Smart Campus with A Learning Management System

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Abstract. Education now requires fast data access and new breakthroughs to support education in Indonesia. Data-based business opportunities that use campus-specific portals in Indonesian education are not new, but also not all levels of education have implemented this system. The purpose of this study is to describe the benefits of using an internal portal campus for the advancement of education and to analyze business opportunities in education. This study used a descriptive method to illustrate the accuracy of the benefits using the campus internal Learning Management System as well as using previous research related to the study. To access data quickly, collages need to build an Information and Communication Technology (ICT) infrastructure, which does not require small capital to build ICT infrastructure, on the other hand, the Learning Management System is an alternative solution for students and lectures. The results of this study show that the function of the Learning Management System is useful in the education field because it can reduce computing costs and increase opportunities for the ICT industry.

1. Introduction
Nowadays, business is starting to compete globally, not only in terms of satisfying customers and the best service but can also contribute to improve the intelligence of the nation through the world of education. The world of education means the availability of channels or facilities that can be used to deliver educational programs. Today’s education world requires fast and accurate data access. With the campus internal portal system, we can control all activities at the campus through mobile devices, tablets, laptops, or PCs from home. As a result, the system will be integrated from the central database and the control system (automation system) can monitor the activities of lecturers and students. With this integration, campus leaders can control teaching and learning activities as well as educational information devices [1].

Learning Management System (LMS) is a combination of hardware, internet network technology, and virtualization simultaneously. LMS is also an evidence of the rapid technological advancements so that it can provide direct education to students easily. LMS is a central of all administration systems, such as student administration, lecture evaluations, attendance, e-Learning, Assignments, Quizzes, as well as Midterm and Final Examination [2]. To make the system interesting and easy for users, a special content management system was developed in the Smart Campus. The complete system consists of a set of flares and applications that can be accessed using a smartphone or PC as well as a Laptop [3]. LMS not only facilitates in various aspects of campus administration but also increases job satisfaction such as productivity in working and achieving work quality improvement. This can be seen from significant numbers based on several variables measured to see the effectiveness the use of LMS. The variables measured include work quality, productivity, and lecturer satisfaction. [4]. LMS is present as a paradigm shift in the delivery of information technology resources and services [5]. LMS
is a media that has the main purpose for customization based on user experience and responses. In other words, LMS provides almost everything that is needed by the user simultaneously in one place [6]. LMS is created as a complement to the education field, it is concentrating heavily on teaching activities as well as learning support activities [7]. In recent years, LMS is considered as a sufficient technology for flexibility in the application and scaling of applications, which are derived in stages from the administration, learning, and various examinations. [8]. LMS refers to applications that provide educational services via the Internet that integrates the hardware and software systems from data centers [9]. The LMS service also has a function as an interactive campus internal education calendar [10].

The purpose of this study is to describe the benefits of using an internal portal campus for the advancement of education and to analyze business opportunities in education. This study used descriptive methods to illustrate the accuracy of the benefits of using the campus internal Learning Management System.

2. Method
This study used descriptive methods to illustrate the accuracy of the benefits of using an internal campus Learning Management System. In addition, this research also used previous research related to the development of Learning Management Systems as a reference and comparison. This research was conducted at a private campus in Bandung city named Universitas Komputer Indonesia.

3. Results and Discussion
Learning Management Systems can be used to monitor staff and students, as well as keep track of assessment and training records. Lecturers can determine whether their course is run for several students in a long period or in a shorter period. The Learning Management System makes it easier for lecturers to deliver their course and help the course to run smoothly. LMS also has a reporting system. LMS offers various features such as the following features:

- **Easy GUI**
  GUI which stands of Graphical User Interface makes LMS users can customize the options. Therefore, they can have a unique display according to their preferences.

- **Customization**
  LMS offers several different customization options to correspond according to the user needs. Language choices, notification settings, and other important features can be changed based on user desires.

- **Enrollment**
  This system allows students to register online and see the progress of the course as well as the results of the tests that students have.

- **Virtual class (Virtual Classroom)**
  This feature helps lecturers to schedule their sessions. This might give the lecturers the ability to send invitations or reminders for class sessions and integrate with the online calendar system, or with outlook.

- **Social network**
  Some LMS might be able to integrate with social media so the users can share content or news items via Twitter, Facebook, and etc.

- **Means of Communication**
The LMS system must also have an ability to built-in functions for communicating with students, such as sending mass emails to the students in a particular course, to individual students, or to students who are learning certain pathways. The system also can send the schedule automated through e-mails, which can be very useful for informing students about upcoming virtual tests or class sessions. LMS might provide a chat room or forum that lecturers and students can use.

- Reports
The LMS has a reporting system that users can enter, generate reports that can export to Excel, and offers a graphical representation of data for easy understanding.

Learning Management System provides a variety of features that can help students to find out what activities the students are currently taking, such as ongoing classes, calendars to view upcoming events, and important information related to the lectures. If the students log in to the LMS, they will be directed to the student dashboard. The student dashboard displays a page that contains a notification of students' activities such as assignments and task deadlines (see Figure 1).

![Figure 1. LMS Dashboard](image)

The learning management system also provides a calendar feature that contains information about the tasks that must be done by the deadlines specified. This feature is helpful to remind students about the tasks to be performed and the deadline so that students can complete the task on time (see Figure 2).
One of the functions of the LMS is students can take classes according to the semester they are currently in, then after taking classes students will go to my course page. On the course page, students can see what classes are going on and how far the process is. On this page, students can also see a list of students who are also currently accessing LMS. The system also provides online discussion forums, discussion mailing lists, and chat (see Figure 3).

After downloading the material provided by the lecturer, students will automatically be present in attendance. This is one of the features that are very helpful in the student attendance process. Where
students no longer need to sign absences in a class, only by downloading material, students have been declared to be present. Certainly, attendance is following the policies of each lecturer. For the effectiveness, every time students download material they must read and understand the material, and the lecturer will conduct tests in the form of questions about the material provided. For students who do not understand the material, they will be assisted by the lecturer by providing guidance and for students who have not read the material are allowed to read first before attending the class (see Figure 4).

![Figure 4. Course on progress](image)

LMS has many classes in it, both from one or more faculties. The existing system requires every student who wants to take the class to enter the enrolment key. Enrolment keys can be obtained from lecturers in the class that the students want to attend. This feature helps to minimize students from entering the wrong class (see Figure 5).

![Figure 5. Class Enrolment key](image)
4. Conclusion
The education world requires the availability of all facilities that can be used to deliver educational programs. Education today needs access to data quickly and accurately. By using LMS services, users can access information anywhere and anytime. The campus can also maximize funds and provide the best service to students and lectures. Besides, this system can integrate all educational information in a website or application, ranging from administration, special email account services, materials, examinations, and attendance to the academic calendar. Other than that, business opportunities are also open for web developers to collaborate with Indonesian schools or campuses since they can facilitate service providers.

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