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Otentikasi Application Using User Experience
Questionnaire (Case Study of PT TASPEN
(PERSERO))

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July 10, 2023

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Abstract — PT TASPEN (Persero) is one of the state-owned companies engaged in insurance, especially insurance for civil servants and state officials. In carrying out its business processes, PT TASPEN (Persero) collects updated data on pension recipients through the Taspen Otentikasi application. The purpose of this research is to evaluate the Taspen Otentikasi application, especially in terms of user experience. The evaluation was conducted online by distributing questionnaires and then the data was processed using the User Experience Questionnaire (UEQ). Analysis was carried out from the results of the questionnaire which was then assessed using UEQ tools which were grouped into 6 assessment categories, namely attractiveness, clarity, stimulation, novelty, efficiency, and accuracy. The results showed a Good evaluation value in the aspects of Attractiveness (mean 1.74), Clarity (mean 1.91), Stimulation (mean 1.67), Novelty (mean 1.26) while for the Efficiency aspect (mean 1.93) and the Accuracy aspect (mean 1.80) received an Excellent score. With UEQ tools can find out parts or features that require improvement and development so as to further maximize the use and functionality of the Taspen Otentikasi application in digitizing services.

Keywords — *Evaluation, Pension, User experience, UEQ tools, Authentication.*

I. INTRODUCTION

Currently, many companies are competing to make innovations related to technology, one of which is by digitizing services. Digitalization is the process of transferring media from printed form to electronic form [1]. PT TASPEN (Persero) is one of the State-Owned Enterprises (BUMN) engaged in insurance which has four programs, namely Old Age Savings, Pension, Work Accident Insurance and Death Insurance for ASN and State Officials [2]. To improve services and reach a wider coverage, PT TASPEN (Persero)

provides services in a digital system in the form of applications that can be accessed anytime and anywhere [3]. This digital as a form of service improvement to give satisfaction to participants [4]. PT TASPEN (Persero) began implementing service digitization to support operational activities, one of which is through the Taspen Otentikasi application which was launched for the first time in 2019.

Taspen Otentikasi application is one way to control pension payments so that pension payments are received by those entitled and there is no delay in pension payments so that it can be used to reduce potential fraud. This authentication process can be done by pension recipients anywhere and anytime without any time limit [5].

Providing and maintaining a good image through excellent service to customers will foster high loyalty to the Company [6]. However, since its launch, the Taspen Otentikasi application has received poor scores on the Play Store and on the App Store. Data on January 28, 2023, the assessment of the Taspen Otentikasi application on the Play Store received a score of 3.1 from 42,353 users [7], while the App Store received a score of 1.5 from 821 users [8]. Of course, this can affect the desire and trust of participants in using the Taspen Otentikasi application because of the low assessment so that it will indirectly affect the company's image.

From these problems, it is necessary to further investigate the obstacles experienced by pension recipients when using the application, so that a solution is obtained to improve application performance and make it easier for pension recipients to use the application. In this study, an evaluation of the user experience in using the Taspen Otentikasi application will be carried out so as to provide an overview of the extent to which the Taspen Otentikasi application can be easily and comfortably used by pension recipients and can find out other obstacles experienced by pension recipients while using the Taspen Otentikasi application. Furthermore, it can be used as material for consideration and evaluation for PT TASPEN (Persero).

II. LITERATUR REVIEW

A. Evaluation

Evaluation is an activity to provide value or consider according to existing criteria to obtain objective and convincing evaluation results [9].

Evaluation is a medium or procedure to find out and measure something in accordance with predetermined ways and rules for the level of program success related to the program environment to provide an overview of whether the program is continued, postponed, improved, developed, accepted, or rejected [10].

B. User Experience

User experience is defined as user perceptions and reactions derived from the use of a product, service, or system that includes emotions, beliefs, preferences, perceptions, comfort, behavior, and user achievement before use, during use, and after use [11].

User experience talks about how the user comes into contact with the product, service, or system, not how it works. When questions arise about how it feels when a user uses a product, service, or service system, then the question is about user experience. Is a simple job complicated to do? Is it easy to find what you are looking for? How do you feel when using the product? [12]. User experience is used to assess a person's sense of satisfaction and comfort with a product, service or system.

C. User Experience Questionnaire (UEQ)

User Experience Questionnaire (UEQ) is one of the techniques that can be used to measure user experience which is able to provide an overview from usability aspects to user experience [13]. The purpose of using UEQ is its ability to quickly conduct an assessment conducted by end users which includes the perceived and preferred impressions of the user.

The UEQ method has the advantage of having Data Tools Analysis which can compare the level of experience of each respondent easily because it can be calculated with the tools provided on the official UEQ website [14]. UEQ can be accessed easily through (<http://www.ueq-online.org/>). UEQ is available in more than 30 languages. The original UEQ was designed in German and has been translated into several languages, one of which is Indonesian [15]. This UEQ consists of 6 scales with 26 items, namely [16]:

- Attractiveness: The overall impression of the product. Do users like the product or not?
- Perspicuity: Ease of getting to know the product. Is the product easy to use and learn?
- Efficiency: Relates to the user's effort and ability to complete tasks in using the product.
- Dependability: Relates to the management and the way users interact with the product.
- Stimulation: Is the product able to attract and motivate users in its use?
- Novelty: Relates to how creative and innovative the product is in understanding the user's interests.

The six scales can be grouped into three groups namely attractiveness, pragmatic quality and hedonic quality. The aspect of attractiveness is related to the user's perception of the attractiveness of the system. The pragmatic quality aspect relates to the user's perception of the technical aspects. The hedonic quality aspect relates to user feelings that involve pleasure, motivation and innovative design [17].

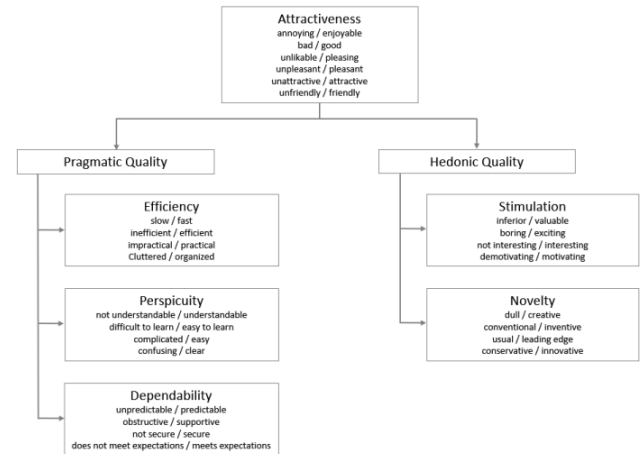


Fig 1. UEQ scale structure

The image below is an example of UEQ for data capture.

annoying	o o o o o o o	enjoyable	1
not understandable	o o o o o o o	understandable	2
creative	o o o o o o o	dull	3
easy to learn	o o o o o o o	difficult to learn	4
valuable	o o o o o o o	inferior	5
boring	o o o o o o o	exciting	6
not interesting	o o o o o o o	interesting	7
unpredictable	o o o o o o o	predictable	8
fast	o o o o o o o	slow	9
inventive	o o o o o o o	conventional	10

Fig 2. UEQ example

D. Slovin

The Slovin formula is a formula used to calculate the minimum number of samples obtained from a survey with a limited population. This formula was first introduced by a mathematician named Slovin in 1960. The Slovin formula is used to determine the minimum sample size in a study. This formula is used to calculate the sample size based on the population size and or estimate the population proportion [18]. The following is the Slovin formula:

$$n = \frac{N}{1 + Ne^2}$$

Description:

n = sample size

N = population size

e = critical value (limit of accuracy) due to sampling error, error rate of 0.1 (10%).

E. Authentication

Authentication is an effort to check the identity of a communication system user in the login process into a system [19]. Taspen Authentication is one of the processes that goes into the pension program as a verification step

taken by PT TASPEN (PERSERO) to ensure that the monthly pension paid is actually received by the rightful person. The Taspen Otentikasi application utilizes participant biometric data that is unique to each individual so that the payment of pension rights avoids errors [20]. This authentication is carried out periodically with the following conditions:

- Authentication is done once a month for veteran fund recipients
- Authentication is done every 2 months for pension recipients who are single/widowed who have no other heirs.
- Authentication is carried out every 3 months for pension recipients who still have heirs (children / spouses).

Before using the Taspen Otentikasi application, Taspen participants must carry out the enrollment process as a first step. Enrollment is the process of recording biometrics in the form of face, voice, and fingerprints of participants [21]. Data that has been successfully recorded in the enrollment process is the basis for using the Taspen Otentikasi application. With the Taspen Otentikasi application, pension recipients can authenticate anywhere and anytime via smartphone. Enrollment is carried out at PT TASPEN (PERSERO) branch offices or through designated payment partners.

III. RESEARCH METHODOLOGY

There are several research methods used in this research to collect information or data and analyze the data that has been obtained.

A. Data Collection Methods

In the process of collecting the data needed in this study, several methods were used to collect data, that it:

- **Observation**
The observation method is carried out to directly observe the use of the Taspen Otentikasi application by participants and see reviews of application usage on the Play Store and App Store. With the observation method, we can learn more about how the application is used.
- **Survey**
The next method is done by using a survey through distributing questionnaires to respondents, namely participants who have used the Taspen Otentikasi application. Data collection was carried out online via Google Form, where sampling was randomized to participants who filled out the questionnaire. The population size taken for this study is the number of users who download the Taspen Otentikasi application via the Appstore and Playstore. Then the minimum sample size for this study, that it:

$$\begin{aligned} \text{Minimum sample} &= \frac{(42.353+821)}{1+(42.353+821)(0,1)^2} \\ &= \frac{(42.353+821)}{1+(42.353+821)(0,1)^2} \\ &= 99,78 \\ &= 100 \end{aligned}$$

From these calculations it can be seen that the minimum number of respondents for this study is 100 respondents.

- **Interview**
The interview method is carried out to verify the data that has been obtained previously using other methods. Interviews were conducted with several participants who came to the PT TASPEN (Persero) office. The type of interview used is structured interview.
- **Document Study**
The document study method is carried out by studying some internal company documentation and reports related to the Taspen Otentikasi application development process, participant satisfaction index and authentication-related data. In addition, document studies were also carried out by studying various theories and similar research from books, reports, journals, and public websites as a basis for conducting research

B. Data Analysis Method

To measure user experience levels in the Taspen Otentikasi application, the User Experience Questionnaire method (UEQ) is used. UEQ has 6 measurement scales that are divided into 26 statement items. Respondents will assess each statement on a Likert scale 1-7. But in UEQ, the statements raised were randomized in the questionnaire to minimize the tendency of answers. Next the process of processing and analyzing data obtained from the distribution of questionnaires using Data Analysis Tools. Data Analysis Tools has a category value limit for each rating scale, which is shown in the following table [22]:

TABLE 1. UEQ DATA ANALYSIS TOOLS CATEGORY

No	Aspect	Category				
		Excellent	Good	Above Average	Below Average	Bad
1	Attractiveness	>1,75	>1,52	>1,17	>0,7	≤0,7
2	Perspiciuity	>1,9	>1,56	>1,08	>0,64	≤0,64
3	Efficiency	>1,78	>1,47	>0,98	>0,54	≤0,54
4	Dependability	>1,65	>1,48	>1,14	>0,78	≤0,78
5	Stimulation	>1,55	>1,31	>0,99	>0,5	≤0,5
6	Novelty	>1,4	>1,05	>0,71	>0,3	≤0,3

IV. RESULT

A. Research Results

After distributing questionnaires to pension recipients who actively use the Taspen Otentikasi application throughout Indonesia, 120 respondents filled out the questionnaire. The questionnaire is accessed online by each respondent and the distribution is carried out through payment partners and PT TASPEN (Persero) branch offices throughout Indonesia. Of the 120 incoming

respondent data, verification and validation of the data from filling out the questionnaire was carried out. From the results of verification and validation, there are 15 invalid data and 105 valid data and can be processed further for analysis. Furthermore, data processing is carried out using the Data Analytics Tool.

- Respondent data were obtained with a total of 12 respondents (11.4%) aged 15-25 years, 3 respondents (2.9%) aged 26-35 years, 4 respondents (3.8%) aged 36-45 years, 7 respondents (6.7%) aged 45-55 years, 30 respondents (28.6%) aged 55-60 years, and 49 respondents (46.7%) aged more than 60 years.

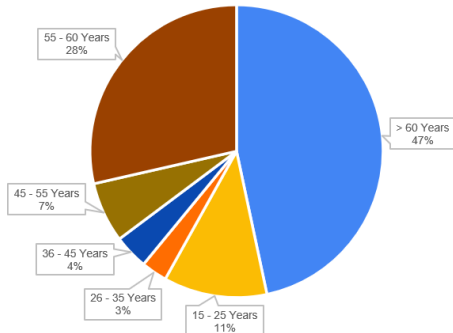


Fig 3. Percentage of respondents' age

- Respondent data was obtained with a total of 26 respondents (24.8%) using the application for less than 1 year, 37 people (35.2%) using the application for 1-3 years, and 42 people (40%) using the application for more than 3 years.

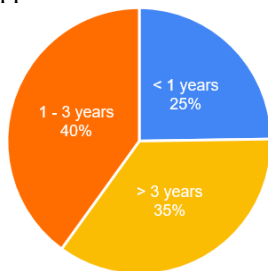


Fig 4. Percentage of length of use of the application by respondents

B. UEQ Analysis Results

After the data is collected through distributing questionnaires, data analysis is carried out using UEQ Tools. Before starting the analysis, first transform the data from the results of 105 respondents into UEQ Tools. Then calculate the overall average value with the results as in the table below:

TABLE 2. MEAN VALUE OF UEQ MEASUREMENT RESULTS

UEQ Scales (Mean and Variance)		
Attractiveness	↑ 1,743	1,51
Perspicuity	↑ 1,907	1,50
Efficiency	↑ 1,926	1,15
Dependability	↑ 1,800	1,25
Stimulation	↑ 1,667	1,59
Novelty	↑ 1,260	1,53

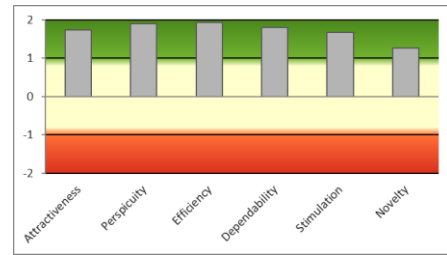


Fig 5. UEQ scale value of Taspen Otentikasi application

The results show the results of the evaluation of each variable measuring user experience using UEQ on the Taspen Otentikasi application from 105 respondents. In all aspects of the assessment, the positive evaluation results above 1 are marked with a green up arrow.

TABLE 3. AVERAGE RESULTS OF EACH GROUP

Pragmatic and Hedonic Quality	
Attractiveness	1,74
Pragmatic Quality	1,88
Hedonic Quality	1,46

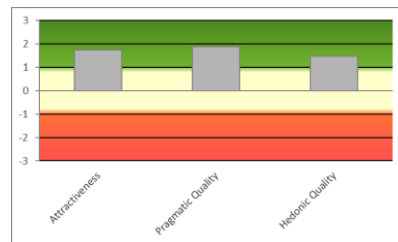


Fig 6. UEQ 3-aspect scale scores

After calculating the average of the 6 scales, there are also calculations based on 3 aspects of UEQ, namely (attractiveness) pure dimensions, (Pragmatic quality) aspects that focus on the goals and needs of respondents, and (hedonic quality) aspects that express pleasure in using the product. The results of the evaluation of the 3 aspects of UEQ are, attractiveness (1.74), pragmatic quality (1.88), and hedonic quality (1.46).

Furthermore, the average value is compared to the benchmark data set. Comparison of the value obtained with the data on the benchmark is done to see the quality of the Taspen Otentikasi application compared to other applications.

TABLE 4. UEQ VALUE BENCHMARK RESULTS OF TASPEN OTENTIKASI APPLICATION

Scale	Mean	Comparison to benchmark
Attractiveness	1,74	Good
Perspicuity	1,91	Good
Efficiency	1,93	Excellent
Dependability	1,80	Excellent
Stimulation	1,67	Good
Novelty	1,26	Good

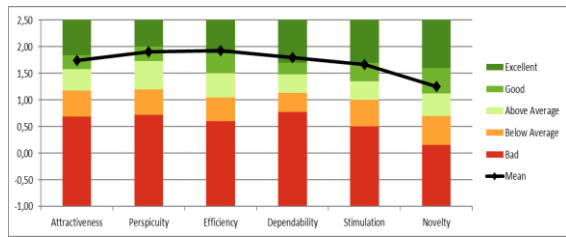


Fig 7. UEQ scale value benchmark results Taspen Otentikasi Application

Based on the picture above, it can be seen that when compared to other products, the Taspen Otentikasi application gets excellent scores for aspects of efficiency and accuracy. As for the aspects of attractiveness, clarity, stimulation, and novelty with good scores.

C. Recommendation

From the results of user experience research using the UEQ method, suggestions and recommendations can be given for the application, one of which is in terms of a better appearance and in accordance with user needs.



Fig 8. UI recommendations for the initial view

The application displays clearer instructions with a larger font size so that users can easily read the instructions given.



Fig 9. UI recommendation of face authentication process

The application provides a choice of the type of camera the user will use and instructions for successful authentication.



Fig 10. UI recommendation for successful authentication

The application can display informative data such as an additional display of the nominal pension received each month and the payment partner used.

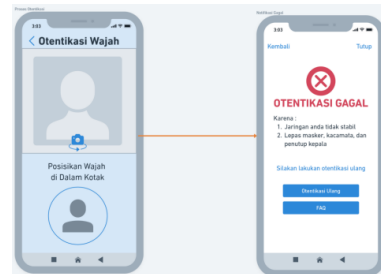


Fig 11. UI recommendation for failed authentication

The application displays more specific information on the cause of failed authentication, making it easier for users to make improvements.



Fig 12. UI recommendations for application notification

The app can send notifications to authenticate every month and provide notifications periodically during the month if users have not authenticated by the deadline.

V. CONCLUSION

A. Conclusion

Based on the results of the discussion and analysis carried out, conclusions can be drawn, that it:

- Based on the results of data processing on 105 respondents using adjusted attributes in processing using UEQ, it is known that the Taspen Otentikasi application received a positive assessment of all aspects of the assessment with details having a Good evaluation value in the aspects of Attractiveness (mean 1.74), Clarity (mean 1.91), Stimulation (mean 1.67), Novelty (mean 1.26) while for the Efficiency aspect (mean 1.93) and the Accuracy aspect (mean 1.80) received an Excellent score.
- From all aspects of the evaluation assessment, the

efficiency aspect has the greatest value compared to others and the novelty aspect has the smallest evaluation value compared to other aspects.

B. Suggestions

Some suggestions that can be considered for management to make improvements to the Taspen Otentikasi application, including:

- Routinely take measurements in order to know the results of user experience evaluation and explore periodic improvements. One of them is by displaying the rating filling in the application after each application update, so that the application gets maximum feedback from users
- Measure against similar applications to make comparisons.
- Evaluation can be done with other tools or other methods such as Heuristic Evaluation, Usability, Severity Rating in order to explore more deeply the shortcomings that exist in the application.
- Develop in the Taspen Otentikasi application with better innovation and creativity so that it can attract the attention of users and increase the value of participant satisfaction, by adding features as recommended display of the user interface that has resulted from this study.

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