**MINISTRY OF**

**EDUCATION AND TRAINING**

**FPT UNIVERSITY**

Capstone Project Document

**Corporate Training System**

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

-Ho Chi Minh City, ***8th January, 2018***-

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# Definitions, Acronyms, and Abbreviations

|  |  |
| --- | --- |
| **Name** | **Definition** |
| CTS | Corporate Training System |

# A. Report No. 1 Introduction

## 1. Project Information

* Project name: **Corporate Training System**
* Project Code: **CTS**
* Product Type: **Website application**
* Start Date: **8th January, 2018**
* End Date: **April, 2018**

## 2. Introduction

In this document, we will introduce a solution for Corporates to train their employees more effectively. Nowadays, many companies are having problem to find a system that can provide them an environment to train new staffs easier.

Based on ours researches and analysis, we proposed a solution for this problem. We build a system, which allows any corporate to post its training program on our website. Through our system, staffs can access to training anywhere and anytime, making learning and training more effective.

Besides, this document also shows our working process and our perspective in the system, designs, architecture and workflow.

## 3. Current Situation

In recent years, e-learning or studying online is becoming more and more widely used. Corporations with an online training system find out their employees are training faster and better than those who do not have access to online learning. However, it seems not easy for each company to build their own training system.

Whenever a Corporate want to develop a system to train their employees, they usually hire a software company to build a system that suitable for their needs with a cheap price. Nevertheless, it’s hard to seek a software company to acquire the two requirements above.

## 4. Problem Definition

From above current situation, we have these disadvantages:

* No platform for any Corporate to train its employees online
* Learner cannot communicate in real time with author to understanding content of that course if they get trouble in learning.
* Learner have to wait for their manager to accept the request before they can begin to learn a course.
* When an author creates a course, they do not need to receive a permission from manager or administrator. Therefore, that course will have a bad influence on learners.
* An author maybe wonders what plan or program that their courses belongs to.

## 5. Proposed Solution

Our proposed solution is to build a system named Corporate Training System (CTS) who has troubles with finding a place to train their employees online.

Corporate Training System is a web application with following functions:

### **Feature functions**

* Manage plan, programs, skills and courses.
* Manage users.
* Manage corporate brand and information.
* Participate to a plan or program.
* Enroll in a course.
* Learn a lecture.
* Take quiz and view quiz result.
* Make statistic report.
* View learners’ report on learning activities
* Manage personal information
* Manage discussion.

### **5.2 Advantages and Disadvantages**

* Advantages:
  + - * + Necessary for all corporate
        + New idea
        + Easy to use application
        + Friendly interface
* Disadvantages:
  + - * + Finding a suitable price for customer.
        + The cost in web application maintenance is high
        + Users’ demand change

## 6. Functional Requirements

Function requirements of the system are listed as below:

* Learner component:
  + View program
  + View study plan
  + Search study course
  + View study course
  + Enroll course
  + Manage profile
  + Manage discussion
  + View learning activity
  + Sign in, Sign out
* Author component:
  + View learner statistic
  + Manage course
* Manager component:
  + Manage training plan
  + Manage user
  + Manage program
  + Manage skill
  + View learners’ report
  + Add learner to program/plan
  + Remove learner from program/plan
* Admin component:
  + Manage corporate’s information and brand
  + Change user’s role
  + Ban user from study

## 7. Role and Responsibility

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Full Name | Role | Position | Contact |
| 1 | Nguyễn Huy Hùng | Project Manager | Supervisor | hungnh@fpt.edu.vn |
| 2 | Lê Phúc Thịnh | Developer | Leader | thinhlpse61759@fpt.edu.vn |
| 3 | Võ Thạch Nguyên | Developer | Member | nguyenvtse61778@fpt.edu.vn |
| 4 | Phạm Chánh Hưng | Developer | Member | hungpcse61807@fpt.edu.vn |
| 5 | Đặng Thế Anh | Developer | Member | anhdtse61372@fpt.edu.vn |

# Table 1: Roles and Responsibilities

B. Report No.2 Software Project Management Plan**1. Problem Definition**

**1.1 Name of this Capstone Project**

- Official name: Corporate Training System

- Vietnamese name: Hệ thống đào tạo cho doanh nghiệp

- Abbreviation: CTS

**1.2 Problem Abstract**

This project is our concern about development of training online for corporation. We call it Corporate Training System (Traisy). As current in Vietnam, as well as other developed countries, websites and applications for e-study are limited in functions and often focus on only certain companies. For example, many platforms for learning online only contains video lecture. Meanwhile, some systems support many functions but only available to a specific company, such as SAKAI for FPT SOFTWARE.

Those websites that focus on several tasks for e-learning are often designed for international users and thus, are not particularly suitable for Vietnamese people.

The solution is to provide a system for all corporates, especially Vietnamese Corporates, a way to satisfy all their needs of a simple and effective e-training for employees.

**1.3 Project Overview**

**1.3.1 Current Situation**

Below are some problems encountered in this project:

* **Business logic:** Some scopes of project are not clear to every team member in early stage of developments. For example, learners cannot self-enroll their selves into a training program but being enrolled by their manager or admin.
* **Schedule of team member:** team members can have a conflict in meeting schedule because of sick, or class and work schedule, etc.
* **Framework study:** team member have a problem when applying the play framework into project. The team needs an amount of time to get familiar new techniques.
* **Some tools require premium package to access:** For convenience for play framework, we use Intellij IDE, which requires premium account and expensive for our team members.
* **Lack of UI (user interface), UX (user experience) design skill:** Our team members all study IS major and no one has studied UI, UX design. Therefore, that some UI may misunderstand or hard to use with normal user.
* **Knowledge about training plan:** this project is about how a corporation or company trains their employees. The knowledge of this issue is new to members.

**1.3.2 The Proposed System**

The proposed system is Corporate Training System. The system contains a web application for learner, author, manager and admin.

In detail, the web application provides following features:

* For learners:
  + Learners can view study courses. In this function, they can view all resources and lectures of a course they are assigned and through this, they can study any lecturer.
  + Learners can view their learning activities. After a course is enrolled for learners, they can view process of their study.
  + Learners can update their info and manage their discussion.
* For author:
  + Authors can manage their courses. Author has full function to edit their lessons such as update, delete and add.
  + Author can view learner statistic. In this function, author can view all learners’ progress who takes their lectures. By doing this, author can easily improve their lesions.
* For manager:
  + Manager can manage learners. Manager can add a learner to a program/plan, or remove learner from any program/plan of their company.
  + Manager can create, edit or delete a skill.
* For admins:
  + Manage corporate’s information. Admin can edit their corporate’s related information and change company’s logo or brand name.
  + Admin can edit all users’ role.

**1.3.3 Boundaries of the System**

This section suppose that users of the system has stable Internet connection while using.

**The system can:**

* Allow any corporate to register their training program online.
* Allow only author, manager to create courses
* Allow only admin to change role of users
* Learners only allow to search programs/plans or courses that they are enrolled

**Besides, the system cannot:**

* Let the learner to self-enroll their selves

**1.3.4 Development Environment**

1.3.4.1 Hardware requirements

**For server**

|  |  |  |
| --- | --- | --- |
| **Server** | **Minimum Requirements** | **Recommended** |
| **Internet Connection** | Cable, Wi-Fi (4 Mbps) | Cable, Wi-Fi (8 Mbps) |
| **Operating System** | Window Server 2008 | Window Server 2008 |
| **Computer Processor** | Intel® Xeon ® 1.4GHz | Intel® Xeon ® Quad Core (12M Cache, 2.50 GHz) |
| **Computer Memory** | 1GB RAM | 2GB or more |

*Table 2: Hardware Requirement for Server*

**For PC**

|  |  |  |
| --- | --- | --- |
| **PC** | **Minimum Requirements** | **Recommended** |
| **Internet Connection** | Cable, Wi-Fi (4 Mbps) | Cable, Wi-Fi (8 Mbps) |
| **Operating System** | Window 7 | Window 7 or more. |
| **Computer Processor** | Intel® Core i3 1.4GHz | Intel® Core i5 2.50GHz |
| **Computer Memory** | 1GB RAM | 2GB RAM or more |
| **Web Browser** | Firefox (v52 or higher), Chromes (v28 or higher) | Chrome latest stable version |

*Table 4: Hardware Requirement for PC.*

1.3.4.2 Software requirements

|  |  |  |
| --- | --- | --- |
| **Name** | **Name/Version** | **Description** |
| **Environment** | Java JDK 8 | Specification for developing web application |
| **Operating System** | Window 7 | Window 7 or more or Mac OS. |
| **Integrated development environment** | - IntelliJ IDEA 2017.2.3 (Web Service/Staff Web Application Development) - Bracket (Front-end Application Development) | Programming tools |
| **Modeling tool** | StarUML 2.8,  Lucidchart.com | Software modeling tool |
| **Database Management System** | MySQL 5.7 | Used to create & manage the database for system |
|  |  | Java script ? |
| **Source control** | Git hosted by Github.com | Used to source control & version control. |
| **Web browser** | Chrome 28 or higher. | Testing browser |

**2. Project organization**

**2.1 Software Process Model**

This project is developed under Scrum model (Scrum Methodology). We apply Scrum model to capable with current situation in our team. We choose this model due to following reasons:

+ Easy in tracking process: In Scrum, a product backlog (a wish list of tasks that need to be prioritized in a project) is created. Thanks to product backlog, our team can create sprint backlog so that we can tracking member's tasks easier in each sprint.

+ Quality: We agreed with each other that sprint is one week. In specific week, we always have a sprint planning meeting that takes place at the beginning of each sprint, a daily meeting that is held for a brief period (about 15 minutes) each day to allow each member to brief the team on what they did the previous day and a sprint review meeting, this meeting is held at the end of each sprint. With all of this meeting, we can review and guarantee quality of all our works.

+ Fast and convenient: Scrum Methodology is very suitable with our project and team because scrum can work with any technology/ programming language.

+ Easy to manage: Due to short sprints and constant feedback, it becomes easier to cope with the changes. Besides, it is also a lightly controlled method which insists on frequent updating of work progress through regular meetings. Thus, there is clear visibility of the development project.



*Figure 1: Agile Scrum Methodology*

For more information:

* <http://scrummethodology.com/>

**2.2 Roles and responsibilities**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Full name** | **Role in Group** | **Responsibilities** |
| **1** | Nguyễn Huy Hùng | Project manager | * Specify user requirement * Control the development process * Give out technique and business analysis support |
| **2** | Lê Phúc Thịnh | Team Leader,  BA, DEV, Tester | * Managing process * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **3** | Võ Thạch Nguyên | Team member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **4** | Phạm Chánh Hưng | Team member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |
| **5** | Đặng Thế Anh | Team member, BA, DEV, Tester | * Designing database * Clarifying requirements * Prepare documents * GUI Design * Create test plan * Coding * Testing |

*Table 5: Roles and Responsibilities Details*

**2.3 Tools and Techniques**

|  |  |  |
| --- | --- | --- |
|  | **Tools** | **Techniques** |
| **Front-end** | Bracket | HTML5  CSS3  Javascript  jQuery  Bootstrap |
| **Back-end** | IntelliJ IDEA | JavaEE  Play Framework  JPA |
| **Temporary Storage** | Redis | N/A |

Table 6: Tools and Techniques

\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Need to edit

**3. Project Management Plan**

**3.1 Product Backlog**

Refer to Apendix

**3.2 Sprint Backlog**

Refer to Apendix

**3.3 All Meeting Minutes**

https://drive.google.com/drive/folders/1WAf1QdqQeW3tomYAzrgIgtoPDhu-GKNg?usp=sharing

**4. Coding Convention**

Java: Using to develop web application and web service.

* Naming Convention:

+ Follows camelcase syntax for naming the class, interface, method and variable.

+ If name is combined with two words, second word will start with uppercase letter always e.g. actionPerformed(), firstName, ActionEvent, ActionListener etc.

* Method names should be verbs.
* Class names should be nouns, in mixed case with first letter of each internal word capitalized.
* Constant names should be all uppercase with words separated by underscore.
* Comment:
* Using /\* \*/ for block comments.
* Using // for line comments.

Android: Using to develop mobile application.

* Follow Field Naming Conventions

+ Other fields start with a lowercase letter.

+ Public static final fields (constants) are ALL\_CAPS\_WITH\_UNDERSCORES.

Using Java coding convention from:

<http://www.oracle.com/technetwork/java/codeconvtoc-136057.html>

Using Android coding convention form:

<https://source.android.com/source/code-style.html>

**C. Report No. 3 Software Requirement Specification**

**1. User Requirement Specification**

**1.1 Learner Requirement**

Learner is a person who access to the system as learner role. Learner can use following functions:

* Login
* View course
* View plan
* View program
* Learn lecture
* Take quiz
* View learning activity
* Manage discussion

**1.2 Author Requirement**

* Manage discussion

**2. System Requirement Specification**

**2.1 External Interface Requirement**

***2.1.1 User Interface***

- The user interface uses Vietnamese.

- The user interface displays best on 1366x768 resolution on desktop.

***2.1.2 Hardware Interface***

Desktop PC.

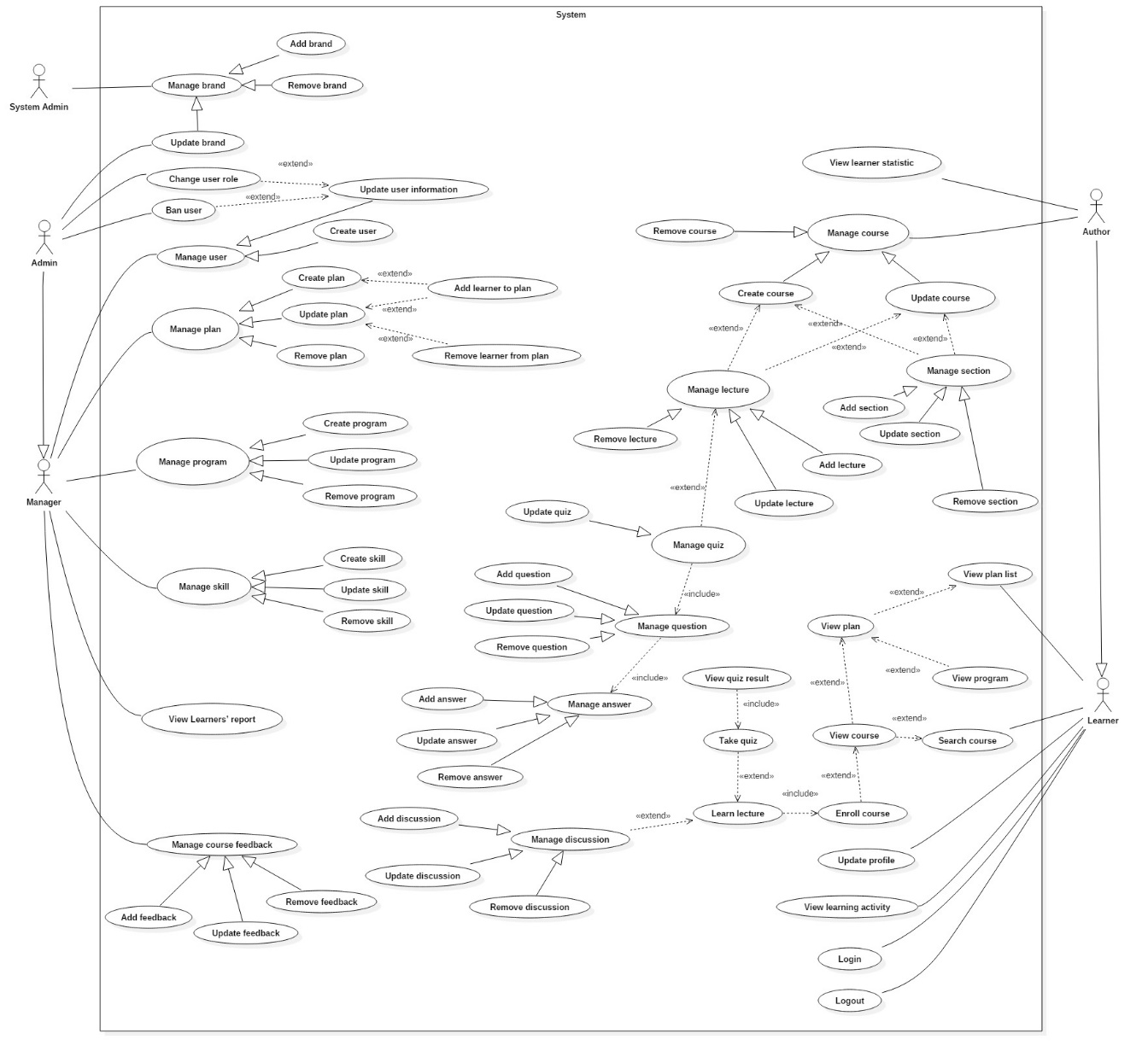
***2.1.3 Software Interface***

Web application: work with browsers Firefox (v52 or higher), Chromes (v28 or higher), Internet Explorer (v10 or above) or with any web browser that supports HTML5 & CSS3

***2.1.4 Communication Protocol***

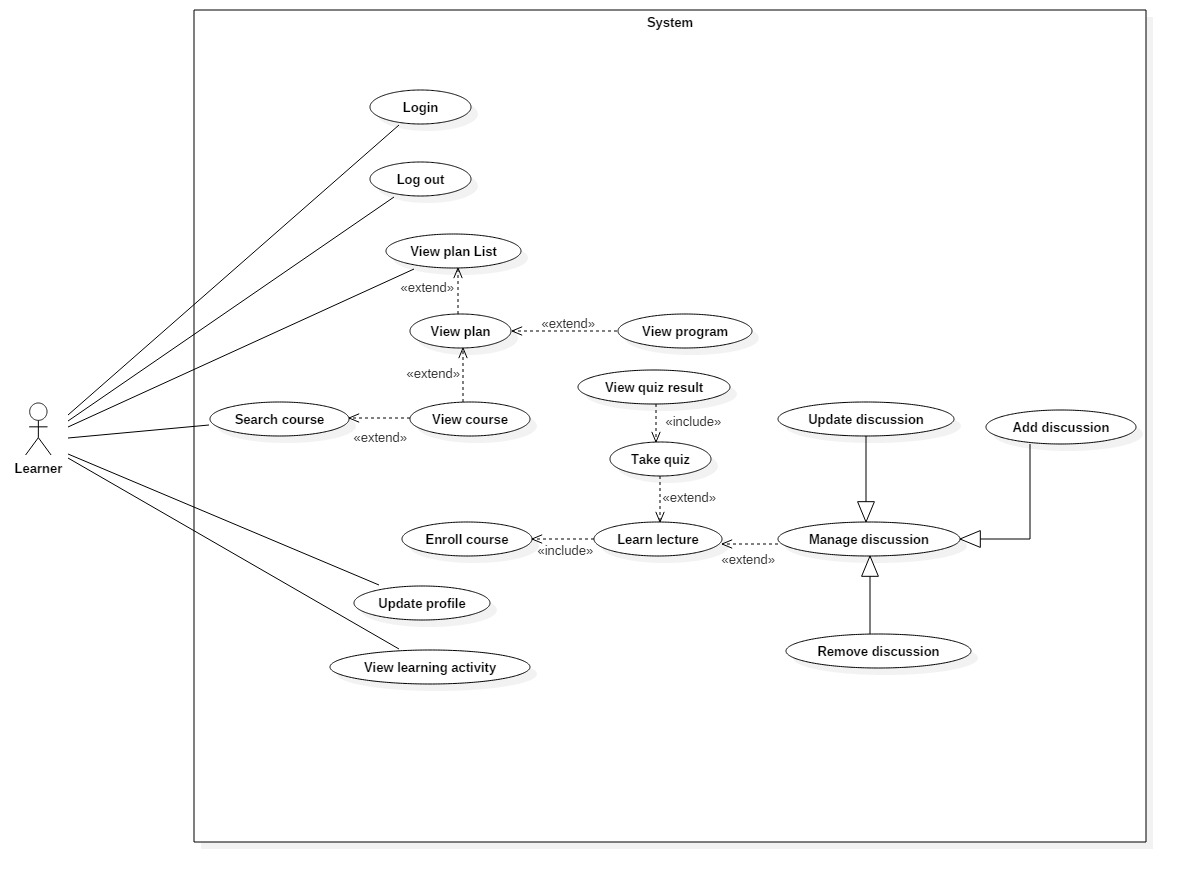
Use HTTP protocol 1.1 for communication between the web browser and the web.

**2.2 System Overview Use Case**



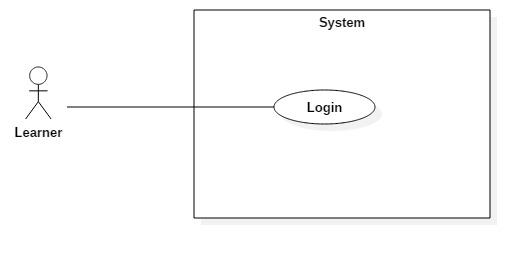
**2.3 List of Use Case**

**2.3.1. <Learner> Overview Use Case**

****

**Figure 1: <Learner> Overview Use Case**

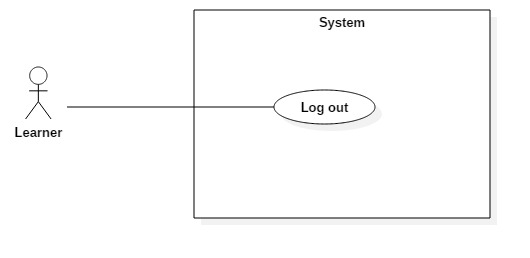
**2.3.1.1 <Learner> Login**



**Figure 2: <Learner> Login (UC\_TRAISY1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY1** | | | |
| **Use Case No.** | UC\_ TRAISY1 | **Use Case Version** | 0.2 |
| **Use Case Name** | Login | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/3/2018 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows authorized learner to login to system.   **Goal:**   * To login to the system.   **Triggers:**   * Actor sends login command.   **Preconditions:**   * Learner does not login yet.   **Post conditions:**   * Success: Actor accesses the system successfully. * Fail: System shows error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Learner goes to login page | System require information:  Tên đăng nhập: text input  Mật khẩu: text input | | 2 | Learner inputs information  (Username and password) |  | |  |  |  | | 3 | Learner sends command to login (Click “Đăng nhập” button after input login form). | [Exception no.1]  [Exception no.2]  System displays the home page. |   **Alternative Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Learner inputs wrong information. | System notices that “Thông tin đăng nhập không hợp lệ” | | 2 | Learner has been inactive by admin/manager |  |   **Relationships:** **N/A**  **Business Rules:**   * Username must be at least 5 characters. * Password must be at least 4 characters. * Pasword must be encrypted. | | | |

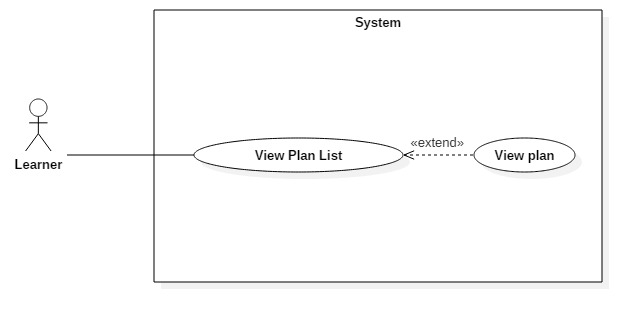
**2.3.1.2 <Learner> Log out**



**Figure 3: <Learner> Logout (UC\_TRAISY2)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY2** | | | |
| **Use Case No.** | UC\_ TRAISY2 | **Use Case Version** | 0.2 |
| **Use Case Name** | Logout | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/03/2013 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows user to logout the system.   **Goal:**   * To logout the system.   **Triggers:**   * Actor sends logout command.   **Preconditions:**   * Learner logged in the system.   **Post conditions:**   * Success: User session is removed and system displays login page. * Fail: System displays error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Actor clicks “Đăng xuất” button. |  | |  |  | User session is removed and system displays login page. |   **Alternative Scenario: *N/A***  **Exceptions:**   |  |  |  | | --- | --- | --- | | ***No*** | ***Cause*** | ***System Response*** | | 1 | Learner is not participated in any plan. | System displays page with message: “Bạn chưa tham gia khóa học nào.” |   **Relationships:** **N/A**  **Business Rules:**   * Actor has already accessed to the system. | | | |

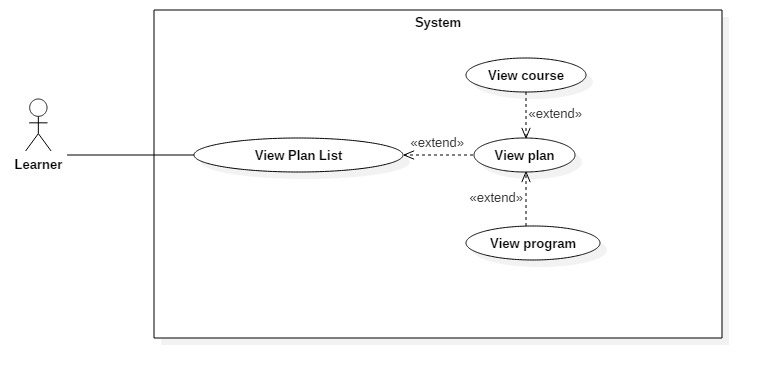
**2.3.1.3 <Learner> View plan list**



**Figure 4: <Learner> View plan list (UC\_TRAISY3)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY3** | | | |
| **Use Case No.** | UC\_ TRAISY3 | **Use Case Version** | 0.2 |
| **Use Case Name** | View plan list | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/03/2013 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows learners to view all their participated plans.   **Goal:**   * To view information of all plans that he/she has participated in.   **Triggers:**   * Actor sends view plan list command.   **Preconditions:**   * Learner logged in the system.   **Post conditions:**   * Success: System displays all participated plans. * Fail: System displays error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Actor clicks on “Khóa học của tôi”. |  | |  |  | System navigates to list of all plans that learner participated. |   **Alternative Scenario: *N/A***  **Exceptions:**  **Relationships:**   * Extended by: View Plan   **Business Rules:**   * Participated plans will have progress bar which indicates the learning activity of learner. * Participated plans which are overdue are not accessible by learner. | | | |

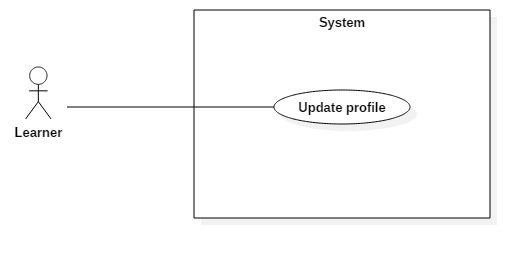
**2.3.1.4 <Learner> View plan**



**Figure 5: <Learner> View plan (UC\_****TRAISY4)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY4** | | | |
| **Use Case No.** | UC\_ TRAISY4 | **Use Case Version** | 0.2 |
| **Use Case Name** | View plan | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/03/2013 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows learners to view a participated plan.   **Goal:**   * To view information of a specific plan that he/she has participated in.   **Triggers:**   * Actor sends view plan command.   **Preconditions:**   * Learner logged in the system.   **Post conditions:**   * Success: System displays information of the participated plans. * Fail: System displays error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Actor clicks on a specific plan | [Exception no.1]  [Exception no.2] | |  |  | System navigates to the selected plan’s page with details of plan. |   **Alternative Scenario: *N/A***  **Exceptions:**   |  |  |  | | --- | --- | --- | | ***No*** | ***Cause*** | ***System Response*** | | 1 | Learner has already been removed from the selected plan. | System displays notice: “Bạn chưa tham gia vào khóa học”. Then redirects learner to blank plan page. | | 2 | The selected plan has been removed by admin/manager of that brand. | System displays notice: “Khóa học đã bị xóa bởi người quản lý”. Then redirects learner to blank plan page |   **Relationships:**   * Extend from: View Plan List * Extended by: View course * Extended by: View program   **Business Rules:**   * Learner must be a participant of the selected plan. * The selected plan must be active ( In duration time ). | | | |

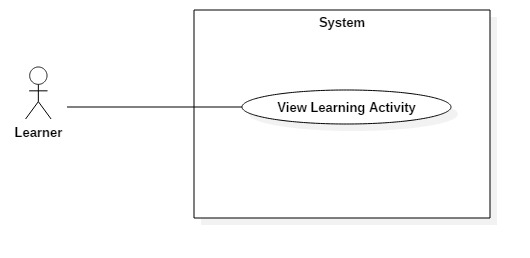
**2.3.1.5 <Learner> Update profile**



**Figure 6: <Learner> Update profile (UC\_TRAISY5)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY5** | | | |
| **Use Case No.** | UC\_ TRAISY5 | **Use Case Version** | 0.2 |
| **Use Case Name** | Update profile | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/03/2013 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows learners to update their information.   **Goal:**   * To update profile.   **Triggers:**   * Learner sends update profile command.   **Preconditions:**   * Learner logged in the system.   **Post conditions:**   * Success: Account is updated successfully, and system displays the user profile page. * Fail: System displays error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Actor clicks “Thông tin người dùng” | System displays user information page with:  Họ tên: text input  Chức danh: text input  Mật khẩu: text input  Xác nhận lại mật khẩu: text input | | 2 | Actor clicks “Cập nhật” button in the update profile page. | [Exception 1]  [Exception 2] | |  |  | Account is updated successfully and system displays the user profile page. |   **Alternative Scenario:N/A**  **Exceptions:**   |  |  |  | | --- | --- | --- | | ***No*** | ***Cause*** | ***System Response*** | | 1 | Learner does not input required fields. | System notices that guest need to input all these field:  - “Họ tên”: System displays warning message: “Họ tên không được trống”.  - “Chức danh”: System displays warning message: “Chức danh không được trống”.  - “Mật khẩu mới”: System displays warning message: “Mật khẩu không được trống”.  - “Xác nhận lại mật khẩu”: System displays warning message: “Xác nhận mật khẩu không được trống”. | | 2 | Guest input wrong some fields with requirement. | System notices that guest need to re-input all these field:  - “Mật khẩu”: System displays warning message: “Mật khẩu phải từ 4 tới 30 ký tự”.  - “Xác nhận lại mật khẩu”: System displays warning message: “Mật khẩu và xác nhận mật khẩu phải giống nhau”. |   **Relationships:** N/A  **Business Rules:**   * Fullname is not null and maximum of 45 characters * Title is not null * Password must be at least 4 characters | | | |

**2.3.1.6 <Learner> View Learning Activity**



**Figure 7: <Learner> View Learning Activity (UC\_TRAISY6)**

|  |  |  |  |
| --- | --- | --- | --- |
| **USE CASE – UC\_ TRAISY6** | | | |
| **Use Case No.** | UC\_ TRAISY6 | **Use Case Version** | 0.2 |
| **Use Case Name** | View Learning Activity | | |
| **Author** | Phạm Chánh Hưng | | |
| **Date** | 23/3/2018 | **Priority** | High |
| **Actor:**   * Learner   **Summary:**   * This use case allows authorized learner to view process of his/her learning activity.   **Goal:**   * To view process of learning.   **Triggers:**   * Actor sends view process command.   **Preconditions:**   * Learner logged in the system.   **Post conditions:**   * Success: Learners can see their learning process. * Fail: System shows error messages.   **Main Success Scenario:**   |  |  |  | | --- | --- | --- | | ***Step*** | ***Actor Action*** | ***System Response*** | | 1 | Actor clicks to any plan or course in plan/course page | System displays learning activity/ process bar for each course and plan that learner has studied. | |  |  |  |   **Alternative Scenario: N/A**  **Relationships:** **N/A**  **Business Rules:**   * Learner must participate in plan to view learning activity of plan * Learner must enroll in course to view learning activity of course * Learner must study lecture in order to view learning process | | | |