E-COMMERCE INFORMATION SYSTEM USING TECHNOLOGY ACCEPTANCE MODEL APPROACH

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Abstract

E-commerce websites are one of the most accessed in Indonesia during the covid-19 pandemic. In research conducted for clothing product brands from PT. Mong Kreasi Indonesia, the problem that occurs is the company has not made full use of the information system. The company only uses media social like Instagram and WhatsApp for sales and communication order. Processing and recording of data and transactions are also still manually. The purpose of this research is to design an e-commerce sales information system, that is useful for solving existing problems. To measure the achievement of the designed system, a questionnaire was distributed to the respondents. Total of 70 questionnaires were answered and then tested using the Technology Acceptance Model method using the SMART PLS application. The results is variable Attention to Use on Behavioral Intention to Use has an influence level of 5.063, Perceived Ease of Use on Attention to Use has an influence level of 2.569, Perceived Usefulness on Attention to Use has an influence level of 3.382, and Perceived Usefulness on Behavioral Intention to Use has an influence level of 2.352. Each value is above 1.996, this means each variable has a positive and significant effect in benefits, easy to use, gives satisfaction to users and users has the intention to recommend this system to another.

1. INTRODUCTION

In the current era, technology is developing faster in every part of the world, including Indonesia. In 2020 Indonesia has 175.5 million internet users out of a total population of 268,583,016. This number has reached the target penetration rate of 64% [1]. Indonesia experienced a 400% increase in online shopping during the Covid-19 pandemic [2]. E-commerce websites are one of the most accessible when people in Indonesia want to shop online. Understanding e-commerce is defined as a place to exchange information and transactions between sellers and buyers on the internet [3].

PT. Mong Kreasi Indonesia with the brand name Monkers Apparel has not use of the information system. It still uses social media Instagram as a means of selling clothes products and Whatsapp which is used for communicating with customers in ordering products. This method not effective because it does not use the company's own system, difficulty in tracking previous orders, and detailed product information to customers. E-commerce has the ability to transform conventional business characteristics into new business [4]. Therefore a good solution is to create a e-commerce website. With this website, it aims to facilitate the process of selling and buying between companies and customers, making it easier for companies to record sales and reports.

II. STUDY LITERATURE

In a study conducted by carolina and rusman [5], selling clothes using online media is an easy

way to improve service and make it easy for customers to get information. By utilizing good information technology, the way of working will be more effective and efficient. In addition, similar research was carried out by yani et all [6], in designing a system for selling clothing in website, customers will find it easier and product updates that have been ordered. By utilizing this system, the report will be more accurate and accelerate the search for transaction data.

The application of a sales system to stores has an important role because data processing can be done quickly, precisely and accurately. Using the system, the human resources used will be more optimal and the data can be maintained and not easily lost [7]. In another research by kusuma and prasetya [8] white box testing give the percentage of customer satisfaction in shopping for clothes using an e-commerce system is 70%. Research conducted by rahayu et all [9], TAM testing indicators will give information that user influence the acceptance of the system. The results tested can also provide information about user knowldege, benefit, and user interest.

Meanwhile, The acceptance study of e-commerce customers based on TAM research conducted by susilo et all [10], that Perceived Usefulness and Perceived Ease of Use simultaneously and partially have a positive and significant effect on Behavior Intention, where the effect of Perceived Ease of Use is more dominant than Perceived Usefulness.

Based on review the journals above, TAM has a purpose to test whether it has a related effect of several dependent and independent variables. The results of this TAM test is to measure how much influence the variable factors that affect the use of the system at PT. Mong Kreasi Indonesia.

III. FRAMEWORKS

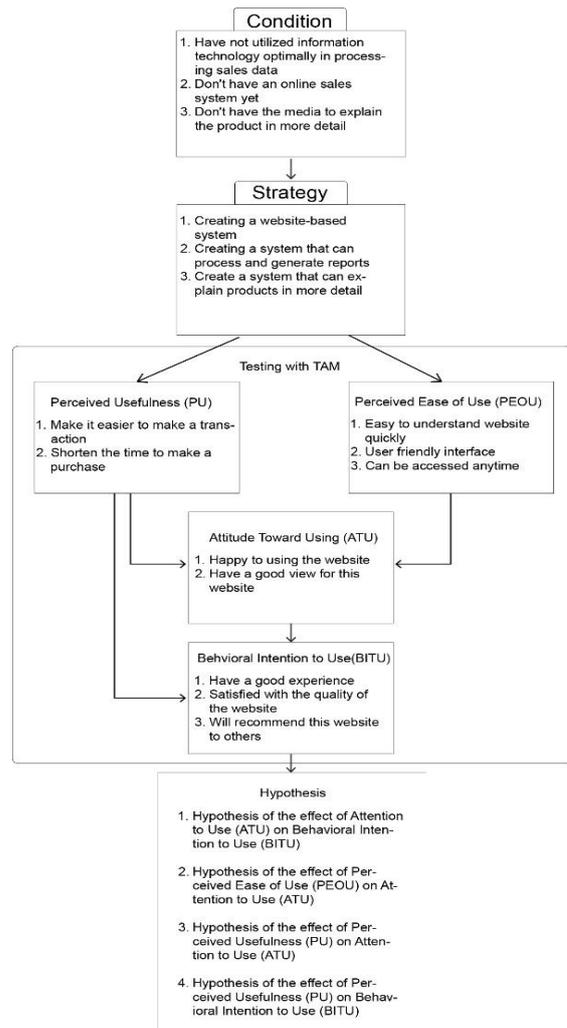Below is the framework used:

Figure 1. Frameworks

IV. RESEARCH METHODS

The Technology Acceptance Model or TAM can be abbreviated as having the aim of exploring the basic influence of external factors on user attitudes, beliefs and goals [11]. Technology Acceptance Model (TAM) testing will be carried out using the SMART PLS application. Explaining the research model used to analyze the acceptance factors that can affect the convenience and benefits obtained from the system is the understanding of the SMART PLS application according to Handayani [12]. See Figure 2. below about TAM model used:
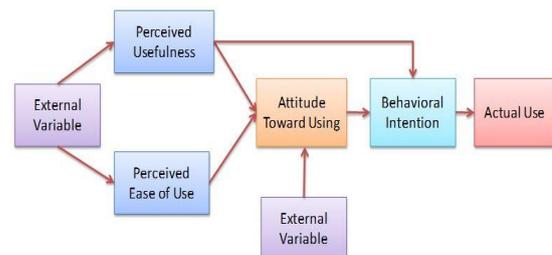

Figure 2. Model Technology Acceptance Model [11]

This research was conducted using 4 variable factors including:

1. Perceived Usefulness (PU) is the level of user confidence that by using the existing system, it will increase their productivity at work.
2. Perceived Ease of Use (PEOU) is the ease felt by the user, will describe the level of user confidence in operating the system.
3. Attitude Toward Using (ATU) is an attitude towards use that appears during or after using the system being tested.
4. Behavioral Intention to Use (BITU) is behavior that is influenced because the user has a purpose, intention, or desire.

Testing the system designed was carried out by distributing online questionnaires to respondents with the following questions:

Table 1. Questionnaire

No	Question
Q1	This website makes it easier for me to buy Monkers Apparel products (PU1)
Q2	This website can shorten the time in purchasing Monkers Apparel products (PU2)
Q3	This website easily to understand (PEOU1)
Q4	This website has a user friendly interface (PEOU2)
Q5	This Website can be accessed anytime (PEOU3)
Q6	Enjoy to using this website to shop for Monkers Apparel products (ATU1)
Q7	Have a good view for this website (ATU2)
Q8	Have a good experience using this website (BITU1)
Q9	Satisfied with the overall quality of this website (BITU2)
Q10	Will suggest this website to others for shopping Monkers Apparel (BITU3)

Each question from the distributed questionnaire using likert scale of 1 to 5 and has the following value description [13]:

1 = Strongly Disagree
2 = Disagree
3 = Enough
4 = Agree
5 = Strongly Agree

The technique used in calculating the sample in this study is simple random sampling. The sample size was determined using slovin formula [14].

Formula: $n = \frac{N}{1+N(e^2)}$ .... (1)

Where:
n = sample
N = Population
E = percentage error of 5%

The stages of TAM testing using SMART PLS are as follows:

a. Creating Path Diagrams
   That is the stage of describing all the variables, connecting the variables and loading all the indicators according to the variables. This stage is also used to determine the independent (exogenous) and dependent (endogenous) variables. The independent variable (exogenous) is the variable that influences while the dependent variable (endogenous) is the variable that is affected. The variables that cause exogenous variables are not included in the model, meaning that there are factors outside the research model that affect these exogenous variables, so they are called exogenous [15].

b. Evaluation of the measurement model (Outer Model)
   In this stage, three stages of measurement will be carried out, that is convergent validity, discriminant validity and reliability measurements. Presenting the strength and weakness of the measures (variables) that are correlated with each other is the notion of convergent validity.

   In convergent validity there are 2 things that can be measured, spesifically outer loading and average variance extracted (AVE). The outer loading is a value generated by each indicator to measure the variable, while the average variance extracted (AVE) is the value that each variable has. According to Latan and Ghozali in [12], the outer loading valid if the value is above 0.7 and the average variance extracted (AVE) is said to be valid if the value is above 0.5.

   For discriminant validity there are Fornell-Larcker and Cross Loading criteria. Fornell-Larcker criteria is the correlation value between the variable with the variable it self & with other variables [16]. The variable with the variable it self not smaller than the other variables, so that it can be valid. Meanwhile, Cross Loading is the correlation between indicators and variables. Cross Loading will be valid if the indicator that measures the correlation variable must be greater than the correlation of the indicator with other variables.

   Measurement of reliability is testing the reliability of the questionnaire questions are effective or appropriate. The reliability test can be said to be valid as seen from Cronbach's alpha of more than 0.6 according

to Umi Narimawati in the journal [17] and the composite reliability result is satisfactory or valid if it has a value above 0.7.

c. Evaluation of the structural model (Inner Model)

In SMART PLS, calculations using bootstrapping will be carried out to obtain 2 stages of the structural model that will be used, that is R-square and hypothesis testing. R-square is a value that shows how much the independent variable (exogenous) affects the dependent variable (endogenous). Hypothesis testing is done by comparing the t-count value with the t-table at a significance of 5% or 0.05 [17]. And the p-value below is ≤ 0.05 then it is declared positive. The way to find the t-table value used is by the number of respondents - the number of indicators [18].

Below is the main page display about the main menus and there are also profile navigation buttons, shipping, cart and etc.
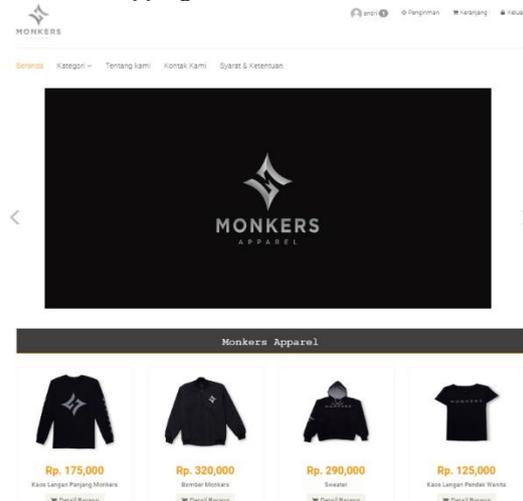

Figure 3. Homepage

This page will display the pre-selected items to be checked before entering the shipping process.
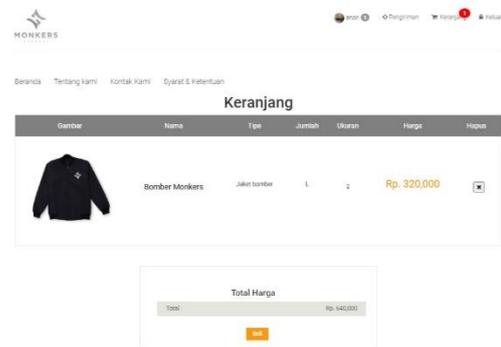

Figure 4. Cart

The shipping or checkout page will appear if the customer press the buy button in the cart menu. On this page, customers can choose a product delivery address and choose what type of shipping they want to use
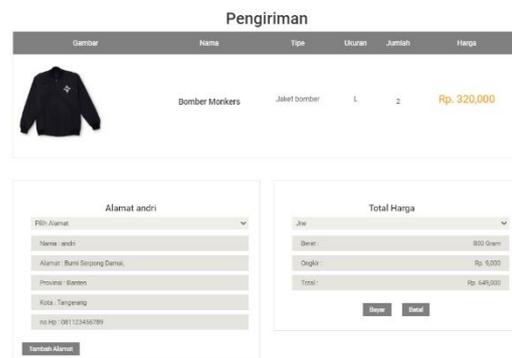

Figure 5. Checkout

Results

The system that has been designed will be tested on 85 customers by being given a website link and a questionnaire link for assessment. To get the minimum sample required, the Slovin formula is used as follows (1):

$$n = \frac{85}{1 + 85\,(0.05^2)} = 70.1$$

Minimum number of respondents required for this test is 70 users, seen on Table 2. Below:

Table 2. Respondent Answer Questionnaire

Respondent	Question									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	4	4	4	4	4	5	4	2	3	4
2	5	5	4	4	5	4	4	4	4	4
3	4	5	4	5	5	4	4	4	5	4
4	4	4	5	5	4	3	4	4	5	4
5	4	4	3	3	3	4	3	4	3	3
6	5	5	5	5	5	5	5	5	5	5
7	5	5	5	5	5	5	5	5	5	5
8	4	5	5	5	5	5	4	4	4	5
9	5	5	5	5	5	5	4	5	5	5
10	4	5	5	5	5	5	4	4	4	5
11	5	5	4	4	4	5	5	5	4	5
12	4	4	5	5	5	4	5	5	5	5

13	3	4	5	3	5	4	4	4	5	5
14	5	5	5	4	5	4	5	4	5	5
15	4	4	3	3	5	4	3	3	3	3
16	5	4	5	4	5	4	4	5	4	4
17	4	5	5	4	5	4	5	4	4	5
18	4	4	4	5	5	4	4	3	4	3
19	4	4	4	4	4	4	4	4	4	4
20	4	3	4	4	4	5	4	3	4	5
21	5	5	5	5	5	5	5	5	5	5
22	5	5	5	5	5	5	5	5	5	5
23	5	5	5	5	4	4	5	4	5	5
24	4	4	4	4	4	4	4	4	4	4
25	5	5	5	5	5	5	5	5	5	5
26	4	5	4	4	5	4	3	3	4	4
27	5	5	5	5	5	5	5	5	5	5
28	4	3	4	4	3	4	5	4	5	4
29	4	4	4	4	4	4	4	4	4	4
30	5	5	5	5	4	4	4	4	5	4
31	3	3	5	5	3	3	4	3	3	2
32	4	4	4	4	4	4	4	4	4	5
33	4	4	5	4	4	4	5	4	5	4
34	4	5	5	5	4	3	4	4	4	5
35	5	5	5	5	5	5	5	5	5	5
36	5	5	5	4	5	5	5	5	4	5
37	4	4	4	4	3	4	4	4	4	3
38	5	5	5	5	5	5	5	5	5	5
39	4	5	4	4	5	5	5	5	5	5
40	4	4	4	5	5	5	5	5	5	5
41	5	5	5	5	5	5	5	5	5	5
42	4	5	4	4	4	5	4	4	4	5
43	3	5	5	4	4	3	3	4	4	5
44	5	5	5	5	5	5	5	5	5	5
45	4	3	4	4	4	4	4	4	4	5
46	4	5	4	5	5	4	5	5	5	4
47	5	4	3	5	4	3	4	5	4	5
48	5	5	5	4	4	4	4	4	3	4
49	4	3	4	3	4	4	4	3	3	3
50	4	4	4	5	5	5	5	5	5	5
51	4	4	4	4	4	4	4	4	4	4
52	4	4	4	1	4	4	4	4	4	4
53	4	4	4	4	4	4	4	4	4	4
54	4	5	4	4	4	3	5	3	5	3
55	4	4	4	5	4	3	5	4	4	4
56	4	4	5	5	5	4	4	4	4	4
57	5	4	5	4	4	4	5	4	4	4
58	5	5	5	5	5	5	5	5	5	5
59	5	5	5	5	5	5	5	5	5	5
60	4	5	4	5	5	4	4	4	5	4
61	5	4	5	5	5	5	5	5	5	5
62	4	4	4	4	4	4	4	4	4	4
63	4	4	5	4	5	3	4	3	5	4
64	4	4	5	4	4	4	5	4	4	5
65	5	5	4	5	4	5	5	4	4	5
66	5	5	5	5	5	5	5	5	5	5
67	4	5	4	4	5	4	3	3	4	4
68	5	5	5	5	5	5	5	5	5	5
69	5	5	5	5	5	5	5	5	5	5
70	5	5	5	5	5	5	4	4	5	4

After 70 respondents answers have been collected, the next step is to create a path diagram and then calculate it in the SMART PLS application, the results can be seen in figure 6. below:
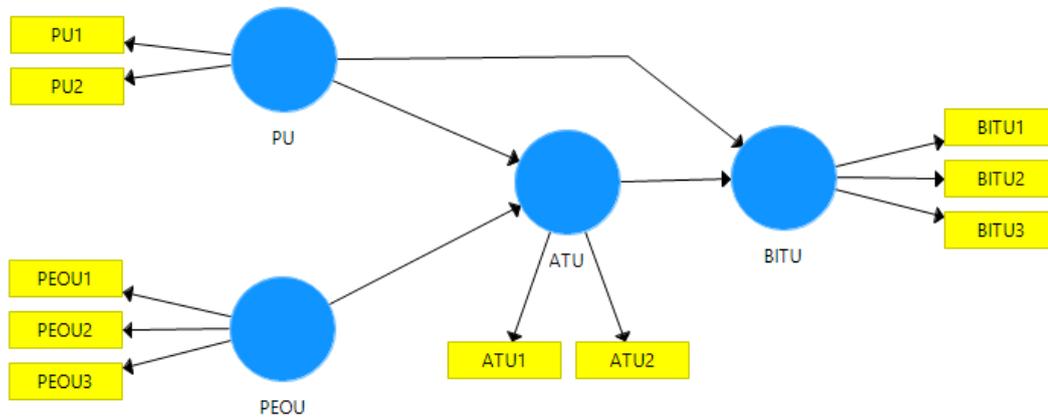

Figure 6. Path Diagram

In this path diagram the independent variables (exogenous) are PU and PEOU because these 2 variables affect ATU and BITU. ATU and BITU are dependent variables (endogenous) because these 2 variables are influenced by PU and PEOU. Further continue to the outer model stage, that is the convergent validity test. The first stage is to test the outer loading. In the Table 3. below, the outer loading of each variable is above the value of 0.7, which means that all data are valid.

Table 3. Outer Loading

	ATU	BITU	PEOU	PU	Results
ATU1	0.833				VALID
ATU2	0.863				VALID
BITU1		0.890			VALID
BITU2		0.807			VALID
BITU3		0.843			VALID
PEOU1			0.773		VALID
PEOU2			0.774		VALID
PEOU3			0.771		VALID
PU1				0.908	VALID
PU2				0.827	VALID

Next is the average variance extracted (AVE) test, which can be seen in the Table 4. below. The values of Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attention to Use (ATU), and Behavioral Intention to Use (BITU) show the value above 0.5, it means that the AVE is valid.

Table 4. Average Variance Extracted (AVE)

	AVE	Results
ATU	0.719	VALID
BITU	0.718	VALID
PEOU	0.597	VALID
PU	0.754	VALID

Table 5. Fornell-Larcker

	ATU	BITU	PEOU	PU
ATU	0.848			
BITU	0.719	0.848		
PEOU	0.544	0.661	0.773	
PU	0.589	0.606	0.594	0.868

Then continue to the discriminant test stage. The first is check at the Fornell-Larcker results in the Table 5. below, which shows that the correlation between the variable, and the variable it self has a greater value than the other variables, so the results are declared valid.

The next discriminant validity test is to see the results of Cross Loading. The Table 6. below is valid because the indicator that measures the correlation variable is greater than the correlation of indicators on other variables.

Table 6. Cross Loading

	ATU	BITU	PEOU	PU
ATU1	**0.833**	0.543	0.436	0.543
ATU2	**0.863**	0.670	0.486	0.461
BITU1	0.658	**0.890**	0.523	0.583
BITU2	0.554	**0.807**	0.640	0.454
BITU3	0.609	**0.843**	0.533	0.496
PEOU1	0.406	0.483	**0.773**	0.412
PEOU2	0.417	0.502	**0.774**	0.446
PEOU3	0.436	0.545	**0.771**	0.515
PU1	0.622	0.550	0.482	**0.908**
PU2	0.369	0.501	0.568	**0.827**

Next is test construct reliability, in construct reliability there are 2 values that must be checked, that is Cronbach's Alpha and Composite Reliability. Both values must be above 0.6 and in the Table 7. below it can be seen that both values are above 0.6 so the result is that the variables tested are reliable.

Table 7. Construct Reliability

	Cronbach's Alpha	Composite Reliability
ATU	0.610	0.837
BITU	0.804	0.884
PEOU	0.662	0.816
PU	0.680	0.859

All stages in testing convergent validity, discriminant validity and construct reliability have obtained valid results, so we can proceed to the next stage, that is inner model test stage which aims to see and analyze the existing values. Next step check the R-square value. The results used are the Adjusted R-square because the variables affected are more than 1. ATU as an endogenous (dependent) variable is influenced by exogenous (independent) variables, namely PU and PEOU by 39%. while BITU as an endogenous (dependent) variable is influenced by exogenous (independent) variables, namely PU and PEOU by 56%. Show on Table 8. below:

Table 8. R-Square

	R-Square	Adjusted R-Square	Results
ATU	0.405	0.387	39%
BITU	0.568	0.555	56%

Next is to test the inner model, which is to analyze the hypothesis of the model that has been made. Before analyzing the hypothesis, the t-table must be searched first by the number of respondents - the number of variables, from 70 respondents minus 4 indicators, the result is 66. In the t-table the for 66 at a significance of 5% or 0.05 the result is 1.996.

Table 9. Hypothesis

	T Statistic (O/STDEV)	P Values
ATU -> BITU	5.063	0.000
PEOU -> ATU	2.569	0.010
PU -> ATU	3.382	0.001
PU -> BITU	2.352	0.019

The results of the hypothesis are obtained as follows:

a. Hypothesis 1: Based on the results of the Attention to Use (ATU) test on Behavioral Intention to Use (BITU), the t-statistic value is greater than the t-table value (5.063 > 1.996) and the P-values have a value below 0.05, that is 0.000. So this result is Attention to Use (ATU) has a positive and significant effect on Behavioral Intention to Use (BITU).

b. Hypothesis 2: Based on the results of the Perceived Ease of Use (PEOU) test on Attention to Use (ATU), the t-statistic value is greater than the t-table value (2,569 > 1,996) and the P-values have a value below 0.05, that is 0.010. So this result is Perceived Ease of Use (PEOU) has a positive and significant effect on Attention to Use (ATU).

c. Hypothesis 3: Based on the results of the Perceived Usefulness (PU) test for Attention to Use (ATU), the t-statistic value is greater than the t-table value (3.382 > 1.996) and the P-values have a value below 0.05, that is 0.001. So this result is Perceived Usefulness (PU) has a positive and significant effect on Attention to Use (ATU).

d. Hypothesis 4: Based on the results of the Perceived Usefulness (PU) test on Behavioral Intention to Use (BITU). The t-statistical value is greater than the t-table value (2.352 > 1.996) and the P-values have a value below 0.05, that is 0.019. So this result is Perceived Usefulness (PU) has a positive and significant effect on Behavioral Intention to Use (BITU).
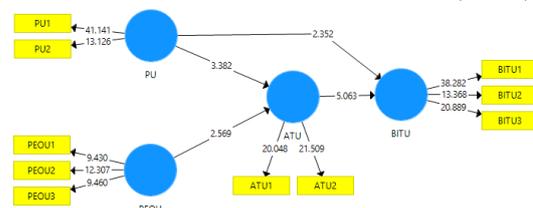

Figure 7. Inner Model Test Results

Figure 7. Above is a path diagram description of the results TAM test using the SMART PLS application. The results of R-square show that the variable from all indicators have a positive and significant effect between Attention to Use (ATU) on Behavioral Intention to Use (BITU), Perceived Ease of Use (PEOU) on Attention to Use (ATU), Perceived Usefulness (PU) on Attention to Use

(ATU), and Perceived Usefulness (PU) on Behavioral Intention to Use (BITU).

V. CONCLUSION

From all the results that have been researched, Systems made for PT. Mong Kreasi Indonesia is proven to be able to make sales and purchases transactions easier. This data is obtained the results of questionnaire feedback from 70 respondents. And than processing through SMART PLS resulting that Attention to Use on Behavioral Intention to Use has an influence level of 5.063, Perceived Ease of Use on Attention to Use has an influence level of 2.569, Perceived Usefulness on Attention to has an influence level of 3.382, and Perceived Usefulness on Behavioral Intention to Use has an influence level of 2.352. Each value is above 1.996, each data has a positive and significant effect. It means this designed system provides benefits and convenience so that it can be felt by users. Besides that the users get satisfaction, good experience in using the system, and users will recommend this system to others.

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