



Analysis of the Role of Accountants in the Development of Enterprise Resource Planning Systems in the Era of Industrial Revolution 4.0

Dave Dominic Panglewai^{1*}, Aini Indrijawati², Rahmawati³, Grace T. Pontoh⁴

¹Accounting Firm Public Drs. Thomas, Blasius, Widartoyo & Partners

^{2,3,4}Department of Accounting, Faculty Economics and Business, Hasanuddin University

Corresponding Author: Dave Dominic Panglewai davepanglewai@gmail.com

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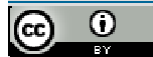
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ABSTRACT

This study aims to analyze the role of accountants in the development of ERP systems in the 4.0 era. Accountant roles as strategist, ERP expert, IT expert and communicator. This study uses qualitative methods with data collection techniques, namely interviews. Data validation was checked using the triangulation method. The research results show that (1) the role of the accountant as a strategist functions to review the company's system and then develop a strategy for the development of the company's system; (2) the accountant's role as an ERP expert serves as a monitor that oversees and controls the company's systems; (3) the role of the accountant as an IT expert serves to provide accounting data information in the company's system; (4) the role of accountants as communicators does not have much effect because they have been replaced by artificial intelligence functions in company system applications

INTRODUCTION

The Era of Industrial Revolution 4.0 (IR 4.0) conceptualizing rapid changes in technology, industries, and patterns as well as societal processes in the 21st century because of the increasing interconnectivity and smart automation. Industry 4.0 is reshaping legacy systems and traditional software application by integrating next-generation technologies such as artificial intelligence, internet of things, and cloud computing. Therefore, it becomes more important to align company systems in compliance with industry 4.0 standards to remain viable in the years to come. The best way to achieve this is to upgrade the existing Enterprise Resource Planning (ERP) system with the integration of the latest technology.

LITERATURE REVIEW

ERP systems solve business problems by reducing manual complexity and providing control over business processes. The use of Industry 4.0 technologies in ERP systems will enable organizations to gain better visibility into manufacturing processes and supply chain activities. Additionally, ERP systems can optimize their logistics operations, improve inventory tracking, and efficiently manage their workforce with automated resource planning. Accountants use ERP systems to make the job of reviewing company financial reports easier.

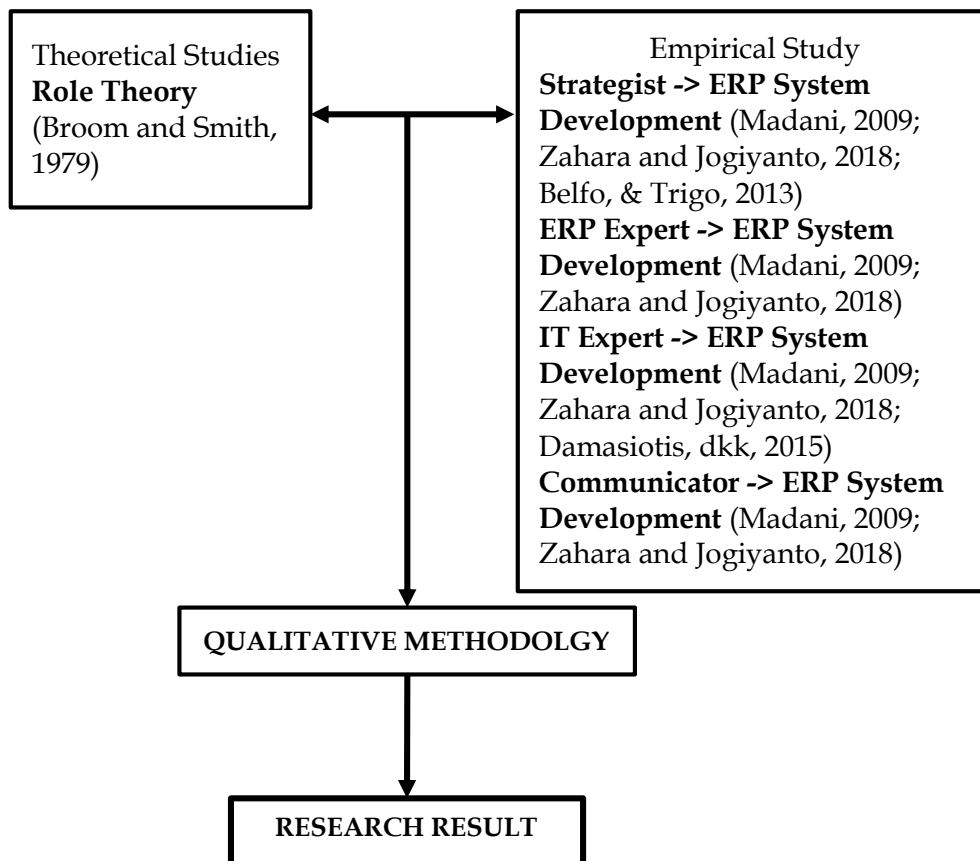
Hall (2016, p.60) suggests that one of the roles of accountants is as a system designer. The accountant plays an important role in the system development team as an expert. Regarding this matter, accountants are responsible for aspects of the conceptual system related to certain operational rules, such as requirements, reporting and achieving internal control objectives that the system must achieve.

Madani (2009) conducted a literature review to develop a theoretical framework that helps examine the role of internal auditors in ERP-based companies. The results illustrate that the ERP system requires new relationships with internal auditors and five groups related to software vendors, information systems, information technology managers, ERP users and consultants. The role of internal auditors is divided into strategists, ERP experts, information technology (IT) experts, and communicators. Strategists are involved in strategic planning and organizational decision making. They develop an understanding of business process reengineering with users including management and facilitate the work of consultants. ERP experts evaluate ERP system control features and assess current and future risk exposure. They also highlight the importance of soft controls and delegating control accountability. IT experts update and unify terminology to take advantage of the integrated nature of ERP systems. They share skills, knowledge, and ideas with IS/IT management. Communicators maintain relationships between all parties throughout the organization and facilitate the implementation of audit controls with users, as well as with consultants from outside the company.

Zahara and Jogiyanto (2018) refers to research by Madani (2009) who conducted case study research at PT Perkebunan Nusantara XI which analyzed the role of internal auditors at the planning and implementation stages of the ERP

system. Okab & Al-Oqool (2014) and Saeidi et al. (2015) have conducted research on the role of accountants in accounting information systems. Okab & Al-Oqool (2014) explained that accountants play a role in the planning and analysis stages, design stages, and implementation and evaluation stages of developing E-Accounting information systems at banks in Jordan. Saeidi et al. (2015) also explained that accountants play a role as users, designers and auditors of the systems used by companies. There is still little previous research that analyzes the role of accountants/auditors specifically in ERP systems.

This research will analyze the development of the ERP system at PT Semen Tonasa by referring to the research of Madani (2009) and Zahara and Jogiyanto(2018) using the interview method with two accountants as informants in this research. The aim of this research is to analyze the following roles of accountants. 1) The role of accountants as strategists in developing ERP systems. 2) The role of accountants as ERP experts in developing ERP systems. 3) The role of accountants as IT experts in ERP system development. 4) The role of accountants as communicators in ERP system development.



Picture 1. Conceptual Framework

METHODOLOGY

This study uses a qualitative research approach. Qualitative research can be used to understand how individuals subjectively perceive and give meaning to their social reality. The data used in this research is primary data, namely data obtained directly from the research object through interviews with selected informants. According to Moleong (2013) an interview is a conversation with a specific purpose. The conversation is carried out by two parties, namely the interviewer who asks questions and the interviewee who provides answers to those questions. The research was conducted at PT Semen Tonasa which is one of the ERP-based subsidiaries of the Semen Indonesia Group and located in South Sulawesi. The informants for this research were 2 accountants, namely, Mrs. S and Mr. A who were interviewed in 2022.

RESULT

The results of the interview with Mrs. S and Mr. A provide an opinion that is in line with previous researchers that

(1) The role of accountants as strategic experts in developing ERP systems is to help top level management to make decisions from the information collected.

Mrs. S's opinion said:

"The role of accountants is to be the front line in determining the quality of the system implemented so that it has the ability to produce trustworthy and reliable financial reporting. "The system is also required to ensure the reliability and validity of transactions that occur in the company's business processes."

Mr. A also gave an opinion saying:

"Planning and control functions are also used in developing targeted strategies to make them more predictable."

(2) Mentioned by Mr. A, accountants have a role as those who prepare implementation materials and then as those who supervise the system to be controlled so that the functions in the system are not chaotic.

Mr. A's opinion reads:

"The role of accountants in the ERP field needs to ensure the concept and mapping of master data, which is related to the chart of accounts. At the start of implementing a new system, it is necessary to ensure integration and master data. Then after implementation, the accountant functions as a supervisor or in other words monitors the process, and also serves as an information analyst and data provider. These functions are useful for strengthening control over system processes which are useful for providing data for the company."

(3) Mrs. S's statement is in line with Madani's (2009) statement that accountants need to enter the world of information technology in more depth, not just financial reports on paper.

Mrs. S said

"Accountants need to be more aware of technological developments, especially in an era that requires knowledge in reading system analysis. The Industrial Revolution 4.0 also revolves around the concept of big data and the Internet of Things as a place for circulation of circulating information

data. As a result of developments over time, the public also has a high desire to be aware of a company's climate impacts and demands continued responsibility for this demand for environmental care. So, from aspect 4.0, digitalization of the provision of company system data regarding financial disclosures that affect the environment (climate) is required."

(4) From the interview conducted with Mrs. S and Mr. A, there was a conclusion that artificial intelligence from SAP S/4HANA had become a communication mediator for parties who needed information.

Mr. A said:

"...the function of accounting is only monitoring, no more journals or anything like that, ensuring that all processes that are set up from the start are reflected in the data processed in the account, both in the balance sheet and TML..."

"...the role of accounting will be important... being an integrator, the integrator ensures that all functions in the company are connected to one another, including accounting and finance."

And, Mrs. S said:

"And the role of the accountant is always on the front line to always determine how the quality of the system can truly deliver financial reporting that is backed up with reliability, trustworthiness and reliability of the system to then always ensure that the transactions are valid or reliable."

DISCUSSION

The discussion is divided into four parts according to the issues raised, namely (1) the role of accountants as strategic experts, (2) the role of accountants as ERP experts, (3) the role of accountants as IT experts, and (4) the role of accountants as communicators. The discussion description is based on the results of research interviews based on the role theory of Broom and Smith (1979) and research by Madani (2009) and Zahara (2018).

The Role of Accountants as Strategists in ERP System Development

The role theory explained by Broom and Smith (1979) is the role of the Expert Prescriber which is described as an individual who has all the important information in the organization to analyze the situation that occurs so that he can then provide a solution to the situation. In Hall (2016, p.573), the role of accountants (auditors) in the field of organizational strategy is to review the work of systems that are not effective in terms of costs, and the risks that can occur. Madani (2009) and Zahara & Jogiyanto (2018) suggest that an internal auditor who functions as a strategist needs to provide top level management with advice that helps management to set their company objectives, develop an understanding of business process reengineering with users including management, and facilitate the work of consultants. According to Belfo and Trigo(2013), there is a change in the obligations of the accounting profession from traditional accounting operations to guiding and supporting strategic management from the results of a study conducted by CIMA (Chartered Institute of Management Accountants) in 2010.

The results of the interview with Mrs. S and Mr. A provide an opinion that is in line with previous researchers that the role of accountants as strategic experts in developing ERP systems is to help top level management to make decisions from the information collected.

Mrs. S's opinion said:

"The role of accountants is to be the front line in determining the quality of the system implemented so that it has the ability to produce trustworthy and reliable financial reporting. "The system is also required to ensure the reliability and validity of transactions that occur in the company's business processes."

Mr. A also gave an opinion saying:

"Planning and control functions are also used in developing targeted strategies to make them more predictable."

Based on the explanation above, the role of the accountant as a strategist in the development of the ERP system in the company, is to review the flow of the system so that the system runs effectively so as not to produce risks such as unnecessary/necessary additional costs, defects in transactions entered into. system, and the system can properly produce financial reports desired by those who need them (such as managers, company directors and shareholders). The results of the review can be used as a reference for further development of the company system, where accountants play a role in calculating the benefits and costs of this development which are prepared in a company strategic plan.

The Role of Accountants as ERP Experts in ERP System Development

Broom and Smith's (1979) Problem-Solving Process Facilitator role theory explains that the consultant's role can only be effective when the consultant and customer are directly involved in the consultation process activities. Hall (2016, p.573) states that an accountant needs to recognize the control implications of each alternative plan and ensure accounting conventions and understand legal requirements. Hall also stated that the system implemented must be auditable. Madani (2009) and Zahara (2018) stated that as ERP experts, internal auditors are needed to ensure that the ERP system compromises internal control mechanisms. ERP experts evaluate the control features of ERP systems and assess current and future risk exposure. They also demonstrate the importance of soft control and delegating accountability from control. Therefore, as ERP experts, internal auditors should be involved at an early stage in the planning process for the implementation of any ERP system.

As mentioned by Mr. A, accountants have a role as those who prepare implementation materials and then as those who supervise the system to be controlled so that the functions in the system are not chaotic.

Mr. A's opinion reads:

"The role of accountants in the ERP field needs to ensure the concept and mapping of master data, which is related to the chart of accounts. At the start of implementing a new system, it is necessary to ensure integration and master data. Then after implementation, the accountant functions as a supervisor or in other words monitors the process, and also serves as an information analyst and data provider. These functions are useful for

strengthening control over system processes which are useful for providing data for the company."

Based on this explanation, it can be concluded that the role of accountants as ERP experts in developing ERP systems in companies is as monitors to have control power over the systems being implemented. The system development life cycle has five phases, namely planning, system analysis, design, implementation and maintenance.

- (1) The accountant concerned at the system planning stage to determine the application scope of the company system. Therefore, the system implemented must have the capacity to be auditable, in order to produce a report that can be reviewed.
- (2) In the analysis stage, the accountant's role is to analyze the current system, then plan the development of a new system from the results of this analysis.
- (3) The role of the accountant at the design stage is not as big as at other stages where the accountant only supervises the design of the company system carried out by the individual concerned.
- (4) In the implementation stage, accountants play an important role due to system changes replacing the old system with a new one, where accountants must adapt to changes that will occur in the company's financial reports after implementation.
- (5) The system maintenance stage includes the processes necessary to ensure the continuity, smoothness and improvement of the system that has been operated. In this stage, accountants act as observers to control the maintenance of company systems.

The Role of Accountants as IT Experts in ERP System Development

The theory of the role of the Technical Services Provider by Broom and Smith (1979) is explained as a relationship between a consultant who has public expertise and a customer in which the customer can carry out other activities and wait for the results of the consultant's work, then will become the recipient who will evaluate the solution offer made by the consultant. In Hall (2016, p.573) accountants are also involved in system development. The involvement of accountants in system development is closely related to the development of accounting information systems, and several external aspects related to accounting. Madani (2009) and Zahara (2018) stated that an internal auditor also plays a role in the organization as an IT expert. There may be difficulty in obtaining accountants with broad information technology skills. However, a substantial understanding of these technical requirements will enhance the accountant's role in implementing ERP. Internal auditors help IT experts to develop reliable systems, which can produce highly reliable information quickly.

Damasiotis et al. (2015) stated that the accounting profession has been expected to have expertise in the IT field since the 1990s with knowledge such as a) spreadsheets, b) database management systems, c) telecommunications, d) accounting systems, e) system development, and f) other IT topics. In Damasiotis' research, the International Federation of Accountants (IFAC) stated that an accountant is expected to be able to carry out the following roles throughout his

career, namely, a) user, b) assurance provider and evaluator, c) information systems manager, and d) information systems designer. This does not rule out the possibility that more detailed roles within narrower domains will be required to be undertaken by accountants in key roles. To address these roles IFAC proposes a broad set of IT skills categorized as follows, a) general IT skills, b) user role IT control competencies, c) assurance provider and evaluator role competencies, d) manager role competencies, and e) designer role competency.

Mrs. S said

"Accountants need to be more aware of technological developments, especially in an era that requires knowledge in reading system analysis. The Industrial Revolution 4.0 also revolves around the concept of big data and the Internet of Things as a place for circulation of circulating information data. As a result of developments over time, the public also has a high desire to be aware of a company's climate impacts and demands continued responsibility for this demand for environmental care. So, from aspect 4.0, digitalization of the provision of company system data regarding financial disclosures that affect the environment (climate) is required."

Mrs. S's statement is in line with Madani's (2009) statement that accountants need to enter the world of information technology in more depth, not just financial reports on paper.

The role of accountants as IT experts obtained from this presentation in developing ERP systems in companies is as data providers in matters relating to accounting information systems. Accountants are expected to have additional abilities in the world of programming so they can have data analysis skills. Accountants must also be aware of developments in reports that will be required by shareholders, which always change according to changes/developments over time. End users and shareholders increasingly need information on developments in financial reports to be accessed more quickly. According to Mrs. S, shareholders now want real-time data on the company's financial reports.

The Influence of the Accountant's Role as a Communicator in ERP System Development

Broom and Smith's (1979) role theory of the Communication Process Facilitator is described as an information intermediary whose main function is to facilitate the exchange of information so that the parties involved have sufficient information to relate to each other and to make decisions in the common interest. Madani (2009) and Zahara (2018) argue that internal auditors also play the role of communicators. Lack of communication can cause data quality issues, thereby affecting data integrity in ERP. Internal auditors ensure that adequate documentation of the ERP system is prepared and provided to users to follow. They should encourage multiple communication channels and means to encourage feedback and enable rapid corrective action when necessary.

From the interview conducted with Mrs. S and Mr. A, there was a conclusion that artificial intelligence from SAP S/4HANA had become a communication mediator for parties who needed information.

Mr. A said:

"...the function of accounting is only monitoring, no more journals or anything like that, ensuring that all processes that are set up from the start

are reflected in the data processed in the account, both in the balance sheet and TML..."

"...the role of accounting will be important... being an integrator, the integrator ensures that all functions in the company are connected to one another, including accounting and finance."

And, Mrs. S said:

"And the role of the accountant is always on the front line to always determine how the quality of the system can truly deliver financial reporting that is backed up with reliability, trustworthiness and reliability of the system to then always ensure that the transactions are valid or reliable."

Based on this explanation, the role of accountants as communicators in developing ERP systems in companies is not completely necessary. This is because technological developments related to communication from one division to another have been fulfilled through the features of the implemented system, both applications used by the relevant accountants and run by AI (Artificial Intelligence) programmed in the system.

CONCLUSION AND RECOMMENDATION

Based on the results of interviews and discussions, it can be concluded that the role of accountants in developing ERP systems in the Industrial Revolution era. 4.0, acting as a strategist, ERP expert, IT expert and communicator. However, the role of accountants as communicators in the development of ERP systems is starting to be replaced by artificial intelligence (Artificial Intelligence) in the Industrial Revolution 4.0 era. This is not in line with research by Madani (2009) and Zahara (2018).

The role of an accountant as a strategist in developing an ERP system is to review the system that has been implemented in the company so that it runs effectively when the company was founded. Then plan developments that can be made to improve the company's system.

The role of the accountant as an ERP expert in developing an ERP system is to monitor the system that has been implemented so that the system remains under control and does not pose a risk that is detrimental to the company.

The role of the accountant as an IT expert in the development of the ERP system is to provide information data related to the accounting information system that is needed so that the system that has been implemented by the company runs as desired and produces the intended financial reports.

The role of accountants as communicators in developing ERP systems is not completely necessary due to the existence of artificial intelligence applications which function as communication tools between divisions regarding the exchange of necessary financial information.

SUGGESTION

This research has limitations that it is difficult to obtain informants. The informants for this research are based on acquaintances because there is no data available on accountants who work in ERP companies. Apart from that, the interview technique used was an unstructured interview. Future research should use structured interview techniques to provide more detail according to the topics discussed.

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