

## DEVELOPMENT OF WEB-BASED REPOSITORY TECHNOLOGY FOR LECTURER'S PERFORMANCE MONITORING

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**ABSTRACT-** Higher education performance assessment on Accreditation requires the results and evidence of lecturer performance. Currently, the Faculty is already using FTP and Google Drive technology. However, the weakness of using these technologies is that the Faculty still has to process data manually, so it is not effective and efficient. Therefore we need technology that can help effectively and efficiently monitor and record performance along with supporting document evidence. With this web repository, the Faculty can monitor and, at the same time, be able to draw supporting evidence for the preparation of accreditation forms. The research method used in this study is a combination method between Design Thinking and Scrum methods as a method for application development.

**Keywords:** Monitoring, Accreditation, Forms, Web, Lecturers.

### 1. INTRODUCTION

The complexity of work at the Faculty is increasing, especially in monitoring the academic activities of lecturers. The activities and activities of the lecturers are monitored by the Faculty, which is used for preparing accreditation forms and evaluating the Faculty's performance. The Faculty of Information Technology currently uses FTP (File et al.) to collect supporting evidence for lecturer activities. The results of the files contained in the FTP must be processed manually by the Faculty and then combined with reports from the research and community service directorate. The problem faced by using FTP is that it creates difficulties for the Faculty because the Faculty consider this activity ineffective and inefficient. The movement of compiling accreditation forms also requires effectiveness and efficiency in making reports and also supporting visitation activities because, in visitation activities, faculties are asked to present supporting evidence. Based on direct observation at the research location, the researchers concluded that the problems faced by FTI were caused by the absence of a media, which became a vessel that accommodated all FTI's needs in monitoring lecturer performance.

Based on these facts, the researcher proposes the development of a web-based repository that can be used by FTI lecturers and also provides an information dashboard related to the storage uploaded by the lecturer. The technology is expected to assist Faculty in monitoring and preparing the accreditation process.

The goal of developing this repository technology is to create a prototype for *tools* that can be used to facilitate faculty work in monitoring lecturer performance. The prototype describes the system so that users have an overview of the system to be developed (Marbun et al., 2021). The repository

is a storage place for hundreds of applications or files and can be accessed via the Internet (Ambriani & Iwan Nurhidayat, 2019).

There is previous research that is similar both in the research method used and the type of application developed. Research conducted by Fahrudin and Ilyasa with the title "nugas" application design uses design thinking and agile development methods. This research aims to produce an application that can assist students in managing and doing assignments. So in this research, the method used is Design Thinking for making UI/UX Design, and Agile Development is used for application development (Fahrudin & Ilyasa, 2021).

Development of the Kalimantan Institute of Technology Accreditation Data Repository Information System, conducted by Kamran et al. the development of this information system also facilitates the ITK Quality Assurance Center (PJM) in monitoring the performance of each Study Program. The software development method used in this study is the Agile methodology with the Scrum method. The development of this accreditation repository information system also uses the Laravel framework, which has implemented the Model, View, and Controller architecture. This research produced an accreditation repository information system for LKPS instruments (Kamran et al., 2020).

Research with titles development of the Kolepa mobile app user interface using the design thinking method and system usability scale. This research aims to create a mobile-based application that can make it easier for customers who want to visit by providing a table reservation feature and a mini golf score calculation feature to replace physical paper for writing scores. Before the application is developed, it is necessary to design the user interface

display (Inspiration of Firman Ashari and Rahmat Rizky Muharram 2022).

Research with the title design of a web-based application information system repository for student street vendor reports. The results of this study are a repository system in the form of a digital collection that will make it easier to manage and retrieve information and present it. As well as speeding up data search and street vendor report recap. The results of ISO 25010 testing that was carried out involving 5 respondents that the conclusion of the feasibility quality of the software with a score of 89.07% produced as a whole has a "Good" scale (Rauf et al. Tri 2021).

The method used in this study is the Design Thinking method and the Scrum method. The reason for choosing the Design Thinking method is because this method has the advantage of being able to spur innovative ideas when the team goes through the inspiration, idea, and implementation phases, often hitting each cycle more than once when developing new ideas and exploring new solutions. (Wibowo and Setiaji 2020). The advantage of using the scrum method is because a scrum method is a method that it is easy to control, flexible, and contains an overall development strategy where the entire team works as a unit to achieve the same goal. In addition, it can provide optimal satisfaction in completing requests (Nugraha et al., 2021).

## 2. STUDY OF LITERATURE

To solve this problem, the author uses the Design thinking approach method. Design Thinking is a form of collaboration that gathers many ideas from disciplines to develop an innovative solution. Design thinking is a humanist approach that focuses not only on what is seen and felt but also on the user's experience. The Design Thinking method focuses on solving problems with the early stages of defining the needs of prospective users and analyzing the problems they face (Kelana et al., 2022). Design thinking is used to find the most effective and efficient solution to a complex problem (Sari et al., 2020). The Design Thinking method is a method that also focuses on user experience (Soedewi, 2022). The Design Thinking method is very suitable for startup development cases (Chusnan et al., 2016).

The repository is a place to store or can also be interpreted as a series of services developed by institutions in the form of digital management and dissemination of various results of scientific activities (Harliansyah, 2016). The policy to create online services for the results of lecturers' scientific work so that the public can access them widely is necessary (Nuraeni & Kurniawaty, 2019).

An information system is a service used to disseminate information to all organizational stakeholders (Kemenristekdikti, 2010).

The Scrum method is an Agile method that is quite popular today (Muhammad et al., 2017). This method

is adaptive, repeatable, fast, flexible, and effective. Scrum guarantees transparency in application development.

## 3. RESEARCH METHODS

The research method used combines Design Thinking and Agile methods. Design Thinking researchers use to identify problems and select solutions that follow the conditions that exist in the Faculty. At the same time, Agile is used to develop applications.

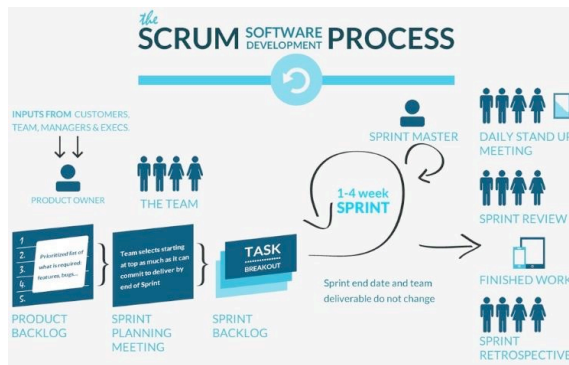


Picture 1. Design Thinking method (Fariyanto and Ulum 2021)

1. *Empathize*: In this phase, and the researcher will identify the problems faced by the Faculty by observing the activities of collecting documents supporting the performance of lecturers.
2. *Define*: From the output of the next Empathize phase is to analyze needs according to the problems that arise in these activities. The approach used in this phase is a human-centered approach by creating personas from prospective users from the lecturer and faculty perspective.
3. *Ideate*: The Ideate phase is a phase where researchers think about what innovations are best suited to the problems in document collection activities to support lecturer performance.
4. *Prototype*: After validating the solution innovations, the research team will then create a prototype using Figma as a medium. Figma is used to display UI/UX as a manifestation of phases 1, 2, and 3 in design thinking.
5. *Test*: The last step after creating a prototype is testing the prototype on the personas that have been defined in the previous phase.

For application development, the research team will use the Scrum method. The consideration is using the Scrum method because the time allotted for web development is very short, which is less than three months. Therefore the research team agreed to use the method.

This.



Picture2. Scrum(Warkim et al. 2020)

Documents in Scrum are(Schwaber and Sutherland 2020):

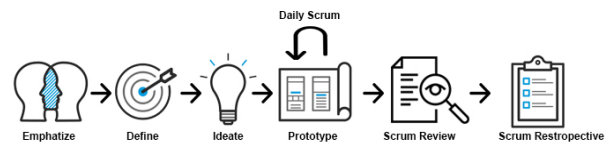
1. *Product Backlog*: This is a list of what features will appear in the development
2. *Sprint Backlogs*: These are part of the features that will be done in a sprint. Before carrying out a Sprint, the team will determine what features will be worked on which are taken from the Product backlog.
3. *Sprint*: Sprint is a process in which product results are presented in the form of a prototype to the parties involved in the certification process(Suharno et al., 2020).

Scrum Events is(Kadenic, Koumaditis, and Junker-Jensen 2023):

1. *Sprint Planning*: The team determines the steps and success variables for the Sprint. The success variable is a condition where the Sprint activity is considered complete.
2. *Sprints*: An activity to create features according to Sprint Planning. In this activity, the team may not carry out other activities and focus on the specified task.
3. *Daily Scrums*: It is an activity every day where the research team and the Faculty review the progress of the work.
4. *Sprint Reviews*: This is an internal meeting held at the end of the Sprint, and the results are displayed to stakeholders.
5. *Retrospective Sprints*: In this activity, the research team will review the Sprint. Analyze what are the obstacles during the Sprint.

## 4. RESULTS AND DISCUSSION

The development of this repository is done by combining two methods, namely the design thinking method and the Scrum method. After conducting an assessment of the framework of each method, the researcher designed a framework that is a combined method of the two methods.



Picture3. A combined method of design thinking and Scrum

### 4.1. Emphasize

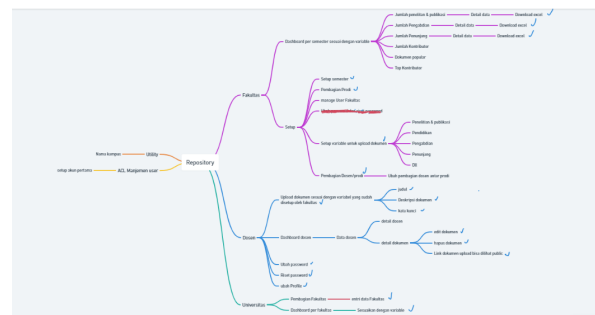
In the empathize stage, direct observation of the running system is carried out in the faculties that are the object of research. From the results of the monitoring, it was found that the running system that had been used so far was not very effective in supporting the process of monitoring lecturer performance by the Faculty.

### 4.2. Define

After identification of the next problem analyzing needs according to the problems that arise in the results of the empathize stage. The approach used in this phase is a human-centered approach by creating personas from prospective users from the lecturer and faculty perspective.

### 4.3. idea

In the Ideate phase, the researcher thinks about what innovation is best suited to the problems in the collection of supporting documents for lecturer performance. The research team conducted interviews with lecturers and Faculty to validate the innovative solutions offered.



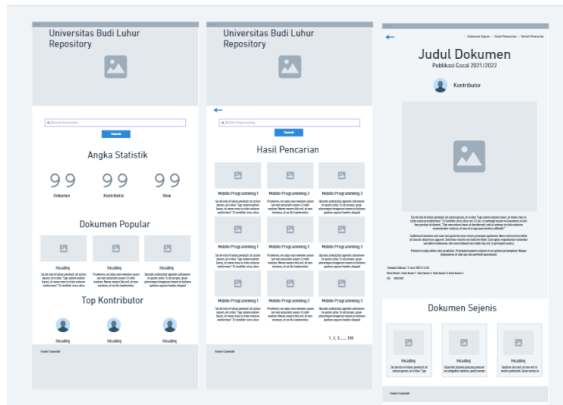
Picture4. System flow framework

From the results of the ideate stage, an agreement was obtained regarding the system modeling that will be used in the lecturer performance monitoring repository, as shown in Figure 4. Details of the system flow framework can be accessed at <https://whimsical.com/repositori-k3askjsuZFAqJ9oDIKsvo>.

### 4.4. Prototype

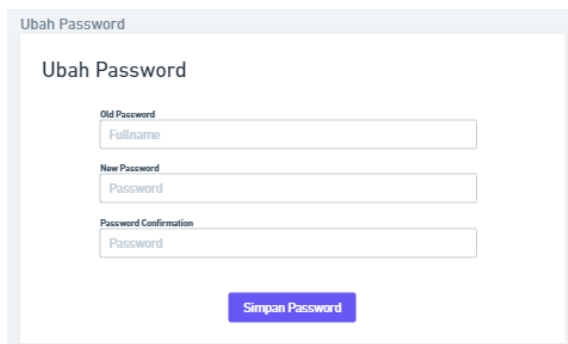
At the prototype stage, the researcher designed a prototype for all user access rights, both from the lecturer and faculty perspectives. The prototype image presented below has passed the daily Scrum stage several times and is the final prototype that will

be used in the development of the lecturer monitoring repository.



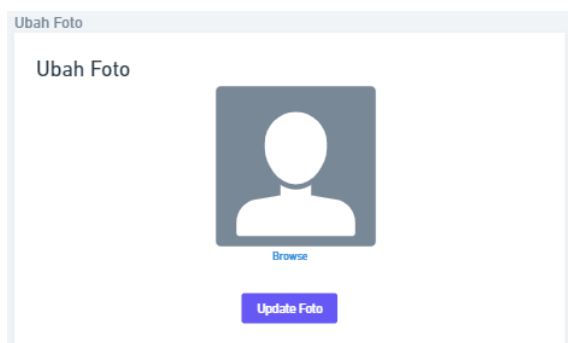
Picture5. Veranda prototype

For lecturer interface 8, there are features that will be developed, namely: Change passwords, change profile pictures, upload documents, lecturer profiles, document search features, document lists, and Edit documents.



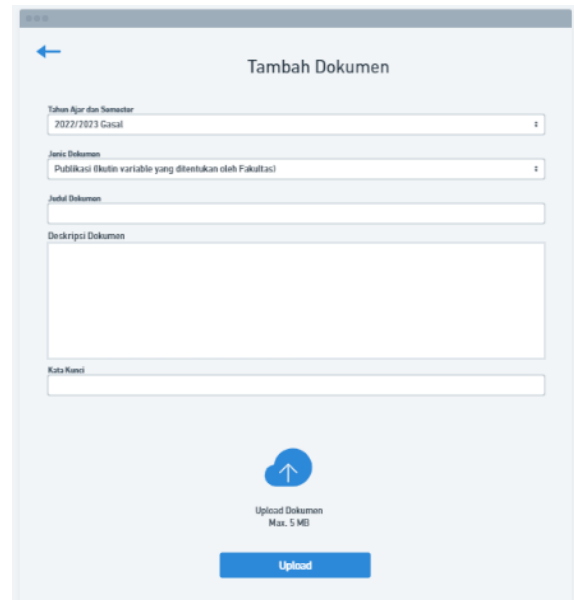
Picture6. Prototype change password page

The change password page allows lecturers to change passwords if it is felt that the default password provided by the Faculty is too difficult to remember or too vulnerable.



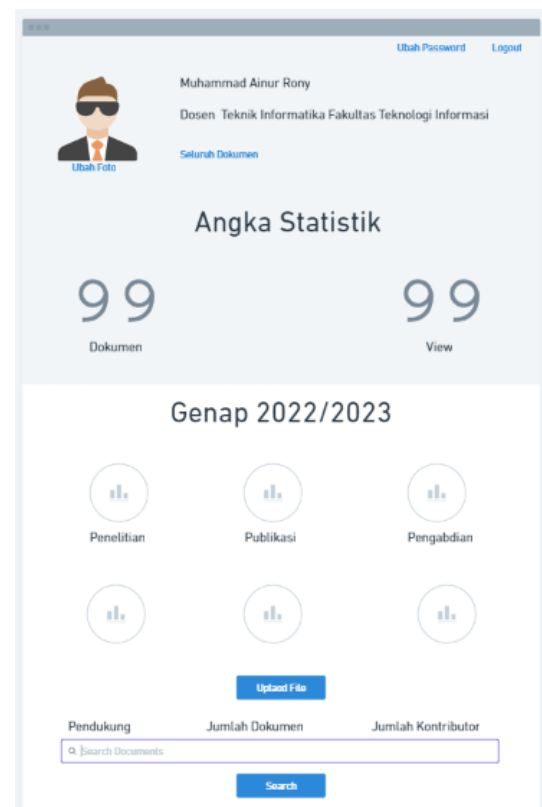
Picture7. Prototype page change profile picture

*Prototype* This is designed for photo change features for lecturers.



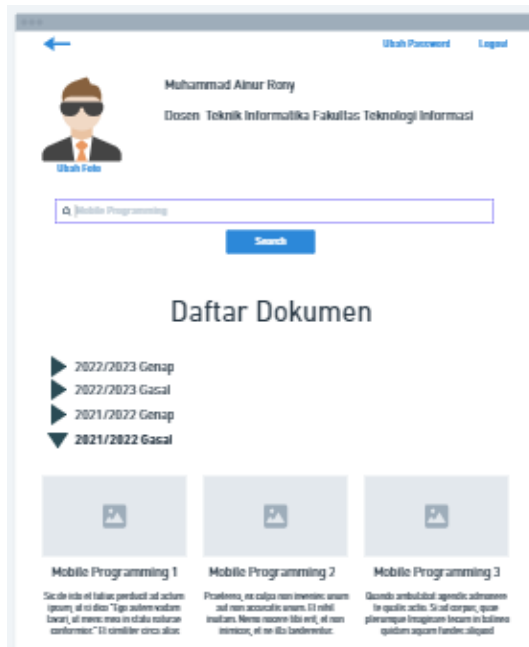
Picture8. Document upload page prototype

*Prototype* This is designed for the needs of lecturers in uploading evidence of the implementation of higher education tri dharma, starting from teaching, research, and also community service.



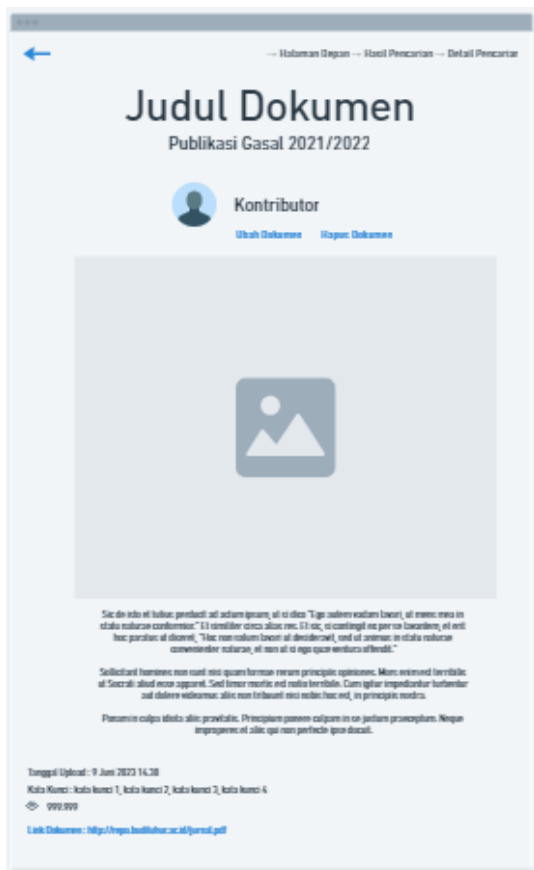
Picture9. Lecturer profile page prototype

This page contains a profile of the implementation of the tri dharma of higher education that has been carried out by the lecturer concerned.



Picture10. Document list page prototype

This page allows lecturers to access a list of documents that have been uploaded, which have been sorted based on the academic year of implementation.

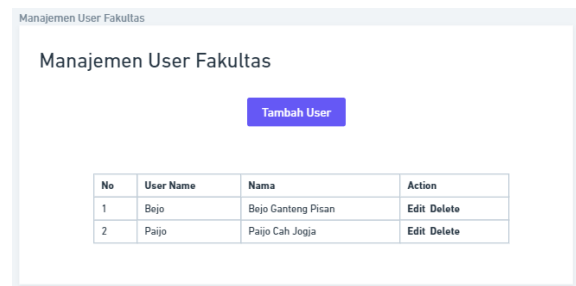


Picture11. Document edit prototype

This page allows lecturers to delete and change documents if an error occurs in the document upload process.

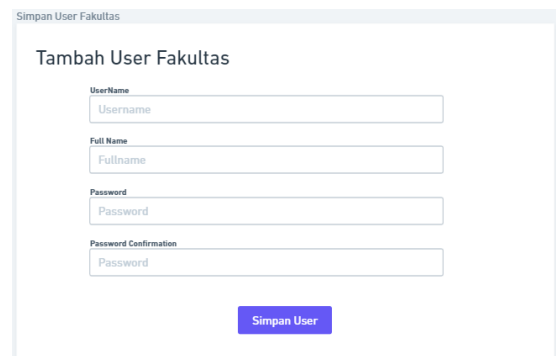
For details on the prototype page of the lecturer can be accessed at the following link <https://whimsical.com/dashboard-dozen-EuM6HtLKvNxYvy2VDJRM8D>.

For faculty-level access rights, 13 features will be developed, namely: User management, save user, edit user, setup management and school year, set up study program, pop up study program, change study program, contributor list, setup contributor list, export contributor data, faculty profile, research dashboard pop up, document detail dashboard pop up, and contributor dashboard pop up.

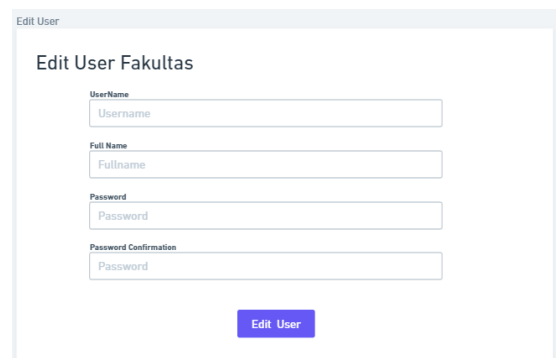


Picture12. Prototype of faculty user data page

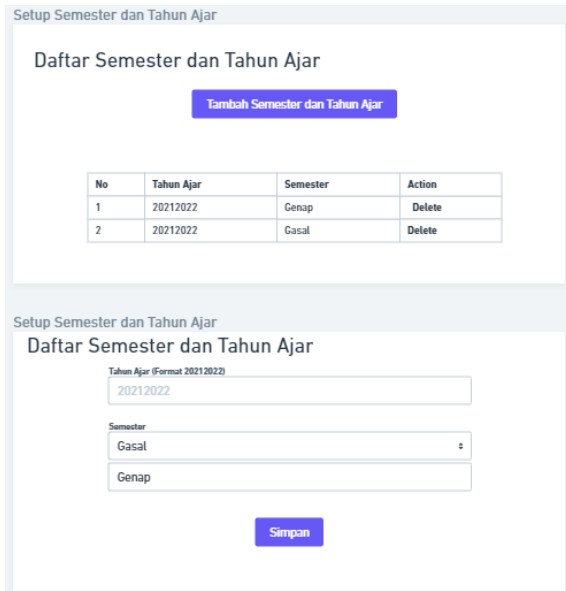
This page contains a list of users from a faculty that uses the repository system. Besides being able to view the list of users, a feature is also provided to add users (Figure 13) and also edit users (Figure 14).



Picture13. The prototype page added a user

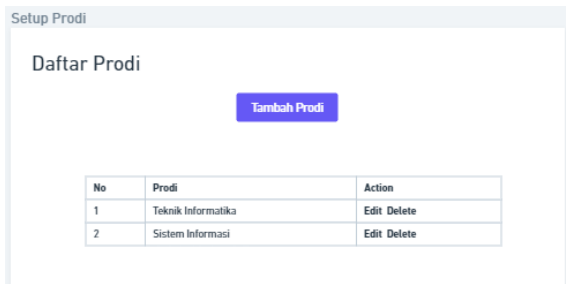


Picture14. User edit page prototype



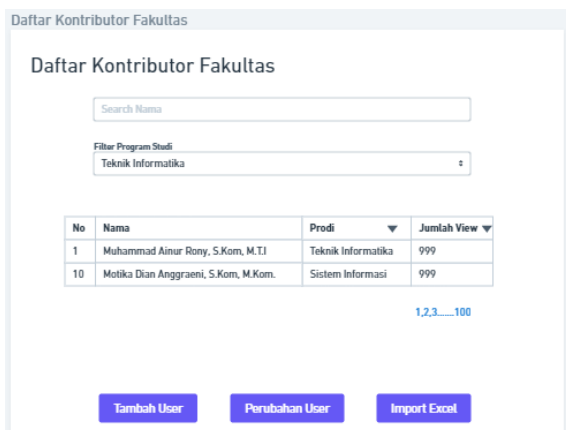
Picture15. Prototype of semester and school year pages

Figure 15 is a prototype for semester and school year pages. The first image lists the school year. In addition to the school year data, users can also add semester and school year lists, as shown in the second image.



Picture16. Prototype of study program list page

The continuation of Figure 16 is a page that allows the user to add a list of study programs and also make edits if an error occurs during the input process.



Picture17. Faculty contributor page prototype



Picture18. Faculty profile page prototype

Figure 18 contains a summary of the profiles of all lecturers in terms of carrying out their obligations as a lecturer, including the obligations to implement the tri dharma of higher education.

Details of the prototype for the faculty page can be accessed at the following link <https://whimsical.com/dashboard-fakultas-UMdzrC2XMzA6BEv4ZDMFHg>.

## 5. CONCLUSIONS AND RECOMMENDATIONS

After conducting a series of research, it can be concluded that developing a repository for lecturer performance can be done well by combining two methods, namely the design thinking method and the Scrum method. The result of this research is a prototype that has gone through the review process several times by the user and has been approved by the user as a prototype that will be used in the development of lecturer performance monitoring repositories.

Suggestions for future researchers are to develop a web-based repository system that can be accessed anytime and anywhere by lecturers and Faculty as the monitoring party.

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