

How IT Support a Telecommunication Company's Agility to Respond Changing Market Needs? : Literature Review

1st Eristya Maya Safitri
Information System
UPN Veteran Jawa Timur
Surabaya, Indonesia
maya.si@upnjatim.ac.id

2nd Apol Pribadi
Information System
Institut Teknologi Sepuluh Nopember
Surabaya, Indonesia
apolpribadi@gmail.com

3rd Agussalim
Information System
UPN Veteran Jawa Timur
Surabaya, Indonesia
agussalim.si@upnjatim.ac.id

4th Seftin Fitri Ana Wati
Information System
UPN Veteran Jawa Timur
Surabaya, Indonesia
seftin.fitri.si@upnjatim.ac.id

5th Anita Wulansari
Information System
UPN Veteran Jawa Timur
Surabaya, Indonesia
anita.wulansari.sisfo@upnjatim.ac.id

6th Anindo Saka Fitri
Information System
UPN Veteran Jawa Timur
Surabaya, Indonesia
anindo.saka.si @upnjatim.ac.id

Abstract—The phenomenon of very dynamic and competitive business competition requires every telecommunication company to be adaptive in all changes. Now information technology does not only play a role in supporting business processes. IT is expected to play a major role in supporting the company's agility to adapt to the business environment. Corporate agility can provide various advantages, namely the organization is able to detect changes early and explore various solution options as a decision-making process in creating innovation. This journal provides an effective conceptual model related to how information technology is able to create organizational agility in telecommunications companies. This conceptual model is expected to be a reference for the adoption of information technology in providing a fit impact for the company.

Keywords— *IT strategic planning , Agility, IT Capability, Digital Option, Innovation*

I. INTRODUCTION

PT. Telkom Indonesia is one of the largest telecommunications companies in Indonesia. This company is one of the organizations that invest heavily in IT for supporting its business processes. On the other hand, the rapidly changing needs of the community is a challenge that makes these service providers must be able to adapt and innovate. In addition, the movement of competitors and reputation problems in the eyes of the public are also factors that affect the resilience and improvement of the company's performance.

It was noted that there was a 2.46% decline in shares in January 2020. Director of finance, Harry M.Zen considered that the factor that triggered the decline was an underappreciated attitude in the market. Another fact is that the cellular segment, which previously contributed up to 90%, currently only contributes 70%. In addition, there is investor attention on the issue of increasingly intense business competition. Recently, other operators have started to expand outside Java, especially in Sumatra and Kalimantan.

This phenomenon shows the truth of the paradoxical IT theory, namely that IT that has been invested on a large scale may not necessarily improve company performance [1]. In adopting information technology, developers need to consider adopting the main factors in creating organizational agility from the adopted information technology. Organizational

agility is the organization's ability to sense change and explore knowledge that will be used as a solution option to create innovation. This capability will improve the company's adaptation process in dealing with various forms of change related to the business environment.

Several previous empirical studies have discussed the appropriate conceptual model in creating organizational agility with the support of information technology. However, there are gaps between the conceptual models promoted by some of these researchers. Therefore, this study seeks to carry out a comprehensive conceptual model from various points of view. A complete and practical conceptual model will make it easier for developers to implement it in the company.

II. RESEARCH METHODOLOGY

The method approach used in this study is to use a systematic literature review method by Kitchenham Steps. The literature review technique includes the planning stage, conducting stage and reporting stage. At the planning stage, the researcher formulates a research question and develops a review's protocol. After the research question was determined, the next stage was conducting. At this stage, identify the relevant literature by selecting journals according to the scope of the study, extracting data, assessing the quality of the study and synthesizing evidence from several selected journals. The last stage is the reporting stage. At this stage, journal documentation is carried out in accordance with the results of the literature review.

The research question analyzed in this journal is to develop a model of organizational agility with the support of information technology. In developing the model, it is necessary to analyze the factors related to the success of the implementation of information technology. besides that it also analyzes the relationship between variables that can create the agility of the organization.

The literature review process begins with finding quality journals according to the study topics and research questions that have been determined. the place to search for journals is to use science direct, IEEE Xplorer, emerald and google scholar. The selected journals are journals published in the last 5 years, accredited Q1-Q3. The proceedings were not included in the analysis of our study. All selected journals will be synthesized and used as the basis for building a model

that corrects the shortcomings from various perspectives of previous researchers.

III. THEORITICAL ANALYSIS

There are four previous studies that carry the conceptual model of organizational agility with IT support from different approaches and perspectives. The four main studies are research conducted by Chian Tan Felix et.al, Paul Benjamin Lowry, et.al, Carmen M.Felipe, et.al and Ravichandran T. The following will review the conceptual model of organizational agility from several researchers' perspectives.

A. *IT-Enabled Operational Agility: An Interdependencies Perspective (Ter Chian Tan Felix, Tan Barney, Wang Wenjuang, Sedera Darshana, 2017)*

This study aims to analyze how IT can be used to achieve operational agility which focuses on the interdependence of operational processes in the organization with reference to IT and company capabilities [2]. This research is motivated by the hope that companies that have invested heavily in IT can have a positive impact on their supply chain operations. However, success is not only limited to IT adoption but also must be able to compete with information asymmetry and interdependence between resources simultaneously. Peter Drucker's statement as a famous management professor in highlighting information asymmetry is "Management by objective work - If you know the objectives, ninety percent of the time you don't. most of what we call management consist of making it difficult for people to get their work done". Previous research stated that to form information asymmetry, it is necessary to facilitate workflow coordination to overcome problems in decision making and conflicts between departments. The complexity of IT management systems will lead to a cultural shift that unifies and coordinates the core entities of the organization. This potential will support the organization to innovate and create agility within the organization. With varying degrees of uncertainty about IT capabilities, current researchers are expected to seek developments beyond issues of structure, processes and people interacting with IT. Therefore, this study focuses on organizational operational agility by looking at the interdependence of IT capabilities and organizational capabilities in every organizational operational process. The result of the research is to develop an interdependence model between IT and organizational capabilities with the type of resource dependence required at each operational stage.

Companies must develop capabilities through the form of corporate structure and interdependence between IT managers and other managers in negotiating and influencing the operational processes of using IT. Organizational agility is built with an understanding of how companies perceive environmental changes and respond effectively in an increasingly competitive and digital-oriented environment. The specific implication for corporate management is that managers must classify and manage innovations in the management of the company. Managers should not expect IT investments to have an impact on a company's supply chain operations. However, how to bring up IT operational agility with the conditions of many competing stakeholders with information asymmetry and concurrent resource dependence. Managers must recognize the context of interdependence that affects the negotiation process.

B. *Creating Agile Organizations Through IT: The Influence of Internal IT Service Perceptions on IT Service Quality and IT Agility (Paul Benjamin Lowry and David Wilson ,2016)*

This study analyzes and examines the interconnectedness of internal perceptions of IT services in supporting IT agility. This research is motivated by the emergence of business development pressures that encourage companies to invest heavily in IT resources [3]. It is very important for them to implement effective management strategies to better utilize these resources. Market demands, rapidly changing market environment and culture make organizations rely on IT resources to support organizational agility. In managing IT resources has several challenges. Previous research has raised a lot about IT strategy and innovation, portfolio management, IT structure, and others. Although many studies have linked IT resources with IT agility, not many studies have predicted complementary factors for aligning the goals and priorities of people in the department itself. Therefore, the research will focus on the internal perception of IT services to shape the quality of IT services and IT agility. The conceptual model built by the researcher emphasizes the contribution of the internal perception of IT services as an aspect that aligns the perceptions of many people in the department to improve the quality of IT services and create IT agility for the company. The following is a conceptual drawing of the model and the hypotheses compiled:

C. *An Explanatory and Predictive Model for Organizational Agility (Carmen M.Felipe, Jose L.Roldan, Antonio L. Leal-Rodriguez , 2016)*

This study analyzes and examines the relationship between learning factors as a moderator in the formation of organizational agility with IS capabilities. Previous research discussed the relationship between organizational agility with the IS capability approach, both directly and indirectly. Researchers focus on the IT aspects of business are organizational factors such as culture, communication and leadership [4]. To cover the research gap, the researcher will propose a conceptual model that includes organizational aspects, namely organizational learning and culture as a mediator and moderator between IS capability factors and organizational agility. The conceptual model built by the researcher is emphasizing on the ability of employees' absorption capacity for the use of IT in the organization's business processes. The level of absorption capacity (learning) by employees will create innovations in the company's operations so that organizational agility is formed. The conclusion of this study is to find the supporting factors that mediate the relationship between IS capability and organizational agility directly or indirectly. The results of the analysis state that the absorptive capacity must be formed from the SI capability. The ability to absorb the IT needs in the organization's business processes support the creation of organizational agility

D. *Exploring The Relationship Between IT Competence, Innovation Capacity And Organizational Agility (Ravichandran.T, 2017)*

This study aims to ascertain and examine the relationship between IT competencies and innovation competencies in creating organizational agility. The conceptual model built by

the researcher emphasizes the contribution of the innovation capacity of a company which is an important aspect for organizations in utilizing IT competencies and digital platform competencies that have been designed agilely and agilely [5]. The conclusion of this study is that IT competencies combined with other complementary organizational assets tend to provide positive value for the company.

E. Summary

The four conceptual models from previous studies show that there are different points of view by researchers in managing information technology to create agility in the organization. However, there are also similarities in perspectives in several studies. The following is a conceptual summary of the model from several previous researchers by looking at the character of each model as seen from the logical form, assumption and role of time from the accuracy of using the model.

TABLE I. MODEL CONCEPTUAL PREVIOUS RESEARCH

Criteria	Logical form	Assumption	Role of Time
Chian Tan Felix	If resource interdependence between IT departments and other division is well, it can create organisation agility	A good definition of resource interdependence between IT department and other division may not be able to create organisation agility	Sequential process between fit-resource interdependence and organisation agility
Paul Benjamin	If internal IT service perception is well organized, IT service quality and IT agility will be formed	Well-organized of Internal IT service perception may not be able support IT service quality, so it can't support IT agility.	Sequential process between IT service perception, IT service quality and IT agility
Carmen M.Felipe	If Information capabilities can support absorptive capacity process, so it will create organizational agility	Information system capabilities may not be able to create absorptive capacity and also organization agility	Sequential process of information system capabilities and absorptive capacity
Ravichandran. T	A good IT Competence which was intervened by innovation capacity will be able to create organization agility	IS capabilities may not be able to create digital platform capabilities. Digital platform capabilities and innovation capacity may not be able to create organisation agility	Sequential process of IS Capability, Digital platform capability and innovation capacity to support organizational agility

IV. THEORITICAL SYNTHESIS

A. Construct Operationalization

The background behind this conceptual model is that there are confusing results from previous studies that discuss how to create organizational agility with the support of information technology, especially in telecommunications companies. This is because the telecommunication company is one of the companies that cannot be separated from the

speed of technological development in providing services to its users [6]. Telecommunications companies are required to provide excellent service if the company wants to maintain its existence. This conceptual model of organizational agility discusses the variables or success factors related to the use of information technology to achieve organizational agility by considering various perspectives of previous research.

Organizational agility is defined as the organization's ability to sense and respond to changes in the company's environment quickly and accurately. This ability is formed from the ability to explore intelligence in the form of change and the solutions provided in responding to these changes in a broad and deep manner [7]. Experts generally call for IT capabilities to create organizational agility. The use of IT is considered to be able to reach the broadest information and get the deepest scope of information related to the company's environmental conditions. Therefore, many researchers conclude that IT capability is a critical factor that can improve the ability to sense (sensing) and respond to (responding) changes so as to enable the creation of organizational agility [8].

However, referring to research (Paul Benjamin Lowry, 2016), (Ravichandran, 2017), (Felix Ter Chian Tan, 2017) states that to create organizational agility it is not enough to pay attention to IT capabilities. The role of organizational capabilities in increasing the ability to feel and respond to change is also needed. Organizations need to support and condition the role of IT capabilities in creating a more effective and efficient organization. Research (Carmen M. Felipe, 2016) brings up the absorptive capacity factor as an organizational capability in increasing the ability to feel environmental changes from existing IT capabilities. Research (Paul Benjamin Lowry, 2016) also discusses the role of organizational capability in increasing the ability to feel environmental changes, namely by carrying out internal factors of IT service perception. Research (Ravichandran, 2017) carries the innovation capacity factor as an organizational capability in responding to change. Based on the gap above, the research focuses on the context of developing a conceptual model of organizational agility with the support of information technology which emphasizes the approach of IT capabilities and organizational capabilities. Both approaches were adopted in the context of increasing the ability to feel and respond so as to manifest agility in dealing with changes in the organizational environment [9].

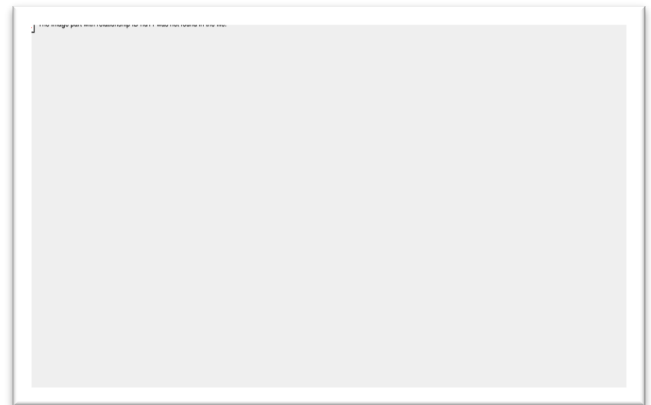


Fig.1. Research Model

The conceptual model above explains that organizational agility is shaped by several factors for successful IT implementation. As explained earlier, the factors that are related to organizational agility are factors that are able to increase the ability of two components of organizational agility, namely the ability to sense and respond to changes in the organizational environment [10]. To optimize the two components, an equally strong contribution is needed regarding the organization's ability to feel change and the organization's readiness to respond to change.

Efforts to increase the ability to feel the company by an organization require information technology capabilities. Information technology capability is the suitability of information technology used in supporting the organization's business processes. Good information technology capabilities will support the work efficiency of the information technology department. The ability of HR in communicating business processes will be more effective with the existence of information technology capabilities. The combination of information technology capabilities and IT department capabilities is a combination that supports the creation of efficient digital option capabilities. With the capabilities of the IT department and IT capabilities, it will produce an output, namely the organization's ability to feel change quickly. While the capability of this digital option is the process of extracting organizational environmental literacy from various organizational perspectives with a number of trusted information sources. This process will produce as many solution options as possible so that it will be easier for the company to take further action in any changes that may threaten the stability of the organization. It doesn't just stop at getting a number of solution options, but also requires action. Action is how to realize a number of solution options into a company innovation. By being strengthened by the organization's ability to create innovative capacity, organizational agility can be achieved.

V. CONCLUSION AND FUTURE RESEARCH DIRECTION

To benefit from the implementation of information technology, companies should not stop at the process of investing in information technology. There needs to be certain activities that create a culture of effective and efficient use of information technology. Agility is one of the most important benefits to be adopted by every organization, especially in organizations that are vulnerable to changes in the business environment. Changes in the business environment can arise from competitors, customer preferences, government regulations, current trends, technological developments and others. Therefore, supporting supporting factors are needed so that it can bring up organizational agility in moving in the business world. The flexibility of the company will prepare the company to excel and be able to realize the business. Several factors that support organizational agility include information technology capabilities, information technology department capabilities, digital options capabilities and information capacity. These factors work sequentially, that is, they have a relationship with each other.

The results of the analysis of this literature study are still limited to building a model based on the importance of creating organizational agility in dealing with and responding to change. For further research, the implementation of testing

the model that has been built can be carried out. Model testing can be done quantitatively using the SEM approach or using qualitative methods. Model testing will complement the quality and accuracy of the selected variables in building organizational agility.

ACKNOWLEDGMENT

We say many thanks to various parties who have contributed in the completion of this journal. This research was supported by UPN Veterans of East Java and PT.TELKOM INDONESIA as research objects. Our most grateful thanks to the research team who have worked hard to achieve good quality research

REFERENCES

VI. BIBLIOGRAPHY

- [1] K. M, "Information Technology and The Networked Economy," *Information Technology*, vol. 3, pp. 305-330, 2018.
- [2] F. T. C. Tan, "IT-Enabled Operational Agility: An Interdependencies Perspective Information and Management," *European Journal of Information System*, vol. 54, pp. 292-303, 2017.
- [3] P. B. Lowry, "Creating Agile Organizations Through IT: The influence of Internal IT Service Perception on IT Service Quality and IT Agility," *Journal of Strategic Information Systems*, vol. 25, pp. 211-226, 2016.
- [4] C. M. Felipe, "An Exploratory and Predictive Model for Organizational Agility," *Journal of Business Research*, vol. 69, pp. 4624-4631, 2016.
- [5] T. Ravichandran, "Exploring the Relationship Between IT Competence, Innovation Capacity and Organizational Agility," *Journal of Strategic Information Systems*, vol. 8, pp. 200-213, 2017.
- [6] Levinthal, "A New Perspective on Learning and Innovation," *Administrative Science*, vol. 5, pp. 112-224, 2019.
- [7] M. Hitt, "Beyond Computation: Information Technology, Organizational Transformation and Business Performance," *Journal of Economic Perspective*, vol. 14, pp. 23-48, 2020.
- [8] K. D. S. B. Kawtar Imgharene, "Agility Metrics Model for Business IT Alignment," *International Conference on Control, Decision and Information Technologies*, vol. 1, pp. 23-45, 2020.
- [9] Z. W. et.all, "Achieving IT-Enabled Enterprise Agility in China: An IT Organizational Identity Perspective," *IEEE Transactions on Engineering Management*, vol. 61, no. 1, pp. 220-401, 2014.
- [10] O. C. Williams, "A Technological Approach Towards the Measurement of Enterprise Agility," *Iberian Conference on Information Systems and Technologies*, vol. 15, pp. 30-45, 2020.