Tekmapro : Journal of Industrial Engineering and Management
Vol. 20, No. 02, Tahun 2025, Hal. 79-89
e-ISSN 2656-6109. URL: http://tekmapro.upnjatim.ac.id/index.php/tekmapro

User Interface (UI) Design for Monitoring and Evaluation (MONEV) Learning: Focus on Preparation and Learning Process in the UPNVJ

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ABSTRACT

This study aims to design an innovative Dashboard User Interface (UI) for monitoring and evaluating learning in the Universitas Pembangunan Nasional "Veteran" Jakarta. In its design process, a User-Centered Design (UCD) approach is adopted to ensure that user needs, preferences, and experience are the primary focus. By involving various stakeholders, such as lecturers, students, and academic managers, UCD enables the resulting dashboard to be more intuitive and effective in supporting data-driven decision-making. The data collection method is carried out by pulling data directly from the university's internal quality assurance information system (SPMI) database, which includes information about the performance of lecturers, students, lecture materials, community service activities, and learning feedback. This data is processed and analyzed to provide comprehensive insights into the preparation and learning process. Through mockup evaluation and prototype testing, the resulting UI can provide a holistic and in-depth picture, ensure compliance with higher education quality standards and support continuous improvement according to SPMI principles. The UI dashboard serves as a useful tool for stakeholders to make the right decisions and identify areas that need to be improved. Implementation challenges and limitations of this design have been identified, with recommendations proposed. Recommendations for further development include design updates, improved functionality, and integration with other systems. The overall results of this study make a practical and theoretical contribution to improving learning management at the Universitas Pembangunan Nasional "Veteran" Jakarta and can be a guide for the development of information systems to support policies and evaluate learning in higher education.

Keywords: *Dashboard, Monev, Learning, SPMI, User Interface.*

A. INTRODUCTION

Universities play an important role in shaping the potential and quality of human resources in a country. In the era of ongoing digital transformation, the challenge for universities lies not only in innovation or other outputs, but also in the ability to conduct effective monitoring and evaluation [1]. Monitoring and evaluation practices are crucial to ensure the effectiveness and quality of various aspects of learning in the university environment.

In the rapidly developing world of information, the practice of monitoring and evaluation (Monev) in the university environment is inevitable [2] The success of the implementation of Monev has a significant impact on the effectiveness and quality of learning,

allowing for early identification of areas for improvement, information-based decision-making, and the achievement of continuous improvement indicators in the preparation and learning process [3]

Universitas Pembangunan Nasional "Veteran" Jakarta (UPNVJ)[4], as one of the Universities that is currently in the process of becoming a Legal Entity State University and always pays attention to the development of the Internal Quality Assurance System (SPMI)[5], UPNVJ recognizes the importance of good monitoring and evaluation. Without this practice, institutions will have difficulty identifying which areas need improvement.

This study is focused on designing a User Interface (UI) that is devoted to monitoring and evaluating learning in Universitas Pembangunan Nasional "Veteran" Jakarta, by focusing on the preparation stages and the learning process. The design of this User Interface (UI) is expected to provide a holistic view of the dynamics of learning in the university environment, this is in line with the principles of the Internal Quality Assurance System (SPMI).

By conducting a comprehensive study on good monitoring and evaluation (Monev) practices in higher education [6][7] this study aims to develop information system-based solutions that support policies and evaluate learning outcomes efficiently as well as to design User Interfaces (UI) that are not only in accordance with user needs, but it is also comprehensive for monitoring and evaluating learning.

The implementation of good monitoring and evaluation (Monev) in the university environment not only ensures that students get a quality education, but also responds to their needs and equips them with relevant skills in the industry. In addition, good monitoring and evaluation also play a key role in ensuring accountability and transparency, as well as maintaining the quality and effectiveness of higher education institutions, as well as encouraging continuous improvement.

One of the successes of the Dashboard system for monitoring and evaluation is highly dependent on the extent to which the User Interface (UI) is able to provide relevant, accurate, and easy-to-understand information [8] by stakeholders, including lecturers, students, and policymakers. Therefore, effective User Interface (UI) design is key in bridging information and evaluative needs [9] from stakeholders in the environment Universitas Pembangunan Nasional "Veteran" Jakarta.

B. LITERATURE

B.1. User Centered Design (UCD) Waterfall Map

User Centered Design (UCD) is a user-oriented design process, which aims to improve user satisfaction with the final product. This process involves researching users to understand their needs, expectations, and behaviors. In the context of software, UCD helps in creating an intuitive and easy-to-use interface, which can improve productivity and user satisfaction [10], [11], [12]. UCD also encourages collaboration between designers, developers, and users to ensure that the resulting products meet user needs.

B.2. Use Case Diagram

Use Case Diagram is one of the UML diagrams used to illustrate the interaction between the user (actor) and the system. This diagram helps in identifying the key functions that the system should provide, as well as how users will interact with those functions [13], [14]. By using Use Case Diagrams, development teams can better understand user needs and design systems that better match their expectations. In addition, these diagrams also serve as an effective communication tool between developers and stakeholders, thereby minimizing misunderstandings in the development process [15].

B.3. Activity Diagram

An Activity Diagram is a diagram used to model a workflow or process in a system. This diagram illustrates the steps involved in a process, including the decisions to be made and the alternative paths that may exist [16]. Activity Diagrams are particularly useful in the context of UCD because they allow teams to visualize and analyze the processes that users will go through when interacting with the system. Thus, developers can identify potential problems and design better solutions to improve the user experience [17].

B.4. Sequence Diagram

Sequence Diagrams illustrate the interactions between objects in a system in a specific time order. This diagram shows how objects communicate with each other through messages, as well as the sequence of those interactions. In the context of UCD, Sequence Diagrams help development teams to understand how users will interact with the system in detail, as well as how the system will respond to those interactions. By visualizing these interactions, developers can design interfaces that are more responsive and in line with user expectations[17], [18].

B.5. Class Diagram

A Class Diagram is a diagram that depicts the static structure of a system by showing classes, attributes, and relationships between classes [18]. In the context of UCD, Class Diagrams help development teams to understand how data will be organized and managed in the system. This diagram also allows developers to design more modular and easy-to-maintain systems, which in turn can improve the user experience. In addition, Class Diagrams also serve as the basis for code development, thus ensuring that the implementation of the system is in accordance with the design that has been created[17].

B.6. Mockup

A mockup is a visual representation of a user interface designed to give an idea of how the final product will look and function. Mockups are often used in the early stages of development to gather feedback from users before further development takes place [19], [20]. In the context of UCD, the use of mockups allows teams to test design ideas and gain valuable insights from users, which can be used to refine the design before implementation. As such, mockups serve as an important tool in UCD's iterative process, where user feedback is used to continuously improve the design.

C. RESEARCH METHOD

The method used in this study is User Centered Design (UCD). This method outlines the phases throughout the design and development lifecycle, with the primary focus on the user of the application. The process of implementing User Centered Design (UCD) [10][11] in this study, it is represented in a Waterfall process map that describes the steps of each stage of development.

User Centered Design (UCD) emphasizes the importance of understanding the needs, preferences, and experiences of users in designing applications. Through this approach, studies can detail the process from initial planning to implementation, ensuring that each stage considers the user's perspective thoroughly.

The Waterfall process map with the use of User Centered Design (UCD) becomes a visual tool that facilitates the understanding of how each phase in development is directed to provide solutions that suit the needs of users [12][13].

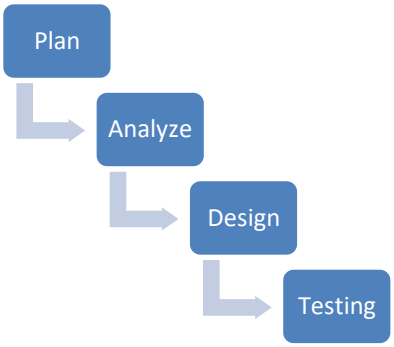

Figure 1. User Centered Design (UCD) Waterfall Map

The following is an explanation of each stage in the Figure 1

a) *Plan*: This stage is the initial planning for UI design. The focus is to understand the business context, set user goals, and detail what requirements are needed.
b) *Analyze*: At this stage, an in-depth analysis of user needs and user environment is carried out. This information becomes the basis for decision-making during the design process.
c) *Design*: The design phase is a creative step in creating a UI that meets the needs of users and business goals.
d) *Testing*: The testing stage involves evaluating and validating the UI, this stage is to ensure that it has or has not been met for the suitability of the UI Design.

D. RESULT AND DISCUSSION

D.1. Result

Based on the method applied in this study, the results are manifested through the creation of designs using Unified Modeling Language (UML) [21]. Some of the UML elements implemented in this design use Use Case Diagrams, Activity Diagrams, Sequence Diagrams, and Class Diagrams. In addition, this study also uses interface design by adding a Mockup design.

The use of UML as a key tool in designing provides a comprehensive and structured framework. Use Case Diagrams are used to illustrate the interactions between the system and users, Activity Diagrams to show the workflow in the system, Sequence Diagrams to show interactions between objects or actors in a given scenario, and Class Diagrams provide a structural view of the system.

By involving the design of the display (Mockup), this study not only limits itself to structural and functional aspects only, but also considers the experience of the user visually. The integration of UML methods and display design provides a good foundation in designing a learning monitoring and evaluation system in Universitas Pembangunan Nasional "Veteran" Jakarta. The results of this design are expected to provide a holistic view and support the effectiveness and sustainability of monitoring and evaluation practices within the university.

D.2. Use Case Diagram

By monitoring and evaluating both the preparation and the learning process, institutions can effectively track progress against various indicators and identify areas for improvement. By leveraging this Use Case Diagram, developers and stakeholders can clearly understand how the system interacts with users and support the necessary steps in learning monitoring and evaluation. This diagram becomes a useful element for detailing the functional interaction between the user and the system, creating a good basis for continuous development and improvement.

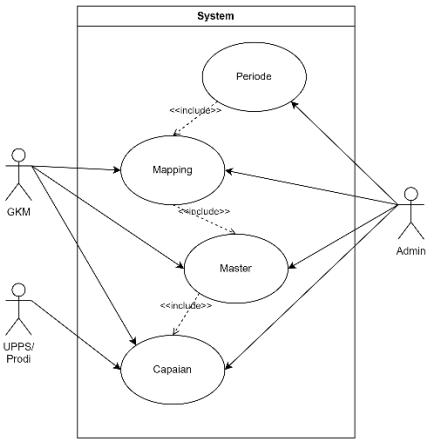

Figure 2. Use Case Diagram Monev Learning

The following is an explanation of the Use Case Diagram in figure 2.

a) Period: It is a *case* of a series of actions or interactions that occur during a certain period of time. In the context of a learning monitoring and evaluation system in the university environment, the period can include a specific time range that is the focus of monitoring and evaluation, such as an academic semester or academic year.
b) Mapping: Mapping-related *use cases* can provide information about how the establishment for information or indicators to be measured and connected and integrated in the context of monitoring and evaluation.
c) Master: Master-related *Use Cases* consist of activities that are carried out to meet the indicators that have been set in the Mapping stage. Such as Processes, Steps, or procedures for data management and policy setting.
d) Achievements: *Use cases* related to Achievements can involve steps to achieve the achievement of a predetermined indicator. The interactions and activities in these *use cases* can provide an overview of how the system is achieving the desired results through effective monitoring and evaluation.

The Use Case Diagram that has been created provides an overview of the interaction between the user and the system. This use case covers a wide range of usage scenarios, including monitoring predefined indicators and evaluating results for display in the Dashboard. This diagram presents a comprehensive view of the functionality that each user can access.

D.3. Activity Diagram

Activity Diagrams illustrate the workflow in the system. This diagram details the steps to monitor and evaluate learning, while showing the interactions between actors in each activity. Activity Diagram is an effective visual tool to understand the process involved in creating a Dashboard.

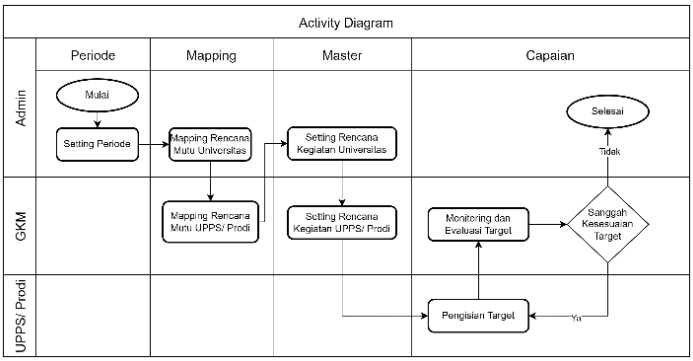

Figure 3. Activity Diagram Monev Learning

With Activity Diagrams, it helps users and stakeholders to recognize the sequence of activities, understand workflows, and identify which indicators or areas need improvement. Overall, the Activity Diagram provides a detailed and intuitive picture of how the process is structured and how the interaction between actors occurs in the context of using the Dashboard. This is a strong foundation for further analysis, improvement, and development.

D.4. Sequence Diagram

Sequence Diagrams display the interactions between objects or actors in a given scenario. This diagram provides a glimpse of the sequence of steps that occur during the monitoring and evaluation process.

With Sequence Diagrams, the interactions between objects or actors are clearly shown, highlighting the interconnectedness and dependencies between the steps. These diagrams help in visualizing the chronological sequence of activities that occur, providing an in-depth understanding of how each element interacts with each other during the monitoring and evaluation process.

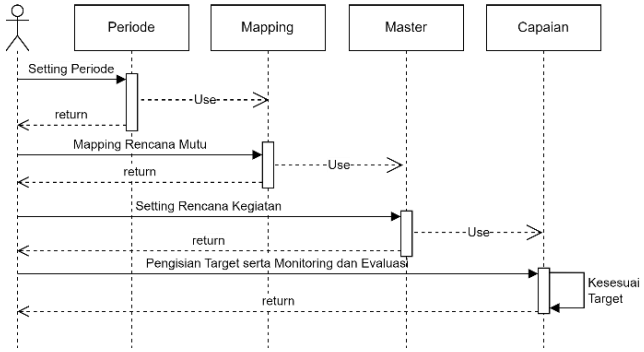

Figure 4. Sequence Diagram Monev Learning

Using Sequence Diagrams, stakeholders can easily see how information and control moves between objects or actors, providing a comprehensive picture of the dynamics in the

process. This is a good element to detail and explain interactions in certain scenarios during monitoring and evaluation.

D.5. Class Diagram

Class Diagrams provide a structural view of the system, showing the main classes, attributes, and relationships between classes. In the context of this study, this diagram focuses on the structure of the User Interface (UI) Dashboard system that is being developed. Class Diagrams help visualize the key elements involved in the implementation of monitoring and evaluation practices.

By displaying the main classes and the relationships between them, Class Diagrams help ensure the design and implementation of the User Interface (UI) to display data or information accurately according to the needs and principles of monitoring and evaluation practices.

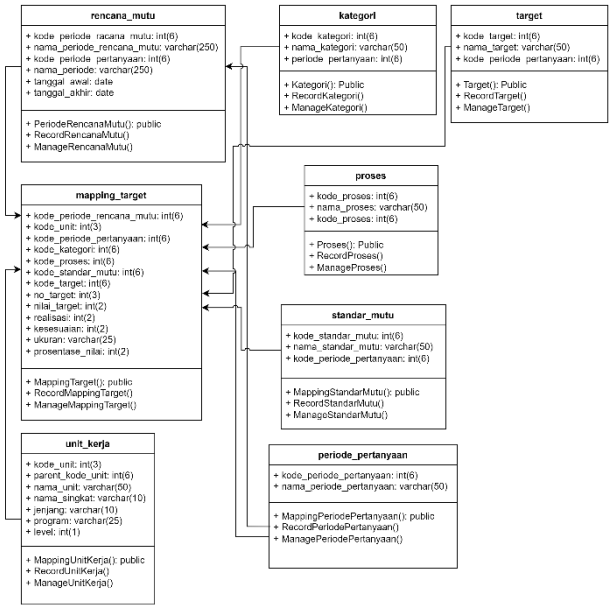

Figure 5. Class Diagram Monev Learning

Overall, Class Diagrams are an effective tool to help stakeholders understand and communicate the structure of the system clearly. By leveraging this structural view, developers and stakeholders can collaborate more effectively to achieve a good implementation for the development of this Dashboard user interface (UI).

D.6. Mockup

The Dashboard Display Mockup design is created to provide a visual representation of the resulting user interface. This mockup includes key User Interface (UI) elements, layouts, and functionalities that are accessible to users. As a design guide for developers, this mockup provides a clear visual representation of how the user interface will look and function in the final system.

The Dashboard View Mockup not only serves as a tool to visualize the design, but also serves as a guide for developers in implementing every detail accurately. By guiding developers through key User interface (UI) elements and functionality, this design helps ensure that the resulting Dashboard accurately reflects the necessary monitoring and evaluation practices.

The visual representation provided by the Dashboard View Mockup helps developers understand the final look and user interaction with the system. This gives confidence that the implementation of monitoring and evaluation practices will be well realized in the form of an interface that suits the needs and expectations of users. Thus, the design of the Dashboard Display Mockup is an important instrument in ensuring successful implementation in the context of the system being developed.

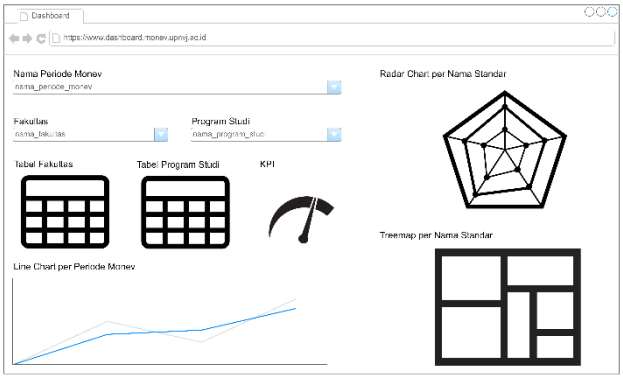

Figure 6. Mockup Dashboard Monev Learning

The User Interface (UI) design that has been implemented combines the principles of User Centered Design (UCD) with the aim of creating an optimal user experience. The advantages that can be obtained from this design include intuitive navigation, good layout, and clear representation of evaluation data. Positive responses came from users, including Education Staff, Lecturers, and stakeholders, who appreciated the ease of use and accessibility of the information presented through the User interface (UI) design.

The User Centered Design (UCD) principles implemented in this design put the user as the primary focus, ensuring that every element of the interface is adapted to meet their needs and preferences. Intuitive navigation is designed so that users can easily access the features they need, while a good layout helps to present information clearly and in an organized manner. Clear representation of evaluation data provides optimal visual understanding for users, making it easier for them to understand and evaluate information. Table 1 provides brief information about what elements were used in this study.

D.7. Discussion

The resulting User interface (UI) design, as presented in the Results chapter, has gone through an in-depth evaluation process. Prototype testing is carried out to get feedback from users regarding the success of functionality, clarity of navigation, and user satisfaction levels. The results of this evaluation are the basis for discussing the advantages and potential improvements of the proposed User interface (UI) design.

Through the evaluation of the user interface (UI) design, the feedback obtained from users provides an in-depth understanding of the quality of functionality, the level of clarity of the layout for navigation, and the level of satisfaction from users. The results of this evaluation open a discussion about the effectiveness of design in meeting functional goals, user needs, and providing experience to users or users.

Based on the evaluation of the User interface (UI) design that has been carried out, it can be concluded that the proposed design successfully fulfills its function, provides good navigation, and achieves a high level of user satisfaction. These results prove that the User

interface (UI) design has undergone concrete validation from stakeholders, especially to ensure that the implementation of monitoring and evaluation practices can achieve the desired goals.

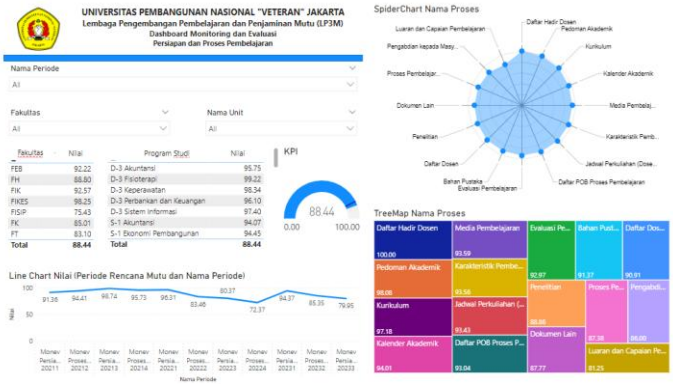

Figure 7. User interface (UI) for the Monev Dashboard

Based on the results of the evaluation and feedback obtained, it can be concluded that the monitoring and evaluation practices carried out through the Dashboard Display Mockup Design have made a positive contribution to increasing transparency, efficiency, and effectiveness in managing the learning process in the university environment. This evaluation gives an idea that the user interface (UI) design has succeeded in making software that supports better and structured learning monitoring and evaluation.

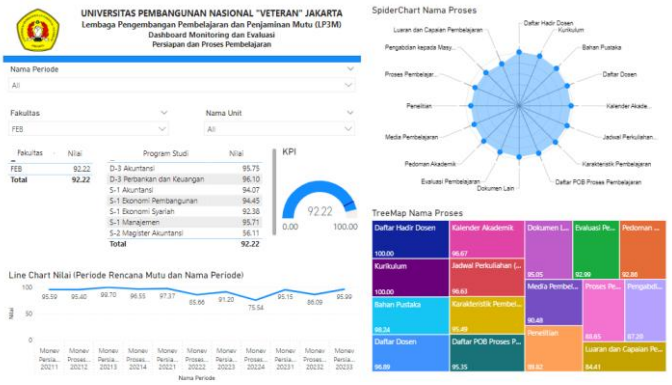

Figure 8. Dashboard after selecting one of the Faculties

In addition, the implementation of good monitoring and evaluation practices has a positive impact on the decision-making process and forms a culture of continuous improvement within the university. The ability to access evaluation information and data more quickly and efficiently through a well-designed user interface (UI) has created a strong foundation for improving sustainability in the implementation of learning.

Although the user interface (UI) design has achieved a number of successes, there is still potential for further improvement and development that needs to be identified. Some areas that require further attention include navigation adjustments based on user feedback, improved visual representation of evaluation data, and the integration of additional features that support the effectiveness of learning monitoring and evaluation. Conducting regular evaluations and gathering feedback from users will be an important strategy in identifying deficiencies or areas

that need improvement. Thus, continuous efforts to improve and develop the User interface (UI) design will support the achievement of better monitoring and evaluation goals in the university environment.

E. CONCLUSION

The conclusion of this study confirms the success in designing a Dashboard User Interface (UI) for monitoring and evaluating learning in the university environment. By using the User Centered Design (UCD) method, a good UML design and through evaluation and prototyping, the User Interface (UI) is able to provide a holistic picture of the entire learning process. This design not only makes a significant contribution to managing and improving the quality of learning in higher education, but also successfully integrates monitoring and evaluation features. In line with the principles of the Internal Quality Assurance System (SPMI).

Although this study is faced with implementation challenges and limitations, the proposed solution is able to be the basis for overcoming these obstacles. Further development can take into account the recommendations that emerge during the evaluation. The practical and theoretical implications of this design are expected to have a positive impact on higher education management and improve user experience.

In addition to increasing transparency, effectiveness and efficiency, this design makes a positive contribution to higher education institutions. The study also emphasizes the importance of continuous improvement and adaptability in design and implementation.

Overall, the study confirms that good monitoring and evaluation practices, along with effective User Interface (UI) design, play a key role in improving learning outcomes at the University. By accommodating evolving needs and demands, this design can be a good foundation for the development of better monitoring and evaluation systems in the future.

Bibliography

[1] L. R. Maghfiroh, "Observation and heuristics evaluation of student web-based application of SIPADU-STIS," *J. Phys. Conf. Ser.*, vol. 1511, no. 1, p. 012019, Mar. 2020, https://doi.org/10.1088/1742-6596/1511/1/012019.

[2] H. Soewardi and M. H. Ramadhan, "Usability Analysis of an Academic Faculty Website: A Case Study of the Selected University," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 722, no. 1, p. 012020, Jan. 2020, https://doi.org/10.1088/1757-899X/722/1/012020.

[3] M. S. Sumbawati, Hariyati, U. T. Kartini, W. Sukartiningsih, A. N. Azhiimah, and K. Khotimah, "Monitoring and Evaluating Online Learning Using Online Media," in *Proceedings of the 2nd International Conference Innovation in Education (ICoIE 2020)*, Paris, France: Atlantis Press, 2020. https://doi.org/10.2991/assehr.k.201209.207.

[4] UPNVJ, "Visi dan Misi UPNVJ," Upnvj. [Online]. Available: https://www.upnvj.ac.id/id/tentang-upn/visi-dan-misi.html

[5] LP3M UPNVJ, "SPMI UPNVJ." [Online]. Available: https://lp3m.upnvj.ac.id/spmi/

[6] W. S. L. Nasution and P. Nusa, "UI/UX Design Web-Based Learning Application Using Design Thinking Method," *ARRUS J. Eng. Technol.*, vol. 1, no. 1, pp. 18–27, Aug. 2021, https://doi.org/10.35877/jetech532.

[7] M. S. Abubakari, Nurkhamid, and G. Hungilo, "Evaluating an e-Learning Platform at Graduate School Based on User Experience Evaluation Technique," *J. Phys. Conf. Ser.*, vol. 1737, no. 1, p. 012019, Jan. 2021, https://doi.org/10.1088/1742-6596/1737/1/012019.

[8] A. B. Maulachela, A. Abdurahim, J. Qudsi, and M. Tajuddin, "Performance Dashboard Sebagai Visualisasi Evaluasi Diri Perguruan Tinggi Menggunakan Pendekatan User-Centric," *JTIM J. Teknol. Inf. dan Multimed.*, vol. 3, no. 3, pp. 144–151, Aug. 2021, https://doi.org/10.35746/jtim.v3i3.162.

[9] L. K. Luu and L. Phan, "The process of evaluating students based on university program learning outcomes," *Vietnam J. Educ.*, vol. 4, no. 4, pp. 93–99, Dec. 2020, https://doi.org/10.52296/vje.2020.86.

[10] W. Siregar, I. Irvan, and E. Rahayu, "Sistem Informasi Pembayaran Iuran Keamanan Dan Kebersihan Pada Perumahan Berbasis Website Menggunakan Metode Design Thinking," *JiTEKH*, vol. 8, no. 2, pp. 50–58, 2020, https://doi.org/10.35447/jitekh.v8i2.204.

[11] M. Iqbal, G. I. Marthasari, and I. Nuryasin, "Penerapan Metode UCD (User Centered Design) pada Perancangan aplikasi Fitur Darurat," *J. Repos.*, vol. 2, no. 8, 2020, https://doi.org/10.22219/repositor.v2i8.218.

[12] Usability.gov, "User-Centered Design Basics," Usability.gov. Accessed: Jan. 22, 2024. [Online]. Available: https://www.usability.gov/what-and-why/user-centered-design.html

[13] J. Sejans and O. Nikiforova, "Problems and Perspectives of Code Generation from UML Class Diagram," *Sci. J. Riga Tech. Univ. Comput. Sci.*, vol. 44, no. 1, pp. 75–84, 2012, https://doi.org/10.2478/v10143-011-0024-3.

[14] R. Hafsari, E. Aribe, and N. Maulana, "Perancangan Sistem Informasi Manajemen Inventori Dan Penjualan Pada Perusahaan Pt.Inhutani V," *PROSISKO J. Pengemb. Ris. dan Obs. Sist. Komput.*, vol. 10, no. 2, pp. 109–116, 2023, https://doi.org/10.30656/prosisko.v10i2.7001.

[15] A. Nanthaamornphong and A. Leatongkam, "Extended ForUML for Automatic Generation of UML Sequence Diagrams from Object-Oriented Fortran," *Sci. Program.*, vol. 2019, pp. 1–22, 2019, https://doi.org/10.1155/2019/2542686.

[16] M. Balaban and A. Maraee, "Finite satisfiability of UML class diagrams with constrained class hierarchy," *ACM Trans. Softw. Eng. Methodol.*, vol. 22, no. 3, pp. 1–42, 2013, https://doi.org/10.1145/2491509.2491518.

[17] N. Sulaiman, S. S. S. Ahmad, and S. Ahmad, "Logical approach: Consistency rules between activity diagram and class diagram," *Int. J. Adv. Sci. Eng. Inf. Technol.*, vol. 9, no. 2, pp. 552–559, 2019, https://doi.org/10.18517/ijaseit.9.1.7581.

[18] S. Shcherban, P. Liang, Z. Li, and C. Yang, "Multiclass classification of four types of UML diagrams from images using deep learning," *Proc. Int. Conf. Softw. Eng. Knowl. Eng. SEKE*, vol. 2021-July, pp. 57–62, 2021, https://doi.org/10.18293/SEKE2021-185.

[19] H. H. Farghal, S. T. Mansour, S. Khattab, C. Zhao, and M. A. Farag, "A comprehensive insight on modern green analyses for quality control determination and processing monitoring in coffee and cocoa seeds," *Food Chem.*, vol. 394, 2022, https://doi.org/10.1016/j.foodchem.2022.133529.

[20] D. Arifudin, L. Heryanti, and D. Pramesti, "Pelatihan desain mockup dan logo sebagai branding produk untuk meningkatkan nilai jual bagi UMKM," *JMM (Jurnal Masy. ...*, 2021, [Online]. Available: http://journal.ummat.ac.id/index.php/jmm/article/view/5304

[21] E. Borelli *et al.*, "HABITAT: An IoT solution for independent elderly," *Sensors (Switzerland)*, vol. 19, no. 5, 2019, https://doi.org/10.3390/s19051258.

[22] S. Wang *et al.*, "Technology to support aging in place: older adults' perspectives," *Healthc.*, vol. 7, no. 2, 2019, https://doi.org/10.3390/healthcare7020060.

[23] R. Aditya, V. H. Pranatawijaya, and P. B. A. A. Putra, "Rancang Bangun Aplikasi Monitoring Kegiatan Menggunakan Metode Prototype," *J. Inf. Technol. Comput. Sci.*, vol. 1, no. 1, pp. 47–57, 2021, [Online]. Available: https://e-journal.upr.ac.id/index.php/jcoms/article/view/2955