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## Paperless Mail Office System and Data Integration at UNIKA Soegijapranata

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**Abstract**—Paper-based correspondence has many constraints on sending, receiving, and filing. The filling makes it difficult to search document. The purpose of this research is to facilitate the process of sending, searching, and integrating data and documents. With electronic-based office mail is expected to reduce paper usage. Application development methods using the SDLC method consist of system investigation, analysis, design environments, testing, training, and transition, operation and maintenance. Electronic-based office mail is able to solve many problems regarding the mail system such as speed of delivery, filing, and searching of documents. By utilizing the database system, documents can be stored well and integrated. It's cannot eliminate the use of paper. The main reason is the habit of employees needed paper evidence in their work.

**Keywords** office system, paperless system, database, data integration.

### 1. INTRODUCTION

A manual letter is the process of making, sending, displaying and disposing letter manually, not use information technology. Manually service letters have many weaknesses, namely slow mail delivery, difficulty in sending, complicated mail tracing, irregular archiving, mail not reaching the destination, and irregular stacking of paper.

Information technology is the integration of technology[1][2][3], information, computers, and information systems, and computer devices. Processes used for

computers and devices to create, modify, store, process, transmit, and retrieve information securely.[4].

The terms of "paperless," "electronic," and "digital" are made by people who use information technology and communication technology. A paperless office in a work environment where the creation, modification, storage, and retrieval of documents takes place electronically. It supports the management of business documents[4]. See also an understanding of the Electronic Service Manuscript which is part of an e-Government that will roll out forms that can be used to manage more easily, quickly, transparently, orderly, integrated, efficient, safe and efficient[5]. In the electronic understanding where the letter of service no longer use paper but the letter of service made, sent and stored using the information technology and communication in digital form.

The digital document management system stores all documents on the server with guaranteed security. Documents can be authorized and not everyone can access the data, thus avoiding documents accessed by unauthorized persons.

The digital management system can result in better and more accessible customer service. This will help in retrieving information in serving customers

Improve efficiency where digital management system will be easy in search and retrieval of documents easily and simple.

The system has been created for the purpose of: reduction of paper usage Streamlining Communication; Eliminates the use of versatile software for routine

mechanistic daily work to be directed at the full system usage; Concentrate the assignment of human resources to mechanistic non-routine work that requires the power of inventiveness, taste; Suppressing the use of paper only to print documents that have special legal powers such as certificates, promissory notices and so on.

Communication and mobile technologies have influenced consumers' lives, including how they read books. Book readers begin to change reading habits, choosing different types of book formats, such as e-books. An e-book, also known as an electronic or digital book, is a digitally released version of the book, often consisting of text and images and available on electronic devices, such as specially designed e-book readers.

Paperless is also used in education where communication used e-learning where the use of "paperless" educational technology increases the potential of teachers by offering more freedom and creativity to new teaching techniques and technologies that engage students in the creative process[6].

The Chambers Thesaurus proposes alternative words to paper as certificates, documents, files, gazettes, journals, newspapers, letters, notes, manuscripts, theses, etc. This term all refers to products containing information.

Paper documents refer to typeset documents (hard copy) and digital documents refer to the document on the screen (soft copy). Although the document may be in the form of various combinations of text, digital, video and digital audio stored in the form of file files or folders[7].

Document management automatically creates a paperless working environment[8]. Focusing on business processes and automation forces organizations to be customer-oriented and operate across organizational, cross-functional boundaries, ensuring competitive advantage.

Real business integration remains a key challenge that needs to be addressed by integrating applications[9] (documents, papers, voice and database, handling email,

fax and phone). The role of corporate information portal, in this case, should be a growing research[7].

Using web-based technology for the dissemination of course materials and for the storage of test results provides many benefits to instructors and students. Web-based software for users has many benefits such as 24-hour accessibility from any internet connection, electronic archive, paper stack removal, and reduced tasks[10].

Information and communication technology brings to the needs of fast and accurate transactions (online and real-time). By using internet technology, data can be sent in seconds, so the paper is no longer needed. Evan Golub says that web technology has replaced paper, so the paper is no longer needed anymore.[11]

Electronic office letter is a web-based application system that works to replace the work process of the system of physical correspondence[12] (manual). This system works integrated with the smallest unit to the highest leadership. (bureaus, institutions, department, faculty, and rectorate).

The system will work following a well-built manual workflow. Letters that have been made and approved by the boss will be automatically sent to the destination, from the recipient side of the letter will be read in seconds after the letter was sent. This process will reduce send errors, and delivery time is very significant, and no less important is to reduce the employees in charge of sending mail. Service letters are specially designed such as letters in order to format and shape the same as paper mails.

Electronic-based office letters are expected to be able to solve many problems regarding the mail system such as speed of delivery, archiving, document search, reducing paper, and switching to digital paper. Ease of storing: with a digital document management system, all documents can be stored and accessed easily[13]. Ease of audit: Every company has strict document rules in document storage and display. Documents that have unique numbers can be traced automatically.

Search for time-saving documents[14] is done quickly and easily and provides very fast results.

## 2. METHOD

Research by conducting literature studies on several manuals regarding application design, then design the application based on the analysis of existing needs. The implementation process is done by creating a web-based application. Where to access using a browser. Application testing is carried out with users, in this case administrative staff, totaling 38 staff representing 50% of the prospective user population. Testing the use of applications using simple statistics.

Design mail office Web-based uses two stages of web-based application development and application usage survey.

SDLC (software development life cycle) software development method consist of System investigation, System analysis, Design Environments, Testing, Training, and transition, Operations and maintenance[15].

Evaluation: Spreading questionnaires to test the capabilities of built applications and user satisfaction.

Questionnaires were deployed to view the satisfaction of electronic mail usage and receive input for system perfection.

Analysis: by spreading the question form to the user. There are 15 questions that can help infer the usefulness of the mail system.

Table 1. List of Question

the paperless office helpful in making letters (digitizing letters)
the paperless office helps to searching for data
the paperless in the office make us do not print a letter (paper form)
the paperless office makes you faster reporting
the paperless office have Backup function on the application
the paperless office is an Easy Feature / short-key to remember and understand

the paperless office is the system quickly responds to inputs

the paperless office system are easy to learn

the application is very accurate in providing reports

the paperless office system the system

provides information when there is an error

paperless office system provides a help menu

the paperless office system are still relevant

the system makes it easy to complete the job

there is a complete manual documentation

easy to learn documentation

## 3. RESULT AND DISCUSSION

The Old System uses manual methods where letters are sent by employees. This mail delivery method takes a long time, requires employees to send, filing employees, and the problem of stacking paper.

The solution to the problem is to build an integrated mailing information system, where the staff simply makes the letter and is approved by the leader, then the letter will automatically be sent. An integrated system can reduce staff work and speed up mail delivery, reducing paper. Archiving of event documents is well stored and easy to search.

### Identify actor

The primary business actor is a Stakeholder taken in most benefited from the implementation of use-case. They received benefit in cases that their mail system can run well so that their business processes can run smoothly.

Primary system actor: Stakeholders that interact directly with the system to trigger business or system events (business or system events) in this case are administrative staff and related leaders.

External server actor: is a Stakeholder that responds to requests from use-case. Head Unit authorizing letter can be sent or not

External receiver actor: is a Stakeholder which is not a primary actor but receives something of value from use-case. A Staff and Lecturer receiving the letter.



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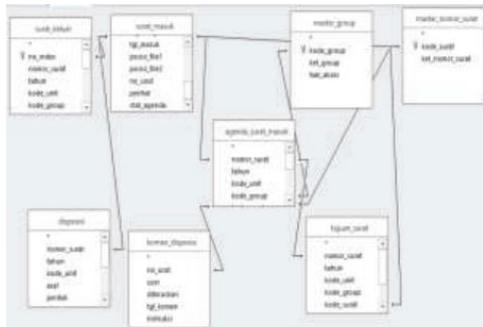


Figure 4. Data design outgoing mail

Implementation of Input Design

User login

Figure 5 view of user login, everyone who will access paperless system must authenticate users and passwords in order to avoid data manipulation. Sync user can use ID and also by using an institutional email address.



Figure 5. login form

Front view

The front view after login is designed to display all mail information in both incoming mail, outgoing mail, or disposition. If there is a change that is incoming, outgoing or disposition letter will appear red status. Users will automatically see and perform as soon as possible. So there is no delay in activities, as shown in Figure 6<sup>th</sup>.



Figure 6. form information incoming and outgoing letter

The view creates a letter

At the time of making a letter, the user simply selects the destination, the letter number, the origin of the letter using pulldown so as to avoid writing errors. Only the contents of the letter should be typed in accordance with the needs, as shown in Figure 7.

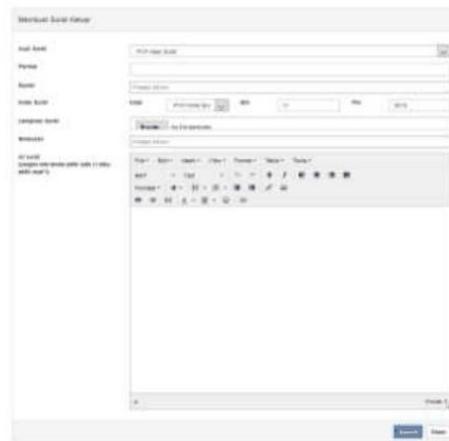


Figure 7. login form create letter

Incoming letters view

The incoming and outgoing messages display all the information from the mail, so the user can easily see and open and the button used to display the content simply use on click, as shown in Figure 8<sup>th</sup>

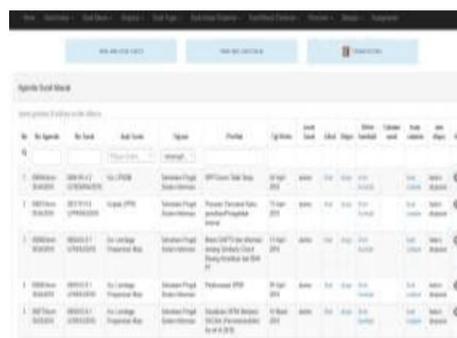


Figure 8. display incoming and outgoing letter

### Data analysis

From the data processing obtained 3 Group where group 1 which has an average value 3.5. The value is considered a good enough value. Group 2nd is a moderate group between 3.0 and 3.5. While group 3th with low value that is less than 3.0, as shown in table 2<sup>nd</sup>. In 2<sup>nd</sup> group has an average value above 3.5. The system is very helpful in making letters (digitizing letters), respondents provide an average grade of 4.26. In search of respondent data facilitated by the system with average value 3.7.

Table 2nd. group 1 good result

question	1	2	4	7	8	11	13	14	15
total	196	170	180	210	190	186	186	180	186
average	4.26	3.70	3.91	4.57	4.13	4.04	4.04	3.91	4.04

On the 3th table letters are still printed, system error information, ease of use of the application get a low value. this means that e-mail must still be printed to be submitted to the manager.

Table 3th results below average

question	3	10	12
total	124	126	132
average	2.70	2.74	2.87

On the 4th table data backup, additional features, and systems provide reports of getting an average or medium response.

Table 4th average results

question	5	6	9
total	144	140	160
average	3.13	3.04	3.48

With the e-mail, the process of making reports faster because with the letter response quickly and making reports immediately done. At the system level, respondents see that the system response is very fast that the data load is very short and the data storage process /is very fast because it is supported by an adequate server.

Respondents stated that studying online letters is quite easy and enough to see well-organized forms so that new users have no trouble using them. The help menu helps respondents in understanding the letter system to make it easier to understand the application.

Respondents can complete the work of the correspondence easier and faster this is because there is ease of editing sentences and delivery with a very short period, and ease in making the letter again by looking at the pattern of the mail archive.

In group 2<sup>nd</sup> has an average value of 3 to 3.5. respondents still need ease of understanding of existing features, application backup and application accuracy in generating reports even though data inputted as outgoing mail, and received as incoming mail can be reported accurately and precisely, due to good database design support, no redundancy and not duplicate data.

In group 3th, electronic letters that has been made does not necessarily change the habit of printing a letter. Electronic letters should still be printed as valid proof. In the system, there are still weaknesses that have not provided an error message if something goes wrong or the process is not working properly. The system based on client-server is not easy to be changed according to the needs of each client. Changes must be centralized.

Another weakness in this system is the word processing function is still not able to match word processing like Microsoft word that has many features. This system uses TinyMCE template which fundamentally this letter system has been able to solve the problem of digitalization of correspondence system.

## 4. CONCLUSIONS

The paperless app has helped digitize the mail office system well and all parts run the work using electronic mail. And the system runs stable. The paperless system has been able to solve the problem of late delivery and

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receipt of mail and letter can be searched quickly.

Applications are able to simplify some business processes viewed from the fast and easy delivery process and digital archives can be seen clearly.

The e-mail application stores all documents on the server with guaranteed security. Documents may be authorized according to their respective access rights.

The electronic mail system has not been able to change the habit of printed the letter, many still keep printing letters as physical evidence.

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