 **MINISTRY OF EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Timetable Management Support Tools**

|  |  |
| --- | --- |
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| **Ext. Supervisor** | N/A |
| **Capstone Project code** | TMST |

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# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Definition** |
| TMST | Timetable Management Support Tools |
| Local | Data on laptop/personal computer |
| Server | Data on server. It Synchronize to local data through webservice |

# Software Project Management Plan

## Problem Definition

### Name of this Capstone project

* **Timetable Management Support Tools (TMST)**

### Problem Abstract

The Timetable arrangement is not a simple task in FPT University. The staff have to complete it as fast as possible before each semester whereas it consumes much time and effort. The biggest problem is optimizing the promptitude and accuracy are needed. However, all the things that staff have to do are done entirely by themselves with no assistance tool but Excel. In this current method, the mistakes always exist even if how prudent the staff was. So the possible solution is creating a tool that could help them to perform their work easier and faster with significant increase precision.

### Project Overview

#### Current Situation

The TMST is the system should help staff handling their works in a gentle way. They import data into system where it will be parsed and stored into database. A part of timetable would be created based on inputted data and staff just input the required files or fill necessary information to complete it. The conflicts could be checked automatically and be notified. Based on that, the staff could modify or update the timetable whenever they want and they could request the system to export it into excel file. The system also could send or synchronize to the instructor’s mail or inform students. Additionally, the system support staff in creating room usage, calculating the timekeeping, and suggest staff creating guide project schedule.

The major restriction of this system comes from the data that staff would input. The imported excel files must match with predetermine template and information in those files could not be checked by the system. Therefore, if the data is not correct, the result outputs would go wrong.

Finally, one more noticeable restriction is the consistency among two staff in creating timetable would be difficult and costly. Thus, creating timetable should be done by only one staff at a time.

#### The proposed system

The TMST system should provide the flexible way for user to handle the timetable creating task. Beside that it should support user managing and checking errors, adjusting and exporting data files, mailing and reporting, etc. In more detail, the system would contain following features:

* Data management:
  + User should be able to fill manually or import data.
  + System could parse data from Excel files.
  + System could export formatted Excel files.
  + Staff should be able to manage storage data.
  + Synchronize data between local and server.
* Timetable management:
  + System could create timetable based on inputted data.
  + Staff should be able to review the created timetable with/without exporting.
  + System could check and notify to staff when there are conflicts.
  + Staff should be able to modify the timetable.
  + System could calculate the timekeeping follow period was configured before.
  + System could send/synchronize the timetable, timekeeping to instructor’s mail follow time preconfigured.
  + System could suggest the guide project schedule.
  + Staff could be able to modify the guide project schedule.
* Room usage management:
  + System could support to create the room usage schedules based on the timetable.
  + Staff should be able to modify the room usage schedule.

#### Boundaries of the System

* The system could be used by FPT University’s staff with a laptop/ personal computer.
* The system could not support multi-users at a time.
* The used language of the system is English.
* The completed product contains:
  + The TMST desktop application.
  + All the involved documents.

#### Development Environment

##### Hardware requirements

**For system**

|  |  |  |
| --- | --- | --- |
| Windows | Minimum Requirements | Recommended |
| Operating System | Windows 7, 8 | Windows 7, 8 |
| Computer Processor | Intel® Core 2(TM) i3 CPU M370 @2.4GHz 3.39GHz | Intel® Core(TM) i5-2410M CPU @ 2.30GHz |
| Computer Memory | 2GB RAM | 4GB or more |
| Internet Connection | Cable, Wifi (2 Mbps) | Cable, Wifi (12 Mbps) |

Table : Hardware Requirement for system

**For server (webservice)**

|  |  |  |
| --- | --- | --- |
| Windows | Minimum Requirements | Recommended |
| Operating System | Window Server 2008 | Window Server 2008 |
| Computer Processor | CPU Intel Xeon E3 2.0GHz | 2.0 GHz CPU 6 core E5-2620 |
| Computer Memory | 2 GB RAM DDR3 | 4 GB RAM DDR2 |
| HDD | 100 GB HDD Raid 0,1 | 500 GB HDD Raid 0,1 |
| Bandwidth | 300Mbps | 500Mbps |
| International bandwidth | 2Mbps | 10Mbps |

Table : Hardware Requirement for Server

##### Software requirements

* Window Server 2008: operating system for deploy webservice.
* 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 5.0: used to create models and diagrams.
* Skype 7.0: used for communication and meeting.
* Netbean IDE 8.0.2: used to implement application and webservice.
* Google Code & TortoiseSVN 1.8: used for source control.

## Project organization

### Software Process Model

Project is developed under agile method – Iteration model.

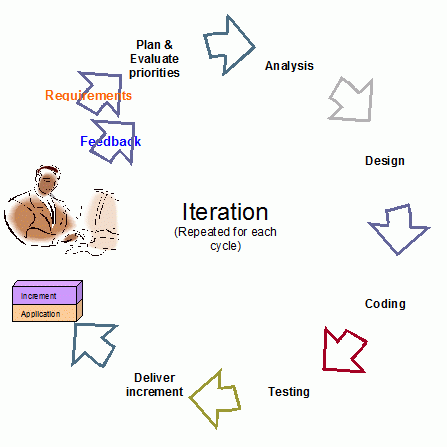


Figure : Iteration Model

For more information: <http://www.indicthreads.com/1439/quick-introduction-to-agile-software-development/>

(Owner: IndicThreads.com. Online Software Developer Magazine and Conferences)

The purpose of applying Iteration model for TMST is because of:

* Characteristics of TMST requirement:
  + Customer is more actively involved, and get higher priority.
  + Requirement is changed frequently.
* Characteristics of Project Team:
  + Feedback is needed during project evolving.
  + Project team should focus on the specific requirements at a time.

### 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** | Lu Quoc Cuong | Team Leader, BA, DEV, Tester | * Managing process * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **3** | Pham Tran Tuan Vu | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **4** | Ho Thien Nguyen | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **5** | Ha Trong Trung | Team Member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |

Table : Roles and Responsibilities Details

### Tools and Techniques

* Application is built on java platform.
* Web Server: RESTful.
* Database Management System: MS SQL Server 2008 Enterprise R2

## Project Management Plan

### Software development life cycle

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Phase/** **Iteration** | **Description** | **Deliverables** | **Resource needed** | **Dependencies and Constrains** | **Risks** |
| **Create the Timetable** | - Support to create the timetable with input/import planned semester, student list, instructor’s assignment.  - Check conflict after creating timetable | - Desktop application support to create the timetable.  - Related document (SRS, SDD,  Installation Guide, Manual Guide…) | 60 man-days | N/A | - Lack of experience.  - The implemented parsers are not the best.  - Lack of test data. |
| **Timetable Management** | - Calculate the timekeeping  - Suggest the guide project schedule depending the available information  - Send and synchronize the timetable, timekeeping to instructors' mail  - Export the excel with formatted font and comprehensive presentation  - The data mining functions from timetable | - Desktop application support to create the timetable.  - Related document (SRS, SDD,  Installation Guide, Manual Guide…). | 60 man-days | Dependence on “Create the Timetable” Iteration | - Lack of experience.  - Not have a clear understanding about business process. |
| **Room usage management** | - Support to create the room usage and manage schedules based on the timetable | - Desktop application support to create and manage the room usage schedules.  - Related document (SRS, SDD,  Installation Guide, Manual Guide…). | 30 man-days | Dependence on “Create the Timetable” Iteration | - Lack of experience.  - Not have a clear understanding about business process. |
| **Webservice functions** | - Build webservice to synchronize data between local and server. | - Webservice provide API to synchronize data.  - Desktop application provide synchronize data function  - Related document (SRS, SDD,  Installation Guide, Manual Guide…). | 30 man-days | N/A | - Lack of experience.  - Not have clear technical to synchronize data.  - Not have a clear understanding about business process. |

Table : Software Development Life Cycle Detail

### Phase Detail

#### Phase 1: Create the Timetable

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| 1. Plan & evaluate priorities | - Evaluate function’s priorities and plan for this iteration.  - Identify what function should have implement in this iteration | CuongLQ |
| 2. Analysis | - Find which systems currently provide similar service, their strengths and weakness.  - Information from FPT University’s staff.  - Identify this function how to implement. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 3. Design | - Choose architecture style.  - Create ER diagram, database.  - Write SRS document, detail design. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 4. Coding | - Implement selected functions base on design task. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 5. Testing | - Write and do test cases for unit test, integration testing. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 6. Deliver increment | - Deliver this application to FPT’s staff.  - Write installation guide and user manual | CuongLQ, VuPTT, TrungHT, NguyenHT |

Table : Phase 1 - Create the Timetable

#### Phase 2: Timetable Management

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| 1. Plan & evaluate priorities | - Get feedback from staff on deliver application in the in the previous step iteration**.**  - Evaluate feedback, function’s priorities and plan for this iteration.  - Identify what function should have implement, update. | CuongLQ |
| 2. Analysis | - Find which systems currently provide similar service, their strengths and weakness.  - Information from FPT University’s staff.  - Identify this function how to implement. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 3. Design | - Update ER diagram, database.  - Update SRS document, detail design. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 4. Coding | - Implement, update selected functions in plan & evaluate priorities phase. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 5. Testing | - Write and do test cases for unit test, integration testing.  - Update testing document. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 6. Deliver increment | - Deliver this application to FPT’s staff.  - Write installation guide and user manual | CuongLQ, VuPTT, TrungHT, NguyenHT |

Table : Phase 2 - Timetable Management

#### Phase 3: Room usage management

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| 1. Plan & evaluate priorities | - Get feedback from staff on deliver application in the in the previous step iteration**.**  - Evaluate feedback, function’s priorities and plan for this iteration.  - Identify what function should have implement, update. | CuongLQ |
| 2. Analysis | - Find which systems currently provide similar service, their strengths and weakness.  - Information from FPT University’s staff.  - Identify this function how to implement. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 3. Design | - Update ER diagram, database.  - Update SRS document, detail design. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 4. Coding | - Implement, update selected functions in plan & evaluate priorities phase. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 5. Testing | - Write and do test cases for unit test, integration testing.  - Update testing document. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 6. Deliver increment | - Deliver this application to FPT’s staff.  - Write installation guide and user manual | CuongLQ, VuPTT, TrungHT, NguyenHT |

Table : Phase 3 - Room usage management

#### Phase 4: Webservice functions

|  |  |  |
| --- | --- | --- |
| **Task** | **Description** | **Author** |
| 1. Plan & evaluate priorities | - Get feedback from staff on deliver application in the in the previous step iteration**.**  - Evaluate feedback, function’s priorities and plan for this iteration.  - Identify what function should have implement, update. | CuongLQ |
| 2. Analysis | - Find which systems currently provide similar service, their strengths and weakness.  - Information from FPT University’s staff.  - Identify this function how to implement. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 3. Design | - Update ER diagram, database.  - Update SRS document, detail design.  - Compare many algorithms about synchronize data and choose the best one. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 4. Coding | - Implement, update selected functions in plan & evaluate priorities phase. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 5. Testing | - Write and do test cases for unit test, integration testing.  - Update testing document. | CuongLQ, VuPTT, TrungHT, NguyenHT |
| 6. Deliver increment | - Deliver this application to FPT’s staff.  - Write installation guide and user manual | CuongLQ, VuPTT, TrungHT, NguyenHT |

Table : Phase 4 – Web service functions

### All Meeting Minutes

Refer to Meeting Minutes folder

## 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 (“\_”).
* Indentation
  + 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.
    - Prefer higher-level breaks to lower-level breaks.
    - Align the new line with the beginning of the expression at the same level on the previous line.
    - If the above rules lead to confusing code or to code that’s squished up against the right margin, just indent 8 spaces instead.
* Declaration.
  + One declaration per line is recommended since 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>