UNIVERSITY OF WATERLOO

WUIM

Software Requirements Specification

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1 Introduction

1.1 Purpose

The purpose of this document is to provide complete and unambiguous description of the requirements for the software that is being used for the University of Waterloo's WUIM website. This document specifies in detail, the intended behaviour and expected input for the WUIM software through various types of diagrams, user interaction descriptions and screen diagrams of the system.

The intended audience for this software requirement specification are all the users that will interact with the WUIM website. This includes but not limited to users such as the students, employees, guests and super users. The readers are assumed to have general knowledge in regards to the WUIM website and have some experience in the terminology used in this document. Basic knowledge of UML 2.0 and database is also required.

1.2 Scope

The WUIM software specified in this document is mainly responsible for creating a user-friendly interactive web interface that can help a UW person create or recover a ID. This document also includes details about different types of user inputs to the system and their expected output. One of the main goals of the WUIM system is to ensure that every user ID and alias request follows the requirements specified by the IST and does not collide with the already existing IDs. This is achieved by searching through the UW and the IST database for duplicates of the registering user. Additionally, WUIM is also responsible for enforcing privileged access rights to certain functions like updating database only to special users such as super users.

This document only describes the software specifications of the WUIM system and does not include the hardware requirements such as servers that will be utilized to run the system. It also does not include the internal structure of UW database that will be used to store and verify different users records. Other components such as programming language,security measures of the system are also not included.

1.3 Acronyms, Abbreviations, Definitions

Acronyms:

SRS: Software Requirements Specification

UW: University of Waterloo

IST: Information Systems and Technology

ID: WatIam User ID

WUIM: WatIam User ID Maker

UC: User Case

UWPDB: University of Waterloo Personnel Database

Definitions:

User: A person who uses the features of the WUIM system. It is one of the five categories: student, employee, guest, super user or anyone else.
Super User: A user who has a higher access privilege of the WUIM system and is capable of making unrestricted, potentially adverse, system-wide changes such as editing the database records.
Session: It is a user initiated semi-permanent exchange of information between the user and the WUIM website. It is terminated by the user after they finish and logout.
Alias: An alternative email address that is easier to guess and remember by other human beings and forwards emails to the original email address of the user.

1.4 References

1. *University of Waterloo Identity and Access Management*, University of Waterloo, https://watiam.uwaterloo.ca/idm/user/activateEdit.jsp?id=%23ID%235776-%3A8543A71BF51%3A64E9871%3A67313CD9A020A5E9, accessed on Nov 12, 2017.
2. *Software Requirements Specification & Analysis,* Mike Godfrey, https://www.student.cs.uwaterloo.ca/~se463/Slides/SRSs.pdf, accessed on Nov 12, 2017.
3. *WUIM Class Model*, Daniel Berry, https://www.student.cs.uwaterloo.ca/~se463/Slides/WUIM_CandDM.pdf, accessed on Nov 12, 2017.
4. *WUIM Use Case Model*, Daniel Berry, https://www.student.cs.uwaterloo.ca/~se463/Slides/use.case.2.pdf, accessed on Nov 12, 2017.
5. *uberTurnstile "Example Requirement Specification Document",* https://www.student.cs.uwaterloo.ca/~se463/ExampleSpecs/SRS-Alex-Kalaidjian.pdf, accessed on Nov 12, 2017.

1.5 Overview

In the rest of the SRS document all of the requirements for the WUIM system is divided into different sections.
Section 2 gives a general description of the WUIM system and lists the user characteristics that are required to interact with the system. It also identifies all the assumption and constraints placed on the system.
Section 3 contains detailed overview of various functional and non-functional requirements demanded by the customer and placed upon the system. The following section also illustrates the functionality of user interface that should be used to interact with the WUIM system.
Section 4 section includes the class and use case diagram to briefly outline the WUIM system.

2 General System Description

The product described in this document is software for the **W**aterloo **U**ser **I**d **M**aker, or WUIM. The WUIM web portal is an extension of the IST system, responsible for creating user IDs for students, employees, and guests at the University of Waterloo. If functioning correctly, the software should allow participants to create user IDs, register their own email aliases, change and recover their passwords, and recover their ID if need be. In addition, there are features that allow super users to update any information that can't easily be adjusted through the user flows. The system is comprised of a series of pages, the WUIM server that will serve the pages and process requests, and the IST database.

2.1 Product Functions

The primary function of the WUIM web portal is to interface between the user in and IST database in such a way that the user is able to self-serve their own user id, and required interaction with super users or IST support is minimized. In order to interface with the users of the portal, WUIM uses a web portal. Interaction with this portal is how WUIM is able to process, save, and update data in the IST database, as well as provide feedback to the user. Here are some of the following ways in which WUIM interacts with the user and IST database:

- Provides an interface for users to register a user ID that is subsequently saved in the IST database
- Provides an interface for users to recover their passwords using information queries from the IST database
- Provides an interface for users to update their passwords and propagates this updated data to the IST database

- Provides an interface for super users to directly update data in the IST interface

2.2 User Characteristics

The users of the WUIM web portal must be students, employees, or guests at the University of Waterloo. Since the WUIM web portal is online, they must have internet access and a computer or other device that is capable of giving real or simulated keyboard and mouse input to the web interface. The current iteration of the WUIM site is in English, so the users must be able to read English in order to interact with the interface. Finally, the users must be willing to divulge at least their name, date of birth, and one unique ID that can be used to identify their specific account.

2.3 General Constraints

The underlying software that WUIM runs on may constrain some design decisions pertaining to acceptable input, concurrent connections, and storage capacity. Additionally, certain privacy rules pertaining to the safety of user data impose constraints on the WUIM system. The following is a list of constraints enforced by the WUIM system:

- A user will only be able to access and edit information pertaining to their own account
- WUIM will only accept characters encoded in UTF-8
- WUIM will only allow five email aliases per user
- WUIM will only allow a user to be signed in at one location per session

2.4 Assumptions and Dependencies

The following are a list of assumptions made about the users and WUIM system that affect the WUIM product

- The user is a student, employee, or guest at the University of Waterloo
- The user can read and write in English
- The user has access to an internet connected device
- The user knows a unique identifier for their person
- The IST database is functional and has granted the correct access writes to the WUIM system

The following are a list of dependencies that the WUIM system assumes are functional in order for the WUIM system to function properly:

- IST database
- IST services (for superuser access)
- WUIM servers
- Client computer or device running the WUIM portal

3 Specific Requirements

3.1 Communication Interface

The WUIM system is a software that is designed to communicate with 2 different database servers. It communicates with the University of Waterloo personal database (UWPD) server to retrieve records of users and determine if they are personnel of University of Waterloo. If a user who is part of University of Waterloo succeeds in creating an ID, the WUIM updates the UWPD with the user's newly generated ID. Additionally, when generating an ID for a user, the WUIM system also checks the IST database to determine if the user is already registered and has a record in the database. If the user is already registered, it notifies the user and prompts user with various authentication question to find if the current user is the owner of the conflicting record. If the user is not registered, WUIM adds a new record to the IST database with user's newly generated ID and information.

3.1.1 User Interfaces

A first-time user of the WUIM should be directed to page that should allow him/her to request an ID with his or her personal information, see Figure 3. Following the request, the user should be redirected to the change password page with the current password auto filled, see Figure 10.

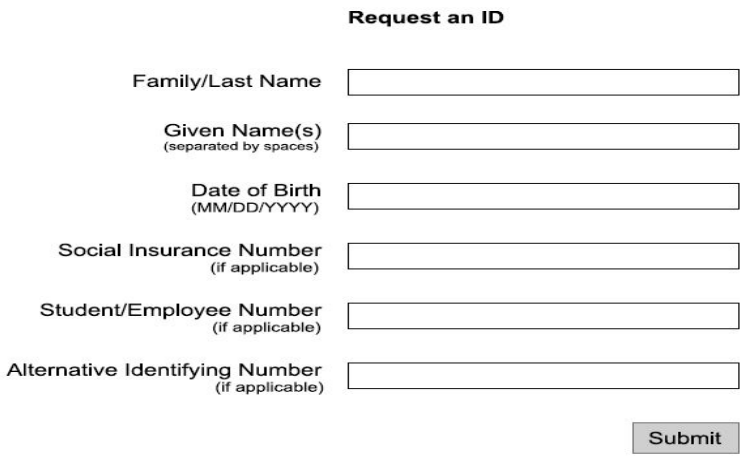

Figure 1: Requesting an ID Interface

An existing user should be able to navigate the WUIM website to reach the login page where he/she should be able to login using his/her user ID and password, see Figure 4.

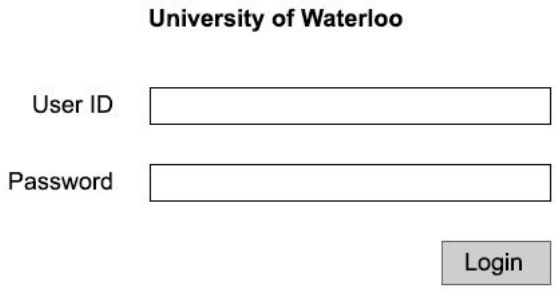

Figure 2: Logging in Interface

If an existing user forgets his/her password for his/her previously registered account, he/she should be able to request to recover his/her password by submitting his/her user ID, see Figure 5. Following this request, the user should then be directed to the recover password authentication questions page as shown in Figure 6, where he/she can give his/her personal information. If the given information matches the information stored in the WUIM database, the user should then be automatically logged in and redirected to the change password page with the current password autofilled, see Figure 10.

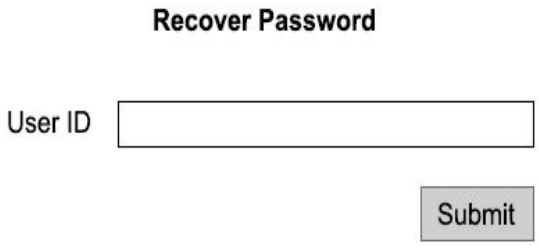

Figure 3: Recovering their Password Interface

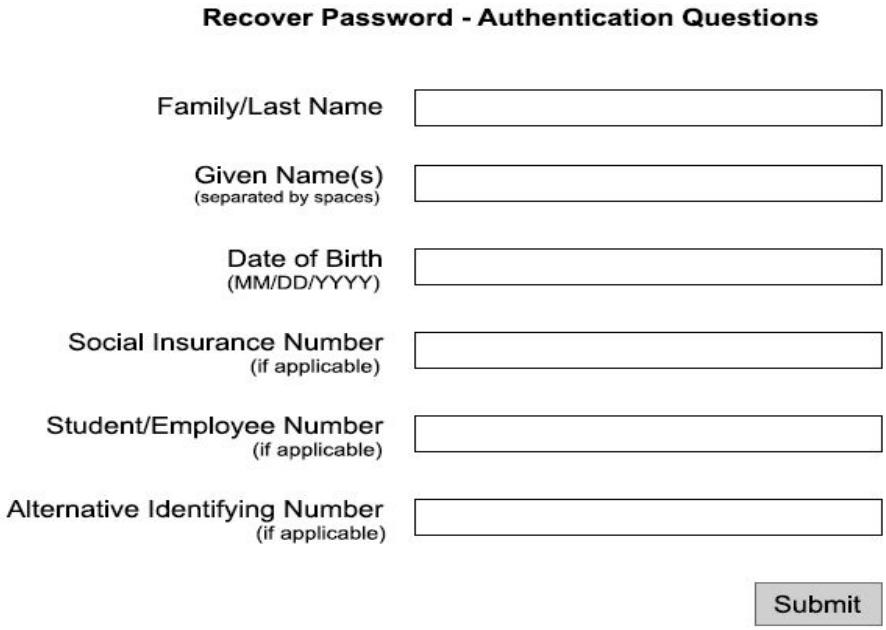

Figure 4: Recovering Password Authentication

Similar to recovering a password, if an existing user forgets his/her user ID, he/she should be able to request to recover his/her ID by submitting his/her family name and given names. Following this request, the user should then be directed to the recover ID authentication questions page as shown in Figure 8, where he/she can give his/her personal information. Following recovery, the user should see his/her user ID, see Figure 9.

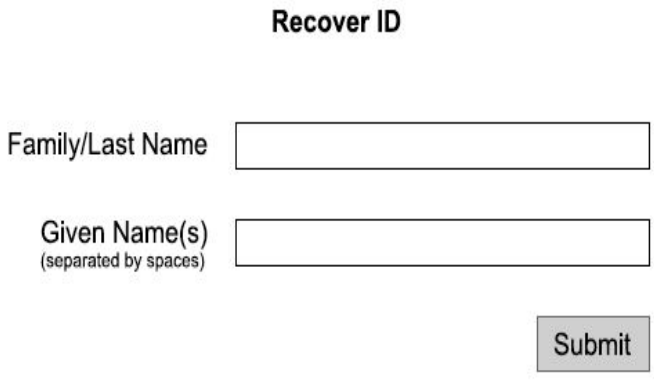

Figure 5: Recovering their ID Interface

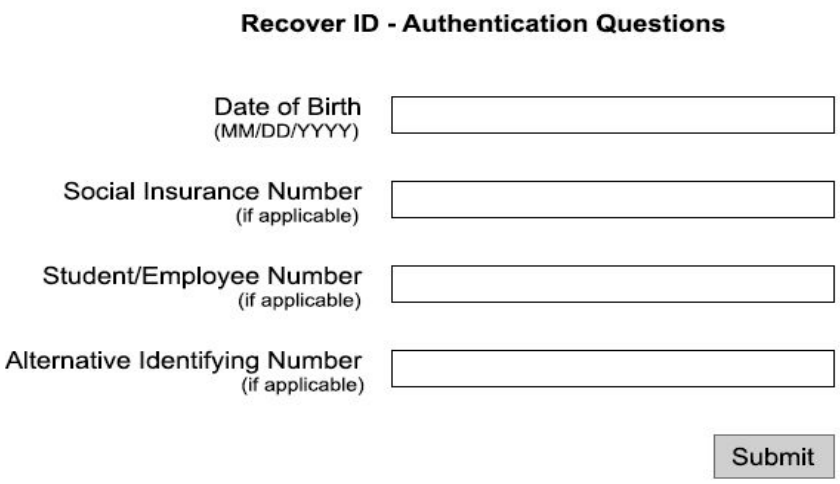

Figure 6: Recovering ID Authentication

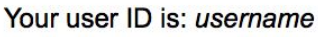

Figure 7: User Receiving Recovered User ID

To change his/her password, an existing user should be able to enter his/her current password and his/her desired new password, see Figure 10.

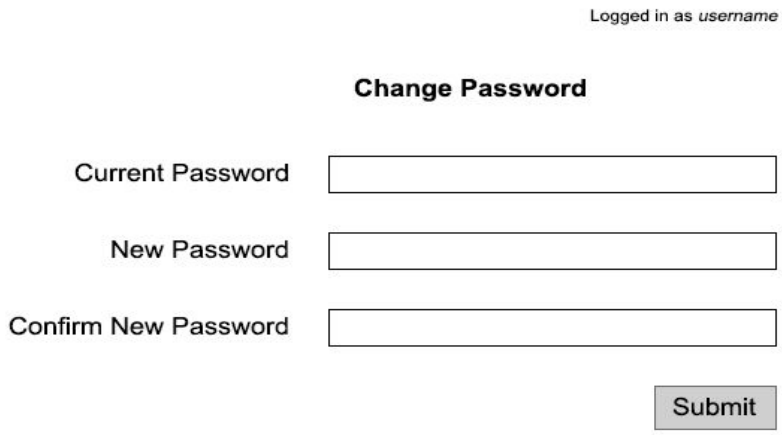

Figure 8: Changing their Password Interface

An existing user should be able to request an email alias, see Figure 11.

Figure 9: Requesting an Alias Interface

An existing superuser should have access to view and edit the WUIM database, see Figure 12.

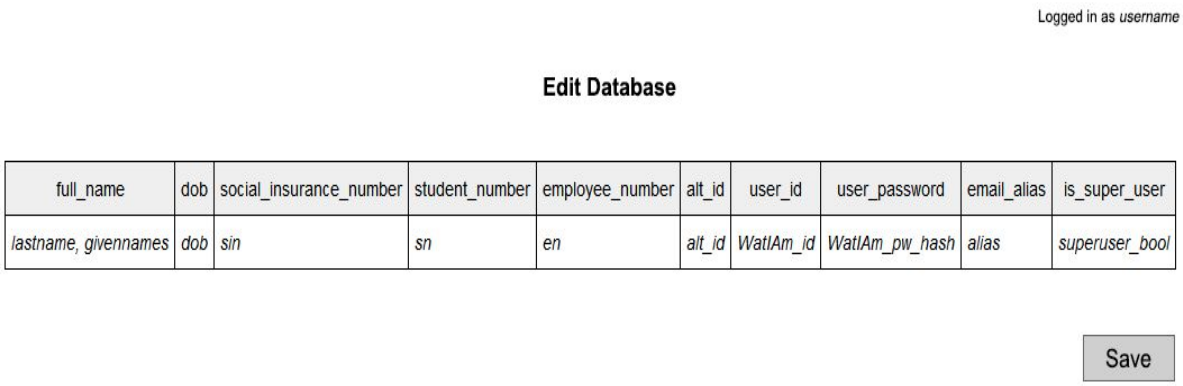

Figure 10: Editing the Database Interface

A user that is logged in should be able to logout, see Figure 13.

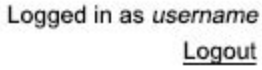

Figure 11: Logging out of WUIM

3.2 Non-Functional Requirements

The types of non-functional requirements include but are not limited to the subsection listed below.

3.2.1 Reliability

- All the changes that the WUIM system makes are atomic. In other words, they are either successful and update the database with the new information of the user or fails in case of system failure such as server failure and notify the user.
- The WUIM system assumes that the information provided by the user is correct and non-malicious.

3.2.2 Usability

- The users needs to have the basic knowledge of English language, knows how to use a computer (pointer, keyboard) and have a basic understanding of navigating through basic websites using an appropriate web browser.

3.2.3 Scalability

- The WUIM systems can handle and process requests from multiple users at the same time.
- The WUIM can be enhanced to allow it to perform additional task by adding appropriate interface and underlying functionality to the system e.g adding security question to recover password etc.

3.2.4 Security

- In order to properly end an ongoing session, the user needs to logout from the WUIM system.
- For existing users, correct password is required to login. The system is locked after more than 5 failed attempts by the user.

3.3 Functional Requirements

3.3.1 Functional Requirement 1

ID: FR1
TITLE: Requesting WUIM ID
DESC: A user should be able to request an ID through the web application by submitting a website form containing their full real name, date of birth, SIN number (if any), employee number (if any), student number (if any), or any other identification number a user wishes to

provide. In return, WUIM should create a new user session and redirect user to “update password” page.
RAT: In order for a user to create an ID
DEP: None
Exceptions:

1. A user enters information that already exists for a user in the database. In this case the user has already been assigned an ID. WUIM should redirect the user to the ID recovery page.

3.3.2 Functional Requirement 2

ID: FR2
TITLE: User logging in
DESC: When a user enters their username and password into a WUIM login form, WUIM should create a new session and serve the WUIM home page to the user.
RAT: In order for a user to start a WUIM web application session.
DEP: FR1
Exceptions:

1. If a user is logging in for the first time, WUIM should redirect the user to the password reset page.
2. If a user enters an incorrect password, WUIM should serve the password recovery page.
3. If a user enters an unknown ID, WUIM should serve the ID recovery page.

3.3.3 Functional Requirement 3

ID: FR3
TITLE: User password recovery
DESC: When a user navigates to the password recovery page, WUIM should serve a list of recovery questions derived from the data provided by the user on registration. When the user submits this data, WUIM should start a new user session and send them to the password reset page.
RAT: In order for a user to recover their password.
DEP: None
Exceptions:

1. If a user enters incorrect recovery data, WUIM should serve a page asking the user to contact IST to further recover her account.

3.3.4 Functional Requirement 4

ID: FR4
TITLE: User ID recovery

DESC: When a user navigates to the ID recovery page, WUIM should serve a list of recovery questions derived from the data provided by the user on registration. When the user submits this data, WUIM should serve a page with the user's ID on it.
RAT: In order for a user to recover their user ID.
DEP:
Exceptions:

1. If a user enters incorrect recovery data, WUIM should serve a page asking the user to contact IST to further recover her account.

3.3.5 Functional Requirement 5

ID: FR5
TITLE: User password update
DESC: When a user enters in their new password to the password recovery page, WUIM should update the associated password in the database.
RAT: In order for a user to update their password.
DEP: FR2

3.3.6 Functional Requirement 6

ID: FR6
TITLE: User email alias request
DESC: When a user requests a new email alias, WUIM should grant the user the alias and update the database with the new alias associated to the username.
RAT: In order for a user to request a new email alias.
DEP: FR2
Exceptions:

1. If a user enters an alias that has already been taken, WUIM should respond with the alias request page.

3.3.7 Functional Requirement 7

ID: FR7
TITLE: Super user is editing the database
DESC: When a super-user edits the database through the database editing UI, WUIM should update the appropriate data in the database.
RAT: In order for a super-user to edit the database.
DEP: FR2

3.3.8 Functional Requirement 7

ID: FR8
TITLE: User is logging out
DESC: When a user requests to log out, WUIM should invalidate the user's session.
RAT: In order for a user to log out.
DEP: FR2

4 Use Cases and Class Model

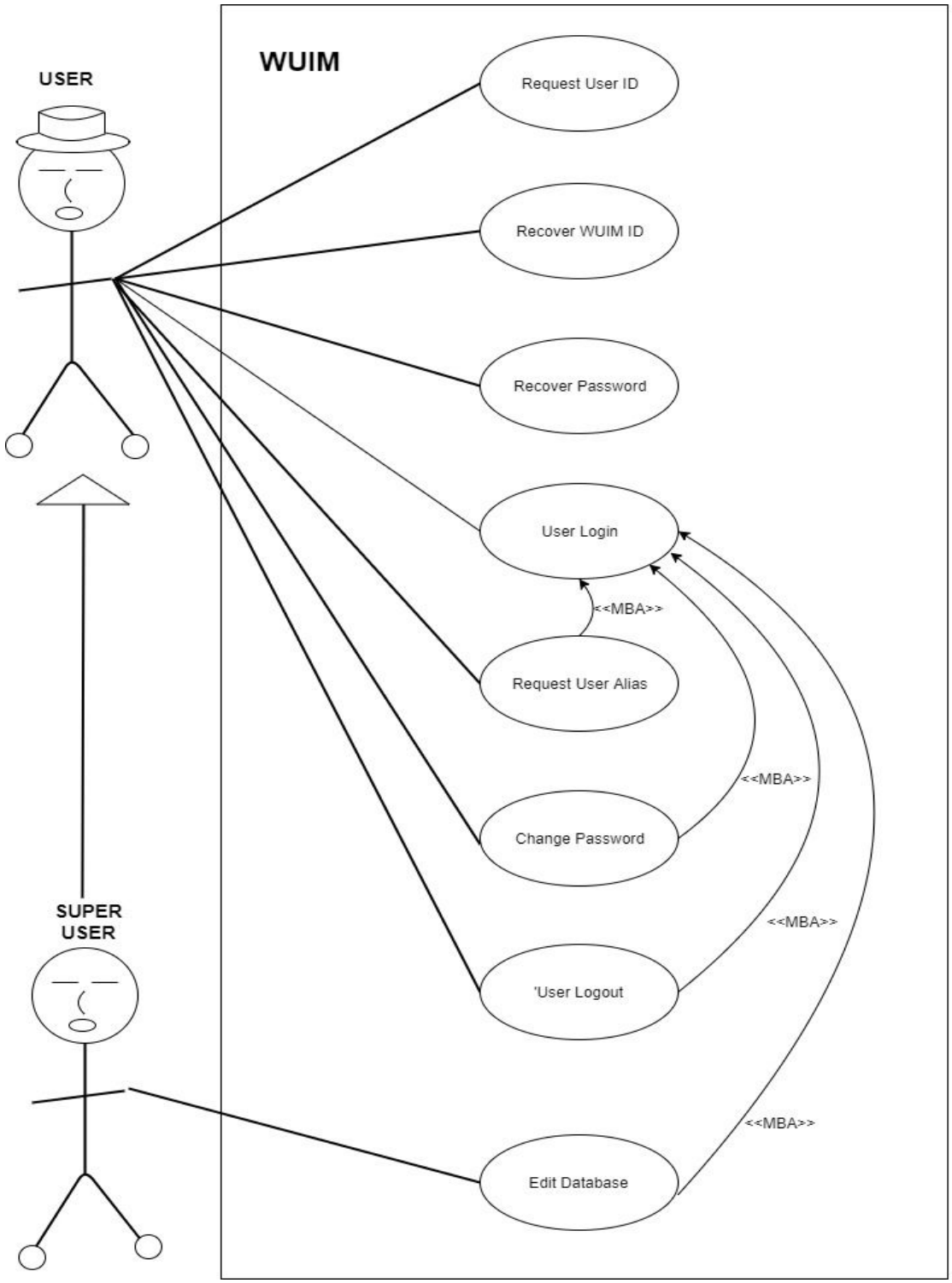

Figure 12: Use Case Model

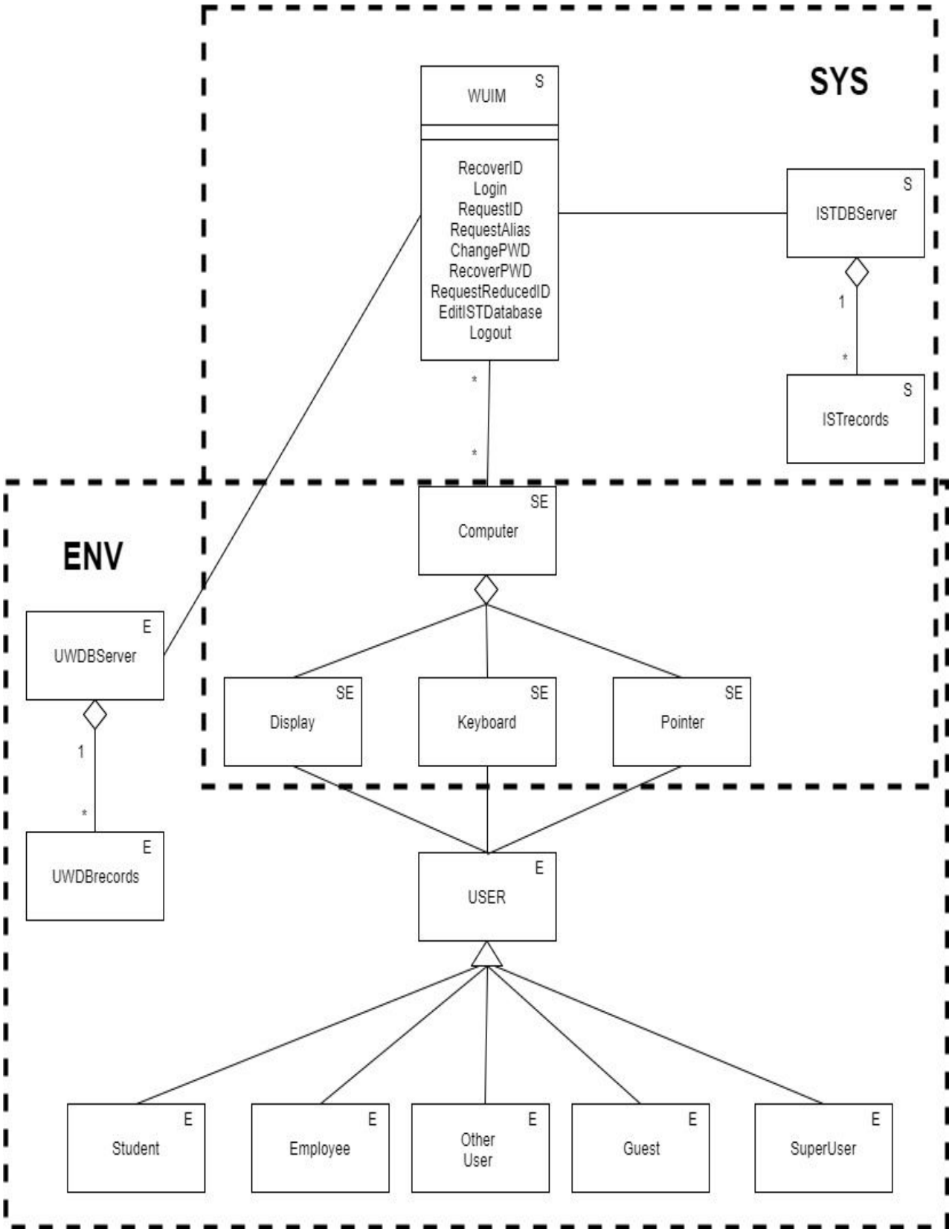

Figure 13: Class Model