

Individual Appropriation of Technology: Branch Employee Perspectives on Enterprise Information System Transitions

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Abstract—The transition of the enterprise information system is something that needs to be considered, the inhibiting and supporting factors of transition are the key to success in transitioning an information system in the company so that it is expected to achieve the company's business goals. Internet service provider (ISP) A is one of the largest ISPs in Indonesia to transition the enterprise information system to improve the performance and achievement of the company because there are still many obstacles in the previous system that hamper work and make the service to customers is affected by the constraints of previous enterprise information systems. However, in implementing the transition at ISP A, there were still many problems found in the appropriation of individuals towards the new enterprise information system. In this study, individual appropriation of the system becomes the subject of discussion. A qualitative positivistic approach with interview data collection methods is conducted in order to obtain as much information as possible from the resource persons involved in the use of information systems in each of their work. The individual appropriation of technology theory becomes a reference as a research framework to explore information about individual appropriation of the enterprise information system when the transition is implemented.

Keywords: *Transition; Enterprise information systems; Individual appropriation of technology.*

I. INTRODUCTION

As the development of information technology progresses, many industries or companies begin to integrate every element of their business by utilizing enterprise information systems that are intended to provide changes to the company in order to compete in the current era (Kadiri et al., 2016). One of them is by implementing enterprise resource planning (ERP) as an enterprise information system providing solutions in integrating every element of the organization in a company to achieve its goals and to be able to compete in an increasingly global market by integrating every part of the company in a centralized system well (Wibisono, 2005). Many companies have begun to switch to enterprise resource planning (ERP) software from conventional information systems to integrate every element of

the company so that it can help companies run business processes well (Kurbel, 2013).

The need for the use of information technology in companies to provide competitiveness becomes a crucial need (Fathian, Akhavan, & Hoorali, 2008). However, the changes that occur in the company's information system are an important concern when a company will reform an enterprise information system that is still conventionally becoming an integrated and centralized ERP-based information system that includes various divisions such as finance, logistics, accounting, production and human resources. The challenges faced during ERP implementation are organizational barriers, individual factors and technological factors (Babaei, Gholami, & Altafi, 2015). Not only when the conventional system changes to ERP, the version changes in an ERP that was previously used as a version that has better capacity and performance than before will have an impact on the company's business processes. The first thing that needs to be considered when implementing ERP in a company is the readiness of the organization for ERP adoption, namely the readiness of the organization in the face of the cultural changes that occur, the involvement of all users in the system and the involvement of decision-making executives by utilizing the system to achieve company goals (Sun, Ni, Lam, & Ng, 2016)

In addition, investments that require large and time-consuming costs in ERP implementation can be the problems that will be faced in the company (Costa, Ferreira, Bento, & Aparicio, 2016). Effective strategies are needed in the implementation of enterprise information systems to provide value from IT investments in the company (Rezvani, Dong, & Khosravi, 2017). Proper integration by obtaining relevant information in its application can help overcome obstacles during implementation (Kong, Wang, & Zhang, 2008). The five main domain strategies during ERP implementation include: setup, design, re-engineering, configuration and testing and training of use (Singla & Goyal, 2005)

Internet service provider (ISP) A as one of the leading internet service providers in Indonesia sees the capabilities

offered from the application of information technology and implementing an enterprise information system for several years. At ISP A, the enterprise information system used previously is still a lot of shortcomings that are felt by employees in their use related to work. The previous system also had a lot of bugs which caused some divisions to experience difficulties in carrying out their work, one of the example is in the store specialist or admin department that often has problems with customer data errors that are active, so that it can cause some problems that are quite a concern. Over time, ISP A made adjustments and increased the ability of the enterprise information system to enable the company to continuously improve the quality of its services. In the beginning of 2017 and the fourth quarter of 2017 the company began to change the previous enterprise information system by using another version which is expected to provide better capabilities and capacity than the previous version. System changes that occur at ISP A include changes in the customer administration system, financial and internal administration. However, the implementation of the transfer of the previous information system to the new system at ISP A is not an easy matter, there are obstacles and risks that will be accepted if the implementation of this system transition will not have an impact on the company (Sun et al, 2016; Costa et al, 2016; Rezvani et al, 2017).

Individual appropriation of technology when transitioning at each ISP A branch is the subject of the discussion presented. Individual appropriation of technology is proposed as a theoretical framework to find out how a person or group of individuals in conformity with the application of information systems to improve the quality and performance of individual performance.

II. THEORETICAL FRAMEWORK

A. Enterprise Information System

Enterprise information systems are widely adopted and implemented quickly by many industries or companies to integrate every element of their business aimed at providing change in the company to compete in the era of the global economy (Guo, Wang, & Luo, 2006). The ability which provided by an enterprise information system dynamically to change management models, adjust business processes, see changes continuously over time regarding user needs and readjust business processes. The main objective is to utilize thoroughly of the company's information sources and increase the effectiveness of information system investments in companies in the face of global competition (Yang & Xie, 2007).

Every element of the organization involved in the company's business process can be integrated by utilizing enterprise information systems, ranging from manufacturing, planning, marketing, distribution, finance, logistics, accounting, production and others, according to the organizational elements involved in the company's business processes (Babaei, Gholami, & Altafi, 2015). The challenges that need to be considered when adopting an enterprise information system for a change in the company's business processes in the face of highly global competition which very competitive include: (1) value chain data management, (2) system context awareness, (3) usability, interaction and visualization system, (4) spending on human resources and ongoing training (El et al., 2016).

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B. Enterprise Resources Planning

Enterprise information systems begin to penetrate the world of industry or companies in order to continue to be competitive in the global era, to meet these needs the company sees the capabilities provided by the enterprise information system to integrate every element of the organization in a system better known as enterprise resource planning. Enterprise resource planning consists of several integrated modules, including: sales and marketing, human resources, finance, procurement, logistics, and several other organizational elements involved in the company's business processes (Romero & Vernadat, 2016). The ability of enterprise resource planning in handling the company's business processes to improve coordination and collaboration between departments is the main reason many companies have begun to switch to enterprise resource planning (Wagaw, 2017).

C. Enterprise Information System Transition

The transition from the previous system to the new system in a company is not taboo in the era of global competition, the demand for information systems that are able to provide the best ability to support the company's business processes in order to achieve its goals is the main reason for the implementation and change of the system. ERP as an enterprise information system is expected to provide a solution to integrate every element in the organization in a company to achieve its goals and to be able to compete in an increasingly global market by integrating every part of the company in a centralized system (Wibisono, 2005), the company will reform the enterprise information system which is still conventionally becoming an ERP-based information system that is integrated and centralized by encompassing various divisions such as finance, logistics, accounting, production and human resources (Babaei et al., 2015). In table I can be seen several previous studies that raised the issue of the transition of information systems in companies.

TABLE I. THE PREVIOUS STUDIES RELATED INFORMATION SYSTEM TRANSITION

Author	Study
(Liu, Miao, & Li, 2007)	This study uses indicators of return on assets (ROA), return on sales (ROS) and costs of goods sold (COGS) from Barber et al. to analyze the impact of ERP implementation on the performance of financial performance of 50 chemical companies in China. This study concludes that it takes at least three years to implement ERP so that it can benefit its financial performance and this can be a reference for other companies to switch to investing in ERP in handling the company's business processes..
Chofreh, Ariani, & Klemes, 2017	This study discusses the application of Sustainable Enterprise Resource Planning systems (S-ERP) in companies that have implemented the previous information system. By using the conceptual research method, this study discusses the barriers found when implementing S-ERP in a company that is related to the lack of overall planning of S-ERP implementation. By determining the roadmap, framework, and guidelines for the implementation of S-ERP it will be in accordance with the planning.
Ferreira, Santos, Soares, & Machado, 2013	This study discusses the suitability of process-level requirements analysis with product-level requirements. This resulted in modeling in the development of information system implementation with the company's needs not aligned. The V-Models approach model (the V + V process) is used to overcome the level process mismatch with the level product so that it can be aligned in its application for the implementation of information systems in the company
Demoč, Vyhňáliková, & Aláč, 2015	This study discusses the optimization of IS that has been implemented for a long time in the company so that it can be upgraded and centralized in helping the company's business processes. Dynamic changes that occur in information technology are an important concern in this study so that the information system that has been implemented can be in accordance with the progress of information technology changes that continue to grow rapidly in helping companies to improve their competitiveness.
Assmann & Engels, 2008	This study discusses the implications of the implementation of Service-Oriented Architecture (SOA) in companies, by using Enterprise Architecture (EA) service

Author	Study
	orientation and the challenges of architecture must be understood so that modeling fits the needs of the company

From several previous studies, this has inspired researchers to propose research on problems that arise when transitioning the enterprise information system at ISP A by focusing on the problem of individual appropriation for the new enterprise information system. There are still confusion and complaints by employees which is an important point in this study to prove the indicators of what causes these individual employees to be constrained. This needs to be reviewed properly so that employee performance is expected to improve and help companies achieve business goals.

D. Individual Appropriation of Technology

Individual appropriation of technology which is the concept of psychological ownership theory as a case study framework in ISP A. Antecedents consists of five variables that have an impact on consequences, antecedents variables include: satisfaction expectation (individual satisfaction with the use of technology), desire for pleasure (feeling happy because you can master the use of technology to help work), desire for autonomy and control (the desire to regulate and control technology that is appropriate for the job), enjoyment expectation (sense of comfort in using technology), and desire for security (sense of security when using technology at every job). These antecedents variables influence the variables of consequences after implementing individual appropriation of technology which has an impact on the performance of individuals in the organization. In figure 1 can be seen antecedents and consequences used in individual research appropriation of technology (Gaskin & Lyytinen, 2012).

The antecedents raised in individual appropriation of technology research show a significant impact on individual suitability for technology in the company. Consequences indicators are proposed to find out internal factors that show the appropriation of individuals to technology in each of their jobs in order to improve performance in achieving company goals. This research assumes that the individual appropriation of technology theory has a positive impact on the consequences variables, including: personal and object-related satisfaction (users are satisfied with the features of the technology so as to improve performance in the organization), control (users can control results acquired on technology at work), social power and status (individuals who use technology feel they find confidence in work so as to improve the individual's social status), self-identity (individuals find their identity in the organization after feeling the benefits of technology), security (users feel safe using technology in work), extra-role behavior (users who feel the benefits of technology and get satisfaction with technology in their work tend to contribute more to the organization to complete their work), job satisfaction (individuals feel satisfaction in using technology in every job), commitment to organization (individuals who feel the benefits of technology in their work tend to give more commitment to the organization than individuals who have not benefited from technology appropriation), organizational self-esteem (increased individual confidence in each job which will have an impact on its contribution to the overall organization), organizational citizenship (individuals who utilize technology in their work

tend to give the nature of loyalty to the organization), efficacy (individuals who use technology in the organization will increase effectiveness in their work), and competence (individuals who use technology will feel more competent in every job) (Gaskin & Lyytinen, 2012).

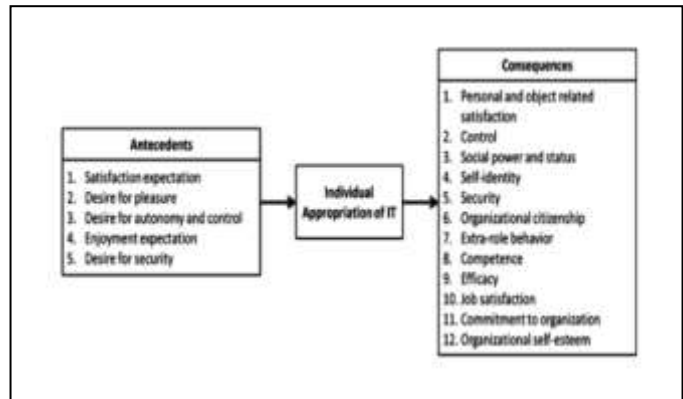


Figure 1. Antecedents and consequences proposed in the framework of individual appropriation of technology (Gaskin & Lyytinen, 2012)

III. RESEARCH METHODOLOGY

This study adopts antecedents and consequences variables which are presented in the individual appropriation of technology framework which is a concept of psychological ownership theory as a case study research framework at ISP A (Gaskin and Lyytinen, 2012). The phases in the case study research conducted in this study consisted of three stages as shown in figure 2. The data collection in this study was carried out with a qualitative positivistic approach using interview methods to extract information from informants who acted as an important part or hidden population in management and company operations, as well as analyzing the facts and empirical data that affect individual appropriation of the enterprise information system when the transition implementation in this case study is taken from the perspective of branch ISP A employees (Heckathorn, 2011).

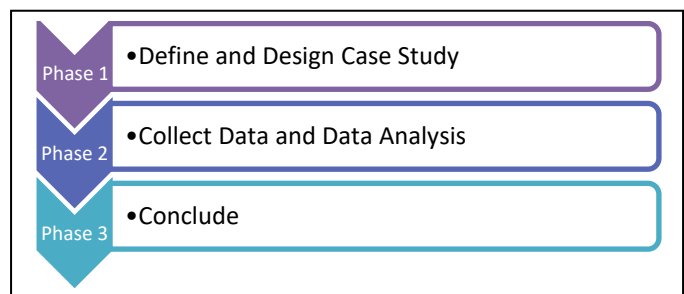


Figure 2. Phases of research implementation case study of individual appropriation of technology

The study was conducted on research subjects, namely ISP A branch employees located in Central Java and Yogyakarta Special Region. The selection of branches is also based on the grade of the branch itself, three branches are taken as research objects based on the area that is divided into several branch grades, namely Yogyakarta branch (grade A), Solo branch (grade B) and Klaten branch (grade C). The detailed explanation

of the sources who are the object of research can be seen in table II.

TABLE II. INTERVIEWEES IN RESEARCH

Branch	Interviewees	Interviewees Code	The Intensity of Use	Grade Branch
Yogyakarta	Engineer	A3	The use of certain times (Low)	A
	Customer Care	A2	Continuous use (High)	
	Store Specialist/ Admin	A1		
	Inside Sales	A4		
Solo	Engineer	B1	The use of certain times (Low)	B
	Supervisor	B2	Continuous use (High)	
	Store Specialist/ Admin	B3		
Klaten	Engineer	C1	The use of certain times (Low)	C
	Store Specialist/ Admin	C2	Continuous use (High)	

The antecedents and consequences adopted in this study were collected by interviewing sources involved in the use of enterprise information systems. In table III can be seen the questions raised based on the framework of individual appropriation of technology as inspiration for data collection during the system transition.

TABLE III. QUESTIONS IN RESEARCH

Construct (Gaskin & Lyytinen, 2012)	Questions	Code
Satisfaction expectation (P1)	How satisfied are you in expecting to use a new enterprise information system?	S1
	What are the differences that you feel in the previous enterprise information system in terms of the ease of your work?	S2
Desire for pleasure (P2)	How pleased are you with this system in helping your work?	D3
	How do you master this system to help your work?	D4
Desire for autonomy and control (P3)	How far do you master the use of the new system?	D5
	How important is this system in improving the performance of your work for the company?	D6
Enjoyment expectation (P4)	How comfortable are you with the system after a transition?	E7
	What difference do you feel after a change from the old information system to a new system for your work?	E8
Desire for security (P5)	How believe are you with the security of each of your work data on this system?	D9
	What difference do you feel in the previous enterprise information system in terms of the ease of your work?	D10

IV. RESULT AND DISCUSSION

A. Enterprise Information System Transition

ISP A, which transitioned the enterprise information system from the previous information system, saw several reasons for consideration, to achieve better business goals than the previous system. The previous system had many obstacles such as administrative problems, failure in synchronization and so on, which were taken into consideration by the company to transition the enterprise information system. The issue of maintenance costs from the previous system is also a major addition to the reason the managerial party made the transition.

The transition carried out at ISP A in its implementation still found some obstacles, in this study the focus taken was the appropriation of individuals towards the new enterprise information system. From field observations, many individual employees are still confused and still have not found the best performance when using a new enterprise information system. Therefore, it is proposed the concept of individual appropriation which is inspired by the individual appropriation of technology theory to explore what factors become obstacles that are felt by individual ISP A employees.

B. Classification of Interview Results

Data information that has been collected through interviews is conceptualized based on the concept of individual appropriation of technology theory. There are five potential constructs used to explore information related to antecedents needed in the individual appropriation of technology theory. The results of the interviews that have been taken are then analyzed by designing conceptualizations that refer to the concept of individual appropriation of technology. The codified question constructs are analyzed according to the antecedents and consequences as inspiration to get the solution of the system transition done so that it is expected to be in accordance with business processes and achieve the company's business goals. The distribution of constructs based on antecedents and consequences can be seen in figure 3.

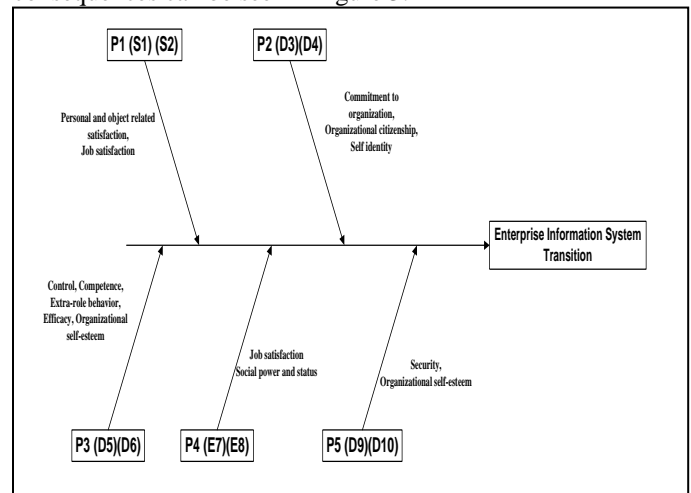


Figure 3. Constructive implications for the transition of enterprise information systems

C. Classification of Interview Results

The results of the interviews were collected in one interview transcript which was analyzed by classifying the answers obtained from the interviewees. The study takes a simple classification using three categories, in table IV can be seen the classification of the answers of interviewees.

TABLE IV. SENTIMENT CLASSIFICATION FROM INTERVIEWEES

No	Classification	Sentiment
1	Positive	If the resource person feels sufficient, happy or very happy
2	Neutral	If the resource person feels confused, or answer 50:50 with what the resource person feels about the information system transition
3	Negative	If the resource person feels dissatisfied, or the percentage mentioned by the resource person to the transition is less than 50

D. Analysis of Interview Result

The findings in this study are based on interviews with resource persons related to the use of enterprise information systems when the transition provides an understanding of how an individual in an organization or company can accept a new system by considering several aspects of the construct referred to. In table V can be seen the findings of this study.

This finding results in the opinion that the overall results still lead to a system mismatch with individual employees, this is due to the comfort and individual satisfaction of the new enterprise information system after the transition. As in the statement given

TABLE V. SENTIMENT CLASSIFICATION FROM INTERVIEWEES

No	Construct Code	Sentiment			Close Sentiment
		Positive	Neutral	Negative	
1	S1	4	-	5	Negative
2	S2	4	-	5	Negative
3	D3	4	1	4	Neutral
4	D4	4	1	4	Neutral
5	D5	4	1	4	Neutral
6	D6	9	-	-	Positive
7	E7	4	-	5	Negative
8	E8	4	-	5	Negative
9	D9	8	-	1	Positive
10	D10	8	-	1	Positive

by one of the informants, "... I am not too satisfied because the contents are not too complete, because I am still new, I still have not mastered the system ...", or "... The system that used to be easier to understand ... because we still memorize it in the use of a new system, so it's not satisfied ... ". In figure 4 can be seen the factors that influence the appropriation of individuals in the research that has been carried.

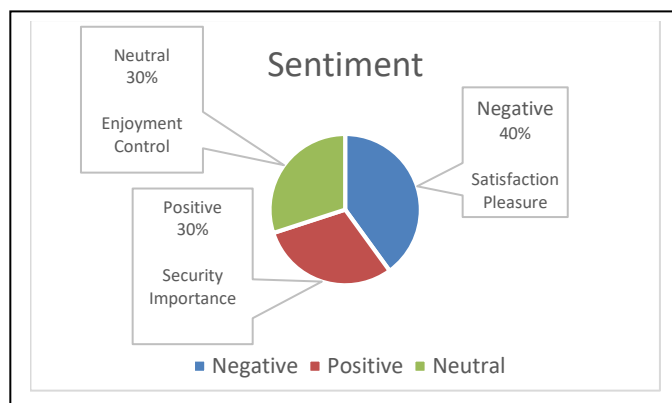


Figure 4. Individual appropriation diagrams of the enterprise information system transition

Neutral sentiment is implicated in the pleasure factor and individual mastery when using an enterprise information system. Both of these factors represent commitment to organization variables, organizational citizenship, self identity, control, competence, extra-role behavior, efficacy, and organizational self-esteem that are felt by individual employees when implementing the use of enterprise information systems. Some informants who felt that the system gave them new abilities and they were also happy to use it, as in the statement of one of the following informants "... Actually 50:50 are happy ... because access to the System can only be accessed from the office ..." or in other statements "... We are new only 'the skin', because it is just an introduction ... ", but some others are still trying to adapt and learn more about the system after the transition which results in dissatisfaction of some individual employees

Meanwhile, positive sentiment is implied for the individual's sense of security when using an enterprise information system with regard to each data of their work as shown by the statement of one of the following informants "I believe it because we have each account, there is also a division responsible for the system and can only be accessed from the office network". Another link that gives a positive sense to the system that has been switched is a sense of awareness of the importance of a system to improve the quality of the company in order to achieve the vision and mission that has been established (Wijaya, 2011). The importance of information systems is a positive reason for the transition to individual appropriation, such as the following statement "... very important because all customer data that we execute is all here ...", other statements "... Very important because the system is 'the staple food' in the work ...".

The sentiment that has been generated from this study is expected to provide knowledge for each organization or company about the importance of the role of individual appropriation towards the success of a transition that is implemented, and is expected to be a new learning for academics to be the subject of subsequent discussions

V. CONCLUSION AND SUGGESTION

Based on the findings of the research that has been done, it can be concluded that the transition of the enterprise information system is not an easy thing to do, many indicators must be considered before making a transition, one of which is an indicator of individual appropriation of the enterprise information system of each employee in order to improve employee performance in working and ultimately can achieve the company's goals well. Pleasure and satisfaction factors are interrelated indicators of individual appropriation for the enterprise information system that is new during transition, so that indicators of autonomy and control, enjoyment, and security are expected to be significantly affected by indicators of pleasure and satisfaction. Furthermore, this research can be used as a reference for every company or organization when it will make a transition.

Suggestions for companies that will rejuvenate enterprise or transitional information systems, one of the indicators that influence the success of the transition is the construct of individual appropriation of technology theory so that it can be properly balanced with each individual's appropriation for the new enterprise information system so that the purpose of the system transition is expected to help increasing employee performance in order to achieve business goals well.

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