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Analysis of Management Information System for Financial Data Management (Case Study XYZ Polytechnic)

Az Zahra Izaaz ¹⁾, Tubagus Muhamad Yusuf Khudri²

^{1),2)} Universitas Indonesia

ARTICLE INFO

Keywords:

Management Information System (MIS), Technology-Organization-Environment (TOE) Framework, Financial Data Management, Polytechnic.

Article History:

Received: 16-12-2022

Accepted: 12-05-2023

Corresponding author:

Az Zahra Izaaz

E-mail:

az.zahra05@ui.ac.id

ABSTRACT

The Technology-Organization-Environment (TOE) framework is used to evaluate the adoption of Management Information System (MIS) for financial data management and provide recommendations for optimizing MIS implementation in XYZ Polytechnic with three contexts: technology, organization and environment. The research method uses a qualitative approach obtained from interviews with five respondents. The results showed that in the context of technology, the relative advantage attribute of MIS is useful in providing financial service information to all parties of XYZ Polytechnic, but in compatibility and complexity there are still technical obstacles in SIM, it needs improvement in the calculation of the Basic Teaching Fee accurately, employee pay slips with automatic format, actual data and information integration. For the organizational context, there needs top management support to make decisions in determining developers as MIS providers to fix these technical problems, sufficient training to improve the quality of human resources and additional MIS user staff for work efficiency according to organizational needs. Environmental factors are influenced by regulatory support in the form of Government Regulations and standard operating procedures to ensure the implementation and provision of MIS, industry characteristics with competition among colleges can improve Polytechnic performance through improving the quality of financial services on MIS.

INTRODUCTION

XYZ Polytechnic is a vocational education in a number of fields of science and technology has switched categories from PTN-Satker (ministerial work unit) under the Directorate General of Vocational Education of the Ministry of Education and Culture to Higher Education with the category of Public Service Agency (BLU) which has been proposed by the Director to the Ministry of Education and Culture. Previously, when XYZ Polytechnic was still a PTN-Satker, all of its revenue accounts, including student tuition fees, had to go to the state account (ministry of finance) before being used.

Based on Government Regulation number 23 of 2005 article 25 that BLU applies a financial management information system in accordance with the needs and sound business practices. Article 32 also states that BLU financial officials function as financial responsible persons who are obliged to

p-ISSN: 2528-6145, e-ISSN: 2541-3198 Accredited Third Grade by Ministry of Research, Technology and Higher Education of The Republic of Indonesia, Decree No: 148/E/KPT/2020

Cite this as: Izaaz, A, & Khudri, T. (2023). Analysis Of Management Information System For Financial Data Management (Case Study XYZ Polytechnic). JURNAL AKSI (Akuntansi dan Sistem Informasi), Vol 8 (2), Pages 166-174. <http://doi.org/10.32486/aksi.v8i2.669>

organize a financial management information system. In line with Joko's research (2010) states that there are five main performance indicators that must be met for standard eligibility criteria in management or management at state universities, namely, the implementation of higher education programs such as work systems and mechanisms, infrastructure in the form of land, buildings, equipment and various other facilities, finance such as income, costs and use of funds, human resources such as student recruitment systems, recruitment and development of teachers, and other supporting employees, and information such as internal network connections through good management information systems.

Management Information System (MIS) is the role of the information system of an organization that produces information and data required by the management level. Management information systems can be defined as a collection of interactions between information systems responsible for collecting and managing information to provide useful information at all levels of planning and control activities (Ma, 2020). Currently, information technology is not just a tool to support organizational operations, but has become an organizational strategy to achieve its goals. Higher education is an academic organization that uses information technology to form information technology that can shape various business processes in it. In general, the current management information system is limited by various problems, such as computer systems that have not been integrated, limited human resources available for computers, data collection systems that have not been centralized to provide information needed at all levels of management.

From 2015 to 2020, XYZ Polytechnic has been using a Management Information System (MIS) called the Financial Management Information System (SIMKEU) provided by Gajah Mada University (UGM) as the developer. Then, XYZ Polytechnic has switched developers and collaborated with Politeknik Elektronika Negeri Surabaya (PENS) by creating a Management Information System (MIS) since 2021 until now. Management Information System (SIM) is for managing lecturers' and employees' pay slips, checking employee account data, information about employee groups and employee taxes, as well as information on student UKT (Single Tuition Fee) payment bills, both UKT at the first diploma level to postgraduate in all departments at XYZ Polytechnic.

In using and managing the Management Information System () in the finance department, there are still shortcomings faced by users as staff of the XYZ Polytechnic financial services unit due to the limited development of the Management Information System (MIS). Users still make lecturer and employee payslips manually first with excel, then input them into the Management Information System. This makes them feel uncomfortable and inefficient. Then another shortcoming is the lack of transparency regarding lecturer honorarium information in the Management Information System, so that there will be a negative stigma caused between lecturers and the management of the XYZ Polytechnic financial services unit. In terms of technology, it has not developed and innovated reliably in its use, then in terms of organization, members who use SIM in managing financial data are also only two staff from the financial services unit, internal regulations from XYZ Polytechnic are still in the process of preparing Standard Operating Procedures (SOP). These problems are not in accordance with the implementation based on PP No. 23 of 2005 articles 25 and 32.

This is in line with the research of Rahmadi et al (2022) regarding the impact of management information systems on the education sector that the impact of management information systems and information needs greatly affects the level of quality of education, more advanced processes must be supported by systems and tools that can provide guidance, information and proper management. In line with that, Lee's research (2016) states that technological capabilities affect process and product innovation, technological capabilities must be evaluated objectively as one of the most important factors in technological competitive advantage and to ensure sustainable business advantage. Aboelimged (2014) mentioned that the evaluation of technological capability for organizations aims to increase the ability of the skills and abilities needed to apply technology. Technology adoption capability can be measured using the Technology Organization and Environment (TOE) framework. Also, adopting technology implementation is also influenced by technology that has been used internally and externally, organization and environment with the Technology-Organization-Environment (TOE) framework (Chong & Olesen, 2017).

The Technology-Organization-Environment (TOE) framework is an organizational process for adopting technology which is influenced by three contexts, namely the technological context, organizational context and environmental context (Malik et al., 2021). The TOE framework was first developed by Tornatzky and Fleischer in 1990 as a technology adoption framework at the organizational

level. In line with the research, the researcher will evaluate the adoption of the current application of the XYZ Polytechnic management information system and to optimize MIS in the future based on the TOE framework with three contexts, namely the technological context consisting of relative advantage, complexity and suitability/compatibility. Then, the organizational context which is divided into human resources, organizational size and management support. The environmental context is industry characteristics and government regulations.

MATERIALS AND METHODS

Based on Government Regulation of the Republic of Indonesia Number 4 of 2014 concerning the implementation of higher education and higher education management article 1, Polytechnics are universities that organize vocational education in various clumps of science and/or technology and if qualified, Polytechnics can organize professional education.

A Management Information System (MIS) is a network of data processing methods developed in an integrated manner into a system that aims to provide information to management as a basis for decision making. The purpose of studying SIM is to see that the value of information is very valuable, so it must be managed properly. As an entrepreneur, staff employees and managers must be able to know and be able to process information to develop a company or business (Kaukab, 2020).

The TOE framework was developed by Tornatzky and Fleischer in 1990 to explain the decision to adopt technological innovation by an organization based on three contexts, namely technology, organization and environment. These three contexts can affect the organizational process of adopting, implementing and using technological innovation. Based on these three contexts, it is presented in Figure 1

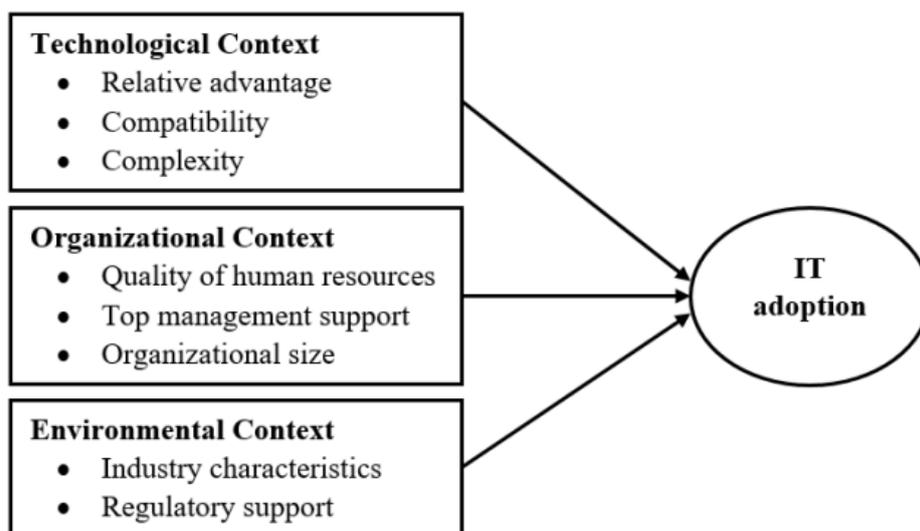


Figure 1
TOE Framework

Technological context consists of internal and external technology related to existing technology in the organization is important in the technology adoption process because focusing on the structure, quality and characteristics of technology can affect the adoption process of an innovation. The technological context in the TOE framework consists of relative advantage, compability and complexity. According to Chong & Olesen (2017), the organizational context refers to the characteristics, structures, processes and resources that limit or facilitate the adoption of technological innovations. the quality of human resources, top management leadership, and organizational size are the factors most often discussed with the organizational context that affect innovation adoption. According to Chong & Olesen (2017), in the environmental context, industry characteristics and regulatory factors are the dominant factors that influence the adoption of a technology.

Researchers use descriptive methods with a qualitative approach. Qualitative research is conducted to analyze phenomena or events that occur using data obtained by researchers by direct

observation and interviewing sources so that qualitative research is descriptive, where qualitative data is in-depth about certain phenomena, situations, and events.

Researchers use descriptive methods with a qualitative approach. Qualitative research is conducted to analyze phenomena or events that occur using data obtained by researchers by direct observation and interviewing sources so that qualitative research is descriptive. Data collection in this study used observation, interview and review methods of the application of management information systems. Furthermore, using primary data in the form of interview results and written reports based on predetermined sources.

Interviews were addressed to five experienced resource persons in the Financial Services Unit and Digital Transformation Unit at XYZ Polytechnic who were involved in the implementation of MIS. The following is a list of respondents contained on Table 1.

Table 1
List of Respondents

Respondent	Position	Basis for Selection of Resource Persons
Respondent 1	Deputy Director II	<ul style="list-style-type: none"> • Served as Deputy Director for General Administration and Finance since 2020. • Serves as top management who participates and considers in making decisions on SIM with Director
Respondent 2	Head of Subdivision of Financial Services Unit	<ul style="list-style-type: none"> • The person in charge of the finance section of XYZ Polytechnic • Supervisor of the finance department of XYZ Polytechnic
Respondent 3	Financial Services Unit Staff 1	<ul style="list-style-type: none"> • Has been working for two years • User of Management Information System • The person in charge of the SIM for the staff and student affairs section
Respondent 4	Financial Services Unit Staff 2	<ul style="list-style-type: none"> • Has been working for two years • User of Management Information System • The person in charge of the SIM for the staff and student affairs section
Respondent 5	Digital transformation Unit Staff	<ul style="list-style-type: none"> • Has been working for three years • Responsible for the internet connection network and data backup on MIS

RESULTS AND DISCUSSION (Arial 10)

The instrument used by researchers is interviews, interviews using a method with a meeting to provide information and ideas to each other, so that it can become a meaning in shaping certain topics (Sugiyono, 2018). The questions asked were in accordance with the roles and functions of each

respondent. The interview focused on questions related to the three contexts of the TOE framework associated with the implementation of SIM at XYZ Polytechnic. The interview was conducted for three days with the duration according to the opportunity given by the respondent. All respondents' answers have been recorded and written into the transcripts contained in the appendix.

The results of the interviews that have been conducted will become data to evaluate the ability of XYZ Polytechnic to implement Management Information Systems (MIS) using the TOE framework consisting of contexts related to technology, contexts related to external and internal organizations.

Technology Context

According to Baker (2012) the technological context consists of all relevant technologies in relation to the organization, including technologies that are already in use internally and externally available technologies that have not yet been implemented or developed in the organization. In the technological context in the TOE framework with three attributes including; relative advantage, compability and complexity.

Ngah, Zainuddin & Thurasamy (2017) mentioned that how the relative advantage in innovating so that it can change to be more useful than the use of previous methods. Organizations may be able to implement technological innovation if it provides benefits to the organization such as improving performance and generating economic benefits (Chong & Olesen, 2017). This is in line with the answers stated by Deputy Director II, Staff user 1 and user 2, and Digital Transformation Unit staff.

"The goal of XYZ Polytechnic is to adopt and implement a Management Information System (SIM) to provide governance transparency. The information available in MIS has provided benefits to support the management of the tridharma of higher education, accounting and finance, personnel, student affairs and alumni" (RW 1, 2022).

"The management information system used at XYZ Polytechnic is currently useful for providing information on lecturer and employee salary slips, checking employee account data, information on employee groups and employee taxes, and information on student UKT (Single Tuition Fee) payment bills" (RW 3, 2022)

"The management information system used today can function as an access to information disclosure for all parties at XYZ Polytechnic, regarding salary and honorarium payments and bills. Although, all the information provided is clear and in accordance with the needs. However, some are still not informative in an up-to-date manner. So, for example, information on salary slips for lecturers and employees is still late or not according to the running time" (RW 4, 2022).

"The obstacle of less up-to-date information is indeed from the system developed by the developer, so if there are shortcomings or problems, they are usually handled immediately" (RW 5, 2022).

Based on the relative advantage attribute, so far the management information system has provided many benefits in providing appropriate data and information, this is in line with Chandra and Kumar's research (2018) that the role of the relative advantage factor of technology in influencing the adoption of augmented reality in organizations for e-commerce purposes. However, the information regarding the salary slips of lecturers and employees is not in accordance with the characteristics mentioned by Romney and Steinbart (2021), the information provided must be timely to make decisions. This needs to be improved by the developer to integrate data that matches the field so that the information can be provided in a timely manner and there are no obstacles.

Combability is the level of innovation from potential adoption so that it is consistent with business activities and values (ISO et al., 2010). Implementation of technology initiatives can be driven by technology that is more compatible with the organization's technology, processes and work application systems (Chong & Olesen, 2017). Employees of the financial services division argue that the use of SIM is still necessary and needed to make it easier to provide information to employees, lecturers and students. In addition, there are still weaknesses in the management of the Management Information System (MIS).

"The facilities, infrastructure and infrastructure provided by the developer are currently good enough in accordance with the information needs for students, employees and lecturers. For example, the finance department provides access to SPP payments, salary applications, honorarium applications, tax applications, teaching lecturer honorarium approval, teaching lecturer honorarium payments, browse lecturer attendance, bank account masters and BLU bills" (RW 3, 2022).

"For management, it needs to be improved by developers in managing salary slips which are still input manually with a different format from the civil servant salary application printout, calculating

the basic teaching rate which is accurate and timely in providing information about employee and lecturer salaries" (RW 4, 2022).

For the management of pay slips, a system that has been automatically integrated in the MIS with the same format and as needed so that staff do not repeat their work in making pay slips. Then, it is necessary to review the Basic Teaching Fee by creating hourly lecturer honorarium data according to each lecturer's status consisting of Prospective Civil Servants (CPNS), Civil Servants (PNS) and part timers, calculations that need to be regulated from the XYZ Polytechnic, and regular audits are needed so that the calculation of the Basic Teaching Fee is precise and accurate.

Complexity is how difficult or complicated it is for users to understand and use the system (Hoti, 2016). For more complex technology initiatives, employees may take longer to understand and adapt to new technology (Chong & Olesen, 2017). The research is in line with the opinions of two staff users that the use of the XYZ Polytechnic Management Information System (MIS) is still easy to use because the features are still simple, but there are things that are complicated when making employee and lecturer pay slips manually.

"The features are still simple and user friendly, and there is a menu of steps in using MIS directly so it is easy to understand in using SIM" (RW 3, 2022)

"During the process of uploading the transfer list for making employee payslips, we have to use a different format than what is usually used, so it is less efficient" (RW 4, 2022).

The Management Information System still has shortcomings in making employee pay slips in MIS by using different formats manually, so that user staff feel complicated and inefficient. On the other hand, the use of MIS with simple and user friendly features, along with a menu of steps for using MIS makes all users, both students, employees and lecturers feel quite easy to use.

According to Chong & Olesen (2017), the organizational context is based on resources, processes, structures and characteristics that facilitate and limit the adoption of technology. the quality of human resources, top management leadership, and organizational size are the factors most often discussed with the organizational context that affect innovation adoption.

The quality of human resources in the organization is related to how technical knowledge is available (Chong & Olesen, 2017), the greater the capacity of human resources available, the greater the chances of success in implementing new technology (Cooper & Molla, 2014). In addition, the tendency to use innovative technology is supported by the organization's commitment to developing the skills of its employees (Effendi et al., 2020).

"There has been training using the management information system from the developer directly, but it was only held once. We have also received the manual, both in softcopy and hardcopy" (RW 3 and RW 4, 2022).

"Maybe because the developer is also quite responsive in handling MIS problems, so it is reliable and there is no need for internal professionals. We usually only handle the internet connection network and data back up" (RW 5, 2022).

In terms of technical skills, the users have also been able to manage and use it well because they have been using it for two years. However, training needs to be held more than once, around two to four times so that all employees at XYZ Polytechnic also understand the use of SIM. At XYZ Polytechnic, there are also no internal professionals in the IT field to develop innovations and handle Management Information Systems (MIS), so they only rely on external professionals who can support to develop innovative Management Information Systems (MIS), which only require developers to create and develop Management Information Systems (MIS).

According to Chong & Olesen (2017) innovation in organizational strategy depends on the leadership role of top management in encouraging and providing facilities. In line with the results of Cooper and Molla's (2014) research which states that top management commitment is an important factor in directing and leading organizations to adopt information technology. So, top management also has an important role to play in adopting more technological innovations.

"Since 2015, it has implemented a Management Information System (MIS) from the previous Director, XYZ Polytechnic in collaboration with Gajah Mada University (UGM) called the Financial Management Information System (SIMKEU), but SIMKEU still has not many functions like the MIS currently used. Since, the change of Director, in 2021 then switched developers with Politeknik Elektronika Negeri Surabaya (PENS). Currently, SIM has many uses for academic, personnel and finance. The procurement and maintenance of this management information system is also supported by the budget owned by XYZ Polytechnic" (RW 1, 2022).

Then the Head of the Financial Services Unit Subdivision added his opinion, that the Director had provided a SIM, then since the change of the new Director the SIM has continued to be developed and updated by PENS as a new developer in 2021. Currently, XYZ Polytechnic is also planning to fix deficiencies in MIS with other developers.

"We are constantly trying to evaluate the implementation of the Management Information System (MIS). Always try to follow the developer's progress too, if there are still shortcomings that have not been fixed by the developer and maintenance costs are not affordable. So, we keep trying to find a better developer. We are currently planning to choose and switch to another developer so that the MIS can develop even better" (RW 2, 2022).

This is in accordance with PP No. 23 of 2005 article 32 states that BLU financial officials function as financial responsible persons who are obliged to organize financial management information systems and performance reports of XYZ Polytechnic, the Director has the duty and authority to organize a reliable information and communication technology-based management information system so as to support the management of tridharama universities, accounting and finance, personnel, student affairs and alumni. Also, the availability of a management information system through the XYZ Polytechnic website to achieve transparency or openness of governance means that information related to governance can be accessed by XYZ Polytechnic stakeholders based on Information and Communication Technology (ICT).

Less flexible structures and bureaucratic inertia are usually possessed by organizations of larger size, so they will experience more in the acceptance and application for technological change (Damanpour, 2010). Conversely, smaller size organizations may find it easier to facilitate the use of innovations with less bureaucratic inertia and simpler and less complex structures, making communication and coordination easier (Chong & Olesen, 2017).

The research is in line with the facts found at XYZ Polytechnic, that a direct decision from upper management, namely one director with the considerations of several Directors to replace new developers in creating and developing Management Information Systems (MIS). In the organizational structure and work procedures of the XYZ Polytechnic there is only one Director and four Deputy directors. So, the bureaucracy and organizational structure is not too complicated like a public company.

"For bureaucracy regarding the optimization of management information systems, it usually only needs consideration from the Director and Deputy Director with the developer directly" (RW 1, 2022).

However, there are only two staff members managing the Management Information System (MIS). These staff argue that there is a need for additional manpower to help manage employee and lecturer payslips.

"There are only two staff who manage and use MIS, but we also need additional labor to help us complete the employee and lecturer pay slips. Where the salary slip input must be input manually with a different format in the Management Information System (MIS)" (RW 3 and RW 4, 2022).

"If the user staff feel overwhelmed in using MIS due to lack of manpower, then we will recruit more as needed" (RW 2, 2022).

The bureaucracy to make decisions in adopting management information systems to improve innovation still has little bureaucratic inertia because it only needs consideration from the Director and several Deputy Directors. However, in managing the management information system in the financial services unit, it is necessary to have additional user staff to handle each management information system service, where there are nine financial section services consisting of SPP payments, salary applications, honorarium applications, tax applications, approval of teaching lecturer honoraria, browse lecturer attendance, master bank accounts and Host to Host (H2H) bills.

According to Chong & Olesen (2017), in the environmental context, industry characteristics and regulatory factors are the dominant factors that influence the adoption of a technology. Companies in a rapidly growing industry tend to innovate faster.

In previous research, namely Chong & Olesen's research (2017), industry characteristics include pressure from business partners and competitive pressure. XYZ Polytechnic as a university, of course, has quality competition in education with other universities to improve its performance. To support in improving this quality also requires good management. So, the hope of the two staff users is that the quality increases and efficiency in using MIS is better, such as creating employee and lecturer salary slip data automatically on the XYZ Polytechnic SIM website, accurate calculation of the Basic Teaching Fee (TDM) and timely information about employee and lecturer salary slips.

"It is expected that the MIS application can provide actual and interconnected information". (RW 3 and RW 4, 2022).

"Hopefully, MIS can innovate and be used optimally and can meet the needs of services at XYZ Polytechnic" (RW 1, 2022).

Regulatory support is a major influential factor in the environment, such as the existence of government regulations that can prevent or trigger organizations to adopt technological innovation (Effendi et al., 2020). The provision and use of Management Information Systems (MIS) has been regulated by the government with Government Regulation number 23 of 2005 article 25 that BLU implements a financial management information system in accordance with the needs and sound business practices. Article 32 also states that BLU financial officials function as financial responsible persons who are obliged to organize financial management information systems. This was stated by Deputy Director II

"Government regulations already exist regarding the implementation of Management Information Systems in Government Regulation number 23 of 2005 articles 25 and 32. So, XYZ Polytechnic as a BLU category university continues to provide a Management Information System (MIS) and work with developers to develop it further" (RW 1, 2022).

Then, internal regulations are also clarified by the Head of the Financial Services Unit Subdivision regarding the Management Information System (MIS) in the XYZ Polytechnic Performance Report and plans to make a Standard Operating Procedure (SOP) regarding the use of MIS.

"The purpose of providing and the authorized party to provide the Management Information System (MIS) has also been included in the XYZ Polytechnic Performance Report. We are also planning and drafting an SOP for the use of MIS" (RW 2, 2022).

The hope is that the making of the SOP can become a guideline and reference or regulation for carrying out operational activities of the management information system in accordance with functions and responsibilities, and minimize the risks and problems that occur.

CONCLUSIONS AND SUGGESTION

In the context of technology, it is necessary to improve the technical problems of the MIS in the adjusted Basic Teaching Tariff, and to audit it regularly. The format of employee payslips needs to be synchronized to the automatic civil servant salary application printout, as well as information in the SIM to be integrated in an actual and timely manner. For the organizational context, top management support from the Director and Deputy Directors with uncomplicated bureaucratic inertia is very important to make decisions and policies in developing and improving the MIS, as well as additional user staff needed for all financial services on the MIS. Training in the use of MIS is sufficient for the needs of all employees in understanding data management in SIM. Based on the evaluation of the environmental context, it is hoped that XYZ Polytechnic can improve operational quality in MIS financial services to improve performance. The existence of Government Regulation number 23 of 2005 articles 25 and 32 can encourage XYZ Polytechnic to comply with the implementation and implementation of implementing MIS. In addition, XYZ Polytechnic immediately completes the preparation of the SOP so that MIS operations become organized and prevent the risk of problems that will occur.

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