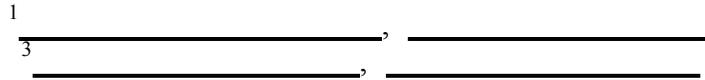# A Web Based Industrial Training Management System

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Abstract: - The Industrial Training Management System is a web-based system, which is developed to assist the administrator in managing the related activities industrial training. This system is expected to replace the manual system. The system includes several management process namely, student registration, mailing process, announcement and evaluation of the training. Students who will undergo the industrial training are required to register through this system. Also, this system can automatically calculate the total marks gained by each student once the supervisors evaluated the respective students. Several reports will be generated for reference. Through this system, all the data are kept in a more systematic way. MySQL is being used as the database to store data. The system development is done using PHP, JavaScript and HTML as the programming tools.

Keywords: - Industrial Training Management System, Unified Modeling Language (UML), PHP, MySQL.

1. Introduction

The developments of computerized management systems are expanding over the past years and most of these systems are increasingly replacing the manual system [5,6]. For instances, there are the registration system, clinic system, hotel management system and so on that are widely used.

This Web-Based Industrial Training Management System is another system that needs to be developed in order to replace the current management that are run manually. The system is a wise way to effectively control and manage industrial training related affairs. This system is specified for the use of Computer Science Department, University College of Science and Technology Malaysia (KUSTEM). Industrial training has become a program compulsory to students majoring in the Bachelor of Information Technology. All students will undergo the training with duration of approximately 12 weeks, either in private or government sectors. Each student will have an industrial supervisor and another supervisor from the university called internal supervisor. Those supervisors will guide the students during the training and evaluate students' performance at the end of these training.

Since the number of students undergoing the training has increased over the years, the manual system is deemed to be no longer efficient to manage the students' affairs in industrial training. By developing this system, it will be a good alternative and can efficiently complement the management process as compared to the manual system.

1.1 Objective

Generally, there are several objectives that have been identified in developing this system. These include:
i. To replace the manual management system.
ii. To keep all the data and records in a systematic and efficient way.
iii. To help the administrator in letter writing with ready to use templates.
iv. Reduce the overall time spent on students' industrial placement and in allocating students to their respective supervisors.
v. To automatically generate reports required for references.
vi. Establish an online evaluation or virtual evaluation of students' performance.

1.2 Scope

The scope of the system can be divided into 3; they are registration, processing and management, and evaluation. In registration, those students who will undergo the industrial training and those to

be the supervisors will go through the online registration.

For management and processing, the administrator will place the students in the suitable organizations, which offer a place to undergo the training. Then, those students will be divided into several groups and put under a particular lecturer to supervise them during the training.

For evaluation purposes, both supervisors from the company and university are required to fill up the evaluation form on the student's performance online. The marks will then be automatically calculated by the system to get the total marks for all students.
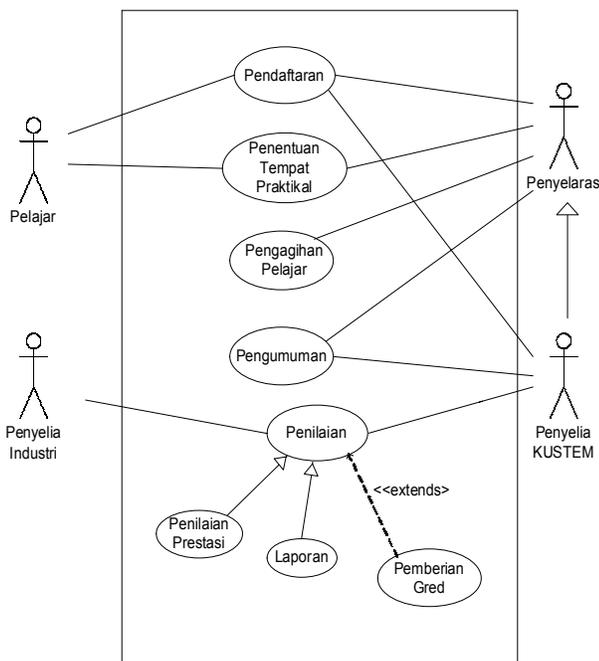

Figure 1. Use Cases Diagram

2. Review on Manual System
2.1 Weaknesses of Manually System
A research has been done to gain improvement from the manual system. There are several weaknesses and inefficiency discovered in the manual system. Some of the weaknesses are listed below:
i.   Delay in processing application
ii. Lost of data or duplication of data caused by the increasing number of students
iii Inefficient data storage

iv. Assessment by the industrial supervisors typically takes longer time because they need to post the assessment form.
vi Lack of communication between the student and the internal supervisor.

2.2 Proposed Solution
Through the development of the Web-Based Industrial Training Management System, most of the problems discovered in the manual system could be overcome. Below are some of the advantages of the system:
i.   All data stored in a more systematic way.
ii. Duplication of students' data can be avoided.
iii. Students attending the training can do online registration.
iv. Data can be accessed more easily.
v.   Assessment by the industrial and internal supervisor can be done online.
vi. All the letter templates are supplied
vii. Several reports can be generated for reference purposes.

3. System Design
3.1 UML Method
The Web-Based Industrial Training Management System is designed using the model of UML (*Unified Modeling Language*) as a methodology of the system. The UML model is applicable to object-oriented problem solving [1,4]. There are many different types of UML notation to represent the system in a diagrammatic way. Below are descriptions of each notation used in modeling the system:
i.   *Use Case Diagram*
     Use Cases are used to obtain the system requirements from a user's perspective. A use case diagram is a collection of   actors, use cases, and their communications. There are five use cases, which are registration, training place application, distribution of students, issuance of notice, and student's evaluation. Students, administrator, internal supervisors and industrial supervisor are among the actors who will interact with the use cases. Figure 1 shows the *use case diagram* of the system.
ii. *Class Diagram*
     A class diagram gives an overview of the system by showing   its classes and the relationships among them, as shown in Figure 2.
iii. *Activity Diagram*

An activity diagram focuses on the flow of activities involved in a single process, such as the company application processes, student distribution processes, and students' evaluation processes.

iv. *Sequence Diagram*

A sequence diagram is an interaction diagram that details out how operations are carried out, what messages are sent and when.
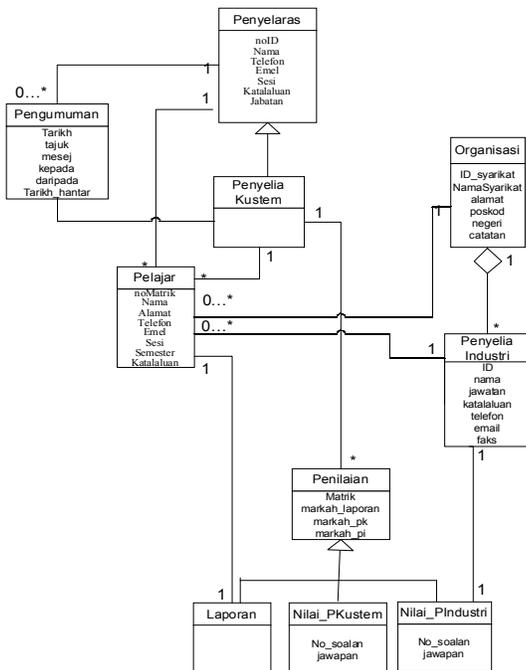

Figure 2. Class Diagram

3.2 Files and Data Structure

Below are descriptions of each table in the database for the physical design:

i. *Student* - This table contains the students' personal information.
ii. *Internal_Supervisor* - This table contains the information about the supervisors from the university.
iii. *Company* - This table contains company's information.
iv. *Industrial_Supervisor* - This table contains the information about industrial supervisors.
v. *Distribution* - This table contains the records of students with their internal and industrial supervisors.

vi. *Result* - This table contains the evaluation marks and report.
vii. *Internal_supervisor_assessment* - This table contains the number of questions and marks given for each questions by internal supervisor to each student.
viii. *Industrial_supervisor_assessment* - This table contains the number of questions and marks given for each questions to each student by the industrial supervisor.
x. *Question* - This table contains all the questions for evaluation.
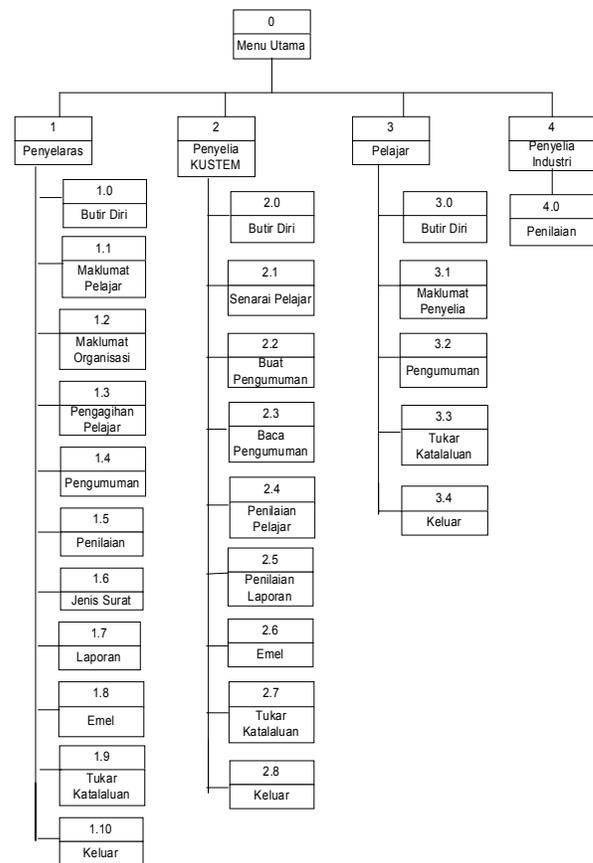xi. *Announcement* - This table contains the records of each announcement.

Figure 3. Hierarchy System

4 System Implementation
4.1 Menu Hierarchy of System

Web-Based Industrial Training Management System specifically has four main menus as shown in Figure 3. They are menu for:
i. Administrator
ii. Internal Supervisor
iii. Industrial Supervisor

iv. Student

Every menu has its related modules. There are four main modules in the whole system, which are the module for admin, internal supervisor, industrial supervisor and student. The admin module is used to enable the administrator to manage and operate all of the industrial training management processes. The internal supervisor module let the internal supervisor to register, make announcement and evaluate students' performance and generate reports. The module for students enables students to register and read announcements posted by the administrator or internal supervisor. The industrial supervisor module allows the industrial supervisor to evaluate the performance of students. The main interface as shown in Figure 4 displays all the modules.

Figure 4. The Main Interface

4.2 Module Implementation
4.2.1 Administrator Menu
i. *Personal Information* - This module displays the information about the administrator and allows the administrator to update his information and input the start and end dates of the training.
ii. *Student Information* - Student information allows the administrator to review students' information and the information related to industrial training. The administrator is allowed to update or delete student's record.
iii. *Organization Information* - This module displays the company profile. Administrator is allowed to insert, update or delete company's data.
iv. *Student Distribution* - This module enables the administrator to assign students to a particular

lecturer or also known as the internal supervisor as shown in Figure 5.
v. *Announcement* - This module allows the administrator to post announcements to all students, university's supervisor or both.
vi. *Evaluation* - This module allows administrator to check the evaluation forms as filled by the supervisors. The administrator is allowed to make changes to each form.
vii. *Format of Letters* - This module displays all letters format. The administrator can just select a format and chooses the receivers based on the list of receiver as displayed by the system. The letter will then be opened in Microsoft Word and can be printed by the administrator.
viii. *Reports* - This module displays several kind of reports to for the administrator's reference.
x. *Email* - This module allows the administrator to send mail to students, internal supervisors or industrial supervisors.
xi. *Change Password* - Administrator is allowed to change their password here.
xii. *Log out* - Is used by the administrator to log out from the system.

Figure 5: The Student Distribution Interface

4.2.2 University Supervisor Menu
i. *Personal Information* - This module displays the information about the supervisor and allows the administrator to update his information.
ii. *List of Student* - This module displays the students' information that are supervised by the internal supervisor.
iii. *Make Announcement* - This module allows the supervisor to make announcements to all students, internal supervisor or both.
iv. *Read Announcement* - This module displays the list of announcements for supervisors' reference.

v. *Evaluation of Student Performance* - This module allows the supervisor to fill up the evaluation form as shown in Figure 6. 20 percent of the total mark is obtained from this evaluation.

vi. *Evaluation of Student Report* - This module allows supervisor to evaluate the students' report by giving marks to each student as shown in Figure 7. This evaluation carries 50 percent of the total marks.

v. *Email* - This module allows supervisors to send email to other supervisors, industrial supervisors or students under their supervisions.

vi. *Change Password* - Supervisors are allowed to change their passwords here.

v. *Log out* - For supervisors to log out.

Figure 6. Performance Evaluation Form

4.2.3 Student Menu

i. *Personal Information* - This module displays the student information and allows students to update their information as shown in Figure 8.

ii. *Supervisor Information* - This module displays the information about the student's supervisor.

iii. *Read Announcement* - This module allows the student to review the announcement made by administrator or university's supervisor.

iv. *Change Password* - Students are allowed to change their passwords through this sub module.

v. *Log out* - Log out from the system.

Figure 7: Report Evaluation

Figure 8. Student Registration

4.2.4 Industry Supervisor Menu

i. *Evaluation of Student Performance* - This module allows the supervisor to fill up the evaluation form. In order to access the evaluation form, the industrial supervisor just needs to enter the student's id and password that have been provided by the administrator as shown in Figure 8. If successful, the system will automatically

display the performance evaluation form as shown in Figure 6. The percentage of this evaluation is 30 percent.

After both the internal and industrial supervisors have done all evaluations, the administrator can automatically get the total marks from the module. Basically the total marks are given by the following:

Performance evaluation from the industry: 30%
Performance evaluation from the university: 20%
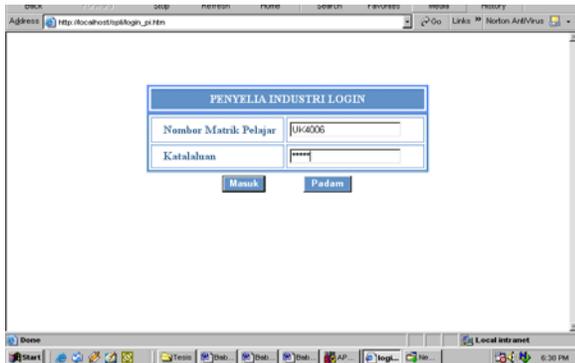Report evaluation from the university: 50%

Figure 9: Access from Industry

5 Conclusion

The development of the Web-Based Industrial Training Management System offers a lot of advantages and meets the users' needs. Among the significant advantages are all data are stored and kept in a database to ensure a systematic and efficient way.

Secondly, the system is well controlled especially for sensitive data, such as passwords. All passwords will be encrypted before it is stored in the database to prevent unauthorized users from seeing the password.

Also, communication between students and internal supervisor (lecturer) can be done more efficiently and faster through this system. As mentioned before, this system provides a facility to make announcements and send e-mail. By this way, students are ensured to get the latest notices and information from their supervisors and administrator.

Furthermore, all the evaluations are done online by the internal and industrial supervisors at the end of the training. This can ensure that all the assessments can be done in a shortest time possible and hence eliminating time consumption for the process of the students result.

By the way, this system is specifically developed only for use by the Computer Science Department. The management of industrial training process are only limited to one program only, that is Bachelor in Information Technology.

For future enhancement, maybe the system can be expended or open to others bachelor programs in KUSTEM that offer industrial placements. Hence, the same system can be used and benefited multiple programmes and not only for the Department of Computer Science.

References:
[1] Charles Richter (1999). Designing Flexible Object-oriented Systems with UML, USA: McMillan Technical Publishing.
[2] Michael Sweeney, Interactive Graphics for Web Based Applications, *International Conference on Web Information Systems Engineering*, Vol.1, 2000, pp. 409
[3] David Cohen, Gary Larson & Bill Ware, A Web Based Wireless Order Management Application, *International Conference on Computer Networks and Mobile Computing*, 2001, pp. 27.
[4] Frederick T. Sheldon, Case Study: Implementing a Web Based Auction System Using UML and Component-Based Programming, *International Computer Software and Applications Conference*, 2002, pp. 211.
[5] M. Orlowska, Integrating Web Based Applications? Challenges and Opportunities, *International Conference on Database Systems for Advanced Applications*, 2001, pp. 3.
[6] Mingyu Lu, Recommendation of Web Pages Based on Concept Association, *International Workshop on Advanced Issues of E-Commerce and Web Based Information System*, 2002, pp. 221.