration and housekeeping
4	Planning Section	4.1	Carry out the preparation of plans, programs and budgets
		4.2	Conduct program evaluations, budgets, and performance reporting
5	Financial departmen t	5.1	Execute budget and treasury
		5.2	Perform budget verification, agency accounting, SIMAK SMN, BLU accounting, and preparation of financial reports
6	OKH Bagian section	6.1	Manage, develop, and transfer employees
		6.2	Carry out organizational and management arrangements, performance reports, and laws and regulations
7	Academic Section	7.1	Manage academic information
		7.2	Carry out academic administration
		7.3	Performing academic services
8	Student Affairs Bagian	8.1	Carrying out student administration, fostering student talents and interests
		8.2	Carry out administration and empowerment of alumni
9	Cooperati on Section	9.1	Carry out administrative preparation, cooperation, and institutional development
10	PR	10.1	Doing public relations, documentation, and information
11	LPM	11.1	Coordinate the implementation of quality implementation of academic activities at the Faculty and Postgraduate levels
		11.2	Controlling and auditing the quality implementation of academic activities at the Faculty and Postgraduate levels
		11.3	Implementing the quality of student development and mentoring (Quality Mentoring and Development Center Student)
12	LP2M	12.1	Carry out the preparation of plans, evaluation of programs and budgets as well as reporting for research
		12.2	Carry out the preparation of plans, evaluation of programs and budgets as well as reporting for community service
		12.3	Carry out the preparation of plans, evaluation of programs and budgets as well as reporting for the publication of research results and community service
		12.4	Carry out the preparation of plans, evaluation of programs and budgets as well as reporting in the development of the study center
13	library	13.1	Carrying out services, coaching, and developing libraries, holding collaborations between libraries, controlling, evaluating, and compiling library reports
14	PTIPD	14.1	Manage and develop management information systems, development, network and application maintenance, database management, other technology development and network collaboration
15	Language Center	15.1	Carry out language training and development for the university's academic community
16	P2B	16.1	Carry out management, marketing, and business development of the university
17	Internatio nal affairs office	17.1	Carry out the management of International Services
18	Ma'had al-Jamiah	18.1	Carrying out services, coaching, academic development and student character based on Islamic boarding schools
19	UIN Press Printing	19.1	Carry out publishing and management in the printing sector
20	SPI	20.1	Implementing Internal Control

3.2. System Architecture

A system architectural design is created using the Odoo ERP basis based on the outcomes of the business process identification, as shown below.

Table 2. Procedures for AAK Mutation

No.	Activity	Executor							Raw Quality			Ket
		Student	General Affair	AUPK Bureau	Head of AAKK	Head of Academic	Head of Subdivision for Academic Adm	Head of Sub Division Adm. And Academic Information	Completeness	Time	Output	
1	Submit a mutation application addressed to the Chancellor (included in the General Section)								The application is accompanied by the terms of approval from the department, good behavior from the	15 minutes	Application letter and transfer requirements file	
2	The Head of the AUPK Bureau shall assign the application letter to the Head of the AAKK								Disposition sheet	30 minutes	AUPK Head of Disposition Sheet	
3	The AAKK Head of Bureau assigns to the AK Division Head								Disposition sheet	60 minutes	AAKK Head of Disposition Sheet	
4	The AK Division Head gives instructions to the AK Sub Division Head to make a mutation letter								AAKK Head of Disposition Sheet	60 minutes		
5	The AK Subdivision Head makes a transfer letter									10 minutes	Transfer letter draft	
6	The Head of Subdivision of Adm and Information processes the granting of a new NIM								Transfer letter draft	5 minutes	New ID	
7	Give initial								The draft of the transfer letter that has been given a new NIM	10 minutes	The most recent transfer letter	
8	Signing the mutation statement								The most recent transfer letter	5 minutes	Confirmed letter	
9	Students receive a transfer approval letter with a new NIM								Confirmed letter	5 minutes	Accepted by students	
10	Provide university stamp/stamp										Stamped university	

Table 3. AUPK for RM Salary Submission

No.	Activity	Executor						Raw Quality			Ket
		BP	KDP	PPSPM	KPA	KPPN	Bank	Completeness	Time	Output	
1	PPABP prepares the completeness of the Salary List to make a detailed list of requests by inputting and printing from the GPP Application to be submitted to the PPK							POK RKA KL/DIPA	1 day	LS SPP Completeness Draft	
2	PPABP examines the completeness and submits it to PPK for signature, then SPP is issued							LS SPP Completeness Draft	10-30 minutes	SPP signed by PPK	
3	The LS SPP file is requested for approval from the KPA							SPP signed by PPK	10 minutes	KPA approved tuition fees	
4	After KPA approves then PPSPM examines/verifies the completeness of the SPP to then issue the SPM.							KPA approved tuition fees	15 minutes	SPM	
5	Furthermore, the Print SPM & ADK SPM along with the completeness are submitted to KPPN							SPM and accessories	1-3 hours	SPM	
6	After the SPM submitted by the Satker is verified for completeness, then KPPN issues the SP2D							SPM	1 day	SP2D	
7	Employee salaries are credited to their respective accounts							SPM	1 day	SP2D	
8	Treasurer records SP2D Salary Then in the General Cash Book and Assistance Book consisting of: Tax Assistance Book, Cash Cash Assistance Book, Bank Assistance Book, and Credit Supervision Assistance Book							SP2D	15-30 minutes	Bookkeeping	

Table 4. Issuance of Documented Information by the ISO Secretariat Control Document

No.	Activity	Executor		Raw Quality			Ket
		ISO Secretariat	Authorized Officer	Completeness	Time	Output	
1	The processes that exist in the scope of application of the quality management system at UIN Maulana Malik Ibrahim are informed and documented in a documented information (document) quality system			Quality system Documented Information (Documents)	1 week	Quality system document results	
2	Quality system documents are checked and approved by authorized officials in accordance with the Authorized Table of Authorization Documented information (documents) attached			• Documented Information (Documents) quality system • Authority to validate Documented Information (Documents)	1 day	Certified quality system document	
3	Documented information (document) of the quality system that has been approved, stamped "MORE" on the approval sheet, and recorded in the Register of Documented Information (document) of the Master. This documented information (document) is stored in the ISO Secretariat			• Quality system documents • Stamps • Attestation sheets • Master documents	1 day	Documented Information (Document) Master	
4	Documented information (external document) that is used as a reference in carrying out work at UIN Maulana Malik Ibrahim is stamped "REFERENCE USED" and recorded in the List of Documented Information (External Document).			External Documented Information (Documents)	1 day	List of External Documented Information (Documents)	

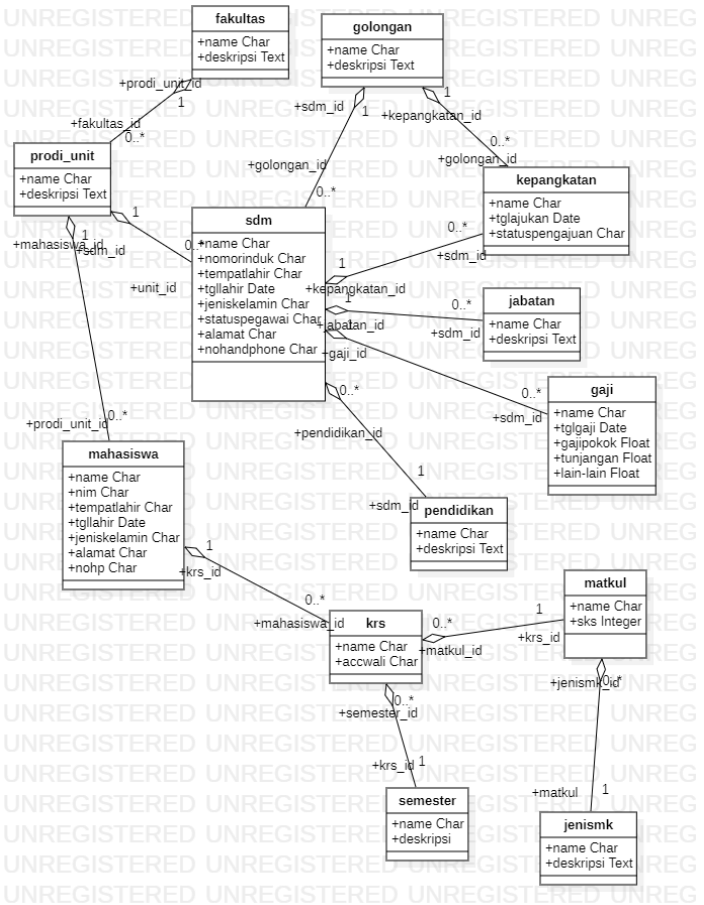

Figure 1. System Architecture

The Odoo ERP platform can be used to generate this design, as shown in the following image.

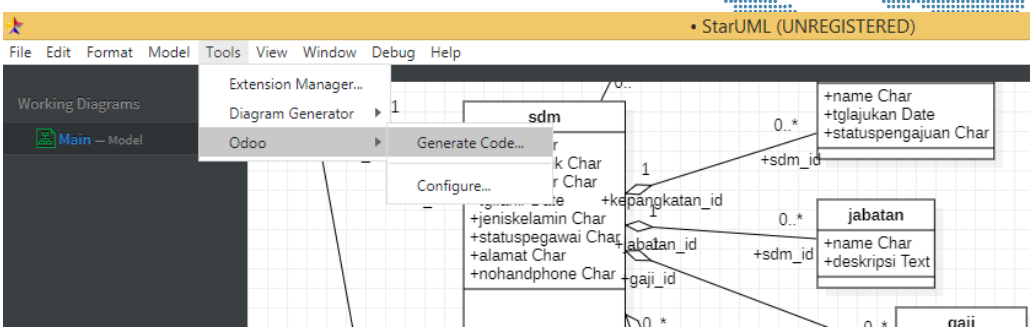

Figure 2. Generate System Architecture

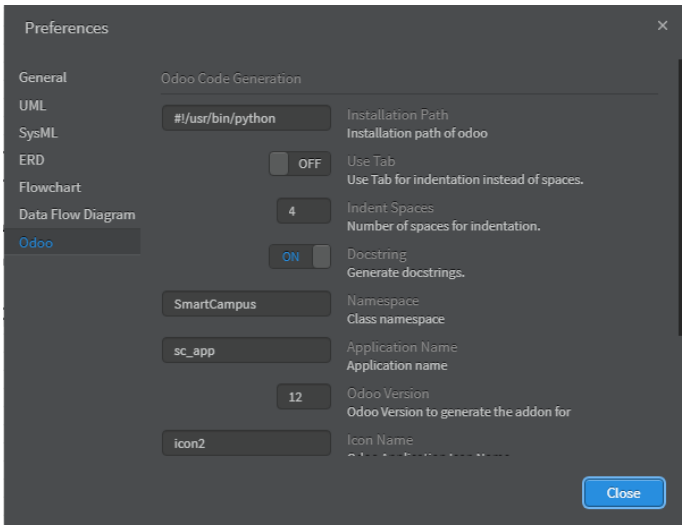

Figure 3. System Architecture Configuration Using Odoo ERP Platform

4. Conclusion

Using the odoo ERP platform, the following research resulted in the identification of business processes in each sub-satker and system architecture modeling. The results of the architectural design show that the methods used are compatible with the existing problems, allowing them to produce designs and implement the subsatker section at UIN Maulana Malik Ibrahim Malang. The system architectural design utilizing the Star UML tool with the addition of Odoo ERP addons generates a suitable design because in its development it has adopted the notion of Enterprise Resource Planning.

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Authors

Supriyono, S.Kom., M.Kom
Education that has been taken in the Department of Computer science at Universitas Brawijaya Malang and the Magister Program of Informatics Engineering of Institut Teknologi 10 Nopember Surabaya in the field of software engineering. Currently, the Lecturer majoring in the Department of informatics at Universitas Islam Negeri (UIN) Maulana Malik Ibrahim Malang. Current research is related to system needs engineering, software quality, software management, and software development using several methods applied as well as in general, the research conducted in the centration in the field of software engineering.