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# IMPLEMENTATION OF SCRUM FRAMEWORK IN AGILE TECHNOLOGY IN GUEST RECEPTION OF GOVERNMENT OFFICES: MONITORING OF GUEST RECEPTION DASHBOARD

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**ABSTRACT**
The presence of guests from various circles at the Prosecutor's Office is very diverse, so guest data collection is needed to monitor guests who come to the prosecutor's office. Data collection is carried out by adding several features to the dashboard according to the year, including the number of guests and guest graphs of various types, including, the average number of visit duration, the overall number of visits, the number of registered guests, the number of vehicles entering, the number of PTSP visits, the number of ticket taking, the visit graph, the guest type graph, the guest type graph, the visit type graph, the guest age graph, the guest arrival time graph, the time of arrival at the kamdal, graph of the time of guests coming to PTSP, graph of total visits by day, graph of total visits by month, graph of the most visitors received, graph of total survey votes, and graph of most frequently visited guest data. The method used is development by implementing the Scrum Framework, one of the Agile development methodologies. The stages carried out consist of, problem identification, literature study, product backlog and sprint planning, sprint backlog, daily scrum, as well as sprint review and restrospective sprints. The duration of the work time for this project is estimated at 39 working days. The final results obtained from this research are in the form of details of the work and scheduling, to the prototype of the interface.

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## I. INTRODUCTION

The implementation pattern of sustainable IT Governance development needs to be prepared, planned and developed in a relatively short period of time [1]. One of them is software development whose management has 3 stages, namely development by implementing the Scrum Framework, one of the Agile development methodologies. This scrum method is gradual, iterative, and relies on user involvement [2]. Scrum is a lightweight framework that helps people, teams, and organizations generate value through adaptive solutions to complex problems [3]. Agile development methodologies are one of the software development methods that have adaptive and responsive properties to changes [4]. The scrum stage begins with the product owner gathering suggestions from stakeholders and then summarizing them into a care product that is transformed into a product backlog [5].

In the development of a system, it is difficult to predict things that will happen during the development process, one of which is the change or addition of system needs [6]. Scrum is considered to be able to produce good software quality according to the desired and be able to adopt every change encountered [7]. In the end, they create products by finding solutions to unexpected challenges they encounter on their journey to deliver the desired results [8].

For example, Modeling Goods Sales Information Systems using the Scrum Method is a very effective approach in developing solutions that are responsive and adaptive to dynamic needs in the sales industry [8]. The Scrum method, a software development framework based on the principles of collaborative and iterative teamwork, allows developers to quickly respond to changing business needs. In the context of the Goods Sales Information System, Scrum allows teams to continuously update and improve the features of the system based on customer feedback and market dynamics. A regular Sprint process in Scrum ensures the iterative and gradual completion of various system features, while providing transparency and opportunities for adjustment during the development process. By applying the Scrum Method in the modeling of the Goods Sales Information System, organizations can achieve higher development speeds, improve product quality, and remain responsive to changing market needs

Nowadays, all social interactions involving the use of communication and information technology, cause many people to change their communication patterns [9]. One of the problems that occur in the project is ineffective and

efficient communication between team members and occurs in the application development process on the project [10]. Effective means achieving project objectives by making the right choices and being successful in implementing them. Meanwhile, efficient is defined as the minimal use of resources to achieve optimal results [11]. Communication can be overcome by the scrum method, by forming a team, setting a project timeline with a series of sprints, each with a specific goal and related to product backlog items [12]. Effective means achieving project objectives by making the right choices and being successful in implementing them. Meanwhile, efficient is defined as the minimal use of resources to achieve optimal results [13]. Communication can be overcome with the scrum method, by forming a team, setting a project timeline with a series of sprints, each with a specific goal and related to the product backlog items [14]. Open and continuous communication ensures a good understanding of needs and allows for more effective problem-solving [15]. Assists in identifying problems early and ensuring higher software quality [16]. With continuous testing, agile methods help in reducing risks in software development. Problems and errors can be identified and corrected early, reducing the greater impact on the project. [17] [18].

Information and Communication Technology has developed rapidly in society, including in Indonesia, and has had a good impact in various fields, one of which has an impact on the field of software development itself. In the face of the development of information technology and global changes, it is necessary to increase the results in the implementation of government duties and functions in the field of science and technology [19]. One of the government institutions engaged in the legal field, namely the High Prosecutor's Office, has many guests who come every day and needs to be monitored so that guest archives are stored that are useful in the present and the future. Monitoring systems can support the evaluation process to be faster [20]. Therefore, an application is needed that can monitor guests and record their activities using the scrum method. A methodology is needed to assist in application development [21]. The final result is expected to be perfect and on target because in the development process analysis and communication to users has been carried out [21].

## II. RESEARCH METHODS

This research uses an agile method with a scrum model for the development of the Monitoring of Guest Reception Dashboard application. The research flow can be seen in figure 1. The selection of the scrum method is because it has advantages in making the development of the Monitoring of Guest Reception Dashboard application in accordance with user needs. Error problems can be quickly overcome with intensive communication between teams. These stages are guidelines for conducting application development research [4] [7].

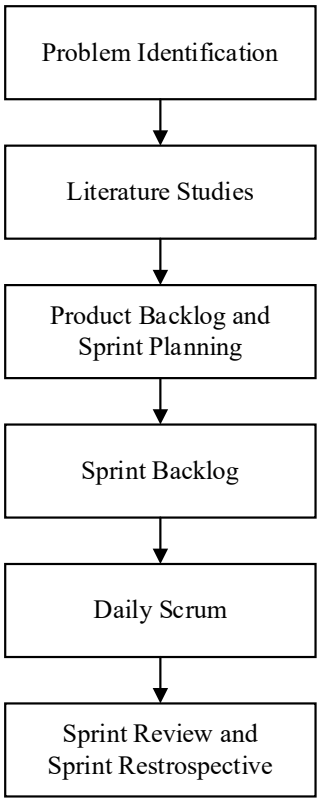


Figure 1. Research Flow with Scrum Model

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### A. Problem Identification

The research stage begins by identifying problems with the aim of obtaining the background of the research and the formulation of the problem from the research. Problem identification is carried out by means of interviews and observations to related parties. The results obtained are.guest monitoring with various types and graphs.

### B. Literature Studies

The literature study stage is to search for theoretical references related to research from various sources from previous research, such as journals, proceedings and theses. This can help researchers in developing the Monitoring of Guest Reception Dashboard application.

### C. Product Backlog and Sprint Planning

The product backlog contains a backlog of items created based on the requirements obtained from the data collection. The requirements in the product backlog are dynamic so that they will continue to increase if they get feedback from users during application reviews and demos.

Sprint Planning is planning in the work of the product backlog in the sprint. In this stage, it consists of designing a system in the form of mapping the functional needs that have been analyzed into a diagram. In the process of designing a system design, there is an explanation of the Database. In addition, Sprint Planning also estimates the time to work on features in each sprint.

### D. Sprint Backlog

Sprint backlog is a product backlog that has been divided into several parts to be worked on in the sprint phase later. The duration of the sprint depends on the agreement with the Scrum Team. The backlog sprint contains the detailed activities of each backlog product along with the team members involved and the time it will take. The sprint starts after the previous sprint has been completed.

### E. Daily Scrum

The daily scrum stage is the stage of defining the features that have been determined in sprint planning. Discussions were held related to the development of each feature and the implementation of features in order to achieve the sprint goal and produce increment in accordance with expectations at the end of the sprint. The reference that can be seen when doing daily scrum is to look at the activities that are running.

### F. Sprint Review and Sprint Restrospective

The sprint review stage is carried out to review the results of the sprint work. At this stage, system testing is also carried out to ensure that the system can run and according to the wishes. In the sprint review, a discussion was also held by the scrum team to determine the next sprint work so that it can be done optimally. The app is reviewed to the user for final testing. This system test is carried out by looking for system errors.

A retrospective sprint is a stage that is carried out at the end of a sprint. This stage contains a per-formal evaluation of the system work and a discussion is carried out about things that are factors for the success or failure of completing features in the system. In addition, planning is carried out to improve work performance for the next sprint. At the sprint review stage, a demonstration of the results of the related sprints was carried out to stakeholders to get feedback on what had been done in [6].

## III. Results And Discussion

### A. Product Backlog and Sprint Planning

In designing the creation of the Monitoring of Guest Reception Dashboard Application using the scrum method, the first step taken is to compile a product backlog [15] based on the requirements obtained through observation and data collection. At the stage of creating this backlog product, the determination of the backlog features is made based on priority by the product owner. The list of features can be seen in table I as follows:

Table I.
Product Backlog and Sprint Planning

| No. | Backlog Name | Estimate (days) | Planning |
|---|---|---|---|
| 1 | Manage years | 6 | Select year displays the number on all charts, including the average number of visit durations, overall visits, registered guests, incoming vehicles, PTSP visits, and ticket pickups. Select year also displays a graph of visits, guest type, guest type, visit type, guest age, guest arrival time at Kamdal, guest arrival time at PTSP, total visits by day, total visits by month, most visit recipients, total survey votes, and most frequent visitor data. |
| 2 | Average number of length of | 2 | Displays the average number of visits in the selected year |

| | | | |
|---|---|---|---|
| | visit | | |
| 3 | Overall number of visits | 2 | Displays the overall number of visits by the selected year |
| 4 | Number of registered guests | 2 | Displays the number of registered guests by the selected year |
| 5 | Number of vehicles entering | 2 | Displays the number of vehicles entering according to the selected year |
| 6 | Number of PTSP visits | 2 | Displays the number of PTSP visits according to the selected year |
| 7 | Number of tickets taken | 2 | Displays the number of tickets taken according to the selected year |
| 8 | Visiting graph | 2 | Displays a Visitor graph according to the selected year |
| 9 | Guest type graph | 2 | Displays a graph of guest types according to the selected year |
| 10 | Guest kind of graph | 2 | Displays a graph of guest types by selected year |
| 11 | Visits type graph | 2 | Displays a graph of visit types according to the selected year |
| 12 | Guest age graph | 2 | Displays the age graph of guests according to the selected year |
| 13 | Graph of the time guests come to the kamdal | 2 | Displays a graph of the time guests arrive at the kamdal according to the selected year |
| 14 | Chart of guest arrival time at PTSP | 2 | Displays a graph of when guests arrive at PTSP according to the selected year |
| 15 | Graph of total visits by day | 2 | Displays a graph of total visits by day according to the selected year |
| 16 | Graph of total visits by month | 2 | Displays a graph of total visits by month according to the selected year |
| 17 | Graph of the most visitors | 2 | Displays the graph of the most visitors by the selected year |
| 18 | Graph of total survey votes | 2 | Displays a graph of the total survey votes according to the selected year |

## *B. Sprint*

The sprint stage is the development stage of the Monitoring of Guest Reception Dashboard application which consists of sprint backlog, daily scrum, duration, start, finish. In this study, there are a total of 6 sprints with work for each sprint being done for 6 weeks. The results of each sprint are shown in Table II.

TABLE II.
SPRINT DESCRIPTION

| Sprint | Sprint Backlog | | Daily Scrum | Duration (days) |
|---|---|---|---|---|
| 1 | Manage years | | | |
| | Create a year attribute | - | Create a view in the dashboard | 2 |
| | | - | Checking attributes on tables in the database | |
| | Creating year coding | - | Checking the time according to the year on the table in the database that will be displayed on the dashboard | 2 |
| | | - | Running program | |
| | Trial year | - | Check the dashboard page by selecting the year | 2 |
| 2 | Average number of length of visit | | | |
| | Create an attribute of the average length of visit time | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Check the average number of visits | - | Check the average number of visits after the year selection in the dashboard | 1 |
| 3 | Overall number of visits | | | |
| | Create an overall visit attribute | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Checking the overall number of visits | - | Check the overall number of visits after the year selection in the dashboard | 1 |
| 4 | Number of registered guests | | | |
| | Create a registered guest attribute | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Checking the number of registered guests | - | Checking the number of registered guests after the year selection on the dashboard | 1 |
| 5 | Number of vehicles entering | | | |
| | Create the Number of vehicles entered attribute | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Checking the number of vehicles entering | - | Checking the number of vehicles entering after the year selection on the dashboard | 1 |
| 6 | Number of PTSP visits | | | |
| | Create attributes for PTSP visits | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Checking the number of PTSP visits | - | Checking the number of PTSP visits after the year selection on the dashboard | 1 |
| 7 | Number of tickets taken | | | |
| | Create a ticket grab attribute | - | Create a view in the dashboard | 1 |
| | | - | Creating attributes on tables in the database | |
| | Checking the number of tickets taken | - | Checking the number of tickets taken after the year selection on the dashboard | 1 |
| 8 | Visiting graph | | | |
| | Create a Visitor Graph | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the visit graph | - | Checking the Visiting Graph after the year selection in the dashboard | 1 |
| 9 | Guest type graph | | | |
| | Create a guest type graph | - | Create a view in the dashboard | 1 |

| | | | | |
|---|---|---|---|---|
| | | - | Checking attributes on tables in the database | |
| | Guest type graph checking | - | Checking the Guest type graph after the year selection in the dashboard | 1 |
| 10 | Kind of guest graph | | | |
| | Create a Guest type Chart attribute | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the Guest type graph | - | Checking the Guest type graph after the year selection in the dashboard | 1 |
| 11 | Visits type graph | | | |
| | Create a visit type graph | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the Visit type graph | - | Checking the Visiting Type Graph after the year selection in the dashboard | 1 |
| 12 | Guest age graph | | | |
| | Create a guest age graph | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the guest age graph | - | Checking the age graph of guests after the year selection on the dashboard | 1 |
| 13 | Graph of the time guests come to the kamdal | | | |
| | Create a graph of the time guests come to the kamdal | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the graph of the time guests come to the kamdal | - | Checking the graph of the time guests arrive at the kamdal after the year selection on the dashboard | 1 |
| 14 | Chart of guest arrival time at PTSP | | | |
| | Create a graph of when guests come to PTSP | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the time graph of guests coming to PTSP | - | Checking the time graph of guests coming to PTSP after the year selection on the dashboard | 1 |
| 15 | Graph of total visits by day | | | |
| | Create a graph of total visits by day | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking Graph of total visits by day | - | Checking the graph of total visits by day after the year selection in the dashboard | 1 |
| 16 | Graph of total visits by month | | | |
| | Create a graph of total visits by month | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking Graph of total visits by month | - | Checking the graph of total visits by month after the year selection in the dashboard | 1 |
| 17 | Graph of the most visitors | | | |
| | Create a graph of the most visitors | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the graph of the most visitors | - | Checking the graph of the most visitors after the year selection in the dashboard | 1 |
| 18 | Graph of total survey votes | | | |
| | Create a graph of total survey votes | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking Survey total vote graph | - | Checking the graph of the total survey votes after the year election on the dashboard | 1 |
| 19 | Graph of most visited guest data | | | |
| | Create a graph of your most visited guest data | - | Create a view in the dashboard | 1 |
| | | - | Checking attributes on tables in the database | |
| | Checking the graph of the most visited guest data | - | Checking the graph of the most visited guest data after the year selection in the dashboard | 1 |

## *C. Sprint Review and Sprint Restrospective*

The next stage that is done is the sprint review. In this stage, we discuss what the development team of all backlog sprints have been working on to review the increment and change the Product Backlog if necessary. Here is a picture of the results of the sprint review. The results of the sprint review at the sprint 1 stage are shown in figure 2.

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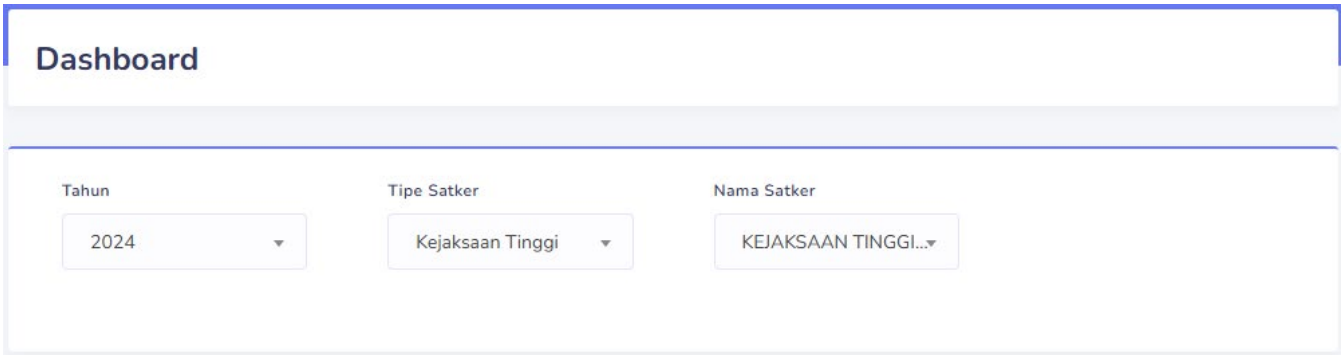


Figure 2. Results of Sprint 1

Sprint review: At this stage, a demonstration of the results of the second sprint was carried out, and the results of the review were obtained from stakeholders, namely all features went well, project work management features and interactive work details, clear and informative design. Sprint restrospective: Planning according to ability, Feature work is not too much reference suitability.

Figure 2 display, which is used only Year. The Satker Type and Satker Name options are not used, because there is only 1 option. And what is explained in the description of the sprint is only the year. Meanwhile, the results of Sprint 2-7 can be seen in the figure 3.


Figure 3. Results of Sprints 2-7

Sprint review: At this stage, a demonstration of the results from the second sprint to the seventh sprint is carried out, this is simultaneous because the sprint is on 1 screen and each demonstration from sprint 2 to sprint 7 has no problems because of the simple features. The results of the review from stakeholders are that all features are running well, project work management features and interactive work details, clear and informative design, request the addition of visit graphs, guest type graphs, guest type graphs, visit type graphs, and guest age graphs. Sprint restrospective: Good performance, it is necessary to make a graph to see the increase or decrease.

Figure 3 shows a display of quantities of different types. All displays are to monitor guests who come to the prosecutor's office. The number displayed depends on the selection on the results of sprint 1, which is the year. After the number is in the form of numbers, figure 4 will display a graph that will depict the guests who came to the prosecutor's office.

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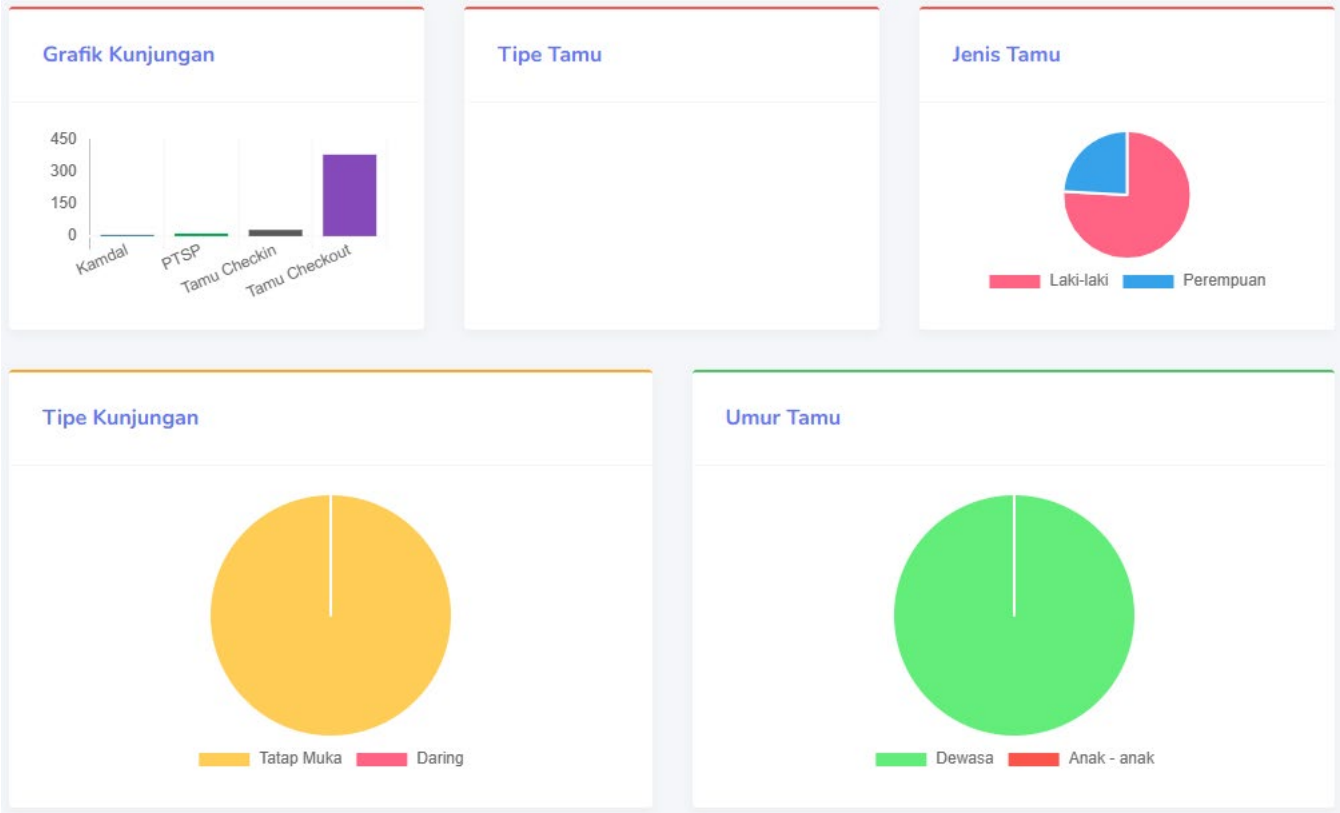


Figure 4. Results from Sprints 8-12

Sprint review: At this stage, a demonstration of the results from the eighth sprint to the twelfth sprint is carried out, this is simultaneous because the sprint is on 1 screen and each demonstration from sprint 8 to sprint 12 has no problems because of the simple features. The results of the review from stakeholders are that all features are running well, the dashboard design has displayed easy-to-understand charts, the addition of seeing the graph of the time guests come to Kamdal and PTSP. Sprint restrospective: The creation of various additions according to the request of the user and with little time.

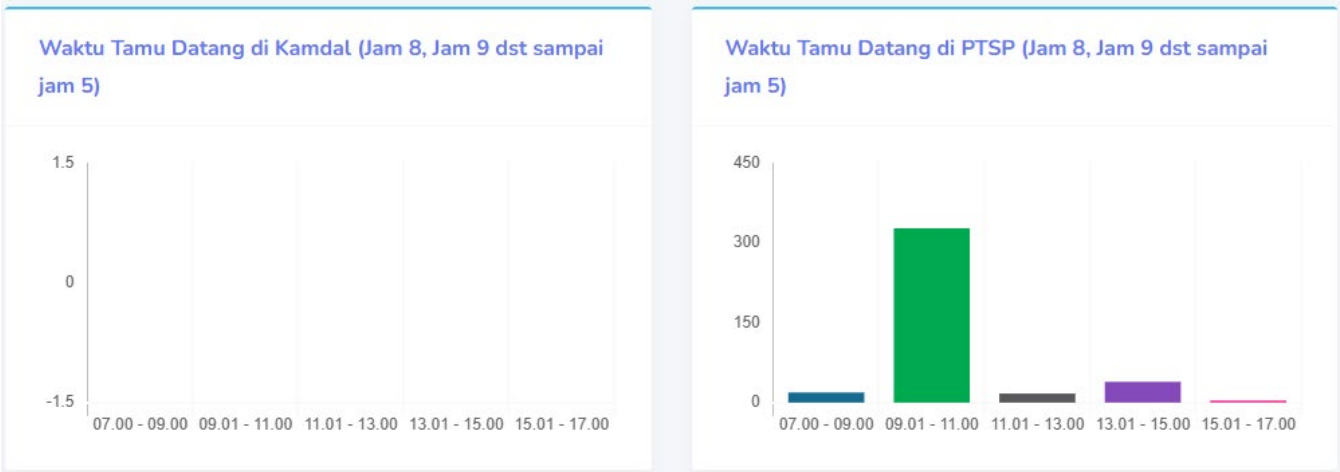


Figure 5. Results of Sprints 13 and 14

Sprint review: At this stage, a demonstration of the results of sprint 13 and sprint 14 is carried out, this is at the same time because the sprint is on 1 screen and each demonstration from sprint 13 to sprint 14 has no problems because of the simple features. The results of the review from stakeholders are that all features are running well, the dashboard design has displayed the time guests arrive at Kamdal, and PTSP, the addition to see a graph of total visits by day and total visits by month. Sprint restrospective: Form creation is smooth and not too complex.

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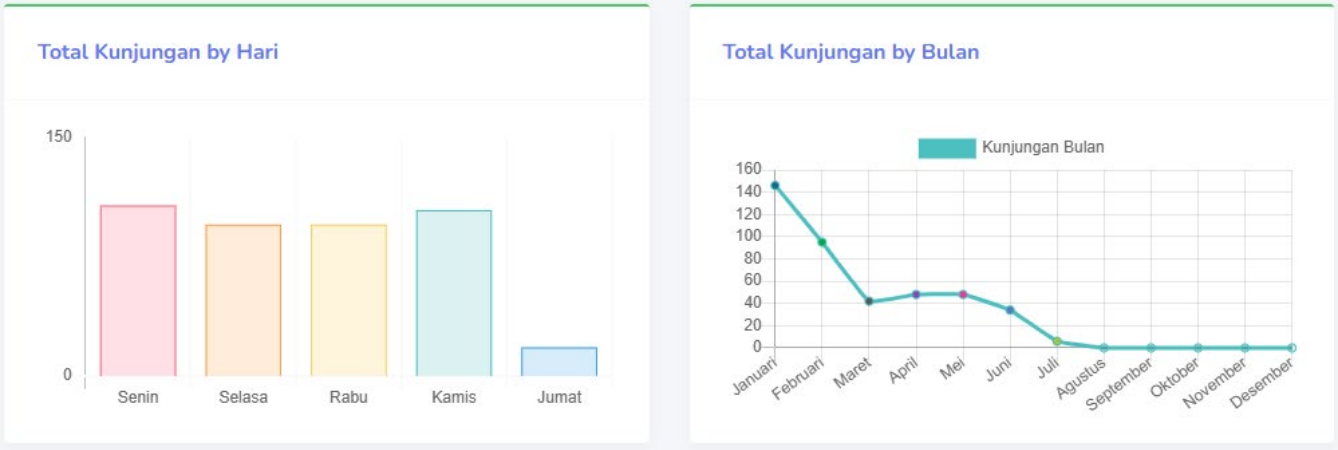


Figure 6. Results of Sprints 15 and 16

Sprint review: At this stage, a demonstration of the results from sprint 15 to sprint 16 is carried out, this is simultaneous because the sprint is on 1 screen and each demonstration from sprint 15 to sprint 16 has no problems because of the simple features. The results of the review from stakeholders are that all features are running well, the dashboard design has displayed a graph of total visits by day and a graph of total visits by month. Sprint restrospective: Making increments is a little difficult on the total visit by day portion.

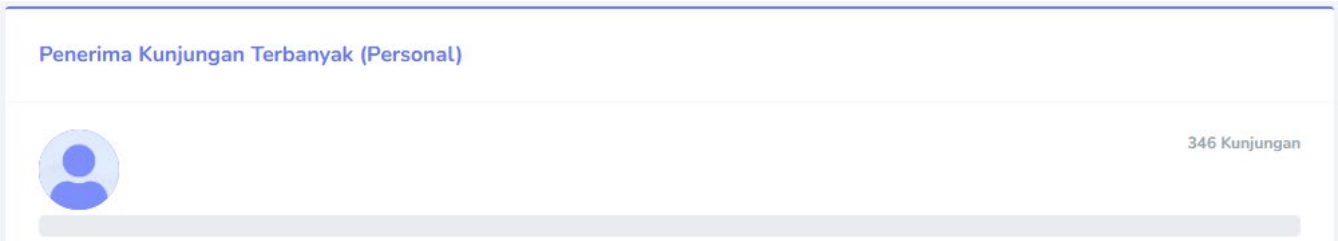


Figure 7. Results of Sprint 17

Sprint review: At this stage, a demonstration of the results of sprint 17 is carried out. The results of the review from stakeholders are that all features are running well, interactive dashboard design. Restrospective sprints: everything went smoothly and according to plan.

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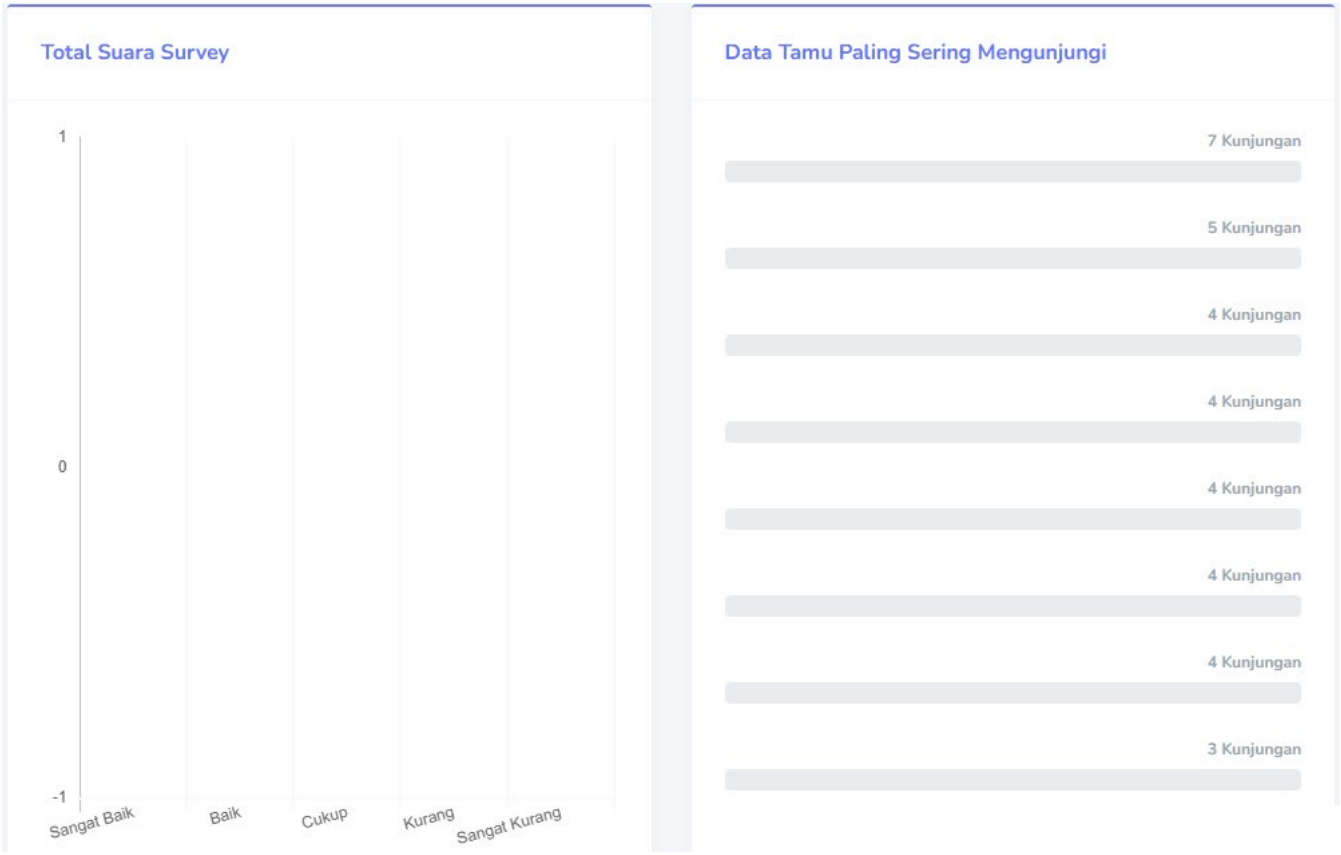


Figure 8. Results from Sprints 18 and 19

Sprint review: At this stage, a demonstration of the results from sprint 18 to sprint 19 is carried out, this is simultaneous because the sprint is on 1 screen and each demonstration from sprint 18 to sprint 19 is not a problem because of the simple features. The results of the review from stakeholders are that all features are running well, the dashboard design is interactive and all are complete. Sprint restrospective: The final final result of the application.

The graphic display in figure 4-8, shows a decrease or increase in guests who come to the prosecutor's office with various types of graphs. This serves to make it easy to identify guests.

In the sprint review step, a working meeting was also held between team members and stakeholders. It is carried out at the end of each sprint and lasts approximately three hours. The increment generated at the end of the sprint is the input for this sprint review. Here each team member will present the results of their work. Stakeholders will provide feedback on the completed increment. Changes in requirements can occur and allow for changes to the product backlog in the next sprint

In this retrospective sprint, the process in working on the project will be discussed. The things discussed are usually about interaction and communication between team members or problems in work practices that may cause conflicts. The retrospective sprint aims to encourage openness between team members, build a spirit of cooperation and improve an uncomfortable work environment. Retrospective sprints aim to encourage openness between team members, build a spirit of cooperation and improve an uncomfortable work environment.

This research produces an application that can meet the needs of users because of effective team communication with retrospective sprints carried out on almost every sprint phase. It is different from the research conducted by previous researchers who conducted a restrospective sprint as a whole [3]. The resulting application is more efficient and effective because each phase of the sprint, the difficulties and problems faced by the team will be known.

## IV. CONCLUSION

The implementation of project management consists of several detailed processes and needs to be supported by all relevant team members consistently and responsibly. With the scrum method as a framework, the implementation of this project becomes transparent and fast in producing a feature. However, an in-depth evaluation is still needed so that every work progress does not have significant obstacles. The duration of the work time for this project is estimated at 39 working days. The study also produced a backlog of 19. The focus of the

work starts from creating a view on the dashboard, creating attributes on the table in the database, coding the program, and checking the application on the dashboard. The final results obtained from this research are in the form of details of the work and scheduling, to the prototype of the interface. The expected goal is that this system can help monitor guests who come in large numbers at the prosecutor's office.

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