Jurnal Sisfotek Global
ISSN (Online): 2721 - 3161, ISSN (Print): 2088 – 1762
DOI: http://dx.doi.org/10.38101/sisfotek.v13i1.3503
Vol. 13, No. 1, March 2023, pp. 35-40

Applying the SCRUM Framework in Managing the Development of Candidate Profiling Project (A Case Study of Bagidata)

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ARTICLE HISTORY

Received : February 28th, 2023
Revised : March 21st, 2023
Accepted : March 27th, 2023

KEYWORDS

Information System
SCRUM
Agile
Object Oriented Analysis and Design

ABSTRACT

Bagidata is a people analytics platform that provides various data analysis solutions for Human Resource Management. Bagidata develops and maintains an application for creating candidate profiles using SCRUM and Agile. However, there are still many obstacles in the SCRUM and Agile processes in developing this application, such as all documentation being done manually with Microsoft Excel and separated, the inability to monitor the process, the and lack of an integrated platform for team members to share work and make documentation. Therefore, a system is needed to facilitate application development and become an integrated platform for application work, monitoring, and web-based documentation. This study uses object-oriented methodology or OOAD (Object Oriented Analysis and Design), and the data collection method is through observation, interviews, and literature review. This web-based application uses Javascript programming language, PostgreSQL database, and Visual Studio Code as tools, as well as UML modeling with 4 design diagrams, namely a use case diagram, activity diagram, sequence diagram, and class diagram. The results of this study are expected to enable the product owner and development team to monitor the development process, organize task allocation among team developers, and provide an integrated platform for documentation, thus improving the candidate profiling application development process.

1. Introduction

In the present time, rapid software development and competition are needed to become a leader in innovating software, which requires new ways to meet these needs, such as using the Scrum method for application design. Scrum is a software development method created in 1990, which consists of a framework of activities including requirements, analysis, design, evolution, and delivery [1]. In each activity, work tasks occur in a process pattern called a sprint, emphasizing team collaboration within and through fast iteration processes, with the aim of developing applications that can enter the market faster and quickly obtain feedback that can be used for further development [2].

Bagidata is a people analytics platform that provides various data analysis solutions for Human Resource Management. In this process, Bagidata obtains a complete picture of candidate and employee behavior and potential from social media. The analysis managed with Big Data is useful for complementing internal data, making data-based decisions, and maturing HR Management strategies for company digital innovation and transformation. Bagidata is located at Telkom Landmark Tower Lt. 38 Jl. Jenderal Gatot Subroto No.Kav 52, RT.6 or RW.1, Kuningan Barat, Mampang Prapatan Kota Jakarta Selatan, 12710, and operates in the field of Human Resources. In practice, software development at Bagidata uses the Scrum system, which is expected to provide faster application updates and feedback, so that the software development cycle can run quickly and effectively, starting from the product owner who receives requests or feedback from clients and then passed on to the design and development team.

The current process when the Product Owner has created a plan of tasks or responsibilities that need to be done by the development team in a backlog is to input it using Microsoft Excel tools, where the backlog contains user stories that developers will work on. The problem with the current data in Microsoft Excel is that all backlogs only use a user point of view and do not contain division and tasks for developers, making it difficult to distribute work properly. Additionally, there are often multiple interpretations of the tasks given.

2. Method

2.1 Collecting Data Method

a. Observation

The author conducted the observation method, which is direct observation of daily activities involving the process of candidate profiling software development at Bagidata.

b. Interview

The author also conducted the interview method, a question-and-answer session with the Product Owner and CTO of Bagidata to ensure any obstacles experienced.

c. Literature Review

The author not only obtained information from the observation and interview methods, but also using the literature review method. This method involves obtaining information and collecting data from various sources (literature) related to the problem.

2.2 Analysis Method and Design

a. Analysis Method

The system analysis conducted in this research involves several stages, namely identifying information needs and identifying system requirements implemented in this research. After that, the analysis results are documented and placed in a report that will be used in the system.

b. Design Method

The design method of this research is an object-oriented research design method that is oriented through several stages, namely creating UML diagrams, databases, and programming that is tailored to elicitation documents that stakeholders have approved. React JS, an open-source framework based on declarative, efficient, and flexible JavaScript, is used to build the user interface. React allows for creating complex user interfaces with small separate code components [3], using PostgreSQL as a database which is a collection of connected data stored together on a media [4].

c. System Development Method

The Scrum method is used, which is a software development method created in 1990. In the Scrum method, there is a framework consisting of requirements, analysis, design, evolution, and delivery [1]. The Scrum team consists of a Product Owner and a Development Team (Design Team, QA Team, Software Engineer). In completing their work, the Scrum team organizes themselves in the best and most efficient way possible and the team must have the competencies needed to complete the work without the need for outside parties beyond the team members [5]. Scrum has events or activities that must be attended in order to support the software development process, all of which are combined within a certain time frame called a sprint [6]. In Scrum, the reporting process is done daily where the development team reports on the progress, obstacles encountered during the sprint, and whether they can be resolved or not. This activity is called the Daily Sprint [7]. At the end of a sprint, a meeting is held between the Product Owner and the development team to discuss the product that has been created during the sprint and whether it is acceptable or needs to be improved. This activity is called the Sprint Review [8]. After the Sprint Review, the Sprint Retrospective is conducted, which is where the development team discusses the obstacles encountered during the sprint [9]. Scrum is part of Agile, which is an iterative software development process. One advantage of Agile is that it is divided into small iterative processes, making it more flexible and allowing for adjustments, cutting, or changes to be made without having to wait for the project to be completed first [10].

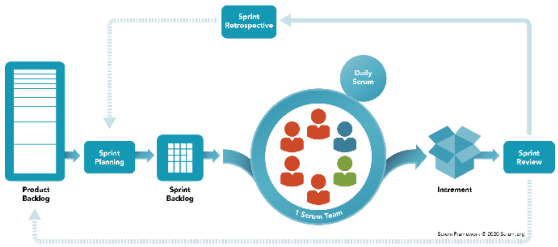

Figure 1. SCRUM Method

d. Testing Method

The testing method used is Blackbox Testing. Black box testing is specification testing, which tests whether a function is working according to the specification. Black box testing focuses on the functional requirements of the software [11].

3. Results and Discussion

3.1 New Proposed System

Based on the description of the existing problems, the author proposes a development using a system through web-based programming using Visual Studio Code software as a text editor, using the Javascript programming language as the scripting language used to program web page behavior. This is a language for the web, servers, personal computers, laptops, tablets, phones, and others [12] with the React JS framework as an open-source framework with a declarative, efficient, and non-strict basis for building user interfaces. React allows for the creation of complex user interfaces with small, separate pieces of code called components [3]. The Express JS library is a web application server framework created for Node js,

specifically designed for building single-page, multi-page, and hybrid web applications [12]. The PostgreSQL database will be accessible by the development team (including the design team) and the product owner in creating new features during the sprint. The author proposes this system to help bridge better communication between the development team and the product owner and can be used as a better documentation place so that documentation does not need to be scattered on the tasks to be completed.

3.2 Diagram Design

The following are diagrams in the system design that will be built. There are 4 UML model diagrams applied, including:

a. Use Case Diagram is a diagram that describes the benefits of a system from the perspective of someone outside the system or an actor.[13] Here is the Use Case for the system design that will be created in Bagidata:

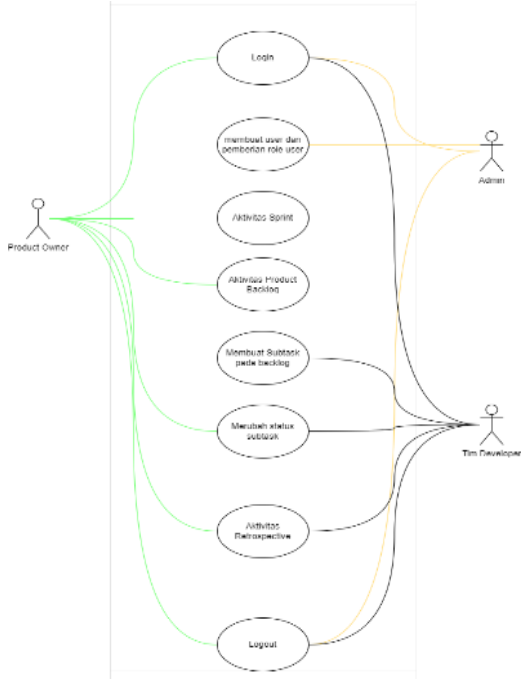

Figure 2. Proposed Use Case Diagram

It is explained in the above use case that there are three actors involved in this system, namely Admin, Product Owner, and Tim Developer.

Table 1. Actor Descriptions

No	Actor	Description
1	*Product Owner*	The actor who has the authority to create product backlog and initiate sprints that will later be worked on by the dev team, and the product owner is the one who can complete the sprint and conduct a retrospective (conclusion on the sprint that has been completed).
2	*Developer & Design*	Aktor yang mengerjakan *backlog* dengan membuat *task* pada *backlog* yang akan dikerjakan lalu dapat diubah statusnya sesuai dengan programnya masing-masing, tim *developer* juga dapat mengisi *retro*
3	*Admin*	The actor who is responsible for creating an account and assigning a role to that account, either as a Product Owner or as a Tim Developer.

b. Activity Diagram is a diagram that shows the activities of a system in the form of a collection of actions, from the beginning to the end of each action. Activity diagrams can also illustrate multiple actions that occur simultaneously [14]. Here is one of the proposed activity diagrams for building an information system at Bagidata:

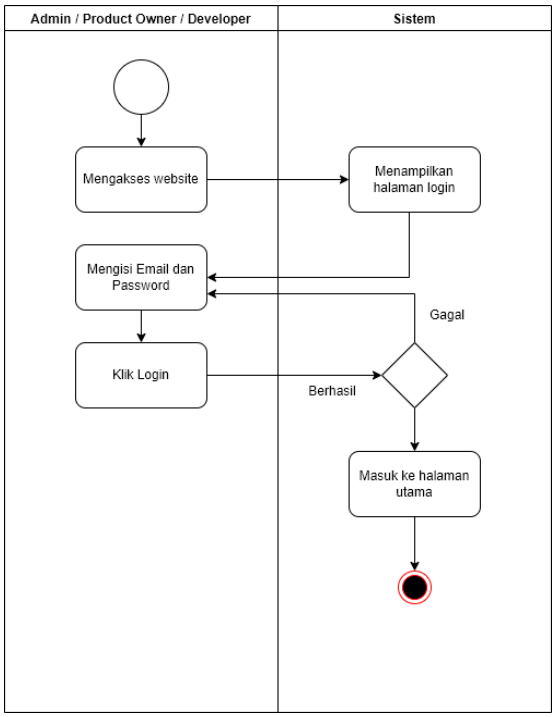

Figure 3. Activity Diagram of Log In System

The above Activity Diagram depicts the admin accessing the system website, displaying the homepage, then selecting the login button, which displays the login page. The admin inputs the email and password, then clicks the login button. The system validates the login, either successfully or unsuccessfully. If the system validation is

successful, the system will immediately display the application's homepage. If it fails, the system will display an error message popup.

c. Sequence diagram is a depiction of the interaction between objects inside, outside, and around the system, including users, interfaces, and other parts of the system, in the form of messages shown over time[4]. Here is one sequence diagram for the information system that will be used in Bagidata:

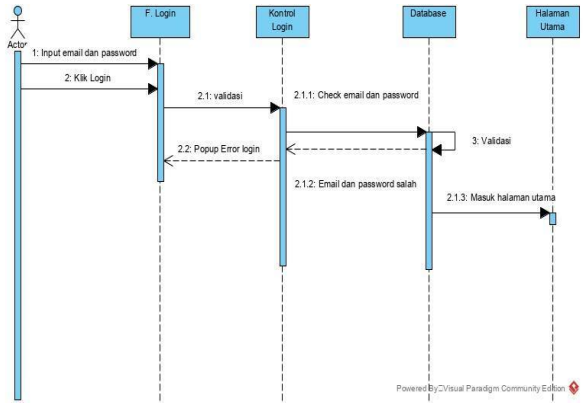

Figure 4. Sequence Diagram of Log In System

To illustrate the sequence of messages sent from the admin to the database to perform login into the application.

d. Class diagram is a diagram that illustrates the system structure by defining the classes that will be created to build it.

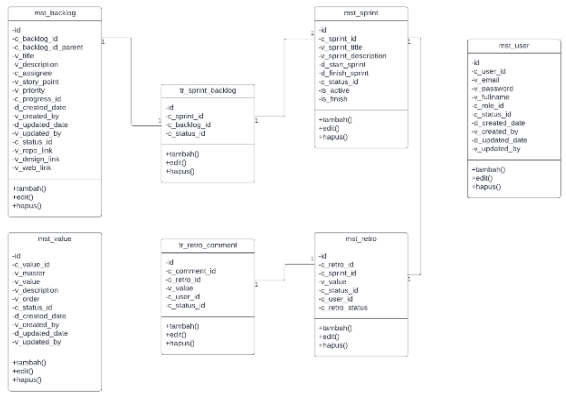

Figure 5. The Proposed Class Diagram

The Class Diagram is grouped into mst_backlog, mst_sprint, mst_user, mst_retro, mst_value, tr_sprint_backlog, tr_retro_comment.

e. After conducting research through data collection and prototyping, the results are as follows:

1. Prototype of Log In

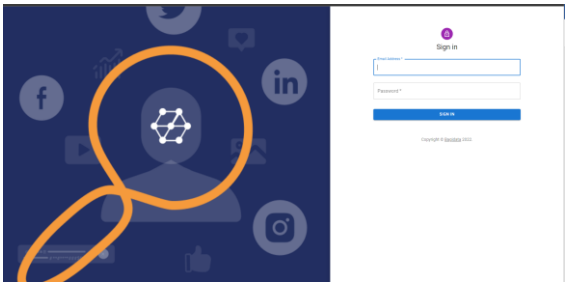

Figure 6. Prototype of Log In

In the user login page, users are required to enter their email and password to proceed to the main page.

2. Prototype of Main Page

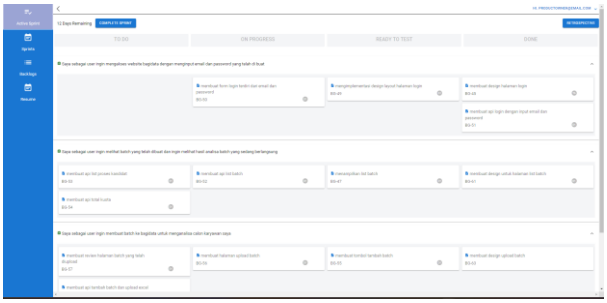

Figure 7. Prototype of Main Page

In the main page, users can view and modify tasks in the backlog for the ongoing sprint.

3. Prototype of Backlogs Page

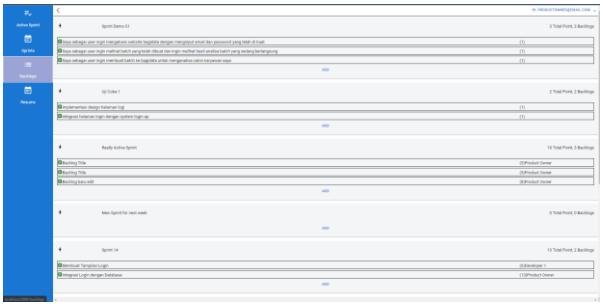

Figure 8. Prototype of Backlogs Page

The page where the backlog creation for each sprint is carried out and from this page, there is a preview of the total points and the number of backlogs created.

4. Prototype of Sprint Tab Plan Sprint Page

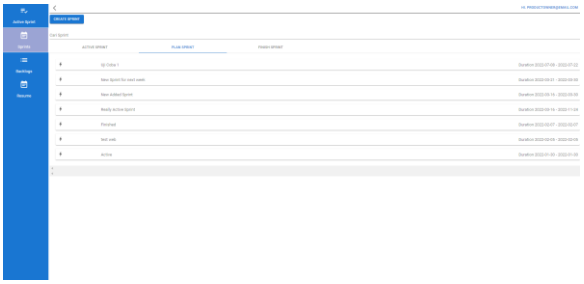

Figure 9. Prototype of Backlogs Page

The page where sprint is created, there are three statuses in the sprint. After the sprint is created, the sprint will be in the plan sprint status.

5. Prototype Retrospective

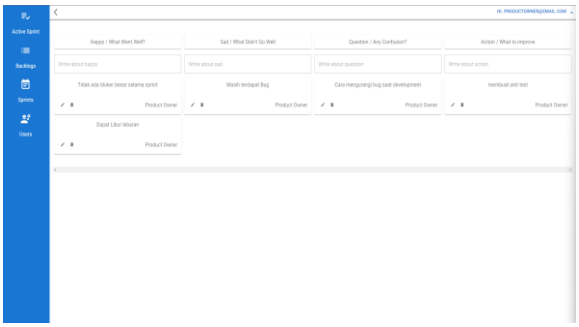

Figure 10. Prototype of Retrospective

The page where the retrospective process is carried out for each sprint, here users can write down things that happened during the sprint, both happy and sad, and if there are any questions or suggestions for the next sprint.

4. Conclusion and Suggestion

4.1 Conclusion

The conclusions from this study are as follows:

a. The current task management system for developers at Bagidata uses Microsoft Excel to allocate developer tasks and as a place for sprint documentation.
b. The challenges faced include data in Microsoft Excel, such as the inability to allocate developer tasks in detail and the inability to break down tasks into smaller ones for easier allocation.
c. The Scrum method implemented at Bagidata for software development involves conducting research and input from the Product Owner, analyzing whether it meets the requirements and whether it can be developed by the current team. The Product Owner assigns the design team to create a mockup with the data provided, and during the planning phase, the Product Owner assigns tasks to the developers, who provide estimates for completion time and level of difficulty. Daily meetings are conducted to check progress during the sprint. During the review, developers showcase completed tasks to the Product Owner, and if approved, the application can be deployed to production.

4.2 Suggestion

For further research development, the author suggests the following:

a. There is a need for system development that can be improved by enhancing user experience in using the application and providing better aspects that can satisfy users.
b. It is necessary to register a domain name and use hosting rental services so that the application can run online.
c. Data backup is needed to ensure data is not lost due to viruses or cybercrime.

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