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DIGITAL TRANSFORMATION IN HIGHER EDUCATION THROUGH THE IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING

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ABSTRACT

Digital transformation through the implementation of Enterprise Resource Planning (ERP) is a strategic step for universities in improving operational efficiency and the quality of academic services. ERP integrates administrative and academic functions into a unified platform, enabling more effective and efficient information management. However, the ERP implementation process is faced with various challenges, including resistance to change, budget constraints, and a lack of technical skills among users. This research aims to analyze the process and key factors for the success of ERP implementation in higher education, focusing on a case study in one of the private universities in West Sumatra. Qualitative methods were used with in-depth interview techniques, observation, and documentation to gain in-depth insight into the experiences and challenges of ERP implementation. The research results show that ERP implementation at universities involves planning, preparation, and gradual stages, which include needs assessment, module selection, socialization, and technical training. This phased approach helps manage risk and ensure the success of each phase. The implementation process has had a significant positive impact on operational efficiency and service quality at the university. Process automation, data integration, and faster access to information provide immediate benefits for administrative staff and students. A well-planned and coordinated ERP implementation is key to maximizing the benefits of the new system and improving the university's overall operational efficiency. This research provides valuable insights for other educational institutions planning to carry out digital transformation through ERP implementation.

Keywords: *Digital Transformation, Higher Education, Enterprise Resource Planning (ERP), and ERP Implementation*

ABSTRAK

Transformasi digital melalui implementasi *Enterprise Resource Planning* (ERP) merupakan langkah strategis bagi perguruan tinggi dalam meningkatkan efisiensi operasional dan kualitas layanan akademik. ERP mengintegrasikan fungsi administratif dan akademik ke dalam platform yang terpadu, memungkinkan pengelolaan informasi yang lebih efektif dan efisien. Namun, proses implementasi ERP dihadapkan pada berbagai tantangan, termasuk resistensi terhadap perubahan, keterbatasan anggaran, dan kurangnya keterampilan teknis di kalangan pengguna. Penelitian ini bertujuan untuk menganalisis proses dan faktor kunci keberhasilan implementasi ERP di perguruan tinggi, dengan fokus pada sebuah studi kasus di salah satu perguruan tinggi swasta di Sumatera Barat. Metode kualitatif digunakan dengan teknik wawancara mendalam, observasi, dan dokumentasi untuk mendapatkan wawasan mendalam tentang pengalaman dan tantangan dalam implementasi ERP. Hasil penelitian menunjukkan bahwa implementasi ERP di universitas melibatkan perencanaan, persiapan, dan tahapan bertahap yang mencakup assessment kebutuhan, pemilihan modul, sosialisasi, dan pelatihan teknis. Pendekatan bertahap ini membantu mengelola risiko dan memastikan keberhasilan setiap fase. Proses implementasi telah membawa dampak positif yang signifikan terhadap efisiensi operasional dan kualitas layanan di universitas. Automasi proses, integrasi data, dan akses informasi yang lebih cepat memberikan manfaat langsung bagi staf administratif dan mahasiswa. Implementasi ERP yang terencana dan terkoordinasi dengan baik merupakan kunci untuk memaksimalkan manfaat dari sistem baru dan meningkatkan efisiensi operasional universitas secara keseluruhan. Penelitian ini memberikan wawasan berharga bagi institusi pendidikan lain yang berencana melakukan transformasi digital melalui implementasi ERP.

Kata Kunci: Transformasi Digital, Perguruan Tinggi, *Enterprise Resource Planning* (ERP), Implementasi ERP

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1. INTRODUCTION

Digital transformation has become an urgent need in various sectors, including higher education. In the era of globalization and rapid technological development, universities are required to adapt to information technology to improve operational efficiency, service quality, and competitiveness. One solution implemented to achieve this goal is an Enterprise Resource Planning (ERP) system. ERP systems integrate various administrative and academic functions into one unified platform, enabling more effective and efficient management of resources and information. According to Magal & Word (2011), an ERP system is software that allows organizations to manage their business with an integrated approach. ERP includes various modules that can be tailored to an organization's specific needs, such as finance, human resources, inventory management, and others. ERP implementation in higher education is expected to unify various separate systems and improve coordination between departments to create a more efficient and transparent workflow (Mansor & Bahari, 2010).

Higher education institutions face various challenges in the ERP implementation process. Rizkiana, Ritchi, & Adrianto (2021) identified that ERP implementation often faces complex technical and organizational obstacles. In a higher education environment, this challenge can be more difficult because it involves various stakeholders with diverse needs, such as lecturers, students, administrative staff, and management. Apart from that, universities must also consider unique aspects in the academic context, such as academic data management, student financial administration, and academic support services.

One relevant study was conducted by Botta-Genoulaz & Millet (2006), which examined the use of ERP systems in the service sector, including education. Their research shows that although ERP can provide significant benefits, successful implementation depends heavily on careful planning, management commitment, and user involvement. An organization's readiness to adopt new technology and change traditional work processes is a key factor in successful implementation (Siska, Bahari, Handra, & Febrianto, 2020). In the context of higher education, this means the importance of full support from the rectorate as well as active participation from the entire academic community in the implementation process.

Digital transformation through ERP implementation in higher education not only has an impact on operational efficiency but can also improve the quality of academic services. Almajali, Masa'deh, & Tarhini (2016) show that implementing ERP can improve the quality of information available to management, which in turn can support better and more strategic decision-making. With an ERP system, universities can utilize data more effectively for academic planning, budget management, and improving services to students.

In Indonesia, several universities have started to adopt ERP systems as part of their digital transformation initiatives. However, this implementation still faces various obstacles, including budget limitations, resistance to change, and a lack of technical skills among staff (Hazam, Mansor, & Bahari, 2019; Rizkiana *et al.*, 2021). Therefore, this research aims to analyze the digital transformation process in higher education through ERP implementation, identify the challenges faced, and determine the key success factors.

By understanding the process and challenges of implementing ERP in higher education, it is hoped that it can provide valuable insight for other educational institutions that are planning to carry out digital transformation. We hope that this research's findings will serve as a useful

roadmap for planning and executing ERP implementation, enabling universities to enhance their operational efficiency and service quality.

2. LITERATURE REVIEW

Digital Transformation in Higher Education

Digital transformation is the process of adopting digital technology to create or modify business processes, culture, and customer experiences to meet changing business and market needs. Magal & Word (2011) explain that digital transformation involves the use of digital technology to solve traditional problems. Some of the technologies involved in digital transformation include virtualization, mobile computing, cloud computing, and organizational systems integration (Loonam, Eaves, Kumar, & Parry, 2018). In the era of digital transformation, small companies can use modern ERP systems such as Cloud ERP and mobile ERP. This system helps reduce the costs of maintaining servers, hardware infrastructure, and other required software (Picek, Mijac, & Androcec, 2017).

In the context of higher education, digital transformation includes the application of information and communication technology (ICT) to improve teaching and learning processes, administration, and services to students and staff. This involves the integration of technology in various aspects of higher education operations, from student registration to financial and human resource management (Bhat, 2021).

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is a software system designed to integrate and manage all main business processes in an organization in an integrated manner. ERP systems combine various business functions into one integrated platform, enabling consistent and real-time information flow across departments and business units (Anggraeni & Andini, 2017). Rizkiana *et al.* (2021) state that ERP is a system that facilitates the smooth and coordinated flow of information throughout an organization, from finance to human resource management, production, and logistics.

According to Pollock & Cornford in Anardani (2012), ERP in higher education is used to replace existing management and administration systems, with a focus on developing, implementing, and utilizing higher education functionality. The purpose and role of ERP in an organization is to coordinate the entire organization's business. ERP is software used in organizations or companies to: 1) automate and integrate many business processes; 2) share a common database and business practices across the company; 3) generate real-time information; and 4) integrate transaction processes with planning activities (Al-Amin, Hossain, Islam, & Biwas, 2023).

ERP Implementation in Higher Education

ERP implementation in higher education involves the integration of administrative and academic functions, including student registration, financial management, and human resource management. Margareth (2013) emphasizes the importance of collaboration between business, technical, and user experts in the success of ERP projects. An implementation team involving the best human resources from a company or institution plays a key role in supporting innovation and creativity.

ERP implementation requires strong support from top management (Al-Amin *et al.*, 2023; Bahari, Yonnedi, & Djunid, 2015). This support is essential for identifying projects as top priorities and ensuring the necessary commitment from the entire organization. ERP adjustments should be avoided whenever possible because they can increase implementation costs, extend implementation time, and reduce the benefits of maintaining and

upgrading the vendor's software (Margareth, 2013).

Case studies in various universities show that ERP implementation can significantly increase operational efficiency and effectiveness (Almajali *et al.*, 2016). However, this implementation is also faced with various challenges that need to be overcome to achieve success. Implementing ERP in higher education is a strategic step to deal with the complexity of business legacy and improve overall system integration, with the ultimate goal of supporting operational and academic excellence.

3. RESEARCH METHOD

Research Design

This research uses a qualitative approach with a case study method to understand in depth the digital transformation process in higher education through ERP implementation. This approach was chosen because it allows for in-depth exploration of the processes and experiences of research subjects (Harahap, 2020), who are universities that have adopted ERP systems. Qualitative methods are suitable for uncovering complexities and nuances that cannot be explained quantitatively, providing a holistic picture of ERP implementation.

The case study approach was chosen as the main method in this research. This method allows in-depth analysis of one or several examples in a real-life context (Yin, 2018). In the context of this research, case studies will provide insight into ERP implementation at certain universities. This study will reveal the challenges, obstacles, and factors that lead to successful ERP implementation in educational institutions.

Research Locations and Informants

This research was conducted at a private university in West Sumatra, which has implemented an ERP system. The selection of informants was based on purposive sampling with key technical personnel, including university management, the IT team, lecturers, and administrative staff involved in the ERP implementation process.

Data Collection

Data collection is a crucial step in research to obtain the information needed to answer research questions (Creswell & Creswell, 2017). In this study, data was collected through three main methods: in-depth interviews, observation, and documentation.

- In-depth Interview

In-depth interviews are a data collection technique that involves face-to-face conversations between researchers and respondents (Sekaran & Bougie, 2016). This interview was designed to explore in-depth and detailed information regarding the respondents' experiences, perceptions, and views regarding ERP implementation.

- Observation

Observation is a data collection method in which researchers directly observe the implementation process and use of ERP systems in higher education. This method helps researchers understand the real context and dynamics in the field (Sekaran & Bougie, 2016).

- Documentation

Documentation is a data collection method that involves collecting and analyzing documents related to ERP implementation. This document provides written evidence that supports findings from interviews and observations (Sekaran & Bougie, 2016).

Data Analysis

Data analysis is an important stage in research to interpret the data that has been collected. In this research, data analysis was carried out using thematic analysis to identify main patterns and themes related to the process, challenges, success factors, and impact of ERP implementation in higher education.

Thematic analysis is a qualitative analysis method used to identify, analyze, and report patterns (themes) in data. This approach allows researchers to organize rich and complex data into meaningful and understandable themes (Nowell, Norris, White, & Moules, 2017).

4. RESULTS AND DISCUSSION

This research was conducted at a private university in West Sumatra from April to June 2024. To obtain accurate results, researchers used direct interview techniques with informants, documentation, and field observations. Interviews were conducted with 5 informants from university management, 3 IT teams, 2 informants from lecturers, and 2 informants from administrative staff. During the interview, the researcher used various tools, such as a MacBook, a voice recorder (smartphone), and a list of interview questions that had been prepared to answer the research problem formulation.

Digital Transformation Process Through ERP Implementation

Based on the results of interviews and observations, the digital transformation process at one of the private universities in West Sumatra through ERP implementation involves several main stages. This is reflected in interview quotes with several informants from university management, the IT team, and administrative staff as follows:

- **Planning and Preparation**

"The ERP implementation process at universities begins with a comprehensive needs assessment to identify the university's specific needs. We conducted an in-depth evaluation of all operational aspects, including interviews with academic and administrative staff, data collection on existing processes and systems, and analysis of problems and opportunities for efficiency improvements."

"After the needs are identified, the next step is selecting the appropriate ERP module to support these processes, such as management of new student admissions, registration and class schedules, finance, and libraries."

"Socialization is the next stage to introduce the ERP system to all members of the academic community through seminars, workshops, and presentations. We also provide technical training to the IT team and end users to ensure they are comfortable and skilled in using the new system."

- **Implementation**

"The ERP implementation process at universities begins with system installation and configuration. We perform hardware and software installation as well as initial testing to ensure all components are functioning properly."

"After installation, we configure the system according to the university's needs, including financial arrangements, student management, and class schedules. We also migrated data from the old system to the new ERP by minimizing risks and ensuring data integrity."

"Verification and validation are carried out to ensure data integrity and consistency. We also test the main functions of the ERP system to ensure its operation meets expectations, as well as carry out checks to ensure data across all modules is consistent and aligned."

- **Testing and Launching**

"The system testing process begins with the main objective of validating that all ERP modules are functioning optimally. We perform functionality, system performance, security, and data alignment testing to ensure fast and efficient response and good data protection."

"The launch of the ERP system was carried out in stages, starting with the most crucial modules such as student management, finance, and class schedules. This phased

approach allows us to focus on each module separately and provide continued training to end users once the modules are launched."

Based on interviews with informants, it can be seen that information regarding the digital transformation process in higher education through ERP implementation is going well through careful planning and preparation, careful implementation, as well as systematic testing and launch. All of these stages ensure that the ERP system functions optimally and supports university operations efficiently and effectively.

Challenges Faced

To answer the problem of "several main challenges faced during the ERP implementation process at a private university in West Sumatra," researchers conducted interviews with 5 informants from university management, 3 IT teams, 2 informants from lecturers, and 2 informants from administrative staff. This is reflected in interview quotes from several respondents, as follows:

- **Resistance to Change**

"At universities, we often face resistance to adopting ERP systems because we are used to old systems. Some staff doubted the benefits and effectiveness of the new system and were concerned about disruptions to their routines."

"One of the main obstacles is the lack of technical skills among staff and lecturers. Many are unfamiliar with new technology and feel less confident. To overcome this, we provide comprehensive training so they can operate the ERP system effectively."

"A communicative and persuasive approach is very important. We demonstrated concretely how an ERP system can improve the university's operational and service efficiency, which helped convince them of the benefits of the change."

- **Budget Limitations**

"Implementation of an ERP system faces high cost challenges, especially for purchasing hardware such as servers and network infrastructure. Apart from that, there are additional costs for using consultants or vendors to help with the system implementation and configuration process."

"After implementation, universities must consider the costs of maintaining the ERP system, including technical support, software updates, and system security. These costs may vary depending on the complexity of the system."

"Once implementation is complete, timely and effective technical support is critical. This includes help in resolving day-to-day problems and answering questions regarding system use. Further training is also important to increase user understanding."

Based on interviews with informants, it can be concluded that the main challenges faced by one of the private universities in West Sumatra in implementing ERP at this university include resistance to change and budget limitations. With a communicative approach, comprehensive training, and adequate technical support, universities can overcome these challenges and ensure the ERP system functions optimally to improve operational efficiency and university services.

Factors for Successful ERP Implementation

To answer "factors that contribute to the success of ERP implementation at a private university in West Sumatra," researchers conducted interviews with 5 informants from university management, 3 IT teams, 2 informants from lecturers, and 2 informants from administrative staff. This is reflected in interview quotes from several respondents, as follows:

- **Management Support**

"Full support from the rectorate and university management is the main key to

the success of ERP implementation. A strong commitment involves the allocation of adequate resources, both financial and human, as well as active support in overcoming obstacles during the implementation process."

"Effective project leadership is critical to overcoming technical and organizational challenges. The project team is experienced in information technology implementation and understands university operations to help ensure the implementation process runs smoothly."

- **User Engagement**

"Active participation from the entire academic community is very important in every stage of ERP implementation. Starting from initial planning to the implementation process, opinions and input from end users must be taken into serious consideration."

"Ongoing training programs are key to increasing ERP acceptance and use. This training covers various aspects, from basic usage to advanced features of ERP modules used in universities."

- **Careful Planning**

"A detailed implementation roadmap is essential. This roadmap includes preparation stages, module selection, installation and configuration, data migration, system testing, gradual rollout, and post-implementation support."

"Evaluation and monitoring serve as important tools to monitor the progress of ERP implementation. This involves regular reviews of milestone achievements and team performance, as well as budget expenditures to ensure that implementation is progressing according to plan."

From the results of interviews with informants, it was revealed that several successful ERP implementations at this university were supported by factors such as strong management support, active involvement of all users, and careful planning. With a structured and comprehensive approach, universities can overcome emerging challenges and ensure the ERP system functions optimally to improve operational efficiency and educational services.

Impact of ERP Implementation on Operational Efficiency and Service Quality

The implementation of ERP has been fully effective in improving operational efficiency and service quality, as can be seen from the results of interviews with several informants at a private university in West Sumatra.

Operational Efficiency

"ERP systems enable the automation of many administrative processes, such as financial management, student management, and staff payroll. This saves time and reduces the risk of errors such as double data entry."

"The integration of organizational functions on one platform facilitates unified data access across all departments. Better collaboration and more timely decision-making can be achieved thanks to comprehensive data integration."

Service Quality

"The ERP system improves the quality of service to students with a faster and more structured registration and payment process. Easy access to academic information such as class schedules and transcripts also becomes more efficient."

Based on the results of interviews with informants, it can be seen that the implementation of an ERP system at universities brings significant benefits in operational efficiency and increased service quality. With comprehensive process automation and data integration, universities can optimize resources and provide better services to all stakeholders, including students and university staff. Centralized data integration enables better decision-making and is responsive to the

strategic needs of universities in supporting their educational vision and mission.

5. CONCLUSIONS AND SUGGESTIONS

Conclutions

Implementing an ERP system at a private university in West Sumatra involves various important stages to achieve successful digital transformation. Based on the results of interviews and observations, several conclusions that can be conveyed:

- The ERP implementation process begins with careful planning and preparation. These steps include needs assessment, module selection, outreach, and comprehensive technical training to ensure that the entire academic community is ready to adopt the new system.
- ERP implementation is carried out in a phased manner, starting from hardware installation, configuration, data migration, and the sequential launch of modules. This approach helps in managing risk and ensures that each phase can be completed successfully before moving on to the next stage.
- ERP implementation has had a significant positive impact on operational efficiency and service quality at the university. Process automation, data integration, and faster access to information provide direct benefits for both administrative staff and students.

As a reference to increase understanding and knowledge of management information systems and accounting, especially in the ERP context.

Suggestions

In facing the challenges of implementing an ERP system in a university environment, there are several relevant suggestions to consider.

- First, it is important to adopt a strong communicative approach to overcome resistance to change. This can be done by providing concrete evidence and live demonstrations of how ERP can improve operational efficiency, as well as winning support from staff and lecturers.
- Furthermore, investment in comprehensive technical training for administrative staff, lecturers, and students is key. This training must cover basic aspects of system use as well as advanced features that support optimal use of ERP.
- Effective and transparent budget management is also a priority, with careful planning to ensure sufficient resources for the implementation and long-term maintenance of the ERP system.
- Continuous evaluation and monitoring of system performance as well as user response is important to identify necessary improvements and further increase efficiency.

Continuous support from management and the university rectorate is also crucial, with a strong commitment to supporting digital transformation and the allocation of adequate resources to overcome obstacles that may arise in the implementation process.

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