

## **Impact of Task-Technology Fit & Habitual Use on Individual Performance Using Partial Latest Square Structural Equation Modeling Methods**

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### **Abstract**

This study discusses whether the task-technology fit on academic support technology and habits in using these devices has an impact on the individual performance of lecturers. Based on a survey in 97 full-time lecturers at Telkom University, the results of this study indicate the impact of task-technology fit in the context of academic support technology on lecturer individual performance is positive and significant. While the impact of habitual use or habit of using academic support technology on lecturer individual performance is positive but not significant. This study also identified that the task mobility which part of task characteristics and technology (reliability, accessibility, and overall quality) characteristic that are found to be positively influenced on task-technology fit for academic support technology, but there is one variable that not influenced to task-technology fit, that is task feedback which another part of task characteristics. This study found that external factors such as perceived critical mass and the reputation of academic support technology has positive and significant influence to habitual use of academic support technology, while the individual internal factor such as self efficacy and trust has not significant influence on habitual use of academic support technology. This study using structural equation modeling with partial latest square (PLS-SEM) to identify the main variables contained in endogenous latent variables. The present findings enable researchers and practitioners to understand the impact of academic support technology that has been used in supporting activities of research, public service and teaching on the individual performance of lecturers at educational organization.

*Keywords: Task-Technology Fit; Habitual Use; Individual Performance; Academic Support Technology; PLS-SEM*

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### **Introduction**

Information and communication technology or ICT in the world is increasingly growing by leaps and bound. The development of this technology is driven by social lifestyle and fast-moving industry (Rachbini, 2017). The rapid development of technology is directly to the existing competition in many areas due to the openness and equal opportunities possessed by each other. Various areas of the organization have a support system in the form of technology that can enhance the creativity of its employees in accordance with requirements which are computer-based systems that can improve performance, the process of thinking and assist in problem solving. Assistive technologies here can be defined as a combination of computer technology and telecommunications with other technology such as hardware, software, databases, and telecommunications devices which connected to the network technology such as the Internet and used as the organization's information system (Ani, 2006:2). The government through the Ministry of Communications and Information Technology focuses on the development of telecommunications infrastructure, developing startup, adapting policies and national cyber defender to improving Indonesia's competitiveness globally goals (Kominfo, 2016). In addition to infrastructure, the government through the Ministry of Research, Technology and Higher Education together with state-owned enterprises to cooperate for the implementation of ICT in higher education (Kemenristekdikti. 2016).

Industrial growth is rapid and faster with their information and communication technology shows the need for studies that evaluated the impact of the use of information and communication technologies supporting the performance, so it can be known whether these technologies can impact the performance of a person in performing his duties (Mayers, 2014: 2). According to Goodhue (1995: 213) model of the technology chain-performance or TTF (Task-Technology Fit) is a model that much comprehensive to understand the relation between information technology with the performance. In this study, the performance in question is the



performance of faculty who use technology in implementing academic support teaching, research and service. According to Widhi (2016), the first step in advancing the education system is improving a lot of teachers quality. With the quality of teaching is good, the education system and educational technology can be run properly. With this research, researcher expected to determine the performance of the technology in an educational institution such as the University and can be used as a source of implementable by other educational institutions.

## **Literature Review**

### **Task-Technology Fit**

The task-technology fit was developed by Goodhue and Thompson in 1995. It is the level of technological capabilities to help people to perform the task. Task-Technology Fit is the relationship between the suitability of the task, the ability of individuals and functionality of the technology. Compliance is more detailed technological tasks can be defined as an ideal profile formed from a collection of task dependencies internally consistent with the elements of the technology used will result in the performance of executive duties (Joyiganto, 2008: 494). The variables used were measured by Goodhue (1993) in Goodhue (1995: 222) with a domain user decision-making tasks are supported by information technology. These variables are the characteristics of the task, technology characteristics and individual characteristics (Goodhue, 1995: 217).

Goodhue (1995: 216) defines a task as an activity undertaken by individuals with change inputs into outputs. In the model of task-technology fit, characteristics of tasks can be defined as activities that use the input of information obtained from the system information is then processed by the individual to produce an output corresponding to the purpose of the task (Goodhue, 1995: 216). In the characteristics of the task, there are two factors used in this study is the task of mobility and task feedback (Chung, 2014: 95). Task mobility is defined as the activities carried out by individuals using mobile technology devices so they can move easily (Gebauer, Shaw and Cribbins 2010: Chung, 2014: 95). Junglas in Chung (2014: 95) states that the task of mobility could replace the characteristics of the task that has been developed by Goodhue. This is because the presence of wireless technologies and mobile devices such as smartphones are changing the way people work in completing the assignment and use of technology (Liu 2011: Chung, 2014: 95). Subsequently, Sims in Chung (2014: 95) defines a feedback task as providing feedback on the activities of certain individuals in the form of assessment work has been done to the individual. Feedback in this study can be given by stakeholders such as the work environment, students, and staff about how good lecturers to do a job. Task feedback is relevant variables to replace the specific organizational characteristics of the task that uses a variety of technologies in carrying out the activity (Chung, 2014: 95).

Goodhue (1995: 213) defines the technology as a tool used by individuals to help their tasks completed. technological characteristics is a technology used by certain individuals to meet its needs and the technology used an organization to support its operations. Chung (2014: 97) also describes factors that exist on the characteristics of such technology is system reliability, system accessibility, and quality systems. Wixon in Chung (2014: 95) said that system reliability is a factor that affects an operating system. According to Wixom in Chung (2014: 95) system accessibility is the ease in accessing information from an information system that is used. Ease of access is an important factor of the reliability of an information system. The quality system is a complement of system reliability and system accessibility (Chung, 2014: 95). This study uses the System Reliability, Accessibility and System quality as the relevance of the characteristics of the technology developed by Goodhue (Chung, 2014: 95).

### **Habitual Use**

The individual characteristics as the dimension of research conducted by Goodhue is not enough detail to describe the performance in using information technology, this study need an external factors that are involved in order to more comprehensive results (Goodhue, 1995: 213). Limayen in Chung (2014: 96) provide an advice in conducting performance assessment based on using information system. First, the user habits in using information technology. The point is people who are accustomed to the use of certain information technology automatically have studied how the technology works. Habitual use or can be called habitual use a person's



basic concepts in learning something (Chung, 2014: 96). Second, Limayen in Chung (2014: 96) suggests the use of habitual use for the frequency of individuals in using information technology provides a comprehensive relationship to the performance generated. In this study, the technology used is the academic support technology devices in educational organizations. However, the habit of using the technology is not only influenced by internal factors are derived from the task in the work environment, but of external factors also influence the use of technology (Chung, 2014: 97).

There are two characteristics used in this study is self-efficacy and trust. Self-efficacy or self-efficacy is defined as a person's ability to use information systems. It was also discovered that self-efficacy has a relationship to the actual usage of information technology (Compeau & Higgins, 1995; Luarn & Lin, 2005; Chung, 2014: 97). The belief here is an individual's belief in using information technology that the technology has benefits for themselves (McKnight, 2002; Chung, 2014: 97). The conviction was a significant influence of the habitual use of information technology. On external factors as well, there are two characteristics that is perceived critical mass and reputation. Is the influence of the social environment that comes from coworkers using a technology specific information that affects the individual directly or indirectly to use the same technology (Lou, 2000; Chung, 2014: 97). According Donney in Chung (2014: 97) reputation is a general view of an information technology from users of these technologies. In this study, the academic reputation of assistive technologies used have the possibility of influencing individuals in using information and communication technology.

### **Individual Performance**

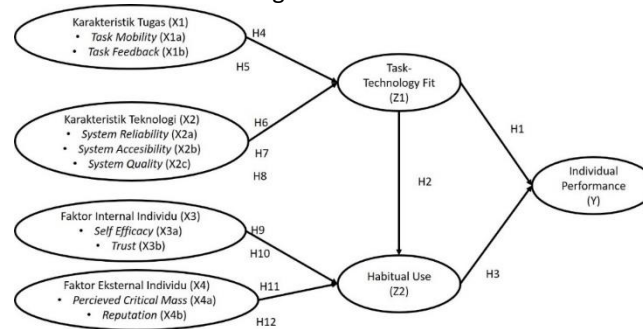
According to Fahmi (2010: 2), the performance is the result obtained by a good organization that is profit-oriented organizations and non-profit oriented generated during a period of time. Armstrong and Baron in Fahmi (2010: 2) says the performance is the result of work that has a strong relationship with the organization's strategic objectives, customer satisfaction, and contribute to the economy. In this study, individuals destination is a lecturer at the Telkom University which has a primary function in Tridharma of universities, namely research, community service and teaching. The main task is to implement the lecturers function in college to the work load of at least commensurate with twelve (12) credits and a maximum of 16 (sixteen) credits each semester according to the academic qualification (Directorate of Higher Education , 2010). This study investigates whether the facility is the technology used to support the main task as a lecturer has an effect on the performance of individual lecturer at Telkom University.

### **Theoretical Framework**

Goodhue (1995: 230) states that the technology evaluation research is influenced by many factors, the more complex the factors used the diagnostic results of research will describe the individual needs of the detail of the technology. The model that fairly comprehensively to evaluate the performance of technology that has been used is task-technology fit with a focus on the characteristics of the task, technology, and individuals (Goodhue, 1995: 213). Evaluation of increasingly complex technology is able to provide more detailed diagnosis on the technology required by each individual (Goodhue, 1995: 230). So Chung (2014: 93) in his study suggests that, using a factor of user habits or habitual use in the use of technology, has significant influence on creativity and individual performance. It is influenced by external factors, namely reputation of technology and environmental perceptions toward the technology. Chung (2014: 97) also uses internal individual characteristics, task characteristics, technology characteristics and task-technology fit as his research variable. Use of the Organization agility as moderator on Chung (2014: 97) had little moderator effect on the individual performance, so this study did not use these variables (Chung, 2014: 104). According to the criteria of correlation required by Sugiyono (2015: 257), perceived job performance does not have a strong relationship on the individual performance with 0.544 R square value, so that variable is not used in this study because the results of the Chung's research provide to adjusting construct which will be used in future studies (Chung, 2014: 109). Framework of this study on figure 1



Fig. 1. Framework



## Research Hypothesis

This study uses a model of the Task-technology fit (TTF), which was considered quite comprehensively evaluating the information technology used by an organization that aims to improve the performance of members of his organization (Goodhue: 1995). The research hypothesis is adopted from Chung's (2014: 98) research which was adjusted by this research context.

### H<sup>1</sup> Task-technology fit within the context of academic support technology devices positively influence on lecturer performance

This hypothesis can be answered by using another construct namely task mobility, task feedback, system (reliability, accessibility and overall quality) on H<sup>4</sup> to H<sup>8</sup> which influencing task-technology fit in the context of academic support technology. Task mobility describe the lecturer doing task when using technology and task feedback is how about the feedback taken by lecturer when using technology in educational environment. While for system construct describe the reliability of academic support technology which used in their environment, its accessibility and overall quality of academic support technology which used in Telkom University

### H<sup>2</sup> Task-technology fit within the context of academic support technology devices positively influence on lecturer habitual use of that technology

This hypothesis will describe how much influence of TTF model on lecturer habitual use of academic support technology which influenced by respectively constructs.

### H<sup>3</sup> Habitual use of academic support technology positively influence on lecturer individual performance

Third, it will be explained how lecturer habits of using academic support technology on lecturer individual performance which influenced by self efficacy and trust for internal individual factor and perceived critical mass with reputation for external factor on H<sup>9</sup> to H<sup>12</sup>. This study has twelve hypothesis to know how technology was working on lecturer individual performance in Telkom University. The hypothesis of this study measured by H<sub>0</sub> and H<sub>1</sub>. If the path coefficient value is positive with significant of t statistic in inner model assessment, H<sub>0</sub> rejected and H<sub>1</sub> accepted. If the path coefficient has negative value or t statistic less than table, H<sub>0</sub> accepted.

## Research Methodology

This study uses a quantitative method. Quantitative method is a scientific method that is concrete, objective, measurable, rational and systematic research in which using data in the form of figures and statistical analysis. The data collection was done by using a questionnaire. The sampling technique used is stratified proportionate random sampling based on the faculty at Telkom University. With a 10% margin of error, this study had a 97 respondents. The analysis technique used is PLS-SEM using Smart PLS application to test the hypothesis of this study. PLS is used because it is considered quite comprehensively to test complex models but has a small sample. PLS also allow this study to test the hypothesis without assuming the data is normally distributed (Chin, Marcolin and Newsted, 2003; Chung, 2014: 101).



In PLS, there are two elements to examine the path model, that is test the measurement model (outer model) and structural models (Hair, 2014: 12). Outer model was used to test the validity and reliability which consists of four steps, namely an indicator reliability provided that if the value of the loading factor > 0.50 then considered valid indicator or item (Hair, 2015; Garson (2016: 60). Internal consistency reliability was used to test the reliability of the construct or variable, provided that if the composite reliability value > 0.70 then constructs said to be reliable (Hair, 2014: 102). Convergent validity is used to determine the extent to which constructs can be correlated with other constructs in a reflective approach to the provision if the value of average variance extracted (AVE) > 0.50 then constructs said to be good and if AVE ≤ 0.50 then the construct not so good (Hair, 2014: 102). The fourth stage is the discriminant validity with the provisions of the outer indicator loadings on the construct must be greater than all the cross loadings with other constructs or the square root of AVE should be greater than the AVE value of that construct then constructs as valid (Hair, 2014: 107). The next element is to test structural models (inner model) used to answer the research hypothesis and measure how well the existing models in this study. Path coefficient value used to determine whether there is influence between the construct and the value of the t statistic used to determine the significance of a construct. Testing how well the model using adjusted R square value and Q<sup>2</sup> to test the relevance predictive analysis. This study has 40 indicator as instrument research which has been adjusted by eliminating invalid indicators. This study found all construct were reliable with composite reliability testing, so the model of this study close enough for future research.

### Research Result

This study has 97 respondent with percentage of 54% or 52 respondents were male and 46% or 45 respondents were women. In this study, the questionnaire was conducted in seven Faculty of the Faculty of Business Economics (FEB) amounted to 13 respondents, Faculty of Informatics (FIF) amounted to 14 respondents, Faculty of Applied Sciences (FIT) amounted to 18 respondents, Faculty of Business Communication (FKB) amounted to 10 respondents, Faculty of Engineering Industry (FRI) a total of 11 respondents, Faculty of Creative Industries (FIK) a total of 11 respondents, and faculty of Electrical Engineering (FTE) amounted to 20 respondents. This study used proportionate stratified random sampling as data collection techniques.

Adjusted R-square value (R<sup>2</sup>adj) is used to assess how much the accuracy of endogenous latent variables. The table 1. shows the adjusted R-square outputs using Smart PLS 3.0.

Table 1. R Square Value Output of Smart PLS 3.0

Construct	R <sup>2</sup>	R <sup>2</sup> adj
Individual Performance	.343	.329
Habitual Use	.395	.362
Task-Technology Fit	.570	.547

Hair (2014: 176) recommends the use of R<sup>2</sup> adjusted as confident of determinant value to avoid refraction. In the construct of individual performance is affected by habitual use constructs and task-technology fit for .329, or 32.9%, while 67.1% are influenced by other constructs beyond this study. The construct of habitual use value which influenced by self efficacy, trust, perceived critical mass, reputation and task-technology fit construct is .362, or 36.2%, while 63.8% are influenced by other constructs beyond this study. Task-technology fit construct which affected by task mobility, task feedback, system reliability, system accessibility and quality system amounted to .547 or 54.7%, while 45.3% are influenced by other constructs beyond this study. R<sup>2</sup> value in Table 2. is calculated by Q<sup>2</sup> formula. For this research model, Q<sup>2</sup> value or Relevance predictive value is 0,836 or 83.6%, so it can be concluded that the model in this study can explain the construct individual performance, habitual use and task-technology fit data is affected by the constructs in this study for 83.6%.

### Hypothesis Testing Result

To test the hypothesis, the value of t statistic resulting from Smart PLS output compared with the value of t table. In addition, the number of original samples used to determine the effect of latent constructs between the indicator and other construct. Testing criteria with a significance level of 10% is determined as follows: If t statistic > t table, ie, greater than 1.66 then the hypothesis is accepted. If t statistic ≤ t table, ie less than or equal



to 1.66 then the hypothesis is rejected. If the path coefficient value is positive, then there is a positive influence between constructs. If the value of path coefficient worth negative, then there is no effect. Table 2 shows an output of smart PLS to answer the hypothesis.

Table 2. Hypothesis Testing

Hypothesis	Relation	Path Coefficient	t statistics	t table (10%)	Information
H1	TTF, IP	.489	4.416	1.66	H <sup>0</sup> rejected
H2	TTF, HUI	.363	2.882	1.66	H <sup>0</sup> rejected
H3	HUI, IP	.151	1.478	1.66	H <sup>0</sup> accepted
H4	TM, TTF	.153	2.593	1.66	H <sup>0</sup> rejected
H5	TF, TTF	-.046	.465	1.66	H <sup>0</sup> accepted
H6	SR, TTF	.542	5.666	1.66	H <sup>0</sup> rejected
H7	SA, TTF	.295	3.688	1.66	H <sup>0</sup> rejected
H8	SQ, TTF	.042	.427	1.66	H <sup>0</sup> accepted
H9	SE, HUI	.113	.878	1.66	H <sup>0</sup> accepted
H10	T, HUI	.044	.368	1.66	H <sup>0</sup> accepted
H11	PCM, HUI	.161	1.401	1.66	H <sup>0</sup> accepted
H12	R, HUI	.225	2.511	1.66	H <sup>0</sup> rejected

## Discussion & Result

The result showed that H1: There is a positive and significant influence on Task-technology fit to the performance of lecturer at Telkom University, the path coefficient value of 0.489 and t value is significant at 4.416. The presence of the technologies at the University is able to facilitate the work of academics at Telkom University. The respondents have felt the benefits of the technology that suits its needs as a lecturer. According Marniati (2015) technology is a priority in order to improve the quality of education. With the technology, expected to academia in general and in particular the teacher force capable of improving the quality of education (Widhi, 2016).

The technology based on teaching needs is an important factor for the application of technology in education (Rachbini, 2015). In H2: There is a positive and significant influence between task-technology fit within the context of the Academic Support technology to habitual use of Telkom University Lecturer in the path coefficient value of 0.363 and t value is significant at 2,882. The availability of appropriate technology, respondents can do its job properly. This is in line with Chung's (2014: 105) research states that the technology can help an organization through good habits that carried workers to improve productivity of the organization.

H3 shows habitual use has not significant positive effect on lecturer performance at Telkom University with path coefficient value of 0.151 and t statistic is not significant at 1.478. Respondents from seven different faculties have different habits in their daily activities of teaching, research and community service as a lecturer. According to Chung (2014: 105) says the technology for enterprise organizations have significant effects for the productivity of the employees. This finding shows there is a difference between the application of technology in education with the organization of the company.

H4 explained that the path coefficient of 0.153 and t value is significant at 2,593. These results prove that there is a positive and significant impact on task mobility with task-technology fit within the context of the Academic support technology. Technological developments give effect to the mobility of respondents task as a lecturer, with an appropriate technology will simplify the task of lecturers. According to Voigt et al. (2012) in Chung (2014: 105) whose said that the appropriate technology is able to provide the ease of communication and collaboration in working on a job. H5 showed no effect on the task feedback on task-technology fit with path coefficient value of -0.046 and t value is not significant at 0.465. we can see that respondent did not get good feedback for his work during a lecturer at Telkom University. This is consistent with the statement from interview session with Sandi (Information System Staff of Telkom University, January 12, 2017) that the lack of feedback given by stakeholders such as students, faculty and staff have an impact on an inaccurate assessment of performance. But not in line with Ching's (2014: 104) research who found that the task feedback on the organization of the



company have a positive influence on employee performance. H6 explained there is a significant and positive effect on the system reliability to the task-technology fit with path coefficient value of 0.542 and t value significant at 5.666. Academic support technology devices provided said to be reliable and facilitate lecturer in their job. This is in line with the statement of Eko (2010) that a reliable technology will have a positive influence on the productivity of individuals and Chung (2014: 104) in his research said reliability technology make a company's employees working easier. H7 describes the system accessibility positive and significant effect on the task-technology fit with path coefficient value of 0.295 and t value is significant at 3.688. The availability of academic support technology that are reliable and easily accessible have been perceived by the respondents that have a significant influence on the resulting performance. This is in line with the results of Chung's (2014: 104) research who states that accessible technology can help employees do the work. H8 revealed that there is positive but not significant effect on the quality system to –task-fit technology in the context of ICT devices supporting academic at the University of Telkom with path coefficient value of 0.042 and t value is not significant at 0.427. This proves that good quality of an academic information system has not significant effect on the suitability of existing tasks. H8 is not in line with research Chung (2014: 104) who say the quality of a significant effect on the suitability of the technology as well as the task of impact on a good performance.

H9 explained that self-efficacy has a positive effect but not significant to the habitual use by the path coefficient value of 0.113 and t value is not significant at 0.878. The ability of respondents in using technology academic support positive effect on basic skills in using the technology (Chung, 2014: 96), but not significant because it is influenced by other factors. H10 explained there is positive but not significant in the trust of the habitual use by the path coefficient value of 0.044 and t value is not significant at 0.368. This shows the confidence of respondents in using technology academic support not significant effect on the habit of using technology that has not kept pace with McKnight (2002) in the Chung (2014: 97) that trusts have a significant effect on the habitual use of technology users. H11 explained there is positive and not significant at perceived critical mass against the habitual use by the path coefficient value of 0.161 and t value is not significant at 1.401. This shows the respondents will use an academic support technology devices because the work environment is also using that technology, but the effect is not significant. This is in line with research of Lou (2000) in Chung (2014: 97) states that a co-worker is able to influence someone in the use of certain information technology although in this study is said to be insignificant influence. H12 explained there is a significant and positive effect on the reputation of academic support technology against habitual use by the path coefficient value of 0.225 and t value is significant at 2.511. This proves that the respondent uses a particular academic support technology significantly influenced by the reputation of the technology in the work environment. This is in line with research of Chung (2014: 105) who states that employees will use a certain technology because of the perception of his or her co-workers for these technologies. Researcher hope for the future study must be able to adjust the variable for next study in accordance to their research object and goals. This study has six hypothesis which accepted and six other has rejected. So, the future research can use that result to adjust their research.

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