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The Influence of User Generation Differences on Individual Performance in Using Information Technology

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Abstract. The effect of different user generation in an organization is one of the factors that cause the decline of information technology user, this is due to the aging and characteristic difference factors of each user generations, so they impact individual performance in using information technology. Organization have user generation with very diverse age range, then the user information technology must have compatibility, flexibility, and ease in assisting completing tasks. This research is quantitative with analytical methods using Partial Least Square Structural Equation Modeling (PLS-SEM) at Mulawarman University in the generation. This study aims to identify and prove the influence of each generation of different users (Generation Y, Generation X, and Generation of Baby Boomers) on the performance of individuals in using information technology. Generation Y it was proven to be superior because the task characteristics had a significantly stronger influence than generation X and the generation baby boomers which was at the 0.05 level of significance. This study is useful for organizations in identifying the influencing factors from the real problems faced by user generation and assisting strategic decision making in order to improve information technology performance.

1. Introduction
Information technology that was once considered as a driving force and supporter of organizational strategy, is now considered an integrated part of business strategy. Many organizations invest capital in the form of resources and finance in order to develop various information technologies in an effort to achieve their goals. This has led to the importance of measuring the success of Management Information Systems [1]. Individual performance evaluation is intended to find out if the planned IT business strategy has been fulfilled so that continuous improvements can be made. In addition, evaluation is conducted to determine the alignment / suitability of information technology to support the activities of organizational tasks in an effort to achieve its objectives.

The impact of the use of information technology and individual performance has been a constant concern in the field of information systems research. A key focus in information systems research is a good understanding of the relationship between information systems and individual performance [2], [3]. With the understanding that information technology has a positive influence on individual performance, technology must be able to be utilized, and technology must be in accordance with the task. Today, even though users see technology as sophisticated, users will not adopt it if the user thinks that the technology is incompatible with the task and cannot improve performance [4], [5].

The impact of individual performance in using information technology in organizations, many previous studies use the technology suitability model for user tasks (Task-Technology Fit). The Task-Technology Fit (TTF) model is a match between the functions of technology and the user's task needs, where existing technology is used to support the tasks of everyday users [6], [7]. In this research focus the size of the impact of individual performance increases is an implication of the combination of increased efficiency, effectiveness and productivity in using information technology.

The user's age is one of the factors that can describe the maturity of individuals both physically, psychologically, socially, attitudes, and behavior in interacting with technology. So that age becomes a moderator variable that is believed to influence the use of information technology. Based on research conducted by [8] shows that age can influence the use of technology in various ways, namely: (1) directly affect the use of technology, (2) indirectly affect technology through perception, and (3) moderate relationship between perception and use of technology.

There are serious problems in the workplace, namely the generation differences that can affect various things, including communication, recruitment, team building, facing change, motivation, managing and improving performance. Generation is a group of individuals from the same birth span where at that time have a uniqueness formed from experience, history or epoch in the same period of time. According to [9] quoted from [10] suggests organizational management can succeed when able to manage several generations with approaches that contribute to the convenience between generations. Identifying the influencing factors toward individual performance based on different user generation in using information technology is required since these findings are very important in improving the use of information technology in organizations.

This study will provide evidence of the influence of different generations of users on individual performance in using information technology in the organization. The findings of this study are very important to identify the risks of the influence of the different generations of users in the organization on individual performance in using information technology. The task technology fit in each generation in the organization? How is the use of information technology in each generation in the organization? How do individuals use technology information in each generation in the organization? Based on the description, this research was conducted to answer the influence of different generations of users on the performance of individuals in using information technology in organizations.

2. Research Model

This study using a Task Technology Fit model by Goodhue and Thompshon (1995) refer to Figure 1. This research uses a quantitative method by distributing questionnaires based on variables that are found from the study literature. Respondents are the Generation (Table 1) users of information technology services at the Mulawarman University. The analytical method using Partial Least Square Structural Equation Modeling (PLS-SEM).
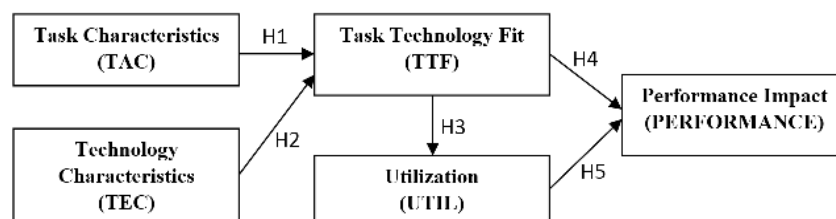
Figure 1. Research Model Task Technology Fit [6]

From generation to generation it always raises special problems and the pattern of resolution will be unique depending on human factors and the conditions that existed in his day. Classifying age into several generations based on birth year can be seen in Table 1.

Table 1. Grouping Respondent Generation by Age

	Baby Boomers	**Gen-X**	**Gen-Y**
Name Alternative	Me Generation	Generation-X, Post-Boomers, Baby Bust	Generation-Y, Echo Boomers, NexGen, Millenials
Year of birth	1945-1964	1965-1980	1981-2000
Seek	Money	Work / Life Balance	Respect and recognition
Work Characteristics	Hard Working, Sacrificing, Lip service paid to family and work/life balance	Technologically literate, Self-sufficient	Technological experts, Change jobs repeteadly
Strengths	Service oriented, Driven, Willing to go the extra mile, Good at relationships, Eager to please, Good team members	Adaptable, Independent, Unintimidated by authority, Creative	Collective action, Optimism, Tenacity, Multitasking
Weakness	Discomfort with conflict, reluctant to go against peers, Sensitive to feedback, Judgemental, Self-centered	Impatience, Lack of people skills, Inexperience, Cynicism	Need supervision and Structure, Lacks experience, poor people skills

Source: [11]

3. Hypothesis

Someone who is often involved in non-routine tasks in his work will make an assessment when using information technology to the daily suitability of technology with tasks [12], [13]. Until finally the users of information technology will make more demands and know more about the shortcomings of information technology that they use to then be adapted to the tasks of everyday users. Therefore, in this study proposes:

"H1: Task Characteristics influence Task Technology Fit on the generation in the use of information technology".

In an organization, the characteristics of technology are the basis for evaluating the use of information technology in the assessment of users on the level of daily technology compatibility with the task. The task technology fit is a rational perspective on whether the technology used can optimize the work or tasks of users [14]. this affirms that the technological suitability of the task is influenced by the characteristics of the task and the practicality of the technology used in assisting the work or tasks of everyday users. Therefore, this research proposes:

"H2: Technology Characteristics influence Task Technology Fit on the generation in the use of information technology".

The research results show that the characteristics of tasks and technology are an assessment of the individual's influence on the task technology fit. Based on [6] suggests that the suitability of technology to tasks influences the use of information technology. This is supported by several studies which also show that the task technology fit is a factor that influences the use of information technology [15] The better the suitability between tasks and technology will result and increase the intention to use [16]. Based on that the study proposes:

"H3: Task Technology Fit influence Utilization on the generation in the use of information technology ".

Task Technology Fit affects the impact of individual performance in using information technology [13], [17]. For example, many users who use and rely heavily on information systems, then will become frustrated when the system used is experiencing downtime and impact on their performance. Users who are very dependent on information systems for easy downtime will be able to judge that the system cannot be relied on to improve their performance. Therefore, the task technology fit will certainly affect the performance of individuals if the function of information technology in the organization is able to support the tasks of everyday users. Based on that the study proposes:

"H4: Task Technology Fit effect on the impact of Individual Performance in the generation in the use of information technology ".

The use of technology will cause user attitudes about the usability system, user satisfaction, user attitudes to social norms and other situational factors that have an impact on the intention to use the system and ultimately increase utilization either directly or indirectly [7]. Individual performance is a function of user usage and satisfaction which aims to show how information technology improves performance [2]. The implication is that increased use will have a positive effect on the impact of individual performance.Based on that the study proposes:

"H5: Utilization effect on the impact of individual performance on the generation in using information technology".

4. Data Analysis and Result

The sampling process of the research was carried out on each generation of users randomly conducted on Generation at the Mulawarman University. Data from questionnaires were collected and processed using PLS-SEM analysis methods then do the test data of the analysis of the measurement model and structural model. grouping level of user generation from the respondent data obtained in this study note that the majority of respondents by 62% are Generation Y (1981- 2000) a total of 257 respondents, the second rank is 25% is Generation X (1965-1980) with the a total of 101 respondents, and the last rank of 13% is the Baby Boomers Generation (1945-1964) with a total of 54 respondents. The total respondents obtained in this study were 412 respondents (Table 2).

Table 2. Demographic Respondents Generation

		Gen BB	Gen X	Gen Y
Gender	Male	35	64	128
	Female	19	37	129
Job	Staff	36	63	90
	Lecturer	18	38	25
	Student	-	-	142
Education	High School	13	8	153
	Diploma	3	4	6
	Bachelor's Degree	13	49	75
	Master's Degree	18	37	23
	Doctoral Degree	7	3	-

4.1. Analysis of Measurement Model

Analysis of the measurement model (Outer Model) was done by testing the convergent validity and discriminant validity. Convergent validity is a measure of internal consistency used to ascertain the factors that are assumed to measure any action latent variable itself and does not measure other latent variables [18]. Table 3 shows the outer loadings, Average Variance Extracted (AVE), composite reliability (CR), and Cronbach alpha (CA). For grades outer loadings all had a valid indicator to measure the latent variable that has a value of outer loadings > 0.6. So based on these results indicators can be used as a measuring tool that is appropriate to measure latent variables.

Average Variance Extracted (AVE) is a measure used to assess the internal consistency of the construct by measuring the number of variants that capture the latent variables of measurement indicators relative to the amount of variance. In Table 3 the Average Variance Extracted (AVE) value

can be seen that each latent variable is greater than 0.5. AVE should be greater than 0.5. It explains the latent variables are able to explain an average of at least 50% of the variance of the indicators that measure [19].

Composite Reliability (CR) and Cronbach Alpha (CA) is a measurement used to examine how well the model is measured by set indicators. However, the interpretation score Composite reliability and Cronbach Alpha is the same. According to [19] suggest larger CA and CR $\geq$ 0.7 as a standard sufficient or acceptable, whereas if the larger 0.8 and

0.9 means very satisfactory. Based on Table 3, almost all known indicators consistent/reliable in measuring latent variables (CA values $\geq$ 0.6) used are said to be reliable.

Discriminant validity is used to indicate the extent to which a given construct different from other constructs. Discriminant validity testing is done by looking at the Cross loadings value each indicator with higher variability has been correlated with their own variables compared to other variables. Based on the analysis of the measurement model has been qualified and reliable validity to then do the analysis on the structural model.

Table 3. Value outer loadings, T-Statistic, AVE, CR, R^2, CA

| Variable | Generation | Outer Loadings | Measurement Model | | | |
			Average Varian Extracted (AVE)	Composite Reliability (CR)	R2	Cronbach Alpha (CA)
Task Characteristics (TAC)	Gen Y		1.000	1.000	-	1.000
	Gen X	> 0.6	0.594	0.815	-	0.663
	Gen BB		0.645	0.876	-	0.819
Technology Characteristics (TEC)	Gen Y		0.513	0.913	-	0.894
	Gen X	> 0.6	0.562	0.953	-	0.948
	Gen BB		0.518	0.959	-	0.955
Task Technology Fit (TTF)	Gen Y		0.516	0.927	0.603	0.914
	Gen X	> 0.6	0.636	0.972	0.567	0.970
	Gen BB		0.519	0.933	0.607	0.922
Utilization (UTIL)	Gen Y		0.704	0.877	0.048	0.828
	Gen X	> 0.6	0.848	0.944	0.224	0.912
	Gen BB		0.880	0.957	0.208	0.933
Individual Performance (PERF)	Gen Y		0.680	0.894	0.610	0.842
	Gen X	> 0.6	0.774	0.932	0.647	0.903
	Gen BB		0.815	0.946	0.552	0.925

4.2. Analysis of Structural Model

Analysis of the structural model is the analysis of the pattern of the relationship between the variables of the analysis of this research hypothesis. The path coefficient between variables is said to be statistically significant, if the value of t-statistic of the relationship between latent variables showed a positive direction with a value of t-statistic that is compared to the value of the t-table and the result is greater (t- statistic $\geq$ t-table). The value of t-statistic obtained from bootstrapping (resampling method) of the PLS.

Table 4. Path Coefficient Variable and Hypothesis Value

| Path Variable (Hypothesis) | Path Coefficient (β) | | |
	Gen-Y	Gen-X	Gen-BB
TAC TTF (H1)	0.121**	0.100	0.206*
TEC TTF (H2)	0.754***	0.735***	0.748***
TTF UTIL (H3)	0.218***	0.473***	0.472***
TTF PERF (H4)	0.752***	0.737***	0.708***
UTIL PERF (H5)	0.103**	0.126*	0.089

Based on table 4, the results of the analysis of hypothesis testing research conducted on the Generation Y (1981-2000) user model at Mulawarman University obtained five hypotheses can be accepted. So that it can be empirically proven that task characteristics and technology characteristics

are identified as factors that influence the task technology fit. task technology fit is identified as a factor that influences utilization. Task technology fit and utilization is a factor that influences individual performance in using information technology at Mulawarman University. The Generation X (1965-1980) user model at Mulawarman University, four hypotheses were accepted and one hypothesis was rejected (table 4). task characteristics proved to have no effect on the task technology fit for generation x (H1). The analysis of hypothesis testing research conducted on the user model of the Baby Boomers (1945-1964) at Mulawarman University, four hypotheses were accepted and one hypothesis was rejected. utilization has proven to have no effect on the impact of individual performance for the baby boomers (H5).

Based on table 3, R^2 is used to indicate the percentage of variance constructs in the model or how much ability all the independent variables in explaining the variance of the dependent variable. Criterion limits of R^2 value can be determined based on three levels : 0.67 substantial, 0.33 Moderate, and 0.19 Weak [20].

Goodness of Fit (GoF) is used to describe the overall performance of the studied model, both on the measurement model and the structural model with a focus on the overall performance of the model predictions. The value of the interpretation GoF Small GoF = 0.10, GoF Medium = 0.25 and GoF Large = 0.36 [21]. GoF value of model Generation Y is 0.53 (GoF Large), Generation X is 0.57 (GoF Large) and Generation BB is 0.55 (GoF Large). These results explain the model task technology fit on the generation in Mulawarman has a great strength of models to represent the variables studied.

5. Discussion and Implications

Generation Y (1981-2000) can more optimally utilize the use of information technology services available at Mulawarman University to complete non-routine tasks they often face. The higher the task characteristics that are often faced by generation y, then requires them to use technology characteristics that are appropriate and able to support daily tasks. The task characteristics do not affect the suitability of the technology used, it is assumed that the tasks often faced by generation X (1956-1980) are not too frequent or more routine and everyday. The task characteristics faced by the X generation are more manual and do not use information technology services too much in completing tasks [3]. Generation Baby boomers (1945-1964) often get tasks that are not routine and interdependent with the need for information and data so that they need appropriate technology characteristics to help support the task. Some previous studies have proven that task characteristics are factors that influence the task technology fit [5], [14], [22].

All Generations who are often faced with non-routine tasks will require more appropriate technological characteristics to help complete their daily tasks such as finding information, finding learning materials, obtaining academic data, and completing their tasks. Technology characteristics at Mulawarman University have been able to support the tasks of the generation, such as accessibility, communication, pleasure, completeness of information, and flexibility. According to stated that the greater the characteristics of tasks faced by users, the greater the need for information technology in coordination and innovation. [16] stated that technology characteristics have a stronger direct effect than task characteristics on the suitability of technology to tasks, because the characteristics of technology that have fulfilled the task requirements will depend on the focus of the activities of the company. Technological characteristics are the basis for carrying out evaluations of users of information systems, where users will be able to assess the characteristics of the systems they use [13], [15]

The Generation considers that the existing technology is appropriate in supporting the tasks, it will influence them in making decisions to increase the use of information technology at Mulawarman University. the higher the suitability of technology to the tasks of all generations will affect the use of information technology services in an organization. Today even though users see technology as sophisticated, users will not adopt or use it if the user thinks that the technology is not appropriate to the task and does not improve performance [4], [5]. Appropriate technology to tasks is a determinant of beliefs about usability, the importance of use, and the benefits gained from using information technology [13]. The better the suitability between tasks and technology will result and increase the intention to use.

The increasing tasks and jobs faced by generations y and x at Mulawarman University cause them to increase the use of information technology services to complete tasks that affect individual

performance. With the increase in the use of information technology from generation y it will affect the performance of individuals, given the characteristics of tasks (non-routine assignments) that they often face such as college assignments, finding information, data transactions, looking for lecture materials, doing tasks that are not routine, and incidental, resulting in generation y to utilize and increase the use of information technology.

Task technology fit is a match between the function of technology and the user's task needs, where information technology used has an influence on individual performance if there is a match between the functionality technology and the task requirements of the user. The impact of performance is the fulfillment of task completion by an individual where an increase in technological suitability for the task will have an impact on increasing individual performance using technology. The results of this study reinforced several previous studies that prove that the impact of individual performance on technological suitability to the task is when technology has provided features and support that are in accordance with the requirements of tasks [23].

Task characteristics of baby boomers who are more routine or everyday tasks and do not demand that they always use information technology services at Mulawarman University. The second reason is based on the data of respondents, the average job or task is not always directly related to the use of information technology and is more manual, such as learning learning, correspondence, signatures, teaching, laboratories, non-IT fields. This result is also reinforced by [24] that the higher a person's age, the lower their perception of information technology and the lack of use of information technology. Several previous studies [25] stated that there are differences in decisions for the use of technology of various ages based on generations Y, X, and Baby Boomers and the performance improvement of each generation is also different. The impact of individual performance is a function of system usage and user satisfaction, which in turn shows that the use of information technology adds value to individual performance and operational effectiveness in helping individuals to complete their tasks more effectively and increase productivity [3].

6. Conclusion

This study empirically tested task-technology fit for individual performance on the generation using information technology at the Mulawarman University. Generation Y (1981-2000) it was proven to be superior because the task characteristics had a significantly stronger influence than generation X (1965-1980) and the baby boomers generation (1945-1964) which was at the 0.05 level of significance. In Generation y proved to be superior because the utilization of information technology had a significantly stronger influence compared to generation x and the generation of baby boomers at the 0.05 level of significance. Based on the results of the study it can be seen that for 5 hypotheses in this study influencing the Generation y better than the generation x and the baby boomers in using information technology that has an impact on performance individual at Mulawarman University. Overall, the results of this study show that there is an influence of differences in the generation of users in using information technology at Mulawarman University, where the results of data processing from each generation are different.

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