



Development of a Semester Learning Plans System based on OBE (Outcome-Based Education)

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Abstract. The increasingly rapid development of the industrial world and technology requires the world of education, especially UPN "Veteran" Yogyakarta as a tertiary institution, to continue to be able to adapt relevant curricula. The concept of preparing a curriculum based on Outcome-Based Education (OBE) is used so that the educational curriculum can be integrated with existing needs in the industry. OBE focuses on the formation of graduates who can achieve learning including aspects of assessing attitudes, knowledge, and skills which are stated in the formulation of Graduate Learning Outcomes (CPL). OBE's achievements can be seen from the preparation of study program curricula with study materials, the formation of courses along with credit weights, curriculum maps, and learning designs expressed in the form of Semester Learning Plans (RPS). Making RPS in the UPN "Veteran" Yogyakarta environment still uses Microsoft Word and Excel manual tools, causing differences in the format for filling out the RPS in each study program. RPS data storage that is not yet centralized makes it difficult to monitor the feasibility and development of CPL, as well as difficult to access RPS information. Therefore, an OBE-based RPS information system in web form is needed. This information system is expected to be able to standardize the format for filling out the RPS and make it easier to access RPS information online, making it easier for lecturers and the RPS development team to monitor the feasibility of the CPL that has been determined.

Keywords: Curriculum, RPS, OBE, CPL, web

1 Introduction

The increasingly rapid development of the industrial world and technology requires the world of education, especially UPN "Veteran" Yogyakarta as a tertiary institution, to continue to be able to adapt relevant curricula to produce educated human resources who have abilities by developments in needs and science and technology. The curriculum is a set of plans and arrangements regarding objectives, content, and learning materials as well as methods used as guidelines for implementing learning activities to achieve the goals of higher education [1]. One approach used to accommodate 21st-century education is Outcome-Based Education (OBE).

Outcome-Based Education (OBE) is a learning method that focuses on outcomes, namely learning outcomes. OBE emphasizes that learning outcomes can be met from the aspects of knowledge, skills, and attitudes according to social, economic, and academic cultural conditions [2]. OBE's achievements can be seen from the preparation of study program curricula with study materials (body of knowledge), the formation of courses and their credit weights, curriculum maps, and learning designs expressed in the form of Semester Learning Plans (RPS). A Semester Learning Plan is a study plan that serves as a guide for teachers and students to carry out lecture

activities for one semester to achieve predetermined learning [3].

Making RPS in the UPN "Veteran" Yogyakarta environment has so far still used Microsoft Word and Excel manual tools, resulting in differences in the format for filling out the RPS in each study program. Apart from that, the RPS data that has been created does not yet have centralized data storage because the RPS data is only stored in each study program. This makes it difficult to monitor the feasibility and development of Graduate Learning Outcomes (CPL), as well as making it difficult to access RPS document information for the future accreditation process. Seeing these conditions, an information system is needed that can accommodate all needs for RPS data and information within the UPN "Veteran" Yogyakarta environment. An information system is a system within an organization that meets managerial needs in carrying out daily transactions, supports operations and represents organizational management and strategic activities in providing necessary reports to certain internal and external parties [4].

Several studies related to the RPS Semester Learning Plan information system have been carried out, including research conducted by [5]. In this research, a system was created that can design a curriculum and evaluate and distribute RPS to related parties easily and quickly. The system development method used in this research is the Three Major Phases method. Furthermore, research was conducted by [6]. In this research, an information system was created that aims to help document the results of CPL scores and help students find out the results of the scores obtained. The information system in this research was developed using the Agile model.

Then there was similar research conducted by [7], in this research, a web-based information system was produced that can assist lecturers in compiling and storing RPS data, as well as enabling the entire academic community and outside parties to access RPS online easily. The system development method used in this research is the waterfall method. Based on the three studies above, the RPS system that has been created has not yet implemented the development of a method for creating RPS based on Outcome-Based Education (OBE) which refers to the National Higher Education Standards currently in effect, namely Minister of Education and Culture Regulation No.03 of 2020. Therefore, in this research a Semester Learning Plan (RPS) information system based on Outcome-Based Education (OBE) will be created using a prototype system development method. This information system is expected to help make it easier for lecturers to prepare RPS by standardizing the format for filling out RPS automatically. The central storage of RPS data in an information system is expected to make it easier to access RPS information for each study program within UPN "Veteran" Yogyakarta, making it easier for lecturers and the RPS development team to monitor the feasibility of the CPL that has been determined. As well as making it easier to capture RPS data within the UPN "Veteran" Yogyakarta environment for accreditation purposes.

2 Literature Review

2.1 Curriculum

Based on Minister of Education and Culture Regulation Number 3 of 2020 concerning National Higher Education Standards (SN-Dikti), states that the curriculum is a set of plans and arrangements regarding objectives, content, and learning materials as well as methods used as guidelines for implementing learning activities to achieve the goals of Higher Education [1].

The Higher Education Curriculum is the task of higher education institutions which must always be updated by developments in needs and science and technology as outlined in Graduate Learning Outcomes (CPL).

In SN-Dikti, CPL consists of elements of attitude, general skills, special skills, and knowledge. Elements of attitude and general skills have been formulated in detail and are listed in the SN-Dikti attachment, while elements of specific skills and knowledge must be formulated by a similar study program forum which is a characteristic of graduates of that study program. Based on the CPL, the curriculum preparation for a study program can be developed.

2.2 Outcome-based education (OBE)

Outcome-Based Education (OBE) is a learning method that focuses on outcomes, namely learning outcomes. Identifying and determining learning outcomes is very important in the OBE method because it will determine learning methods and assessment planning. This is different from traditional learning methods where the main focus is the teaching and learning process. OBE emphasizes that learning outcomes can be met from the aspects of knowledge, skills, and attitudes according to social, economic, and academic cultural conditions [2].

In OBE, learning outcomes or outcomes are identified first, and then planning learning and assessment methods are adjusted to the outcomes. This is different from traditional learning methods where the topic taught is determined by the lecturer and then from this topic, the output will be identified.

OBE integrates several processes including curriculum design, assessment, and teaching and learning methods that focus on what students can do. OBE accommodates student abilities and learning achievements through several strategic steps and academic equipment, including coursework, final assignments, presentations, tests, and student portfolios [2].

According to Killen, OBE is a theory and philosophy that still needs to be translated into practical action in the form of instructional design, teaching processes, and assessment tools. In this case, the teacher designs the lesson so that the OBE philosophy can be incorporated into it. According to Spady, implementing OBE can be started by providing a clear picture of student activities, and then organizing the curriculum, instructions, and measurements to ensure learning occurs. According to Jenkins & Unwin, OBE encourages and motivates teachers to convey learning objectives (expectations) more clearly [8]. Therefore, delivering the curriculum and learning outcomes to students is very important. The characteristics of OBE are as follows [9]:

1. Clear development of learning outcomes that must be met before the end of the learning process;
2. Curriculum design, learning strategies, and learning opportunities to ensure the fulfillment of learning outcomes;
3. The assessment process is adjusted to the learning outcomes and assessments of each student to ensure learning outcomes are met;
4. Provision of remediation and enrichment.

2.3 Semester learning plans (RPS)

The Semester Learning Plan (RPS) is a learning process plan that is prepared and will be used during learning activities in one semester to meet the Learning Outcomes assigned to the course. Graduate Learning Outcomes (CPL) is an expression of educational goals or abilities regarding what students expect, know, understand, and can do after undergoing a period of learning. CPL functions as a basis for analyzing learning needs, identifying learning resources,

and forming courses. Meanwhile, the RPS is a student study guide to produce graduates who have abilities by the established CPL [1].

The Semester Learning Plan (RPS) for a course is a learning process plan prepared for learning activities during one semester to meet the graduate learning outcomes assigned to the course. Semester learning plans are determined and developed by lecturers independently or together in expertise groups in a field of science and/or technology in the study program. A Semester Learning Plan is a written learning plan designed to guide students in carrying out lecture activities for one semester to achieve the expected results. Teaching staff must submit the RPS to the Study Program Director before learning activities take place [10]. According to Yanto and Sari, the Semester Learning Plan is an activity developed by lecturers and students during class learning or lectures [11]. Therefore, RPS is an integral part of learning or lectures. This means that every lecturer who teaches must first prepare an RPS before carrying out the learning process.

2.4 Information Systems

A system is a network of interconnected procedures, gathered together to carry out a certain goal. A system is a series of data or more components that are interconnected and interact to achieve a goal. The system is a unit of data that is connected and organized procedurally [12].

Information is data that has been managed and processed to provide meaning and improve the decision-making process [13]. Information is a collection of data that is processed to produce useful information and this information can be well received by the recipient of the information [12]. So it can be concluded that an information system is a system within an organization that brings together the needs for managing daily transactions, supporting operations, and managerial and strategic activities of a particular organization with the required reports [14]. Information System functions include [15]:

1. To increase the accessibility of existing data effectively and efficiently to users, without intermediary information systems.
2. Improve the productivity of application development and system maintenance.
3. Ensure the availability of quality and skills in critically utilizing information systems.
4. Identifying needs regarding information system support skills.
5. Anticipate and understand the economic consequences.
6. Determine the investment that will be directed at information systems
7. Develop an effective planning process.

3 Research Methods

The system development methodology used in this research is the prototype system development method where system developers and users can interact with each other during the system creation process.

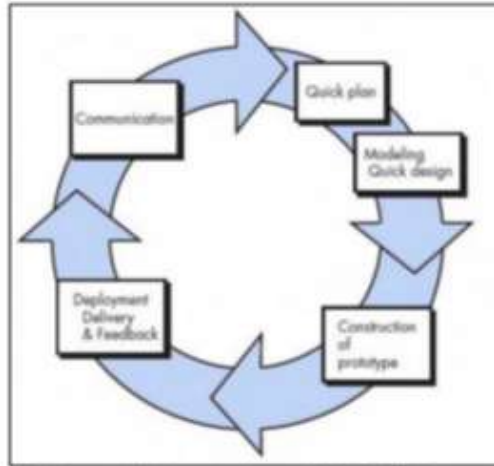


Fig. 1. Stages of the Software Development Life Cycle (SDLC) prototype

Based on Figure 1, the stages of system development with a prototype model include the following:

3.1 Communication

This stage is the stage of identifying system user needs and other supporting information needed in system development from primary and secondary data requirements.

3.2 Quick plan

After identifying system requirements, build a prototype by creating a temporary prototype design to be developed again by presenting aspects based on system requirements and the results of agreements between developers and system users so that development is as expected.

3.3 Modeling & quick design

Next, represent the data obtained by creating a design depicted in diagram form. System design, database design, and user interface design of the system to be created.

3.4 Construction of prototype

After designing the system, database, and user interface, create a program from the system design using the PHP programming language, then integrate it with the database.

3.5 Deployment, delivery, and feedback

At this stage, the system created is then given to system users for evaluation. Feedback from

the evaluation results can be in the form of complaints or suggestions for developing the next prototype until it truly meets the user's wishes and needs which is then implemented.

4 Finding and Discussion

In this research, the results and discussion of system design are described using a use case diagram which shows the visualization of interactions that occur between users (actors) and the system [16]. There are 2 actors involved in this process, namely the study program admin (Admin Prodi) and the RPS developer lecturer. The following use case diagram of the RPS system can be seen in Figure 2

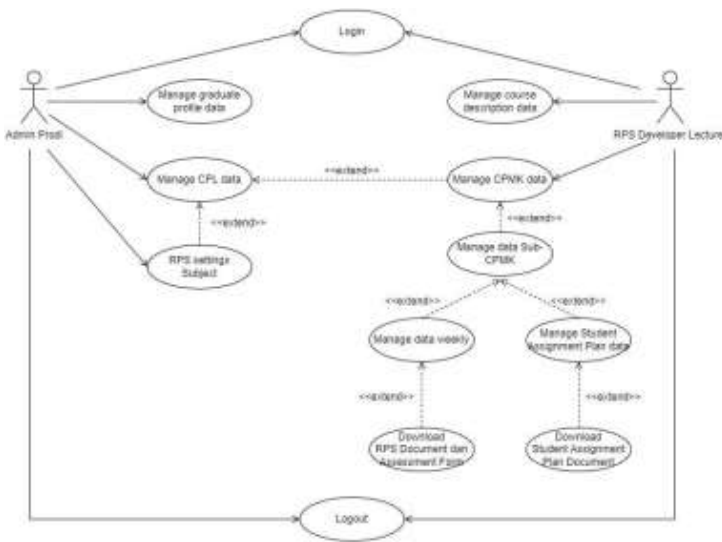


Fig. 2. Use case diagram system rps.

From the picture above, it can be explained that the Study Program Admin actor interacts with the system, namely by managing graduate profile data, managing Graduate Learning Outcomes (CPL) data, and then setting the Semester Learning Plan (RPS) for courses. The RPS setting process for each course can be done after the Study Program Admin has finished inputting the CPL data. In the course RPS setting process, the study program admin must input data including the name of the course, weight of the Semester Credit System (SKS), semester, course family, RPS developer lecturer, course family coordinator, head of study program, and study program CPL charged to the course. the lecture. Furthermore, the RPS Developer Lecturer actor is tasked with managing course description data, CPMK data, sub-CPMK data, managing weekly data, and managing student assignment plan data. After all the data is set, the RPS Developer Lecturer can download the RPS document and assessment form, as well as download the student assignment plan document.

At this system design stage, the author created an activity diagram that illustrates the process flow of the OBE- based RPS system from the beginning until the RPS Developer

Lecturer can download the output results in the form of RPS files and assessment forms.

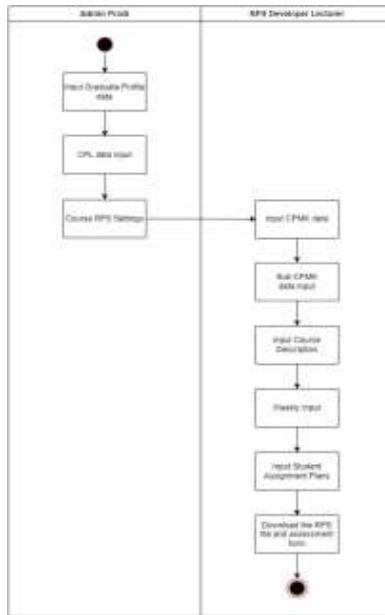


Fig. 3. Activity diagram RPS.

The results of the RPS system design above are implemented into a program using the CodeIgniter framework and MySQL as a Database Management System (DBMS), namely as follows :

4.1 Study Program Admin Role

Study Program Admin (Admin Prodi) accesses the page <https://sadewa.upnyk.ac.id/admin> and then fills in the username and password according to the access rights of each study program. If you successfully log in as a study program admin, you will be directed to the dashboard display, then select the RPS menu. This menu has 3 sub-menus with explanations of each function as follows:

4.2 Graduate profile

The Graduate Profile sub-menu functions to manage graduate profile data, by inputting the desired graduate profile data.

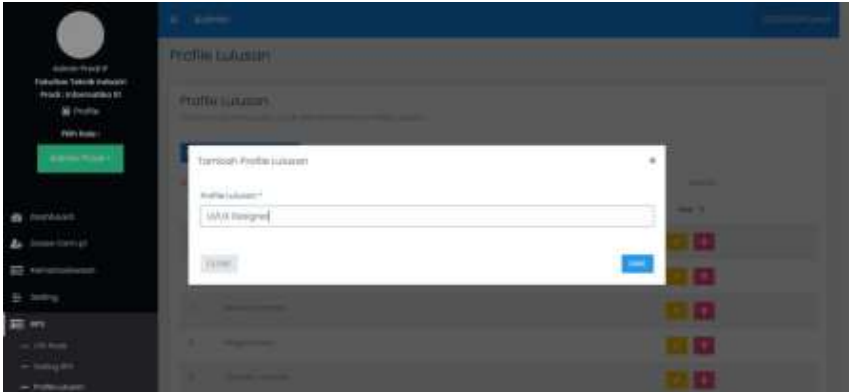


Fig. 4. Graduate profile sub-menu

4.3 Study program CPL

The Study Program CPL sub-menu functions to manage study program graduate learning outcomes (CPL) data. Input for CPL data includes CPL categories, CPL codes, and CPL descriptions. There are 5 CPL categories, namely C for Achievements, S for Attitude, P for Knowledge, KU for General Skills, and KK for Specific Skills.

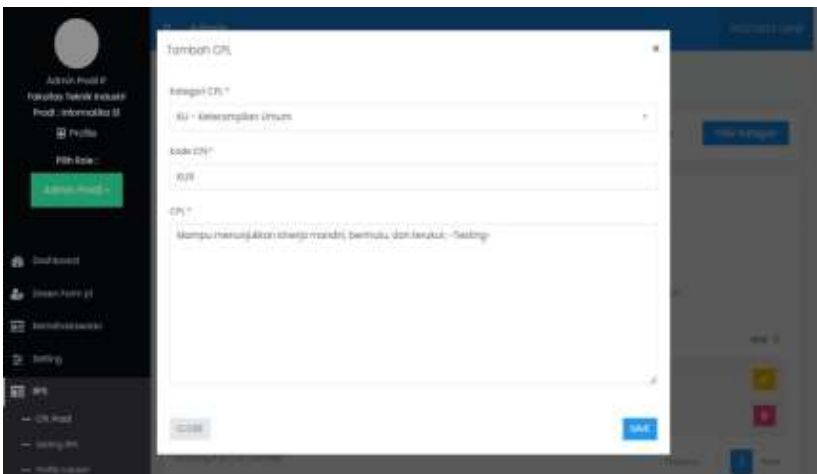


Fig. 5. CPL study program sub-menu

4.4 RPS settings

The RPS Settings sub-menu functions to set the RPS data for each course. At this stage, the study program admin must input data including the name of the course, Semester Credit System (SKS) weight, semester, course family, RPS developer lecturer, course family coordinator, head of study program, and study program CPL charged for the course. The study program admin must input the CPL first to be able to set the RPS.

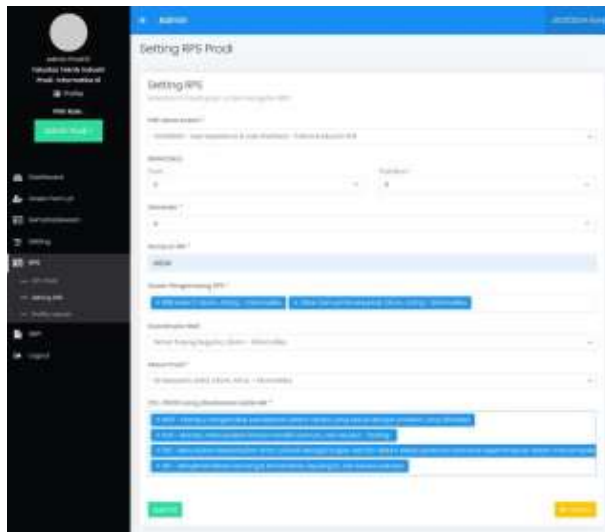


Fig. 6. RPS settings sub-menu

4.5 Role of RPS developer lecturer

The RPS Developer Lecturer accesses the page <https://nakula.upnyk.ac.id> and then fills in the appropriate username and password. If you successfully log in as a lecturer, you will be directed to the dashboard display, then select the RPS menu. On the RPS page, the entire list of courses assigned to the lecturer will be displayed to be developed into an RPS document. In this menu there are several actions in the RPS creation process, namely:

4.6 Input actions for course learning outcomes (CPMK)

The RPS developer lecturer selects a course, then selects the CPMK input action and the CPMK input form will be displayed as in Figure 7. The data entered includes the CPL-Prodi charged, CPMK code, and CPMK description. All study program CPLs charged for these courses must be set in the overall existing CPMK.

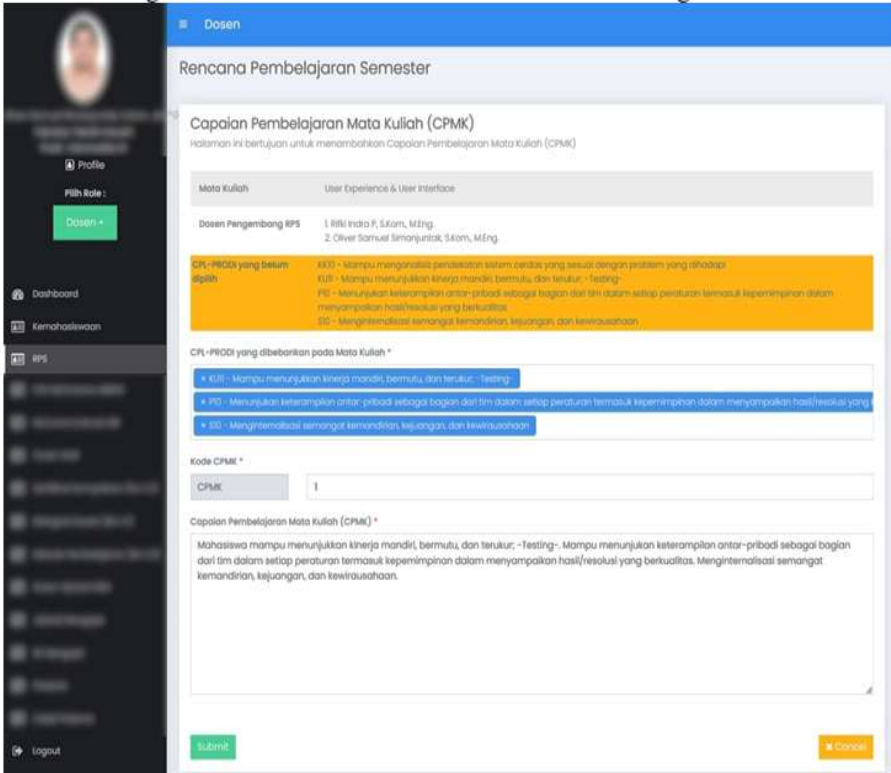


Fig. 7. CPMK input form

4.7 Sub-CPMK input action

CPMK data must be set first before carrying out the Sub-CPMK input action. In the added Sub-CPMK form, the data entered includes CPMK, Sub-CPMK code, description of the final abilities of each learning stage (Sub-CPMK), and cognitive, affective, and psychomotor assessment category scores. All CPMKs must be set to all existing Sub-CPMKs.

Fig. 8. Sub-cpmk input form

4.8 Course description input action

Next, there is a course description input, in the course description input form the data that needs to be set includes a brief description of the course, study materials/learning materials, main and supporting literature, teaching lecturers, prerequisite courses if any, and the date of preparation.

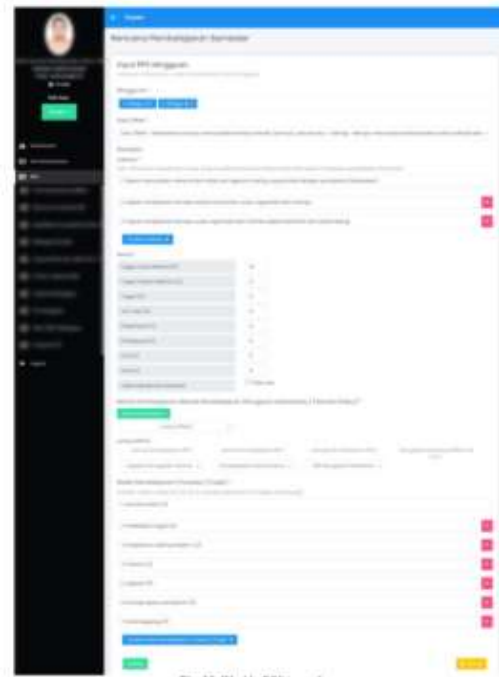


Fig. 10. Weekly RPS input form

4.9.1 Action to input student assignment plans

Furthermore, the RPS developer lecturer can also create a student assignment plan document, where the data entered includes the form of the assignment, title of the assignment, Sub-CPMK, description of the assignment, object of work, method of completing the assignment, form and format of output, indicators and assessment weight, implementation schedule and references. The following page displays the form for adding student assignment plans.



Fig. 11. Form to add student assignment plan

4.9.2 Download the RPS file and assessment form

After all RPS data starting from CPMK input to student assignment plan input is complete, lecturers can download the final RPS file on the RPS page by clicking the blue button with the download icon as in Figure 12.



Fig. 12. RPS page display – RPS download feature



Fig. 13. Preview the RPS document in *.pdf* format

Meanwhile, to download the assessment form file, you can do it by clicking the green button with the download icon which can be seen in Figure 14.



Fig. 14. RPS page display – assessment form download feature



Fig. 15. Preview the assessment form document in .pdf format

The RPS document and assessment form will later become a reference for course lecturers in carrying out the learning process.

5 Conclusions

Based on the analysis and discussion above, the development of this information system can increase efficiency, accuracy, automation, and ease of the process of creating Semester Learning Plan (RPS) documents. The existence of this RPS system helps standardize RPS documents for all study programs within UPN "Veteran" Yogyakarta. As well as centrally storing RPS data in the system, it makes it easier to access RPS information online, making it easier for lecturers and the RPS development team to monitor the suitability of the CPL that has been determined so that they can find out whether the learning quality standards for the courses being taught are appropriate.

Suggestions that can be given to improve the quality of the system being created are that the system design can be further developed with a more attractive and user-friendly user interface design, and the system being built can be further developed with features that do not yet exist in this system.

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