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UI/UX design thinking adoption for integrated AI point-of-sale system (Case study: Plastic Poultry Wholesale Store)

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ABSTRACT

The development of artificial intelligence (AI) technology drives the need for a point of sales (POS) system that is not only efficient, but can also provide adaptive information according to the user's sudden wishes. This research implements the design thinking method in designing a user interface (UI/UX) for a smart POS system integrated with conversational AI features. A case study was conducted at a Plastic Poultry Wholesale Store to gain in-depth insights related to field needs and operational challenges faced. The design thinking method was chosen because of its user-centered approach, through the stages of empathize, define, ideate, prototype, and testing, it is hoped that the final results obtained can be aligned with the concrete needs of users, so that the output of the system that has been designed will not be abandoned, but will always be used. In this design, the implementation of conversational AI is used to enhance the user experience through a virtual assistant feature that is able to answer dynamic questions according to the wishes of the user, so that users can freely explore any information in detail related to their overall business performance. The implementation results show that this system not only increases operational efficiency, but also improves user experience through more intuitive interactions when they want to see their business performance. This research contributes to integrating AI technology with a user-centered design approach for smart, responsive, and adaptive POS system solutions.

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1. INTRODUCTION

In the era of digital technology that continues to develop, various industrial sectors innovate to present effective and efficient solutions in optimizing operational performance, including the retail industry which is encouraged to innovate, especially in terms of transaction systems and sales analysis. Toko Grosir Plastic Poultry is a business engaged in wholesale sales of plastic products and baking materials, has challenges in managing fast transactions, so it requires a system that not only facilitates transactions, but is also able to provide analytical insights that are useful for making business decisions. One of the growing innovations is the point of sale (POS) system. The implementation of the POS system can help record and manage digitally all products, or transactions. POS systems also tend to attach detailed financial reports that seem informative to users. However, the results of interviews with Plastic Poultry shop owners say otherwise, they instead want the reports submitted to be not too many and detailed, but only a summary, but the summary must be flexible according to their sudden wishes, therefore, the implementation of artificial intelligence technology, can answer this. With the integration of artificial intelligence (AI) features, the POS system not only functions as a

tool to facilitate transactions, but also as a platform that can provide deep business insights through automatic data analysis can be the right solution.

AI is a field that refers to the ability of computing systems to mimic human cognition [1]. An AI-powered POS system can accurately track inventory and order transactions based on sales so that it can be a leading system to eliminate losses. The application of ai in POS systems can analyze customer purchase history and provide related product suggestions that customers may be interested in [2]. The integration of advanced analytics and AI is a strategic imperative to achieve supply chain stability and competitive advantage for retailers in predicting demand fluctuations, improving inventory levels, and responding to market dynamics more optimally [3]. To achieve maximum applicability of the smart POS system, an intuitive and easy-to-use user interface (UI/UX) design is required. User interface (UI) refers to the system and the user interacting with each other through commands or techniques to operate the system, enter data, and use content. User experience (UX) refers to the overall experience of direct or indirect use of a system, service, product or content, this includes something related to perception whether it is emotions or thoughts, reactions and also behavior that users feel or think [4]. Conversational AI is the study of techniques for software agents that can engage in natural conversational interactions with humans [5]. The application of Conversational AI can add to the user's intuitive experience. To produce effective UI/UX in creating an optimal user experience, one approach that can be applied is design thinking.

The Design Thinking method is an iterative process that involves several stages to identify and understand users, problems faced, and possible solutions. The process in this method allows the author to define the problem from a certain point of view and generate ideas to develop innovative solutions by changing the design through hypothetical testing and prototyping [6]. The use of the design thinking approach has been proven to be used to generate new ideas that meet the needs of users in the development of a product, and is the fastest way to get design results that are solutive to a problem [7]. Through the design thinking approach, this article will discuss how to apply and the important stages in optimizing UI/UX design on smart POS systems that focus on solving real problems at Plastic Poultry Wholesale Stores, by considering various points of view for both owners, cashiers, and warehouse staff. With this approach, it is expected to create a design solution that suits the needs and optimizes business goals effectively.

2. MATERIALS AND METHOD

In this research we used the design thinking approach method. Design thinking is a collaborative method that gathers diverse ideas from various disciplines to find innovative solutions. This method not only focuses on what the user sees and feels, but also prioritizes the overall user experience. Design thinking is used to find the most effective and efficient solutions to complex problems. This approach emphasizes comprehensive thinking that allows the team to come up with the right solution based on a deep understanding of user needs. Design thinking is divided into 5 stages as follows [8].

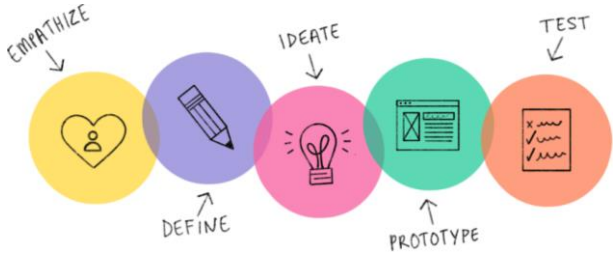

Figure 1. Stages of the design thinking methodology.

2.1. Emphatize

Emphatize is a process to solve problems that arise by approaching people. This method seeks to understand the obstacles experienced by users so that we can feel and find the right solution to the problem. In this method what must be done is an interview [8]. The final results obtained from this phase will be presented in the form of a table containing pain points and user needs.

2.2. Define

At this stage is the process of determining the problem by comparing, managing, and understanding the information obtained at the initial stage based on the results of in-depth interviews with respondents. At this stage, a process of analyzing and understanding the various insights that have been obtained through the previous empathy stage is carried out, this aims to determine the problem statement as the point of view or main concern in the research [9]. At this stage, the rough results of the previous empathize stage will be organized and then mapped to show the detailed sequence of problems and needs to facilitate the process of formulating further ideas. This problem mapping is interpreted in an affinity diagram. An affinity diagram is a method of organizing and grouping related ideas or information in a visual display. This will help in identifying patterns, themes, or relationships that emerge from the collected data [10].

2.3. Ideate

Ideate is a transition process from problem formulation to problem solving, while in this ideate process will concentrate on generating ideas or ideas, then selected and prioritized based on their impact on users and system development as a basis for prototyping the design to be made [10].

2.4. Prototype

Prototype is known as the initial design of a product to be made, in order to detect errors early and obtain new opportunities. In its application, the initial design made is tested on users to get appropriate responses and feedback to improve the design [10].

Figma is a UI design tool with excellent features in terms of design, which is used in UI/UX design and prototyping. Figma is a design tool that is usually used to create the appearance of mobile applications, desktops, websites, and others. Figma can be used on Windows, Linux or Mac operating systems by connecting to the Internet. Generally, Figma is widely used by someone who works in the field of UI / UX, web design and other similar fields. Figma can be classified as a medium fidelity prototyping tool. Therefore, Figma is more complicated and time consuming to use than Adobe XD [11].

2.5. Testing

After the prototype stage is produced, the last stage carried out is testing the prototype to users and then responding to prototype testing. To see how successful the system is, we need to measure the usability of the system we have designed. There are many questionnaire methods to measure usability, one of which is the system usability scale (SUS) [12]. The results of this test will provide input for the researchers to make improvements and optimize the quality of the designed system. This phase is carried out using the SUS.

The System Usability Scale or SUS itself is a tool for measuring the level of usability of a system or product. The SUS itself is the most widely used standard questionnaire for assessing perceived usability [13]. Products that are to be commercially released tend to conduct their own SUS prior to release [14].

3. RESULTS AND DISCUSSIONS

3.1. Emphatize

In the first stage, field interviews were conducted at the Plastic Poultry Wholesale Store, interviews were conducted directly with the store owner and 5 random customers who were shopping. This interview aims to understand the constraints and needs faced in managing the business as well as getting solutions for the desired system [8].

These interviews were conducted in depth with the store owner and 5 random customers we met. During the interviews with the owner, we dug out information related to how they conduct their current business processes, such as the nature of daily operational activities to the level of management.

Below is a documentation of the results of the interviews and field observations with direct shop owners that we conducted at the Plastic Poultry Wholesale Store. The final results of our interviews and observations are presented in tabular form.

Figure 2. Interview related to new needs and constraints in using the old system mechanism.

Direct observations and interviews were conducted with the owner to ask details related to how the transaction management process, product management, and employee management are currently carried out. We also interviewed 5 randomly selected customers to find out if there were any barriers from their side when transacting with the cashier in the store. The owner also has a need to be able to manage members and associate members with a transaction, so when he needs this information, the system can present data on the 10 highest annual members based on their total transactions, the store needs this data so they can distribute holiday allowances a few days before Eid.

Table 1. Outline of problems and needs from users.

No	Problems
1	Difficulty remembering and tracking product and transaction data, this is because previously all records were still done manually written in the ledger.
2	There is no system available for free on the playstore application store that can meet their needs, namely they want 1 product that only has 1 unique code, can have many variants, such as wheat flour which has retail variants of 1 kg, 1/2 kg, and others.
3	Want to get many informative summaries and recommendations regarding their business performance according to what they want to ask. However, they do not want the information presented to be too complex and overwhelming, because they consider that if there are too many data components displayed, it makes it difficult to draw conclusions, because it is difficult to find the informative side.
4	They want to have a system that can link transactions to members, and in the summary side of the report they also want to be able to present 10 member data with the most total transactions.

3.2. Define

In the Define stage, the core problems that seem to be most urgent in the Plastic Poultry Wholesale Store are determined here, where the determination is based on the results of interviews and observations in the previous emphasize stage. From the observations at the Plastic Poultry Wholesale Store, it appears that there are two main categories that are the focus of their discussion, namely user problems and user needs.

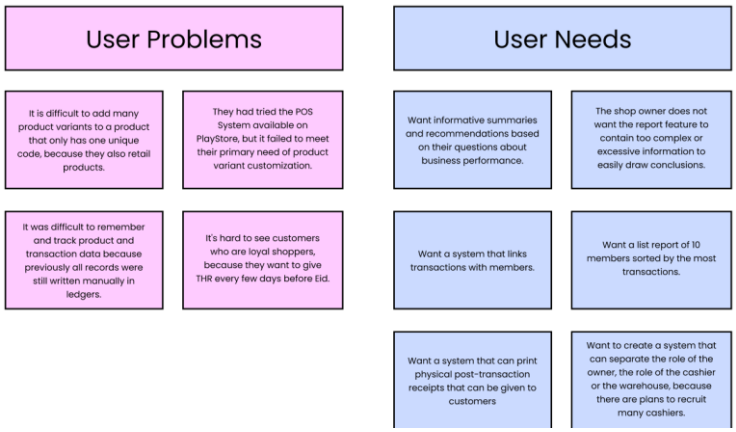

Figure 3. Affinity diagram of the define process based on the previous emphatize results.

At the Plastic Poultry Wholesale Store, there are several categories of problems that need attention. First, problems in managing products and variants, which is still done manually, which can take time to manage many products. Second, problems in carrying out the transaction process at the cashier, which is still manual, sometimes in the transaction process there are problems forgetting product prices due to thousands of products. Thirdly, the owner's need to provide holiday allowances to 10 customers every year by making the most transactions, below we describe the results of the Define stage using the affinity diagram.

Using the affinity diagram, the problems obtained from the empathize stage can be grouped into more organized categories, making it easier to find patterns or relationships between them. This will help in making better decisions in designing to solve problems and needs at the Plastic Poultry Wholesale Store.

3.3. Ideate

After the key problems are identified in the Define stage, the next step is Ideate, which is the process of moving from problem formulation to problem solving. At this stage, the focus is on generating creative ideas and solutions that can be implemented to address the identified problems. In the following, we will propose some ideas based on the results of interviews and needs analysis gathered from the data obtained in the Define and Emphasize phases.

Here we use use case diagrams to describe the interaction between actors (users or other systems) and use cases (system functions) as a medium for visual interpretation of ideas that will later be used as features of the POS system that we will develop in the future.

A use case diagram is a type of diagram that describes the expected functions of a system under development. In a use case diagram, the focus is on "what" the system does, not "how" it does it. A use case represents an interaction between stakeholders and the system [15]. The following are ideas and proposed solutions based on the problems and needs found at the Plastic Poultry Wholesale Store.

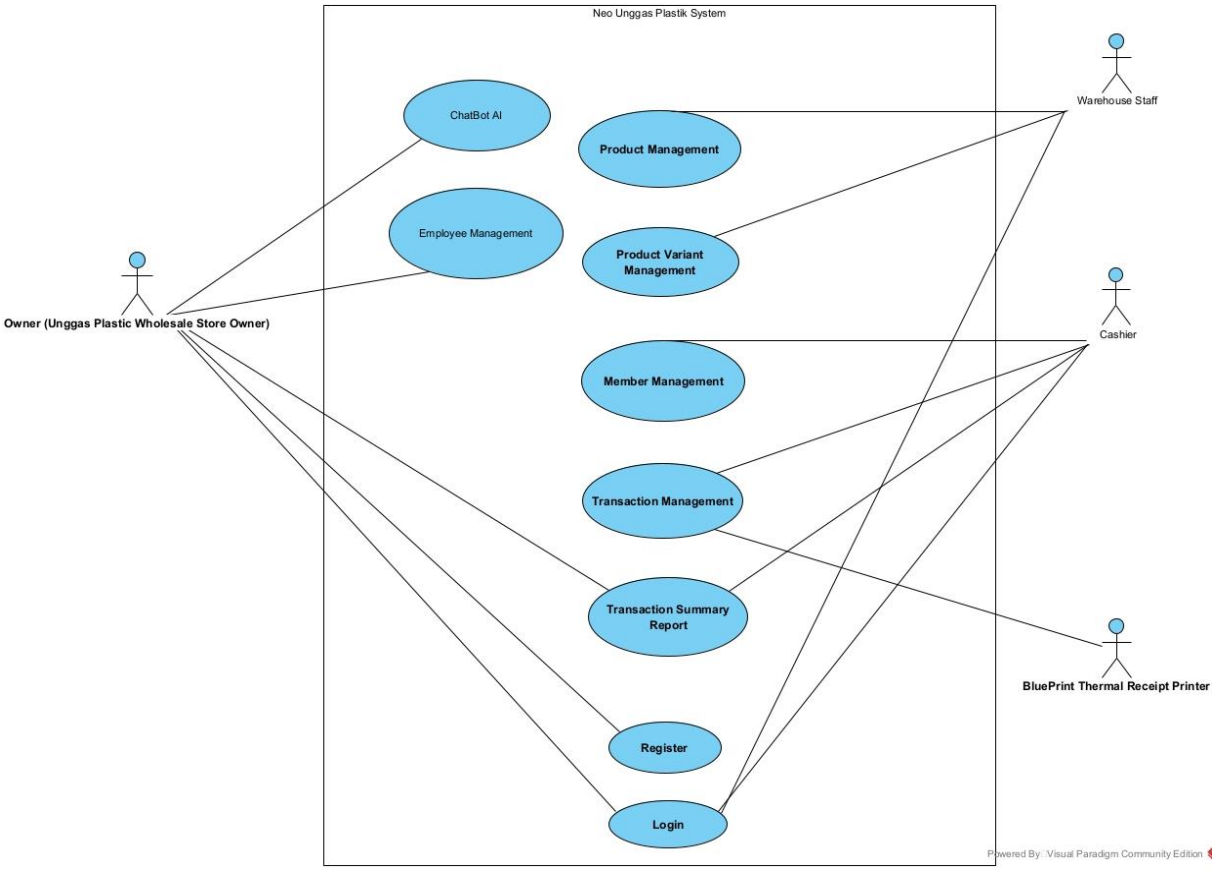

Figure 4. This Diagram contains the formulation of ideas related to the features that will be implemented in the system.

3.4. Prototype

The design or prototype phase, carried out after the data collection, empathize and define process has been formulated, this process refers to the formation of an interface design related to the product to be made with the aim of producing a description of the system model that is expected to meet the needs of the Plastic Poultry Wholesale Store. The end result of this stage is tested and evaluated to validate the suitability of the design that has been created.

Design or prototyping includes the creation of mockups; mockups are useful for providing a more realistic picture of a project, and at this stage include more specific details about the appearance of the system, such as colors, fonts, icon sizes, and layout views. Below is the UI/UX design created using Figma software, where the resulting design relates to the store's needs and problem solving.

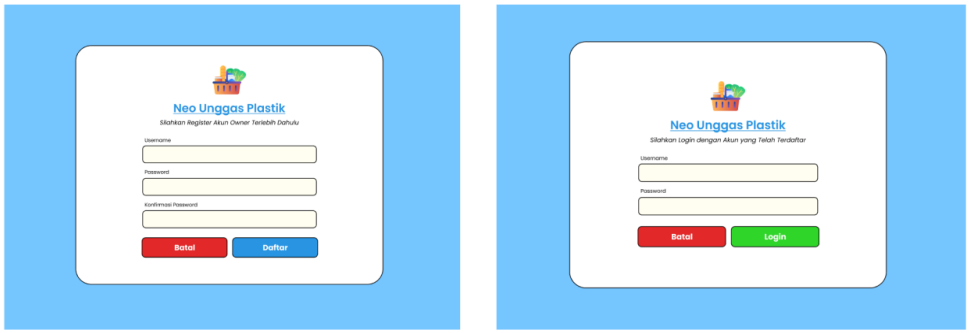

Figure 5. Prototype of the register and login page.

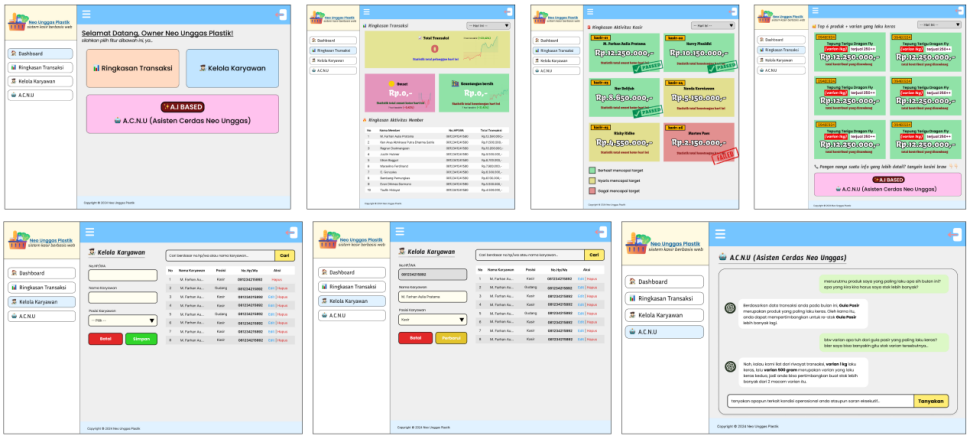

Figure 6. Prototype of the owner role page.

Figure 7. Prototype of the cashier role page.

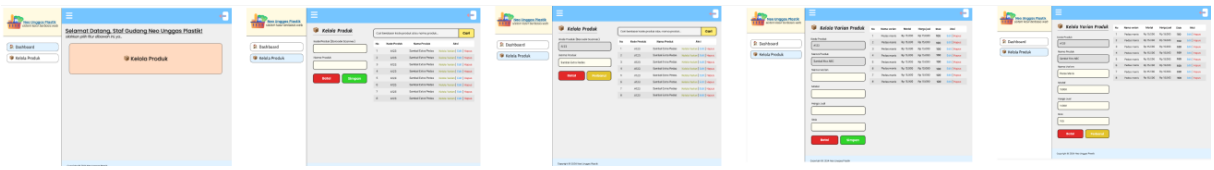

Figure 8. Prototype of the warehouse staff role page.

3.5. Testing

Prospective users are given 10 questions in accordance with the provisions of the SUS analysis, namely in odd numbered questions are presented that lead to positive, otherwise in even numbered questions are presented that lead to negative, the results of this assessment serve as input for researchers to make improvements and improve quality. From the given questionnaire, the results are as shown in Table 2.

Table 2. Respondent SUS results.

Respondent	Calculated score (Data from qustionnaires given to real users)										Total	Score (Total × 2.5)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
Respondent 1	5	4	4	2	5	1	5	1	4	2	33	82.5
Respondent 2	4	4	5	1	5	2	5	1	5	1	38	95
Respondent 3	5	4	5	2	5	1	5	1	5	1	38	95
Average score of final results after divided by total respondents												90

Based on the results of these tests carried out by going directly to the Plastic Poultry Wholesale Store, and telling the owner and several staff employees to use the system that we have finished building. After they tried to use it, we also gave several written questionnaire questions according to the SUS standard to the 3 users, from the results obtained, we managed to achieve an average SUS score of 90, which proves that users provide a positive perspective on the usability of the designed application. Based on these results, it is concluded that the design of the UI and UX of this system has successfully achieved the desired goal of increasing user usability and satisfaction. Determination of the final conclusion is based on the SUS rating scale as shown in Figure 9 below.

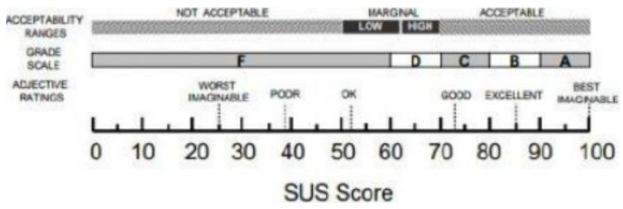

Figure 9. Value scale score according to the SUS standard.

4. CONCLUSION

According to the results of the average SUS score obtained from testing the use of the system on real users, the average SUS score was successfully obtained around 90, this means that the UI/UX design of the Neo Plastic Poultry system using the design thinking method has been successfully carried out. We can also conclude that the use of Conversational AI integration has successfully added to the user experience because it provides a more intuitive, adaptive, and of course meaningful response, this also successfully answers the previous user problems and needs that we got at the empathize stage, which is related to the desire to get a flexible and adaptive business performance summary according to the sudden wishes of the user.

A high SUS score indicates that the application is easy for users to learn, which also means that our application is efficient to use and certainly meets their needs. In addition, the SUS test helps us identify other weaknesses in the interface and user experience of our application. These results certainly provide important insights for us as developers to fix the unsatisfactory aspects and improve the overall quality of the application in the future.

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REFERENCES

[1] Njeru, F. (2023). A review of artificial intelligence and its application in business. *Journal of Enterprise and Business Intelligence*, **3**(1), 44–53.

[2] Santos, V. & Bacalhau, L. M. (2023). Digital transformation of the retail point of sale in the artificial intelligence era. *Management and Marketing for Improved Retail Competitiveness and Performance*, 200–216.

[3] Raparthi, M., Gayam, S. R., Kasaraneni, B. P., Kondapaka, K. K., Putha, S., Pattyam, S. P., Thuniki, P., Kuna, S. S., Nimmagadda, V. S. P., & Sahu, M. K. (2024). Exploratory data analysis techniques-A comprehensive review: Reviewing various exploratory data analysis techniques and their applications in uncovering insights from raw data. *Australian Journal of Machine Learning Research & Applications*, **4**(1), 215–225.

[4] Joo, H. S. (2017). A study on UI/UX and understanding of computer major students. *International Journal of Advanced Smart Convergence*, **6**(4), 26–32.

[5] Ram, A., Prasad, R., Khatri, C., Venkatesh, A., Gabriel, R., Liu, Q., Nunn, J., Hedayatnia, B., Cheng, M. & Nagar, A. (2018). Conversational AI: The science behind the Alexa prize. *1st Proceedings of Alexa Prize 2017*, 1–18.

[6] Razzouk, R. & Shute, V. (2012). What is design thinking and why is it important?. *Review of Educational Research*, **82**(3), 330–348.

[7] Rösch, N., Tiberius, V., & Kraus, S. (2023). Design thinking for innovation: context factors, process, and outcomes. *European Journal of Innovation Management*, **26**(7), 160–176.

[8] Dunne, D. & Martin, R. (2006). Design thinking and how it will change management education: An interview and discussion. *Academy of Management Learning & Education*, **5**(4), 512–523.

[9] Piłat, P. (2024). Designing the design. Application of design thinking to social innovation planning. *Scientific Papers of Silesian University of Technology: Organization and Management Series*, **193**, 317–341.

[10] Wolniak, R. (2017). The design thinking method and its stages. *Support Systems in Production Engineering*, **6**(6), 247–255.

[11] Figliolia, A. C., Sandnes, F. E., & Medola, F. O. (2020, November). Experiences using three app prototyping tools with different levels of fidelity from a product design student's perspective. *International Conference on Innovative Technologies and Learning*, 557–566.

[12] Kaya, A., Ozturk, R., & Altin Gumussoy, C. (2019). Usability measurement of mobile applications with system usability scale (SUS). *Industrial Engineering in the Big Data Era: Selected Papers from the Global Joint Conference on Industrial Engineering and Its Application Areas, GJCIE 2018*, 389–400.

[13] Lewis, J. R. (2018). The system usability scale: past, present, and future. *International Journal of Human–Computer Interaction*, **34**(7), 577–590.

[14] Grier, R. A., Bangor, A., Kortum, P., & Peres, S. C. (2013). The system usability scale: Beyond standard usability testing. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, **57**(1), 187–191.

[15] Rajagopal, D. & Thilakavalli, K. (2017). A study: UML for OOA and OOD. *International Journal of Knowledge Content Development & Technology*, **7**(2).