

# A Problem of Information System Integration At a University in Indonesia

**Ashabu Khair<sup>\*</sup>, Dzakiya Ishmatul<sup>\*</sup>, Yusuf Amrozi<sup>\*\*</sup>**

<sup>\*</sup> Student of Information Systems Study Program, Faculty of Science, UIN Sunan Ampel Surabaya

<sup>\*\*</sup> Lecturer of Information Systems Study Program, Faculty of Science, UIN Sunan Ampel Surabaya

*Correspondence Author: dishmatul@gmail.com*

Article Info :	ABSTRACT
<p><b>Article History :</b></p> <p>Received 29 June 2022</p> <p>Revised 17 July 2022</p> <p>Accepted 10 August 2022</p> <p>Available Online 17 August 2022</p> <p><b>Keyword :</b></p> <p>Information system, Integration, University</p>	<p><i>Almost all higher education information systems in Indonesia have experienced a problem. The challenge of university data management systems is how to integrate data subsystems in the university's internal environment. This can hinder the process of continuing the university's services. Higher education information systems usually include academic, financial, teaching staff, and graduate information systems. Not all universities have integrated the information system sub-sub. As a result, data duplication and data are out of sync. Data is essential in universities because every year, universities have to manage the data of thousands of students. For this reason, an integrated higher education information system is needed. The research method used in this article is a qualitative descriptive method by describing the facts that occurred. The author uses data collection techniques to study literature by looking for relevant and reliable references. After the authorities were collected, the writer analyzed the data qualitatively. At the end of this article, the author provides a solution to integrate higher education information systems.</i></p>

## 1. INTRODUCTION

Technology and information systems are developing very rapidly in the era of globalization as it is today. This requires human resources (users) to be able to computerize well. In education and health, the private sector and government today have used computers as data processors. Computers also facilitate the work and performance of users because computers are used as a medium for information retrieval. Through the internet network, we can access information quickly.

An Internet network is a computer network on a global scale or worldwide. This computer network has an international scale, which makes each computer communicate with the other. Humans can obtain information and communicate with the internet whenever and wherever they are. Information contained on the internet can be easily accessed through the website. Many fields use websites, such as companies, government agencies, educational institutions, etc. They aim that everyone with internet access can use it anytime and anywhere. The website is used as a medium of information, promotion, etc., to provide a clear picture of an agency or institution to the public.

A good college must have a website to inform the public about the college. The information in question can be in the form of profiles, vision and mission, history, and academic and financial information available at the university. With this information, the public can assess the quality of the university and can also provide clarity for students who study through the existing academic information system.

Information systems have a significant role. The company can obtain a strategic advantage if the strategies within the company can be implemented properly (Jogiyanto 2005). We can use information technology to implement and execute company plans effectively.

Information systems are also essential elements in the organization to support ongoing business processes. In addition to helping the company's routine operations become more efficient, information systems are also a major competitive differentiating factor (Winarno 2007). The rapid development of information in education at this time also has increasingly fierce competition to support business processes that run in the organization.

An integrated information system is a system that allows the sharing of data for the entire organization. Another name for an integrated approach is ERP (Enterprise Resource Planning) because the central database is where the user can access all operational data. Organizations can store information electronically with integrated systems. We will not need piles of paper and files to store data. Integrated systems make an organization's business processes much more efficient. With an integrated information system, there is the central database which is very useful because the data is in a consistent design in different modules. Implementing an integrated approach is at risk of causing problems, such as if there is an error in processing data, all modules are also affected.

Foundations engaged in education must realize the importance of change and improvement in each related part. The success of higher education will be achieved if the academic services of student services and finance are under appropriate service quality standards. These three parts have an essential role in the life cycle of a university.

A data collection process and time efficiency are needed to produce useful information. In a higher education information system, data duplication is often found, and a sub-system is not interconnected with other sub-systems, so that is ineffective. To streamline the entire process, we need infrastructure and information system integration that can produce valuable information. This study will discuss the problem of integrating information systems in universities because the author realizes that organizations require data related to one another. The thoughts above explain that this article was compiled to find out the problems of information system integration in Indonesian universities.

## **2. METHOD**

The method used to write this article is a qualitative descriptive research method because the researcher wants to describe the problems of information system integration in Indonesian universities. Qualitative descriptive research is research that defines or describes the object of research based on the facts that appear or as they are (Martini and Nawawi 1996).

In this article, the data collection technique used is a literature study. The author searches for existing relevant references such as journals, essays, final assignments, and other scientific papers related to the title. The data analysis technique used is qualitative data analysis. The author conducts direct research by sorting data, organizing data, and finding patterns of information system integration problems in Indonesian universities.

### 3. RESULTS AND ANALYSIS

#### 3.1. Integrated Information System

An information system within an organization brings together the needs of daily transaction processing, supports operations, is managerial and strategic activities of an organization, and provides certain outside parties with the necessary reports (Jogiyanto 2005). Abdul Kadir expressed his opinion regarding the meaning of "Information" as follows: Information systems include many components (humans, computers, information technology, and work procedures), something is processed (data becomes information), and is intended to achieve a goal or goals (Abdul Kadir 2003). Integration is the interrelationships between sub-systems so that data from one system can routinely pass through to or be taken by one or more other systems.

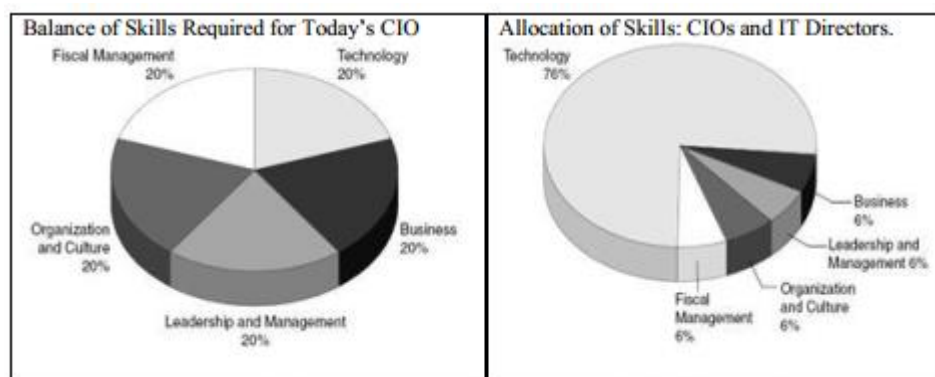
#### 3.2. College Information System

A university requires an information system to facilitate the service and continuity of the university's operations, such as managing university data and information. Typically, a university information system consists of an academic information system that handles student lecture data, a financial system that handles data related to university finances, such as UKT, KKN, and graduation fees, etc., and a graduate system that provides graduate data information. The sub-systems mentioned earlier would be better connected or integrated to avoid double entry and duplication of data.

#### 3.3. Chief Information Officer

Universities are included in the quasi-commercial industry; universities provide educational services but also implement the principles of commercial industry management to gain profit for the university (Brookes 2003). Therefore, the role of information technology in higher education is significant. In implementing IT in universities, encouragement from the Chancellor and an IT management organization is needed that is structured and can meet the organization's needs; in this case, a manager called the Chief Information Officer (CIO) is needed (McLeod 2004).

An organization's information systems and information technology are very dependent on the CIO. CIO is a person who serves as the head of an organization's information system (Indrajit 2012). The CIO can also be called the director of systems and information technology. The following compares the role of the CIO in the current era with the past (Lutchen 2004):



**Figure 1.** Comparison of the role of CIO in the current era with the past.

1. CIO must understand business
2. CIO is the leading role of the executive, which is to understand an organization's business focus in detail. CIOs and CEOs must communicate frequently. One form of information technology implementation is a business solution tool.

3. CIO must understand the technology
4. The CIO must consider and determine what kind of technology is suitable to be used in order to integrate the system.
5. CIO must understand and be able to manage finances
6. The CIO must be able to manage expenses intelligently. Following the organization's budget but also must meet the needs. If the CIO is proficient in managing the organization's finances, this is also beneficial for the organization's future.
7. CIO must understand the HR
8. The CIO must ensure that HR can operate the system that the CIO makes. The CIO must be good at communicating with HR in a language that is easily understood by ordinary people, not using the high-level language that is usually used to communicate with IT people. Conduct directives or socialization on related technology for HR if necessary.
9. CIO must have a leadership and management spirit
10. The benchmark of a CIO's success in realizing his plans is the ability to communicate in explaining a plan. The CIO must have strong leadership skills. After all, he will lead his subordinates.

#### 3.4. Information System Integration Problems in Higher Education

From the research results, it can be concluded that two groups of problems are faced in integrating information systems in universities, namely technical and non-technical. The explanation of the research is as follows:

1. Technical problems of information systems in universities
  - a) Internet
    - Internet speed slows down
    - Low bandwidth quota
    - Internet is difficult to connect
    - The ratio between bandwidth and users is still lacking
  - b) Network Infrastructure
    - Inefficient implementation of network infrastructure
    - Not optimal utilization of network infrastructure components
    - Incompatibility of network infrastructure with the strategic needs of universities
    - Wi-Fi network is not optimal
  - c) Computer and supporting equipment
    - Low specifications and lack of upgrades
    - Lack of Maintenance Komputer
    - Not as needed
  - d) System Security
    - Low information system and web protection
    - Information systems are obtained from ready-made systems

- e) System Integration
  - Lack of integration between systems
  - There are work units that do not yet have a system
  - Incorrect data and information between units
- f) System availability
  - Information systems and the web are sometimes tricky to access
  - The computer system restarts frequently and is not active or shuts down
- g) IT Maintenance
  - Lack of Maintenance and supervision
  - Building locations are spread out and far apart
  - Lack of technological planning with building construction

From the explanation above, it can be concluded that various technical problems that exist in universities in Indonesia, among others, are problem 1). Internet, 2). network infrastructure, 3). computer equipment and its supports, 4). system security, 5). system integration, 6). system availability, and 7). maintenance of Information Technology so that the author can provide solutions to the problems above.

## 2. Non-technical problems of information systems in universities

- a) Acceptance and participation
  - Involvement in using technology is still low
  - There is resistance to change from HR
- b) Culture and behavior
  - The quality of work using technology is still lacking
  - Unable to adapt to information technology-based work
  - Users object to using the system
- c) Human resources
  - Human resources are still minimal
  - There are still some human resources who have not been able to apply Information Technology
  - Human resource approval and support
  - Lack of readiness of human resources in using Information Technology
- d) IT Planning
  - Design of information technology that has not been maximized
  - Information technology development is temporary
- e) IT management and governance
  - Lack of security to supervise
  - Low interaction of learning the use of information systems
  - The lack of information system development

- Lack of training in the use of information systems
- f) Organization
  - Information systems are not in line with the organization
  - The information system does not meet the needs of the organization
  - Improper information system and not interconnected with other work units
  - Organizational ability to use information technology
  - Organizations have not been able to synergize with outside organizations
- g) Content of information system
  - The ability of resources is minimal to fill in the information
  - Information that is not up to date
- h) Budget and costs
  - Cost-benefit analysis cannot be measured
  - Budget costs for information technology are low
  - Technology investment is not yet a priority goal
- i) Leadership support and leadership character
  - Leadership policies on the benefits of technology for system integration
  - Leadership motivation is still low
  - Leadership Loyalty
  - Leaders do not use information technology for leadership character strategic purposes

From the explanation above, it can be concluded that there are various non-technical problems in the integration of information systems in universities in Indonesia, so the author wishes to provide solutions to the problems above.

### 3.5. Solution

The solution to technical problems because a higher education information system is not or has not been integrated is that the CIO must do the following:

1. Auto-migrate data by building a system that can duplicate
2. automatically in other applications.
3. Perform data export-import method to avoid double entry.
4. Creating an API (Application Programming Interface) in the information system that becomes a data migration destination.

However, if the three solutions have been implemented, it is not complete if it is not viewed from a non-technical perspective. A CIO must carry out the roles described above. It is often found that there are university employees or staff who are not tech-savvy or technologically savvy. For this reason, a briefing should be held in the form of socialization for the staff.

## 4. CONCLUSION

Every college needs an information system to facilitate the service and continuity of the college's operations, such as managing university data and information. The problem often encountered in higher education information systems is that they are not yet integrated. For this reason, this article provides solutions, including 1. It automates data migration by building a

machine that can duplicate automatically in other applications; 2. Perform data export-import method to avoid double entry; 3. It creates an API (Application Programming Interface) in the information system that is the data migration destination.

## DECLARATION OF COMPETING INTEREST

We declare that we have no conflict of interest.

## REFERENCES

- Aswati, Safrian. 2015. *Peranan Sistem Informasi dalam Perguruan Tinggi*, Sistem Informasi STMIK Royal Kisaran Sumatera Utara.
- Brookes, Mari. 2003. *Higher Education: Marketing in a Quasi-commercial Service Industry*, International Journal of Nonprofit and Voluntary Sector Marketing Vol 8 Issue 2.
- Hartono, Jogyanto. 2005. *Analisis & Desain Sistem Informasi*, Andi Offset, Yogyakarta.
- Idris, Iswandi. 2014. *Analisis Perancangan Sistem Informasi Terintegrasi*, Jurnal Teknovasi, Vol. 1 No. 2.
- Indrajit, Richardus. 2012. *Chief Information System*, E-Artikel Sistem dan Teknologi Informasi Institut Perbanas Jakarta, Jakarta.
- Joko, Bambang. 2010. *Sistem Informasi Manajemen Perguruan Tinggi Dalam Bidang Pendataan Pendidikan Tinggi*, Jurnal Pendidikan & Kebudayaan, Vol.16 No.2.
- Kadir, Abdul. 2003. *Pengenalan Sistem Informasi*, Penerbit Andi, Yogyakarta.
- Karsidi, Ravik. 2000. *Penerapan Teknologi Untuk Peningkatan Mutu Pendidikan*. Bahan ceramah di Universitas Sebelas Maret Surakarta.
- Laudon, Kenneth C, and Jane P. Laudon. 2016. *Management Information Systems: Managing the Digital Firm*, Pearson Prentice Hall.
- Lutchen, Mark. 2004. *Managing IT as a Business: A Survival Guide for CEOs*, Wiley, USA.
- McLeod. 2004. *Sistem Informasi Manajemen*, PT. Indeks, Jakarta.
- Murtadho, Ali. 2016. *Permasalahan Implementasi Sistem Informasi Di Perguruan Tinggi Swasta*, Jurnal Ilmiah Teknologi Sistem Informasi, Vol. 2 No.1.
- Nawawi, Hadari. 1996. *Penelitian Terapan*, Gajah Mada University Press, Yogyakarta.
- Rahmannita, Eka. 2019. *Kualitas Pelayanan dalam Sistem Informasi Akademik*, Magister Ilmu Administrasi UNILA.
- Rizal, Irhas. 2013. *Analisis Sistem Informasi Akademik Online*, Teknik Informatika Universitas Bina Darma Palembang.
- Wahid, Fathul. 2004. *Peluang dan Tantangan Pemanfaatan Teknologi*, Media Informatika, Vol. 2 No. 1.
- Winarno, Budi. 2007. *Kebijakan Publik: Teori dan Proses Edisi Revisi*, Media Presindo, Yogyakarta.
- <https://sevima.com/siakad-yang-sesuai-regulasi-dikti> diakses pada 14 April 2020.
- <https://klikdata.co.id/blog/5-kendala-akibat-tidak-adanya-siakad-pada-sebuah-perguruan-tinggi> diakses pada 17 April 2020.
- <https://www.jmc.co.id/blog/Solusi-Integrasi-Sistem-Informasi> diakses pada 20 April 2020.
- <https://blog.gamatechno.com/sistem-informasi-terintegrasi-untuk-perguruan-tinggi> diakses pada 20 April 2020.