ACCEPTANCE ANALYSIS OF EXPERT SYSTEM IN FOREX AND COMMODITIES ONLINE TRADING A CASE STUDY OF METATRADER4 USERS

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Abstract

This study measures the acceptance of foreign exchange and commodities traders/investors on the use of the expert system in the form of EA in helping their online trading process. This research model is based on the Technology Acceptance Model (TAM) popularized by Fred D. Davis. Constructs used in this study is Perceived Ease of Use, Perceived Usefulness, Attitude Toward Using, Behavioural Intention to Use, Actual System Use, External Variables (User Involvement.

The primary data in this study were obtained from questionnaires. Some sample of forex traders as respondents were asked to fill out an online questionnaire. The data then processed and analysed by Structural Equation Model (SEM) method with the help of IBM SPSS AMOS 20 software.

The results of this study show that Perceived Ease of Use has a positive and strong influence on Perceived Usefulness, Perceived Usefulness has a positive and strong influence on Attitude Toward Using, Attitude Toward Using has a positive and strong influence on Behavioral Intention to Use, Behavioral Intention to Use has a positive and strong influence on Actual System Use and user involvement has a positive and strong influence on Perceived Ease of Use.

Keywords— *Expert System, Technology Acceptance Model (TAM), Structural Equation Modelling (SEM)*

1. Introduction

The rapid technological developments of recent times greatly affect the field of investment. Investment products such as stocks and commodities such as gold, silver, petroleum and foreign exchange can now be done online. Decisions taken in trading transactions of stocks, commodities and foreign exchange is certainly not done at random but through the process of analysis, both the analysis of price movements, as well as analysis based on economic theory. The accuracy of the results of this analysis largely determines the outcome of the transaction, but unfortunately, the ability of this analysis turns out to be a relatively difficult skill to master.

This problem of causes potential investors are reluctant to invest in trading stocks, commodities, and forex.

Difficulties in this technique of analysis can be overcome by the availability of expert systems in the field of investment that performs analysis of price movements and then automatically performs transactions based on the results of the analysis performed. Expert systems for conducting analysis in this field of investment are available to investors/traders who use the MetaTrader4 trading platform. By using an expert system called Expert Advisor (EA) or a trading robot, investors/traders do not need to masters on analytical skills of price movements of forex or commodities traded in order to take profit from such trades.

Research on the use of EA in online trading, especially for forex and commodities has been done by other researchers by way of comparison of the results of trading done by manual and trading results conducted with EA. The study proves that the use of EA can be more accurate in obtaining profit compared to trading by manual [1].

However, the results of a poll conducted by a site about forex trading stated that EA was only used by 18.80% of traders. This, of course, raises the question of how traders actually accept the use of expert systems in online trading. To answer that question, this research will try to study the acceptance of expert system in investment by taking the case of Expert Advisor (EA) acceptance, which is one of the expert systems in online trading by using Technology Acceptance Model (TAM) model from Fred D. Davis [2].

The TAM model used in this research is a TAM model that has been adjusted based on findings from previous studies, including the results of Sung J. Shim's research

which concludes that the failure of acceptance of expert system in finance is due to the generic nature of the expert system, compatibility and modifiability [3]. Furthermore, consider the results of research conducted by Khaled Al-Share, Arsjad Sjamsuddin, Elizabeth Williams who concluded that TAM variables to measure the acceptance of expert system needs to be adjusted with the nature of the expert system [4] then TAM model in this research will be modified by addition of external variable that is user involvement. Modifications to the TAM model are basically also carried out by previous researchers to adapt the TAM model to the field of research and research objects [5].

1.2 Literature review

### 1.2.1 Technology Acceptance Model

User acceptance of technology has been an important research topic over the past decade. Although other models are also used in these studies, the Technology Acceptance Model or TAM is the most commonly used model. In line with the development of the research conducted, the TAM model itself has grown since it was introduced initially by Davis in 1985 [5].

TAM was developed by Fred D. Davis in 1989, adopted from the Theory of Reasoned Action (TRA) model, the theory of action developed by Fishbein and Ajzen in 1975 [7]. TAM is tailor-made for modeling user information system adoption.
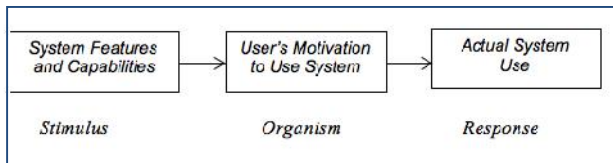
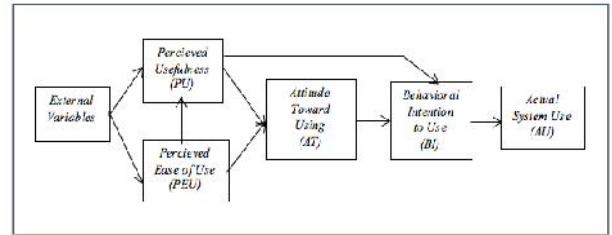**Figure 1.** *Conceptual Model of Acceptance Technology*

Based on the conceptual model of Figure 1, Davis proposed the Technology Acceptance Model (TAM) as shown in Figure 2 [5].
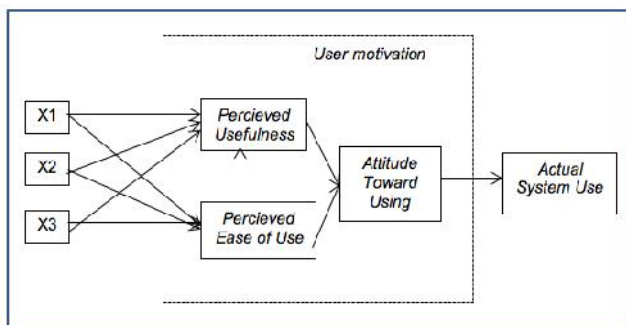

Figure 2. *Original TAM proposed by David*

The TAM model in Figure 2 is then continuously developed by Davis, Bagozzi, and Warsaw [7] by including Behavioral Intention variables.

The framework of thinking in this study is based on the TAM model as shown in Figure 3 below:

Figure 3 *Technology Acceptance Model (TAM)*

From the conceptual model in figure 3 above, then developed the SEM model by determining the manifest variables for each latent variable. The SEM model for this study is shown in Figure 4.
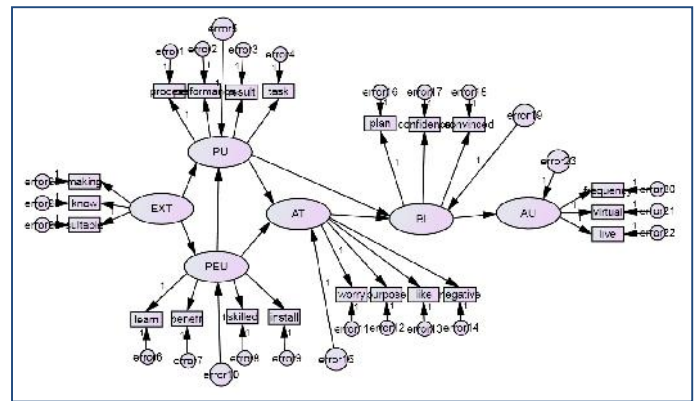
Figure 4 *SEM Model*

Based on the research framework, the hypotheses of this research are as follows:

1. Perceptions of investors/traders on expert system ease of use (Perceived Ease of Use) significantly influence the expert system usefulness (Perceived Usefulness)
2. Perceptions of investors/traders on expert system ease of use (Perceived Ease of Use) significantly influence the expert system attitude of use (Attitude Toward Using)
3. Perceptions of investors/traders on the expert system benefits of use (Perceived Usefulness) significantly influence on expert system attitudes of use (Attitude Toward Using)
4. Perceptions of investors/traders on the expert system benefits of use (Perceived Usefulness) significantly influence the expert system interest to use (Behavioral Intention to Use)
5. Attitude Toward Using the investor/trader in the use of expert system significantly influences the interest of expert system use (Behavioral Intention to Use)
6. Interest to use (Behavioral Intention to Use) of investors/traders on expert system are significant influence the expert system real use (Actual System Use)
7. External factors such as user involvement (investor//trader) in the development of expert

system are significant influence the expert system ease of use (Perceived Ease of Use)

8. External factors such as user involvement (investor/ trader) in the development of expert system are significant influence the expert system usefulness (Perceived Usefulness)

2. Discussion

2.1 Sample and Data Collection

Primary data for this study were collected from the respondents through questionnaires distribution. The population in this study are forex traders, actors of foreign exchange investments who conduct the online transaction through brokers that provide the MetaTrader4trading platform. While the samples in this study are MetaTrader4 users who have at least installed and tried Expert Advisor (EA). Considering the normality requirement, the estimation method used, the maximum likelihood, the complexity of the model and other factors such as limited manpower, funding and research time, then the number of samples taken for this study is 200 respondents. The number of sample 200 is generally accepted as a representative sample on SEM analysis [8].

2.2 Data Processing Result

2.2.1 Validity and Reliability Testing on Questionnaire

Testing to determine the validity and reliability of the questionnaire as a primary data gathering tool in this study was conducted on 20 respondents in the test phase of the questionnaire. The test results show that all variables meet the validity requirements at the 0.01 significance level and also reliable because the Cronbach alpha value is greater than 0.6 [8].

2.2.2 Testing on Research Model

2.2.2.1 Normality Test and Identification of Outlier Data

Normality tests are performed to see the distribution of data to satisfy SEM assumptions about the normal distribution of data. The test is performed on each variable.

Data are categorized as a normal distribution if the skewness and cr value of kurtosis are below the z value of the table [6]. Using the significance level of .002 the z score is $-3.08 < z < +3.08$ [9]. Under these conditions, the existing data has not been normally distributed so that it is necessary to detect outlier data by measuring how far the data is from a certain point with the Mahalanobis method. Data that considered outlier, which has p1 and p2 below 0.05 [6]is deleted, leaving the remaining 169 data for further testing

2.2.2.2 Measurement Test

The measurement test of the model is performed on all construct variables with the result that PU (Perceived Usefulness) and AT (Attitude Toward Using) variables must be modified to meet the fitness (suitability) requirements

2.2.2.3 Structural Test

The initial structural model obtained by modification to the measurement model of some constructs (PU and AT) is shown in Figure 5.
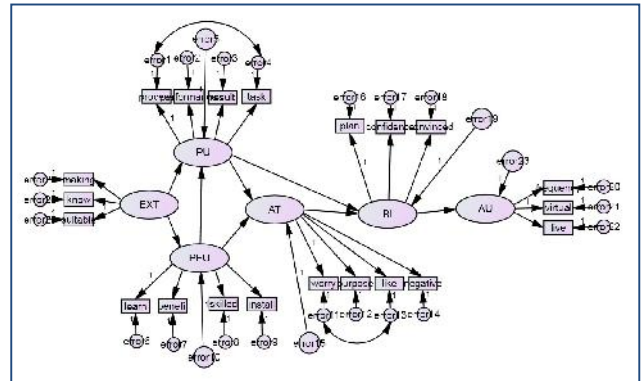

Figure 5. SEM Model after Modification on PU and AT

2.2.2.4 Overall Fitness Test of the Model

The result of model suitability test shows that the model has not fulfilled the fitness model criteria so it needs to be modified by using AMOS recommendation. Modifications made to this structural model was able to improve the suitability of the model so that it entered in the category of medium suitability.

2.2.2.5 Testing of Structural Parameter Estimates

The next structural model test is to estimate the parameters. From the output of AMOS, the results obtained as shown in table 1 below

Table 1 *Estimates and P value*

and the Significance of Relationship between Constructs

			Estimate	S.E.	C.R.	P	significance
PEU	<---	EXT	.560	.059	9.428	***	significant
PU	<---	PEU	.576	.098	5.911	***	significant
PU	<---	EXT	.307	.075	4.101	***	significant
AT	<---	PU	.733	.053	13.875	***	significant
AT	<---	PEU	.172	.050	3.431	***	significant
BI	<---	AT	.845	.091	9.295	***	significant
BI	<---	PU	.179	.076	2.362	.018	significant

	Estimate	S.E.	C.R.	P	significance
AU <--- BI	1.085	.037	29.292	***	significant

Table 1 shows that all paths in the research model are significant because they have P <0.05.

2.3 Testing of the Research Hypothesis

The next test is the test of the research hypothesis based on the value of P in table 3.1 which all show the value of P <0.05 so it can be concluded that the entire hypothesis of this study proved significantly.

2.4 Trimming of the Structural Model and Model Parameterization

The next step is trimming the structural model by looking at the estimated value of the relationships between constructs in Table 3.1, where it appears that PU <--- EXT, AT <--- PEU, and BI <--- PU paths have an estimated value less than 0.5 so it must be removed from the model.

The next step is to test the suitability of the model of the trimming model. The test results show that the model is in the category of mid-level suitability.

Then, re-analyzed the relationship between constructs to the model after the trimming process. The results of this analysis note that all relationships between constructs in the after trimming model is significant.

Finally, analyze the level of closeness of the relationships between constructs by looking at the estimated values of the relationships between constructs in the after trimming model. The results show the estimated value of the overall relationship between constructs in the range of numbers 0.7 and 0.99 which means the relationship between constructs in the model after trimming is very strong.

From the results of trimming and model testing after trimming, we obtained a better model than the initial model. The model after trimming is shown in Figure 6 below.
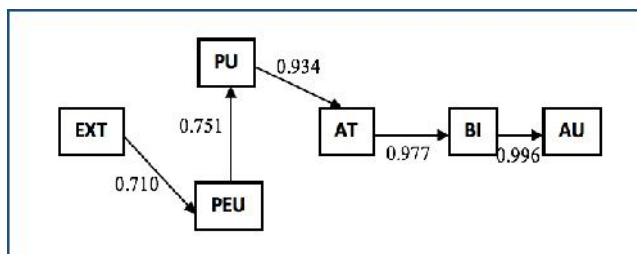

Figure 6. *Model after Trimming*

3. Conclusion

Based on the research results, it can be concluded that in the use of the expert system in the field of investment, in this case, forex and commodities online trading, the following conclusions are taken.

1. Perceived Ease of Use has a strong and positive effect on Perceived Usefulness.
2. Perceived Usefulness has a strong and positive effect on Attitude Toward Using.
3. Attitude Toward Using strongly and positively influence against Behavioral Intention to Use.
4. Behavioral Intention to Use strong and positive influence on Actual System Use.
5. User involvement has a positive and strong influence on Perceived Ease of Use

Based on these conclusions, it is advisable for investors to engage in the development of expert systems that will be used in their investment activities. On the other hand, expert system developers must also understand the needs of their customers and involve them in the development of expert systems so that the expert system can be well accepted.

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