Web-Based Monitoring and Synchronization of Lecturers SKS Information System (Case Study of Muhammadiyah University Cirebon)

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Keywords:	ABSTRACT
web-based monitoring; SKS information system; synchronization	Institutions of higher education are increasingly embracing technology to enhance administrative processes and improve efficiency. This study presents a case study conducted at Muhammadiyah University Cirebon, focusing on the development and implementation of a web-based monitoring and synchronization system for lecturer SKS (Sistem Kredit Semester) information. The system aims to streamline the process of monitoring lecturer workload and credit distribution, thereby optimizing academic resource allocation. Through a combination of qualitative and quantitative research methods, including interviews, surveys, and system evaluation, this study examines the effectiveness and user satisfaction of the implemented system. Findings indicate significant improvements in administrative efficiency, transparency, and data accuracy. Moreover, feedback from users demonstrates a high level of satisfaction with the system's usability and functionality. The study contributes to the body of knowledge on the application of web-based systems in academic institutions and provides insights for similar implementations in other contexts.

Introduction

Higher education occupies a very strategic position in producing quality human resources. This is in accordance with the purpose of higher education, which is to prepare students to become members of society who have academic and/or professional competencies who are able to apply, develop, and/or enrich their lives rich in science, technology, and/or art. (Mohamed & Abbas, 2011). For this reason, it is necessary to prepare universities with all their equipment, the most important thing is teaching staff as the main driver of learning activities. Therefore, faculty members should benefit from planned and commensurate career development. This requirement is also stated in

Government Regulation No. 19 of 2005, National Education Standards, Articles 45 and 46 (Nuraeni & Henderi, 2010).

Law No. 14 of 2005 mandates Teachers and Lecturers, Government Regulation of the Republic of Indonesia No. 37 of 2009 concerning Lecturers, which stipulates that lecturers are professional educators and scientists with an original mission to transform, develop, and disseminate science, technology, and art through education, research, and community service (Kato, Ogata, Inoue, & Goto, 2018). Lecturers are important supporters in higher education, carrying out the tridharma of higher education with a minimum workload of 12 (twelve) credits and a maximum of 16 (sixteen) credits (Urva &; Sellyana, 2020).

University of Muhammadiyah Cirebon is a university whose teaching and learning planning process is carried out at the beginning of each new semester, with stages: Faculty staff collect resource data, including curriculum, syllabus, lecturer data, lecturer competency matrix, and competency summary; (Wiesner & Kovácsházy, 2022) The head of the study program conducts a needs analysis with available resources; If the available resources are not met, the Head of the study program will make a list of outstanding lecturers who may be qualified; Conversely, if resources are met, the next procedure is for the head of the study program to propose the allocation of resources (Paronen, 2015). Collecting allocations to faculties and faculties makes a recapitulation of the distribution of lecturer tasks to the LPKP Institute (Institute for Curriculum Development and Learning) for the semester that will run (Reimers & Stewart, 2016).

It is often stated by the academic field that many cases of lecturers do not fulfill teaching obligations both in terms of the number of credits and in terms of punctuality. This can happen because there is no system used for monitoring and synchronizing lecturer credits. (Pardede &; Novriyenni, 2018).

The purpose of this research is to create a system that can check or monitor lecturer credits and create a system that can calculate and synchronize the number of lecturer credits. And the purpose of this study is to make it easier for Study Program Staff to monitor lecturers, make it easier for Study Program Staff to synchronize lecturer credits and make it easier for Study Program Staff to calculate Lecturer Credits. While the benefits of this research are expected to be a benchmark for the University of Muhammadiyah Cirebon to produce scholars who can carry out system development in a company.

Research Methods

In this study, the author uses a descriptive analysis method, which is a method that describes a situation or problem that is happening based on facts and data obtained and collected when carrying out research.

In this study, the author uses the analysis description research method because the author collects data by looking directly at the conditions in the field so that it can be taken into consideration in decision making. The time it took researchers was 4 months to complete this study.

Place and Time of Research

The place of research in making monitroring information systems and synchronizing lecturers' credits is at the University of Muhammadiyah Cirebon, located in Watubelah village, Sumber District, Cirebon Regency, West Java.

Data Collection Techniques

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Data Collection Techniques in this study were observed, namely reviewing and observing directly to the research location to find out directly about the credit distribution system and its application at the University of Muhammadiyah Cirebon as a research object and record several important things related to the research topic. Interviews were also conducted by conducting face-to-face questions and answers with the head of the study program, lecturers and administrative staff of the Faculty of Engineering, University of Muhammadiyah Cirebon who knew about the distribution of credits and their application at the University of Muhammadiyah Cirebon.

System Development Methods

The system development method applied in this study is using the waterfall method. According to (Pressman, 2016) press The waterfall model is a classic model that is systematic, sequential in building software. The name of this model is actually "Linear Sequential Model". This model is often referred to as the "classic life cycle" or waterfall method.
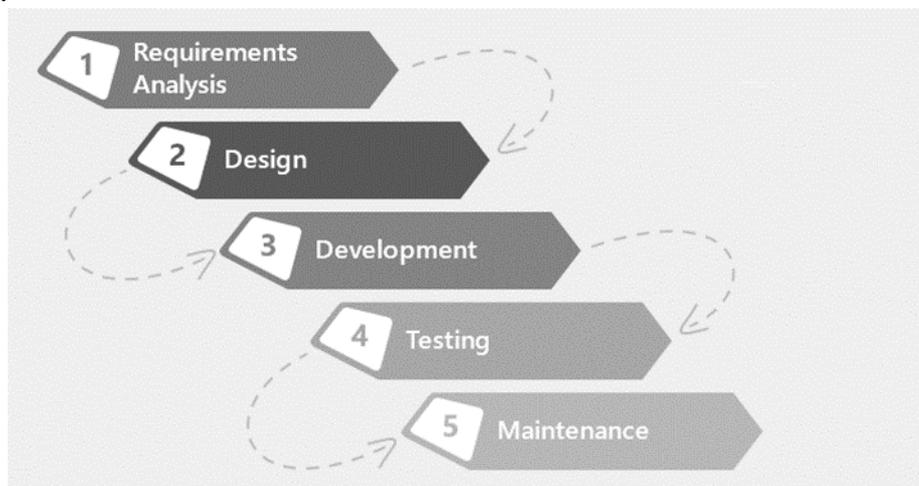
Figure 1 Waterfall Method

For more details, here are the phases in the Waterfall model:

1) Requirement Analysis

At this stage, system developers need a communication that aims to understand the software needed by users and software limitations. This information can usually be obtained through interviews, surveys or discussions.

2) System Design

In the design process, translation of the requirements needs into a software design design that can be estimated before the coding process is made. This process focuses on data structures, software architecture, interface representations, and procedural algorithm details.

3) Implementation

At this stage occurs the process of translating the design design into a form that can be understood by machines, using programming language code code. The resulting program code is still in the form of small modules that will later be combined in the next stage.

4) Integration & Testing

At this stage, a combination of modules that have been made is carried out and this test is carried out to find out whether the software made is in accordance with its design and function in the software there are errors or not.

5) Operation & Maintenance

This is the last stage in the waterfall model. The finished software is run and maintained. Maintenance is included in fixing errors not found in the previous step. Improved implementation of system units and improved system services as new needs

Results and Discussion

Application Usage

The use of applications generated from the Lecturer Credit Monitoring and Synchronization Information System is able to assist the implementation of education, so that universities can monitor and synchronize lecturer credits and can calculate the number of lecturer credits (AbdelRaheem, Hassan, Mohammed, & Nassr, 2022).

Applications that are made are still in the scope of localhost or are in a local network that is connected to each other, so before using this application, in a PC or laptop must be installed a web server, such as Appserver, WAMP, XAMPP, Laragon then import MySQL databases from this application, and activate the web server (Hartmann, Beaudouin-Lafon, & Mackay, 2013).

Information System for Monitoring and Synchronizing Lecturer Credits in general can be explained and divided into 7 users, namely administrators, HR staff, academic staff, study program staff, lecturers, vice rector 1 and faculty admin (Barbosa & Llevado, 2019).

Login Page Display
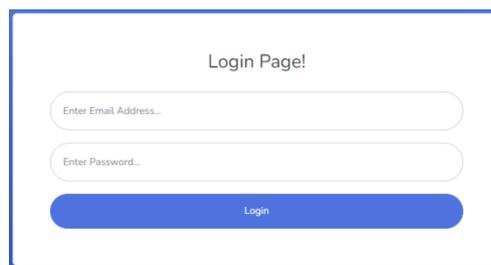
Figure 2 What The Login Page Looks Like

Login Page Display is a Login Page, on this page there are two input fields email address, password and a login button. Email address input field to enter email address, password input field to enter password. Login button that functions to enter the system in accordance with user access rights (Zhang, 2019).

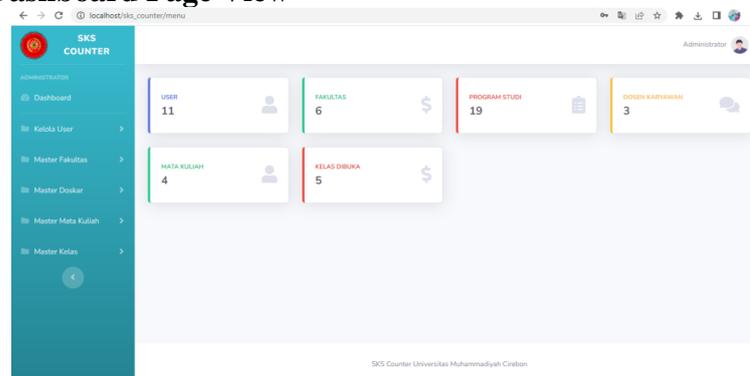**Administrator Dashboard Page View**

Figure 3 Administrator Dashboard Page View

Administrator Dashboard Page Display is a *dashboard page* after successfully logging into the system with Administrator access rights (Zhang, 2022).

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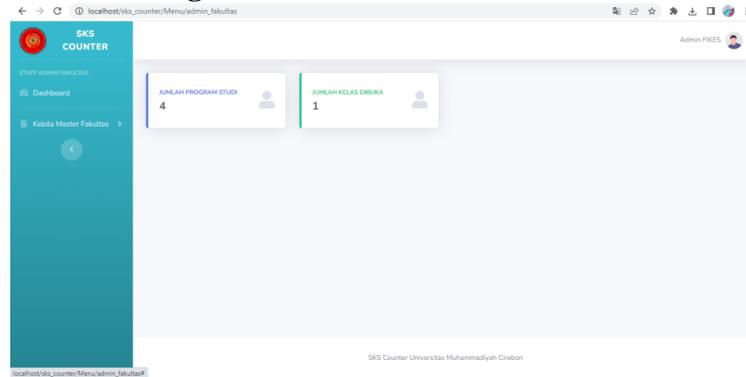**Faculty Admin Dashboard Page View**

Figure 4 Faculty Admin Dashboard Page View

The Faculty Admin Dashboard Page is a *dashboard page* after successfully logging into the system with Faculty Admin access rights.
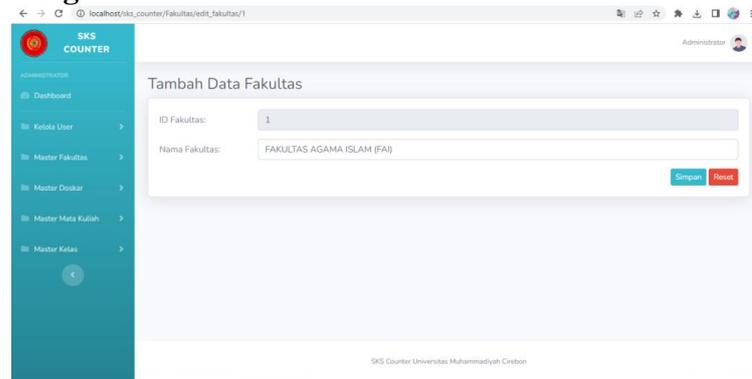
Master Data Page View

Figure 5 Master Data Page view

The master data page view is a master data page with administrator privileges. On this page there is a table of master data that has been saved, an add data button and an export button. The add data button can be used to enter master data one by one. The add data import button can be used to insert master data by using an excel file. The export button can be used to *download* the master data file (Skibniewski et al., 2014).

Master Data Input Page View
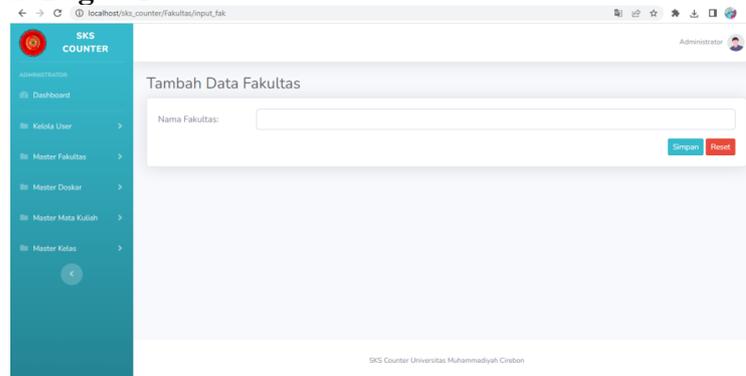
Figure 6 Master Data Input Page Display

The master data input page display is a master data input page with administrator
privileges. On this page, administrators can enter master data one by one and save it.

Edit Master Data Page View

Figure 7 The Edit Master Data page view

The master data edit page view is a master data edit page with administrator
privileges. On this page the administrator can change the master data by id and can
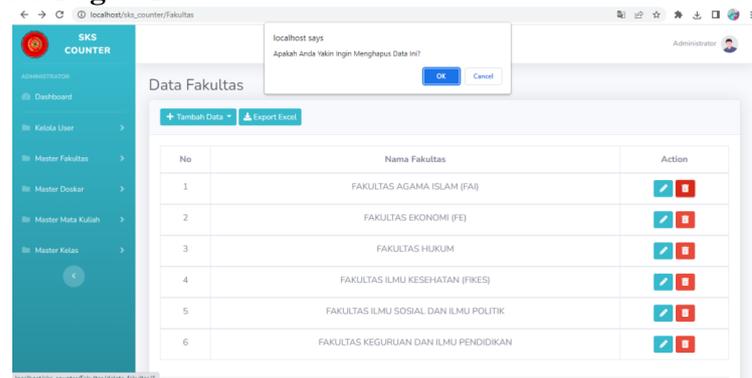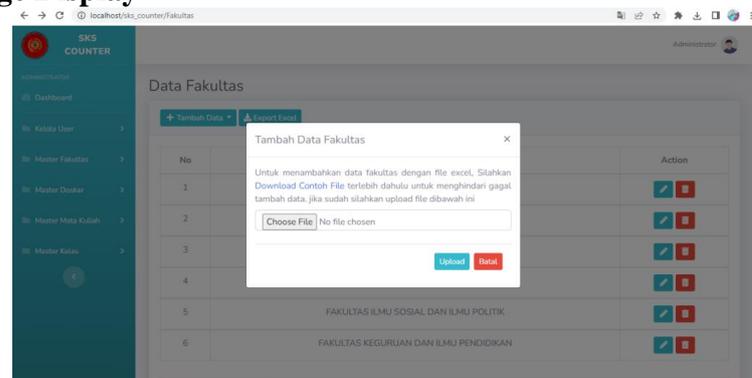be saved.

Delete Master Data Page View

Figure 8 Delete Master Data Page Display

The *delete* master data page display is a *delete* master data page with administrator
privileges. On this page, administrators can delete master data by id.

Import Data Page Display

Figure 9 Import Data Master Page Display

The import master data page display is a master data import page with administrator
privileges. On this page administrators can enter master data by using excel files.

Export Data Page Display
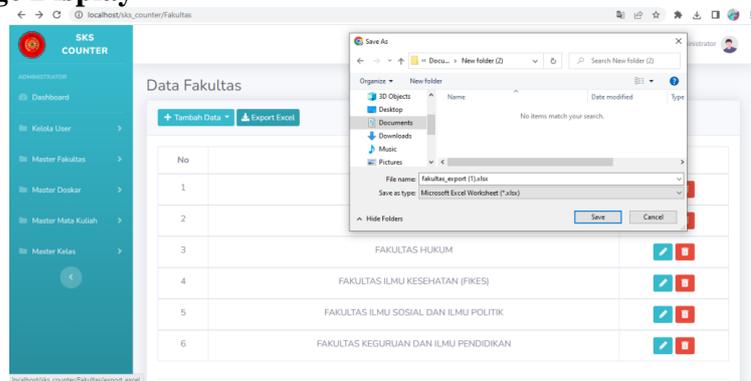
Figure 10 Display of Export Data Master Page

The export data master page display is an export data master page with administrator privileges. On this page the administrator can download the master data excel file.
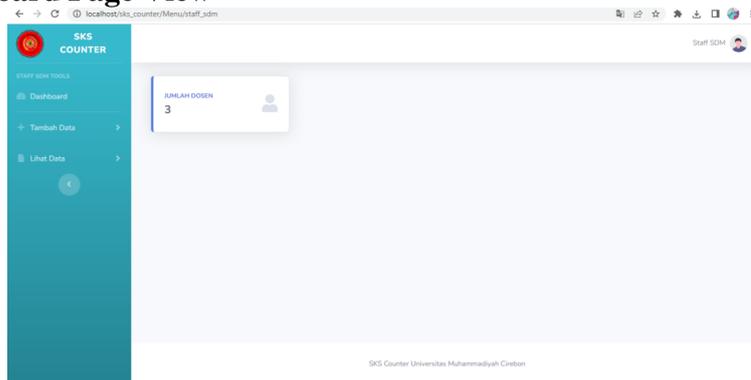
HR Staff Dashboard Page View

Figure 11 HR Staff Dashboard Page View

The HR Staff Dashboard Page is a dashboard page after successfully logging into the system with HR Staff access rights.
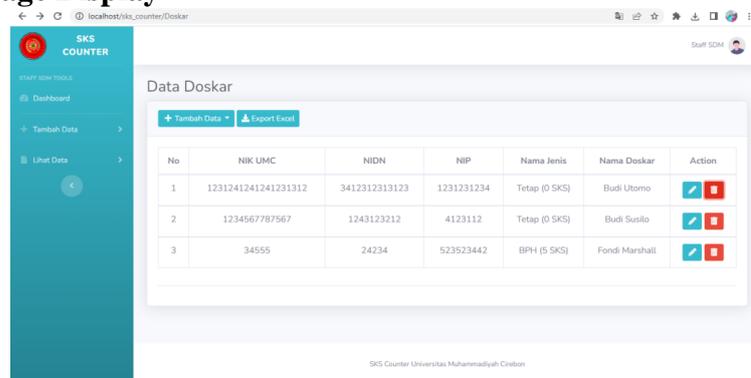
Lecturer Data Page Display

Figure 12 Lecturer Data Page Display

The display of the lecturer data page (HR staff) is a lecturer data page with HR staff access rights. On this page there is a table of lecturer data that has been saved, an add data

button and an export button. The add data button can be used to enter lecturer data one by one. The add data import button can be used to enter lecturer data using excel files. The export button can be used to *download* lecturer data files.
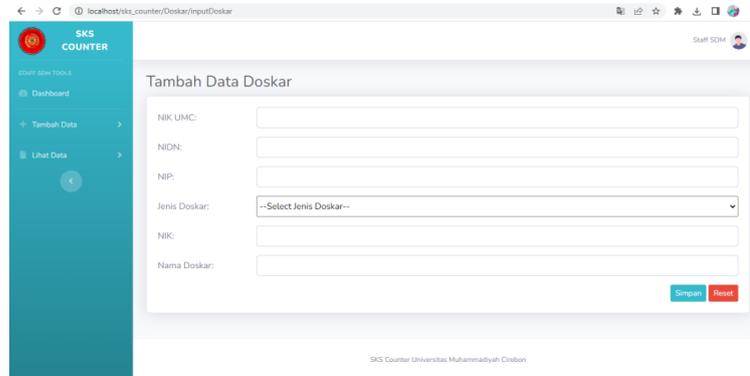
Display of Lecturer Data Input Page

Figure 13 Display of Lecturer Data Input Page

The display of the lecturer data input page is a lecturer data input page with administrator and HR staff access rights. On this page, administrators and HR staff can enter lecturer data one by one and save it.

Edit Lecturer Data Page View
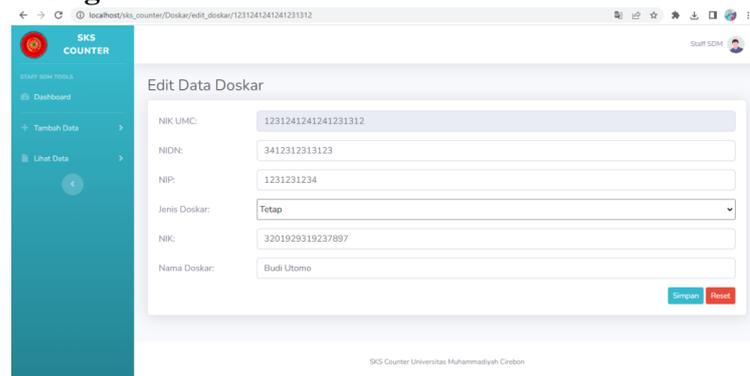
Figure 14 Page View Edit Lecturer Data

The display of the lecturer data edit page is a lecturer data edit page with administrator and HR staff access rights. On this page, administrators and HR staff can change lecturer data based on id and can be stored.

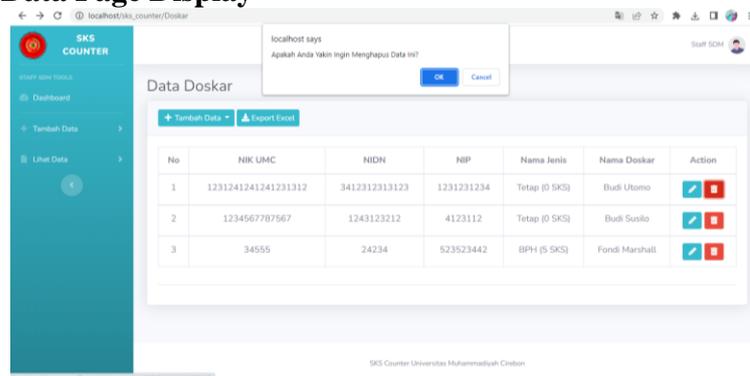**Delete Lecturer Data Page Display**

Figure 15 Page Display Delete Lecturer Data

The display of the *lecturer data delete* page is a lecturer data delete page with administrator and HR staff access rights. On this page, administrators and HR staff can delete lecturer data based on id.
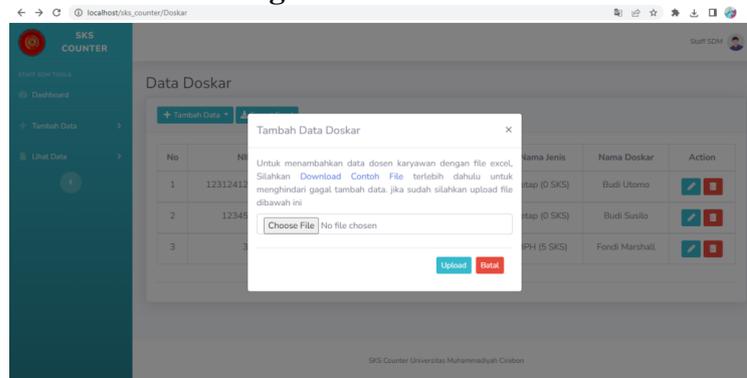
Display of Import Lecturer Data Page

Figure 16 Display of Lecturer Data Import Page

The display of the lecturer data import page is a lecturer data import page with administrator and HR staff access rights. On this page, HR administrators and staff can enter lecturer data using excel files.
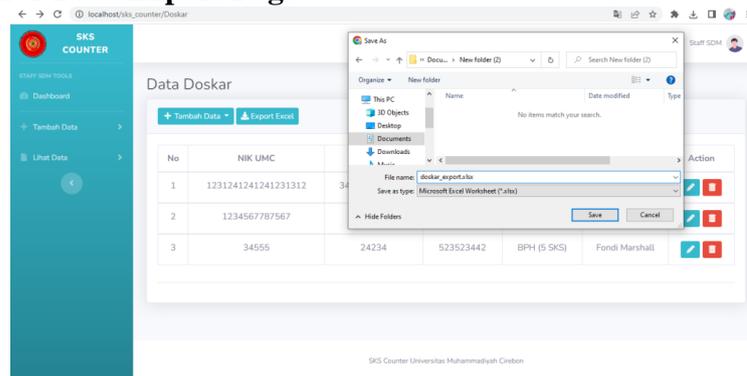
Display of Lecturer Data Export Page

Figure 17 Display of Lecturer Data Export Page

The display of the lecturer data export page is a lecturer data export page with administrator and HR staff access rights. On this page, administrators and HR staff can download excel files of lecturer data.
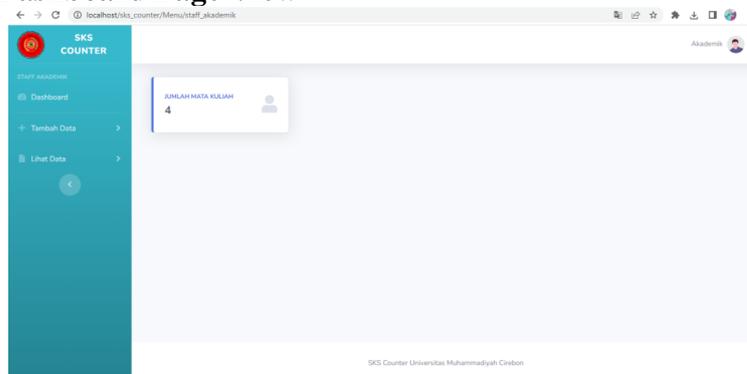
Academic Staff Dashboard Page View

Figure 18 Academic Staff Dashboard Page View

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The Academic Staff Dashboard Page Display is a dashboard page after successfully logging into the system with Academic Staff access rights.
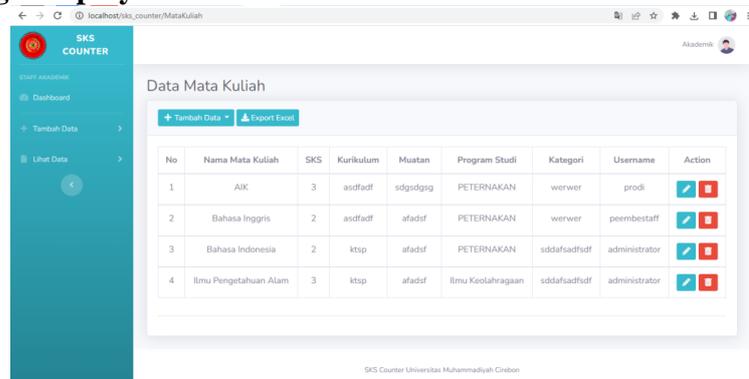
Course Data Page Display

Figure 19 Course Data Page Display

The course data page display is a course data page with access rights for academic staff and administrators. On this page there is a table of course data that has been saved, an add data button and an export button. The add data button can be used to enter course data one by one. The add data import button can be used to enter course data using an excel file. The export button can be used to *download* course data files.

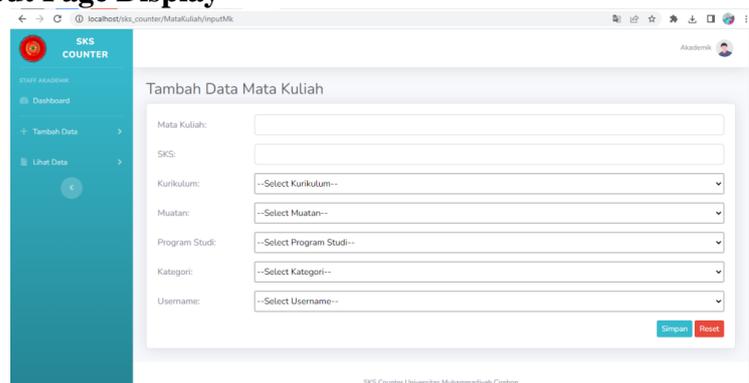**Course Data Input Page Display**

Figure 20 Course Data Input Page Display

The display of the course data input page is a course data input page with administrator and academic staff access rights. On this page, administrators and academic staff can enter course data one by one and save it.
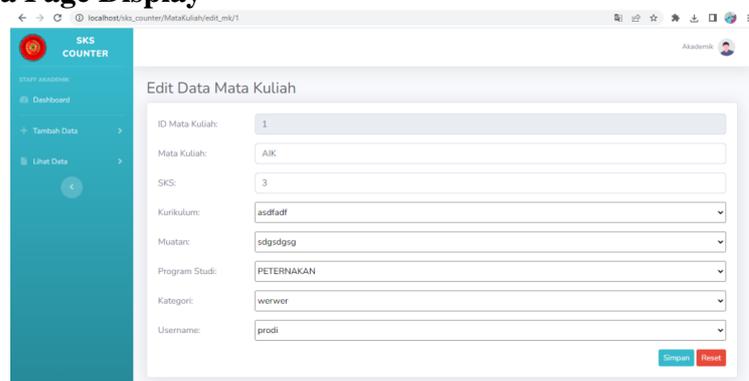
Edit Course Data Page Display

Figure 21 Page Display Edit Course Data

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The display of the course data edit page is a course data edit page with administrator and academic staff access rights. On this page, administrators and academic staff can change course data based on id and can be saved.
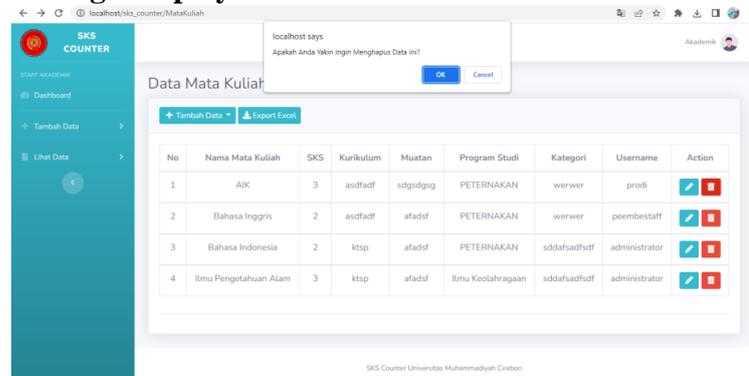
Delete Course Data Page Display

Figure 22 Page Display Delete Course Data

The course data *delete* page display is a course data *delete* page with administrator and academic staff access rights. On this page, administrators and academic staff can delete course data based on id.
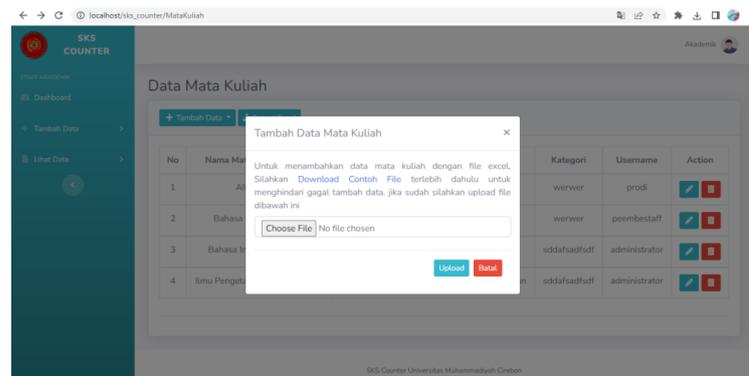
Course Data Import Page Display

Figure 23 Display of Course Data Import Page

The display of the course data import page is a course data import page with administrator and academic staff access rights. On this page, administrators and academic staff can enter course data using excel files.
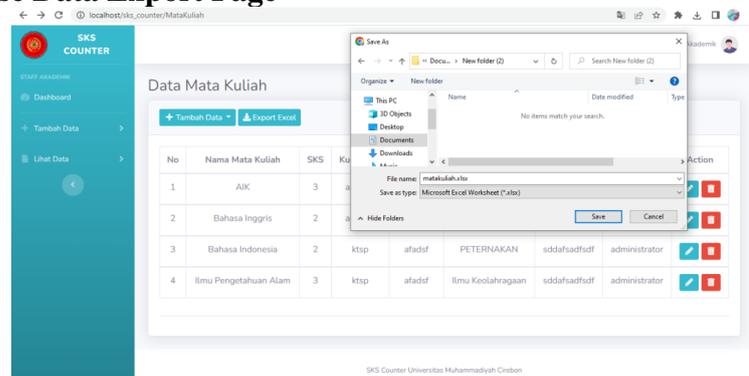
Display of Course Data Export Page

Figure 24 Display of Course Data Export Page

The display of the course data export page is a course data export page with administrator and academic staff access rights. On this page, administrators and academic staff can download excel files of course data.

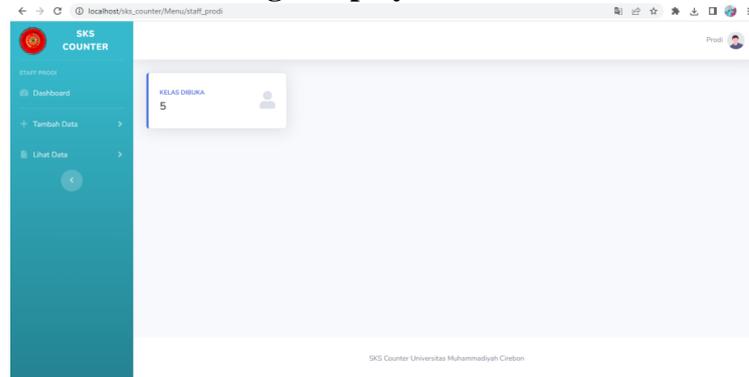**Study Program Staff Dashboard Page Display**

Figure 25 Display of Study Program Staff Dashboard Page

The Study Program Staff Dashboard Page is a dashboard page after successfully logging into the system with the access rights of Study Program Staff.
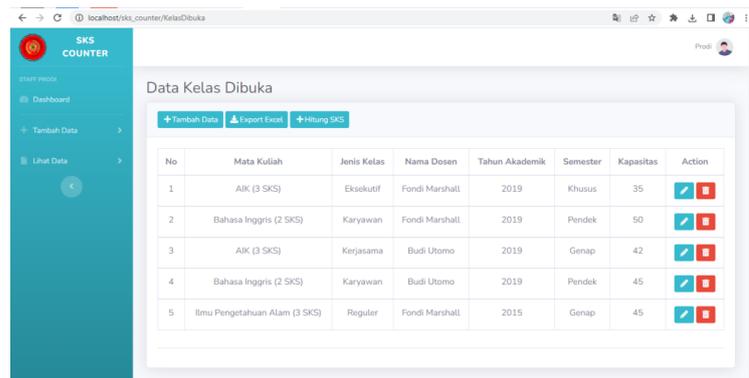
Class Data Page View Opened

Figure 26 Class Data Page View Opened

The display of the opened class data page is an opened class data page with administrator access rights, study program staff and faculty admins. On this page there is an opened class data table that has been saved, an add data button and an export button. The add data button can be used to enter class data opened one by one. The add data import button can be used to insert class data opened by using an excel file. The export button can be used to *download* the opened class data file.

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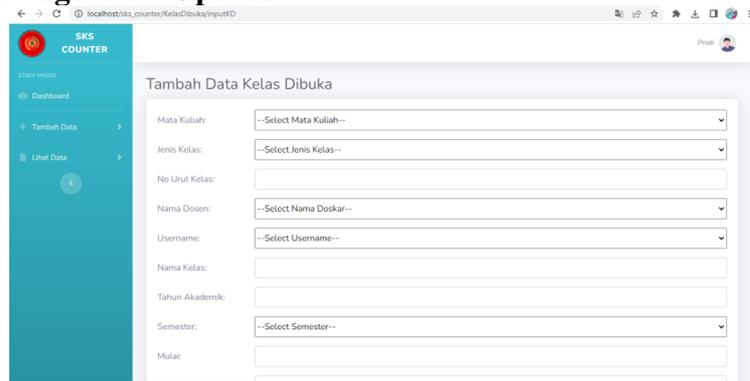
Class Data Input Page View Opened

Figure 27 Class Data Input Page View Opened

The display of the class data input page is opened is a class data input page opened with administrator access rights, study program staff and faculty admins. On this page, administrators, study program staff and faculty admins can enter class data, opened one by one and saved.
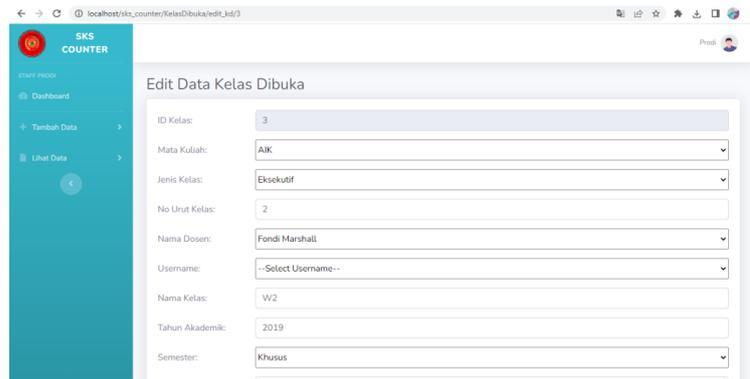
Edit Class Data page view opens

Figure 28 View of Edit Class Data Page Opened

The display of the class data edit page is opened is a class data edit page opened with administrator access, study program staff and faculty admins. On this page administrators, study program staff and faculty admins can change the opened class data based on id and can be saved.
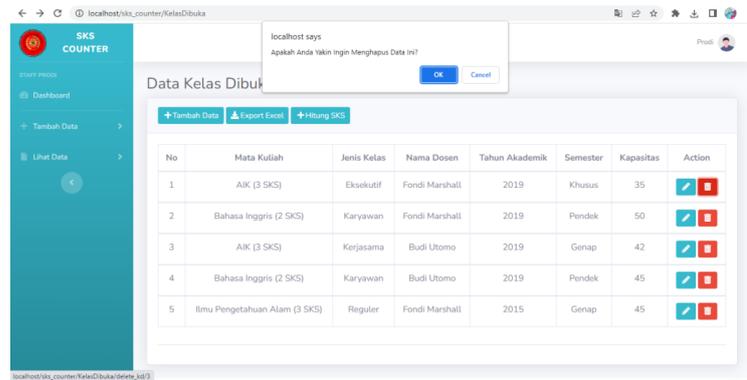
Delete Class Data Page View Opened

Figure 29 Page view of Delete Class Data Opened

The display of the *delete* class data page opened is a delete class data page opened with administrator access rights, study program staff and faculty admins. On this page administrators, study program staff and faculty admins can delete opened class data based on id.

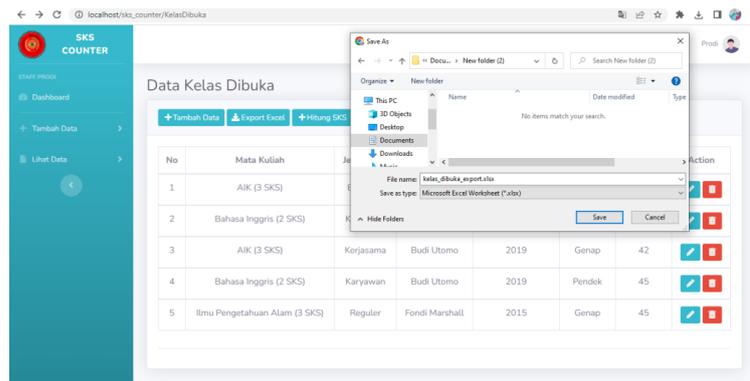**Export Class Data Page Display Opened**

Figure 30 Display of Class Data Export Page Opened

The display of the class data export page is opened is an open class data export page with administrator access rights, study program staff and faculty admins. On this page, administrators, study program staff and faculty admins can download the opened class data excel file.
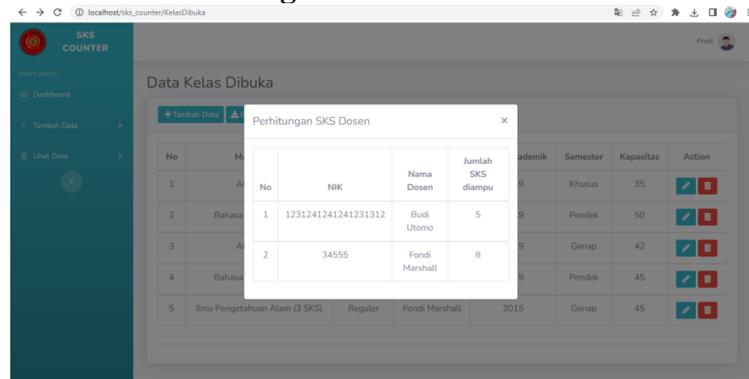
Display of Lecturer Credit Count Page

Figure 31 Page Display of Calculating Lecturer Credits

The display of the lecturer credit count page is a lecturer credit count page with access rights of administrators, study program staff, faculty admins and lecturers. On this page administrators, study program staff, faculty admins and lecturers can display the number of credits held by lecturers.
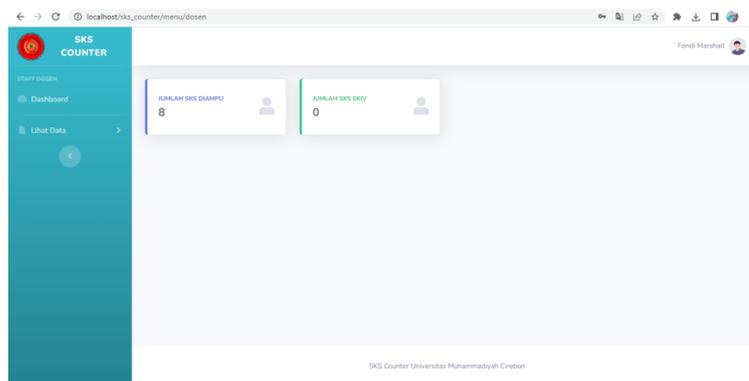
Lecturer Dashboard Page Display

Figure 32 Lecturer Dashboard Page View

The Lecturer Dashboard Page Display is a dashboard page after successfully logging into the system with lecturer access rights.
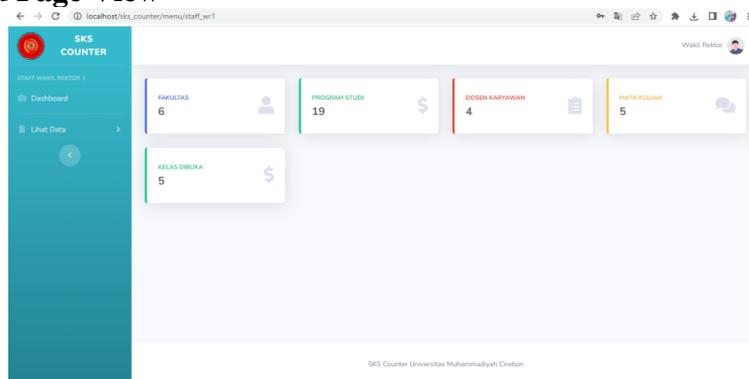
WR1 Dashboard Page View

Figure 33 WR1 Dashboard Page View

WR1 Dashboard Page Display is a dashboard page after successfully logging into the system with WR1 access rights

Conclusion

The following conclusions can be drawn in the following research is that the system can monitor the credits of lecturers by filling in absences in each course or class, the system can synchronize credits between lecturers of the same course, and the system can calculate the number of lecturer credits and provide information if the lecturer has exceeded the limit of the lecturer's credit load.

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