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## Toward Modeling the Effects of Cultural Dimension on ICT Acceptance in Indonesia

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### Abstract

The model of Information and Communication Technology (ICT) acceptance in developing countries is likely different from developed countries especially in terms of cultural dimensions. In this study we evaluate whether cultural dimensions have an effect on the ICT acceptance. We adopted Hofstede's cultural dimension (PDI, IDV, MAS, UAI, LTO) as influence factors to Perceive of Usefulness, Perceive Ease of Use and Social Influence which has been known as the construct of the Unified Theory of Technology Acceptance and Use of Technology (UTAUT) model. Research conducted on 302 respondents from the academic world in various cities in Indonesia. The questionnaire used in this study was developed based on previous studies that have proven validity. A two step modeling approach including confirmatory factor analysis and structural equation modeling were performed to assess the measurement model fit and causal relationships between constructs. The structural model was tested using SmartPLS. The findings indicate PDI and UAI have significant ( $p=0.01$ ) effect on PEOU, while LTO has significant ( $p=0.01$ ) effect on PU, and SI significantly ( $p=0.01$ ) influenced by PDI only. Thus to ensure the successful acceptance of ICT in Indonesia, still needed orders from superiors and supportive environment or peers.

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## 1. Introduction

In recent years the use of ICT in developing countries is increased, and then the acceptance of ICT is also an important issue. It is envisaged to support the successful implementation of ICT. Until now, the use of ICT in Indonesia is still lacking. It is worth exploring the causes, why the acceptance of ICT in Indonesia encountered obstacles. Many factors have been known influencing the ICT acceptance, it is believed that cultural factors play an important role. Most previous studies conducted in the USA and Canada, when performed outside of North America found few differences (Rose and Straub, 1998). Cultural factors proposed as being important in explaining IT usage behavior. (Straub et al., 1997). Another theoretical reason suggests that beliefs and values shared by a group of people can influence people's behavior on the implementation of technological change (England, 1975). The interaction effects from the combination of cultural values in a specific country are expected to affect ICT acceptance in ways that are distinctive to the particular culture (Veiga, 2001). To date, cultural factors have not been prominent in the study of technology acceptance, especially in developing countries like Indonesia.

Addressing these shortcomings, this study will examine the role of culture dimension on IT acceptance in Indonesia using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The (UTAUT) model that strengthened the most prominent eight previous IT Acceptance model was introduced by Venkatesh (Venkatesh, 2003). UTAUT models surpassed any previous models in explaining the user's behavioral intention of accepting ICT. In consequence of its best explanatory over other previous models, the UTAUT model is utilized to examine the probable role of culture in the ICT acceptance in this research. More specifically, our research proposes to empirically examine the triggering roles of cultural dimension on ICT acceptance using the modified UTAUT model.

Cultural dimension used in this study was introduced by Hofstede, presently consists of five dimensions (Hofstede, 1980, 2001). His study yielded what Hofstede initially defined as four dimensions of national culture: Power Distance (PDI), Individualism versus Collectivism (IDV), Masculinity versus Femininity (MAS), and Uncertainty Avoidance (UAI). The 5th dimension, Long-Term versus Short-Term Orientation (LTO), was subsequently added based on a later study carried out in Asian countries (Hofstede, 2001).

Venkatesh conducted validation and comparison testing of all factors found in the previous Technology Acceptance Model and he identified that there are four significant factors: performance expectancy, effort expectancy, social influence, and facilitating conditions. These factors will be used in this study as a technology acceptance construct except facilitating conditions.

## 2. Research Objective and Research Hypotheses

The objectives of the study were to analyze the effects of the cultural dimension on selected constructs such as perceived usefulness, perceived ease of use and subjective norm and to develop a general linear structural model of ICT acceptance of Indonesian academicians based mainly on UTAUT model that would provide a higher learning institution with implications for better implementing ICT.

In accordance with the previously objective and consistent with related literature, this research tested the following hypotheses:

- H1: Perceived Ease of Use has a direct impact on Behavioral Intention to use
- H2: Perceived Usefulness has a direct impact on Behavioral Intention to use
- H3: Social Influence has a direct impact on Behavioral Intention to use
- H4: Perceived Ease of Use has a direct impact on Perceived Usefulness
- H5: Power Distance has a direct impact on Perceived Ease of Used (H5a), Perceived Usefulness (H5b), and Social Influence (H5c)

- H6: Individualism has a direct impact on Perceived Ease of Use (H6a), Perceived Usefulness (H6b) and Social Influence (H6c)
- H7: User Avoidance has a direct impact on Perceived Ease of Use (H7a), Perceived Usefulness (H7b) and Social Influence (H7c)
- H8: Masculinity has no direct impact on Perceived Ease of Use (H8a), Perceived Usefulness (H8b) and Social Influence (H8c)
- H9: Long-Term Orientation has a direct impact on Perceived Ease of Use (H9a), Perceived Usefulness (H9b) and Social Influence (H9c)

### **3. Research Method**

#### *3.1 Research Model*

As has been noted in literature above, we can assume that different cultures can accept the ICT in similar ways but obtain a different result because of the culture. The relationships between the ICT Acceptance and its determinants, as well as the impact of culture are as below. After all there are three critical factors that are related directly towards ICT Acceptance. These are Perceived Ease of Use, Perceived Usefulness and Social Influence (Venkatesh, 2003). Also, from the literature, we found that there are four dimensions that could directly affect these factors which are uncertainty avoidance, collectivism, power distance and long-term orientation (Hofstede, 2008). Therefore, we propose a model on how culture could impact the ICT Acceptance as shown in figure 1. The model shows the relationship between factors of ICT Acceptance and the dimensions of culture.

#### *3.2 Research Design*

This research is cross-sectional and quantitative study using survey design. The questionnaire was developed based on previous studies related to UTAUT Model regarding the technology acceptance and based on Hofstede's cultural dimensions aspect. Cultural dimensions were positioned as the antecedent of the UTAUT construct. The Facilitating Condition and Usage construct had been deleted because the research performed was the cross-sectional. (Venkatesh, 2003).

#### *3.3 Research Sample*

Data was collected from university academics throughout Indonesia. We distributed 800 questionnaires to the respondents of which 308 were returned, 6 questionnaires were incomplete, leaving 302 questionnaires for further analysis. According to the literature (Kim, 2005) and (Sekaran, 2006), the ratio number of cases to the number of free parameters which is 10:1 minimum. The free parameters of this study were 25 parameters, therefore the amount 302 samples were sufficient.

#### *3.4 Research Instrument*

In structural equation modeling, a distinction is made between single item variable and variables computed from multiple items. Single item variables are referred to as observed variables, while multi item variables are called latent variables. In this study there were nine independent variables consisting of nine latent variables. There were Power Distance, Individualism, Masculinity, User Avoidance, Long-term Orientation, Perceived Ease of Use, Perceived Usefulness, Social Influence and Behavioral Intention. Two indicator items each were designed for PDI variable, IDV variable, MAS variable, UAI variable and LTO variable, while four indicator items each for PEOU, PU and SI variable and three

indicator items in Behavioral Intention variable. All together, there are 25 items in the research instrument. The items were designed based on previous researches related to UTAUT and Hofstede's dimension. The reliability of the instrument is based on a Cronbach Alpha value which is more than 0.6.

### 3.5 Data Analysis

To evaluate the structural model, the data were analyzed using Smart Partial Least Square (SmartPLS), one of Structural Equation Modeling (SEM) software. This method is suitable for this study because the objective of this research is to test the causal relationship between the predictor variables (cultural dimension) and Technology Acceptance construct. Two step modelling was performed in this study. The first step is establishing the measurement model using blindfold technique, where the measurement model is revised and confirmed. The second step is testing the structural model using the bootstrap technique, where the direct relations among latent variables were observed.

## 4. Results and Discussion

### 4.1 Reliability and Validity

From Table 1, we know that the square root of the average variance (AVE) of each construct is larger than its correlations with other constructs. Therefore all indicators (items) are **valid**. From Table 2, we can see that all value of composite reliability are greater than 0.7 that's means all indicators are **reliable** to measure the latent variable. And the all Cronbach Alpha value more than 0.6 that means all items are **reliable** to measure the construct.

### 4.2 Hypotheses Testing

In this study we use 3 significant levels there are  $p < 0.01$  ( $t > 1.645$ );  $p < 0.05$  ( $t > 1.96$ ) and  $p < 0.001$  ( $t > 2.58$ ). The result shows, the most conspicuous is the MAS (Masculinity) had no effect on all constructs, quite compatible with the hypothesis. Meanwhile, LTO has an influence on PU only, UAI on PEOU, and IDV on PEOU (very significant). PDI has a significant effect to PEOU and SI, but no effect to PU, while IDV has a significant effect on PEOU only. Thus, there is a discrepancy between the results and the initial hypotheses. The hypotheses result can be seen in Table 3 below.

Table 1. Correlation Latent Variable and Square Root of AVE

	BI	IDV	LTO	MAS	PDI	PEOU	PU	SI	UAI	SQRT(AVE)
BI	1.000									0.788
IDV	-0.229	1.000								0.877
LTO	-0.163	0.341	1.000							0.919
MAS	-0.186	0.757	0.310	1.000						0.900
PDI	0.181	-0.502	-0.265	-0.385	1.000					0.932
PEOU	0.244	-0.379	-0.204	-0.257	0.353	1.000				0.882
PU	0.316	-0.421	-0.321	-0.313	0.341	0.785	1.000			0.930
SI	0.331	0.011	-0.036	-0.021	0.192	0.164	0.208	1.000		0.879
UAI	-0.126	0.081	0.205	0.081	-0.133	-0.190	-0.111	-0.107	1.000	0.714

Table 2. The value of SQRT(AVE), Composite Reliability, R-Square, and Cronbach Alpha of all construct

Var.	SQRT (AVE)	Composite Reliability	R Square	Cronbachs Alpha
BI	0.788	0.831	0.174	0.699
IDV	0.877	0.869		0.699
LTO	0.919	0.916		0.821
MAS	0.900	0.895		0.765
PDI	0.932	0.930		0.849
PEOU	0.882	0.933	0.203	0.904
PU	0.930	0.962	0.655	0.948
SI	0.879	0.931	0.061	0.902
UAI	0.714	0.670		0.643

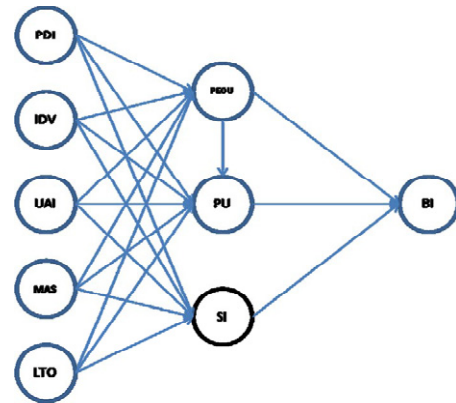


Figure 1. The Research Model

Table 3. Hypothesis Testing Result

Hypotheses	Sample Mean	T Statistics
H1 PEOU -> BI	-0.013	0.093
H2 PU -> BI	0.266	1.647 *
H3 SI -> BI	0.278	2.276 **
H4 PEOU -> PU	0.733	12.605 ***
H5a PDI -> PEOU	0.200	2.791 ***
H5b PDI -> PU	-0.001	0.070
H5c PDI -> SI	0.256	2.682 ***
H6a IDV -> PEOU	-0.302	3.374 ***
H6b IDV -> PU	-0.080	1.202
H6c IDV -> SI	0.205	1.601

Hypotheses	Sample Mean	T Statistics
H7a UAI -> PEOU	-0.146	1.698 *
H7b UAI -> PU	0.053	1.302
H7c UAI -> SI	-0.086	0.939
H8a MAS -> PEOU	0.072	0.851
H8b MAS -> PU	-0.022	0.342
H8c MAS -> SI	-0.078	0.574
H9a LTO -> PEOU	-0.042	0.613
H9b LTO -> PU	-0.151	3.383 ***
H9c LTO -> SI	-0.002	0.035

\* p=0.1 \*\* p=0.05 \*\*\* p = 0.01

### 5. Discussion

MAS has no effect on any constructs, this can be explained because the value of MAS on Hofstede's score was 46 which is rather average, not assertive whether masculine or feminine (Hofstede, 2001). Therefore, in this study, MAS dimension has no effect to all ICT acceptance's constructs was understandable. While PDI (score 78) is a high score. This indicates that most Indonesian people are very docile and obedient to superiors. This nature can be carried on making a decision (Hofstede, 2001). Hence, it was reasonable when we find the PDI have a significant effect on PEOU and SI. Positive feelings towards ICT acceptance could be affected by the orders of superiors. Similarly, the IDV score is low (14), it means Indonesian is not individualistic but collectivist (Hofstede, 2001). In general, the Indonesian prefer to work together, as a group together. Therefore, an individual decision-making could be influenced by environment. The environment could be family, friends, co-workers, peer groups etc., Who always interact with them intensively. Thus, it is easy to understand that the IDV has effect PEOU (ease of use in using new ICT). Regarding UAI (User Avoidance), the degree to which people feel threatened by uncertain, unstructured situations and ambiguity, apparently UAI affects the PEOU. The use of new ICT for instance, could lead to doubts and fears, so the individual could not be sure to use it easily (PEOU aspect). LTO dimension, this implies that all decision-making to be considered whether it

will be more helpful or not. It turns out in this study, the LTO influence the PU (Perceived Usefulness). For example, if ICT is felt to bring a lot of benefits in the future then one can accept.

## 6. Conclusion

The finding above shows that the PEOU (as constructs of Technology Acceptance) are most heavily influenced by cultural dimension. This means that the use of ICT in Indonesia must prioritize the 'ease of use' matter. Then PDI and IDV has a very significant impact on PEOU. This means that the successful implementation of ICT in Indonesia is strongly influenced by the supervisor, leader or manager and the work environment. Therefore, to be successful, the employer must be ordered firmly by boss and will be followed by their subordinates. Besides the people in the work environment is also very influential. In short, the culture dimensions have an effect on ICT acceptance in Indonesia. Thus, to ensure the successful implementation of ICT in Indonesia, this cultural dimension should be properly addressed. For further research we recommend to try the dimensions of culture as a moderating variable between UTAUT constructs with behavioral intentions.

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