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Usability Analysis of MSME Business Accounting Applications Based on User Retention Using ISO 9241-11

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Abstract—BukuWarung has been known as a MSME's bookkeeping application in Indonesia. As the features developed, there were disappointed responses from Playstore reviews, social media, and research interviews who complained about the usability aspect of this application, thus triggering the desire for users to stop using the application. This condition motivates the author to assess the impact level of usability in aspects of Effectiveness, Efficiency, and Satisfaction on user retention. This study used a partial least square–structural equation model method. The total of 248 user samples was obtained using simple random sampling and voluntary response techniques. The research uses CSUQ, as well as questions for user retention. For data testing used Ms. Excel and SmartPLS version 3.3.3. According to the measurement model, 7 of 22 all variables were deleted. This study proves that Effectiveness, Efficiency, and Satisfaction have a positive and significant effect of up to 74.8% on user retention. However, the size of influence and relative influence is weak on user retention. User retention indicators affected by usability are increasing purchases as tenure grows, customer referrals, and premium prices. The implication for BukuWarung is to conduct usability testing on each feature.

Keywords— Usability; User Retention; ISO 9241-11; PLS-SEM; SmartPLS

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I. INTRODUCTION

Micro, small and medium enterprises (MSMEs) have been proven to help Indonesia reduce the economic burden by 1.5% on gross domestic product or GDP during the COVID-19 pandemic in 2020. According to survey research conducted by the Mandiri Institute for MSME business players, 42% of offline businesses have stopped trying during the pandemic while 24% of online businesses can still survive the pandemic [1], [2]. It is estimated that there are more than 65 million MSME entrepreneurs throughout Indonesia [3]. As of March 2021, there are already 4.8 million MSMEs whose business processes have been digitized [4]. However, this figure is not comparable to the number of MSMEs that still carry out conventional transactions.

MSME owners are known to be unique in treating their customers, such as by allowing buyers to borrow in advance and making monthly or daily loans. Most MSME financial tracking still uses pens and books [5], [6]. This can be a problem because they are not or are not used to recording income and expenses regularly, even though if they do, they can find out turnover, profits, and losses so that they can develop in the long term.

The process of digitizing financial records for MSMEs already exists in Indonesia, one of which is the BukuWarung application. The technology applied by BukuWarung can improve the bookkeeping process by helping MSME entrepreneurs save all types of transactions including debt, expenses, sales, and stock as well as providing the ability to monitor cash flow through business reports [7]. The number of MSMEs in Indonesia has also increased rapidly since the pandemic took place. Since was released in 2019 until now, there have been more than 6.5 million business owners registered in the BukuWarung application [8]. Its users are spread across 750 cities and small towns in Indonesia, mostly from tier 2 and tier 3 locations [9].

For two years, the BukuWarung application has helped five million active users of MSMEs in Indonesia to be able to develop in running their businesses. With BukuWarung they can save time for payment of receivables three times faster and save on the cost of office stationery for recording an average of up to IDR a hundred and ten thousand per month [10]. Even though it has received a rating above 4 based on the [11], many users admit that they are confused and do not understand how to use the BukuWarung application itself.

According to an interview with a user on February 21st, 2021, it was proven that the inventory feature or stock management offered in the BukuWarung application is currently helpful but has not been maximal in completing the stock management use case accurately in its business. Then on September 16, 2021, in an interview session for testing the BukuWarung application, the user conveyed that the transaction record feature provided by BukuWarung was not suitable with their business use case, namely not being able to record returns or refund transactions, and there were

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many other cases which resulted in users rarely reusing them. application. These are some of the user experience problems that make them reluctant to persist in using the BukuWarung application again.

Several complaints also emerged through the review of the Playstore and the Facebook group of BukuWarung users. One of the Playstore reviews on June 25th, 2021, one user said that the menu for recording income and expenses in BukuWarung has not separated the features of the capital price and selling price, so the cash payment calculation cannot be calculated, even though the user feels it is needed by their business. At that time the only thing that could be known as the profit or loss earned and the total amount of income and expenses. And another comment from Facebook, of which is that they feel that the appearance of the WhatsApp icon on the debt menu is too large and blocks the customer's name component beside it, so users are uncomfortable when using the Debt menu. If these complaints are ignored, then this will affect the convenience of interaction and trust of BukuWarung application users to continuously use the application.

According to Nielsen, usability is a necessary condition to retain users. If an app is hard to use, people will stop using it. If the main page can't clearly state what users can do the first time they log in, then people will close the site. If the user gets lost while using the app, they will be logged out. If the information on an app is hard to read, difficult to understand, or doesn't answer a user's question, they'll turn to an app that answers what they need[12]. With this pattern in mind, no user needs to use manuals or instructions to use the app or spend a lot of time learning the display the first time they use it. Because there are similar applications that are convenient to use, it's easier for the users to leave the application when facing difficulties [13]. Otherwise [14] explain that Usability definitions usually emphasize three key factors: effectiveness, efficiency and satisfaction. Regardless they are called "attributes", "factors" or "goals", usability dimensions are recurrent in all definitions, including ISO standards.

As stated by [15]–[17], the better the level of trust and convenience provided by an application to customers, the more loyal customers will be to the company. The relationship between companies and users can also be better, making it easier for companies to grow and develop. The activity of building customer relationship engagement is better known as part of a CRM (Customer Relationship Management) solution [18], [19]. CRM is a business strategy that can identify and manage customer needs with the aim of obtaining and retaining customers so that it can generate profits for the company. Retaining customers (retention) to use applications on an ongoing basis is a business strategy undertaken to establish long-term good relationships with customers [20]. The urgency about customer retention has been explained in [21], [22] that if we place our focus particularly on customer retention, and relationship management, CRM is the most recent integrational approach available for relationship management.

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There are various ways to get customer loyalty, one of which is by providing convenience in using the application. Usability assessment is carried out to measure the extent to which the application is useful for customers. A good usability value can be measured by ISO 9241-11, which has become an international standard for measuring the usability of an application. The following advantages of ISO 9241-11 made the researcher decide to measure usability using the ISO 9241-11 metric because [23] makes it clear that usability applies to all aspects of use (a) Learnability, enabling new users to be effective, efficient, and satisfied when learning to use a new system; (b) Regular use, allows users to achieve their goals effectively, efficiently, and feel satisfied; (c) Accessibility, can be more effective, efficient, and satisfying for users with the widest range of abilities; (d) Maintainability, to enable maintenance tasks to be completed effectively, efficiently, and with satisfaction.

Aspects that are assessed for usability in ISO 9241-11, namely: effectiveness, efficiency, and satisfaction have been proven to affect customer loyalty and retention rates in several previous studies. On [24], [25] states that the results using ISO 9241-11 are known that the Effectiveness, Efficiency, and Satisfaction variables individually or collectively affect on Customer Retention. When these three variables increase, it affects user loyalty to using the website. Effectiveness, Efficiency, and Satisfaction together have an effect of 44.6% on Customer Retention. The results of this study provide recommendations for indicators of content, arrangement, ease of reading, links, and navigation.

Meanwhile [26] revealed that the efficiency aspect has a significant value of 1.789 on usability, Effectiveness has an insignificant value of 0.918, and Satisfaction has the most significant value of 6.954 on the usability. It can be concluded that the Personnel Management Information System (SIMPEG) does not meet the Effectiveness rules according to ISO 9241-11 so the results of the SIMPEG development design recommendations are focused on improving the upload, search, and several other menu features so that Effectiveness can be achieved. Furthermore in [27] succeed to improve the usability of mobile TA application, usability and severity measurements have been successfully carried out, which are included in the category with a rating= 1 (cosmetic problem) The results of the metrics in the previous research proved that Effectiveness and Efficiency increased by 40% after interface repair, and Satisfaction got a grade of C in the "Acceptable" category with an increase in satisfaction value after repair of 19.32%. This study conducted usability testing and asked the user to assess through the SUS and USE questionnaires to get the level of satisfaction rating for the UB Bookstore application [28].

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II. RESEARCH METHOD

Following the approach and strategy of this research, Figure 1 illustrates the research procedure activities of how this research goes well. The steps in Figure 1 are based on the activities that occurred during the study. This research consists of several stages of research. Starting from the preliminary study to deep dive into the background study, define the problem statement, and look forward to related work on the literature review. In the data collection, the phase is to determine the population and research sampling, also instrument development, followed by questionnaire distribution. Afterward, in the analysis data stage, the sample data need to be evaluated which is the measurement and structural evaluation according to the research approach. After getting the result, the conclusion of the study should be defined following the interpretation result of the study.

Overall, this research adopts a quantitative approach, applies methods, and uses quantitative tools to be used concretely test research hypotheses [29]. The goal of this study is to determine the correlation between usability aspect to user retention. The usability measurement of the research object of the BukuWarung application was carried out by taking into account the standard variables in ISO 9241-11, then the researchers carried out correlational calculations on the variables of user retention on the BukuWarung application.

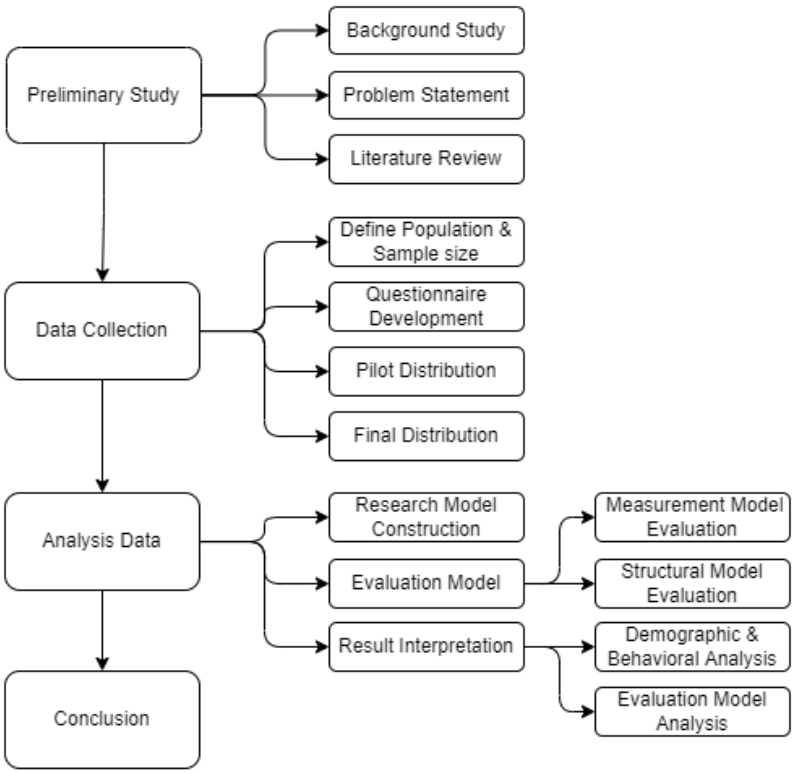

Figure 1. RESEARCH FLOW

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Assumption of there is a relationship between application usability and user retention. To prove this assumption, it is necessary to carry out a quantitative analysis on the level of influence of the usability of the application on customer or user retention in the context of this research. Not only departing from assumptions, researchers also conduct literature studies to obtain theoretical and systematic thinking processes.

Figure 2 visualizes the model for this research. Based on ISO 9241-11 standards [30], [31], three variables represent the usability aspect is consists of Effectiveness (EV), Efficiency (EY), and Satisfaction (S). From [20], [32], has been shown three indicators represent the User retention (R) variable are Increasing purchases as tenure grows, Customer referrals, and Premium prices. After determining the exogenous and endogenous variables, the researcher formulated three hypotheses to be tested in this study, namely:

a) Ho1: Effectiveness (EV) variable has no significant effect on user retention variable (R);
b) Ha1: Effectiveness (EV) variable has a significant effect on user retention variable (R);
c) Ho2: Variable Efficiency (EY) has no significant effect on the variable user retention (R);
d) Ha2: Variable Efficiency (EY) has a significant effect on the user retention variable (R);
e) Ho3: Satisfaction variable (S) has no significant effect on user retention variable (R);
f) Ha3: Variable Satisfaction (S) has a significant effect on the variable user retention (R);

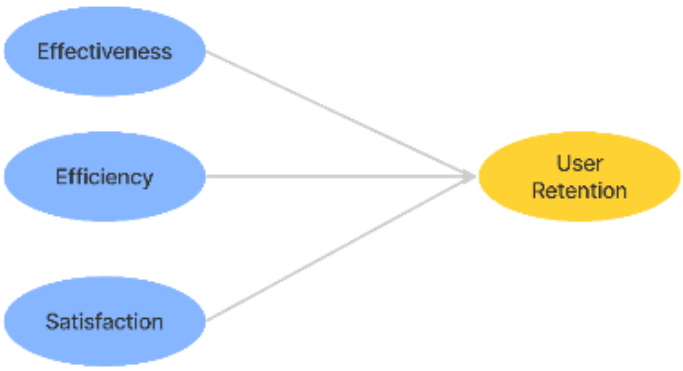

Figure 2. RESEARCH MODEL

According to Figure 2, CSUQ had a chance to represent effectiveness (EV), efficiency (EY), and satisfaction (S) [22], [23]. And also has been shown to measure perceived usability [35]. The indicator of the user retention (R) variable is paying attention to the indicators of Increasing purchases as tenure grows, Customer referrals, and Premium prices [20]. Since the instrument would be using close-ended questions in which the participants choose one or more of the predetermined responses, so it would be easier and faster for participants to answer it. The list of responses in these questions should be exhaustive to include all reasonable alternatives, and also be mutually exclusive [36]. The instrument of this study applies a Likert scale with seven points

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to measure each indicator in the research variables, which is this is larger (step by step) spectrum of choices offers more independence to a participant to pick the 'exact' one (which he prefers most) rather than to pick some 'nearby' or 'close' option. These variations are discussed in more detail (in reference with validity and reliability) [37], [38]. Seven points Likert scale on [21] and [22] has been effective to avoid the habit of the respondents' answers. Basically, the CSUQ also uses seven points Likert scales to indicate higher satisfaction and switches the labels for "strongly agree" and "strongly disagree" [35].

This study conducted a pilot study to avoid technical problems if the questionnaires were distributed to all prospective respondents. In the pilot study, as many as four indicators proved invalid. Then, paraphrase the invalid indicators so that they can be more easily understood by respondents. Furthermore, the results of the second pilot test are compared with the results of the first pilot test, and it is determined which one will be used in the final study.

The participant criteria are BukuWarung users who use more than one feature in the application in the first week of October 2021. From these criteria, a population of 5,972 users is obtained from the internal database of the BukuWarung data team. According to Hair et al. on [40],[41] stated that the minimum sample size guide in the SEM-PLS analysis, namely: the 10-time rule of thumb which is practically 10 times the maximum number of arrows (paths) hitting a latent variable in the SEM-PLS model.

The results obtained as many as 248 samples, this number is considered sufficient to represent the distribution of population data and can be continued for validity and reliability testing. questions related to the assessment of variables in this study, consisting of 16 questions related to the usability of the BukuWarung application using the CSUQ questionnaire and 6 questions for indicators of user retention.

The analysis of this research is divided into two stages, namely characteristic analysis, and statistical analysis. The characteristic analysis includes socio-demographic information that describes community differences based on age, gender, occupation, education, religion, ethnicity, income, family type, marital status, geographic location, and social class [42]–[45]. In this study, the demographic characteristics section contains a description of statistical information based on age, gender, domicile, and also the type of business based on the sample data obtained. There are also behavioral characteristics of the application, such as the distribution of features that have been used and the frequency of use of features in the BukuWarung application. Data processing using Ms. software. Excel 2019 to easily create visualizations of the distribution of data into more representative forms such as charts.

The statistical analysis adopt the partial least square-sequential equation model method, which is divided into two phases called the measurement evaluation model, and the structural

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evaluation model. On the measurement evaluation model serves to test the validity and reliability of the research model used. This study used a reflective model, which is there is a three evaluation step need to do that is [44]:

a) Convergent validity means that a set of indicators represents one latent variable and that underlies the latent variable. The conditions should be:

1) Outer Loading value of each indicator should be > 0.7

2) Average variance extracted (AVE) should be > 0.5.

b) Discriminant validity testing, by reviewing the correlation value between indicators or variables. This value is determined by the calculation of Cross Loading and Fornell Lacker. By ensuring that the calculated value of the correlation of the indicators or variables being considered must be greater in value with the indicator or variable itself compared to the results of the calculation of correlations with other indicators or variables.

c) Internal consistency reliability testing, aims to see the consistency between indicators or between variables in the test itself. The Cronbach Alpha value represents the reliability of all indicators in the model. While the Composite Reliability value is defined as the reliability between variables in the model. Both of the values should be $\geq$ 0,6.

When the values on the indicators and variables have met the three conditions above, it can be assured that the model is valid and reliable to be interpreted through structural evaluation analysis of the model. The evaluation stage of the structural model is carried out to test the inner model, namely, the latent variables are connected to each other. This evaluation aims to analyze existing data with the representation of path coefficient values (path coefficient, coefficient of determination (R^2), T-Statistics test, effect size (f^2), the relevance of predictions (Q^2), and model fit or goodness of fit [45]–[47].

III. RESULT AND DISCUSSION

Based on the demographic results in Table 1 shows that the number of male users is 38% more than female users. Therefore, it can be interpreted that male users dominate the users of the BukuWarung application. The most extensive distribution of age groups starting from the age of 17 to 46, the accumulated value of the distribution reached 89%. This fact explains that BukuWarung users are superior in the productive age group. The fact reveals that the BukuWarung application is needed for entrepreneurs from the productive age group.

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Table 1. THE ANALYSIS RESULT OF USERS DEMOGRAPHICAL

Aspects	Demographical group	Frequency (N=248)	Percentage
Gender	**Male**	**152**	**61%**
	Female	96	39%
Age	26 - 35 y.o.	**93**	**38%**
	17 - 25 y.o.	73	29%
	36 - 45 y.o.	55	22%
	46 - 55 y.o.	21	8%
	More than 55 y.o.	3	1%
	Under 17 y.o	3	1%
Domicile	**Capital city in Java**	**53**	**21%**
	Othe City in Java	50	20%
	Othe City outside Java	46	19%
	Regency in Java	33	13%
	(Bogor, Depok, Tangerang, Bekasi)	23	9%
	Other Regency outside Java	23	9%
	DKI Jakarta	20	8%
Business Type	**Product Digital / Payment Agent**	**124**	**36%**
	FnB	74	21%
	Others	40	12%
	Groceries	37	11%
	Fashion	27	8%
	Gasoline/Water Distributor	15	4%
	Automotive workshop	9	3%
	Health and Beauty	9	3%
	Fresh Diary Fruit and veggies	6	2%
	Farm industries	3	1%
	Laundry	2	1%

The distribution of the domicile area is dominated by urban areas inside and outside the island of Java. Because the number of cities inside or outside Java is more numerous and has a larger population, it can be said that BukuWarung users are more prominent in urban areas. The business type is predominantly in the food and beverage sector, which is reasonable because the BukuWarung application has features for selling credit and bills.

Table 2. THE ANALYSIS RESULT TOWARDS APPLICATION USAGE

Aspects	Behavior towards Using app	Frequency (N=248)	Percentage
Application usage time	**Over than 6 months**	**149**	**60%**
	4-6 months	47	19%
	1-3 months	46	19%
	Less thab 1 months	6	2%
Frequency of using the app	**Several times a day**	**181**	**73%**
	Several times a week	42	17%
	Several times a month	13	5%
	Few times in the last 3 month	12	5%
Features used	**Transaction**	**209**	**31%**
	Debt	184	27%
	Inventory	101	15%
	Payment	102	15%
	Others	83	12%

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The results on Table 2 reveals that users of BukuWarung in the group of more than 6 months were more prominent than the time group below. This phenomenon indicates that BukuWarung users tend to persist in using the application for a fairly long period of time because the business is still running and there is no substitute for the features used in the application. The number of uses of the transactions and payable feature tends to dominate over the other features. This means that the researcher means that the user's purpose for using the BukuWarung application is closely related to the financial records of the business being run. BukuWarung users quite often use the BukuWarung application in their daily lives. Only 10% of users admit to using BukuWarung only a few times in the last month or three months. Researchers measure the model, as shown in Table 3, which covers the calculation results recapitulation at the measurement model evaluation stage.

Table 3. FINAL RESULTS OF MEASUREMENT EVALUATION MODEL

Variables	*N* of Valid Indicators	Cronbach Alpha	AVE	Notes
Effectiveness	3	0.844	0.763	Valid & Reliable
Efficiency	3	0.890	0.820	
Satisfaction	4	0.922	0.811	
Retention	5	0.922	0.762	

Table 3 represent the result of measurement model evaluation process. Based on the measurement it shows that seven indicators were deleted at the discriminant validity testing stage. The deleted indicators consist of EV3, EV4, EY2, EY5, S1, S2, and R6. After going through the evaluation of the measurement model as described in the two points described earlier, it is certain that the remaining 15 indicators have met the requirements of the measurement model so that these 15 indicators are guaranteed to be safe to proceed to the interpretation stage of the structural model analysis.

Table 4. RESULT OF STRUCTURAL EVALUATION MODEL

Path Analysis	β	*T-test*	R^2	f^2
EV→R	0.455	4.772	0.748	0.163
EY→R	0.247	3.004	0.748	0.056
S→R	0.207	2.077	0.748	0.044

Table 5. RESULT OF STRUCTURAL EVALUATION MODEL

Path Analysis	β	*T-test*	R^2	f^2
EV→R	Significant	Ho_1: Rejected Ha_1: Accepted	Strong	Moderate
EY→R	Significant	Ho_2: Rejected Ha_2: Accepted	Strong	Low
S→R	Significant	Ho_3: Rejected Ha_3: Accepted	Strong	Low

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Next, Table 4 and Table 5 show the values of each path analysis in the research model. So, by knowing the value we will interpreted with the hypothesis.

a) How does Effectiveness affect user retention?

It is proven from the T-statistical value and *p*-value in the EV→R path analysis that Ho_1 is rejected and Ha_1 is accepted. The presumption that Effectiveness has no significant effect on user retention is wrong. This research proves that Effectiveness has a significant effect on user retention. This is in line with the results of the path coefficient which is positive indicating a relationship between the two. The significance level of Effectiveness on user retention is also included in the strong category based on R^2. While the value of f^2 indicates that the effect of Effectiveness is moderate. However, the relative impact of Effectiveness is relatively low on user retention from the value of q^2. From the results of the f^2 and q^2 assessments for Effectiveness, it is explained that among the three variables, Effectiveness tends to have a greater influence than the other two variables. Based the value of Q^2 tells that Effectiveness has a predictable relationship.

b) How does efficiency affect user retention?

Based on the t-test of the T-statistical value and *p*-value obtained for the EY→R path, it proves that Ho_2 is rejected and Ha_2 is accepted. The hypothesis about efficiency has no significant effect on user retention is not true. According to the results of the study stated that Efficiency has a significant effect on user retention. This fact is supported by the value of the path coefficient which states that there is a positive relationship between the two. The level of effect of efficiency on user retention is quite strong based on R^2. Meanwhile, the level of effect and the relative impact of Efficiency are low when referring to the values of f^2 and q^2. Even so, the value of Q^2 tells that Efficiency still has a predictable relationship.

c) How does Satisfaction affect user retention?

According to the T-statistical measurements and the *p*-value for the SR path, ensure that Ho_3 is rejected and Ha_3 is accepted. The estimation that satisfaction has no significant effect on user retention is wrong. The results of the analysis reveal that satisfaction has a significant effect on user retention. The statement is like with a positive value of the path coefficient that there is a relationship between satisfaction and user retention. Based on R^2, the significant level of satisfaction with user retention is in a strong group. On the other hand, the calculation of f^2 and q^2 explains that the effect is also relatively low, however, the results of Q^2 explain that satisfaction has a predictable relationship to user retention. Researchers consider the significant results for the variables Effectiveness, Efficiency, and Satisfaction that proved positive. This finding is in line with the significance of the same three variables on customer retention [24]. The results indicate that the hypothesis is accepted, as well as the evidence in this study.

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Theoretically, this study adopts the same research model as the model by [32], which examines the effect of the three variables on customer retention on an e-commerce website. However, in this study, only the efficiency variable had a negative significance. Therefore, the hypothesis of the effect of Efficiency on customer retention was rejected. Meanwhile, in this study, the efficiency variable was proven to influence customer retention, so it can be proven that even with the same research model, the results of accepting and rejecting hypotheses depend on other things, such as the object and research participants.

The usability aspects of ISO 9241-11, namely Effectiveness, Efficiency, and Satisfaction, influence customer retention. Therefore, it is necessary for continuous efforts to pay attention to usability aspects in the product development stage of the BukuWarung application. Furthermore, attention to usability can increase user comfort when using an application, so users tend to reuse the application regularly.

IV. CONCLUSION

The results of this study the ISO 9241-11 variables which are effectiveness, efficiency, and satisfaction, has a significant impact towards user retention. Furthermore, this study define three indicators of user retention that can be affected by the usability are increasing purchases as tenure grows related to the return of users to use BukuWarung again, customer referrals or interest in recommending BukuWarung to others, and premium prices related to prioritizing BukuWarung compared to competitors with the same features. Based on the structural model evaluation, Effectiveness, Efficiency, and Satisfaction have a solid positive value and significant impact on user retention. Otherwise, the effect size level, and the relative impact shows are classified as weak.

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