Invitin Project: Scrum Framework Implementation in a Software Development Project Management

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Abstract—**The printed invitation is commonly used in our community to invite others to special events. In Indonesian society, this has happened inviting someone from door-to-door by sending printed invitations. Due to rapid information technology development, we proposed a website-based online invitation platform, Invitin. In general, the Invitin project has three main actors, which are customer, customer service, and admin. The methodology that we used was based on the SDLC (Software Development Life Cycle) and applied Scrum framework. Implementing the Invitin project using Scrum helps to organize development tasks easier and provides other benefits in some cases. Thus, Scrum increases our team productivity to develop a high-quality dynamic website application.**

Keywords—agile methodology; scrum; website application

I. Introduction

Information and Communication Technology has grown rapidly in the community including in Indonesia and has a good impact in various fields, one of which has an impact on the field of event organization and software development itself. Information and communication technology has become a part of public life today, all communication in society is done using technology so that many changes how they communicate.

As with communication, inviting other people to an event is now quite easy to do using technological media such as invitation cards in the form of images, videos, digital texts that can be called digital invitations. This printed invitation card is commonly used by the people of Indonesia and even the entire world community such as Brunei Darussalam, Iran, Egypt, and Persia to inform others or invite others to attend an event that will be held by the invitee [1].

There are various methodologies in software development projects. One of them is the agile methodology. The concept of Agile software development was created by Kent Beck and 16 colleagues by stating that Agile Software Development is a way of building software by doing it and helping others build it at the same time [2]. Scrum is a development process focused on team collaboration and productivity that adapts to agile methodology. Because Scrum is agile, the Scrum framework is adaptive and incremental to changes. Takeuchi and Nonaka were Japanese people who wrote an article in Harvard Business Review, they described Scrum as a rugby game, where teamwork requires increasing work pace, flexibility, communication, and team member commitment [3]. Ken Schwaber and Jeff Sutherland are co-founders of Scrum. They defined Scrum as a framework that enables teams to solve complex problems productively so that software can produce high-quality products for users. [4].

Therefore, in this paper, we propose the development of website applications as a platform to create digital website invitations by applying the Scrum method (Figure 1). For Indonesian people who want to make invitations online and disseminate invitation card information easily through website

URLs that have been created through our application. Scrum is a repetitive software engineering process for developing and delivering software [5], where the Scrum framework is a lightweight process thus focusing on increasing team productivity by reducing waste and excessive team activity [6].
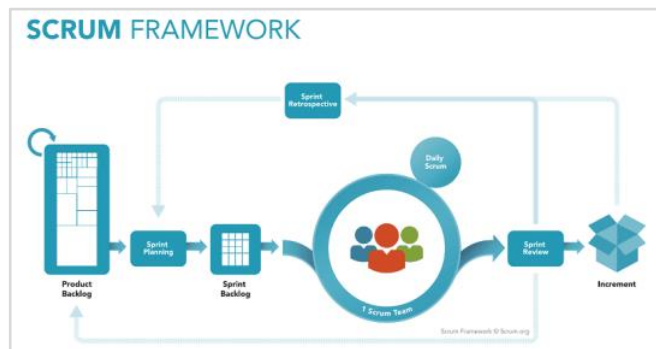

Figure 1. Scrum Flow [7]

II. Research Methodology

A. Method

In this study some steps need to be prepared by developers, the first is to maximize understanding of the agile methodology and Scrum framework and its implementation in software development projects. adjustability [8]. The basis of agile in project management is a methodology in which work is completed and executed in short cycles (sometimes called sprints) and adjusted over time [9].

The scrum framework recognizes three roles, including product owner, team member, and Scrum master whose respective roles have their duties. Hence, the Scrum team must have members whose everyone has a Scrum role and the three roles of the Scrum cannot be eliminated, one of them or cannot be combined with the other role. Each Scrum team usually consists of a Scrum master, product owner, and development team. In the illustration of Figure 2, each of these roles must fulfill responsibilities, interact closely between members, collaborate, and work together, to be able to complete the Scrum project successfully each iteration [5]. In the digital invitation website project, we divide the team roles into 3 Scrum roles, namely 1 Scrum master, 1 product owner, and 2

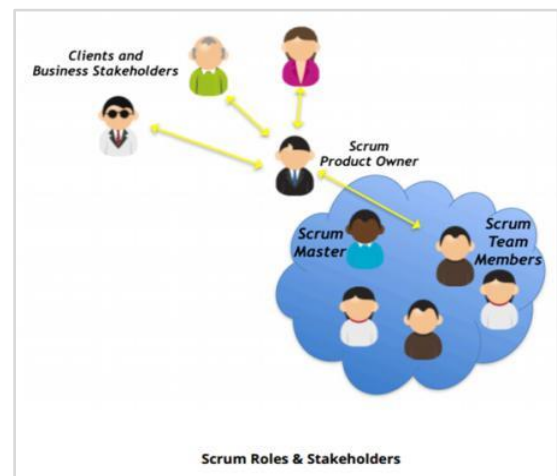people as members of the development team, because in this project we implement Scrum with a small team.

Figure 2. Scrum Roles and Stakeholders [5]

B. Scrum Roles

In this study, we implemented the Scrum methodology in a project with a case study of software development for a digital invitation making website consists of four members, by implementing Scrum the four members were divided into Scrum roles, with the following tasks:

1. Product Owner, consisting of one person in charge of analyzing user needs, analyzing the business of the project and performing product management.

2. The Scrum Master, consisting of one person in charge of serving Scrum project members and external stakeholders (product owners) to understand and properly implement the Scrum framework and Scrum values.

3. Programmers 1 (Developer Team), consisting of 1 person with the task of completing iterations in each sprint with a concentration on the front-end web development section that develops websites on the client/user side, plays a role in using HTML, CSS, JavaScript so that users can interact with easy and see directly the Invitin website application [6].

4. Programmers 2 (Developer Team), consisting of 1 person with the task of completing

iterations with a focus on the system analyst, database, and back-end development which focuses on the workings and functionality of websites such as creating APIs, writing code that interacts with databases, working on business processes and data architecture [5].

III.   Results and Discussion

A. *Discussion*

1) Product Backlog

After defining the Scrum role to implement the Scrum method in our project, we begin to define product goals and product requirements carried out by the product owner by conducting a business analysis of the product.

2) Product Goal

This Product Goal is a commitment from the Invitin project development that describes the targets of the Scrum team and can help define the product backlog and provide focus on achieving goals so that you can choose which work (product backlog) to meet or ignore to achieve the goal.

Product Goal of this case study where we created this project to create a digital invitation platform that can solve environmental problems in reducing the use of paperless invitations.

We collect several scenarios of product requirements needed by users in our products. The scenario from the product requirements is to create a user story that is made in the story narrative.

Figure 3. Narrative Story of Invitin

Figure 3 is a user narrative to perform activities such as viewing, creating invitation templates and purchasing invitation templates. The process of extracting information from the user is modeled into user stories from the user narrative so that it can be easily used as a reference in making product backlogs.

Table 1 of the user narrative from extracting user requirements information is written into a user story with a user story writing format, so that this user story will later simplify and summarize the creation of product backlog items where the product backlog items will be used by the developer team to work on the product in each iteration.

Table 1. List User Stories in Invitin

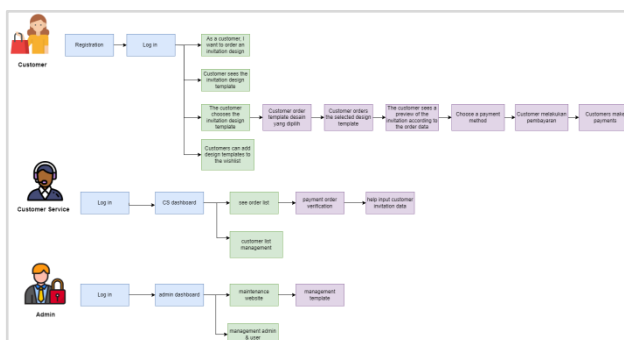| No	User Stories
1	As a Development Team I need to create an admin dashboard feature So that admin users can do data management from the Invitin website
2	As a Development Team I need to create a Customer Service Dashboard feature So that the customer admin user can do template management and payment management
3	As a Development Team I need to create a Template Management feature So that the invitation template can be displayed on the customer landing page
4	As a Development Team I need to create a Customer Landing Page feature So that users can see a list of invitation templates
5	As a Development Team, I want to create a registration page to create an account as a user on Invitin
6	As a Development Team, I want to create a Login to log in to the web Invitin as a user

7	As a Development Team, I want to create a Profile user to set the profile and manage the personal data of each user account
8	As a Development Team, I want to create Management Admin and Users to manage accounts, edit user information, and search users
9	As a Development Team, I want to create a detailed invitation design feature to make users can access and view the invitation design
10	As a Development Team, I want to create an invitation order feature to make users can order invitation designs
11	As a Development Team, I want to create an invitation order payment feature to make users can pay for the invitation design
12	As a Development Team, I want to create an invitation payment verification feature to make users can see the status of the invitation payment
13	As a Development Team, I want to create a successful order notification feature to make the user can know their status order
14	As a Development Team, I want to create an order list feature to make the user can view their order list
15	As a Development Team, I want to create a history order feature to make the user can view their order history
16	As a Development Team, I want to create a wishlist management feature to make the users can manage their wishlist

3) Product Goal

The sprint backlog consists of user stories in the form of product backlog items shown in Figure 4. which are used for software completion in each sprint, work in 1 sprint is completed within 4 weeks. The product backlog is the sprint backlog used to monitor work so that the Scrum team will continue to update it as long as the work is done or

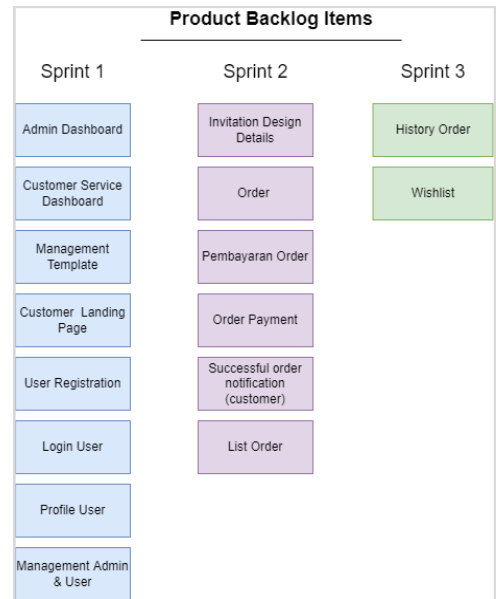completed like the sample on the sprint backlog board (Figure 5).

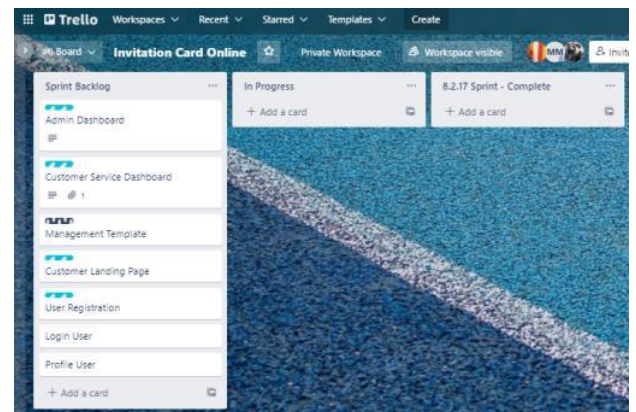Figure 4. Product Backlog Items (PBI) of Invitin

Figure 5. A Sample of Invitin Sprint Backlog Board

Figure 5 when a Scrum member is doing their job (product backlog item) then the product backlog item on the sample sprint backlog board will be set to "Do" or "In progress" status and if the task is complete it will be set to "Complete" status on the board.

4) Definition of Done (DoD)

DoD is about providing an understanding within the Scrum Team of what it takes to make your Product Improvements releasable. When a Product

Backlog item or an Increment is described as "Done", every Scrum Team must understand what 'Done' means. This is the definition of 'Done' for the Scrum Team and it is used to assess when work is complete on the product Increment releasable. Non-Functional Requirements (NFR)s usually take their place in acceptance criteria Definition of Done. The following (Figure 6) are non-functional requirements used in this research:
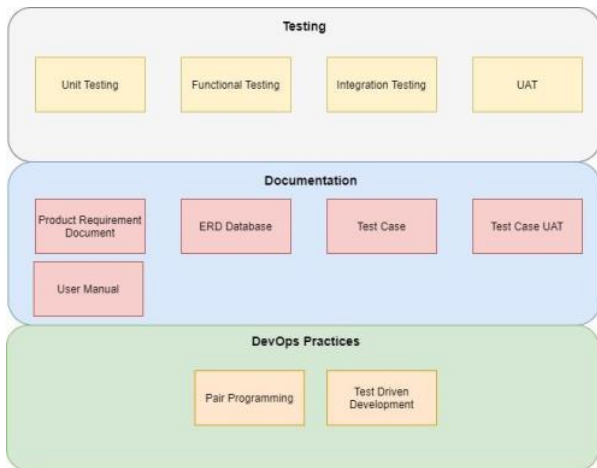

Figure 6. Definition of Done (DoD) of Invitin

5) Product Goal

Sprint planning is a meeting that discusses the work that will be done during the sprint. How long and to what extent the product we develop during the sprint is discussed in sprint planning. Sprint planning is limited to a maximum of eight hours for long sprint periods or one month. Sprints must be attended by all members of the Scrum team and are collaborative.

At this meeting, the Scrum Master is tasked with ensuring that all team members are present and understand their objectives. Here are some of the points that must be prepared in sprint planning.

- What is the goal of sprints?

- What can be presented from the results of sprints that have been running?

- What to do to achieve the goal of the sprint?

Below is an overview (Figure 7) of the activities of each Scrum team in the sprint planning meeting.

Figure 7. Sprint Planning Meeting of Each Role

6) Daily Scrum

Daily Scrum is a daily activity carried out by Scrum members for 15 minutes. Because it is only 15 minutes, then the meeting will be more effective if done by standing. To reduce complexity and maintain consistency, the time and place of the daily Scrum is carried out equally every day.

Daily Scrum improves communications, identifies impediments, promotes quick decision-making, and consequently eliminates the need for other meetings. This meeting uses three simple questions to generate structure:

- What did I work on yesterday?

- What am I working on today?

- What issues are blocking me?

By reporting these questions, the progress and setbacks of each member on the team will be seen. When they report it, it will be seen if there are difficulties and can be immediately helped to solve them.

7) Sprint Review

Sprint review focuses on the product and is held after finishing each Scrum sprint. The Scrum Team has an opportunity to align with the stakeholders, thus we can know what has been accomplished in this sprint. In this step, developers have an

opportunity to demonstrate the work that has been done [10].

8) Sprint Retrospective

We think of a sprint retrospective as a "lesson learned" meeting. Each participant needs to answer of following three questions [11]:

- What went well?

- What did not go so well?

- What actions need to be taken to improve the development process?

The sprint retrospective is led by Scrum Master who is responsible to ensure that all Scrum processes in Invitin are going well. Hence, sprint retrospective results can determine what needs to be improved in the next sprint.

B. Result

Based on the results of the discussion, there are some benefits of implementing the Scrum framework in the Invitin project in its current state as shown in Table 2.

Table 2. Benefits of Implementing Scrum Framework

Case	Benefit
Task Estimation	Detailed planning for tasks to be done during each sprint (2 weeks) is clearer.
Project Monitoring	We use Trello, a kanban board online, to maintain the progress of project work.
Business Process Changes	If there are new changes or requirements from stakeholders, we can have discussions in the final sprint. We will input new changes as new tasks for the next sprint.
Feedback From Customer	We can align requirements with the stakeholder and discuss in the final sprint.
Project View	In sprint review, developers demonstrate their works. Hence, all team members can see the progress of our project every sprint.

In the UI design below, Figure 8 is the interface design of the main user application platform, on this page customers can access the page without having to

log in first, customers can see the products of invitation that exist in the application.
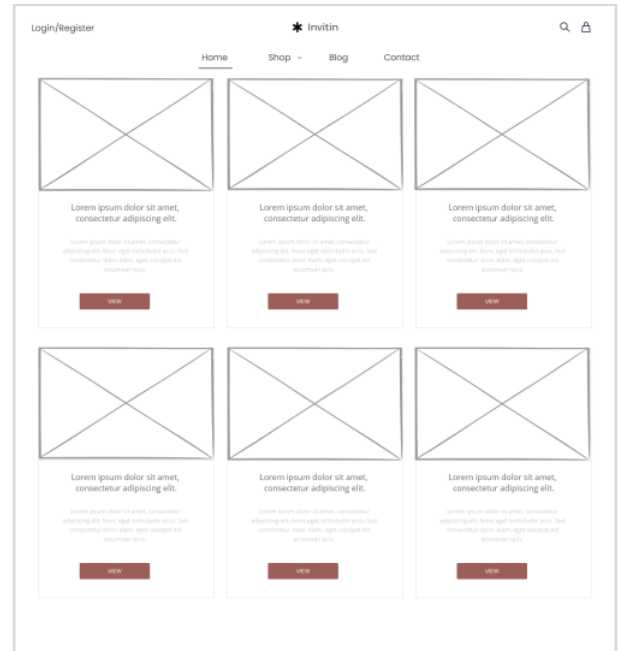

Figure 8. List Template Page

On the register page as shown in Figure 9, new customers who want to buy a website invitation must register first to get an account on the Invitin platform.
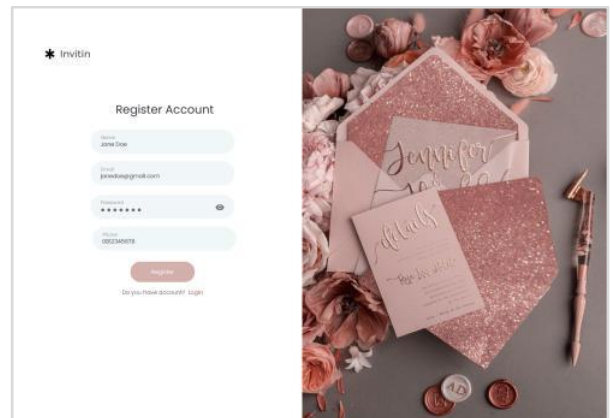

Figure 9. Register User Page

Figure 10 is the user login page, customers after registering and already having an account on the Invitin platform can have more access to the Invitin platform, such as making purchase transactions and viewing template previews.
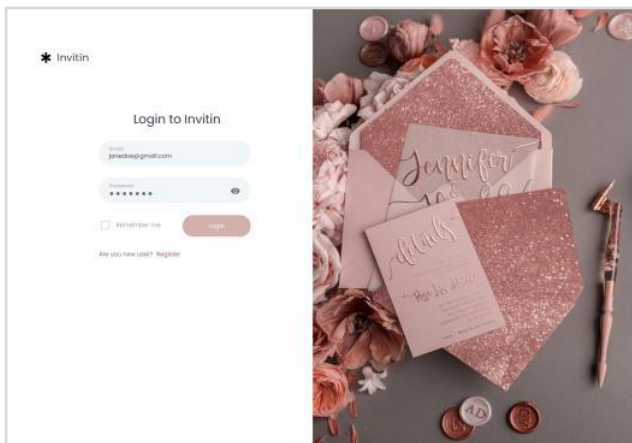
Figure 10. Login User Page

Figure 11 is the interface of the main user application platform, to get more access such as ordering invitations. In this application, customers must register and login first, after that customer can make an invitation order through the application.
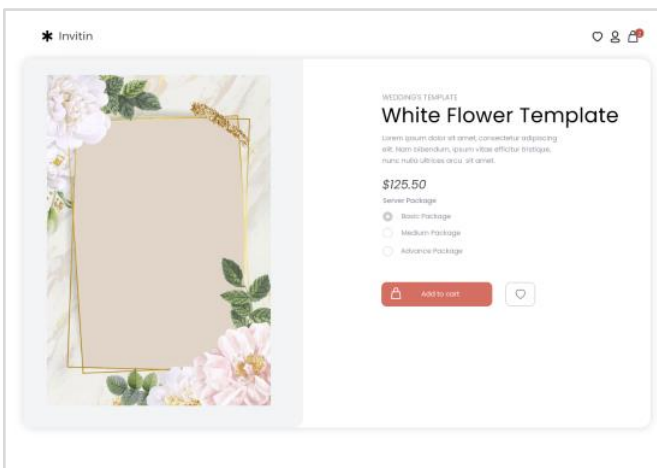

Figure 11. Website Invitation Template Detail

Figure 12 is a dashboard admin page that an admin uses to control transactions, control users, and view transaction lists, and the admin can manage invitation templates. The picture above is a list of orders that have been made by the customer, the data includes the name of the buyer, the number of goods, and the status of the payment.
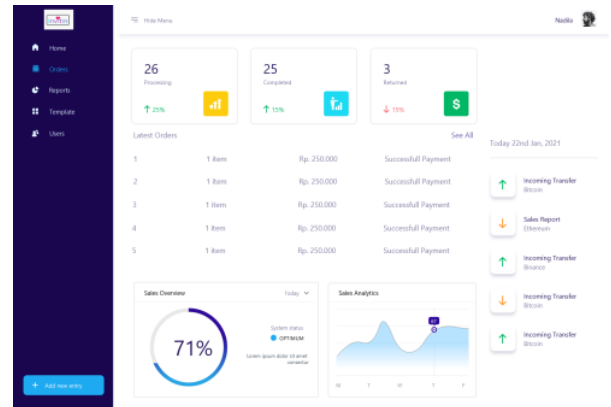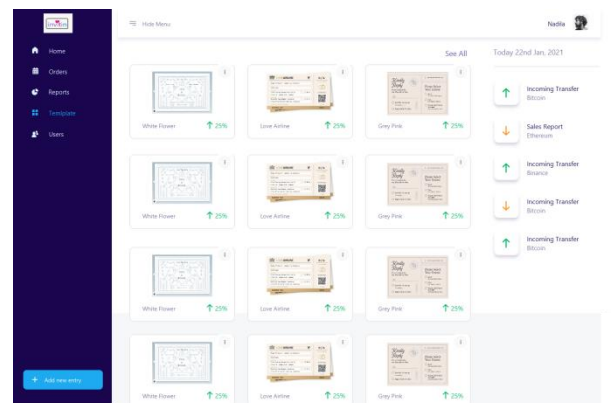

Figure 12. Admin Dashboard

Figure 13. Template Dashboard

Figure 13 is the privilege by admins to be able to add users, delete users, and set roles from users. In addition, admins also have the privilege to enable and disable a user.

IV. Conclusion

Indonesian people have traditional events such as weddings and require an invitation card to invite the closest people, but this invitation card can create environmental pollution due to the use of paper. So, we propose the development of a web-based platform for users to create invitation templates and share this event information (invitations) through only one URL. This platform was developed using the Scrum method in order to get products that are in accordance with the user's desire to customize dynamic website invitation templates. Based on the development of the Invitin

platform by implementing Scrum framework, it can be taken some conclusions as follows:

1. Project management can be done quickly and focus on the objectives of the product.
2. Platform work is carried out in accordance with the product backlog.
3. User story search and product planning becomes

For future studies, the application needs to perform some testing to get feedback for measuring the success of the Scrum framework in our Invitin web-application that we developed.

Acknowledgement

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