

Designing an Integrated Public Complaint System regarding Public Services using the Scrum Method

Fajar Ratnawati and M. Asep Subandri

Rekayasa Perangkat Lunak, Politeknik Negeri Bengkalis, Bengkalis, Riau, Indonesia

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Abstract: One form of accountability of the government of a region to the community is to provide the maximum possible service. However, due to various factors, the services provided sometimes have shortcomings. Of course, with many Regional Apparatus Organizations (OPD) providing services, the leaders of the region cannot supervise them one by one. People who interact directly with OPD and find something that is wrong can provide criticism, suggestions, or complaints. However, not infrequently the complaint becomes a mere passing wind, the complaint is not responded to by the OPD concerned. Apart from feeling lazy to not get a response, people also often complain that they don't know where to complain, then they don't know how to make a complaint. The location of the community which is far from the OPD which is in the city center also discourages the community from complaining about public services that are not optimal. Based on these problems, the authors propose the design of an integrated public complaint system. This system will be designed with one of the well-known models in the agile software development method, namely Scrum. The stages of scrum activities include product backlog, sprint backlog, daily scrum, sprint review, and sprint retrospective. Roles in Scrum include product owner, scrum master, and development team. Scrum has structured and iterative stages, so that if the product in the first sprint is not sufficient to meet the needs, then in the next sprint a system can be developed according to user evaluation. The results of this design are expected to help develop / implement the design into a complete system that is in accordance with the wishes of the user.

1 INTRODUCTION

The development of technology is currently growing rapidly. The community is very familiar and familiar with the existence of information and communication technology (ICT). They already rely on ICT in their daily activities, be it for shopping activities, social activities, or for activities within the government.

In Indonesia, the quality of public services provided by the government is still not optimal. In the aspect of implementing public services, the community as users of public services has the right to provide suggestions or complaints, criticisms or complaints about service problems that occur. Meanwhile, the government must respond to every complaint submitted by the community and provide solutions to problems submitted by the community.

Public complaints are important for the government to see how successful it is in carrying out an activity in this case services, as well as looking for shortcomings from these activities, as evaluation

material to improve the quality of services provided. Where, the better the quality of public services will encourage the advancement of a region.

The problem is the low response of service providers, resulting in the emergence of skepticism in the community. People seem to be deterred from making complaints. Indeed, the number of complaints in several public service agencies is relatively low. However, the low number of complaints does not actually describe the community's satisfaction with public services, on the contrary precisely because people feel unsure of the results that will be obtained by making complaints.

Another reason for the lack of public participation in complaining about a public service is that complaints must be submitted directly to the public service unit and the apparatus, then the public does not understand which government agencies receive and follow up on complaints, the public does not know how to submit complaints, and the complaint procedure is lengthy, complicated and difficult to

make people reluctant to complain about problems related to public services.

Bengkalis is one of the districts in Riau Province. Bengkalis Regency consists of 11 districts. Its territory includes the mainland of the eastern part of the island of Sumatra and the archipelago. The position of the capital city of Bengkalis Regency, which is on Bengkalis Island, makes it difficult for people from the coastal areas of Sumatra and other islands to complain about public services. For this reason, it would be nice if the Bengkalis Regency Government had a service media that could be accessed via the internet so that its people could inform or complain about problems in city development or government problems and problems related to inadequate public facilities easily without having to go to the government office.

Based on this thought, the author proposes a public complaint system related to integrated public services, an online service to accommodate aspirations, complaints and information from the public regarding public services or an incident that occurred in the Bengkalis Regency area. The community can convey the problems they encounter through this system. The complaint will be followed up by the Regional Apparatus Organization (OPD) that provides services. In order to guard the OPD so that they are willing to follow up on complaints, this system will be monitored directly by regional leaders, namely the Regent, Deputy Regent and Regional Secretary. This complaint system will be maintained and managed by the Bengkalis Regency Communication and Information Office (Diskominfo), which is its main task force.

There are two methods that are widely used by most system developers, namely Traditional Software Development and Agile Software Development. In this study, the authors chose to design the system using one of the models in the Agile Software Development method, namely Scrum. Scrum is considered to be able to produce good quality application programs or in accordance with the wishes of the user because it gets feedback on an ongoing basis, with the condition of the development team being limited.

2 RELATED WORK

The research conducted by Sandi et al with the title "Implementation of E-Government Through Service Applications "Apekesah" in Batam City" with the aim of knowing the implementation of e-government in the city of Batam which refers to the indicators of the

e-government component Indrajit (2005) and the results of this study is that all indicators of the implementation of E-government by the Batam City Communication and Information Office have not been fulfilled, namely content development, competency building and citizen interface.

Furthermore, the research conducted by Siti Widharetno Mursalim with the title Complaint Management Analysis of the People's Online Complaints Aspiration Service System (Lapor) in the City of Bandung. Researchers studied and analyzed the management of public complaints in the city of Bandung. It uses qualitative research methods. By using a complaint management theory based on Tjiptono's theory, namely: Commitment, Visible, Accessible, Simplicity, Speed, Fairness, Confidential, Records, Resources and Remedy, he concludes that the People's Online Complaints Aspiration Service (LAPOR!) can facilitate the public in the city of Bandung make complaints, express aspirations, or complaints against the performance of the Bandung city government.

The same research was also conducted by Dimas Ramdhana Prasetya et al. Researchers analyzed the management of public complaints in Malang City who have used the application. The research focuses on assessing how the management of public complaints is carried out by the Malang City Communication and Information Office, then what are the supporting and inhibiting factors of the management of public complaints carried out by the Malang City Communication and Information Office. With the application that can be accessed via the internet, the researcher concludes that public complaints can be easily conveyed, but the bureaucracy is too complicated and there are no information officers hampering the complaint process.

Text mining applications for automatic clustering of public complaints are increasing in the city of Semarang. By using the K-means algorithm, research from Afida et al succeeded in clustering complaint data with good results. This is obtained from the purity value where the value is 1 for each existing cluster.

Lydia Liliana in her research proposed an information system, let's report in order to reach the 2030 Sustainable Development Goals or SDGs. Taking a case study in the Cengkareng Timur sub-district, she found that in general, when people have complaints, they have to go directly to the RT/RW, but these complaints have not of course delivered not even handled quickly. The "Yuk Lapor" application proposed by the researcher is intended to convey aspirations/complaints about problems in their environment. The method used in designing the

application is the System Development Life Cycle (SDLC), but unfortunately it is only at the design stage of the application description.

3 METHOD

In this study, the system design was carried out using an agile method with the Scrum model. Scrum is a software engineering model that uses Agile principles, which refers to the strength of team collaboration, incremental products and iterative processes to achieve goals/products. Scrum is a framework that uses various processes and techniques. Scrum reduces the ineffectiveness of product management and work techniques so as to improve product, team, and work environment performance. Figure 1 below illustrates the process steps of the scrum model:

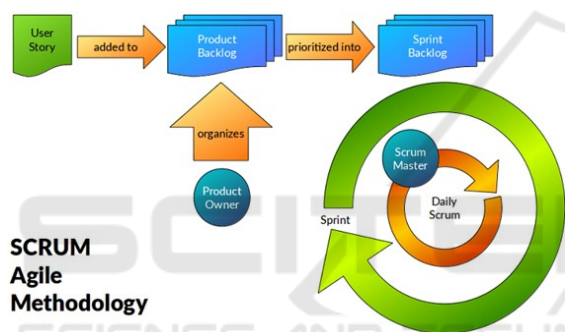


Figure 1: Stages in the Scrum model.

1) The Scrum Master

The Scrum Master is the person who makes the Scrum group work effectively and the Scrum progress always goes well until it reaches the desired goals or objectives if there is an obstacle in the work process, the Scrum master acts as an intermediary then provides solutions and decides the solutions that will be used to solve existing problems.

2) The Product Owner

The Product Owner is the person responsible for ensuring that the Scrum team produces a product that can be presented in front of the client.

3) The Product Backlog

The Product Backlog is a list of user wishes in the form of expectations when this project has been completed, here also we can continue to monitor whether the projects we make are in accordance with the wishes of the user or not.

4) The Sprint Backlog

The Sprint Backlog is the result of slices / fragments of the Product Backlog where we think what we should develop, which must be completed first and how to do it so that the project is achieved according to the wishes of the users in the Product Backlog.

5) User Story

User Story is the result of interviews with users which is then documented from the needs of our software used in agile methods, one of the advantages of user stories is that it is easy to adapt according to software needs, and also user stories are described in a very natural language. so that people who do not have an IT background can understand the software being developed. User stories are input from users, customers, teams and stakeholders

4 RESULT AND DISCUSSION

The results of this study are in accordance with the steps of the method used, namely Scrum which begins with making user stories obtained from input from the community, OPD, teams and stakeholders; product backlog which is the result of user stories; sprint backlog consisting of the sprint process, daily scrum, sprint review, and sprint retrospective. Figure 2 shows an overview of the user story about the system design according to the user. There are 4 users in this system, namely the community, discominfo, OPD and regional leaders.

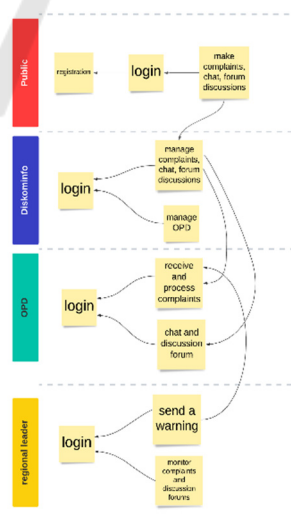


Figure 2: User story.

Based on the information obtained from Figure 2, the following is the design of an integrated public

complaint system related to public services using the Scrum method.

4.1 Product Backlog

At this stage of creating a product backlog, the backlog feature is determined based on the priority of the product owner. Priority determination can be seen in Figure 3.

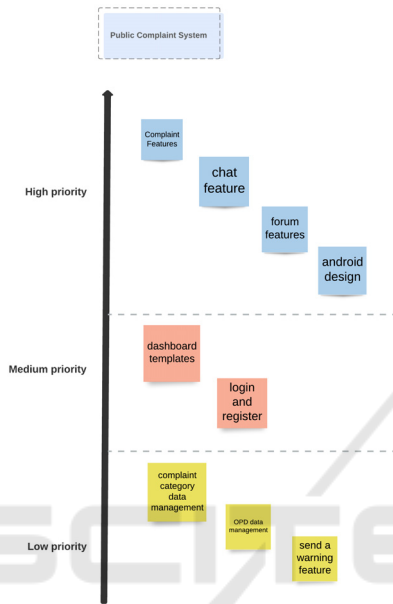


Figure 3: Product backlog.

From the description of the product backlog above, a table is made to see a more detailed product backlog consisting of:

- ID, is the number or unique identity of each product backlog item
- Product backlog item, is a brief description of the task
- Priority, is the priority level of the product backlog item
- Initial estimate, is the estimated processing time for each product backlog item

Table 1: Product Backlog.

ID	Product Backlog Items	Priority	Initial Estimate
1	Creating admin dashboard templates	High	3
2	Create complaint category data management	High	2
3	Create OPD data management	High	2

Sprint 1			7
4	Create android application design	Medium	7
5	Creating citizen login and registration features	Medium	2
Sprint 2			9
6	Create a public complaint feature	low	4
7	Create a chat feature between the community and OPD	low	4
8	Create forum features	low	5
9	Create a feature to send a warning from the leadership to the OPD	Low	2
Sprint 3			15
10	Web admin implementation		
11	Android application implementation		
12	OPD web implementation		
13	Leader web implementation		
Future sprint			

4.2 Sprint Backlog

The sprint backlog is the result of the sprint planning carried out at the beginning of the sprint to plan the work to be done in the sprint. At the sprint stage, it is determined based on the product backlog table. In this study, the resulting sprints were 4 sprints based on the priority of each product backlog with a sprint duration of 31 days.

4.2.1 Sprint 1

Sprint 1 consists of 3 product backlog items that will be done by 3 developers. Sprint 1 is focused on web design. Product backlog items in sprint 1 include creating admin dashboard templates, making complaint category data management, creating OPD data management. More details can be seen in table 2.

In sprint 1 the work estimate at the beginning of the print uses the default focus factor value, which is 70% because there is no previous reference, then the

Table 2: Sprint backlog on sprint 1.

ID	Backlog Items	Status	Estimated days
1	Creating admin dashboard templates	Complete	3
2	Create complaint category data management	Complete	2
3	Create OPD data management	Complete	2

calculation of work capacity and estimated processing time is as follows:

$$\begin{aligned} \text{Work capacity} &= \text{estimated days} / \text{focus factor} \\ &= 7 / 0.7 \\ &= 10 \end{aligned}$$

$$\begin{aligned} \text{Estimated processing time} &= \text{work capacity} / \text{team} \\ &= 10 / 3 \\ &= 3.3 \end{aligned}$$

From the above calculation, the estimated time for sprint 1 is rounded up from 3.3 to 3 days.

The development process in sprint 1 experienced an extension of time from the initial estimate of 3 days to 10 working days. The actual number of working days for the team is 30 working days. The extension of the sprint time on the implementation of sprint 1 is due to the estimated days not running out or not being completed in accordance with the estimated planning time. Because sprint 1 is the start of the team carrying out the sprint, the sprint execution time is added until the estimated days are up to find out the team's focus factor value which will be used to calculate the estimated time for the next sprint. The value of the focus factor with an estimated 7 days and a work capacity of 30 days is 0.23 or 23%.

4.2.2 Sprint 2

Sprint 2 consists of 3 developers who will work on the system design. Sprint 2 will work on the sprint backlog with medium priority. In sprint 2, the target for achieving the sprint is to design an application to submit complaints to the public, as well as login and register features for the community. The estimated days in sprint 2 is 9 days. For sprint 2 can be seen in table 3.

Table 3: Sprint backlog on sprint 2.

ID	Backlog Items	Status	Estimated days
4	Create android application design	Complete	7
5	Creating citizen login and registration features	Complete	2

In sprint 2 the work estimate is obtained from the focus factor obtained from sprint 1, which is 0.23. By knowing the estimated days and the focus factor, the ideal work capacity is 39.13 rounded up to 39 days. To find out the estimated working time, the ideal work capacity value is divided by the developer team, so 13 is produced so that the estimated processing time for sprint 2 is 13 days.

The development process in sprint 2 is faster than the initial estimate of 13 days to 10 working days. The actual number of working days for the team is 30 working days. So the value of the focus factor obtained with an estimated 9 days and a 30 day work capacity is 0.30 or 30%.

4.2.3 Sprint 3

Sprint 3 consists of 3 developers who will work on the system design. Sprint 3 will work on a low priority sprint backlog which consists of making a public complaint feature and creating a chat feature between the community and OPD. The goal to be achieved from Sprint 3 is to design the appearance of the public complaint feature and the chat feature. Estimated days on sprint 3 is 15 days. For sprint 3 can be seen in table 4.

Table 4: Sprint backlog on sprint 3.

ID	Backlog Items	Status	Estimated days
6	Create a public complaint feature	Complete	4
7	Create a chat feature between the community and OPD	Complete	4
8	Create forum features	Complete	5
9	Create a feature to send a warning from the leadership to the OPD	Complete	2

In sprint 3 the work estimate is obtained from the focus factor obtained from sprint 2, which is 0.30. By knowing the estimated days and the focus factor, the ideal work capacity is 50 days. To find out the estimated working time, the ideal work capacity value is divided by the developer team, so the result is 16.67. So the estimated processing time for sprint 3 is rounded up from 16.67 to 17 days.

The development process in sprint 3 is faster than the initial estimate of 17 days to 10 working days. The actual number of working days for the team is 30 working days. So the value of the focus factor

obtained with an estimated 15 days and a 30 day work capacity is 0.50 or 50%.

4.3 Daily Scrum

Daily scrum is an activity with a time limit of 10 minutes every day so the team can synchronize work and plan what to do the next day by updating the burndown chart. The following is the result of the burndown chart from sprint 1 to sprint 3.

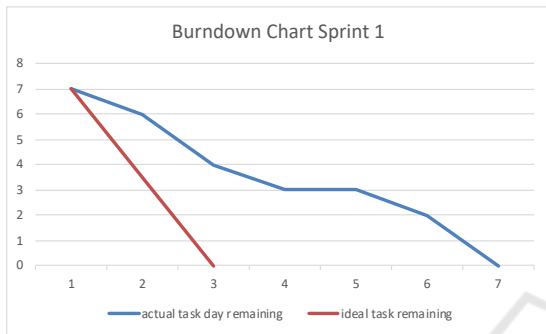


Figure 4: Burndown Chart Sprint 1.

Figure 4 shows the first day of the sprint which is July 5, 2021, the team estimates that there are about 7 estimated days based on team speed. Sprint 1 with an estimated number of 7 days and a 10 day sprint execution time. At the start of sprint 1, the actual task day remaining line decreases further and is above the ideal task remaining line. This shows that the implementation is not in accordance with the estimated time that has been planned.

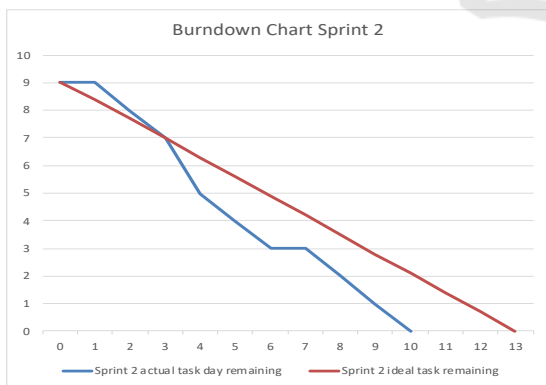


Figure 5: Burndown Chart Sprint 2.

The actual task days remaining line on the burndown chart sprint 2 chart at the start may or may not be far from the ideal task remaining line, this indicates the implementation and planning as planned. It is different from what happened on the 3rd to 10th work days, the actual task day remaining is below the ideal

task remaining line. This condition indicates that the sprint will be completed earlier than the estimated time previously set.

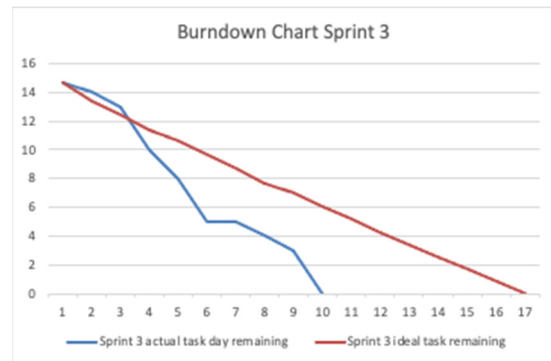


Figure 6: Burndown Chart Sprint 3.

The actual task days remaining line on the burndown chart sprint 3 chart at the start may or may not be far from the ideal task remaining line, this indicates the implementation and planning as planned. It is different from what happened on the 4th to 10th work days, the actual task day remaining is below the ideal task remaining line. This condition indicates that the sprint will be completed earlier than the estimated time previously set.

4.4 Sprint Review

The system demo is done with a direct tutorial using a system design application, namely adobeXD. After the demo tutorial is done, the user provides a review and input on the system design that has been implemented.

The results of the review and input from users will be carried out in the next sprint before being further developed so that it can actually be used by the user. The results of the system design are as follows:

Figure 7: Register.

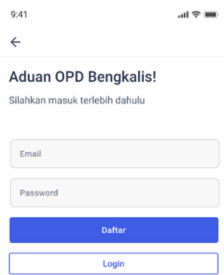


Figure 8: Login.

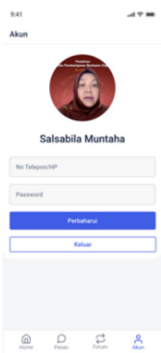


Figure 9: Account.

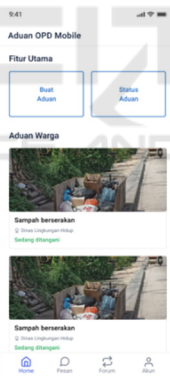


Figure 10: Home.

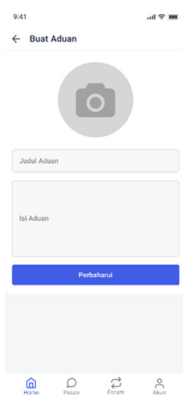


Figure 11: Make a complaint.

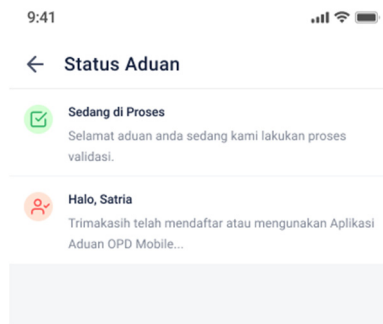


Figure 12: Complaint status.

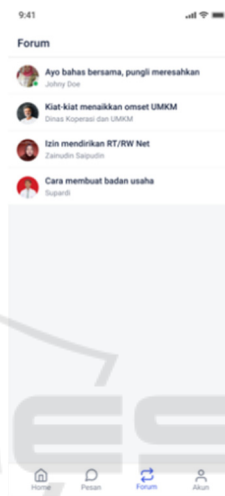


Figure 13: Forum.



Figure 14: Forum contents.

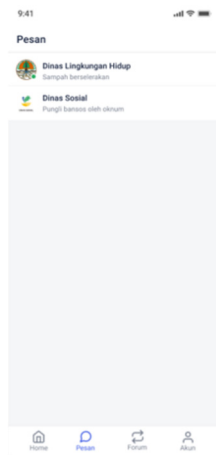


Figure 15: Message.

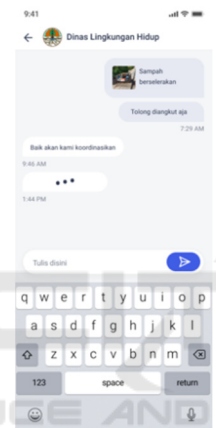


Figure 16: Message content.

4.3 Sprint Retrospective

On This phase is carried out by holding a meeting to evaluate the team's performance for one sprint with a maximum time duration of 3 hours. This is done to make plans regarding performance improvements that will be carried out in the next sprint

5 CONCLUSIONS

Based on the results of the application of the Scrum method in the design of an integrated public complaint system related to public services, it can be concluded as follows:

1. The number of sprints produced is 4 sprints with the focus factor of each sprint (does'n include future sprints) increasing.

2. The scrum method can be applied to mid-scale systems with a limited number of development teams
3. The scrum method can overcome changing requirements from user evaluation results
4. For the next research stage, a future sprint is carried out so that it becomes a complete system that is in accordance with user needs and can be used by the community.

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