**MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

Equipment’s Classroom Management

|  |  |
| --- | --- |
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| **Capstone Project Code** | ECRM |

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1. **Introduction**
2. **Software Project Management Plan**
   1. **Problem Definition**
      1. **Name of this Capstone Project**

**Equipment’s Classroom Management (ECRM).**

* + 1. **Problem Abstract**

Reporting damaged equipment in classroom is very important. It affect the quality of teaching badly since it caused wasting time. If we can optimize it, the quality of teaching will improve. So the ECRM system will provide the platform where people can reduce reporting damaged equipment time, manage equipment and receive suggestions via web site and mobile application.

* + 1. **Project Overview**
       1. **Current Situation**

The ECRM is the system that helps manages equipment in classroom more convenient way. With teacher, they just click (with web app version) or touch (with mobile app version) on the equipment which is damaged and system will notify to the staff immediately. With staff, they can see specific equipment was damaged in which classroom and who reported it. They can also check which classroom is available due to the schedule excel file imported to the system. Staff can read the statistic about equipment in school if they want to.

The system also has restrictions and it comes from the data in schedule excel file. If staff import incorrect data but match the template, the result will be wrong. One more thing is the system couldn’t check user’s behaviors. So if teacher report wrong position of the damaged equipment, there are no way the system can deal with it.

* + - 1. **The proposed system**

The ECRM will be developed in website and mobile application.

* + - * 1. **Website application**
* Classroom management:
* Admin can create a new classroom.
* Admin staff can edit classroom.
* Room type management:
* Admin staff can create a new room type.
* Admin staff can edit room type.
* Notify about damaged equipment:
* Staff can get notification about the damaged equipment.
* Teacher can send notification.
* Equipment management:
* Admin can manage equipment.
* Admin can manage equipment information.
* Create or mapping schedule by import excel file:
* Admin can import the schedule excel file into the system and system will create a schedule.
* Statistic:
* Staff can read statistic about the equipment likes life time, current status…
* Analysis:
  + System analyze the damaged level and give suggestions.
* Send SMS:
  + System send SMS to related peoples.
    - * 1. **Mobile application for teacher**
* Teacher send notification about damaged equipment.
* Teacher see the map of room with interactive graphic in their account.
* Teacher receive notification about fixed equipment or changing room if needed.
  + - * 1. **Mobile application for staff**
* Staff can get notification from damaged equipment which reported buy teacher.
* Staff can send notification to teacher about fixing equipment of changing room if needed
* Staff can send SMS to relative people such as: teacher, security…
* Staff can check status of all room in school.
  + - 1. **Boundaries of the System**
* The ECRM is used by FPT University’s teacher and staff and run by laptop, PC and android smart phone.
* Language: English.
* The lasted product contain:
* The ECRM web site.
* The ECRM android application.
  + - 1. **Development Environment**
         1. **Hardware requirements**

**For system**

|  |  |  |
| --- | --- | --- |
| Windows | Minimum Requirements | Recommended |
| Operating System | Window 7, 8 | Window 7,8 |
| Computer Processor | 2GB RAM | 4GB RAM or more |
| Computer Memory | Intel**®** Core 2 duo | Intel**®** Core™ i5 CPU, M460 @2.53 GHz |
| Internet Connection | Cable, WIFI (2 Mbps) | Cable, WIFI (4Mbps) |

Table 1: Hardware Requirement for system

* + - * 1. **Software requirements**
* Window Server 2008: Operating system for deploy web service.
* Microsoft Windows 7 Professional: Operating system and platform for development.
* SQL Server 2008 Enterprise R2: used to create and manage the database for system.
* StarUML v2.1.2: used to created models and diagrams.
* Skype 7.0: used for communication and meeting.
* IntelliJ IDEA 14.0.3, JDK 7, Apache Tomcat 7, Android SDK 14: used to implement web application, web service, mobile application.
* Github & TortoiseSVN 1.8: used for source control.
  1. **Project organization**
     1. **Software Process Model**

The model for project is: Iterative Development Model



Figure 1: Iterative Development Model

Source: <http://en.wikipedia.org/wiki/Iterative_and_incremental_development>

The reasons for choose iterative development are:

* Members are active but lack of experience when do project so we need to receive feedback as soon as possible about product to complete successful this project.
* We have 14 weeks to do this project include documenting, developing, testing… so we must make sure about quality of product. To do it, we must make sure about each module, so we choose iterative.
* In each phase, member only focus for their function. This will make the result better.
  + 1. **Roles and responsibilities**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Full name** | **Role in Group** | **Responsibilities** |
| **1** | Kieu Trong Khanh | Project manager | * Specify user requirement * Control the development process * Give out technique and business analysis support |
| **2** | Tran Vinh Quang | Team Leader, BA, Developer, Tester | * Managing process * Designing database * Clarifying requirements * Prepare documents * GUI design * Create test plan * Coding * Testing |
| **3** | Tang Viet Hung | Team Member, Developer, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI design * Create test plan * Coding * Testing |
| **4** | Doan Nguyen Minh Chi | Team Member, Developer, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI design * Create test plan * Coding * Testing |

Table 3: Roles and Responsibilities Details

* + 1. **Tools and Techniques**
* Front-end: HTML 5, Bootstrap, CSS3, Javascript, jQuery.
* Back-end: RESTful Web service, Spring MVC, Hibernate,
* Web-server: Apache Tomcat 7.0.
* Database Management System: MS SQL Server 2008 Enterprise R2
  1. **Project Management Plan**
     1. **Software development life cycle**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase** | **Description** | **Deliverables** | **Resource needed** | **Dependencies and Constrains** | **Risk** |
| **Room Type Management** | * Support to create, edit room type. | * Website application allowed to create, edit room type of school. * Related document (SRS, SDD, User Guide…) |  | N/A | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |
| **Classroom Management** | * Support to create, edit classroom with room type. * Support to check status, change status of room. * Support to import, mapping schedule. * Support to remove, update classroom. | * Website application allowed to create, edit, remove classroom. * Related document (SRS, SDD, User Guide…) |  | Dependence on “Room Type Management” | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |
| **Equipment**  **Management** | * Support to manage equipment on school. * Support to check life time,… of equipment. | * Website application allowed to manage equipment. * Related document (SRS, SDD, User Guide…) |  | N/A | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |
| **Notify damage and fixing** | * Support user to notify about damaged equipment. * Support staff to notify about fixing. | * Website application allowed user receive notify. * Related document (SRS, SDD, User Guide…) |  | Dependence on “Manage Classroom”, “Manage Equipment” | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |
| **Web Service** | * Build web service to develop android application. | * Web service provide API. * Related document (SRS, SDD, User Guide…) |  | Dependence on “Notify damage and fixing” | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |
| **Android Application** | * Support user to notify about damaged equipment and receive notification in their smartphone using Android OS with internet connection. | * Android application allow user send notify about damage. * Related document (SRS, SDD, User Guide…) |  | Dependence on “Web Service” | * Lack of experience. * Technology is difficult. * Not have a clear understanding about business process. |

Table 4: Software development life cycle

* + 1. **Phase Detail**
       1. **Phase 1: Room Type Management.**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **Planning** | * Identify start date, end date of iteration. * Identify what team should implement in this iteration. | QuangTV |
| **Requirements** | * Collect requirements from customer * Identify and clarify requirements | QuangTV, HungTV, ChiDNM |
| **Analysis & Design** | * Research and identify technology to implement function * Identify how to implements function * Create ER diagram, database * Create detail design for this function | QuangTV, HungTV, ChiDNM |
| **Implementation** | * Implement function base on detail design, technology had research. | QuangTV, HungTV, ChiDNM |
| **Deployment** | * Create deployment documents, user guide. * Deploy this function to server | QuangTV, HungTV, ChiDNM |
| **Testing** | * Write and run test case for this function * Do unit test and integration test. * Create testing document | QuangTV, HungTV, ChiDNM |
| **Evaluation** | * Receive feedback | QuangTV |

Table 5: Phase 1: Room Type Management

* + - 1. **Phase 2: Classroom Management.**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **Planning** | * Identify start date, end date of iteration. * Identify what team should implement in this iteration. * Notice about feed of customer about previous iteration to team member. | QuangTV |
| **Requirements** | * Collect requirements from customer * Identify and clarify requirements | QuangTV, HungTV, ChiDNM |
| **Analysis & Design** | * Research and identify technology to implement function * Identify how to implements function * Create, update ER diagram, database * Create detail design for this function | QuangTV, HungTV, ChiDNM |
| **Implementation** | * Implement function base on detail design, technology had research. | QuangTV, HungTV, ChiDNM |
| **Deployment** | * Create deployment documents, user guide. * Deploy this function to server | QuangTV, HungTV, ChiDNM |
| **Testing** | * Write and run test case for this function * Do unit test and integration test. * Update testing document | QuangTV, HungTV, ChiDNM |
| **Evaluation** | * Receive feedback | QuangTV |

Table 6: Phase 2: Classroom Management

* + - 1. **Phase 3: Equipment Management.**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **Planning** | * Identify start date, end date of iteration. * Identify what team should implement in this iteration. * Notice about feed of customer about previous iteration to team member. | QuangTV |
| **Requirements** | * Collect requirements from customer * Identify and clarify requirements | QuangTV, HungTV, ChiDNM |
| **Analysis & Design** | * Research and identify technology to implement function * Identify how to implements function * Create, update ER diagram, database * Create detail design for this function | QuangTV, HungTV, ChiDNM |
| **Implementation** | * Implement function base on detail design, technology had research. | QuangTV, HungTV, ChiDNM |
| **Deployment** | * Create deployment documents, user guide. * Deploy this function to server | QuangTV, HungTV, ChiDNM |
| **Testing** | * Write and run test case for this function * Do unit test and integration test. * Update testing document | QuangTV, HungTV, ChiDNM |
| **Evaluation** | * Receive feedback | QuangTV |

Table 7: Phase 3: Equipment Management

* + - 1. **Phase 4: Web Service.**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **Planning** | * Identify start date, end date of iteration. * Identify what team should implement in this iteration. * Notice about feed of customer about previous iteration to team member. | QuangTV |
| **Requirements** | * Collect requirements from customer * Identify and clarify requirements | QuangTV, HungTV, ChiDNM |
| **Analysis & Design** | * Research and identify technology to implement function * Identify how to implements function * Create, update ER diagram, database * Create detail design for this function | QuangTV, HungTV, ChiDNM |
| **Implementation** | * Implement function base on detail design, technology had research. | QuangTV, HungTV, ChiDNM |
| **Deployment** | * Create deployment documents, user guide. * Deploy this function to server | QuangTV, HungTV, ChiDNM |
| **Testing** | * Write and run test case for this function * Do unit test and integration test. * Update testing document | QuangTV, HungTV, ChiDNM |
| **Evaluation** | * Receive feedback | QuangTV |

Table 8: Phase 4: Web Service.

* + - 1. **Phase 5: Android Application.**

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| **Planning** | * Identify start date, end date of iteration. * Identify what team should implement in this iteration. * Notice about feed of customer about previous iteration to team member. | QuangTV |
| **Requirements** | * Collect requirements from customer * Identify and clarify requirements | QuangTV, HungTV, ChiDNM |
| **Analysis & Design** | * Research and identify technology to implement function * Identify how to implements function * Create, update ER diagram, database * Create detail design for this function | QuangTV, HungTV, ChiDNM |
| **Implementation** | * Implement function base on detail design, technology had research. | QuangTV, HungTV, ChiDNM |
| **Deployment** | * Create deployment documents, user guide. * Deploy this function to server | QuangTV, HungTV, ChiDNM |
| **Testing** | * Write and run test case for this function * Do unit test and integration test. * Update testing document | QuangTV, HungTV, ChiDNM |
| **Evaluation** | * Receive feedback | QuangTV |

Table 9: Phase 5: Android Application

* + 1. **All Meeting Minutes**

Refer to Meeting Minutes folder

<https://github.com/tranquang9a1/ECRM>

* 1. **Coding Convention**

Java: Using to develop desktop application.

Summary:

* Naming Convention.
  + Use camel case for both variable and function name.
  + Use Pascal case for class, interface name.
  + The names of variables declared constants should be all uppercase with words separated by under-scores (“\_”).
* Four spaces should be used as the unit of indentation. The exact construction of the indentation (spaces vs. tabs) is unspecified. Tabs must be set exactly every 8 spaces (not 4).
* When an expression will not fit on a single line, break it according to these general principles:
  + Break after a comma.
  + Break before an operator.
  + Align the new line with the beginning of the expression at the same level on the previous line.
* Declaration.
  + One declaration per line is recommended slice it encourages commenting.
  + In absolutely no case should variables and functions be declared on the same line
  + Do not put different types on the same line.
* Code Examples

Follow “Code Conventions for the Java TM Programming Language, by Sun Microsystems, rev April 20, 1999”.

<http://www.oracle.com/technetwork/java/codeconventions-150003.pdf>