

E-Office Application Design for Correspondence Administration in College: Towards a New Normal Era

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Abstract. The Covid-19 pandemic has hit the world in various sectors, including the education sector. Higher education in colleges is forced to implement online learning and forces staff to do Work from Home (WFH). This sudden policy change must have affected the quality of their work. Some systems, including the correspondence administration system, are no longer effective and efficient. Some incoming and outgoing mail is sometimes late to its destination and also becomes difficult to archive. Likewise, the system of letter registration and disposition has become very ineffective. This condition prompted us to design an E-Office application, which is expected to streamline the correspondence administration system. This design was carried out at the Faculty of Language and Literature at Universitas Negeri Makassar (Fakultas Bahasa dan Sastra in Indonesian or FBS-UNM in short) as a sample case. This research was conducted with a Research and Development (R&D) model with a qualitative-descriptive research type. This study produces a research product in the form of an E-Office application for correspondence administration and shows the application's feasibility analysis results. Based on interviews conducted with 25 samples at FBS UNM, there is an opinion that this application is effective and efficient in supporting the quality of office systems and services at the college level. These results can be seen from the interview results, which show that 87% of respondents said that this application makes their work easier and faster.

Keywords: E-Office application, correspondence administration, new normal era

INTRODUCTION

The Covid-19 pandemic is currently forcing humans to carry out and change some of their social behavior. Those who used to do activities freely outside the home now have to carry out their activities and work from home. Those who used to be free to interact with other communities now have to keep their distance. People are forced to change their lifestyle into a new condition, namely the New Normal condition, which requires people to work a lot, do activities from home, reduce or even eliminate contact with other people.

This condition will more or less affect the performance achievements of staff and employees whose work must be done in the office and must interact with other people such as office administration activities, correspondence activities, and other

service activities. This condition also occurs in the college environment where the correspondence administration service system and student services. The effectiveness and quality of administrative services such as correspondence systems and student services have been reduced due to government regulation upon Work from Home (WFH) and Learning from Home (LFH).

Faculty of Language and Literature at Universitas Negeri Makassar (Fakultas Bahasa dan Sastra in Indonesian or FBS-UNM in short) is also inseparable from the above conditions. They are required to continue to provide excellent service to all UNM academics, be it students, lecturers, or other co-workers. On the other hand, they are required by law to comply with the protocol instructions such as physical distancing, frequently washing hands (which will be a nuisance for those who worked with physical papers), wearing the mask, as well as changing them every 3 hours. The traditional activities of administering correspondence, filing systems, and disposing of letters are time-consuming and paperwork. With the increasing number of incoming and outgoing letters and the disposition system of correspondence in each division or work unit within the scope of FBS UNM, it is indispensable to make improvements to the administration and correspondence systems of each staff, lecturers, and students for the effectiveness and efficiency of this work unit.

One application that is very popular and has been implemented a lot along with the Industrial Revolution 4.0 and the green technology campaign (also can be a solution to the conditions mentioned above) is the electronic office known as E-Office. The E-Office is an office application that replaces manual and paper-based administrative processes with an electronic-based process by utilizing local network facilities and internet networks. This application is able to provide solutions to various administrative problems, such as overcoming the problem of time differences, faster response, providing accurate information, and being able to reach remote locations and the problem of waste in using paper in an office.

Based on the problems experienced by universities in Indonesia in general and in this case FBS UNM in particular, an E-Office application is needed to simplify the administration of incoming and outgoing letters of all staff, lecturers, and students of FBS UNM, a letter disposing system among the leaders of FBS UNM, as well as an automatic letter numbering system. This E-Office is expected to reduce the occurrence of direct contact between the academic community, both between students and lecturers, students and co-workers, as well as between lecturers and administrative co-workers of FBS UNM, but the work continues to be effective and efficient.

Thus, the objectives that are expected to be achieved from the implementation of this research are as follows:

- a. Producing e-office applications that suit universities' needs in Indonesia, especially at the FBS UNM.
- b. Design and implement an e-office system to produce the efficiency and effectiveness of the work of various stakeholders in the college environment.

- c. Improve the quality of administrative services and student services amid the Covid-19 pandemic that has hit the world.

While the benefits that are expected to be obtained from this research are:

- a. Can be used as a reference for the e-office system model applied by universities in Indonesia in particular.
- b. Can contribute more to the development of new science concerning the development of information systems.
- c. Producing quality e-office applications to make work easier and improve the performance of anyone who uses them.
- d. As a learning reference, especially in the field of computer engineering and information systems.

The business process of the office administration system and services to students in Indonesian universities is a measurable and structured activity to produce output for the college's academic community. The business processes make it possible to bring manual systems to e-office systems easily and quickly.

LITERATURE REVIEW

1.1. Previous Work

The reference used is a publication by Subari et al. with the title "Design of E-Office system in vocational school Diponegoro University using Code Igniter Framework" to discuss the implementation of the E-Office at Diponegoro University. The application explicitly discusses managing incoming letters, including the online dissemination system. This application only includes a login page, incoming mail management page, and mail disposition page. This study has not discussed how to manage outgoing letters and letter numbering systems and letter categorization [1].

Furthermore, Eka Ardhiantho's scientific paper [2], entitled "Design and Design of Administrative E-Office for the Promotion Activities of Unisbank Semarang," discusses the E-Office system, which aims to help accelerate the administration and archiving systems. The application also allows data storage, data retrieval, data processing, and data recapitulation. It also implements a verification system that makes it easier without being verified in the promotion room. The head of the promotion session will also make it easier to control activities that have been carried out and have not been carried out in real-time.

There are also two articles on the E-Office from Dimas Sigit Dewandaru [3], [4] which raises the results of his research on the function of e-office in increasing the effectiveness and efficiency of office activities that utilize it. This article also aims to determine the role of E-Office in supporting the existing bureaucratic reform program in Indonesia. This article uses data obtained during the implementation of e-office applications, including during system development and testing. The data obtained were analyzed and explained narratively by developments during the e-office implementation at Pusjatan. The analysis results resulted in a table of success indicators that displayed comparative data on conditions before and after using the

E-Office application in Pusjatan. The use of E-Office applications has proven to be very helpful in speeding up office business processes.

Another reference that also discusses e-office is the article by Dharmarajan et al. [5] with the title "E-Office for UiTM: A Survey Analysis." This article surveyed around 15,000 respondents at Universiti Teknologi MARA (UiTM) to determine how they perceived the implementation of e-office on that campus. The analysis results showed that most respondents gave positive responses to the implementation of the e-office at the campus.

As for this research, we are designed an E-Office application that aims at helping FBS UNM in the new normal era of the COVID-19 pandemic. Our design will discuss several pages such as the login page for security needs, the page for the filing system and management of incoming and outgoing mail, the automatic outgoing mail numbering system page, and the incoming mail disposition system. After designing and implementing this E-Office system, we will test this application to see the effectiveness, efficiency, and response of the FBS UNM academic community as potential users of this application.

1.2. Ground Truth

E-Government

The word e-government comes from English, which stands for Electronic Government. The E-government is a new technology in the government bureaucracy system by utilizing the development of information technology that is preferred to improve the performance of the government bureaucracy [6]. Meanwhile, the World Bank defines that the term e-government refers to government institutions' ability to use information technology to connect with the public, business people, or other government agencies [7].

Presidential Instruction of the Republic of Indonesia (Instruksi Presiden in Indonesian or INPRES in short) No.3 of 2003 explains that the objectives of the E-Government consist of:

- a. The establishment of a network of information and public service transactions that have quality and scope that can satisfy the wider community and can be reached throughout Indonesia is not limited by time divides and at a cost affordable to the public.
- b. Establishing interactive relationships with the business world to enhance national economic development and strengthen the ability to face changes and competition in international trade;
- c. Establishment of communication mechanisms and channels with State institutions as well as providing public dialogue facilities for the public to participate in the formulation of State policies;
- d. Establishment of a management system and work processes that are transparent and efficient and facilitate transactions and services between government agencies and the autonomous government.

The purpose of e-government is to greatly assist the government's efforts to improve its quality so that the utilization and exploration of information and communication technology cannot be delayed any longer. The current globalization and technological advances are increasingly demanding that the government quickly adapt and implement e-government concept initiatives if they do not want to be left behind with other countries and be eliminated from world competition.

E-Office

Electronic Office (E-Office) is an office administration system conducted in virtual. It centralizes an office organization's components where data, information, and communications are created and managed through computer-based information technology media [1].

Electronic in E-Office can mean that all work related to office administration is done electronically and uses communication tools and information systems. With the current development of telecommunications technology, high-speed broadband networks, and the internet, offices have become electronically electronic. Office work that has been done manually for decades has turned into electronic, and even some have implemented virtual offices [8], [9]. Electronic office uses communication technology to provide office administration services electronically to anyone, anywhere, anytime.

MySQL

MySQL is the most popular database used to build web applications that use a database as a data source and manager [10]. PhpMyAdmin is a part of managing MySQL databases on a computer with a GUI display. With PhpMyAdmin, one can create databases, create tables, fill in miscellaneous data easily, without having to memorize command lines.

PHP

PHP is a programming language in the form of scripts placed on the server and processed on the server, which was first created by Rasmus Lerdorf in 1995. PHP is an open-source language that can be used on various machines (Linux, UNIX, Windows, or Apple environment) and can be run using runtime via the console, as well as system commands. PHP is a scripting language that integrates with HTML and runs on the server-side [11].

Codeigniter Framework

This framework can be interpreted as a collection of libraries (classes) that can be derived or can be directly used by modules or functions developed [9].

Meanwhile, Codeigniter (CI) is an open-source application in the form of a framework with an MVC (Model, View, Controller) model for building dynamic websites using PHP. CI will make it easier for developers to build web applications quickly and easily than building from scratch. MVC is a software approach that separates application logic from presentation. It is used to minimize scripts from web pages since presentation scripts (HTML, CSS, Javascript, etc.) are separated from PHP

scripting; a common term is to avoid spaghetti code [1]. The following is an explanation of the concept of MVC:

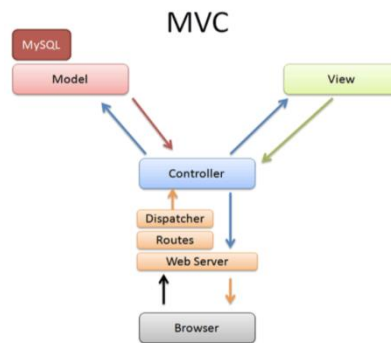


Figure 1. CodeIgniter's MVC Pattern

Website

A website can be interpreted as a collection of pages used to display text information, still or motion images, animation, sound, and/or a combination of these, both static and dynamic, which form a series of interconnected buildings were each linked by a network of pages (hyperlink) [12]. The following is the work process of a Web-based application:

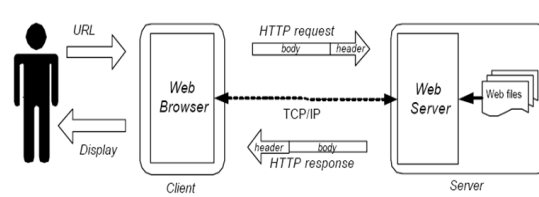


Figure 2. Website's Common Process

RESEARCH METHODS

3.1 Time and Location

The research was conducted at the Faculty of Language and Literature at Universitas Negeri Makassar (Fakultas Bahasa dan Sastra in Indonesian or FBS-UNM in short) DA Building, 2nd floor, Jl. Mallengkeri Raya, Makassar. The research was conducted in March 2020 - October 2020.

3.2 Research Type

The type of research used is descriptive-qualitative research. This technique describes and interprets the meaning of data collected by paying attention and recording as many aspects of the situation under study to obtain a general and comprehensive picture of the actual situation [13]. The descriptive method means that the researcher analyzes the data collected in words, photos, and not numbers. Such data may come from interview manuscripts, field notes, photographs, videotapes, personal documents, notes or memos, and other official documents [14].

Measurement of quantitative data and objective statistics comes from experimental results, which are used to determine the number of text characters accommodated by an image and determine the inserted text's suitability.

3.3 Research Model

We were referring to the problems we have described above, namely how to build an e-office at the FBS UNM, replacing the traditional and paper-based correspondence administration system and service system. According to Geoffrey et al., a research and development (R&D) method is a research method carried out to produce certain products and test their effectiveness [15]. This model is broadly divided into 7 (seven) steps as follows: (1) potential and problems; (2) data collection; (3) product design; (4) product validation; (5) product revision; (6) product testing; (7) Dissemination & Implementation.

Development Step

Gall & Borg describe the ten steps of implementing the research and development strategy we adopted for this study [16]. These steps are as follows:

1. Research and data collection (research and information collecting) includes measurement of needs, literature studies, small-scale research, and considerations in terms of value.
2. Planning is preparing a research plan, which includes what is needed in the research process, the formulation of the objectives to be achieved in this research, the research design, and the possibilities that are carried out in a limited scope. At this stage, the installation process will be designed, content, system components, and system database. This stage also includes identifying the hardware on which to run the application, creating the desired content, and creating the appropriate stylesheet for the appropriate display device.
3. Development of a product draft (develop a preliminary form of product), which is developing a correspondence administration e-office system for all FBS UNM academic community.
4. Preliminary field testing. This trial is the validation will be carried out by several IT experts and visual communication experts. During the trial, interviews and FGD were conducted.
5. Revise the test results (main product revision). Here will be an analysis and product improvement based on previous trials' results.
6. Field testing (main field testing). We are testing the system in the field with limited implementation methods in the UNM FBS environment.
7. Improving the product field test results (operational product revision).
8. Field implementation test (operational field testing), which is used to determine the extent to which the benefits and problem formulations have been resolved by implementing the e-office administration system at FBS UNM.
9. Completion of the final product (final product revision). Before this product is implemented, it will be refined both from the application side and in terms of content until it is deemed ready to be implemented as a whole.
10. Dissemination and implementation (dissemination and implementation). After that, a correspondence administration e-office system will be implemented that

can be run by accessing it locally on the university's wi-fi network (unm.net) or publicly.

System Design

1.3. Business Process

It is necessary to know the business processes at FBS UNM in general, especially the existing correspondence administration system, as shown in Figure 3 below.

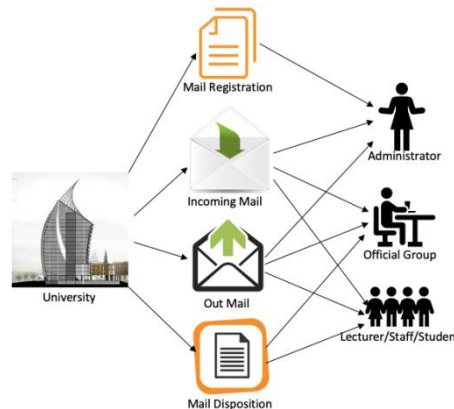


Figure 3. Business Process Flow in FBS-UNM

Figure 3 shows three main actors involved in the correspondence administration system at the university level, namely Administrators or operators, Leadership Groups and Lecturers, Staff, and Students. Meanwhile, the correspondence administration system that is managed includes the receipt of incoming mail, outgoing mail, registering outgoing mail to regulate the numbering, and disposing of incoming letters to related units.

1.4. Software Design

After conducting a needs analysis from the survey results through questionnaires and interviews with some staff and leaders in the scope of FBS UNM, the first thing to do is designing the system. Figure 4 below presents the results of the system design in the form of DFD (Data Flow Diagram). DFD is one of the modelling tools that are often used, especially when the system functions are a more important and complex part of the data manipulated by the system. DFD is a system design tool oriented to data flow with the concept of decomposition, which can describe the analysis and system design that is easily communicated by system professionals to users and programmers.

The context diagram shows that three entities use this application: administrators, staff, and Faculty Leaders. Each entity has different rights and privileges according to their individual needs.

A flowchart is a chart that shows the flow in a program or system procedure logically. Flowcharts are used primarily for communication aids and for documentation. Figure 5 shows a flowchart of the system in general without seeing each entity's boundaries in the context diagram.

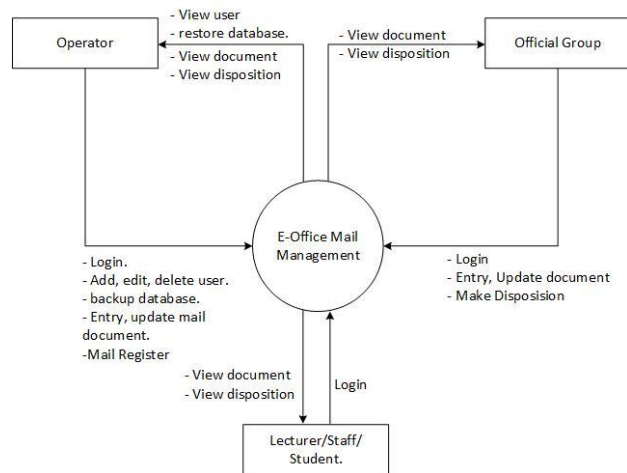


Figure 4. Context Diagram of E-Office FBS UNM

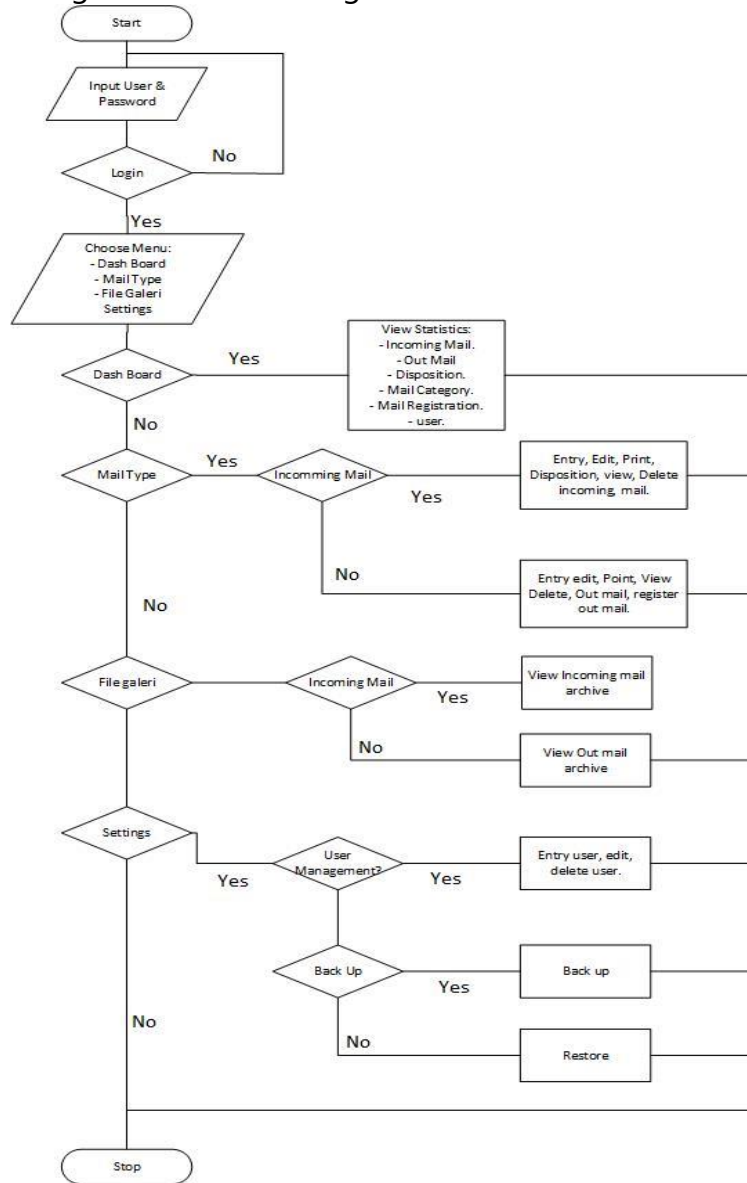


Figure 5. Flowchart of E-Office FBS UNM

RESULTS AND ANALYSIS

1.5. Implementation Result

We built this e-office application for correspondence administration system using a programming language based on PHP and MySQL as the database. There are several main pages on this system.

Login Page

The login page is used for users who will enter the dashboard page. Those who are entitled to access this dashboard are according to the entities in the context diagram, namely Administrators, official groups, and lecturers/staff/students. The login page display is shown in Figure 6.

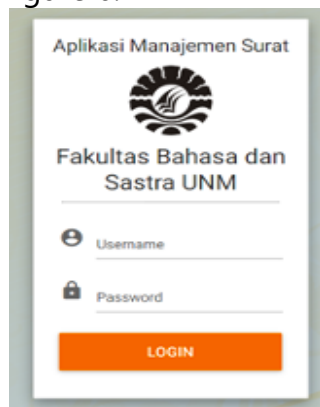


Figure 6. Login Page Display

Administrator Page

If someone is logged in as an administrator, they will get full access to the system, as shown in the system flowchart. Access obtained is in the form of adding, editing, deleting all types of data from the e-office application, the correspondence administration system, to backup and restore databases and the process of managing users and agencies that will access the system. Figure 7 shows the administrator page and the features it has.

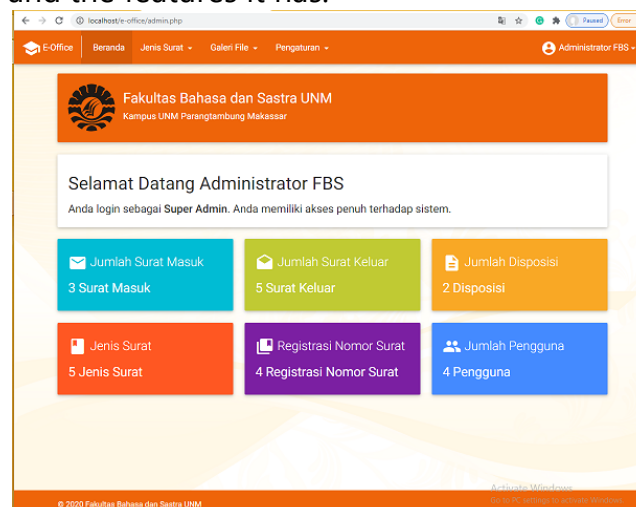


Figure 7. Administrator's Page Display

Outgoing mail registration function and automatic numbering

A quite different function from some existing e-office applications is the automatic numbering system of letters to be registered. This numbering system can be customized as needed based on the type of letter, letter category, and the date the letter was created. Meanwhile, the number will increase according to the order of registration of the letter. Figure 8 below shows the letter registration page performed by the operator or administrator.

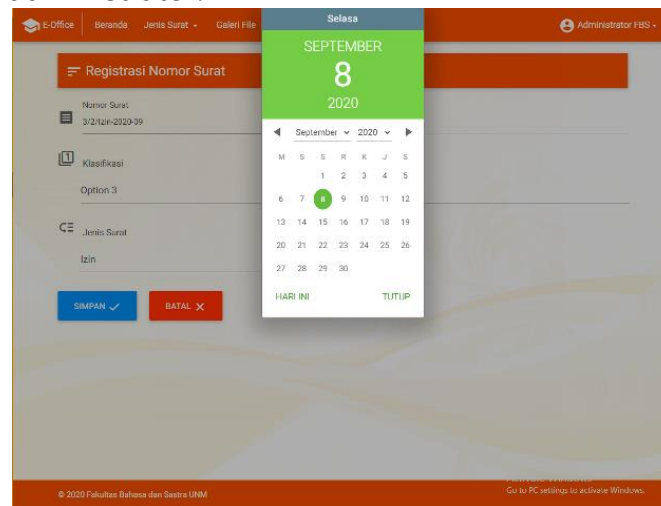


Figure 8. Automatic letter numbering system page

1.6. Analysis and Discussion

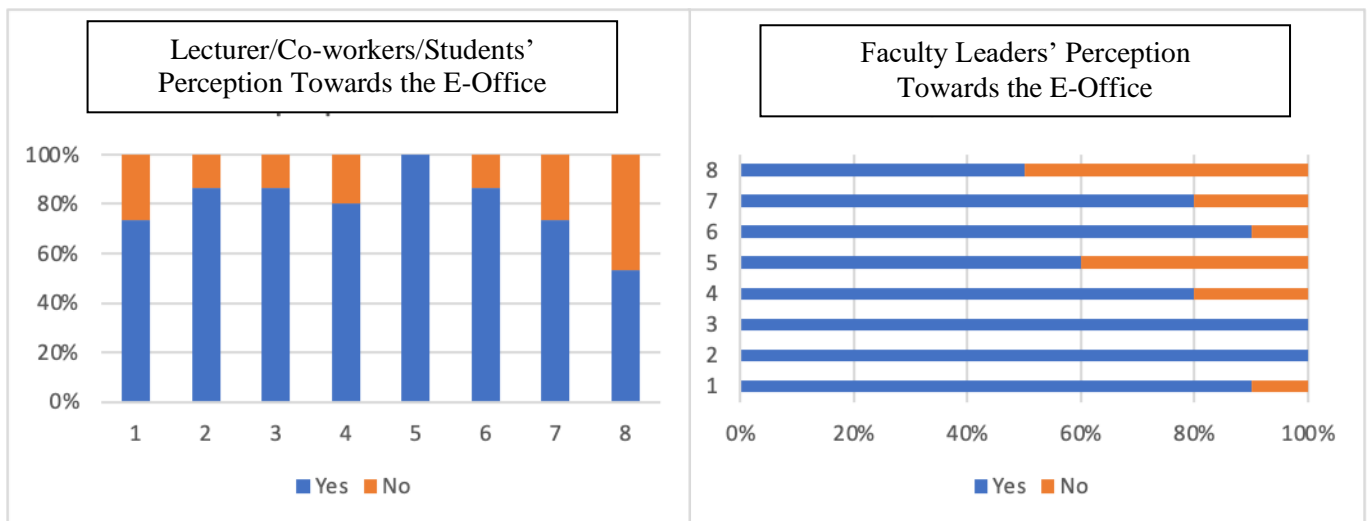
To find out user responses to this application, we conducted a trial using the application and then conducted interviews with several users to determine the responses/feedback to this e-office application. Interviews were conducted with 15 responders consisting of 5 co-workers, five lecturers, and five students as regular users and ten faculty level leaders and study programs who were taken randomly from three different departments in FBS UNM.

Table 1. Question Interview 1 (Opinions of Co-workers and Lecturers regarding Applications)

| No | Questions |
|----|--|
| 1 | Is this e-office display attractive and easy to understand? |
| 2 | Can this application help to facilitate your work? Can this application help to speed up your work? |
| 3 | |
| 4 | Is this application useful for improving the performance of your institution? |
| 5 | Can the information update process be done quickly? |
| 6 | Are you satisfied with this application? |
| 7 | Is the content that this application present is complete enough? |
| 8 | Is the existing e-office mailing administration feature sufficient to meet the needs of your job? |

Table 2. Question Interview 2 (Leaders' Opinions regarding e-office Applications)

| No | Questions |
|----|---|
| 1 | Are these applications easy to understand in general? |
| 2 | Does this application make your work easier? |
| 3 | Can the updating and viewing of information be done quickly? |
| 4 | Are you satisfied with this application? |
| 5 | Is the content that this application presents is complete enough? |
| 6 | Does this e-office application significantly reduce paper usage in your office? |
| 7 | Can this e-office application reduce your interactions with other people? |
| 8 | Is the existing e-office mailing administration feature sufficient to meet the needs of your job? |



(a) Lecturer/Co-workers/Students

(b). Faculty Leaders

Gambar 9. Hasil Interview terhadap pengguna

The first interview was conducted with 15 people from the faculty staff, lecturers, and students in FBS UNM. The results were 73% of the respondents said the e-office application display was interesting and easy to understand; 87% of the respondents said that this application made their work easier and faster. In contrast, 80% of the respondents believe that this application can improve their institutions' performance. Of the 15 respondents interviewed, all were generally satisfied with this application, and 87% said the update process was easy and fast. Also, 73% of respondents said that the content of the information presented was quite complete. However, 47% of them said the features in e-office applications still need to be added.

In the second interview, we showed the application to 10 faculty and study program leaders in the UNM FBS. From the interview results, 90% of the respondents said this application was easy to use. They all agreed that the application made it

easier for them to work as leaders and was also fast in the updating and viewing process. As many as 80% of the respondents said they were quite satisfied with the application as a whole, 40% thought that the contents of the information content were not complete enough. Even though 90% of the leaders said that the use of paper by institutions was significantly reduced and 80% thought that the application could reduce physical interaction between them, there were still around 50% among faculty leaders who asked for this e-office application feature to be added.

CONCLUSION

Currently, the e-office administration system for FBS UNM has been implemented. The correspondence administration process includes incoming mail management, outgoing mail management, automatic letter numbering registration, and letter disposition system, all of which have been done on a paperless basis.

Based on the results of the interviews, we concluded that the academic community feels helped and is facilitated in increasing the efficiency and effectiveness of their work, which directly affects performance improvement. The leadership also felt very helpful and facilitated in updating and presenting various correspondence information in the scope of FBS UNM. Thus it can be believed that the e-office correspondence administration system runs quite effectively and efficiently so that it is feasible to be used and implemented in the scope of FBS UNM in particular and UNM in general.

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