Oxford Brookes University

School of Engineering, Computing and Mathematics

COMP6030 Coursework Case Study

Requirements Definition of

A Multi-Tenant Platform of Virtual Learning Environment

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# Introduction

With the advent of mobile and cloud computing technologies, it is perceived that a new generation of virtual learning environment can be developed to provide a holistic support to teaching and learning in universities and at the same time to automate university operations by taking advantages of IT technology such as Software-as-a-Service (SaaS). The CloudSoft Ltd[[1]](#footnote-1) has decided to develop a system called *ClaClo*, which is a multi-tenant online platform system to realise the advanced functions of teaching, learning, course management and operation. Each tenant should be an educational institute, for example, a university.

This document defines the functional requirements of the system. The remainder of the document is organised as follows. Section 2 defines the targeted user types. Section 3 gives the key design features of the system. The functional requirements of the *ClaClo* system are grouped according to the types of users. From Section 3 to 6, each section lists the functional requirements for one user type.

# Types of Targeted Users

The main types of the users of the system will be:

1. *Students*. They are the students of a university hosted on the platform. They will use a mobile app and/or a desktop computer to participate in the learning of the courses delivered by the university.
2. *Teachers*. They are the teaching staff members of the university. They will use a desktop computer to deliver teaching materials and communicate with the students and the course administrators.
3. *Institutional Managers*. They are typically staff members of the university’s academic management office. They will use a desktop computer to setup, customise and update the site for the institute via entering and updating the data about the university.
4. *Departmental Administrators*. They are typically the administrative staff members of a department of the university. They perform management and administrative tasks on the courses that a department of the university offers.
5. *System Operators*. They are the operational staff members of platform. They will use a desktop computer to manage the tenant universities and provide services to their tenants.

# Key Design Features

The *ClaClo* system is perceived to consist of the following applications connected to services running on the cloud.

1. *ClaClo-Student*: a subsystem for students to receive information and learning materials as well as to do exercises and conduct and/or submit assessments works.
2. *ClaClo-Teacher*: a subsystem for teachers to assign exercises and coursework to the students, to receive and mark student works (include exercises and assessments) and provide feedback to the students.
3. *ClaClo-Admin*: a subsystem for administrators of courses.
4. *ClaClo-Manager*: a subsystem for university managers to manage the curriculum of the university.
5. *ClaClo-Ops*: a subsystem for the platform operators to manage the university accounts hosted on the platform and to provide cross university services.

# Specification of Functional Requirements

## Requirements of University Managers

**FR-IM-1: Manage University Account**. The system should be able to support for university managers to set up (or customise) and update relevant data about the university for the university’s account, which should contain the following types of information:

* *Degree programmes*, which is a list of programmes that the university offers and the documents that specify the programmes;
* *Departments of the university, including the departments’ names and the degree programmes each department offers.*

**FR-IM-2: Manage student records.** The system should provide support to the university managers to manage student records, which include their study plan, including the programme(s) that they take and the time that they take each course of the programme, and their academic performance on each of the courses that they take.

**FR-IM-3: View traces of student record changes.** All operations on a student record must be recorded and archived permanently as auditing purposes. The system should enable the university managers to search for and view the traces of student record changes.

**FR-IM-4: Manage administrative staff records.** The system should provide support to the university managers to manage the accounts of administrative staff members of each department. It should provide a facility to create and update accounts for departmental administrators, and delete and archive their records.

## Requirements of Departmental Administrators

**FR-IM-1: Manage programmes and modules**. The system should enable departmental administrators to set up and update the data about the programmes and modules that the department runs, which should contain the following types of information:

* *Module,* including the module’s name, study level, credit value, and a list of programmes that accept the module;
* *Time table,* including the classes of the module and the weekly timeslots for each class;

**FR-IM-2: Manage teachers.** The system should enable the administrators to assign teachers to the modules and the classes and their roles as the module leader, and/or lecturers, practical class tutor, etc.

**FR-IM-3: Manage students.** The system should enable the administrators to manage students in relation to the modules, which include to assign the students to each module and the classes.

## Requirements of Teacher

**FR-TE-1: Set up exercises and assessment.** The system should enable the teachers to setup online and offline exercises and assessments for students of his/her class.

**FR-TE-2: Mark student works.** The system should enable the teachers to mark online and offline exercises and assessments, and to give marks and feedback to the students of his/her class.

**FR-TE-3: Upload teaching material.** The system should enable teachers to upload teaching materials to the system, for example, lecture slides, reading lists, and documents to read, links to online e-books, etc.

**FR-TE-4: Manage classes.** The system should enable the teacher to view the list of students on his/her class, to add students to a class, and to remove students from a class.

## Requirements of Students

**FR-ST-1: Enrol to and quit from a class**. The system should enable a student to select and enrol to an optional module or quit from an optional module, when they are allowed to do so. If a module has multiple classes, the system should also enable the students to select a class.

**FR-ST-2: Do exercises and assessment work.** The system should push information about exercises and assessment assignments to the students that are assigned by the teachers. The system should support student to do online homework and submit offline homework to the system with a combination of text files, pictures and video clips, and files of specific formats used for teaching and learning.

**FR-ST-3: View Teachers feedback on their works.** The system should enable the students to view teacher’s mark and feedbacks on his/her work and assessments that he/she submitted.

**FR-ST-4: View and download teaching materials.** The system should enable the student to view and download teaching materials that the teacher uploaded to the system for the class.

**FR-ST-5: Manage profile.** The system should enable the student to create and update his/her academic profiles, which could be selected from his/her exercise works and assessments with teacher’s marking and feedbacks. The profile should be able to download and print for the student to share.

## Requirements of System Operators

**FR-SO-1: Manage institute account.** The system should enable the system operators to activate/deactivate a university’s account. Once an account become active, the university’s manager should be able to customise and update its setting.

**FR-SO-2: Manage student surveys.** The system should enable the system operators to conduct an Annual Student Survey for all students of the universities hosted on the platform. The survey results in the form of statistical data and ranking of the programmes for each university should be published on a website. Further detailed statistical analysis should be available to the university managers.

**FR-SO-2: Manage staff surveys.** The system should enable the system operators to conduct an Annual Staff Survey for all staffs of the universities hosted on the platform. The survey results in the form of statistical data and ranking of the universities should be published on a website. Further detailed statistical analysis should be available to the university managers.

1. This is a fictional company specializes in the development of computer application systems. [↑](#footnote-ref-1)