



## Data Storage and Processing Information System in a Website-Based Quality Assurance Agency (BPM) (Case Study: National University)

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### ABSTRACT

At this time technology is a must in advancing performance in every organization and various other activities. One example of the application of technology that will be explained in this study is the design of information storage and data processing systems at the website-based quality assurance agency (BPM) at Nasioal University. UPM by processing and storing it in the system to upload regulations made based on each access of UPM and online will be able to see the results of the Rector's Decree in public and can be downloaded as a PDF file. Previously in making reports from the Chancellor's Decree and other regulations, it still applied a manual system which could not be seen publicly and would take a lot of time and be less flexible. If UPM has made regulations for the Chancellor's Decree, it can be seen publicly where other UPMs can see the report of the Rector's Decree that has been made. In designing this web-based BPM system, the author uses the PHP programming language for the idea server and MYSQL for the database server. In addition, the Captcha system is used to verify first when logging into the BPM system. The purpose of the BPM system can be used as a flexible processing and storage of regulations, making it easier to help speed up the process of activities more quickly.

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## 1. Introduction

At this time the developing technology is increasing. One of the technologies that we want to develop today is the storage and processing information system at the web-based quality assurance agency at the National University. Education quality assurance in accordance with what has been programmed by the Directorate of Higher Education [1]. BPM processes the data recording results from daily lecture activities into strategic information, this is needed by the Quality Assurance to supervise and evaluate the implementation of lectures. BPM has standard facilities in a database management system, two main facilities used in BPM are data recording and reporting for daily lecture monitoring [2]. The information system was built using the PHP programming language as server side and MYSQL as the database server, using the System Development Life Cycle (SDLC) method [3]. In BPM systems have encryption that is used to use the Captcha feature when logged in, UPM will be forced to enter verification in the form of a Captcha that serves to ensure that the response generated may only be made by UPM who has access and not a response made by a computer. With the BPM application system that is made it can facilitate UPM in processing and storing regulations without having to fill in manually again and UPM can also see the results of the processed data that has been stored [4]. UPM has functions that include: 1) to process standard rules, guidelines, daily and monthly activities. 2) to make a report of the results of data processing that has been stored. 3) to process and save regulations from the Rector's Decree. 4) as an explanation (for example government regulations, laws and regulations no. 5) the system divides access for incoming UPMs, meaning that UPM from HR, MAWA, BAA, and BKIK only have access to process the regulatory data that will be made. These regulations include standard rules, guidelines, and rules for daily and monthly activities. 6) for BPM itself has access to process data for Rector's Decree regulations, which in this regulation can be viewed and downloaded in the form of PDF files with other UPM.

## 2. Methodology

### 2.1. Application Planning



The research method used is the SDLC development method with the PHP programming language as server side, CSS as client side and MYSQL as the database server.

a. Metode SDLC(System Development Life Cycle)

SDLC method is a method of developing software systems or software through several stages such as:



Fig 1. Model SDLC [3]

1) System Analysis Stage

Analysis is the first stage in SDLC where collecting as much information as possible for the needs of the development or design of the system with the needs of user input data. And at this stage has several stages including:

a) Survey Requirement

Activities at the survey stage are to collect data as complete as possible, and after the survey stage an interview is also carried out, wherein the interview process is needed as a basis for knowing the needs of users to be built.

b) Structured Analysis

At this stage will be obtained from the survey results and then processed into a structured analysis and will be drawn to create a system design that will be built.

2) Design Analyze

Design is a stage in making a flow or process and appearance of the system to be made based on data from the analysis phase that has been done in the previous stage which will be continued at the Construction stage.

3) Design and Coding Program

Construction Phase is the process of translating the system design into real products. At this stage the system began to be developed based on the design that was created. This system is implemented using the PHP programming language as server side and MySQL as the database server.

4) Implementation Program

This stage includes running / implementing a program and testing / evaluating the system, aiming to find out the results of the functional requirements of the system which are compiled to be matched with the implementation results in the form of a Data Storage and Processing Information System Design at the Website-Based Quality Assurance Agency at the National University.

5) Testing Phase

This stage tests the system based on managing real data in order to obtain test results. Besides testing the system in terms of connectivity, functional systems to find out the program can be applied and get an evaluation of the system trials.

6) Maintenance

This stage is the last stage of the Information System Building System which evaluates the entire program by knowing that the functional data of the system is going according to the plan and the functional system is not working properly. Maintenance which aims to ensure that the system used by the user is really stable and there are no bugs or program errors.

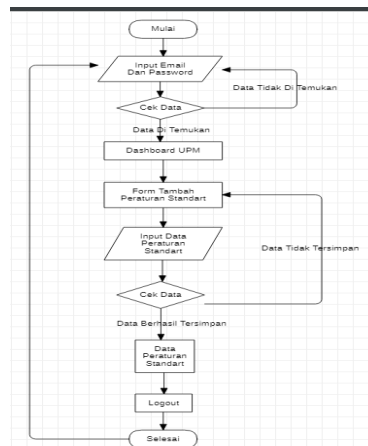


Fig 2. System process flowchart Add Standard Regulations From Each UPM.

From the flowchart image above is the process of adding data from each UPM. First, UPM login first based on the access rights of each unit. After that, the system will check the data whether the data entered by UPM is suitable and found in the database server or not, if the data input by UPM is found it will be transferred to the UPM dashboard and if not then UPM must re-enter the data. After logging in and entering the UPM dashboard on the BPM system, UPM can make standard rules according to the unit and on the form add standard rules, input data that needs to be entered by each UPM to make standard rules. After that the system will check whether the data that has been input by each UPM according to what needs to be input, if not then the system will return to the form added to standard rules, and if successful the system will redirect (divert) directly to standard regulatory data.

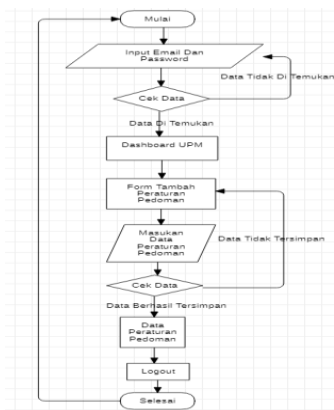


Fig 3. System process flowchart Add Regulations Guidelines From Each UPM.

From the flowchart image above is the process of adding data from each UPM. First, UPM login first based on the access rights of each unit. After that, the system will check the data whether the data entered by UPM is suitable and found in the database server or not, if the data input by UPM is found it will be transferred to the UPM dashboard and if not then UPM must re-enter the data. After successfully logging in and entering the UPM dashboard in the BPM system, UPM can make guideline regulations according to the unit and in the form added to guideline rules, input the data that each UPM needs to enter to make the guideline regulations. After that the system will check whether the data that has been input by each UPM according to what needs to be input, if not, the system will return to the form added to the guideline rules, and if successful then the system will redirect directly to the guideline data.

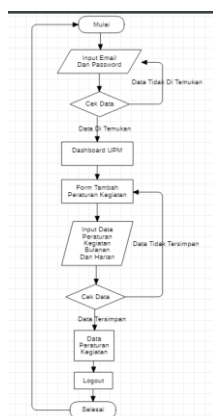


Fig 4. System process flowchart Add Activity Regulations From Each UPM

From the flowchart image above is the process of adding data from each UPM. First, UPM login first based on the access rights of each unit. After that, the system will check the data whether the data entered by UPM is suitable and found in the database server or not, if the data input by UPM is found it will be transferred to the UPM dashboard and if not then UPM must re-enter the data. After successfully logging in and entering the UPM dashboard in the BPM system, the UPM can make activity regulations according to the unit and on the form add activity regulations, input data that each UPM needs to enter to make the activity regulations. After that the system will check whether the data that has been input by each UPM according to what needs to be input, if not, the system will return to the form added to the rules of activity, and if successful the system will redirect (divert) directly to the data of the activity regulations.

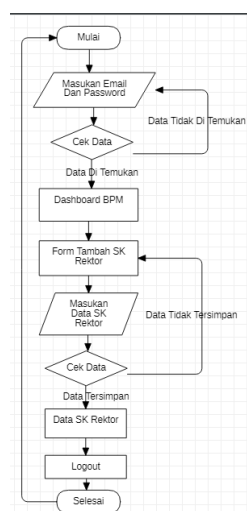


Fig 5. System process flowchart Add Rector's Decree Regulation Made From BPM

From the flowchart picture above is the process of adding Rector's Decree regulation data made by BPM. First BPM login first based on access rights and BPM as admin. After that, the system will check the data whether the data entered by BPM is suitable and found on the database server or not, if the data entered by BPM is found then the system will switch to the BPM dashboard and if not then BPM must re-enter the data. After successfully logging in and entering the BPM dashboard, BPM can make regulations for the Chancellor and only BPM can make regulations from the Rector. In the form added to the rules of the Chancellor, enter data - data that needs to be entered by each BPM to make the Rector's Regulation. After that the system will check whether the data that has been inputted by BPM according to what needs to be input, if not, the system will return to the form added by the Chancellor's Regulations, and if successful then the system will redirect directly to the Chancellor's Regulatory Data.

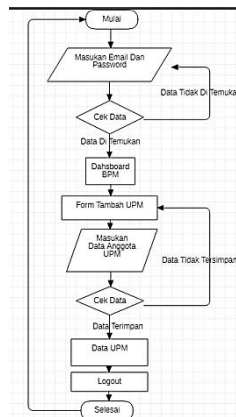


Fig 6. System process flowchart Add UPM Members Made From BPM.

From the flowchart image above is the process of adding data from UPM members made by BPM. First BPM login first based on access rights and BPM as admin. After that, the system will check the data whether the data entered by BPM is suitable and found in the database server or not, if the data entered by BPM is found then the system will switch to the BPM dashboard and if not then BPM must re-enter the data. After logging in and entering the BPM dashboard, BPM can create UPM members and only BPM can create UPM members. On the form added UPM, enter data - data that needs to be entered by BPM to create a member of UPM. After that the system will check whether the data that has been inputted by BPM according to what needs to be input, if not, the system will return to the form added by UPM, and if successful the system will redirect directly to UPM member data.

### 3. Results and Discussion

#### 3.1. System Design

With the development of technology available at this time, all user / actor systems interacting in one system stored on one server, so that user / actor interaction will be modeled in the form of UseCase Diagrams.

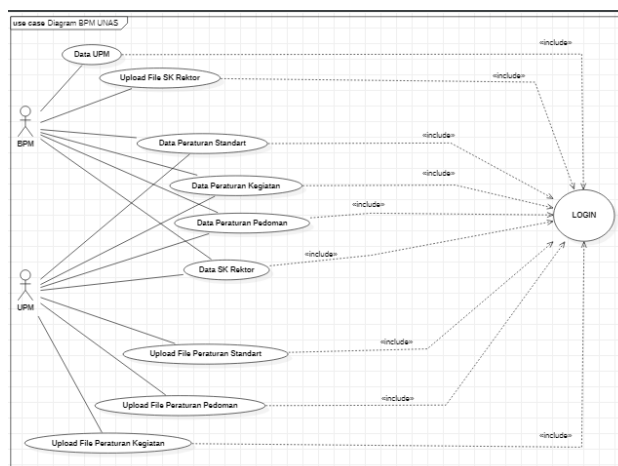


Fig 7. Usecase Diagram

#### 3.2. Activity Diagram

##### a) Activity Diagram Upload of Rector's Decree

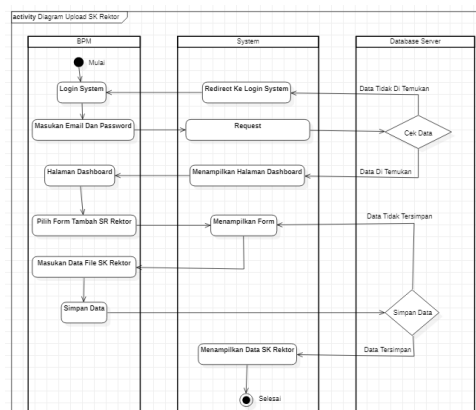


Fig 8. Activity Diagram Upload of Rector's Decree

In the activity diagram above, before BPM can upload the Rector's Decree, the BPM must first log into the system then the system will check / verify whether the entry has access to enter the system or not. And who is logged in whether the data is available in the database server. If the actor that is logged in is not in the database server, the System will return to the login form and will be alerted that the incoming data does not exist and the incoming data does not have access. And if the actor logged into the system has access and the data of the logged actor is available in the database server, the system will deliver to the BPM dashboard system. After entering the dashboard, BPM can upload the Rector's Decree.

b) Activity Diagram Add UPM

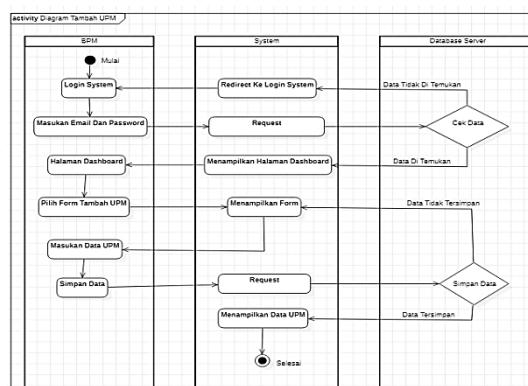


Fig 9. Activity Diagram Add UPM

In the activity diagram picture above, before BPM can add UPM, then BPM must first log into the system then the system will check / verify whether the incoming user has access to enter the system or not. And who is logged in whether the data is available in the database server. If the actor that is logged in is not in the database server, the System will return to the login form and will be alerted that the incoming data does not exist and the incoming data does not have access. And if the actor logged into the system has access and the data of the logged actor is available in the database server, the system will deliver to the BPM dashboard system. After entering the dashboard, BPM can add UPM data.

c) Activity Diagram Uploads of Standard Rules for Each UPM

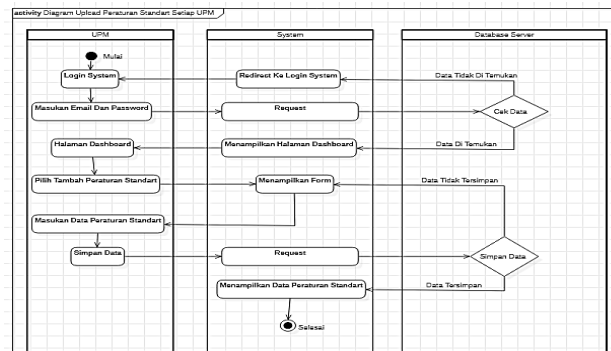


Fig 10. Activity Diagram Upload Peraturan Standart

In the activity diagram above, before UPM can upload the Standard Rules, the UPM must first log into the system then the system will check / verify whether the incoming user has access to enter the system or not. And who is logged in whether the data is available in the database server. If the actor that is logged in is not in the database server, the System will return to the login form and will be alerted that the incoming data does not exist and the incoming data does not have access. And if the actor logged into the system has access and the data of the logged actor is available in the database server, the system will deliver to the UPM system dashboard. After entering the dashboard, UPM can Upload Standard Rules.

d) Activity Diagram Upload Rule Guidelines

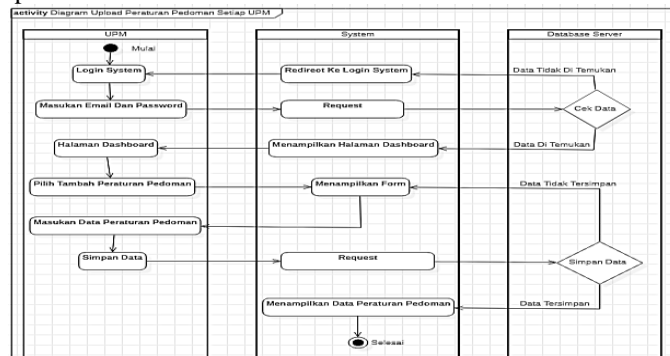


Fig 11. Activity Diagram Upload Rule Guidelines

In the activity diagram picture above, before UPM can upload the guideline rules, the UPM must first log into the system then the system will check / verify whether the incoming user has access to enter the system or not. And who is logged in whether the data is available in the database server. If the actor that is logged in is not in the database server, the System will return to the login form and will be alerted that the incoming data does not exist and the incoming data does not have access. And if the actor logged into the system has access and the data of the logged actor is available in the database server, the system will deliver to the UPM system dashboard. After entering the dashboard, UPM can upload the guideline rules.

e) Activity Diagram Upload Activity Rules

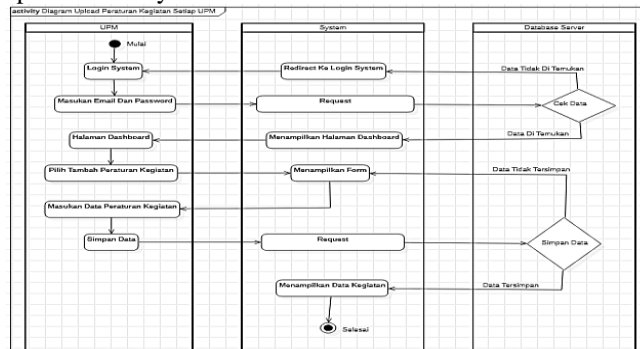


Fig 12. Activity Diagram Upload Activity Rules

In the activity diagram picture above, before UPM can upload the Activity Rules, the UPM must first log into the system then the system will check / verify whether the incoming user has access to enter the system or not. And who is logged in whether the data is available in the database server. If the actor that is logged in is not in the database server, the System will return to the login form and will be alerted that the incoming data does not exist and the incoming data does not have access. And if the actor logged into the system has access and the data of the logged actor is available in the database server, the system will deliver to the UPM system dashboard. After entering the dashboard, UPM can upload the Activity Rules.

f) User Interface Display (Interface For All UPM)

The following are the stages of the User (UPM) uploading Standard Rules, Guidelines, and Monthly and Daily Activities.

1) Display User Login (UPM)

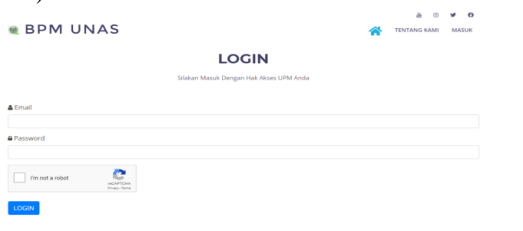


Fig 13. Display User Login (UPM)

2) Display of Standard Regulation Data

No	Nama	UNIT	Tanggal	Data File
1	BAA	BAA	2020-05-03	test.pdf
2	BAA	BAA	2020-05-04	test2.docx
3	BAA	BAA	2020-05-05	Panduan-SPMPPF-edisi-2011.pdf
4	BAA	BAA	2020-05-06	per1 Life cycle.pdf
5	BAA	BAA	2020-05-06	CetakKirkpu/Result.pdf
6	BAA	BAA	2020-05-06	08_Danny_Melrawan.pdf
7	BAA	BAA	2020-05-06	Panduan-SPMPPF-edisi-2011.pdf
8	BAA	BAA	2020-05-06	Penjaminan-Mutu-Penelitian-Pengabdian-dan-Tata-Kelola-Jurnal

Fig 14. Standard Regulation Data UPM

3) Results of the Standard Regulatory Report

**BPM UNIVERSITAS NASIONAL**  
**PERATURAN STANDART UPM**

Data Di Ambil Dari 01 May 2020 sd 31 May 2020.

No	Nama	UNIT	Status	Tanggal	Detail Peraturan Standart
1	BAA	BAA	Ajuf	03 May 2020	Standart BAA
2	BAA	BAA	Ajuf	04 May 2020	Standart BAA
3	BAA	BAA	Ajuf	05 May 2020	Standart BAA
4	BAA	BAA	Ajuf	06 May 2020	Standart BAA
5	BAA	BAA	Ajuf	06 May 2020	Standart BAA
6	BAA	BAA	Ajuf	06 May 2020	Standart BAA
7	BAA	BAA	Ajuf	06 May 2020	Standart BAA
8	BAA	BAA	Ajuf	06 May 2020	Standart BAA
9	BAA	BAA	Ajuf	08 May 2020	Standart BAA
10	BAA	BAA	Ajuf	08 May 2020	Standart BAA
11	BAA	BAA	Ajuf	13 May 2020	Standart BAA
12	BAA	BAA	Ajuf	15 May 2020	Standart BAA
13	BAA	BAA	Ajuf	15 May 2020	Standart BAA
14	BAA	BAA	Ajuf	15 May 2020	Standart BAA
15	BAA	BAA	Ajuf	15 May 2020	Standart BAA
16	BAA	BAA	Ajuf	18 May 2020	Standart BAA
17	BAA	BAA	Ajuf	13 May 2020	TEST SAYA SEBAGAI BAA

Fig 15. Results of the Standard Regulatory Report

4) Display Regulatory Data Guidelines

No	Nama	UNIT	Tanggal	DATA FILE
1	BAA	BAA	2020-05-13	2020-PTK-SI-16312708050002-Syahril_Namadhan_Sertifikat_3.pdf
2	BAA	BAA	2020-05-13	Jurnal_dan_Ringkasan_Faah.pdf
3	BAA	BAA	2020-05-13	94293-03-meme.pdf
4	BAA	BAA	2020-05-13	317-834-1-IPB.pdf
5	BAA	BAA	2020-05-13	5302411196.pdf
6	BAA	BAA	2020-05-13	enid.pdf
7	BAA	BAA	2020-05-15	Endah_Rahawati.doc

Fig 16. Guidance Regulatory Data

5) Results of the Guidelines Regulatory Report

**BPM UNIVERSITAS NASIONAL**  
PERATURAN PEDOMAN UPM

Data Di Ambil Dari 01 May 2020 sd 31 May 2020.

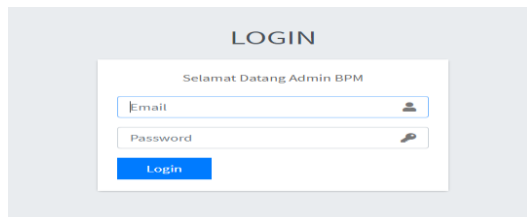
No	Nama	UNIT	Status	Tanggal	Detail Peraturan Pedoman
1	BAA	BAA	Aktif	13 May 2020	TEST PEDOMAN UNIT BAA
2	BAA	BAA	Aktif	13 May 2020	Pedoman BAA
3	BAA	BAA	Aktif	13 May 2020	Pedoman BAA
4	BAA	BAA	Aktif	13 May 2020	Pedoman BAA
5	BAA	BAA	Aktif	13 May 2020	Pedoman BAA
6	BAA	BAA	Aktif	13 May 2020	Pedoman BAA
7	BAA	BAA	Aktif	15 May 2020	Pedoman BAA
8	BAA	BAA	Aktif	15 May 2020	Pedoman BAA
9	BAA	BAA	Aktif	15 May 2020	Pedoman BAA
10	BAA	BAA	Aktif	15 May 2020	Pedoman BAA
11	BAA	BAA	Aktif	15 May 2020	Pedoman BAA

**Fig 17.**Results of the Guidelines Regulatory Report

g) Admin Interface Display (BPM)

The following are Admin (BPM) steps in uploading the Rector's Regulation, Adding UPM Data, controlling UPM, monitoring Standard Data Rules, Guidelines, and Daily / Monthly Activities carried out by each UPM, and making daily, monthly, and data reports. or daily. BPM has full access to the system and can control each UPM and its regulatory data.

1) Display BPM Login



**Fig 18.** DisplayBPM Login

2) Standard Data Pages

Data Standart

Home / Data Standart

Tabel Data standart

Show 7 entries

No	Nama	UNIT	Tanggal	DATA FILE
1	BAA	BAA	2020-05-03	test1.pdf
2	BAA	BAA	2020-05-04	test2.docx
3	BAA	BAA	2020-05-05	Panduan-SPBPPT-etal-2013.pdf
4	BAA	BAA	2020-05-06	per11-life-cycle.pdf
5	BAA	BAA	2020-05-06	CetakKontakPersewaan.pdf
6	BAA	BAA	2020-05-06	08_Danny_Mentawan.pdf
7	BAA	BAA	2020-05-06	Panduan-SPBPPT-etal-2013.pdf

**Fig 19.**Standard Data Pages

3) Guidelines Data page

Data Pedoman

Home / Data Pedoman

Tabel Data Pedoman

Show 4 entries

No	Nama	UNIT	Tanggal	DATA FILE
1	BAA	BAA	2020-05-13	2020-FTKI-SI-16311270050002-Syahril_Ramadhan_Sertifikat_3.pdf
2	BAA	BAA	2020-05-13	Jurnal_dan_Ringkasan_Fagih.pdf
3	BAA	BAA	2020-05-13	9K293-ID-home.pdf
4	BAA	BAA	2020-05-13	317-834-1-PB.pdf

**Fig 20.**Guidelines Data page

4) Activity Data Display Page

Data Kegiatan

Home / Data Kegiatan

Tabel Data Kegiatan

Show 6 entries

No	Nama	UNIT	Tanggal	DATA FILE HARIAN	DATA FILE BULANAN
1	BAA	BAA	2020-05-26	SRS Dikti - Syahril_Ramadhan.docx	SPEKIFIKASI_KEBUTUHAN_PERANGKAT_Akasi_Riku.pdf
2	BAA	BAA	2020-05-26	Spesifikasi_Kebutuhan_Perangkat_Lunak.pdf	master_minggu_11(1).docx
3	BAA	BAA	2020-05-26	LTS-MPTI-INFORMATIKA-R.01.docx	SRS Dikti.docx
4	BAA	BAA	2020-05-26	Template_SKPL.pdf	Modul_Rekayasa_Perangkat_Lunak_3.pdf
5	BAA	BAA	2020-05-26	LTS_RPL-Ritu.docx	Contoh_TOP_Buar_SBK.pdf
6	BAA	BAA	2020-05-26	Modul_Rekayasa_Perangkat_Lunak_1.pdf	--profilKand-4312-14bresi1.pdf

**Fig 21.**Activity Data Display Page

5) Data page of the Rector's Decree

Fig 22. Data page of the Rector's Decree

6) Results of Rector's Decree Regulation Report

**BPM UNIVERSITAS NASIONAL**  
PERATURAN SK REKTOR

Data Di Ambil Dari 01 May 2020 sd 31 May 2020.

No SK	Tahun	Tanggal	Tentang
438/HU/KEP/HR/2009	2017	03 May 2020	Integrasi Pengelolaan Pendidikan Pascasarjana dari Program Pascasarjana ke Fakultas di Lingkungan UNAS

Fig 23. Results of Rector's Decree Regulation Report

7) UPM Data Page

Fig 24. UPM Data Page

8) Results of UPM Data Reports

**BPM UNIVERSITAS NASIONAL**  
DATA UPM

Data Di Ambil Dari 01 April 2020 sd 30 April 2020.

Nama	Email	Username	UNIT	Tanggal Daftar	Status
BAA	baa@gmail.com	baa	BAA	09 April 2020	Aktif
SDM	sdm@gmail.com	sdmunas	SDM	09 April 2020	Aktif
BKIB	bkb@gmail.com	BKIB	BKIB	09 April 2020	Aktif
MHS	mhs@gmail.com	MHS	MHS	09 April 2020	Aktif

Fig 25. Results of UPM Data Reports

4. Conclusion

From the results of the design, development, and implementation of the system that has been carried out in the development of Data Storage and Processing Information Systems at the Website-Based Quality Assurance Agency (BPM), the following conclusions can be obtained:

- a. The BPM website is running well and according to the needs of the National University BPM, starting from the system requirements for uploading regulations that have been made by each UPM and each unit.
- b. Every Rector's SK regulation made by BPM can be seen from each UPM and each Unit.
- c. BPM can fully control everything that is done by UPM.
- d. BPM can remove from the regulations made by UPM if there are no regulatory data that are not in accordance with those in BPM, meaning that BPM can re-check the regulations made from each UPM from different units.
- e. BPM and UPM can make a PDF report based on the specified time.
- f. In the BPM system security, designed to maintain the authenticity of all regulatory data files that have been created on the bpm system, meaning that if the data file is lost, the system will give a warning to immediately re-upload the missing regulatory data file.



## 5. Reference

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