International Journal of Informatics and Information Systems ISSN 2579-7069
Vol. 6, No. 3, September 2023, pp. 103-113

Implementation of Scrum Method for Keep Wallet Application Design

Fitrotul Khasanah [1,*] , Sarmini [2]

[1] Informatics, Faculty of Computer Science, Amikom Purwokerto University
[2] Information Systems, Faculty of Computer Science, Amikom Purwokerto University
[1] fitrohtulkhasanah@gmail.com*; [2] sarmini@amikompurwokerto.ac.id;
* corresponding author

(Received: June 18, 2023; Revised: July 12, 2023; Accepted: August 31, 2023; Available online: September 10, 2023)

Abstract

In a volatile economy, the Keep Wallet app was developed as a solution to help individuals and businesses manage financial difficulties. The purpose of this application is to provide users with the ability to plan, manage, and control their financial resources with the intention of maximizing value for shareholders or business owners. This research not only evaluates the use of the Scrum method in the development of the Keep Wallet application, but also analyzes whether the method can create high-quality software that meets user needs, as well as have the ability to adopt changes easily. The results show that the use of the Scrum method in the development of this application has a positive impact, improving the quality and productivity of software development, making it easier to prioritize tasks, and providing better customer satisfaction. This research provides evidence that the Scrum method is effective in overcoming financial difficulties through the development of software applications, and the results can serve as a basis for the development of other applications that face similar problems, as well as increase understanding of the benefits of using the Scrum method in software development.

Keywords: Scrum, Finance, Application, Software Development

1. Introduction

The development of the world of technology is very fast, one of which is the internet, in this era the internet is very important for everyone, because now almost everything can be accessed by the internet, one of the developments in the internet in the world of finance is the creation of the Keep wallet website. [1]-[3]. Keep Wallet is a website that helps in saving money with our main feature is freezing money whose tempo can be adjusted according to the needs and desires of users. In terms of finance, most people find it difficult to allocate their money with several needs and desires. [4]-[6].

In today's rapidly evolving digital era, technological developments have accompanied the growth of the financial industry, especially fintech (Finance Technology). Fintech refers to various business entities that provide advanced financial technology. The growth of fintech has increased since 2010, especially in the micro, small, and medium enterprise sector. However, simply having capital is not enough. There is a clear need to drive improvements in internal financial services [7]-[9].

In addition, the Scrum method is one of the methodologies included in agile software development. [4], [10], [11]. Scrum is considered capable of producing high-quality software in accordance with user desires and is able to adopt emerging changes. In the software development stage, changes in requirements become unpredictable.

Thus, the development of fintech and the use of Scrum method in software development are two interrelated aspects in the effort to create innovative financial solutions. The development of financial technology requires adaptive development methodologies such as Scrum to be able to respond to changes quickly and produce products that meet user expectations. The use of Scrum method in the context of fintech can be an effective strategy in facing the challenges posed by the dynamics of the evolving financial industry.

This statement is in line with previous studies, such as those who develop finance information systems in the financial sector stating that the use of the scrum method produces a quality website in a short time, also conducting

research using the scrum method in the fields of education, social and finance stating that scrum is the right method to use in the development of a website in a short time. [1], [8], [11].

Financial information according to Keller (Arifin, Kevin and Siswanto, 2017) Mention this financial knowledge you can through training, formal education such as schools, seminars, education and non-formal education such as from parents, friends and work experience personal experience. According to Halim & Astuti [12] financial information is the ability to understand, analyze, and manage financial management to make the right economic decisions and avoid financial problems. With the provision of good education, it can increase impressive financial knowledge regarding financial decisions more economically. [13], [14].

Many opinions say that the millennial generation or the generation currently aged 20-30 years is the most difficult generation in managing finances. This is because the millennial generation has a different lifestyle from previous generations. Most millennials tend to have a more extravagant lifestyle, find it difficult to save and do not really care about investment needs in the future. This will certainly result in financial risks that will be faced by the millennial generation in the future, due to unhealthy financial management. Having clear financial goals and plans will make it easier to determine what kind of financial plan you want to do. So that the financial portion can be right according to its portion. We can divide the financial portion with the 50:30:20 method from the income we have each month. 50 percent for daily living expenses in one month, 30 percent for savings, investments and other financial needs, and 20 percent for consumptive needs.

The SCRUM development model has been used in the product development process since 1990. Because SCRUM is a framework with stages of work accompanied by the spirit of sprinting. Working in sprints maintains a target duration in terms of hours of cooperation between sprints, averaging a month in each sprint. SCRUM Sprint consists of Sprint Planning, Daily Scrum, Sprint Review and Sprint Retrospective. Another advantage of SCRUM is that the development process is always reviewed and adjusted to the desired changes that may evolve with technological developments. In addition, the development process is based on modules or sections and is put together after the completion of each section. Each module or section is always tested and documented during the development stage. [15], [16].

In the success of making a website, it is not only about meeting costs, time, and quality, but overall it can mean that all components of stakeholders are satisfied with the results. [17]. The principles of the Scrum method are team building planning, Determine the Scrum Master and its members by assigning tasks to each member, recovery is useful for assessing progress applied in this part of the company including in information systems, upcoming sprints Used to determine the steps in the process System development according to the Scrum approach. Application development according to the Scrum approach several pieces of work into a package Application testing and documentation continues throughout the process Application development is carried out using this approach Apply a sprint system in which each work run is completed immediately and each sprint is a process Routing log of requested requests. [11].

In addition, the purpose of this study was to evaluate the use of the Scrum method in the development of a fintech application, with a focus on the Keep Wallet application. The purpose of this research is not only to understand the effectiveness of the Scrum method in a fintech context, but also to analyze whether this method is capable of creating high-quality software that meets the needs of users in the financial industry. In addition, this research also aims to gain a better understanding of the Scrum method's ability to deal with changes and adapt to emerging needs during the fintech application development process. As such, this research is expected to provide valuable insights into the use of the Scrum method in fintech application development as well as contribute to a broader understanding of the benefits of this method in a financial context.

2. Literature Review

2.1. Scrum Analysis

Scrum is based on the concepts of empiricism and lean thinking. The concept of empiricism in Scrum prioritizes decision making based on experience and existing reality. While lean thinking in Scrum aims to reduce waste and focus on the most important things. The Scrum approach itself uses an iterative and incremental approach in an effort to achieve optimization, predictability, and risk management. [8], [10], [14].

In Scrum, there are groups of people who work collectively and have diverse skills and expertise needed to get the job done. They share or acquire skills as the project requires. Scrum combines four formal events, namely review and customization, into a single event called Sprint. In a Sprint, a process of review and adjustment is performed to optimize the work.

All these things are successfully realized in Scrum because it applies the empirical pillars of transparency, inspection, and customization. Transparency refers to the openness and accessibility of information required by the team. Inspections are conducted regularly to evaluate projects and deliverables, while adjustments are used to adapt plans and actions based on the results of those inspections. By emphasizing these empirical concepts, Scrum provides an effective and flexible framework for project management.

2.2. Transparency Analysis

To ensure the smoothness and success of a project, it is important for all parties involved, both those doing the work and those receiving the results of the work, to be able to see and understand the ongoing process. [7], [18]. In the Scrum methodology, key decisions are based on three formal artifacts. The presence of these artifacts with a low level of transparency can result in less valuable decisions and increase the risk of errors. Therefore, a high level of transparency is essential in achieving project success, as transparency enables objective inspection and evaluation. On the other hand, if there is inspection without transparency, it will be misleading and not provide significant benefits.

In the context of Scrum, transparency plays a crucial role in ensuring project success. Transparency provides the ability for all parties involved to see and understand the process and work in progress. By having a high level of transparency, the team can easily check in and gain a clear understanding of the project status and the progress that has been made. This allows the team to make better informed decisions and minimize risks that may arise. Transparency also gives stakeholders trust and confidence that the project is being run transparently and fairly.

2.3. Inspection Analysis

It is important to conduct regular reviews of Scrum artifacts and progress towards agreed goals. Any deviations or unwanted issues should be carefully monitored. Scrum provides five events as a space for easy inspection [14], [19]. Without adjustments based on the inspection results, the inspection process will have no significant value. Therefore, the events in Scrum are designed to initiate the necessary changes in the project.

The use of events in Scrum helps facilitate inspection and customization. In Scrum, inspections allow teams to take a critical look at artifacts and the progress that has been made. This is important to detect deviations or problems that may arise during the development process. However, inspection itself will not provide benefits if it is not followed by the necessary adjustment actions. Therefore, Scrum provides room for adjustments and changes based on the results of the inspections performed.

2.4. Adaptation Analysis

If any part of the process goes awry or produces an unacceptable product, adjustments must be made immediately to reduce further discrepancies. Difficulties in adapting arise when the individuals involved do not have enough power and control. In Scrum teams, the ability to adapt quickly when learning new things through inspection is considered critical in achieving success. [4], [20].

3. Methodology

The Scrum methodology, developed by Jeff Sutherland in 1993, aims to be a responsive framework for project development and management. The basic principles of Scrum are applied in software development and product or application management to achieve optimal results. [5], [8].

The research method used in building the Keep Wallet website application is carried out using the Scrum Research method. In this research, Scrum principles are used to organize and guide the application development process iteratively and responsively to changes and needs that arise during the research.

Scrum is a software design method that adopts agile principles through team collaboration, process iteration, and incremental products to achieve the end result. According to Schwaber and Sutherland, Scrum is a framework

capable of solving complex problems that are constantly changing and delivering the desired product quality, as well as increasing user creativity and productivity. In the implementation of Scrum, there are three important roles played, as described by Pamungkas et al. [11], among others:

1) Product Owners are individuals who have the responsibility to continuously interact with the team. They share the vision and priorities with the developers so that maximum business value can be realized from the developed product.
2) The Scrum Master acts as a facilitator between the Product Owner and the Development Team consisting of developers and testers (quality assurance). The Scrum Master does not have the responsibility of leading the team, but they assist the team in overcoming obstacles and achieving goals. The Scrum Master is also ready to provide recommendations to the Product Owner to maximize return on investment (ROI) for the team.
3) The Development Team, also known as the Scrum Team, is responsible for the technical aspects of the project. This team usually consists of about five to nine members who work together on developing the product.

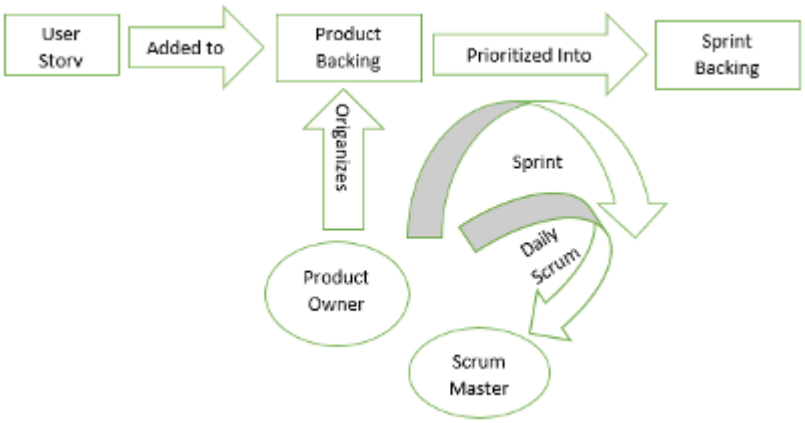

Figure 1. Research flow

An overview of the Scrum process from Figure 2 is as follows:

1) A user story is a detailed description of the system requirements used in a language that is easily understood by the end user. User stories are used as a reference for the creation of the Macet product.
2) Product backlog is an ordered list of all the required elements in a system or product. It contains the features of the product that will be implemented in the system over an estimated period of time. The Product Backlog is constantly changing as the product evolves and is managed entirely by the Product Owner.
3) A sprint is a period of time with a maximum duration of one month or less, during which all product development takes place. The goal of a sprint is to achieve a specific result (sprint goal) within a specified time.
4) The sprint backlog is a collection of items from the Product Backup that are selected and identified by the Scrum Team to work on during the sprint. The team selects and identifies tasks that need to be completed based on existing user stories.
5) Daily scrum is an activity performed daily by the Scrum Team during the sprint to monitor progress, tasks being worked on, and identify possible bottlenecks. Scrum teams use daily Scrum to improve product development and achieve sprint goals.

4. Results and Discussion

4.1. User Story

User Users are used to describe individuals or groups who will use the system or product developed. In this context, the target users are the general public with an age range of 20 years and above who have difficulties in financial management. They are people who need solutions or assistance in managing their personal finances. The process of determining the target user is done by considering the characteristics and needs of potential users. In this case, the target user is determined based on demographic segmentation and the corresponding target market. The age range of

20 years and above was chosen because they are a financially active group and tend to have greater financial responsibility.

Figure 2. Target user

In addition, the target users also include individuals and the general public in general, which indicates that the solution or product developed is not limited to a specific group, but can be used by anyone who needs it. This makes it possible to reach a wider market and provide benefits to the general public as a whole. The determination of target users is based on market analysis, user research, and an understanding of the problems or challenges faced by potential user groups. By understanding the target users well, more relevant and effective solutions can be designed and developed to meet their needs.

4.2. Product Backlog

Product backlog is the first step in the system development method where various elements such as business processes, actors, agreements, and system structures (user personas) are generated. The results of this backlog stage are Figures 3 and 4, as well as Table 1, which illustrates the user stories and acceptance criteria that need to be addressed.

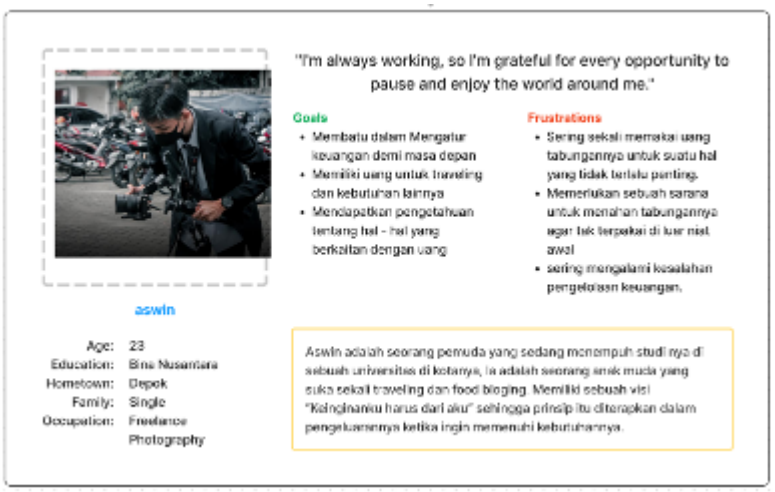

Figure 3. User persona (A)

Figure 4. User persona (B)

Table 1. User Story

No.	User Story	Acceptance Criteria
1	As a user, I want to be able to top up my money so that I can replenish my balance in the Keep Wallet app.	- Users can choose the amount of money they want to top up. - The top up transaction is successful and the user's balance increases according to the amount topped up.
2	As a user, I want to be able to withdraw money from the balance in the Keep Wallet app.	- Users can select the amount of money they wish to withdraw. - The user's balance is reduced according to the amount withdrawn. - The money withdrawn in cash can be received by the user.
3	As a user, I want to be able to transfer money to other users through the Keep Wallet app.	- The user can enter the account number of the transfer destination. - The user can select the amount of money to be transferred. - The sending user's balance is reduced according to the transferred amount. - The receiving user receives the transferred money.
4	As a user, I would like the Lifegoals feature for savings and reminders to help me achieve my financial goals.	- Users can set savings targets with specific amounts and deadlines. - The application provides reminders to users to save regularly and achieve savings targets.
5	As a user, I would like to have the option to freeze some of the money in the Keep Wallet app so that it cannot be used for a certain period of time.	- Users can choose the amount of money they want to freeze. - The frozen money cannot be used by the user within a predetermined period. - The frozen money will become available again after a certain period of time has passed.
6	As a user, I would like to have access to customer service so that I can ask questions or resolve issues related to the Keep Wallet app.	- Users can contact the customer service team through the chat feature or through the contact information provided. - The customer service team provides fast and effective responses and assistance to user questions or problems.
7	As a user, I would like to have a login feature on the Keep Wallet website so that I can access my personal account safely and easily.	- Users can enter login information (username/email and password) to access the personal account. - Correct login information allows users to log into the personal account.
8	As a user, I would like to see a monthly report history that includes details of	- Users can view a monthly report that includes a list of outgoing and incoming money transactions made within

	money transactions in and out of the Keep Wallet app.	a specific month period. - The report displays detailed information such as date, amount, and transaction description.
9	As a user, I would like to get investment news as an alternative feature that can add to my financial insight.	- Users can access investment news related to finance and investment topics. - News is updated regularly to provide current and relevant information.

Figures 3 and 4, as well as Table 1, are the results of the backlog phase in system development. This phase includes the creation of various important elements such as business processes, actors, agreements, and system structures related to user needs. The user stories generated in the table summarize the user needs and goals to be achieved through the developed system. The acceptance criteria listed describe the standards that must be met for the user story to be accepted as a completed feature.

In system development, the first step is to create a product backlog. This stage produces a complete picture of important elements such as business processes, actors, agreements, and system structures (user personas). Figures 3 and 4, as well as Table 1, are the results of this backlog stage. They represent the user stories that need to be addressed and the acceptance criteria that must be met to ensure successful system development. By understanding and addressing the user stories, the development team can direct their efforts towards achieving the goals desired by the users of the system.

4.3. Sprint

The third phase of planning is the sprint, which consists of two sessions: sprint planning and sprint product. In the sprint planning phase, the Scrum team meets to evaluate the product backlog. Each feature that has been created by team members is discussed in detail, and the time required to work on each feature is determined according to the target that has been set.

The following is Table 1 which lists the features that will be developed for the Keep Wallet website application:

Table 2. Sprint

No.	Features of Keep Wallet Website App
1	Top up money, cash withdrawals and transfers
2	Savings life goals and reminders (encouragement in terms of saving)
3	Money Freeze
4	Customer Service
5	Website Login
6	History of monthly reports (money in and out)
7	Investment news (alternative)

4.4. Daily Scrum

This stage of development involves daily changing activities to develop features. The development team works continuously to improve and optimize the features to match the user's needs and expectations.

In this stage, the development team implements the previously planned features. Every day, they make the necessary changes and adjustments to ensure the development of the features is as desired. This process involves coding, testing, and incorporating the features under development.

During the development stage, the development team also engages in intensive collaboration and communication. They share information, provide feedback, and make changes based on the needs and input from the team and users.

With an iterative development cycle, features can be continuously improved and customized to match user expectations and needs.

Overall, this stage of development involves continuous efforts to improve existing features and produce a product that meets user expectations. In each iteration, changes and adjustments are continuously made to ensure that feature development is on track and focused on providing added value to users.

4.5. Sprint Review

The design of the Keep Wallet app, which was part of the Macro Challenge project, involved creating the front-end of the website using HTML, CSS, and the Bootstrap framework.

Figure 6 shows the landing page of the Keep Wallet website. On this page, users can learn about what Keep Wallet is and the features it provides. Figure 7 shows the login page for users when they want to log in to their account. On this page, users can view and access the features available on our website, such as the Home menu, My Piggy Bank, and Financial Records. Figure 8 shows the Home page of Keep Wallet. On this page, users can see the remaining balance of their savings that are not included in the “CelenganKu” feature. If users select the Scan QR menu, they will be directed to the QR code display where they can top up their balance through the code. In addition, on the Freeze Money menu, users will be given information about their savings goals, as well as the terms and conditions they need to agree to before saving.

Figure 9 displays the My Piggy Bank feature, which is a collection of savings that have been inputted by the user. For example, in the Married Pop-up example, if the user clicks on "See More", they will be directed to the Married page where they can see a description of the savings goal, set fees, and freeze end date. Next, there is the Add Money menu where users can add money into My Piggy Bank. The Take Money menu allows users to withdraw money from their savings as needed, and a confirmation will be shown that the user is sure or not to take the money. On the Apply for Deletion menu, users can apply for sudden deletion of funds, but approval from the admin is required before deletion can be done. Users can only apply for deletion and cannot delete or withdraw funds that have been deposited in savings like in Married savings. Afterwards, users will see a confirmation whether they are sure they want to delete or not. Figure 10 displays the Financial Records feature where users can view records of their money spent and earned. Figure 11 displays the Account feature which is part of the user's personal profile. Here, users can set up and use features according to their wants and needs.

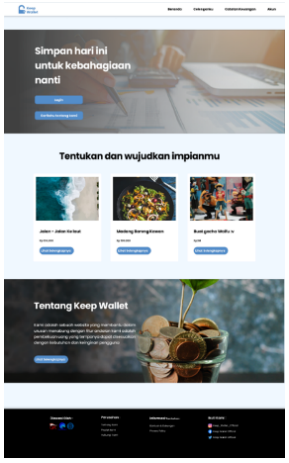

Figure 5. Landing page concept

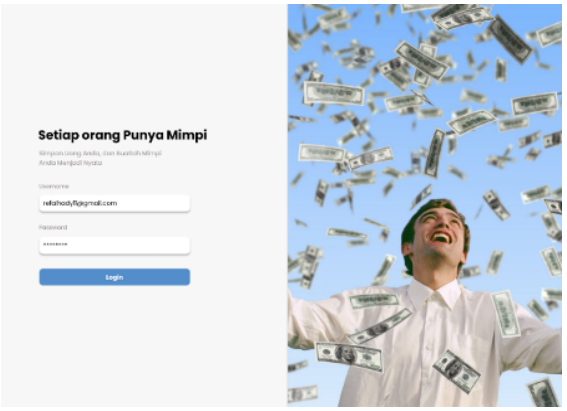

Figure 6. User login concept

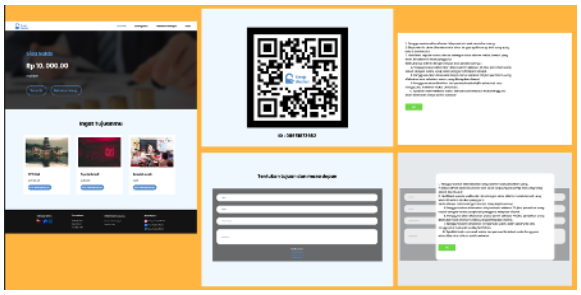

Figure 7. Keep wallet homepage concept

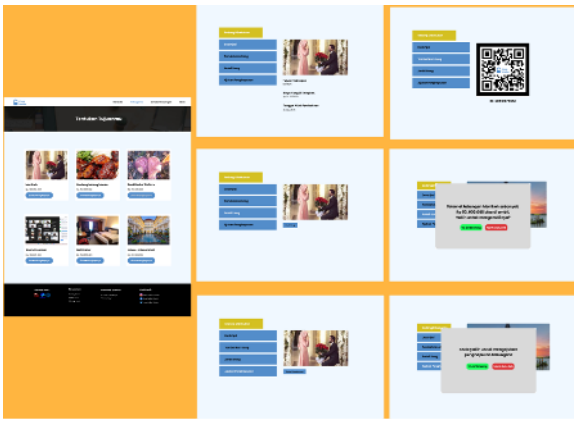

Figure 8. The concept of my piggy bank

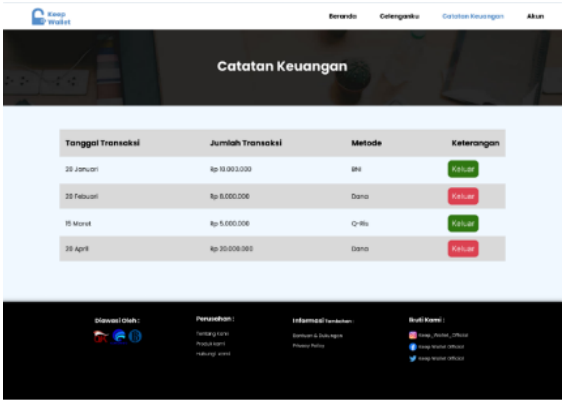

Figure 9. Concept of financial records

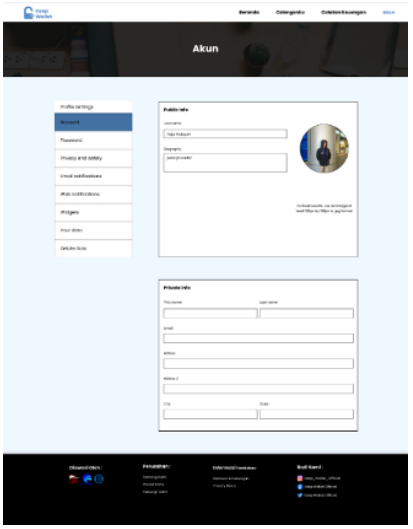

Figure 10. Account concept

4.6. Discussion

In this research, the Scrum method was tested and the front-end design of the Keep Wallet website was designed with the aim of meeting the set criteria. The results showed some relevant findings and results.

First, testing the Scrum method in the Keep Wallet website development gave positive results. The Scrum method helps in organizing and managing the development process more effectively. The use of backlogs and sprint planning allows the team to have clear visibility of the features that need to be developed and the time targets set. In addition, the collaboration and communication that takes place within Scrum teams helps in improving efficiency and user satisfaction.

Second, the front-end design of the Keep Wallet website succeeded in creating a display that was in accordance with the criteria set. The landing page, login page, homepage, My Piggy Bank, financial records, and other features were successfully designed with user needs in mind. The responsive and user-friendly design allows users to easily access and use the features provided.

Furthermore, this study also provides important recommendations. In software development, the use of Scrum method can be adopted to improve efficiency and flexibility in project management. Scrum teams can utilize backlogs and sprint planning to set priorities and gain clear visibility of development progress. In addition, a good front-end design with attention to user needs can provide a better experience and meet the set criteria.

Overall, this study found that the use of Scrum method in software development and front-end design that pays attention to user needs can produce positive results. The recommendations generated from this research can serve as guidelines for software developers in improving development efficiency and quality.

5. Conclusion

This research aims to examine the Scrum method in software development and design the front-end display of the Keep Wallet website. The results of this study provide an in-depth understanding of the application of the Scrum method in software development, as well as designing the appearance of the website in accordance with the established criteria. In this study, the Scrum method proved effective in organizing and managing software development. The application of this method allows the development team to work in a structured and adaptive manner, focusing on achieving predetermined sprint goals. Through daily meetings, sprint planning, and sprint retrospectives, the Scrum team was able to collaborate effectively, identify emerging challenges, and make necessary adjustments in the development of the Keep Wallet website.

In addition, in designing the front-end of the Keep Wallet website, a display that meets the established criteria has been produced. The landing page gives a clear picture of the Keep Wallet concept and the features provided. The login page and menus such as Home, My Piggy Bank, Financial Records, and other features have been designed by considering user needs and an intuitive display. Through this design, the goal of presenting an attractive, easy-to-use interface, and meeting the set criteria was successfully achieved. Overall, this research has proven the effectiveness of the Scrum method in software development and produced a front-end display design that meets the established criteria. This research contributes to the understanding of the application of the Scrum method in the context of software development and provides guidance in designing responsive front-end interfaces that meet user needs. The results of this research can serve as a reference for software developers in adopting the Scrum method and designing optimal interfaces to meet user needs.

References

[1] A. Muhyidin, "Development of Public Relations Communication Media Based on Chatbot 'Unysa' as an Information Service about Yogyakarta State University," *J. Elektron. Educ. Tech. Inform.*, no. September, pp. 1-14, 2019.

[2] H. R. Suharno, N. Gunantara, and M. Sudarma, "Analysis of the application of the scrum method to project management information systems in digital industries & organizations," *Maj. Ilm. Technol. Electro*, vol. 19, no. 2, p. 203, 2020.

[3] S. Hadji, "Implementation of Scrum Method in Website-Based Delivery Order Application Development (Case Study at Lombok Idjo Restaurant Semarang)." Sultan Agung Islamic University, 2019.

[4] S. Sauda, N. Oktaviani, and M. Bunyamin, "Implementation of scrum method in the development of certification try out test engine," *JISKA (Journal of Inform. Sunan Kalijaga)*, vol. 3, no. 3, pp. 202-210, 2019.

[5] B. Septian, I. K. Jayadi, M. Holil, and I. Handriana, "Human Capital Management System Using Scrum Method," *JUST IT J. System. Information, Technol. Inf. and Comput.*, vol. 11, no. 1, pp. 1-16, 2020.

[6] E. Riana, "The Concept of Applying the Scrum Method and RDC System in the Development of a Mobile Web Order Taking System," *J. Media Inform. Budidarma*, vol. 5, no. 1, pp. 297-307, 2021.

[7] S. Hardani, "Development of a sharia kpr information system using the scrum method," *JITK (Journal of Computer Science and Technology)*, vol. 4, no. 2, pp. 223-230, 2019.

[8] S. Pratama, S. Ibrahim, and M. A. Reybaharsyah, "Journal of the Use of Scrum Method in Establishing Web-Based Warehouse Storage Information System," *INTECH (Informatics and Technol.*, vol. 3, no. 1, pp. 27-35, 2022.

[9] G. F. Nama, A. D. Pamungkas, and H. D. Septama, "Designing an Educational Game Application Kolection Aksara Lampung (Koper Apung) Based On Android Using Scrum-Full Cover Method," *J. Technol. Inf. and Comput. Science*, vol. 6, no. 4, pp. 421-430, 2019.

[10] A. Ardiansyah, F. Y. Yahya, A. R. Irawati, and M. Yusman, "Development of Integrated Information System for Faculty of Mathematics and Natural Sciences, University of Lampung (Simipa) Using Scrum Method, " *J. Teknoinfo*, vol. 15, no. 2, pp. 112-120, 2021.

[11] R. W. P. Pamungkas and R. Khalida, "Agile Project Management with Scrum Method Approach as a Company Sustainable Service Improvement," *Pros. SISFOTEK*, vol. 3, no. 1, pp. 187-194, 2019.

[12] T. S. Nugraha, K. Kusnadi, and R. Hardian, "Design of Company Profile Information System by Using Scrum Method at PT Hasna Satya Negara Web-Based," *J. Ilm. Intech Inf. Technol. J. UMUS*, vol. 3, no. 02, pp. 171-179, 2021.

[13] P. D. Mardika and A. Fauzi, "Implementation of Scrum Method in the Design of Web-Based School Administration Information System," *J. Publ. Tech. Inform.*, vol. 1, no. 1, pp. 53-60, 2022.

[14] R. Hisham and H. W. Aripradon, "Design and Development of a Web Marketplace for Household Needs Using the Wdlc Model with the Scrum Method," *J. Ilm. Betrik*, vol. 13, no. 1, pp. 75-86, 2022.

[15] D. W. A. Nugroho, "Designing a Web-based Sports Center Information System with the Scrum Method," *JATISI (Journal of Tech. Inform. and Information Systems)*, vol. 8, no. 4, pp. 1733-1749, 2021.

[16] N. Rafianto, "Application of Scrum Method to the Creation of User Experience Landing Page of Lentera Information System," *J. Sist. Inf. and Science Technol.*, vol. 3, no. 2, p. 492081, 2021.

[17] I. Fakhruddin, R. S. N. Rismawati, and D. R. Sriyanti, "Design of Java-based Thousand Island Tour Package Sales Application System with Scrum Method (Case Study at PT. Abarter Global Indonesia)," *J. Nas. Computing and Technol. Inf.*, vol. 5, no. 1, pp. 104-111, 2022.

[18] N. Azharandi, S. Andryana, and A. Gunaryati, "E-Commerce Kedai HP Based on Model View Controller (MVC) with Scrum Method," *J. JTIK (Journal of Technol. Inf. and Communication)*, vol. 6, no. 1, pp. 49-55, 2022.

[19] A. Andipradana and K. D. Hartomo, "Designing a Web-based Online Sales Application Using the Scrum Method," *J. Algorithm.*, vol. 18, no. 1, pp. 161-172, 2021.

[20] D. Darmansyah, N. Apriani, and D. Apdian, "Development of Information Systems Using the Scrum Method: A Systematic Review," *J. Tech. Comput.*, vol. 6, no. 2, pp. 163-168, 2020.