Development of Information Systems for Human Resources (HR), Cooperation, Facilities and Infrastructure to Support Accreditation of Study Program at Postgraduate *Universitas Negeri Semarang*

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Article Info	Abstract
	Postgraduate Universitas Negeri Semarang as an educational institution organized by the government is required to improve the quality of services, be able to set service standards with the dimensions of maintaining quality and meeting the needs of the entire academic community both in Postgraduate and the scope of UNNES. Service quality is also intended so that all stakeholders can enjoy the service to the fullest. Therefore, to facilitate the use of services that integrate several aspects, such as human resources (HR), cooperation, facilities and infrastructure, the Postgraduate Program seeks to develop an online information system that is expected to facilitate the performance of the UNNES academic community. Based on the explanation above, UNNES Postgraduate wants to develop an information system that includes human resources (HR), cooperation and facilities and infrastructure. The collection of data in these 3 fields is very important so that it can be used when data is needed during accreditation. The conclusion is the Postgraduate Accreditation Information System (SIAPA) can be used by the UNNES Postgraduate academic community, especially for administration in the field of human resources (HR), cooperation, facilities and infrastructure.

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INTRODUCTION

Universitas Negeri Semarang (UNNES) Postgraduates in the era of the industrial revolution 4.0 want to improve service quality based on the needs and satisfaction of service users. The accreditation process is carried out openly as a form of assistance and empowering educational programs and units to achieve educational goals national (Herawati et al., 2020) . In the current era of the industrial revolution, disruption has occurred in various aspects, including the service sector. This is very likely to occur when there is a shift in the pattern of service delivery that used to be government-oriented as a service provider to become one that is oriented to the needs of the community and students as users. According to Hibana & Surahman, (2021) the purpose of accreditation is as a form of accountability to ensure the quality of education. Then, accreditation is an assessment activity to determine eligibility Study Programs and Colleges (Nisa, 2018). Accreditation form management process most of the study programs so far are still manual, paper-based, as well as forms of communication and coordination physical between the parties. Running system condition manuals like this can result in a number of difficulties and problems (Sampath, 2012). Then, the decision to adopt an information technology is in the hands of managers, but the success of using information technology depends on the acceptance and use of each individual user (Sitanggang et al., 2017).

The development of information technology encourages various university to implement appropriate information technology (Megawati & Afita, 2019); and Postgraduate UNNES as an educational institution organized by the government is required to improve the quality of services, be able to set service standards with the dimensions of maintaining quality and meeting the needs of the entire academic community both in Postgraduate and the scope of UNNES. Accreditation is carried out

by BAN-PT on the basis of criteria which is open. Accreditation is a process that carried out to determine the feasibility of programs and units education in formal and non-formal education level and type of education (Nuphus et al., 2019). The National Accreditation Board for Higher Education (BAN-PT) isinstitutions that have the authority to evaluate and assess, and improve the status and quality rating of study programs based on established quality standards (Gunawan et al., 2019).

Service quality is also intended so that all stakeholders can enjoy the service to the fullest. Therefore, in an effort to facilitate the use of services that integrate several aspects, such as human resources (HR), cooperation, facilities and infrastructure, the Postgraduate Program seeks to develop an online information system that is expected to facilitate the performance of the UNNES academic community.

The use of online information systems that are used to simplify and accelerate performance is increasingly needed in today's era (Yakub, 2012). This is expected to be supported by advances in information technology and reviewing several systems that have been developed by UNNES, making it possible to develop information systems to be more advanced and leading.

An information system is a system created by humans, which generally consists of a set of computer-based components and some manual equipment used to collect, store and manage data and provide output information to stakeholders. The purpose of making an information system in a university is to collect a fast and accurate source of information which will ultimately be assessed by BAN-PT at the time of accreditation or field assessment, both globally and for each study program.

Accreditation is carried out on Study Programs and Higher Education based on the interaction between standards in the Higher Education Standards, namely the National Higher Education Standards plus the Higher Education Standards set by the Higher

Education (Sukamto et al., 2016). Accreditation of Study Programs and Universities is carried out using accreditation instruments. Assessment and accreditation instruments must be able to measure the dimensions: 1) Quality of leadership and governance performance: including the integrity of the vision and mission, leadership (leadership), governance, resource management system, strategic partnership (strategic partnership), and internal quality assurance system; 2) quality and productivity of outputs and outcomes: in the form of graduate quality, scientific and innovation products, as well as benefits for the community; 3) process quality: includes the learning process, research, community service, and academic atmosphere; 4) input quality: includes human resources (lecturers and education staff), students, curriculum, infrastructure, finance (financing and funding).

BAN-PT sets the focus of the assessment into criteria based on SN-Dikti and relevant regulations. The accreditation assessment criteria are expected to be a driving force for universities to develop and improve quality in a sustainable manner. Accreditation criteria are benchmarks that must be met by Tertiary Education Institutions which consist of several key indicators that are used as the basis: (1) presentation of data and information regarding the performance, state and educational instruments of Higher Education, as outlined in the accreditation instrument; (2) evaluation and assessment of the quality of performance, state and educational apparatus of Higher Education; (3) determination of the feasibility of higher education institutions to carry out their programs; and (4) formulation of recommendations for improvement and development of higher education quality. Higher education accreditation criteria include criteria regarding higher education commitments to institutional capacity development and increasing educational effectiveness, as well as implementation and evaluation of educational program

implementation which are grouped into 9 (nine) accreditation criteria as follows Triwahyuni (2014); Agustiansyah (2017): Criterion 1) Vision, Mission, Objectives and Strategy Criterion; 2) Governance, Governance, and Cooperation Criteria; 3) Students Criteria; 4) Human Resources Criteria; 5) Finance, Facilities and Infrastructure Criteria; 6) Education Criteria, 7) Research Criteria; 8) Community Service Criterion; 9) Outcomes and Outcomes Tridharma is in accordance with the characteristics of Higher Education accreditation, the assessment of Higher Education accreditation focuses more on aspects of leadership, governance and governance, human resources, finance and infrastructure, as well as policies for developing education, research and community service in accordance with the vision-mission set.

Research on user behavior towards information systems has been carried out by several researchers, including those conducted by Suryono et al (2019) entitled "Analysis of User Behavior of Artificial Drug Knowledge Information Systems for Self-Medication Needs". They tried to examine user behavior in a self-medication information system. In this research, they used a quasi-experimental method to see changes in user behavior before and after a training was held. The results of their research found that users began to understand the self-medication system better after receiving training on a system.

The next research is a research conducted by Bendi & Andayani (2013) entitled "Application of the UTAUT Model to Understand User Behavior of Academic Information Systems". Based on research conducted by Bendi and Andayani (2013), they tried to apply the UTAUT model to measure user behavior towards the information system being used. The results of his research stated that the UTAUT model was able to explain the user variance by 70%, but the adoption of the model in this study was

only able to explain the user variance of 27.2%.

The research mentioned above is also in line with the research conducted by Assegaff (2017) entitled "User Behavior Analysis on Utilization of Online Ticket Ordering Services on Mobile Applications: Perspective of Trust and Risk by Consumers". In this study, Assegaf used the TAM (Technology Acceptance Model) method. TAM is basically developed to understand and predict user acceptance of a particular technology. TAM offers a theoretical basis to find out the basic elements that influence human behavior in deciding to use or not to take advantage of an available technology. TAM in its concept explains the causal relationship between beliefs (of the benefits of an information system and its ease of use) and the behavior, goals or needs and actual use of users of an information system.

In connection with the research above, there is a research that is integrated by applying data mining which is used to analyze data about user experience. In the research conducted by Zhao et al., (2010) entitled "Study and Implementation of User's Behavior Analysis", tries to map the interest and disinterest of a user towards the system that is being used. The results of his research show that a good system should try to pay attention to the economic benefits for its users.

The information system has components contained in it, which consist of input blocks, model blocks, output blocks, technology blocks, database blocks, and control blocks. The explanation is as follows according to Jogiyanto (2009):

1. Input block, input represents data that enters the information system consisting of methods and media for capturing data to be entered in the form of basic documents.

2. The sample block consists of a combination of logical models and mathematical models, as well as examples of mathematical models that will manipulate input data and communication tools that

contain information both written and illustrated to be conveyed to other parties concerned and have their own advantages in terms of confidentiality, effectiveness and economical.

This is also reinforced by Putra (2016) in his research who said that information systems on student data management can provide solutions to problems that arise in the management of prospective new student data and this can also be used by staff to monitor accreditation data, and minimize duplication of accreditation data.

To compile a study program accreditation form, we basically collect academic data for the last 3-5 years, which is calculated starting from the submission of the accreditation form (Putro, 2014). Therefore, to facilitate the collection of some data that will be used, this research focuses on developing a system that helps the process of collecting data.

The information system that has been developed by several researchers will be developed and adapted to the needs of the UNNES Postgraduate in accordance with the standard criteria from BAN-PT based on the *SAPTO BAN-PT* Assessment Guide which includes the fields of human resources (HR), cooperation, and facilities and infrastructure. It was developed to support technological advances in the era of the industrial revolution and to facilitate public services in storing data that will be needed during the accreditation process for Higher Education or Study Programs.

Based on the explanation above, UNNES Postgraduate wants to develop an information system that includes human resources (HR), cooperation and facilities and infrastructure. The collection of data in these 3 fields is very important so that it can be used when data is needed during accreditation.

METHODS

The implementation of this research will broadly be divided into two stages, namely the first stage of developing an information system that is used to record the performance of the academic community at Postgraduate UNNES, especially in the fields of HR, Cooperation and facilities and infrastructure. The second is to evaluate the system users.

This assessment process will be used as the basis for the development and implementation of the developed system so that it can provide benefits for administrative activities in the UNNES Postgraduate environment. There are two methods used in this research, namely the information system development method and the method used to determine the behavior of the developed information system users.
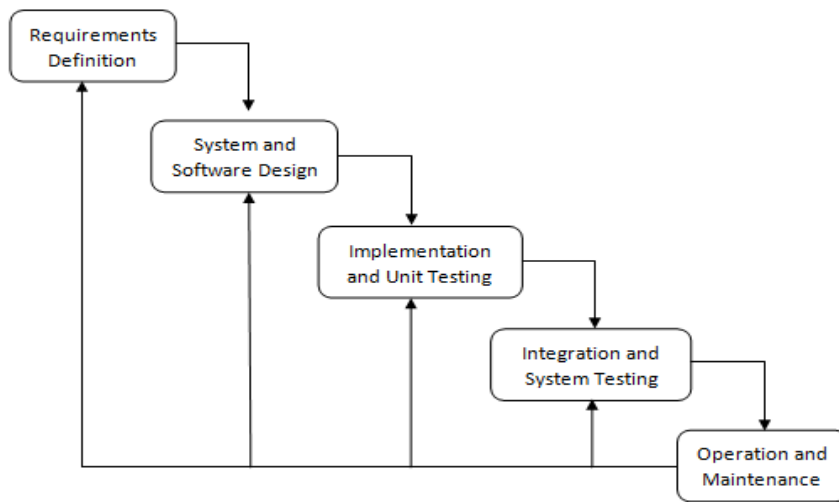
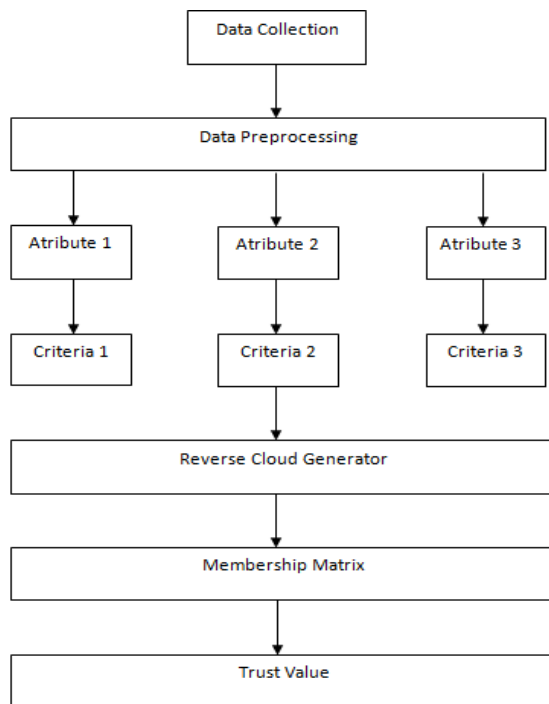**Figure 1.** Waterfall Methods in Developing Information System

Figure 2. Analysis Method of User

This research has two stages, namely the first stage of information system development and the second stage is the analysis of the behavior of information system users. Below is an instrument that will be used to analyze the behavior of information systems taken from the UTAUT method. (Venkatesh et al., 2003) offer UTAUT (Unified Theory of Acceptance and Use of Technology) as a model to explain user behavior towards information technology.The selection of the UTAUT method reflects the analysis that will be carried out in other studies compared to the methods that have existed previously.

The object of this research is the use of the system in the UNNES Postgraduate environment related to the field of HR, cooperation and facilities and infrastructure. In conducting research to obtain data and information, the method used in the data collection process is carried out as follows:

1. Interview Method
2. Questionnaire
3. Literature Study Method

The system development method used is FAST (Framework for the Application of Systems Techniques). In this development there are 7 phases used, namely:

1. Scope Definition
2. Problem Analysis (Problem Analysis)
3. Needs Analysis (Requirements Analysis)
4. Logical Design (Logical Design)
5. Decision Analysis
6. Physical Design
7. Construction and Testing

RESULTS AND DISCUSSION

The development of an information system aimed at processing data by the Postgraduate of the State University of Semarang is a system that integrates human resource data (HR), cooperation, and infrastructure into a system called WHO. The development of the WHO system has been inputted into the UNNES server system, namely *https://accredit.pps.unnes.ac.id/* and in

using the WHO system there are several things that need to be considered, including:

There are two methods that can be used by users, namely Input and Download

Currently, the contents of *SIAPA* are still in the form of electronic books, journals, scientific articles, and so on. However, the development team will continue to be updated so that it contains other content.

There are three levels in the *SIAPA* system, namely super admin, operator, and user which will be explained in more detail in the next discussion.

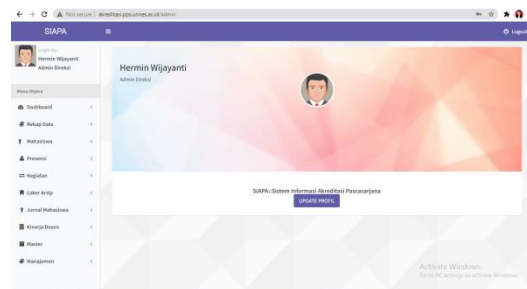To use the next system, use
Username: admin
Password: pasca2021

Figure 3. Dashboard of SIAPA System

In developing the WHO system, there are several types of user levels, namely:

Super Admin

The Super Admin level is the level that has access to all system features. This user can monitor errors and things that need to be corrected. This user can also make changes to content and modify features in this system.

Operators

The operator level has functions to manage the contents of the system, such as managing materials, managing loans, and viewing statistics.

Libraries

The user level is the general level for registered users in the application. The application will ask for some data to identify the user. The library feature can do several

things like borrow books, download books, and also search for books. For users, there is a Borrow and Download Book feature that can be used if you want to read or save material.
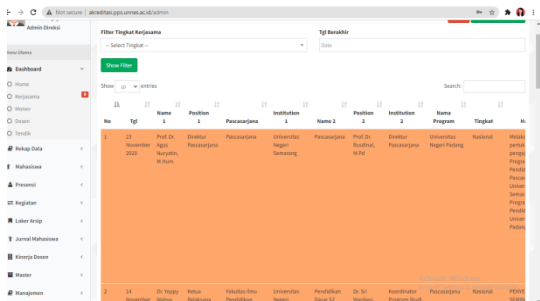

Figure 4. Dashboard of Cooperation

There are several features that can be used on this WHO system:

Admin Features

The Admin feature is one of the features in the WHO system. This feature can be used to check, input data and map the input data.

This feature consists of the Director, Deputy Director, Jamintu Team, and Head of Study Program.
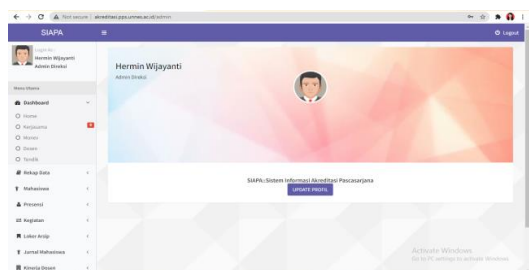

Figure 5. Admin Fiture

Presence Features

Fitur ini untuk presensi dosen, baik dosen luar maupun dosen UNNES, sehingga dapat mempermudah pendeteksian dan dapat merekam wajah dengan jelas. Pada fitur presensi dapat digunakan untuk apel pagi dan senam sebelum pandemic Covid-19, dan selama pandemic Covid-19 kegiatan ini dilaksanakan secara daring.
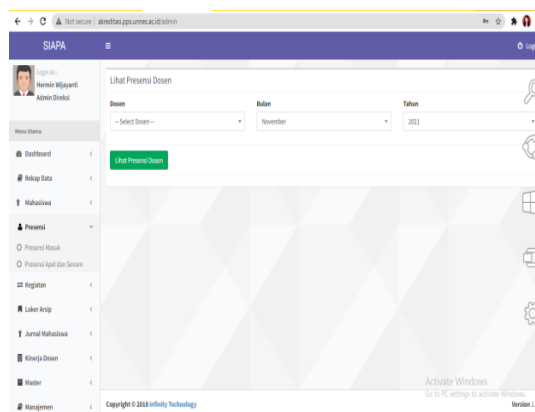

Figure 6. The List of Presence

Cooperation Features

The management of evidence of this collaboration is very much needed to support the administration of the Postgraduate UNNES both regionally, nationally and internationally in the implementation of activities in the field of ongoing cooperation.
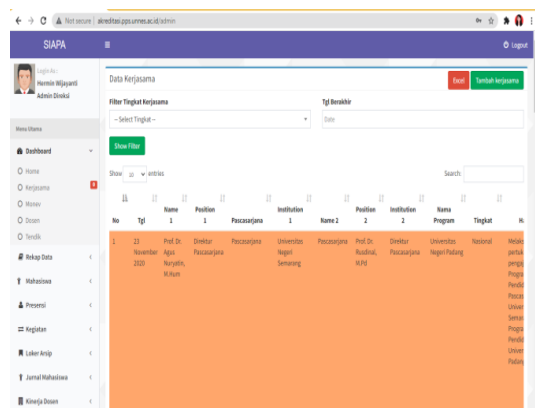

Figure 7. Cooperation Features

Accreditation

The purpose of this system is to use it to assist in the archiving of several files that may be needed during the accreditation process in several study programs and at the university level.

Figure 8. Data Recap Feature Page for Accreditation

The Effect of Using The Information System in terms of Data Management at the Beginning and After the Use of This System

In this study, as for the effect of using the information system in terms of data management at the beginning and after the use of the SIAPA system. The researcher gave several questions in the questionnaire which was distributed to the users of the WHO system. The following are some of the questions asked to users of the WHO system.

Based on the results of the questionnaires that have been distributed to users of the SIAPA system, some 50% of respondents stated that the SIAPA system was useful for them in completing data input. In addition, 66.7% of respondents also feel that using the SIAPA system can increase productivity in working in the UNNES Postgraduate environment. The SIAPA system also supports the administration system to be more structured when using this system and 75% of respondents answered the same thing.

By working in a structured manner, 58.3% of respondents stated that they could complete their work more optimally, especially in the fields of human resources, cooperation, and infrastructure. Thus, during the implementation of accreditation, they can easily access some of the data that will be needed during the event and this is also in accordance with the answers of some respondents as much as 75%.

For some respondents, the SIAPA system is easy to use and they easily understand what has been made. And most of the respondents also understand the procedure for inputting into the WHO system. This is because the menus provided in the SIAPA system are easy for users of this system to fill. The use of this system also received support from several parties involved in the socialization of this program. In addition, the leadership also recommends that staff also use this system so that they can integrate various data needed during the accreditation process in the future.

Measurement of Performance from the Field of Human Resources (HR), Cooperation and Management of Facilities and Infrastructure Based on the Achievement Criteria that have been Prepared by BAN-PT Standards

In filling out the 9 criteria for Accreditation of Higher Education and Study Programs, supporting documents are required. Ideally, in filling out/compiling the 9 criteria accreditation instruments, it should be prepared at least 1 or 2 years before uploading the LED, LKPT or LKPS to SAPTO. Self-Evaluation Report (LED) is a report on every policy or regulation that has been implemented in every Institution and Study Program. The Performance Reports of Higher Education and Study Programs (LKPT and LKPS) are reports of activities that have been carried out in each College and Study Program. In filling out this system, it should have something to do with explaining policies regarding the preparation of self-evaluations in higher education which includes the purpose of the LED preparation. In this section, the institution should be able to demonstrate the relevance of LEDs to the institutional development plan.

The self-evaluation report must contain 9 (nine) accreditation criteria which include the following criteria: 1) Vision, Mission, Objectives, and Strategy; 2) Governance,

Governance, and Cooperation; 3) Students; 4) Human Resources; 5) Finance, Facilities, and Infrastructure; 6) Education; 7) Research; 8) Community Service; 9) Outcomes and Achievements of Tridharma. Thus, the system developer wants to integrate several fields that are considered to have quite a large data base into one more efficient system, namely the WHO system. The scope of aspects between the evaluated criteria: completeness, breadth, depth, accuracy, and sharpness of the analysis to identify the root cause of the problem supported by reliable and adequate data/information and consistent with the results of the analysis presented on each of the criteria above. For the WHO system that has been created by the development team, there are several fields that must be filled in by system users, such as those shown in the image above. The columns are also adjusted to the indicators in the SAPTO from BAN-PT.

CONCLUSION

Based on the results of the research that has been carried out, it is concluded that the Postgraduate Accreditation Information System (SIAPA) can be used by the UNNES Postgraduate academic community, especially for administration in the field of human resources (HR), cooperation, facilities and infrastructure. Based on the development model with the waterfall system and interactive model, it is hoped that this system can continue to be developed by the team and the validity test has been carried out with the blackbox testing model, so that the data used can be accounted for. In addition, this system will continue to develop in addition to covering the 9 criteria from BAN-PT and it is possible that there will be changes to the appearance of the parts being developed by the system development team.

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