ONLINE WEB-BASED INDUSTRIAL INTERNSHIP SYSTEM

Aliza Sarlan, ¹Wan Fatimah Wan Ahmad, ²Judy Nadia Jolonius, ³Norfadilah Samsudin
Universiti Teknologi PETRONAS,
Bandar Sri Iskandar, 31750 Tronoh, Perak.
aliza_sarlan@petronas.com.my,
¹ fatimhd@petronas.com.my

ABSTRACT

An Online Industrial Internship System, to automate the currently manual business processes has been developed. The system performs internship registration, student-lecturer assignment, visit schedule, online-logbook submission and monitoring as well as grade book of industrial internship program in Universiti Teknologi PETRONAS. PHP, Macromedia Dreamweaver MX, MySQL are used to develop OITS. Iterative model has been used in the development process by applying business process automation technique. Findings show that the prototype can be used as communication medium for all parties involved during the industrial internship program. The System can be easily used as an aid for the internship program.

Keywords: Industrial internship, Online System, System Automation, Iterative Model, business process, prototype.

INTRODUCTION

Industrial Internship Program has been introduced as part of the curriculum for most of higher learning institutions worldwide. Its main purpose is to expose students to a real working environment and relate theoretical knowledge with applications in the industries. The objectives are to produce well-rounded graduates who possess technical competence, lifetime learning capacity, critical thinking, communication and behavioral skills, business acumen, practical aptitude and solution synthesis ability. Issues such as, long distance learning, communication, monitoring and management arise as crucial to ensure the success of the program. Student Industrial Internship Unit (SIUU) is responsible of handling and monitoring the process for students' internship. SIUU responsible in internship processes starting from student application, checking students' eligibility status, internship placement application and confirmation, lecturer visit scheduling, and grading. Many problems arise since all processes are still been done manually, such as data missing and redundancy, delay in grading process, communication problems and most crucial is student monitoring. Currently, telephone and email are the main methods of communication which have imposed many problems such as update to all students has to be approached individually and resulted in high cost of communications.

The main objective of this project is to develop a prototype of Online Industrial Training System (OITS) that automate current manual processes to reduce possible problems in communication, data loss and redundancy. It makes monitoring, instructor assignment and scheduling, grading and reporting easy and to greater extent, error free.

LITERATURE REVIEW

Online System

One of the major concerns in developing an online system is to enhance user’s accessibility to relevant information by providing users with useful relationships or navigations (Cataniao et al., 2003). Navigation represents the action of jumping from one page through another hyperlink (Quintero & Valderrama, 2002). It is important to make sure that every page in a site has a clearly marked navigations bar, the appearance of the site to an initiated end-user and strive to make the site elegantly simple to navigate, no matter how complex, sophisticated, or lengthy.

Another concern is the usability of the online system that is creating a system that users can find what they are looking for quickly and more efficiently. Zhang et al., 2002) lists 3 principles to help ensuring good usability:
Consistency: In one system, software should use the same terms, styles, and procedures for achieving the same functionality. Color and font should also be consistent throughout the system.

Controllable: Users usually like to do what they want, when they want, without being constrained by the system.

Predictable: Users can continually build on their experience, and develop more sophisticated and accurate models about how the system works. Users will assume that if a particular set of commands work in one situation they will work in other similar situations too.

Distance Learning Concept
Student Industrial Internship refers to the placement of students on spread locations for implementing their knowledge or having practical experience in the real industry sector. Distance learning concept implies that, there exist a separation of instructor and learner in space and/or time, control of learning by the student rather than the distant instructor mediated by some form of technology (Sherry, 1996). Muirhead (2006) raised real concerns that students appreciated the accessibility of their distance learning courses even though their on-line courses contained far less dialogue than the conventional face-to-face classes.

In distance teaching, educators must address different teaching challenges than when teaching in a traditional classroom (Gottschalk, 2003). Teachers have to come up with new strategies to evaluate the student’s performance. Some strategies include (Gottschalk, 2003):

1. **Weekly reports** - Each student is required to submit reports on a weekly basis for monitoring purpose. This is to let the teachers know what they have learnt and gained during their placement.

2. **Electronic mail** - Can be very effective for instructors and students to communicate. Moreover, while the instructor is eliciting information about classroom learning, students become familiar with the use of electronic mail, which is a valuable skill.

3. **Telephone** - Call students often. Ask them open ended questions to let students voice their concerns.

System’s Automation
Among the aims of system’s automation are: Release valuable floor space taken up by the myriad of filing cabinets; deliver incoming mail directly to the desktop of the addressee and allow them to response as soon as possible; ensure that all members of staff had access to all users’ documents and are not dependant on finding correspondence files, etc. and keep files secure and confidential (Friedman, 2005). As for the current research, it is relevant for system’s automation since it involves a huge number of students with their correspondence records, a lot of interactions which require quick response, and all information should be kept confidential. There are actually many ways to automate a system, such as using robots-driven tools, or other mechanisms. Using robots-driven tools require a large volume of costs. Yet, it does not really suit the current research. Therefore, it has been decided that SIIU goes for automation through a computerized system. A computerized system is a system which is programmable through programming source codes to perform certain task. It can be either a web-based application or just a stand-alone application.

PROBLEM IDENTIFICATION
Currently, the system is working manually. However, number of problems and pitfalls has been increasingly arising and causing some deficiencies in the system. Some of the problems in the current manual system are:

- Difficulties in communicating with the students since all communications are using phone and emails.
- Loss of students’ placements applications, resume and other important documents due to too many papers and manual process involved.
- Manual system using Microsoft Excel, Word provide limited features just for entering, searching and printing the data.
- There are no efficient ways to notify the status of placement, post announcement and update the placement of internship.
• The manual system only supports two computers with centralized database. As a result, it has limited the ability to access the information.
• All the business process depends mostly on the one person who knows the process. Other’s have difficulty to interrupt in order to complete the process.
• Weekly report submission to UTP lecturers been done manually. Hence, it always missing and not reach the respective lecturers on time.
• Difficulty in monitoring the students’ progress and performances as the assigned lecturers to the students can only view the weekly report at the end of the program.
• Grade calculation that been done manually always poses problem such as missing of the evaluation forms.

Therefore, the new system (OITS) needs to be developed to automate most of the manual processes to reduce errors and time, and to increase the efficiency in student monitoring and communications.

OITS Development
The OITS serves the following objectives:
• To closely monitor the students’ performance by allowing the SIIU and respective lecturers to view the students weekly report online and ensure that the students are monitored closely in a timely manner.
• To ease the task of scheduling the visits and assigning UTP Supervisors, and to assist in assigning the students to the respective lecturers, based on their program of study and location of the host companies. Besides, the lecturers can also view the list of students assigned under their supervision together with the name of host companies. SIIU need neither to make calls to inform the lecturer nor the students about it. This will reduce the workload of SIIU and make the process more organized.
• To automatically calculate the final mark of students at the end of the internship program once their marks have been entered into the system. Besides preventing miscalculations, this type of task automation actually assists in freeing staff’s time and workloads.
• To generate specific reports based on certain criterion, such as the Host Company, location, program of study and the supervisor for further references and analysis.

The OITS is developed based on the iterative model. During the analysis phase in identifying the critical business processes which need to be automated; the main focus has been on business process automation technique. Basically, Business Process Automation (BPA) means leaving the basic way in which the process operates unchanged and using computational methodology to do most of the work. BPA can make the process more efficient but has the least impact on the business. BPA projects spend significant time on understanding the current as-is system before moving on to improvements and to be system requirements. Problem analysis is one of the BPA techniques (Dennis et al. 2005)).

Open Source Software is used to develop OITS, (that is Personal Home Pages (PHP) for the server side scripting, Macromedia Dreamweaver MX to create the user interface and MySQL for the database). OITS prototype is developed in two phases where the manual processes of industrial internship will later be automated. The first phase covers the pre-internship processes till the confirmation of placement as shown in Table 1. The second phase covers the during-internship and post-internship processes as shown in Table 2.

Table 1: Phase 1

<table>
<thead>
<tr>
<th>Pre-Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student registers for internship</td>
</tr>
<tr>
<td>• Check student’s eligibility</td>
</tr>
<tr>
<td>• If ok, students apply for placement - OPU and non-OPU companies</td>
</tr>
<tr>
<td>• Sort, endorse and submit application to OPU</td>
</tr>
<tr>
<td>• SIIU notify offer received through SIIU or</td>
</tr>
<tr>
<td>• Student notify SIIU on placement offering and confirmation</td>
</tr>
<tr>
<td>• SIIU update host companies database</td>
</tr>
</tbody>
</table>
Table 2: Phase 2

<table>
<thead>
<tr>
<th>During the Internship</th>
<th>Post-Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student registers at the host company and submit re-confirmation form on placement to SIIU.</td>
<td>• SIIU prepare, coordinate and confirm second visit schedule by lecturer</td>
</tr>
<tr>
<td>• Within a month, student must submit their training schedules.</td>
<td>• Second visit commence.</td>
</tr>
<tr>
<td>• Every week, for the 32-weeks period, student submits weekly reports to SIIU after endorsement from their supervisor.</td>
<td>• Students submit their Final Reports to their respective lecturers.</td>
</tr>
<tr>
<td>• Student has been assigned to a lecturer for monitoring.</td>
<td>• Lecturer and host company supervisor assess student’s performance during internship.</td>
</tr>
<tr>
<td>• SIIU submit logbook to the respective assigned lecturer</td>
<td>• Lecturer evaluates Final Reports and submits the marks to the Program Coordinator.</td>
</tr>
<tr>
<td>• SIIU prepare, coordinate and confirm first visit schedule by lecturer</td>
<td>• In parallel, SIIU submits students’ Logbook marks to the Program Coordinator.</td>
</tr>
<tr>
<td>• First visit commence.</td>
<td>• Internship Program Coordinator will then compile and submit students’ marks to SIIU.</td>
</tr>
<tr>
<td>• Lecturer assesses training schedule and organization environment.</td>
<td>• SIIU checks the marks, then forwarded to the Exam Unit.</td>
</tr>
<tr>
<td>• Lecturer submit visit report to SIIU</td>
<td>• Exam Unit processes students’ result slips.</td>
</tr>
<tr>
<td>• Students view their results.</td>
<td>• Students view their results.</td>
</tr>
</tbody>
</table>

The OITS Prototype
The OITS prototype contains seven modules, namely: **Announcement Module, Check Eligibility Module, Register Module, Placement Module, Monitoring Module, Scheduling Module and Grading Module**. Figure 1 shows the representation of the web map of the system. There are three different types of users that can log on to the system with different level of access – student, SIIU staff (administrator) and lecturer. When users log on to the system, they will be directed to the welcome page which consists of a brief description on the functionality of the website and the links if users want to go to their designated page limited to their privilege access.

![Figure 1: OITS Web map](image)

Figure 2 shows the Check Eligibility module for the student. This page can be accessed by the students without log on to the system. Students must enter their IDs and Programs to check whether they are eligible to go internship for that particular semester or not. If the
student's name is on the eligible list, a message will prompt out asking the student to register for the internship by filling up the online registration form.

Figure 2: Check eligibility

Figure 3 shows the main page (Home) for the system where user must log on to access the system. Only eligible students are allowed to use their own IDs and Passwords to log on to the system. For security purposes, they can change the password once they log on to the system.

Figure 3: Main page

After successfully log on to the system, the student can view the latest announcement regarding internship. Figure 4 shows the Announcement Module for the student.
In the Placement Module, student can browse the list of potential non-PETRONAS companies (NON-OPU) that they can submit the application to. For NON OPU, students need to enter maximum of FIVE companies that they applied to. Also, students can register themselves to PETRONAS (OPU) for internship placement. For OPU Application of Placement, students must download a form and send the application directly to SIIU through their own emails. Once the student fill in all the company details, the default status will be pending. The student can view; update the status and the company profile as well. Students must determine which company they choose to go for their internship. Figure 5 shows the View Application Status for Placement Module.

The Scheduling Module is important in order to establish a systematic process to schedule the visit of students by lecturers at the host companies. This can be done through the following pages: viewing of all students’ placements, assigning students to respective lecturer, determining the date and time of visits by lecturers to host companies, which will also be attended by students and their respective Plant Supervisor.
In the Monitoring Module, students' performance and activities during their internship period will be monitored closely through the following pages: Confirmation of students' placements by students and Plant Supervisors, online submission of training schedule, online submission of weekly reports, assessment of weekly reports by Plant Supervisor and viewing of students' weekly reports and marks by lecturer and SIIU.

The Grading Module manages the overall students' marks for grading purposes. Those marks which have been keyed-in either by the lecturer or Plant Supervisor into the OITS, will be total up in order to obtain a particular student's grade for the internship. After the internship ends, students can obtain their final result by viewing their results online.

CONCLUSION AND FUTURE WORK
The OITS system is currently under thorough testing procedures to ensure its reliability and usability. From the preliminary results we conclude that the new system is feasible economically and technically. The team suggests that further research efforts must be done to evaluate the system and widen its functional capabilities.

REFERENCES