

## Enterprise Resource Planning (ERP) Evaluation using User Experience Questionnaire and Development of Chatbot for Indonesian Insurance Company

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### ABSTRAK

Penerapan Enterprise Resource Planning (ERP) dapat memfasilitasi perencanaan dan pengelolaan sumber daya perusahaan. Salah satu perusahaan asuransi di Indonesia yang menerapkan ERP adalah PT Asuransi Jiwa Manulife. Platform yang digunakan adalah ERP berbasis cloud dari perusahaan Infor CloudSuite. Fitur Cloud ERP yang digunakan adalah MiPOS, untuk bagian dari pembuatan proposal asuransi calon pelanggan. Dalam implementasi MiPOS masih terdapat kekurangan pada User Experience (UX) yang belum user friendly; oleh karena itu dilakukan evaluasi UX pada MiPOS dengan menggunakan metode User Experience Questionnaire (UEQ) yang dibagikan kepada pengguna MiPOS sebagai responden. UEQ memiliki enam aspek dengan 26 kriteria penilaian sebagai ukuran. Namun dalam penelitian ini, pengukuran difokuskan pada aspek Perspicuity. Hasil penelitian menunjukkan bahwa skor aspek Perspicuity memiliki nilai terendah yaitu -0,379 poin yang termasuk dalam kategori netral. Pengaruh aspek Perspicuity menjadi dasar pengembangan ERP dengan membuat halaman Frequently Asked Questions (FAQ) yang dilengkapi dengan fitur Chatbot.

### Kata Kunci:

Cloud ERP, Chatbot, Enterprise Resource Planning (ERP), User Experience Questionnaire (UEQ)

### Keywords :

Cloud ERP, Chatbot, Enterprise Resource Planning (ERP), User Experience Questionnaire (UEQ).

### ABSTRACT

*The application of Enterprise Resource Planning (ERP) can facilitate the planning and management of corporate resources. One of Indonesia's insurance companies implementing ERP is PT Asuransi Jiwa Manulife. The platform used is a cloud-based ERP from Infor CloudSuite. The Cloud ERP feature used is MiPOS to make a prospective customer's insurance proposal. In the implementation of MiPOS, there are still areas that need improvement in the User Experience (UX), which could be more user-friendly. Therefore, a UX evaluation was carried out on MiPOS using the User Experience Questionnaire (UEQ) method, which was distributed to MiPOS users as respondents UEQ has six aspects with 26 assessment criteria as a measure. However, in this study, the measurement focused on the Perspicuity aspect. The results showed that the Perspicuity aspect score had the lowest score, namely -0.379 points, which was included in the neutral category. The influence of the Perspicuity aspect forms the basis for ERP development by creating Frequently Asked Questions (FAQ) pages equipped with the Chatbot feature.*

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## INTRODUCTION

The development of digital technology has affected many aspects of human life, especially in the business aspect. Businesses need reliable information system technology. An accurate, fast, and integrated system is necessary to manage daily business activities, and the information system technology is Enterprise Resource Planning (ERP). Based on the understanding of Gartner, Inc., ERP is "the ability to deliver an integrated suite of business applications" (Gartner, 2022). ERP helps companies automate and integrate business sectors such as marketing, finance, production, human resources, quality management, sales, research & development, legality, and executives. ERP also facilitates company analytical activities (such as analysis of total production, material usage, products sold, and material stock) and reporting in the finance sector. Using ERP can tidy up the company's business processes, especially in the sales and finance division, for making quotations and solving 80% of problems in these divisions. From the user side, it makes their work more straightforward, even though there are difficulties in operating it, as well as organizational and technological characteristics factors play an essential role in the success of ERP implementation (Bangun, K., Susanto, Y. B., and Natalia, Friska, 2021).

Over time, ERP has experienced system technology developments to increase capability, performance, and flexibility. One of the developments in ERP technology is how to deploy the system. ERP Deployment is divided into On-Premise ERP, Cloud ERP, and Hybrid ERP (Gerardus B, 2019). Premise ERP is an ERP system that runs on the company's Information Technology (IT) infrastructure, and the on-premise ERP system is run through the company's servers. The company runs, manages, and manages the company's ERP system. Based on the understanding of the on-premise ERP above, the company has the burden of choosing on-premise ERP because all system costs, such as software licenses, electricity bills, maintenance, and hardware costs, are borne by the company. Hence, it requires a lot of time and money; besides, if a disaster impacts ERP systems, companies can lose valuable data and suffer material losses.

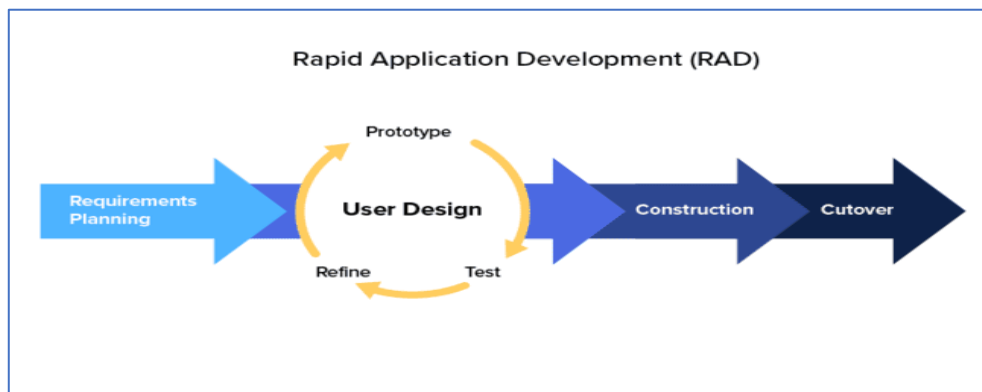
Cloud ERP is an ERP system offered by providers in the form of services. The provider provides the infrastructure to run the system somewhere so that users only need to use the ERP system via the internet; regarding fees, users must pay a service fee to the provider periodically. Hybrid ERP is a mixture of on-premise ERP and cloud ERP. Hybrid ERP is also known as two-tier ERP, where tier 1 is an on-premise system to carry out the company's crucial business processes, and tier 2 uses cloud ERP to support some or all business units or regions (ORACLE, 2022). Cloud ERP systems can be accessed and used through internet services. It can facilitate access to ERP systems anywhere and using various platforms or other devices. This convenience is an essential factor in the success of the user experience satisfaction level in using the ERP system.

User Experience (UX) is a person's perceptions and responses resulting from the use or anticipation of a product, system, or service (ISO 9241-210, 2010). User experience aims to provide a positive experience that keeps users loyal to the product or brand. UX is one of the essential things because UX is expected to fulfill what users need. Based on the explanation above, UX is one of the crucial things in ERP implementation. If the user experience in an ERP system is terrible, then the effectiveness of the ERP system will be reduced and can even hamper business processes within the company. At PT Asuransi Jiwa Manulife Indonesia, insurance agents who have joined often experience problems learning the point of sale ERP module cloud called MiPOS. The MiPOS system's many features and complicated navigation are the main obstacles to mastering the technique.

Based on the background above, a study was conducted that aimed to evaluate the UX of the ERP system using the UX evaluation method on MiPOS using the User Experience Questionnaire (UEQ) method used by PT Asuransi Jiwa Manulife Indonesia. The evaluation results will be used as a reference for creating a website-based FAQ feature with the Chatbot feature so that it can help make it easier for MiPOS users to use it.

## RESEARCH METHODOLOGY

In this study, researchers used the most appropriate method to solve the problems studied using the Rapid Application Development (RAD) system development method. The RAD method is used because this method can reduce cycle times and increase productivity with the users concerned. RAD generally reduces costs and minimizes risk, achieving complete customer satisfaction and business needs. However, this risk arises because researchers must provide a fast response to users who update the system, and the next drawback is that researchers cannot use the system (Mathiassen, L, 2002). RAD itself must engage the developer with the appropriate users of this system and require fast results. The resulting implementation also reduces the awkward aspect of what the user wants. Initiatives to improve software processes begin with a traditional light assessment of the current software process, based on the understanding of action researchers that improvement should start with evaluation (Valacich, Joe, and Joey F. George, 2020). In Figure 1 below, it will be shown the cycles/stages in implementing the RAD method:



**Fig 1. Rapid Application Development Method**

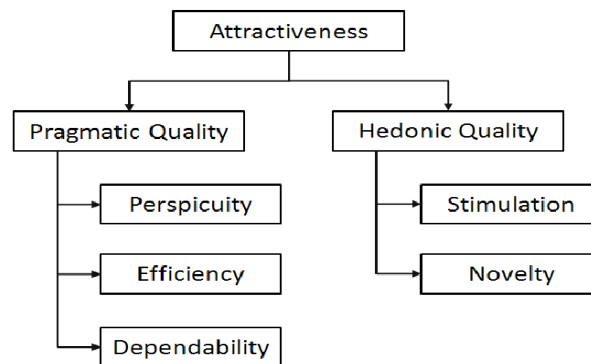
Based on Figure 1 above, we can see the steps to implement the RAD method, starting with requirements planning, user design, construction, and cutover. The following is a brief explanation of each stage. At the requirement gathering stage, interviews will be conducted to seek user information, design system preparations, and determine what features will be used in the application. Users and analysts will discuss identifying system objectives and be oriented towards solving business problems. Some of these theories conclude that evaluation is an activity based on specified criteria and observations (P. Yosevine, R. S. Oetama, J. Setiawan, 2021). During the user design phase, a face-to-face description of all the requirements described in the analysis stage will be carried out at this stage (Kendall, Kenneth, E. and Julie E Kendall, 2019). From the conditions obtained, it will be turned into Unified Modelling Language (UML) Diagram in the form of use case diagrams that can describe the main functions of the system to be created and explain the relationship between system users later (A. Dennis, B. H. Wixom and R. M. Roth, 2014). During the construction phase, the main focus is system development. In the RAD method, users must continue to participate and can suggest changes or improvements as the report progresses. The developer's job is system development, coding, and system testing. At this stage, developing the Chatbot feature is also carried out so that the objectives of the improving perspicuity aspect can match the previously described problems. And the last stage in the implementation of RAD is Cutover. The data to be tested using the user acceptance with the black-box testing model will be transferred to the new system and continued with user training. In addition, a comparison will be made between RAD and traditional methods, and as a result, the new system should be able to be delivered and operate fast. After the RAD Implementation, the Systems will need to be evaluated using User Experience Questionnaire (UEQ). The questionnaire is one way of collecting quantitative and qualitative data in a study. In addition to the questionnaire, it can contain questions that can be filled freely by the respondent, as well as questions in the form of choices where the respondent must choose one or more of the options provided. The primary purpose of the User Experience Questionnaire (UEQ) is to enable the measurement of User Experience

directly and quickly (M. Schrepp, A. Hinderks, and J. Thomaschewski, 2014). The User Experience Questionnaire (UEQ) is a tool to measure the User Experience of a system/application/object. The UEQ assessment was carried out using a 7-point Likert scale. UEQ has six aspects: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The six aspects of UEQ are shown in Table 1 below:

**Table 1. Six Aspects of UEQ**

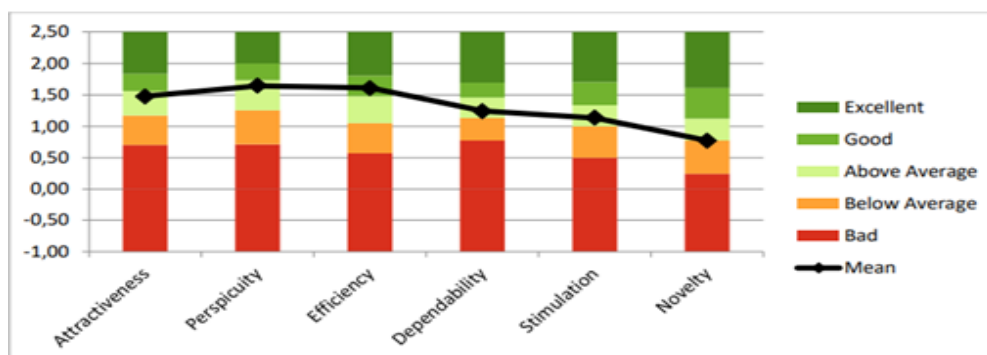
Aspects	Description
<b>Attractiveness</b>	The impression of the application. Do users like it?
<b>Perspicuity</b>	Is the application easy to understand?
<b>Efficiency</b>	Is the user able to complete the task using the application without any problems?
<b>Dependability</b>	Does the user feel in control of the interaction with the application?
<b>Stimulation</b>	Is it fun to use the app?
<b>Novelty</b>	Whether the application used is innovative and creative

In Figure 2 shown below, Attractiveness has its dimensions. Meanwhile, Perspicuity, Efficiency, and Dependability are aspects of pragmatic quality, which are goal-oriented. Stimulation and Novelty are part of the hedonic-quality aspect, which is not goal-oriented.



**Fig 2. Six Aspects of UEQ**

UEQ has an assessment standard divided into five categories per aspect: Excellent, Good, Above Average, Below Average, and Bad. In Figure 3, each aspect has a different mean value.



**Fig 3. UEQ Benchmark Graphic**

Assessment with UEQ will be considered positive if an aspect's importance is more than 0.8. If the value is -0.8 to 0.8, it will be considered neutral. If the value < -0.8, the aspect will get a negative value. Figure 2 shows a positive value assessment of a product using UEQ. The UEQ has six aspects and 26 items. In Figure 4 below, the questions on the UEQ, which has 26 items to measure the aspect value of the Attractiveness, Efficiency, Perspicuity, Dependability, Stimulation, and Novelty aspects. Respondents answer UEQ questions by selecting or circling the



numbers 1 to 7, which have a shape similar to a Likert scale. Figure 5 below shows an example of how to answer the UEQ questions correctly after collecting data. The data will then be entered into an excel file to be calculated and searched for the UEQ value from the software.

not understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	understandable
easy to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	difficult to learn
complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy
clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	confusing

**Fig 4. An example of how to answer a question with a Likert scale**

	1	2	3	4	5	6	7		
annoying	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	enjoyable	1
not understandable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	understandable	2
creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	dull	3
easy to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	difficult to learn	4
valuable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	inferior	5
boring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	exciting	6
not interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	interesting	7
unpredictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	predictable	8
fast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	slow	9
inventive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	conventional	10
obstructive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	supportive	11
good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	bad	12
complicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	easy	13
unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasing	14
usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	leading edge	15
unpleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pleasant	16
secure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	not secure	17
motivating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	demotivating	18
meets expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	does not meet expectations	19
inefficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	efficient	20
clear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	confusing	21
impractical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	practical	22
organized	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	cluttered	23
attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unattractive	24
friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	unfriendly	25
conservative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	innovative	26

**Fig 5. UEQ Questions**

## RESULTS AND DISCUSSION

The followings are the results and discussions carried out in this study based on the research methodology using the RAD method. The planning requirements process is the first phase in the RAD method. At this stage, requirements gathering is done by collecting data/information from the user using UEQ and determining what features will be developed for the system. The requirements planning begins by distributing the UEQ questionnaire to MiPOS users to find out the user's impression of using MiPOS. Afterwards, the users and analysts discuss to identify the purpose of the system and are oriented toward solving business problems. The questionnaire was distributed online through a google form. The questionnaire distribution began on July 4th, 2022, and closed on August 20th, 2022. The total number of respondents who filled out the questionnaire was 35 people. Respondents who were chosen to fill out the questionnaire were insurance agents of PT Asuransi Jiwa Manulife Indonesia who used the MiPOS.

The result of data from 35 respondents who filled in the UEQ questionnaire, and the data will be transformed into a more processable form. After the evaluation data is transformed, the transformed data will be checked for its consistency. The figure 6 below shows the consistency testing data:

No	Scales with inconsistent answers						Critical?
	Attractiveness	Perspicuity	Efficiency	Dependability	Stimulation	Novelty	
1							0
2							0
3							0
4	1						1
5	1	1					2
6	1						1
7			1				1
8							0
9		1			1		2
10							0
11		1			1		2
12							0
13							0
14							0
15							0
16				1			1
17	1						1
18						1	1
19							0
20							0
21							0
22							0
23							0
24		1				1	2
25							0
26							0
27							0
28							0
29							0
30							0
31	1				1		2
32							0
33			1	1			2
34	1						1
35						1	1

Fig 6. Consistency testing data.

Figure 6 shows the data that has been checked for its consistency, and checking is done using the UEQ Data Analysis Tool. Does the data that is considered inconsistent have a critical value? Yes, it has three and more than 3. Results of checking the consistency of the data from Figure 6. the number 5 has a value of 2 as a critical value. The highest so that the data is considered relatively consistent.

UEQ Scales (Mean)	
Attractiveness	➔ -0.033
Perspicuity	➔ -0.379
Efficiency	➔ -0.164
Dependability	➔ 0.036
Stimulation	➔ 0.014
Novelty	➔ -0.186

Fig 7. Final results of UEQ

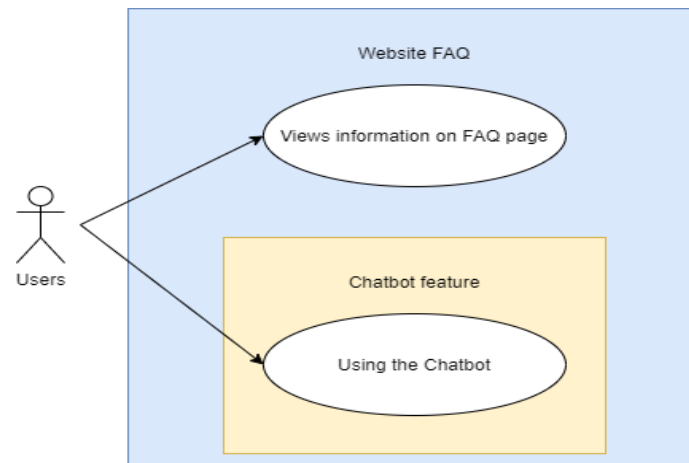
Figure 7 is the final result of the UEQ evaluation. The assessment of all variables is neutral. In determining the value of the evaluation results, UEQ sets a scoring for the final score above 0.8, then the impact is positive. For the final score below -0.8, the effect is negative, and the range of values between -0.8 and 0.8 is considered neutral. Based on the results of the UEQ evaluation, the researchers assessed the MiPOS. The system requires a solution in the form of a FAQ website and a chatbot, and the answer is taken based on the lowest variable value from the UEQ evaluation results. The variable with the lowest value is the Perspicuity variable. Perspicuity is a variable that

measures whether the user is easy to get used to while using the system. Table 2 shows the user requirement based on the final UEQ results:

**Table 2. User requirements**

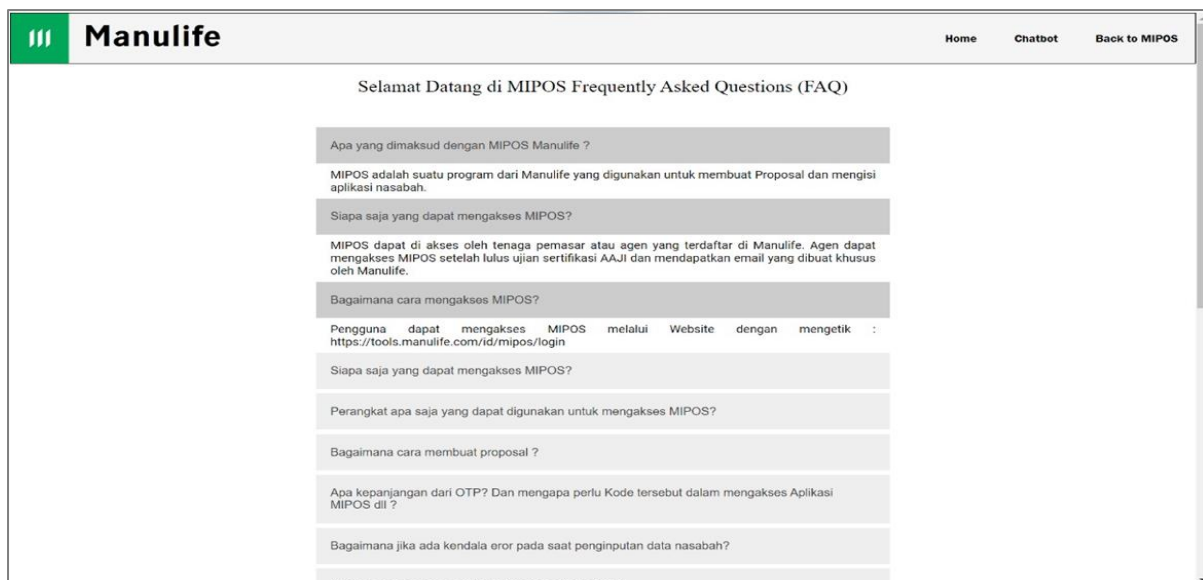
Actor	Feature	Role
User	Website FAQ	Displays static information in the form of FAQ
User	Chatbot	Respond to user input accurately and without reloading on the website
Admin	Website FAQ	Add, remove and change content on the main page
Admin	Chatbot	Add, remove and modify chatbot database

After using requirement planning, the next phase is to create a user design in the form of a UML Diagram. A Use Case Diagram will be made to describe the primary function of the FAQ website and Chatbot feature.

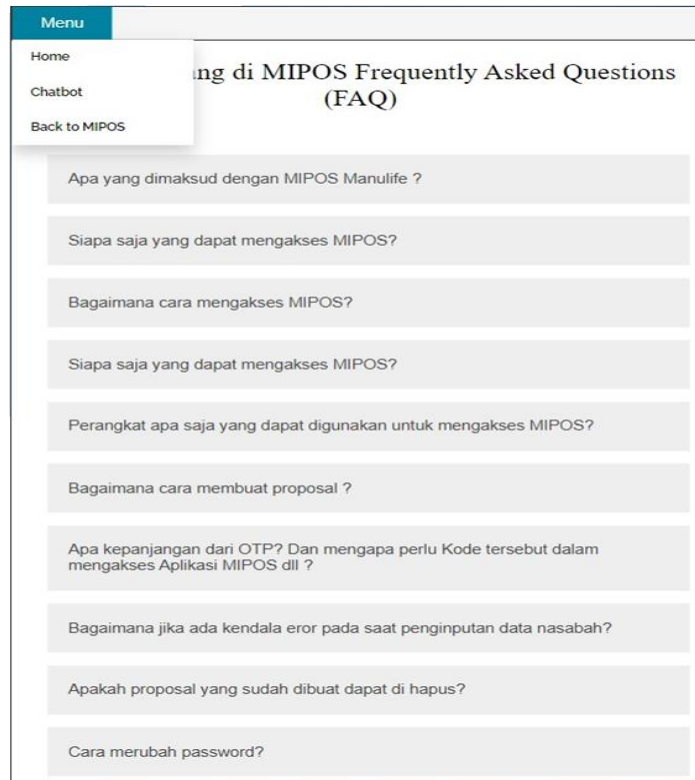


**Fig 8. Use case diagram**

Based on the figure 8 above, the users of MiPOS can view information about the MiPOS through the website and users can interact with the Chatbot on the FAQ website. After going through the user design stages using UML diagrams, the construction of FAQ website pages and chatbot features is carried out so that users can find information related to the use of MiPOS and interact with parties providing the guide with MiPOS through the chatbot feature. The figure 10 below shows the user interface of FAQ website.

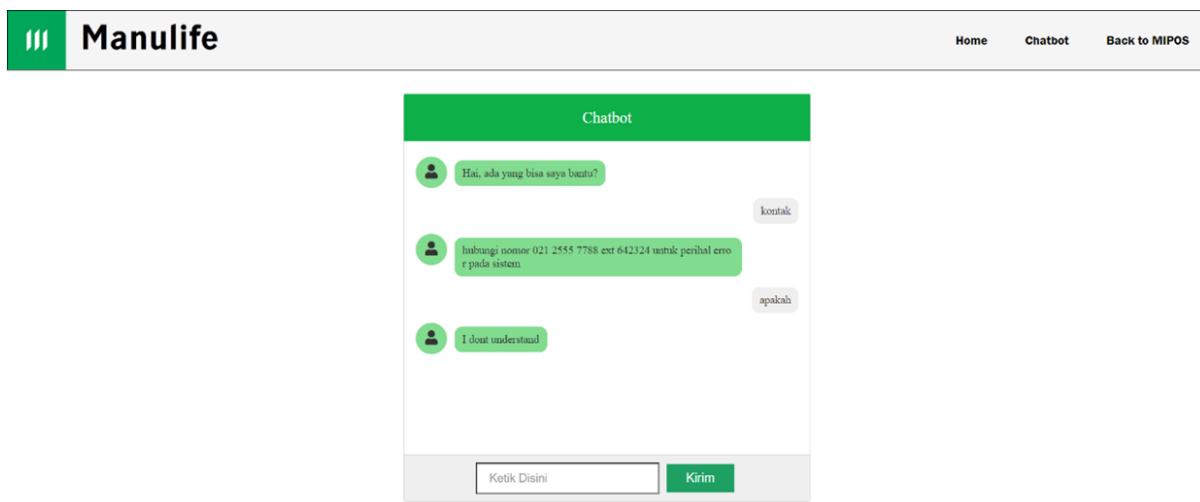


**Fig 9. User Interface of FAQ website**



**Fig 10. FAQ Information about MiPOS**

In addition to the website's FAQ home page menu, there is an FAQ page that contains essential information for using MiPOS so that it can be information for users when experiencing problems when using MiPOS.



**Fig 11. Chatbot feature on MiPOS**

Furthermore, if the information available on the FAQ page still has limitations, then the chatbot feature can be a solution for interacting in solving existing problems regarding the use of MiPOS. The final stage of the RAD method is Cutover which is carried out by testing scenarios using UAT on the FAQ website and chatbot features. This test is carried out to determine whether the design and implementation results have been carried out as expected or not. Table 3 below will show the results:



**Table 3. User Acceptance Test (UAT)**

No	Testing case	Result	
		Success	Failed
	Process description	Expected results	
1	Access the question menu from homepage	If the question is send, then the chatbot will display the answer.	✓
2	Input “nasabah” keyword on the chatbot	Chatbot response: “Untuk membuka nasabah baru, silakan buka menu nasabah lalu pilih buat data nasabah”	✓
3	Input “produk” keyword on the chatbot	Chatbot response: “Untuk detail informasi menu produk, silakan akses menu produk”	✓
4	Input “terima kasih” keyword on the chatbot	Chatbot response: “terima kasih kembali”	✓
5	Input “error” keyword on the chatbot	Chatbot response: “mohon kirimkan sceenshot error ke email: helpdesk.agency@manulife.com”	✓
6	Input “password” keyword on the chatbot	Chatbot response: “silakan akses link <a href="#">forgot password?</a> dan ikuti instruksi yang diberikan”	✓
7	Input “kontak” keyword on the chatbot	Chatbot response: “hubungi nomor 021 25557788 dengan ext 642324 terkait perihal error pada MiPOS”	✓
8	Input “daftar” keyword on the chatbot	Chatbot response: “untuk membuat proposal, buat data nasabah terlebih dahulu, setelah itu klik simpan dan buat proposal”	✓
9	Input “terhapus” keyword on the chatbot	Chatbot response:”data nasabah yang terhapus dapat dikembalikan dengan menekan tombol reload pada menu nasabah”	✓
10	Input other keywords on the chatbot aside the keywords No. 2 - 9	Chatbot response: “Untuk Informasi lebih lanjut silakan hubungi helpdesk”	✓

## CONCLUSION AND RECOMMENDATION

### Conclusion

Based on the evaluation results using UEQ on MiPOS, scores for the six aspects of UEQ have the same neutral results. The following is the order of the variable scores from the highest to the lowest score: Dependability with an average overall score of 0.036 (neutral), Stimulation with an average overall score of 0.014 (neutral), Attractiveness with an average overall score of -0.033 (neutral), Efficiency with an average overall score of -0.164 (neutral), Novelty with an average overall score of -0.186 (neutral), Perspicuity with an average overall score of -0.379 (neutral).

Even though it has a negative value, if the value is still in the range of -0.8 to 0.8, it is still included in the neutral category. Based on the UAT results, it can be seen that all use cases and features have been running without any problems. Users can view the required information by accessing the FAQ website and accessing the chatbot via the chatbot button on the navigation.

### Recommendation

For further research and to obtain more optimal results, the following recommendations can be suggested: Develop chatbot algorithms to become more accurate and master many words and understand complex expressions and make other solutions based on the other five aspects aside from perspicuity because these five aspects have the same value as the perspicuity aspect, which is still within the range of neutral values.

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