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Fisherman's Acceptance of Information and Communication Technology Integration in Malaysia: Exploring the Moderating Effect of Age and Experience

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Abstract: This study used Structural Equation Modeling (SEM) design, in which 400 Malaysia fishermen from the four fishery districts namely Langkawi Island, Besut, Larut-Matang and Mersing were administered to explore the factors that influence their acceptance of Information and Communication Technology (ICT) integration in Malaysia. The aim of this study was twofold: The primary purposes was to test the Unified Theory of Acceptance and Use of Technology (UTAUT) including performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) in the prediction of behavioral intention to use ICTs among Malaysia fishermen. Second, explore the moderating effects of age and experience linked between predictors and behavioral intention based on multi-group analysis. The findings of this study clearly show the model accounts for almost 25% of the variance in user intentions, with FC, PE and EE surfacing only as the key determinants for their behavioural intentions of ICT usage. In an additional analysis revealed that age significantly moderates purposed relationship between the overall UTAUT constructs and behavioral intention while the moderating effect of experience was only established in PE and EE. Finally, the result suggests support for the application of the model in studying the acceptance of ICT in fishing communities. The factors were found to be significant in this study should be taken into account in the implementation of ICT projects and another validation of the ICTs research model in similar research institutions in Malaysia is advised.

Key words: Fishing community, the UTAUT model, behavioural intentions, ICT usage

INTRODUCTION

Fisheries and aquaculture are important to the Malaysian population particularly those in the rural areas. Despite the impacts of climate change on these activities and on the fisherman's quality of life, the development of fisheries industry is still stable mostly when Information and Communication Technologies (ICTs) have started to use in profiting the industry. These days, ICTs become more integrated with fishing communities in many ways, from navigation and location finding on fish to obtaining knowledge on trade at a local market and improve their livelihood enhancement (Hassan *et al*., 2011; Omar *et al*., 2012). Furthermore, there are many studies in Malaysia point to the fact that ICT is helpful to fishermen when used for the right purposes. According to Hassan *et al*. (2011), ICTs can assist them to enhance their safety aspects and productivity which encourage fishermen to apply ICTs in their fishing operations. The key point is not about how we integrate ICTs intoall fishermen, but it is all about how we can operate ICT for effective use in fishing communities. In addition, manystudieshaverecently been done in Malaysia on fishing technology, based on the usage of offshore technology, knowledgeable fishermen, the impact of behavioral factors on mobile phone users and also the influence of social factors on ICT adoption among fishermen (Hassan *et al*., 2011; Mazuki *et al*., 2013; Omar *et al*., 2012; Ramli *et al*., 2013). Regardless of these studies, there is concern as to whether fishermen are enough ready to integrate the ICTs that is accessible to them into effective use for their fishing routine.

There are numerous models of technology acceptance have been established in Western nations during the past two decades, some of which have deployed to focus on an people's intention to use new technologies (Kripanont, 2007; Louho *et al*., 2006) and by predict acceptance and application usage. This study applies the model of Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh *et al*. (2003) which is considered to be more accurate than other models in examining fishermen'

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acceptance of ICT if our fishing communities value ICT in their fishing routine. Until now, the model has been used in several studies to assess the usage of ICTs in different settings (Al-Qeisi, 2009; Anderson and Schwager, 2004; Birch and Irvine, 2009; Kripanont, 2007; Louho *et al.*, 2006; Ramli *et al.*, 2013; Schaper and Pervan, 2007; Suhendra *et al.*, 2009; Tibenderana *et al.*, 2010). However, it has rarely been applied in ICTs related studies, especially in a developing country like Malaysia. Thus, the aim of this study is to test the UTAUT constructs that influence fishermen' acceptance of ICTs integration and add hypothesize age and experience as fishermen to the model that affect our fishermen feel easy integrating ICTs to provide them for their activity that values technology. This study also seeks to answertwo research questions:

- Do the UTAUT constructs (performance expectancy (PE), social influence (SI), effort expectancy (EE) and facilitating conditions (FC)) influence fishermen' acceptance of ICT integration
- Do age and experience as fishermen moderate the effect of the four direct determinants in the UTAUT constructs?

LITERATURE REVIEW

Fishing community in Malaysia: The Food and Agriculture Organization (FAO) data reported by the World Bank shows that fisheries offer a key entry point to reach millions of people of Asian-pacific, including Malaysia to assist in increasing people's income, improving the nutrition and health of families and becoming active agents of economic development (Dixon *et al.*, 2001). The Malaysian government controls aquaculture and fisheries, mainly in terms of the number of people working in fisheries and the government also has placed a great deal attention in this sector via several plans, for example subsidizing fuel costs of sailing and offering fishermen with a monthly payment worth USD66. According to the census held by the Department of Fisheries Malaysia (DOF, 2010), recently the proportion of Malaysians registered in fisheries industry has increased to a total of 129,622 in 2010, compared to 2006 which the number of registered fishermen has only been 97,947. Even though, most of the fisheries industry in Malaysia can be found in 74 districts where are located at the west and east coasts of Malaysia with 41 districts and other 34 districts are in Sabah/Sarawak, the states of Sabah and Sarawak have the highest number of registered fishermen and accounted for more than half of the total value of gross output (54.6%) (DOF, 2009). In addition, the total fishery sector in 2010 showed an increase of 3.77% in production compared to the year before and fisheries produced a total 2,014,534.84 million tonnes of fish with the value of RM9,495.28 million, 1,428,881 tonnes worth RM6, 651.89 million for marine capture fisheries, general water and seaweed aquaculture, 1,108,897 tons valued at RM5, 362.97 million for coastal fisheries and 319.984 tons valued at RM1, 288.92 million from deep sea fishing. On the whole, fisheries industries have generated RM6, 8030 billion Ringgit incomes in Malaysia (DOF, 2010).

Beside the big number of registered fishermen, represent an increase in 2005 till 2009, the number of registered vessels has also increased significantly. In 2009, all of the registered vessels in Malaysia were 48,745, compared to 2005, almost 25% increase. The statistics (DOF) indicate that east coast zone has a high number of registered vessels with total 88940 in 2009, followed by west coast with total 21604 and Sabah/Sarawak with total 18247 and this fishing vessels have been licensed to fish in Malaysian coastal waters with 48,589 units and there are 1167 units of licensed fishing vessels at sea (DOF, 2010). Based on the data presented, we can conclude that the livelihoods of fishermen depend on the fisheries industry in Malaysia thus, this industry needs to be flourished to take those actions through increased access to appropriate mechanisms such as ICTs.

Malaysian fisherman's acceptance of ICT: An acceptance of Information and Communication technology (ICT) has been and will continue to be a common topic for research in information systems disciplines. As long as many industries allocate many funds to improve adoption and usage rates of new information technologies. Fisheries industry is exactly like other industries continue to look to information technologies as a new ways for developing their place in the market. Based on previous research, ICTs are becoming more vital in fisherman's regular lives and therefore in fisheries industry in Malaysia. For example, ICTs offer numerous advantages for fishing communities. One of the main advantages is to offer continuing knowledge and information to communities mostly the fishermen to lead their fishing routines (Ramli *et al.*, 2013). ICT in this industry is also a motivator for fishermen as it relates to their interests and their lives. Studies have also shown ICT has a good impact on the fishing communities such as improving productivity and income of fishermen, reducing operational costs, supporting the supply chain, marketing and commercial activity at an optimum level, enhancing safe working condition of the fishers and creating new opportunities and delivery of services to rural areas (Abubakar and

Abdullahi, 2009; D'Silva *et al*., 2010; Gupta, 2006; Hassan *et al*., 2009; Shaffril *et al*., 2010). There are also occasions when ICTs as a means create some possibility that could not have been achieved without technology. In Malaysia, this industry has attempted to offer several types of advanced equipment related to information technologies to assist fishing operations such as sonar, echo sounders, Geographical Positioning Systems (GPS), radar and, of course, the more traditional methods such as mobile phones and wireless sets (Hassan *et al*., 2011; Omar *et al*., 2011). GPS, for instance, is one of the popular forms of fishing equipment, with a large amount of fishermen having GPS in their vessel. The key reasons why fishermen use GPS are because it is comparatively affordable, enables them to mark the fishing location by delivering essential info including latitude, longitude and altitude (Hassan *et al*., 2011; Omar *et al*., 2011, 2012). Moreover, sonar is another ICT tool used to provide an inclusive updated and accessible map of the full fishing zone. Similar to GPS, it will give a direction to the particular desired fishing spot. In addition, echo sounders also are additional ICT tool which assists the fishermen to detect fish under the vessel and to improve safety and security (Hassan *et al*., 2011; Omar *et al*., 2012). Similar to echo sounders, radar is a useful tool to improve fishermen's safety as it can act as an early warning system with respect to informs fishermen of any approaching environmental threats (Thean *et al*., 2011; Hassan *et al*., 2011; Lowrey, 2004; Mazuki *et al*., 2012). Within its exact use advanced ICT tools, fishermen can take advantages of mobile phone service in a sense that it assists the fishermen to keep their information about weather, fishing location and market price up-to-date (Hassan *et al*., 2011; Jensen, 2007). According to Omar *et al*. (2011), though directing their fishing routines, fishermen are always faced with a very difficult situation such as sudden climate changes and therefore mobile phones can act as a safety tool. In such setting, wireless sets similar to mobile phone might enhance market performance and twice fishermen income, since the key function of both is communication. However, mobile phones are more appropriate and cheaper than wireless sets. In overall, the advantage of ICT tools have confirmed to be crucial for the fishermen.

Applying the UTAUT model: Technology acceptance models are one way scholars evaluate behavioral intention to a technology usage and by extension predict subsequent acceptance and usage. These kinds of model attempt to advance in an effort to improve implementation success rates and better predict adoption. This study is more interested in the Unified Theory of Technology Acceptance and Use (UTAUT) model in the process of formulating the research framework due to the fact that is counted to be a more adequate model than others, with the ability to explain 70% of variance (adjusted R2 = 70%) in usage behavioral intention where the other models just explained between 17 and 53% of variance (Venkatesh *et al*., 2003). Until now, a large amount of research has been conducted on validation of the UTAUT model in a variety of settings from Western to non-Western nations over the last two decades. For example, Al-Gahtani *et al*. (2007) applied the UTAUT model in a non-western environment on business disciplines. In this study, the model explained 39.1% of intention to use variance and 42.1% of usage variance. Anderson *et al*. (2006) used the UTAUT model to assess user acceptance of Table PCs by the college of business. The model accounted for 44.6% of the variance in usage of Table PCs. In similar study, the UTAUT model tested with radiologists. The model found to be a suitable model for this setting. Two constructs of the model which namely Performance Expectancy (PE) and Facilitating Condition (FC) were the only significant factors in predicting behaviour attention. Explained variance was 46%. Eckhardt *et al*. (2009) found that the impact of System Information on adaption significantly differ with regard to both peer groups and adopters and non-adopter of the influence. A similar study managed by Wang and Yang (2005) focused on the validation of the model in an informational kiosks setting. Im *et al*. (2008) research applied the UTAUT model to higher education disciplines in order to investigate four moderating variables including new-perceived risk (PR), technology type (TT), user experience (UE) and gender. It found that model fits the data a very good. All this findings indicated that the UTAUT model was robust enough to work for all disciplines. In this regard, the UTAUT model has four key constructs include Performance expectancy (PE) which is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh *et al*., 2003), effort expectancy (EE) "the degree to which an individual perceives it important thatothers believe he or she should use the new system" (Venkatesh *et al*., 2003), social influence (SI), described as the degree of user perceives that is important other thinking he/she should technology usage and facilitating conditions (FC), derived from users' perception of the resources and availability of support that can perform a behavior (Venkatesh *et al*., 2003). These constructs are direct factors of usage behavioral intention and individual factors include age, gender, experience and voluntariness of use are labeled as key moderators that influences on behavioral intention as well. These moderators influence each of the factors in different ways (Venkatesh *et al*., 2003). Gender, for example, is shown to affect PE, EE and SI. Previous research discovered that males more likely than females use and adopt behaviors of technology (Kripanont and Tatnall, 2009; Wan *et al*., 2005). The UTAUT posited that age is considered to play moderating roles on PE, EE, FC and SI while people who are older more likely than younger age to be influenced by others (Garfield, 2005; Pervan and Schaper, 2004). Other individual factor "experience" influences EE, FC and SI conditions. According to Burton-Jones and Hubona (2006), experience leads to a positive relationship with perceived usefulness. Finally, voluntariness of use influences only SI (Venkatesh *et al*., 2003). Based on the above reviews, research model of this study is developed in which the behavioral intentions (BI) to use ICTs is endogenous variable, PE, EE, FC and SI which are four constructs of the UTAUT model are exogenous variables. The age and experience as fishermen are the moderator variables that affect magnitude of the relationship between the exogenous variables and the endogenous variable.

MATERIALS AND METHODS

This study employed a quantitative approach where data was gathered by way of a self-administered survey questionnaire. The data were collected from the four fishery districts namely Langkawi Island in Kedah, Besut in Terengganu, Larut-Matang in Perak and Mersing in Johor and total of 400 respondents from these four fishery districts were randomly selected as respondents through multi-stage simple random sampling technique; based on the literature their sample size should be at least 400 in order to use SEM (Comrey and Lee, 1992). Guadagnoli and Velicer (1988) review several studies that conclude that absolute minimum sample sizes, rather than subject to item ratios, are more relevant.

To achieve the research questions of the study, Structural Equation Model (SEM) design was used to evaluate the hypothesized model regarding the factors influencing Fisherman's acceptance of information and communication technology integration in Malaysia and also multi-group analysis was used to explore the moderating effects of age and experience factors and their linked between predictors and behavioral intention. The descriptive statistics were employed to examine the demographic information provided by the respondents. The variables of the study were based on were based on the UTAUT model which was PE (9 questions), SI (8 questions), FC (6 questions), EE (9 questions) and BI (7 questions). The questionnaire contained questions regarding the following moderators developed by Venkatesh *et al*. (2003): Age were computed as a continuous variable and experience was computed, using a year from 1 year to 60 year experience as fishermen. Lastly, the questionnaire used a five-point Likert scale where the score 0 represented 'strongly disagree' while the score 4 represented 'strongly agree'.

RESULTS AND DISCUSSION

Study respondents: Four hundred surveys were received from the four fishery districts namely Langkawi Island, Besut, Larut-Matang and Mersing in Malaysia, representing an effective response rate of 100%. Table 1 provides basic sample characteristics. The result shows that of the four hundred fishermen, 395 were male (98.8%) and five were female (1.3%). According to Omar *et al*. (2012), fisheries is still a male dominated industry in Malaysia. In addition, the average age and experience working as fishermen respectively were almost 47, ranging from 20 to 72 and 24.45 which years worked ranged from 1 to 60 years and with respect to respondents' income, majority (49%) of them earn between RM501-RM1000 a month.

Descriptive statistics for latent constructs: The exogenous and endogenous variable scales were shaped by averaging the responses to the suitable questions as arranged on the UTAUT model. The descriptive statistics for the five latent constructs are outlined in Table 2.

The results in Table 2 displays that for the respondents, on average, it is perceived that the Performance Expectancy (PE) is slightly above average

Table 1: Basic characteristics of respondents

Sample characteristics	Frequency	(%)	Mean	SD
Gender				
Male	395	98.8		
Female	5	1.3		
Age (years)			46.99	11.97
18-40	121	30.3		
40<	279	69.7		
Income (RM/month)				
<RM500	142	35.5		
RM501-RM1000	196	49.0		
>RM1001	62	15.5		
Experience as fishermen (years)				
<30	285	71.2		
>30	115	28.8		

Table 2: Descriptive statistics of latent constructs

Constructs	Mean	SD
Performance Expectancy (PE)	2.239	0.77
Social Influence (SI)	1.42	0.868
Facilitating Condition (FC)	1.767	0.766
Effort Expectancy (EE)	2.6	0.88
Behavioral Intention (BI)	2.38	0.93

(M = 2.239, SD = 0.077) and the effort expectancy appears to be even higher (M = 2.6, SD = 0.88). It was also found that on average, respondents believed that having facilitating conditions (FC) is above average than social influence (M = 1.767, SD = 0.766). On average, it is perceived that the behavioral intention (BI) to use ICT to assist fishermen in performing their jobs is above average (M = 2.38, SD = 0.93).

Structural equation modelling (SEM): This study is conducted, using structural equation modelling (SEM). SEM was preferred as the most suitable statistical analysis strategy because it is able to reduce measurement error, test latent (unobserved) and manifest variables in dependence relationships and assess simultaneous overall tests of model fit and individual parameter estimate tests. This part provides a step-by-step discussion of data analysis procedures and the results. Before conducting data analysis, test of normality, using the maximum likelihood estimation techniques, is necessary to use for screening the data. By far the most common method of estimation within CFA is maximum likelihood (ML), a technique which assumes that the observed variables is normally distributed.

According to Byrne (2009) data is considered to be normal if Skewness is between -2 to +2 and kurtosis is between -7 to +7. In this study, assessment of normality displayed the Skewness ranged from -0.917 to 0.595 and kurtosis ranged from -1.162 to 0.903 in which the data considered to be normal and there was no items to be non-normal. Thus, with the data for this study being multivariate normally distributed. Then, two steps of analysis in SEM were conducted to answer the study's hypothesis: Confirmatory Factor Analysis (CFA) is the first steps for the individual construct is employed to test the measurement model and confirmed the dimensions for all items in the survey and the second step was to specify and assess the structure model.

Measurement model: In a reliable manner, the measurement model was determined to confirm that selected items to reflect the unobserved constructs (Hair *et al*., 2010). The measurement model test in here included the five latent variables of performance expectancy (PE), social influence (SL), facilitating condition (FC) and effort expectancy (EE). Each latent variable has different indicators five observed variables for PE, five observed variables for SI, four observed variables for FC, six observed variables for EE and five observed variables for BI. In addition, the specified measurement model was improved regarding to the factor loading which must be more than 0.5, positive and not more than 1.0. The specific criteria for global fit indices of measurement model assessment display that the measurement model presents a good fit between data and the proposed measurement model. The fit indices and threshold values obtained in this study are outlined in Table 3. The values obtained are Normed Chi-Square (2/df) =1017.460, Relative chi-square (CMIN) = 3.839, Goodness-of-fit-index (GFI) = 0.827, Adjusted goodness-of-fit-index (AGFI) = 0.788, Comparative fit index (CFI) = 0.923, IFI = 0.923, TLI = 0.912, Normed fit index (NFI) = 0.899 and Root mean square error of approximation (RMSEA) = 0.084. Comparing these results to the threshold values suggests that the UTAUT model for this study fits the data quite well, though RMSEA, GFI and AGFI failed to meet the fit measure threshold value with (< 0.9) and (<0.08).

The second purpose of measurement model is to assess construct validity of the instrument by conducting both convergent and divergent validity. It can be assessed by using all constructs' composite reliability (C.R>0.7), high factor loadings (= 0.5) (Hair *et al*., 2010) and average variance extracted (AVE) should be higher than 0.50 (Fornell and Lacker, 1981) to indicate high convergent validity. Results of convergent validity testing showed that reliability scores of latent constructs ranged between 0.85 (facilitating condition) and 0.96 (effort expectancy). The AVE values ranged between 0.56 (performance expectancy) and 0.78 (effort expectancy), it can be concluded that an average variance extracted and construct reliability for all constructs are met the criteria (Table 4).

Finally, measurement model was used to demonstrate the set of construct between variables. Researchers also use the measurement model to examine the extent of interrelationships and covariation (or lack thereof) even when the two measurement methods are similar among

Table 3: Model-of-fit evaluation of the research model

Fit indices	Threshold value	Authors	Results obtained
CMIN/DF	< 5.0	Bentler (1990)	3.839
GFI	>0.90	Chau (1997)	0.923
AGFI	>0.90	Chau (1997)	0.788
CFI	>0.90	Bentler (1990)	0.923
IFI	>0.90	Bentler and Bonett (1980)	0.923
NFI	>0.90	Bentler and Bonett (1980)	0.899
RMSEA	<0.08	Byrne (2001)	0.084

Table 4: Average variance extracted and construct reliability of study instruments

Construct	Initial Items	Final No. of Items	AVE	CR
Performance Expectancy (PE)	9	5	0.56	0.86
Social Influence (SI)	8	5	0.63	0.89
Facilitating Condition (FC)	6	4	0.59	0.85
Effort Expectancy (EE)	9	6	0.78	0.96
Behavioral Intention (BI)	7	5	0.75	0.94

Table 5: Average variance extracted (on the diagonal) and squared correlation coefficients (on the off diagonal) for study instruments

Construct	PE	SI	FC	EE	BI
PE	0.56				
SI	0.211	0.63			
FC	0.193	0.422	0.59		
EE	0.372	0.115	0.04	0.78	
BI	0.152	0.09	0.176	0.109	0.75

Table 6: Unstandardized and standardized regression weights in the hypothesized path model

Hypothesised relationship	Unstandardized estimate	S.E	Standardized estimate	C.R	p	R^2
BI<--- FC	0.421	0.079	0.363	5.314	***	25
BI<--- PE	0.190	0.096	0.138	1.987	0.047	
BI<--- SI	-0.075	0.075	-0.066	-0.996	0.319	
BI<--- EE	0.231	0.070	0.197	3.304	***	

the constructs. In other words, convergent and discriminant validity require that multiple measures of a construct relate highly to each other and less highly to measures of other constructs. While for the discriminant validity propose, all construct's AVE was found higher than squared correlation coefficients for each pair (Table 5).

Structural model and hypothesis tests: The results of SEM analysis, with the sample sizes of 400 from Malaysian fishermen, done on the research model to uncover unstandardized path estimates, standardized error, the standardized path estimates, Critical Ratio (CR) and their statistical significance (p-value) are shown in Fig. 1 and Table 6. The results of assessing the structural model fits indicated that the data fit the model by meeting the requirement of five indices: χ^2 (265) = 1017, p = 0.000, χ^2/DF = 3.839, CFI = 0.923, IFI = 0.923 and TLI = 0.912. The results of SEM analyses between the exogenous variables and behavioral intention of technology use were as follows:

H1: There is a significant relationship between facilitating condition (FC) and fisherman's behavioral intention of technology use

Facilitating condition (FC): The result of the structural model, based on Table 6, indicated the FC had significant contribution towards the prediction of BI (β = 0.7, CR = 1.136, p = 0.000) in a significant way (0.05). Therefore, H1was supported:

H2: There is a significant relationship between performance expectancy (PE) and fisherman's behavioral intention of technology use

Performance expectancy (PE): As depicted in Fig. 1 and Table 6, PE latent constructs consist of five indicators, was found to have a significant relationship with the fisherman's behavioral intention of technology use (β = 0.138, C.R. = 1.987, p = 0.047). As depicted in Fig. 1, indicator 5 indicated by the highest standardized coefficient 0.87. Therefore, H2 was supported as there is enough statistical evidence to reject H_0:

H3: There is a significant relationship between social influences (SI) and fisherman's behavioral intention of technology use

Social influences (SI): The result of the structural model, according to Table 6, found that SI latent construct including five indicators had not significant contribution towards the prediction of fisherman's behavioral intention of technology use. The standardized path coefficient indicated that the data were not reliable with the hypothesis by showing no significant relationship (β = - 0.066, C.R. = -0.996, p = 0.319) between SI and the behavioral intention. Thus, SI fails to reject H_0:

H4: There is a significant relationship between effort expectancy (EE) and fisherman's behavioral intention of technology use

Effort expectancy (EE): According to the results as shown in Fig. 1 and Table 4, there is a significant relationship between EE latent construct and behavioral intention (β = 0.197, C.R. = 3.304, p = 0.000). Therefore, H4 was supported.

In general, the three variables (FC, PE and EE) explained 25% of variance in fisherman's behavioral intention (BI) of technology use:

H5: The direct path hypotheses H1, H2, H3 and H4 address age as a moderating factor, such that the effect is stronger for fishermen and particularly for younger fishermen

H6: The direct path hypotheses H2, H3 and H4 address experience as a moderating factor such that the effect is stronger for who have working experience as fishermen

To examine the moderation effect of age and experience on the relationships of the selected constructs of the UTAUT model and behavioral intention multi-group analysis produced two unconstrained (variant-Group) and Measurement Residuals (Invariant-Group) in which the Variant-Group referred to group differences and the Invariant-Group refers to sharing same regression weights (Hair *et al.*, 2010).

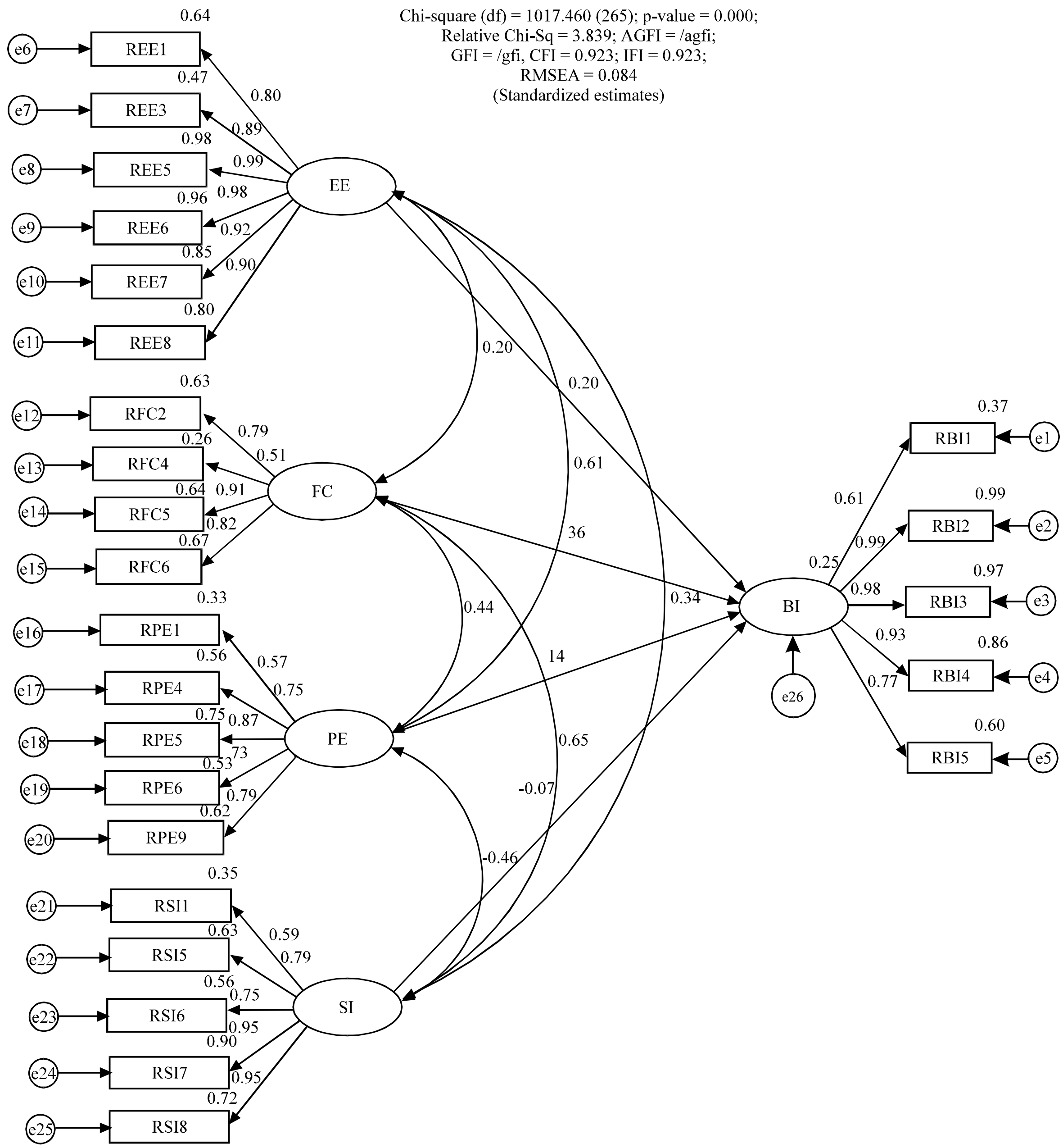

Fig. 1: Structural model of the study

Age: Venkatesh *et al*. (2003) formulated age was added to the model and were hypothesized to moderate the effect of four constructs (FC, PE, SI and EE). The respondents of the survey categorised into two groups: The first group ranged in age from 18 to 40 years which is considered as young fishermen and a second group ranged in age from above 40 which considered as adult. The first step is to evaluate the moderating effect of fishermen's age on the overall model. Results indicated that the differences were significant ($p<0.05$) and the variant-Group is better than the Invariant-Group (= 171.826 (1584.242 - 1412.415); df = 85 (170-85); p = 0.000), then we can conclude that there is some form of moderation effect of age on the overall model. The second step is to test the moderation effect of fishermen's age on the individual paths. The results of Table 7 indicated that age significantly moderates the path relation between four constructs (FC, PE, SI and EE) and BI.

Table 7: Results of moderation test of age and experience on a relationship between predictors and behavioral intention

Construct	Unstandardized estimate	Standardized estimate	p	CR for differences
Facilitating Condition (FC)				
18-40 (age)	0.199	0.168	0.061	0.089
40<	0.478	0.614	***	5.380
Performance Expectancy (PE)				
18-40	-0.182	-0.191	0.119	-1.558
40<	0.216	0.318	0.012	2.517
Social Influence (SI)				
18-40	0.180	0.161	0.092	1.685
40<	-0.197	-0.239	0.019	-2.353
Effort Expectancy (EE)				
18-40	0.449	0.413	***	0.100
40<	0.138	0.174	0.047	1.985
Performance Expectancy (PE)				
<30 (experience)	0.434	0.735	***	3.409
>30	0.004	0.006	0.956	0.055
Social Influence (SI)				
<30	-0.046	-0.059	0.772	0-.290
>30	-0.086	-0.090	0.239	-1.178
Effort Expectancy (EE)				
<30	-0.046	-0.061	0.661	-0.439
>30	0.320	0.349	***	4.503

Experience: The second moderator was fishermen' experience. The experience was also added to the model of the UTAUT by Venkatesh *et al*. (2003) and was hypothesized to moderate the effect of the three direct determinants (PE, EE and SI) on the user's intention. In addition, the respondents at fisheries industry were categorized based on fisherman's experience (less that 30 years experience/above 30 years experience). Results indicated that there is some form of moderation effect of fisherman's experience on the overall model (= 196.958 (1648.073-1451.115); df = 80 (615-530); p = 0.000). The result of the moderating effects assessment as portrayed in Table 7 show that experience only moderate the path relation between PE and EE with behavioral intention and while the moderating effect of experience was not established in SI.

CONCLUSION

This study has presented the theoretical basis behind the development of the UTAUT model to examine ICT acceptance and utilization by Malaysian fishermen and to develop the model amongst this group. Based on the model, we were exploring the relationships among four constructs and fishermen' intention to use the various types of advanced equipment and technologies. As theorized, facilitating condition (FC), performance expectancy (PE) and effort expectancy (EE) were found to have an influence on fisherman's attention on ICT use. However, the analysis showed a lack of statistically significant paths between social influence (SI) and behavioral intention (BI). SI is a core construct of various technology acceptance models. The absence of support for this variable's effect on fishermen' intention warrant further confirmatory analysis. In addition, we theorized the moderating effects of age and experience on the relationship between the constructs and fishermen' intention technology use. The analysis unveiled age moderated relatively include PE, EE, SI and FC on behavioral intention. In particular, we discovered that the effect of these constructs on behavioral intention is more pronounced for older fishermen. Nevertheless, any of the effects of EE, SI and FC were moderated by experience.

The importance of the constructs within UTAUT that affecting fishermen' intention of ICT use had some implications for practitioners and researcher.

First, the result suggests support for the application of the model in studying the acceptance of ICT in fishing communities. The factors were found to be significant in this study should be taken into account in the implementation of ICT projects and another validation of the ICTs research model in similar research institutions in Malaysia is advised.

Second, our findings recommended that system developers, designers and institutional purchasers of advanced equipment and technologies to aid their fishing operations wisely consider the fishermen' need and warrant that selected advanced equipment effectively meet these demands.

Finally, although the findings delivered meaningful insights for the technology use among Malaysian fishermen, a person's perceptions may change over time when they get more experience (Venkatesh and Davis, 2000; Venkatesh *et al*., 2003). Thus, longitudinal study should be considered to examine the validity of the UTAUT model and our findings.

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