

# ONLINE ACADEMIC ADMINISTRATION SYSTEM TO SUPPORT DISTANCE LEARNING AT FACULTY OF COMPUTER SCIENCE UNIVERSITY OF INDONESIA

Harry B. Santoso

*Faculty of Computer Science, University of Indonesia  
Depok, West Java Indonesia  
harrysantoso@cs.ui.ac.id*

Zainal A. Hasibuan

*Faculty of Computer Science, University of Indonesia  
Depok, West Java Indonesia  
[zhasibua@cs.ui.ac.id](mailto:zhasibua@cs.ui.ac.id)*

## ABSTRACT

Faculty of Computer Science (Fasilkom), University of Indonesia (UI) develops Web Based Distance Learning Systems for Graduate Program in Information Technology as part of Information and Communication Technology (ICT) based Distance Learning. The systems are developed using Enterprise Resources Planning approach that consist of student-centered e-Learning system, Digital Library and Online Academic Administration System. The latter manages online administration processes in academic activities such as: transcript, online registration, academic calendar, syllabus, news, and file management. This paper elaborates the on going development of Online Academic Administration System as a sub-system to support the Distance Learning at Fasilkom UI.

## KEYWORDS

Distance Learning, student-centered e-Learning, online academic administration, enterprise resource planning.

## 1. INTRODUCTION

Distance learning is often defined as *flexible* and *open*. *Flexible* means that learning options can be adjusted for both current and future learning needs and provides for the learner at any time, any place that suitable to his or her needs. On the other hand, *open* constitutes the removal of academic restrictions and privileges- that is, the elimination or reduction of the barriers between areas of knowledge, careers, institutions, the increasing and enriching of useful activities and experiences to complement the academic educational purposes [1].

Very often, the existing Distance Learning System offers services (such as courses) through internet but lack of other supporting systems such as online academic administration, electronic library materials and learning environment. The Distance Learning at Fasilkom UI attempts to develop integrated systems that comprise online academic administration system, digital library system, and student-centered e-Learning environment system [2]. The idea of developing such systems is to help us create new paradigm in education or academic field. Fasilkom UI also wants to share its long-term experience and accumulated knowledge to less fortunate institutions as well as to students who are less fortunate due to reasons such as disparity of available infrastructure, remote geographical distribution, and the digital divide in Indonesia.

The objectives of this distance learning systems are:

1. To minimize digital divide in Indonesia by providing larger opportunity to Indonesian people, especially IT professional and postgraduate students.
2. Introduce distance learning In Indonesia that is managed professionally and sustainable.
3. Improvement of human resource capacity in Information Technology, especially potential human resources from rural area.
4. To provide wider access to a better quality of higher education.
5. To develop strong professionals on IT who are ready to contribute in the related field.

In Indonesia, there are many institutions have offered distance education. Common problem on distance education is a minimum scientific atmosphere because most of the programs do not run on classroom or campus. According to Surahman in [3] there are common practices of distance education in Indonesia, such as:

1. Found a campus near the implementation of distance education program.
2. Run distance education using teleconference system that means lecturers are at main campus, students are at their place (home or anywhere). And learning system is done through telephone, video, or Internet. But, campus atmosphere still can not be presented as the ideal condition.
3. *Credit-earning activities* system that distance education process only part of all academic/learning process. Some courses and academic activities still offered at main campus.

The most popular academic institution in Indonesia which provides distance education since is The Indonesian Open Learning University or Universitas Terbuka (UT). UT implements distance and open learning system using media, both printed and non-printed (audio/video, computer/internet, radio, and television). Beside academic institution, companies in Indonesia also use distance education to improve their employees' ability and competency. For instance, PT Telekomunikasi Indonesia (Telkom) has developed e-learning system which is called Telkom E-Learning. Telkom E-Learning is web based training service which is own by PT Telkom Training Division.

Concerning to several attempts of implementation distance education in Indonesia, we named our system as distance learning instead of distance education. The rationale is we

want to promote “e-learning environment” as a bases of developing distance education. In this paper, we focus on the development process of Online Academic Administration as a supporting system to the distance learning systems.

## **2. METHODOLOGY**

In order to develop information system that take into consideration cultural diversity from various ethnic background Indonesia, careful steps had been taken.

### **Data Collection**

Related data is collected from several sources such as:

1. Documentation  
Document of Fasilkom’s Long-term Strategic Planning that consists of: vision and mission, human resources, infrastructure resources, SWOT analysis. Document of National Educational Ministry regulations on Distance Education.
2. Interview  
Interviews have done to staff of Computer Science Faculty and graduates of the program.
3. Survey  
Survey to several distance education system which is own by both academic institutions and companies.

### **System Development**

The System Development Life Cycle methodology combined with Prototyping techniques are used for the development processes. From the data collection we captured functional and non-functional requirements. These requirements are presented in Context Diagram, Decomposition Diagram, and Data Flow Diagram Level 1.

## **3. SYSTEM ANALYSIS**

### **3.1 Requirement Analysis**

There are two kinds of requirements, functional requirement and non functional requirement. Functional requirement of this system related to academic business processes that are:

- Delivering academic transcript, so that students can look at their grades in any specific semester of all course they have taken.
- Handling online course registration so that student can register courses they take for next semester.
- Handling user management so that academic administrator can add, edit, or delete student data.

- Handle learning materials management so that students can upload and download them. The learning environment itself is provided in the student-centered e-Learning system [4].

Non functional requirements for this system are:

- User friendly user interface, so users can use and navigate the system easily and effectively.
- Tracking activity mechanism, so we can evaluate the usage of this system
- High connection speed, because of this factor will influence users' durability in using this system and helps users download learning materials.

### 3.2 Process Modeling

Process modeling is a technique for organizing and documenting the structure and flow of data through a system's processes and/or the logic, policies, and procedures to be implemented in a system processes [6]. In order to describe any process and flow of data through the system, we use Data Flow Diagram (DFD) technique. Figure 1 shows Context Diagram (DFD Level 0) which depicts global process in the system. There are four external agents in the Context Diagram: lecturer, student, secretariat staff, and administrator.

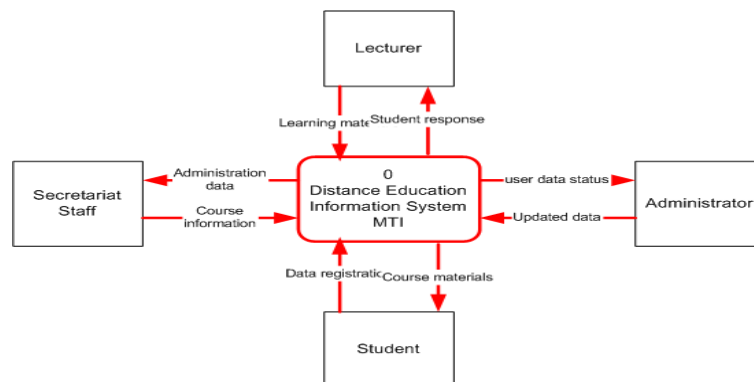


Figure 1. Context Diagram

Figure 2 describes decomposition diagram that shows all functional requirements of the system.

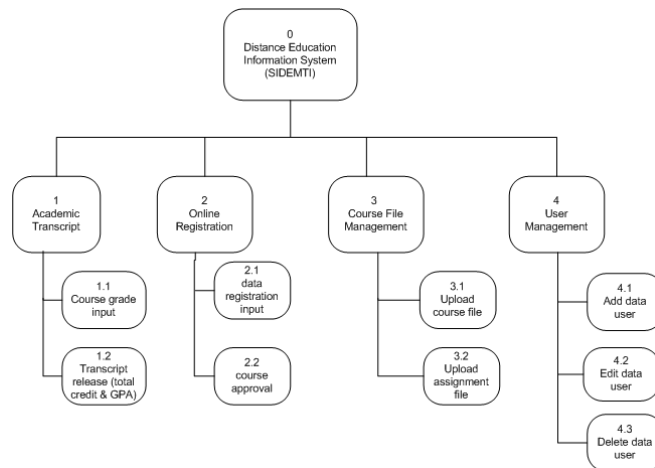


Figure 2. Decomposition Diagram

Figure 3 describes data flow diagram of level 1. In order to get access to this system, student must have an account that they apply to administration register. Lecturers can upload course files regularly. Academic staffs have authority to approve student academic plan, submit news, and submit student grade. Administrators have authority to maintain users' administration.

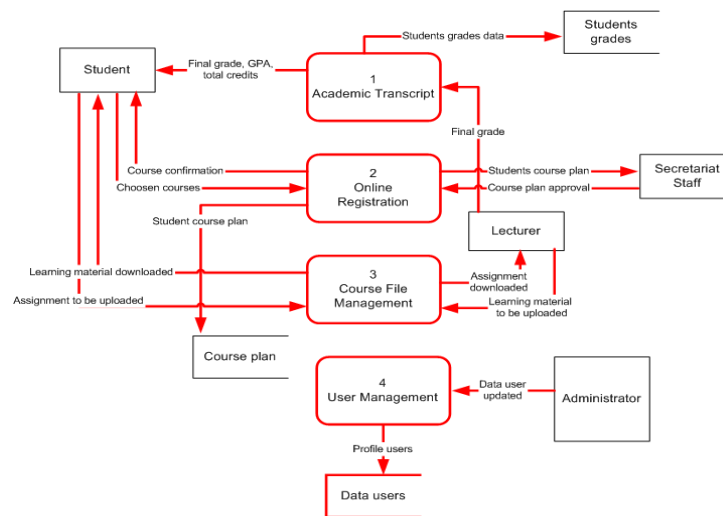


Figure 3. Data Flow Diagram Level 1

#### 4. SYSTEM DESIGN

This system is a web-based Information System that uses 2-tiers architecture. Level 1 handle HTTP-request and give the response after the request is processed by web server and module program. Level 2 handle database, directory, mail server, and SNMP (Simple Network Management Protocol). Figure 4 describes the design of system architecture.

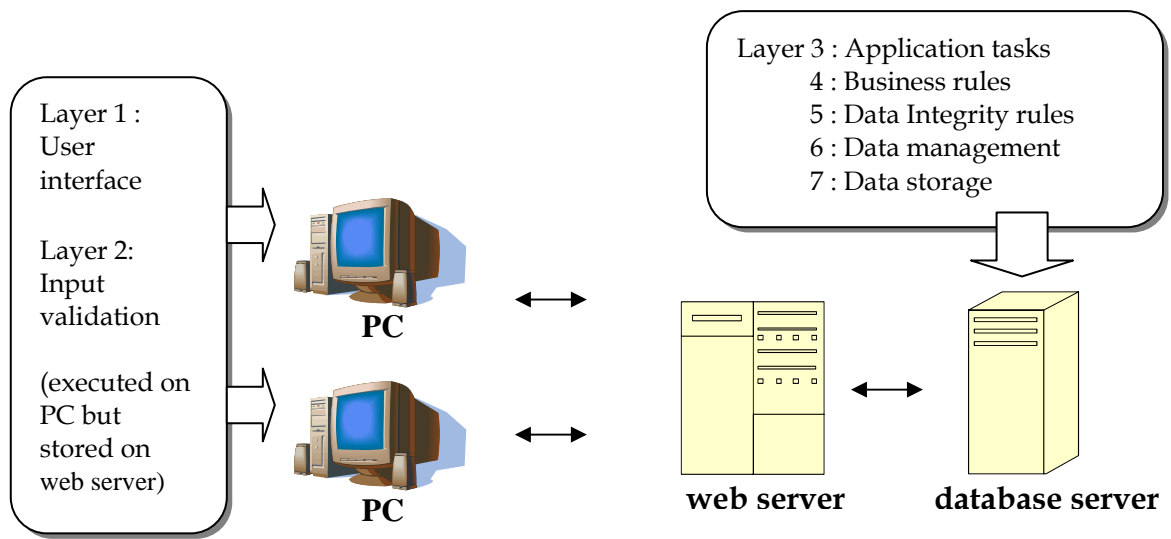


Figure 4. System Architecture Design

Development tools which are used to implement this system is open source, such as PHP 4 as programming language, MySQL as database server, and Apache as web server.

Interface design is the design where colors, text fonts, font sizes, shapes and line thickness are strategically composed in an aesthetic manner to please the user and also set a hierarchy in the communication. This helps the user focus and attend to the information on the page sequentially [5].

- Academic Transcript Design.  
Figure 5 depict Academic Transcript Design where student can look their grades, total credits, GPA in specific semester or all semester they enroll. Lecturer can input grade for each student who enroll to specific course(s).

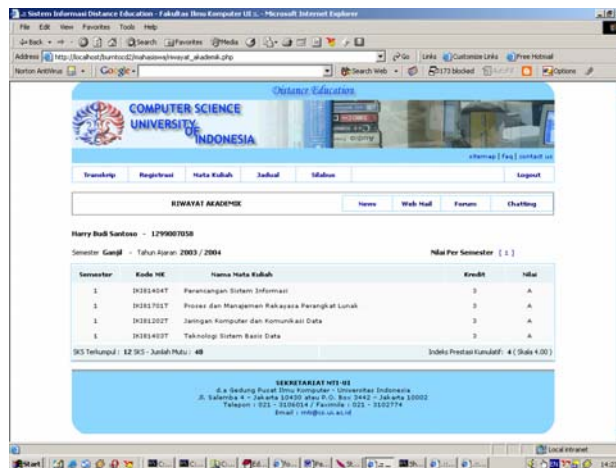


Figure 5. Academic transcript interface

- Registration Online  
Figure 6 shows Registration Online System that handles online course registration so that student can register for incoming semester.

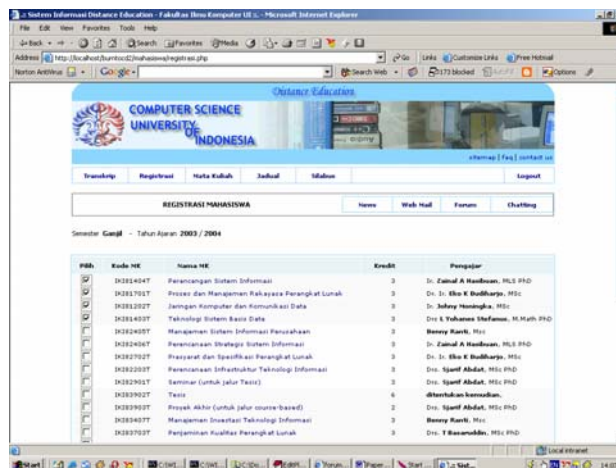


Figure 6. Registration Online interface

- Syllabus  
Secretariat academic can input course planning in a semester, also update courses syllabus (see Figure 7).

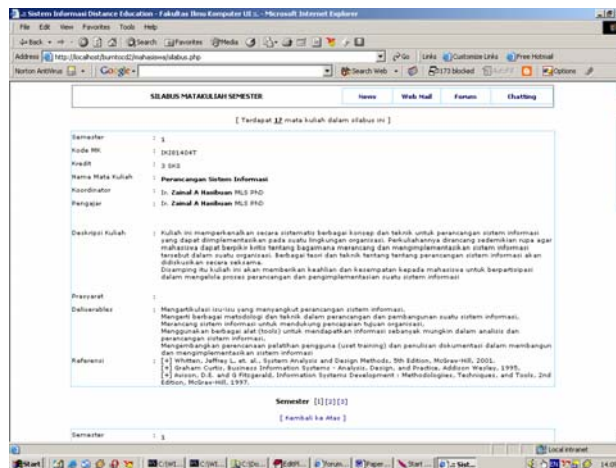


Figure 7. Syllabus interface

- Learning Material Management  
System can handle learning material (file) management, where lectures and students can upload and download files (see Figure 8).

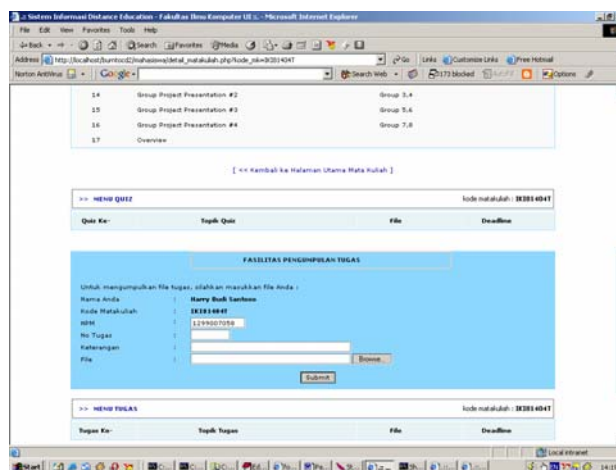


Figure 8. Learning Material interface

- User Management  
By using user manager, administrator has authority to add, edit, or delete any user's data (see Figure 9).

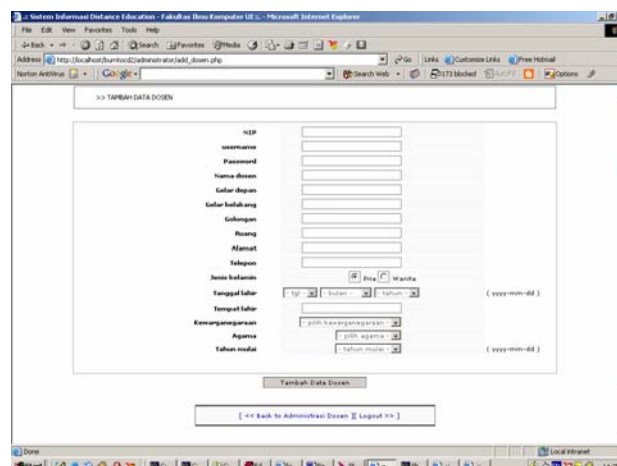




Figure 9. User Management interface

- News  
News will inform anything new related with distance education, campus events, and learning process (see Figure 10).



Figure 10. News interface

- Calendar  
By looking academic calendar, anyone can prepare anything related with their responsibility (see Figure 11).

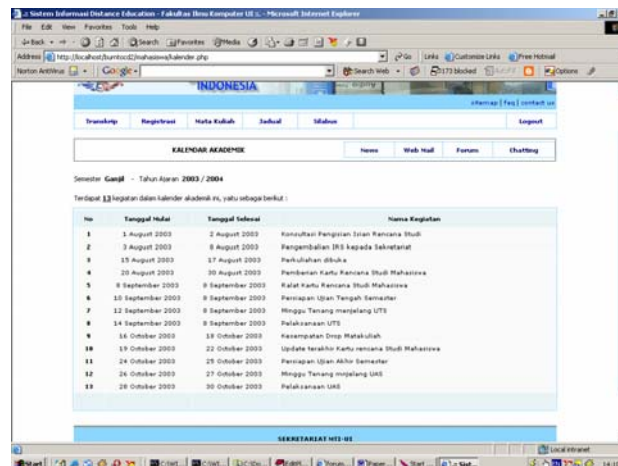


Figure 11. Academic calendar interface

## 5. CONCLUSION

This web based online academic administration system is developed to support distance learning. The system manages several processes such as: academic transcript, calendar academic, online registration, syllabus, news, user management also file learning material management. It is a system that is part of enterprise resources planning in distance learning systems.

For future work consists of:

1. To extend the online academic administration into University of Indonesia wide program.
2. Wireless implementation by using WAP, so students can access transcript, calendar, register online, or download learning materials.

## REFERENCES

- [1] Reviere, Ruth, 2000. A Case Study: Evaluating Distance Education at the University of the West Indies. *Conference Proceedings of Distance Education in Small States, 2000*. Ocho Rios, Jamaica, pp. 58-66.
- [2] Improving Competitiveness of Human Resource Through the Use of IT to Promote Intellectual Capability. 2004. Proposal of Distance Learning, Faculty of Computer Science, University of Indonesia.
- [3] Oetomo, Budi Sutedjo Dharma, 2002. *e-Education Konsep, Teknologi dan Aplikasi Internet Pendidikan*. Penerbit ANDI Yogyakarta, Indonesia.
- [4] Due-Like Project. 2003. Report on the Development of Computer Mediated Learning. University of Indonesia.

[5] Ramanathan, I. and Bartakke, P., 2001. Product Design: A Case Study. *National Seminar on "E-Learning & E-Learning Technologies"*. Eleltech, India, Session 6: e-Learning Standards, Cost Economics, Project Management and Infrastructure Issues.