Proceeding

International Conference on Vocational Education and Electrical Engineering

(ICVEE) 2015

PPG Building UNESA, November 18th 2015

Organized by :

Electrical Engineering Department
Engineering Faculty
Universitas Negeri Surabaya
2015

ISSN 2461-0909

Proceeding

International Conference on Vocational Education and Electrical Engineering

(ICVEE) 2015

Edited by ICVEE Team

International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015

HONORARY COMMITTEE

Prof. Dr. Warsono, M.S.
Prof. Ekohariadi, M.Pd.
Puput Wanarti Rusimamto, S.T., M.T.

GENERAL CHAIRMAN

Prof. Dr. Supari Muslim, M.Pd.

STEERING COMMITEE

Prof. Ekohariadi (Unesa)
Prof. Ir. Sukandar M.Sc. Ph.D. (UTHM, Malaysia)
Prof. Ashari (Univ. Telkom)
Prof. Bambang Suprianto (Unesa)
Dr. IGP Asto (Unesa)
Dr. Son Kuswadi (PENS)
Prof. Dr. M Nuh DEA (ITS)
Prof. Dr. Ir. Mauridhi Hery Purnomo, M.Eng. (ITS)
Dr. Hendrawan (ITB)
Dr. Agus Harjoko (UGM)
Azis Muslim Ph.D.(Univ. Brawijaya)
Prof. Datuk Dr. Ir. Mohd Noh Dalimin (UTHM, Malaysia)
Dr. Fathul Arifin (UNY)

ORGANIZING COMMITTEE

Dr. Lilik Anifah, S.T., M.T.
Hapsari Peni, S.Si., M.T.
Prof. Dr. Bambang Suprianto, M.T.
Dr. I G.P. Asto B., M.T.
Dr. Tri Rijanto, M.Pd., M.T.
Dr. Agus Budi Santosa, M.Pd.
Dr. Euis Ismayati, M.Pd.
Dr. Wiryanto, M.Si.
Ir. Achmad Imam Agung, M.Pd.
Nur Kholis, S.T., M.T.
Eppy Yundra, S.Pd., M.T., Ph.D
Lusia Rakhmawati, S.T.,M.T.
Joko Catur Condro, S.Si, M.T.
Nurhayati, S.T., M.T.
Subuh Isnur H., S.T., M.T.
M. Syariffudin Zuhri, S.Pd., M.T.
Pradini, S.T., M.T.
Yulia Fransisca, S.Pd., M.Pd.
Arif Widodo, S.T., M.Sc.
Mahendra WIdyartono, S.T., M.T.
Rifqi Firmansyah, S.T., M.T.
Widi Aribowo, S.T., M.T.
Aditya Chandra H., S.S.T., M.T.
Reza Rahmadian, S.St., M.Eng.Sc.
Farid Baskoro, S.T., M.T.
Pradini Puspitaningayu, S.T., M.T.
Imam Basuni, S.T.
Sugiono, S.T.
Trisiana Dewi Aurora, S.S.
Moch. Ma'ruf, S.T.
Gitut Sudarto, S.T.
Subchan
Sholikun
Jamil

OPENING SPEECH FROM RECTOR OF UNESA

Assalamu Alaikum Wr. Wb.,

Good morning Ladies and Gentlemen, allow me in this opportunity to open this conference by first praying our grateful and praise to Almighty God for all His blessings, grace, and mercies that have made us possible to gather here in this room in excellent condition and health.

Dear distinguished guests and participants of the **The International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015 with the theme** "Overcoming Challenge towards Asean Economic Community (AEC) 2015 in Profesional Qualification on Vocational Education and Electrical Engineering". Universitas Negeri Surabaya (Unesa) is very pleased to host this conference in Surabaya.

I believe the conference will provide an opportunity for participants to disseminate new knowledge specially in Vocational Education, Electrical Engineering, and Informatics major, and share recent experiences and knowledge as well as new practices, technologies, and new concept.

My sincere appreciation also goes to all Keynote Speakers who have volunteered and spent your tight schedule to contribute to this special event in Surabaya. Your contribution to this conference and specially to Indonesia is highly appreciated.

Greatest thanks are due to all our Organizing Committee members for their dedication and continuous efforts and hard work in preparing as well as organizing this conference with the supports from Unesa lecturers and students. To our main and supporting sponsors and donors, our most gratitude and thanks for their generous contributions to make this conference possible.

Greatest thanks also to our participants, especially those who have contributed technical papers, thank you for your participation in this conference. I am convinced that this conference will be inspiring, and wish you all a successful and memorable time.

I would like to sincerely congratulate all of you to have fruitful conference and discussions and enjoy meeting new friends and colleagues and to take advantages to support your profession during this conference. I wish you all have a truly sweet memory and enjoyable stay in Surabaya.

Wassalamu Alaikum Wr. Wb.,

Prof. Dr. Warsono, M.S.
Rector of UNESA

ADDRESSING MESSAGE FROM DEAN OF FACULTY OF ENGINEERING UNESA

Honorable Rector of Universitas Negeri Surabaya, Prof. Dr. Warsono.
Honorable Speakers and Participants,
Distinguished Delegates, Guests, Ladies, and Gentlemen.
Assalamu Alaikum Wr. Wb.,

I am sincerely glad to welcome all you here, especially as I see very many familiar colleagues, friends, and our patners.

Welcome to our campus!

First of all, I would like to praise God for His blessings and mercies which allow all of us to be here today in this building in good health. I wish to express our deepest appreciation to those who have come from far away, many of them having been involved in commencing exactly what we have gathered here for.

It would be our great pleasure to welcome all of you, experts, engineers, and professional researchers from all over the world. **The International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015** is a scientific forum where all of us could meet colleagues and friends of broad areas, discuss and disseminate research findings and discoveries as well as to develop knowledge, technology, arts, and sustainable research networks, particularly in vocational education, electrical engineering, and informatics. This year conference raises a very important theme on "Overcoming Challenge towards Asean Economic Community (AEC) 2015 in Profesional Qualification on Vocational Education and Electrical Engineering". Therefore, it is a great pleasure and beneficial for all of us here today if we are able to take this advantage to build strong sustainable networks among researchers in order to develop knowledge, technology through recent research and innovation.

By hosting this conference, Faculty of Engineering Unesa is not only gaining the advancement of science and technology from all the findings and discoveries delivered during the conference, but also fruitful to encourage and enhance the arts and cultural values that would further dignify our nation and country among other worldwide.

Finally, I would like to convey our sincere gratitude to all participants, distinguished guests, and speakers that make this conference a great success. Thank you very much for being here. On behalf Faculty of Engineering Unesa, I thank you very much for your hard and untiring efforts. I wish that all of you may put all your continuous plants into undisturbed actions. And should push come to shove, that all your core processes may be continued seamlessly elsewhere. Today's program offers many various approaches to the issue. I wish you a very successful, productive, and inspiring conference!

The conference is an annual event which is held near the end of the year. We do hope that we could welcome you again next year in the 2nd ICVEE 2016, which certainly offers the most recent topics as well as advance science and technology in various areas.
Thank you most cordially for your attention.
Wassalamu Alaikum Wr. Wb.

Dean of Faculty of Engineering
Universitas Negeri Surabaya

Prof. Ekohariadi, M.Pd.

WELCOME SPEECH OF GENERAL CHAIRMAN OF ICVEE 2015

Dear Distinguished Delegates and Guests,

First, let us pray gratitude to the presence of Almighty God, for blessing and His permission, so "The 1st International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015" can be done well. Secondly, let us convey my warm welcome and high appreciation for the presence and the willingness of key speakers who came from Taiwan, Brunei, Malaysia, and Indonesia as well as other speakers, at an international seminar held on this day.

Ladies and Gentlemen,

Science and technology continue to evolve. Discovery after discovery continues to be obtained so as to make the world continues to change and evolve into a better direction. Tokyo Motor Show (TMS) in 2015 is one evidence of some of the latest findings. TMS 2015 exhibited a number of recent developments in the automotive field. Nissan Corp showing a concept car without a driver (Intelligent driving system = IDS). This concept makes Nissan IDS seem futuristic. The car has a manual and automatic mode. Automatic mode is used when the passenger wants to chat along the way. In that mode, the steering wheel will automatically folded down, replaced the screen so that someone can open an email, or talking through a "video call". IDS will become a mainstay of the new Nissan to be the pioneer in the world automotive industry. Next year there are at least a driver replacement system for toll roads in Japan, and is targeted by 2020, IDS cars can pave the roads of Japan.

Mitsubishi Motors Corporation introduced the concept car "X electric crossover" is the latest electric car system. This car took part of the Outlander PHEV which includes models that demonstrate the framework of the technical features of electric vehicles and plug-in system twin motors 4 WD, so it is easy to drive. This car can monitor the situation around the vehicle, can control the speed, including a driver can use a smartphone to give instructions so that the car can park itself. To 44 other manufacturers, competing to develop fuel cell cars. Fuel cell car that's environmentally friendly hydrogen fuel. The chemical reaction between hydrogen stored in the fuel cell stack and oxygen that exist in nature, generating electrical energy stored in batteries. Electricity from the battery rotating electric motor to drive the car. Under conditions of full hydrogen, the car can travel a distance of 650 km, making the manufacturer mentions that fuel cell cars will become the flagship car of the future.

Hopefully some examples of the development of science and technology as described above, inspired on "The 1st International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015" held on November 18, 2015 on the campus of the State University of Surabaya.

Ladies and Gentlemen,

This seminar can be accomplished, for the help of various parties. On this occasion, let us express our appreciation and gratitude to the key note speaker, the speakers, both from within and outside the country, so this seminar is warm and lively. To all those who have helped so that this international seminar to run smoothly in accordance with the intent and purpose, we extend our appreciation and gratitude. Not to forget we convey an apology, if in the organization of this seminar there are many shortcomings, and it all happened, solely because of the limitations that exist in us. Thus, thank you for all the attention, billahi taufik walhidayah, assalamu allaikum warahmatullahi wabarokhatuh.

Chairman,

Prof. Dr. H. Supari Muslims, Drs. MPd
General Chairman of ICVEE 2015

Table of Content

A. Keynote Speaker

B. Vocational Education

C.Electrical Engineering and Informatics

International Conference on Vocational Education and Electrical Engineering (ICVEE) 2015

SIMONTA: Responsive Web-Based Thesis Management System

Ibnu Febry Kurniawan[1], Yuni Yamasari[1], Andi Iwan Nurhidayat[1], Wiyli Yustanti[1]

[1] Informatics Department, State University of Surabaya
Kampus Ketintang, Surabaya, Indonesia
ibnufebry@unesa.ac.id, yuniyamasari@unesa.ac.id,
andil34k5@gmail.com, wiyliyustanti@unesa.ac.id

***Abstract* - As one of compulsory student requirements to graduate, Thesis (Undergraduate, and Diploma) contains various procedures to be completed. Those procedures of each has different due date include topic submission, supervisor searching, proposal submission, proposal presentation, and oral defense.**

Similar to other departments, Informatics conducts these processes as well. There are approximately 70 students following proposal presentation and oral defense each semester. This number grows as the number of students register thesis annually. Consequently, thesis monitoring and management effort grow significantly.

This research propose an accessible software for various stakeholders namely students, lecturers, and administrator. The software will integrate some existing business processes in order to help thesis implementation such as real-time, online, and paperless files including thesis proposals, letter of topic agreement, and advisor decree.

Index Terms - Management System, Thesis, Administration, Responsive, Online

I. INTRODUCTION

Thesis plays important role in developing student's scientific ability. It demands student to demonstrate both writing and speaking skill in high level of academic. Extensive scientific work and good speech are needed if one wants to pass the examination.

UNESA, one of government-owned universities, also conducts this activity every semester. Students from various faculties enroll this coursework as one of requirements to judicium phase. The phase is final evaluation performed by university committee to determine whether a student is eligible to graduate.

Despite of regular arrangement, repetitive errors arise resulting unseen future effects. First, the increasing number of untraced almost-expire students. Many students enroll and do their thesis unmonitored, and less-supervised. Secondly, less-managed thesis documentation files which is one of important requirement for national university ranking. Third, there still exists unbalanced share of supervision. These errors, together, are likely to produce a degrading student quality. This unforeseen impact must be avoided if UNESA wants to keep its track to be top university in Indonesia.

SIMONTA is designed and developed in attempt to leverage mentioned errors. The main reason behind this software construction is to minimize human error during thesis arrangement, and organize supporting documents. SIMONTA is able to keep related records systematically. Records will be stored by considering categories, and time. Therefore, any future needs can be accommodated quicker.

Finally, provided screenshots demonstrate built modules which are already hosted at live server. The screenshot also shows that responsive concept in different platform.

II. PRELIMINARY KNOWLEDGE

A. Scientific Work

Scientific writing is a text discussing a certain problem in certain discipline by using methods of display completely, regularly, and consistently. As its name implies, scientific work demands a strong demonstration of scientific basic with 3 requirements, such as:

- Has content related to scientific knowledge.
- Utilizes scientific method or way of thinking.
- Displays a view of suitable scientific writing.

People who have scientific thinking will always have skeptical, analytical, and critical behaviors when facing social phenomena. In addition, utilizing scientific methods will obtain knowledge through rational steps or procedures. Any scientific activities will reflect working process use scientific methods indicated with correct, and relevant theoretical arguments. Furthermore, there is also exist analysis of assessment which links between theoretical arguments and empirical facts. Finally, scientific activities can be categorized to research, evaluation, and development.

B. Thesis

Thesis is a required scientific work done by final-year students in order to obtain Bachelor or

Diploma title. This activity is usually proposed as a final step before judicium phase. The work can be either field or theoretical research report.

Field research is a research which focuses on empirical data collection with quantitative and qualitative approaches. While quantitative approach has deductive-inductive perspective, qualitative approach is oriented to deliver symptoms holistically and contextually through data collection.

Theoretical research is a research performed to solve certain problem with critical and in-depth analysis making use of relevant foundations. Those foundations are used as source to locate idea or concept as material to deduct existing knowledge then new theories can be obtained as future fundamental solution.

Thesis aims to give an understanding which is used by students to think logically and scientifically when decomposing and discussing problems then deliver them systematically.

Students who want to perform thesis must meet certain prerequisite conditions, such as:

- Has completed courses with total credit of 100.
- Has completed Research Methods course with minimum score of C
- Has cumulative grade of 2.25
- Active students (not in leave periods).
- Has enrolled Thesis courses.

Despite of differences in universities, thesis has similar procedures such as:

- Students find thesis topic by consulting prospective adviser.
- If the proposed topic is agreed by prospective adviser, then student must construct thesis proposal which is must be approved by the adviser.
- Students register thesis proposal presentation.
- If the proposal is approved then students have to complete the thesis with periodic consults.
- If the thesis is done and approved by adviser, then students may register oral defense.
- Students do oral defense.
- Students submit approved thesis report.
- Students obtain thesis score.

C. Responsive Web Development

Web development scope includes every action of web building in internet world. The development process ranges from single-page to complex-page websites process with various business process, internet application, and social media involvement.

Since its establishment in 1989 in which Web 1.0 introduced with static and one-way information, web has grown rapidly with more features. Web 2.0 then launched with is wisdom concept and finally, web 3.0 is also initiated.

To enrich the user experience in web 3.0, a range of technology is introduced such as semantic, micro format, user-language searching, machine learning, and recommendation supply agent. Furthermore, a revolutionary concept of web view was born. Responsive-web concept has emerged to enhance mentioned concepts further.

Responsive web approach grants a concept of responsive architecture. This architecture attempts to response human existence in certain physical space. The concept also produces smart mirror technology that can view resident's density automatically when reaching defined threshold. Finally, privacy level can increase.

Responsive web can provide a design and web development appropriately since it can response to users' behavior and environment. The environment changes include platform size, and screen orientation. This approach is implemented using a combination of flexible grid, layout, pictures, and accurate CSS.

III. METHODS

A model of software development is chosen as platform to analyze, design, and build the proposed solution. Thus, RAD model is chosen as foundation of Software Development Life Cycle. This model is chosen due to its robust and rapid approaches to design changes defined in real business process.

A. Model

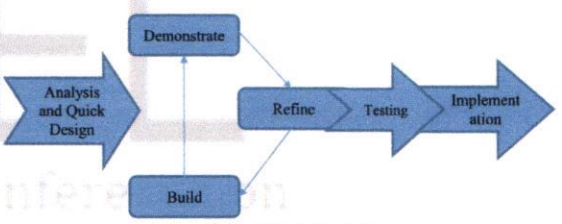

Fig. 1 RAD Model

There are 5 stages based on RAD model which is performed during the development of proposed solution, such as:

1. Analysis and Quick Design Requirement

A comprehensive analysis and design are constructed within minimal amount of time in order to obtain suitable functionality. The requirements in proposed solution include thesis registration, proposal registration procedure, consulting process, oral defense and revision process, and thesis advisory decree letter.

2. Build

Software development is performed in this phase to realize business processes which are defined in prior step. As a result, software modules will be produced namely:

a) Proposal registration and advisor decision module.

b) Proposal oral defense scheduling module.

c) Thesis supervision and monitoring module.
d) Final oral defense and revision module.
e) TA Administration module.
f) Document management module.

3. Demonstrate

This third phase requires user to check whether the business processes suitable with built modules. It is possible to show each module operation only. Thus, received revisions will be limited to certain module prototypes. Users that will observe the demonstration such as:

a) Thesis committee.
b) Advisors.

4. Refine

Refine phase is done to fix module prototypes which have been demonstrated to end-users. One of end-users can be one IT feasibility and thesis process business expert. If there are any mistakes, flaws, extra features exist, and then improvement will be performed shortly. Consequently, an extra iteration will take place.

5. Testing

Used software still needs nourishment since bugs may appear during its lifetime. This aims to clean software from bugs and to adapt new requirements.

There are materials tested in this phase, which are:

a) Black-Box Testing

In this method, developed software will be evaluated by giving a wide range of input types, and checked if produce appropriate output.

b) Feasibility of implemented responsive technology

By using questioner filled in by respondents, an overall illustration will be obtained.

6. Implementation

Final software deployment will be performed at Informatics server. Online software will be ready to serve users' request.

B. Designs

Following illustration depicts overview of proposed system:

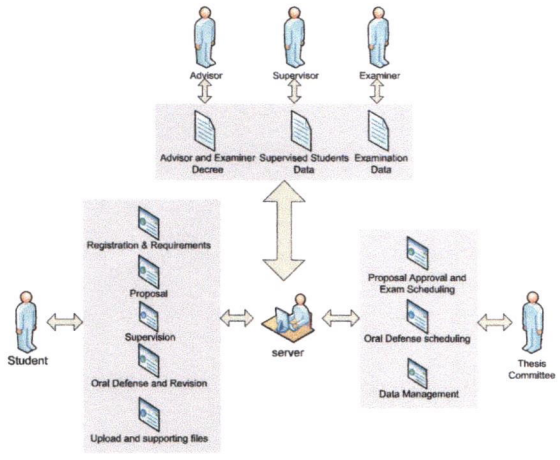

Fig. 2 SIMONTA Overview

To obtain proposed solution there several things designed as output of phase 1 in RAD model. These outputs will be presented accordingly in this sub-chapter. Following models are:

1. Data Flow Diagram (DFD)

A transformation between user business process and software development domain is achieved by creating a detailed DFD. In this diagram, retrieved require-ments are listed then modeled using actors who involve in proposed solution. Data movements between actors may be illustrated in different level of DFD. Therefore, following DFD (fig. 3) is constructed

2. Data Models

Database models are composed to further conversion real business process to technical domain. There are types of database models which are constructed sequentially. Those types are Entity Relationship Diagram (ERD), Conceptual Data Model (CDM) and Physical Data Model (PDM).

ERD supplies high-level of technical domain with attributes, entities, and relationship components. This diagram also provides attribute types to inform the system designer how strong or weak an entity is. Yet, this diagram does not include any extra tables as a result of many-to-many relationship. This issue will be fixed in CDM.

CDM delivers conceptual level of technical domain. Not only brings extra tables created in many-to-many relationship, but also defines data types of each entity's attributes. In this model, entity concept has revolutionized into table concept. In addition, CDM can illustrate relationship degree between tables. This concept is called Cardinality. The illustration of overview system can be seen on figure 4.

Finally, PDM provides technical level of data representation in implementation and deployment stage. This model gives exact picture of database-level implementation. Therefore, syntax which is relevant with chosen database exists. SIMONTA uses MySQL as Database Management System. PDM can be automatically generated from CDM. Therefore, PDM has a tight-coupling relationship with CDM. The PDM of SIMONTA is illustrated by figure 5

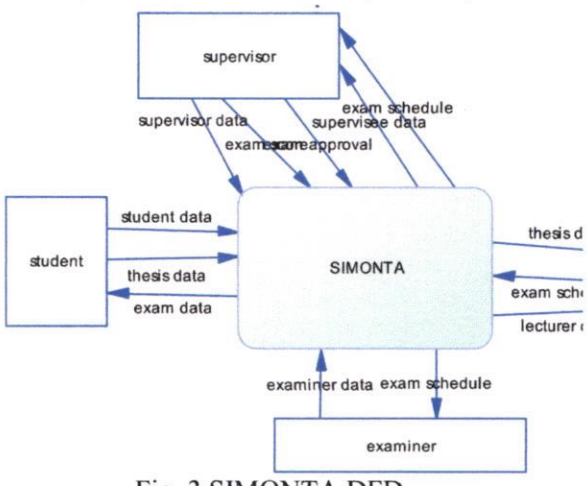

Fig. 3 SIMONTA DFD

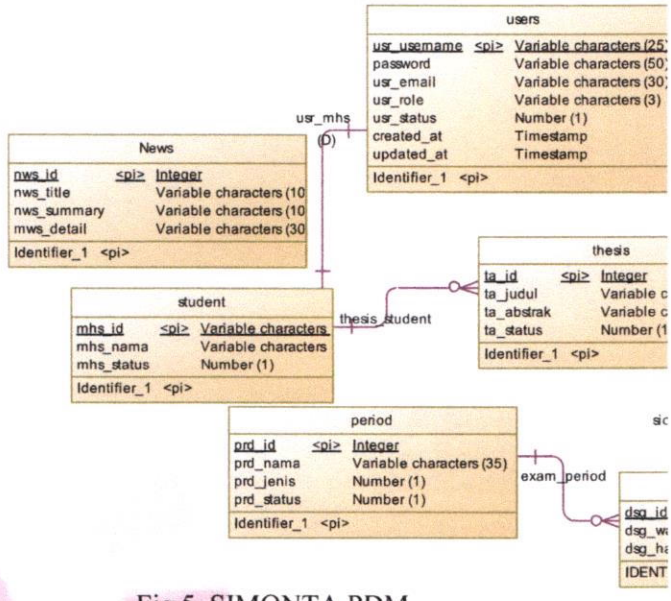

Fig 5. SIMONTA PDM

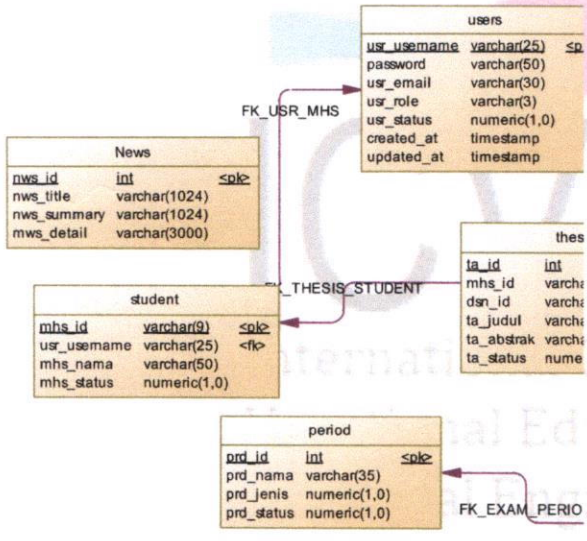

Fig. 4 SIMONTA CDM

IV. RESULTS

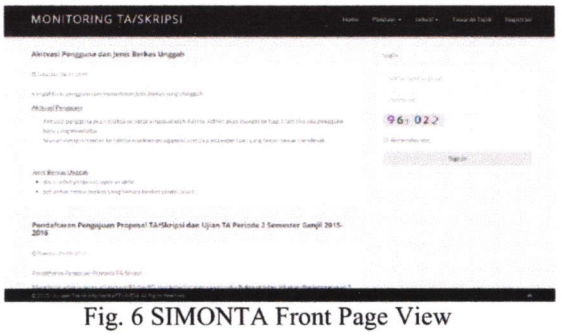

Fig. 6 SIMONTA Front Page View

Figure 6 shows the main page of SIMONTA which is themed white and black. On the right side of screen there is a login section with Captcha feature to give extra security. Moreover, figure 7 and figure 8 depict the main page in resized monitor view. This figure clearly shows that proposed responsive aspect has been achieved.

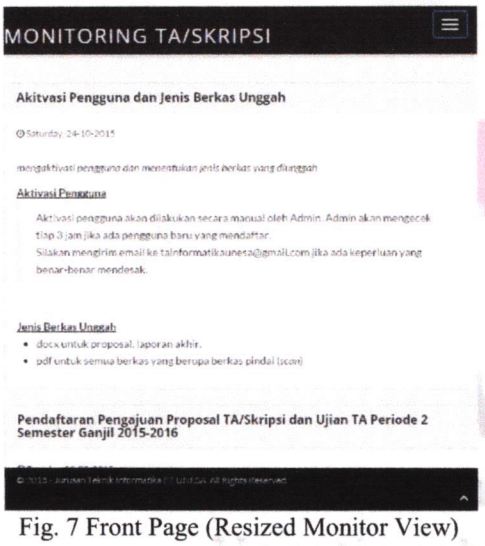

Fig. 7 Front Page (Resized Monitor View)

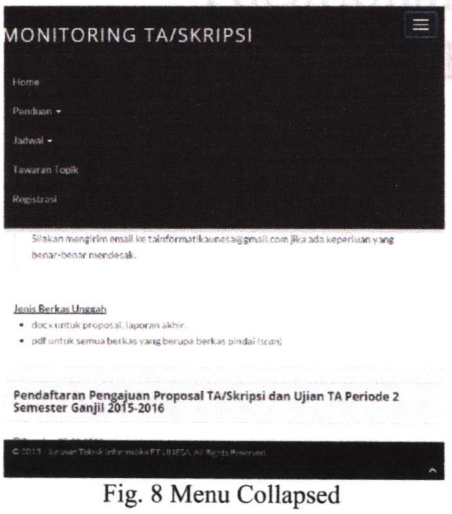

Fig. 8 Menu Collapsed

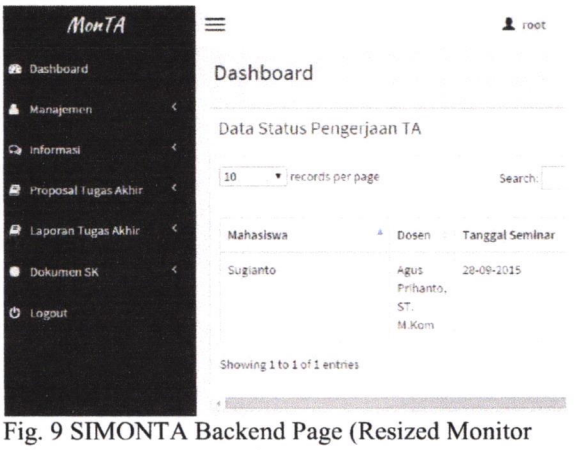

Fig. 9 SIMONTA Backend Page (Resized Monitor View)

Administration page is located at backend segment of SIMONTA. Figure 9 shows the dashboard of administrator in resized monitor view. There are 6 menus available in this page such as Management (Student, Lecturer, and Thesis), Information (News, and Thesis topic offering), Thesis Proposal (Schedule, Exam), Examination (Schedule), and Document Management.

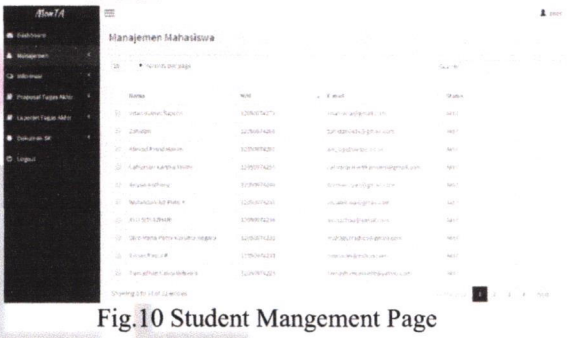

Fig.10 Student Mangement Page

Figure 10 and 11 demonstrate thesis document upload process in student's perspective. In this page, student can choose which document they want to upload and the result is provided at lower part of the page.

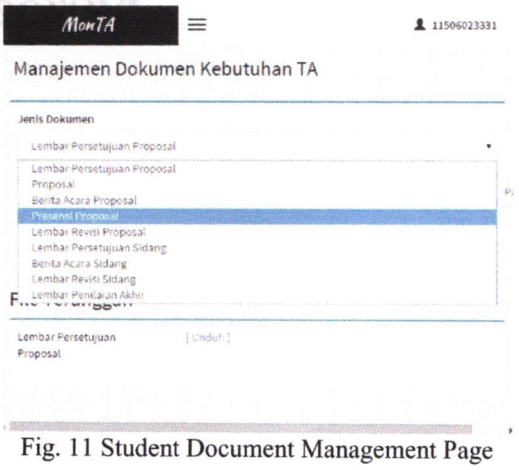

Fig. 11 Student Document Management Page

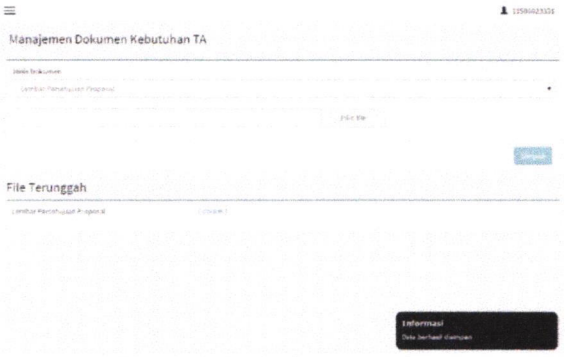

Fig.12 Upload File Succeed

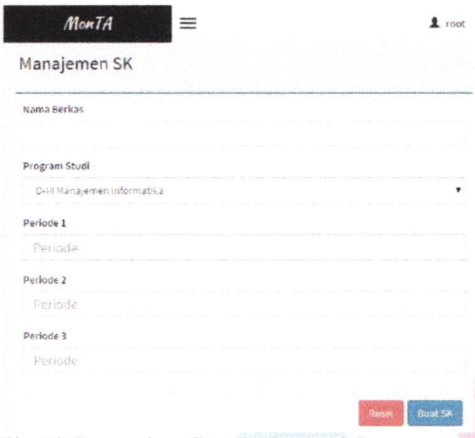

Fig.13 Supervisor Decree Letter Management Page (Resized Monitor View)

To monitor all student theses working time, a section at dashboard provides list of student and the duration.

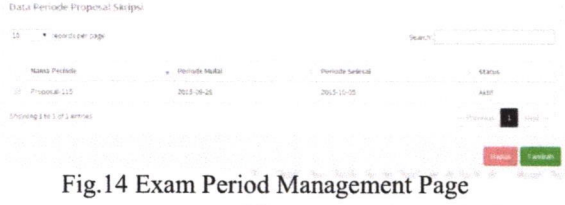

Fig.14 Exam Period Management Page

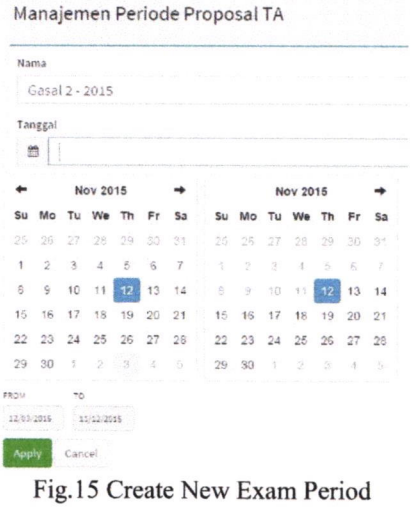

Fig.15 Create New Exam Period

Finally, exam period management pages are shown in figure 14 and 15. These figures show how to create a new exam period. The created period will determine how long examination takes place and manage report accordingly.

CONCLUSION

The proposed solution has successfully delivered integrated service which is able to administer thesis arrangement and to monitor thesis work time. Those achievements are based on defined business processes.

FUTURE WORK

Despite vast modules achieved by SIMONTA, there are still other improvement can be done. First, student filtering feature can be enhanced. Current version of SIMONTA shows all students' current status, and thesis lifetime. This can be improved by giving an extra tool to filter which students to be showed. Secondly, examiners' document management. Due to growing administration requirement, lecturer who also does examination phase need to provide letter as a proof. This module can be added into future version.

ACKNOWLEDGMENT

This research is supported by grants from Faculty of Engineering, State University of Surabaya.

REFERENCES

[31]Boronczyk, Tim, *PHP and MySQL Create-Modify-Reuse,* Wiley Publishing, Inc: 2008.
[32]Darie, Cristian, *Ajax and PHP, Building Modern Web Application – Second Edition,* Packt Publishing: 2009.
[33]Doyle, Matt, *Beginning PHP 5.3, Programmer to Programmer,* Wrox, 2010.Sommerfville, Ian, *Software Engineering, Ninth Edition,* Pearson Education: 2011.
[34]Ibrahim, Ali, 2011, *Pengembangan Sistem Informasi Monitoring Tugas Akhir berbasis SMS Gateway di Fasilkom Unsri,* Jurnal Ilmiah JUSI Vol.I, No 2. September 2011, ISSN: 2087-8737.
[35]L. Bass, P. Clements, R.Kazman, "Software Architecture in Practice (3rd Edition) (SEI Series in Software Engineering)", United States: 2012
[36]Marcotte, Ethan, *Responsive Web Design*, CSS, Layout & Grids, Mobile/Multidevice, Responsive Design, Interaction Design: 2010.
[37]Otwell, Taylor, *Laravel: From Apprentice to Artisan*, Leanpub, 2014.
[38]Tim, *Panduan Skripsi Universitas Negeri Surabaya,* UNESA Press: 2006.
[39]Vernon, D, *Year 5 Software Enginnering 2 (Modul 514)*, Khalifa University, 2008.