The Development of Web-Based Correspondence Information Systems in University Using Scrum

Nurirwan Saputra¹, Meilany Nonsi Tentua¹, Ratna Purnama Sari²
¹Department of informatics, Faculty of Science and Technology, Universitas PGRI Yogyakarta, Indonesia
²Department of Accounting, Faculty of Business, Universitas PGRI Yogyakarta, Indonesia

nurirwan@up.ac.id

Abstract. Correspondence management at Universitas PGRI Yogyakarta (UPY) is still managed manually. When a student needs a letter from UPY, he or she must come directly to the Faculty admin. Students are required to write down the type of letter needed and their personal data. After that the letter will be signed by the dean of the faculty. This process takes a long time, especially when the faculty dean has a busy agenda or is not in place. This article develop a web-based Information System for PGRI Yogyakarta University. Scrum is a method to developing this system, which only need 1 month to finish this system, which faster and more effective than conventional method. By Using conventional method, usually to develop system in University need minimum 6 months, it means Scrum 6 times faster than conventional Method. Based on the survey result of 30 respondents regarding the application, 73% having easy navigation, regarding whether the speed of application access 70% agree this system is relatively fast, regarding whether the features of the complete system 53% agree this system is very fast.

1. Introduction

Universitas PGRI Yogyakarta (UPY) is an organizer of education and profession in undergraduate and magister degree that refers to the National Education Standard. The UPY education process is related to the administration of correspondence needed by students and stakeholders.

Letter is an essential tool for every institution, including the regional secretariat of Pacitan regency. Important and confidential information relating to the agency is contained therein. Therefore, every activity related to the mailing must be done storage of the mail archive and well documented. Timeliness in the receipt of letters both outgoing and incoming mail should also be considered. Therefore the management of incoming and outgoing letters must be implemented appropriately [1].

This letter management activity includes an important activity that must be done by an organization, and the management activities of the letter can be different for each institution. The activities of correspondence must be very considerable because the contents of the letter in the company or the agency will be the means of achieving the objectives of the organization or agency in question. Therefore it is necessary to manage the letter. In an organization or company, letters according to its procedures are differentiated into two, namely incoming and outgoing letter [2].
An institution both private and government in conducting its activities are not separated from the correspondence activities, because the letter has a function and important role in the means of achieving the objectives of the company/agency concerned [3].

One of the important applications of information technology is the archiving system. This is because the archives system serves as the collective memory of the agency (corporate Memory), data or information for decision making (decisions making), the supporting material of the court proceedings (litigation support) and depreciation of work files (retention)[4].

Currently, management of letters needed by students is still done manually. Students who need a letter from UPY should come directly to the Faculty of Administration where the student is enrolled. Then students should write down the types of letters needed and data themselves. Students should also wait when the administration makes letters and ask for signatures from faculty leaders. This process takes a long time, especially when the faculty leader has a robust agenda. The registration of this letter is still done manually by the administration is only written on the ledger.

An incoming letter-and-letter-out in a manual manner has also occurred at the Medan High Court office. The process is still by separating between incoming mail and outgoing mail so that it takes a long process and time, with the information system of the letter Pengagendaan as a means of useful information and facilitate the management of mail [5].

The condition of filing a conventional letter of correspondence causes UPY services to students to be less effective and efficient. Even because the recording of letters done manually can happen to lose archive on outgoing mail, therefore a system will be able to manage the letters needed by the students and organize them well.

Agile software development has become a popular way of developing software. Scrum is the most frequently used agile framework, but it is often reported to be adapted in practice [6]. Dien of Faculty Sains and Technology as a Product Owner committed to using Scrum as a development method, since requirements were changing rapidly and the team needed to deliver quickly. Management support of the agile process included enabling the team to embrace, adapt, and manage the process so that it worked better for them rather than mandating certain styles [7].

With the letter management information system, students can directly submit a letter as he wants, the letters that are commonly described by the Faculty of Engineering are the payment of final project, admission permit, permit research, KKN, Active students, book assistance, submission of the thesis, late Heregistrasi, late KRS, KP. Furthermore, a dean can immediately accept or reject a letter submitted by a student with just one click. Students who have received his letter submission can directly print the letter in PDF form in a standard format and standardized from the Faculty of Engineering of University PGRI of Yogyakarta.

The Academic Assessment Information System, the study was to create a Web-based academic assessment information system used in education to facilitate student assessment. The results showed that the academic assessment system facilitates school information on assessing and issuing value to students and is also expected to be more efficient [8].

The letter handling system of the governor's office of Bangka Belitung, with a computerized mail handling system, the processing of letters, information presentation will be faster, and data security will be more secure because the place Or storage media is more awake [9].

Codeigniter Framework to construct the Letter Information System Application of teaching assignments and practical work letter at the Faculty of Engineering of Sangga Buana University that can help secretarial staff faculty in processing outgoing letter. Information System for a letter of teaching assignment and letter for student practice can improve the performance of the Faculty of Engineering secretarial staff in providing information accurately, effectively and efficiently in the processing and data retrieval [10] [11].

The use of mobile web in thesis management administration system can facilitate the management of the letters needed and the final project recap. This system can also browse the titles of final assignments that have been made so as to reduce duplication of final assignment titles. This study concludes that using the system can facilitate and speed up the management of the documents needed.
This system can also sort the titles of final assignments that have been taken so as to avoid duplication [12].

Based on previous research above, the Web-based information system can be used in the management of correspondence existing in UPY. This article will propose Web-Based Correspondence Information Systems is a Web-based information system that can be used to store and manage data in the form of mail information needed by students. With this system, students can apply for the required letter from UPY anywhere. Students come to the administration of the faculty only take the mail file that has been signed by the faculty leader without a long time. Additionally, outgoing mail can be well managed.

2. Methodology

Information system is a set of organizational procedures which when implemented will provide information for decision makers and/or to control the organization [13]. The speed of data processing and information delivery has a very important role for every agency, data and information that must be processed, of course, cannot be done all manually.

The subjects involved in the Web-Based Correspondence Information Systems are the Dean of the Faculty of Engineering, Lecturers in the Faculty of Engineering, and students in the Faculty of Engineering.

2.1. System Development Methods

Development of Web-Based Correspondence Information Systems using the Scrum Method. The Scrum method is an agile project management framework [14] for managing complex projects—are few, straightforward, and easy to learn [15]. Scrum method is develop to make more effective dan efficiency developing project or system, that's why, with this method only need 1 month to finish project depend on complexity of project. The Scrum meeting should last 15 to 30 minutes, which provides enough time to address obstacles, but does not allow time to brainstorm a solution [16].

![System Development System Method](image)

**Figure 1. System Development System Method**

2.1.1. Product Backlog

This phase is collecting data and everything that be required to developing this system, like product request, product transformation, user fitur etc. Product Owner make an item list and sorting by priority.

2.1.2. Sprint Planning

Sprint planning is an event in scrum that kicks off the sprint. The purpose of sprint planning is to define what can be delivered in the sprint and how that work will be achieved. Sprint planning is done in collaboration with the whole scrum team [17]. So in this phase, the ability each member of team must be recorded and must suitable with job list.
2.1.3.  1-4 Weeks Sprint
This phase is period of each sprint. One project can be done in one or more sprint. 1-4 weeks Sprint is easier evaluate and review.

2.1.4. Daily Scrum
This phase is doing a meeting every day with team with only maximum 15 minutes that discuss about the problem was found, the task that already done, and what to do next and take sprint backlog.

2.1.5. Sprint Retro
In this phase is reflexions about past sprint. The Scrum team performs its own inspection and determined wheter the sprint that has done before is going well or need to be improved. This phase is very important before moving on to the next sprint.

2.1.6. Sprint Review
In this phase, team is presented and demo the task that has been finished. Product Owner will explain which task has been completed or no. Task is completed when appropriate with Definition of Done (DoD).

2.2. Flow Chart System
The process of submitting letters by students is presented in the form of a flow chart which can be seen in Figure 3. The system can be accessed on the ft.upy.ac.id, then a menu for the type of letter will be presented. After the type of letter is selected, students can fill in the required forms. The completed form will then be forwarded to the dean for approval, if it is approved the letter submitted can be printed, otherwise it will return to the type selection menu.

Figure 2. Flowchart System

2.3. Context Diagram
In the Information System of Letter Management (Simas FT UPY) consist of 3 users: Admin, Dean and Student. Data identification (input) and information (output) shown in Table 1.

| Table 1. Data Identification |
|-------------------------------|
| Users | Data (Input) | Informasi (Output) |

Based on the user identification table, data and information can be described in a context diagram as shown in Figure 1.

![Context Diagram](image)

**Figure 3. Context Diagram**

3. **Result and Discussion**

Web-Based Correspondence Information Systems development can be accessed at the address ft.upy.ac.id. This system has four authorities, namely students, deans and administrators. An admin must log in on the Administrator page, the admin can log in using a username or email. This admin page is made simple and is intended as a super user or user with the highest access rights in the Mail Management Information System. The access rights that the admin has are adding users, deleting users, editing users and viewing all existing transactions. Transactions that occur in the system are submission of letters by students, providing letter numbers when approved by the dean, printing letters that have been approved and printing any letters that have been issued for a certain period.

On the dean side, the system will report letters submitted by students. The approval submitted by the student will be carried out by the dean after checking by the administration. When the application is approved, the dean verifies the system.

Web-Based Correspondence Information Systems on the student side can make letter application transactions as needed. Types of letters that can be submitted are student activity letters, thesis payments, practical work permits, research permits and KRS late letters. To enter the student system, you must log in using your student ID number and password. The form for submitting a letter can be seen in Figure 4.
Web-Based Correspondence Information Systems testing was carried out with Alfa testing conducted by 30 respondents. The test results regarding the content provided are simple, making it easier for application users, namely 60% strongly agree, 37% agree, 3% say normal. Figure 5 shows a graph of the system test results.

Based on the results of a survey of 30 respondents regarding the application having easy navigation, namely 73% strongly agree, 27% agree, 0% say that it is normal, 0% disagree, and 0% strongly disagree. Based on the results of a survey of 30 respondents regarding whether the speed of application access is relatively fast, the following results were obtained: 70% strongly agreed, 30% agreed, 0% said they were normal, 0% disagreed, and 0% strongly disagreed. Based on the results of a survey of 30 respondents regarding whether the features of the complete system were as follows: 53% strongly agreed, 37% agreed, and 10% said they were normal.

4. Conclusions
A Web-based Letter Administration Information System for PGRI Yogyakarta University using Codeigniter has been built. The stages used are using the Scrum approach which is more effective and more efficiency than conventional method. Based on the black box testing, the results show that all functions have run well, the functions tested include: (1) User Verification (2) Data Management (3) Information and reporting. Based on alpha testing, it can be seen that the system developed by reusability is considered good, the assessment aspects include: ease of use, ease of navigation, speed of access, completeness of features and an attractive appearance.
References

[1] M. Luqman, “Pembangunan Sistem Informasi Manajemen Surat Masuk dan Surat Keluar Pada Bagian Umum Sekretariat Daerah Kabupaten Pacitan,” *Speed - Sentra Penelit. Eng. dan Edukasi*, vol. 5, no. 3, pp. 21–27, 2013.

[2] A. Vironica and Sukadi, “Rancang Bangun Aplikasi Pengelolaan Surat Masuk Dan Surat Keluar Pada Sekolah Menengah Pertama Negeri 2 Nawangan,” *Speed - Sentra Penelit. Eng. dan Edukasi*, vol. 5, no. 4, pp. 44–51, 2013.

[3] D. Anggraeni and S. Iriani, “Sistem Informasi Pengarsipan Surat Masuk Dan Surat Keluar Pada Kantor Kecamatan Pringkuku,” *Indones. J. Netw. Secur.*, no. 24, pp. 6–9, 2019, doi: 10.31227/osf.io/bhj5q.

[4] A. Darlanto and I. Permana, “Sistem Informasi Pencatatan Surat Masuk,” *J. Rekayasa dan Manaj. Sist. Inf.*, vol. 2, no. 1, pp. 37–43, 2016.

[5] H. T. Sihotang, “Sistem Informasi Pengagendaan Surat Berbasis Web Pada Pengadilan Tinggi Medan,” *J. Inform. Pelita Nusant.*, vol. 3, no. 1, pp. 6–9, 2019, doi: 10.31227/osf.io/blhj5q.

[6] D. Anggraeni and S. Iriani, “Sistem Informasi Pengarsipan Surat Masuk Dan Surat Keluar Pada Kantor Kecamatan Pringkuku,” *Indones. J. Netw. Secur.*, vol. 5, no. 3, pp. 21–27, 2013.

[7] A. Darlanto and I. Permana, “Sistem Informasi Pencatatan Surat Masuk,” *J. Rekayasa dan Manaj. Sist. Inf.*, vol. 2, no. 1, pp. 37–43, 2016.

[8] H. T. Sihotang, “Sistem Informasi Pengagendaan Surat Berbasis Web Pada Pengadilan Tinggi Medan,” *J. Inform. Pelita Nusant.*, vol. 3, no. 1, pp. 6–9, 2019, doi: 10.31227/osf.io/blhj5q.

[9] A. Darlanto and I. Permana, “Sistem Informasi Pencatatan Surat Masuk,” *J. Rekayasa dan Manaj. Sist. Inf.*, vol. 2, no. 1, pp. 37–43, 2016.

[10] J. Sofian and H. H. Solihin, “Pembangunan Aplikasi Sistem Informasi Surat Tugas Mengajar Dan Surat Kerja Praktek Pada Fakultas Teknik Universitas Sangga Buana Dengan Memanfaatkan Teknologi Framework Codeigniter,” *J. Techno-Socio Ekon.*, no. May, 2016, doi: 10.5281/zenodo.1495846.

[11] M. L. F. Kurnia Adhi Saputra, “Perancangan Sistem Informasi Pengelolaan Surat Masuk Dan Surat Keluar Pada MTs Guppi Jetiskidul,” *Indones. J. Netw. Secur.*, vol. 3, no. 4, pp. 119–144, 2014.

[12] M. N. Tentua, M. Fairuzabadi, and S. Sumarmi, “Mobile Web-Based Information System for thesis’s Administration in University PGRI Yogyakarta,” *J. Phys. Conf. Ser.*, vol. 1254, no. 1, 2019, doi: 10.1088/1742-6596/1254/1/012058.

[13] A. M. Langer, *Analysis and design of information systems: Third edition*. 2008.

[14] T. Sulaiman, B. Barton, and T. Blackburn, “AgileEVM - Earned value management in scrum projects,” in *Proceedings - AGILE Conference, 2006*, 2006, vol. 2006, pp. 7–16, doi: 10.1109/AGILE.2006.15.

[15] K. Schwaber, *Agile Project Management with Scrum - Ken Schwaber - Google Books*. 2004.

[16] L. Rising and N. S. Janoff, “Scrum software development process for small teams,” *IEEE Softw.*, vol. 17, no. 4, pp. 26–32, Jul. 2000, doi: 10.1109/52.854065.

[17] D. West, “Sprint Planning | Atlassian.” https://www.atlassian.com/agile/scrum/sprint-planning (accessed Nov. 04, 2020).