Exploration of Cultural Influence on the Internet Acceptance in Yogyakarta Indonesia

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Abstract: Research on the influence of culture on the acceptance of Internet technology in Yogyakarta Indonesia has been completed. This study used Hofstede's cultural dimensions, namely power distance, individualism, uncertainty avoidance and long term orientation. This cultural dimension is used as an external variable in the Technology Acceptance Model (TAM) of davis. This study is an exploratory and quantitative research, conducted cross-sectionally with a population of respondents coming from Yogyakarta Province. We use SPSS as a tool for describing data processing and we use the theory of Structural Equation Modelling (SEM) to conduct the factor analysis and path analysis, using SmartPLS software. This study used $p<0.05$ and $p<0.01$ or $t>1.96$ and $t>2.58$ as level of significance. The results of this study showed that TAM of davis can be used as the basis for the framework of this study we found the evidence that all of the hypotheses of the Davis fulfilled and cultural dimensions of factors that influence the acceptance of internet technology are IDV, UAI and LTO while PDI has no effect. PU influenced by IDV and LTO while PEOU influenced by the UAI and LTO. It is seen that LTO contribute significantly to the acceptance of this internet technology. That is the Yogyakarta community will be able to accept internet technology when internet is stated as a kind of future investment.

Key words: Cultural dimension, technology acceptance, internet, structural equation modelling, data processing

INTRODUCTION

One of the challenges in Asia-pacific countries recently is preparing the citizens and the government to face the globalization era as well as information and communications revolution. Policy makers, government officials, business executives, NGO activists, academicians and ordinary citizens should be increasingly concerned about the strong competitiveness in the information age. E-ASEAN task force and UNDP Asia Pacific Development Information Programme (UNDP-APDIP) give confidence that with the Information and Communication Technology (ICT), the countries will be able to deal with the challenges of the information age.

ICTs let them leap forward to a higher level in several fields such as social development, economic and politics. ICT continues to play an important role in the competitive advantage of organizations. The use of ICT is required for the business organization because it is able to support better decision making, enhance business performance, elevate operational efficiency, improve stakeholder relations aswell as increase revenue and market share (Baltzan *et al.*, 2009).

World Bank has found that a 10% increase in the internet penetration led to a rise of 1.7% growth in gross domestic product (Freund and Weinhold, 2000). Accordingly, internet creates increased productivity through platforms such as cloud computing, enable small startups to challenge the global business and enable distributed access to investment through the crowde sourcing'. Thus, for developing countries giving priority to economic growth and social welfare, the internet management can no longer be ignored.

Internet has been very popular in the world but its penetration in Indonesia is still low. In November 2015, Indonesia has internet user as many as 78 million people with the internet penetration of 30.5%, 1.5 times higher than in 2012, however still left behind compared to other countries in Asia (Malaysia 67.5%, Thailand 55.9%, Vietnam 50.1%, Philippines 43.0%). Comparing with the developed countries, it appears that Indonesia continued to lag behind (South Korea 92.3%, Japan 90.6%, USA 87.4%, Canada 92.5%, UK 91.6%, Germany 88.4%). Correspondingly, it is implied that there is a problem of internet technology acceptance in Indonesia. Meanwhile, the theory of internet technology acceptance that has evolved was originally from the developed countries so
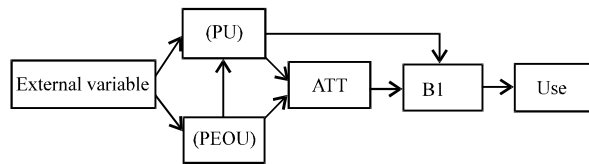
Fig. 1: Technology acceptance mode 1

that it is rather irrelevant when the theory is applied to Indonesian context. The situations and cultures in developed countries are not necessarily the same as Indonesia. Therefore, a research on technology acceptance model for Indonesia is necessary.

Information technology acceptance theory: The main theory of information technology acceptance is the technology acceptance model (Davis, 1989). In TAM, it is known that there are several variables decider against Behavioral Intention (BI) which are Perceived Usefulness (PU) and Attitude Towards behavior (ATT). ATT is influenced by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In turn, BI will affect the actual Behaviour while both PU and PEOU can be affected by other external variables as shown in (Fig. 1).

Dimensions of culture: A well known cultural Dimensions theory is expressed by Hofstede. In 1980, Hofstede conducted a research funded by IBM (International Business Machines) a giant computer company from the USA, to determine the size of the cultural dimension. It was expected to be used by IBM to support its computer industry. The result showed that hofstede discovered five cultural dimensions in the beginning, namely.

Power Distance Index (PDI): This dimension revealed the extent to which the less powerful members (less influence) of an organization or a community of people can accept and understand that power is distributed unequally. The higher this number is stated indicates the higher level of compliance.

Individualism (IDV): These dimensions reveal individualistic nature as opposed to collectivist attitudes. The higher this number stated, the more individualist society and everything is rated and based on self-dependency.

Masculinity (MAS): High score (masculine) in this dimension shows that people agree on a competitive attitude to excel and achieve success. Thus, this is not a matter of gender.

Uncertainty Avoidance (UAI): To what extent the members of a community feel threatened by ambiguous or uncertain situations. Avoiding this is reflected in the UAI score. The higher the scores in this dimension show that people feel more indifferent about uncertainty.

Long Term Orientation (LTO): It shows the orientation of a community in using something (in this case is the new technology) for a long term

There is an opportunity to enter other variables into the original TAM as an external variable (Fig. 1) (Veiga *et al.*, 2001; Sriwindono and Yahya, 2012, 2014) and it is possible to use cultural factors as an influential factor in the TAM. Several previous studies have concluded that:

Related to the PDI factors:
- In the hierarchical community, changes of technology emerged from the supreme leader (Hill *et al.*, 1998)
- Participatory project development methodology is not appropriate to be applied to the people who have a high PDI (Gader, 1997)
- ICT can increase the power of IT workers because it can give them the same opportunity as other leaders (Hasan and Ditsa, 1999)

Related to IDV factors:
- Collective perceptions influence the technology acceptance (Straub 1994)
- ICT support to individuals affects the acceptance of the technology (Hasan and Ditsa, 1999)

Related to MAS factors:
- There is no influence of MAS on the acceptance of the use of MIS in Indonesia
- It is difficult to enter MAS as the determining variable in TAM (Veiga *et al.*, 2001)

Related to UAI factors:
- Fear of the unknown effect inflicted by new technologies raises the resistance of the user
- Culture with a high UAI can only adopt a low-risk technology (Hasan and Ditsa, 1999)
- UAI as control is an important antecedent in the use of ERP systems (Chau, 1996)

Related to LTO factors:
- Changes in ICT can be a problem for people with a short-term orientation culture (Hasan and Ditsa, 1999)
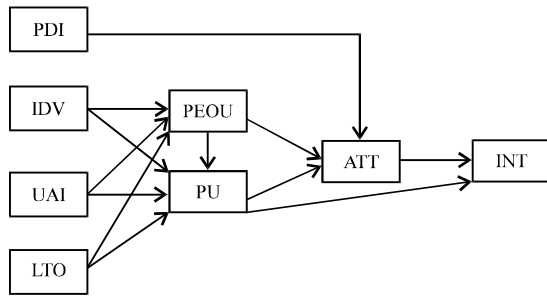
Fig. 2: Research framework

- Near-term usefulness influence the intention to use technology in the USA (Chau, 1996)
- Fatalistic orientation towards future causing resistance to the long-term IT planning in arabian gulf countries (Gader, 1997)

From study results mentioned above, a hypothesis can be arranged which is cultural influence on the acceptance of the technology in a particular place with a certain local culture such as in Yogyakarta. The framework of this research model can be assembled as in Fig. 2.

MATERIALS AND METHODS

As described in the literature review, it is assumed that different cultures can receive the information technology in the same way but obtain different results due to the culture. There are two important factors that relate directly to the information technology acceptance intentions which are PEOU (Perceived ease of use) and PU (Perceived usefulness) (Davis, 1989). Also, it can be found that there are four cultural dimensions that directly affect technology acceptance model above, i.e., PDI, IDV, UAI and LTO (Sriwindono and Yahya, 2014). Therefore in this study a model of how culture can affect internet technology acceptance is proposed with the framework as shown in (Fig. 3). This model shows the relationship between TAM factors and cultural dimensions as antecedents. A detailed hypothesis is compiled as follow:

- H_1: "Perceived Ease of Use" affects "Attitude" positively
- H_2: "Perceived Ease of Use" affects "Perceived Usefulness" positively
- H_3: "Perceived Usefulness" affects "Attitude" positively

- H_4: "Perceived Usefulness" affects "Intention" positively
- H_5: "Attitude" affects "Intention" positively
- H_6: "Power Distance" affects "Attitude" positively
- H_7: "Individualism" affects "Perceived Ease of Use" positively
- H_8: "Individualism" affects "Perceived Usefulness" positively
- H_9: "Uncertainty Avoidance" affects "Perceived Ease of Use" positively
- H_{10}: "Uncertainty Avoidance" affects "Perceived Usefulness" positively
- H_{11}: "Long Term Orientation" affects "Perceived Ease of Use" positively
- H_{12}: "Long Term Orientation" affects "Perceived Usefulness" positively

Research design: This research is an exploration research and cross-sectional shape of quantitative research. The questionnaire was developed based on previous research related to TAM (Davis, 1989) regarding the acceptance of the technology and is based on aspects of the cultural dimension (Hofstede, 2001). Cultural dimensions will be positioned as an antecedent to construct TAM variables. Data are collected by distributing questionnaires to the respondents. The distribution of questionnaires is conducted in two methods, i.e., direct face-to-face with the respondent and online over the internet. Target respondents are residents of Yogyakarta province. Respondents were randomly selected (random sampling), with a rate of reliance is 95%. Data are analyzed using SPSS 16.0 Software and data analysis has been done using the principle of structural equation modeling and smart PLS Software.

RESULTS AND DISCUSSION

Descriptive analysis: Data were collected from all districts of Yogyakarta in November and December 2014. Respondents were selected by random sampling and were addressed to adults only (> 20 years old). In total, the data obtained are 239 valid respondents consisted of 119 men and 120 women, dominated by the young adults (Table 1). In terms of education can be seen in Table 2 in which the majority of the respondents had completed high school or equivalent (over 50%).

Occupations of the respondents have been collected in this study which is shown in Table 3. An occupation as an entrepreneur was ranked the highest about 38%. From data processing results using SPSS with crosstab functions, interesting facts were obtained: respondents

Table 1: Composition of respondents age

Age	Frequency	Percent
20-24	79	33.1
25-29	29	12.1
30-34	17	7.1
35-39	22	9.2
40-49	41	17.2
50-59	45	18.8
60+	6	2.5
Total	239	100.0

Table 2: Composition of respondents education

Education	Frequency	Percent
Elementary	3	1.3
Secondary	12	5.0
High school	124	51.9
Bachelor	91	38.1
Master	9	3.8
Total	239	100.0

Table 3: Composition of respondents occupation

Occuption	Frequency	Percent
Farmer	8	3.3
Entrepreneur	92	38.5
PNS teacher	51	21.3
PNS lecturer	5	2.1
PNS non teacher/lecturer	14	5.9
Soldier/police	3	1.3
Others	66	27.6
Total	239	100.0

who often use smartphone to access the internet are dominated by young people. Table 4 shows that 92% of respondents aged 20-24 years using the internet with a frequency of often, very often and almost always. In terms of education, it is seen that the respondents who had completed high school or equivalent and above (S1, S2) are the most frequently using internet as shown in Table 5. According to the occupation type, respondents who work as entrepreneur use internet the most, compared to other occupations as shown in Table 6.

Structure analysis using SEM

Validity and reliability: Confirmatory factor analysis is conducted using PLS Software, it is used to check the validity of all existing indicators at each construct. Indicators considered valid if the loading factor is >0.5 or very significant. Loading factor can be seen in (Table 7). Table 8 shows that the values of composite reliability are all above 0.7. It indicates that all indicators measurements are reliable to measure latent variables. In addition, it is also evident that the cronbach alpha values are above 0.5, which means that the indicators measurement is reliable to measure each construct.

Examination hypothesis: In this study, two levels of significance were used that is equal to $p < 0.05$ ($t > 1.96$) and $p < 0.01$ ($t > 2.58$). The results of running the bootstrap procedure on PLS are shown in Table 9. It appears that the hypothesis of H_6, H_7 and H_{10} are not proven while the others were proved in accordance with the study design. From this study, it can be seen that the Perceived Ease of Use (PEOU) significantly affects Perceived Usefulness (PU) as shown in the second hypothesis, meaning that in Yogyakarta population the sense of ease in using internet affects its usefulness.

Similarly, both PEOU and PU affect the attitude of internet usage (hypotheses 1 and 3) and in turn attitude also affects the intention of internet use (hypothesis 5). Likewise, it appears that the benefits of internet will affect the user intention (hypothesis 4), meaning that the desire to use internet triggered by the significance of the benefits provided. As of now, the technology acceptance model of davis (TAM), seems quite appropriate to the conditions in Yogyakarta.

Taking a note at the influence of cultural factors (represented by the cultural dimensions of Hofstede), there are several important things as followed: Individualism affects Perceived Usefulness (hypothesis 8), meaning that for most people who are more individualistic the benefits of internet is bigger. Arguably, internet benefits are more likely to be perceived by public who are individualist. On the other hand, it appears that this individualistic trait has no effect on PEOU (hypothesis 7). Furthermore, it seemed that Power Distance also has no effect on Attitude (hypothesis 6). Initially it was suspected that the higher power distance resulting in a higher attitude towards the use of internet, however it turns out that this allegation is incorrect because it does not apply to people in Yogyakarta, the fact that Power Distance has no effect. This means that people who works under other's authority (workers) or the one holds authority (employer) has nothing to do with the attitude towards the internet. Subsequently, UAI (User avoidance) apparently only affects PEOU (hypothesis 9) and has no effect on PU (hypothesis 10). This finding is interesting, because the User Avoidance indicates the level of indifference towards uncertainty. In addition, it appears that it affects the feel of ease to use internet. That is indeed true that the user is not afraid of new things, will find it easier to use new things such as Internet and does not care about its usefulness. Another finding is that LTO (Long Term Orientation) affects PEOU (hypothesis 11) and PU (hypothesis 12). This shows that in a future-oriented society, these behaviors affect Perceived Ease of Use (ease of use) and the Perceived usefulness (utility function).

Table 4: The frequency of internet use vs age

Age	Barely never	Seldom	Normal	Often	Very often	Almost always	Total (4+5+6)	Percentage	Total	Percentage
20-24	2	1	3	17	33	23	73	92.4	79	33.1
25-29	3	4	2	5	10	5	20	69.0	29	12.1
30-34	1	2	3	6	4	1	11	64.7	17	7.1
35-39	1	1	4	10	6	0	16	72.7	22	9.2
40-49	10	6	4	13	6	2	21	51.2	41	17.2
50-59	17	7	8	10	3	0	13	28.9	45	18.8
60+	4	0	0	2	0	0	2	33.3	6	2.5
Total	38	21	24	63	62	31	156		239	

Table 5: The frequency of internet use vs education

Educational level	Barely never	Seldom	Normal	Often	Very often	Almost always	Total
SD	3	0	0	0	0	0	3
SMP	5	3	0	1	3	0	12
SMA	27	10	16	26	26	19	124
S1	3	8	7	33	30	10	91
S2	0	0	1	3	3	2	9
Total	38	21	24	63	62	31	239

Table 6: The frequency of internet use vs occupation

Occupation	Barely never	Seldom	Normal	Often	Very often	Almost always	Total
Farmer	5	2	1	0	0	0	8
Entrepreneur	17	10	8	20	29	8	92
PNS teacher	5	4	9	16	13	4	51
PNS lecturer	0	0	0	1	4	0	5
PNS non teacher/lecturer	2	3	1	5	3	0	14
Soldier/police	0	0	1	1	0	1	3
Others	9	2	4	20	13	18	66
Total	38	21	24	63	62	31	239

Table 7: Loading factor

Indicator	ATT	IDV	INT	LTO	PDI	PEOU	PU	UAI
AT1	0.887	-	-	-	-	-	-	-
AT2	0.883	-	-	-	-	-	-	-
AT3	0.893	-	-	-	-	-	-	-
AT4	0.863	-	-	-	-	-	-	-
IDV1	-	0.968	-	-	-	-	-	-
IDV2	-	0.971	-	-	-	-	-	-
IDV3	-	0.848	-	-	-	-	-	-
INT1	-	-	0.849	-	-	-	-	-
INT2	-	-	0.877	-	-	-	-	-
INT3	-	-	0.815	-	-	-	-	-
INT4	-	-	0.885	-	-	-	-	-
INT5	-	-	0.803	-	-	-	-	-
LTO1	-	-	-	0.617	-	-	-	-
LTO2	-	-	-	0.795	-	-	-	-
LTO3	-	-	-	0.893	-	-	-	-
PDI1	-	-	-	-	0.882	-	-	-
PDI2	-	-	-	-	0.915	-	-	-
PDI3	-	-	-	-	0.972	-	-	-
PE1	-	-	-	-	-	0.889	-	-
PE2	-	-	-	-	-	0.878	-	-
PE3	-	-	-	-	-	0.887	-	-
PE4	-	-	-	-	-	0.915	-	-
PU1	-	-	-	-	-	-	0.890	-
PU2	-	-	-	-	-	-	0.914	-
PU3	-	-	-	-	-	-	0.920	-
PU4	-	-	-	-	-	-	0.926	-
UAI1	-	-	-	-	-	-	-	0.904
UAI2	-	-	-	-	-	-	-	0.973
UAI3	-	-	-	-	-	-	-	0.884

Table 8: The Value of AVE, CR and CA

Indicator	AVE	Composite reliability	Cronbachs alpha
ATT	0.778	0.933	0.905
IDV	0.866	0.951	0.936
INT	0.716	0.927	0.901
LTO	0.603	0.817	0.682

Table 8: Continue

Indicator	AVE	Composite reliability	Cronbachs alpha
PDI	0.853	0.946	0.914
PEOU	0.796	0.940	0.915
PU	0.833	0.952	0.933
UAI	0.849	0.944	0.911

Table 9: Hypothesis test result

H	Hypo-thesis	O	M	STDEV	STERR	|O/STERR|
H_2	PEOU->PU	0.760013	0.757728	0.034976	0.034976	21.729499**
H_3	PU->ATT	0.647768	0.648837	0.032090	0.032090	20.186146**
H_1	PEOU->ATT	0.336784	0.335790	0.031067	0.031067	10.840552**
H_5	ATT->INT	0.595134	0.599994	0.065650	0.065650	9.065191**
H_{11}	LTO->PEOU	0.310651	0.313058	0.052215	0.052215	5.949513**
H_9	UAI->PEOU	-0.312982	-0.316215	0.060532	0.060532	5.170554**
H_4	PU->INT	0.328815	0.323629	0.066562	0.066562	4.940022**
H_{12}	LTO->PU	0.161923	0.163986	0.035437	0.035437	4.569333**
H_8	IDV->PU	-0.069576	-0.067669	0.031900	0.031900	2.181111*
H_{10}	UAI->PU	-0.029706	-0.031205	0.024993	0.024993	1.188544
H_7	IDV->PEOU	0.050342	0.053824	0.083161	0.083161	0.605357
H_6	PDI->ATT	-0.005509	-0.005748	0.016541	0.016541	0.333030

O = Original sample ; M = Sample Mean ; STDEV = Standard Deviation; STERR = Standard Error; |O/STERR| = t-statistics; *,**p<0.05, 0.01

CONCLUSION

Technology Acceptance Model (TAM) of davis has been proved able to indicate internet technology acceptance for the special region of Yogyakarta. In addition, it is confirmed that the expansion of TAM using cultural dimensions variables of Hofstede as external variables is feasible in this study but apparently not all the cultural dimensions of Hofstede affecting the constructs in TAM. Furthermore, it is verified that Long Term Orientation (LTO) and Uncertainty Avoidance (UAI) factors have an effect on Perceived Ease of Use (PEOU), as Long Term Orientation (LTO) and Individualism (IDV) factors are affecting Perceived Usefulness (PU) and Power Distance (PDI) factors has no effect on attitude.

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