

Software Requirements Specification

Forensic Medicine Mobile Application

Version: 1.0

Organization:
University of Pretoria: TCP Solutions

GitHub:
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Name	Date	Changes
TP Solutions	14 May 2014	Vision and Scope
TP Solutions	15 May 2014	Addition to vision and scope and quality requirements.
TP Solutions	16 May 2014	Software Architecture
TP Solutions	23 May 2014	Final Version
TP Solutions	26 June 2014	Functional Requirements
TP Solutions	27 June 2014	Domain Objects
TP Solutions	26 July 2014	Updated Quality Requirements
TP Solutions	31 July 2014	Updated Activity Diagram

Contents

1	Overview	2
1.1	Document conventions	2
2	Vision and Scope	2
3	Scope Limitations and Exclusions	3
4	Architecture requirements	4
4.1	Access channel requirements	4
4.2	Quality requirements	4
4.3	Integration requirements	5
4.4	Architecture constraint	5
5	Software Architecture Documentation	6
5.1	Architecture requirements	6
5.2	Architectural Pattern	7
5.3	Use of reference architectures and frameworks	8
6	Functional Requirements	8
6.1	Introduction	8
6.2	Required functionality	9
6.3	Use case prioritization	12
6.4	Use case/Services contracts	13
6.5	Process Specification	13
7	Open Issues	14
8	Glossary	14

1 Overview

This document provides the overall vision and scope of the Forensic Medicine Mobile Application project. It explains and illustrates what the system will do and look like. This document basically provides the skeleton of our project. It includes the scope limitations and exclusions which will help guide the stakeholders on what is expected and not expected. This document also include use case diagram which will help explain and show the whole system.

1.1 Document conventions

Documentation formulation: LaTeX

Unified Modelling Language: version 2.0

2 Vision and Scope

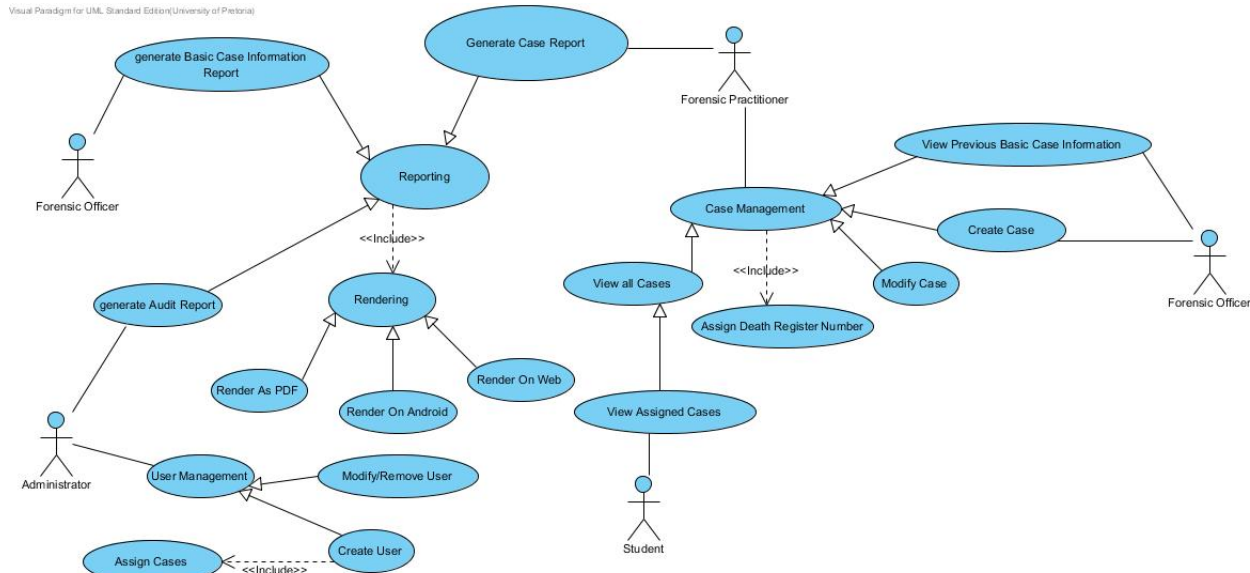


Figure 1: The Scope of the system

The proposed system is the death scene register that allow:

- Forensic officers to:
 - Capture data from death scene – the FO’s will gather information on every scene based on the template it has on the mobile application.
 - View basic information. The FO views personal details of the deceased and police officer who was at the scene.
- Forensic practitioner to:
 - Generate reports – FP’s will generate web, android and pdf reports specifically to their needs e.g. generate report of all hanging cases 2014.

- View all cases – every scene stored on the database they should be able to view them.
 - Edit case information. If there was any errors made on the form such as spelling errors FPs should be able to correct them.
 - Manage cases. FPs will dictate if the case is natural and non-natural death and do other functionalities.
- Students to:
 - View all the cases cleared to them – this is for research purpose only.
- Administrator to:
 - Add new users.
 - Remove users.
 - Edit users – change personal details and access rights.
 - View audit report.

3 Scope Limitations and Exclusions

Pictures that demonstrate how the incident happened are excluded on this phase, maybe they can be added at a later stage.

4 Architecture requirements

4.1 Access channel requirements

It is going to be accessed by humans using android and web application.

4.2 Quality requirements

- **Security**

- Authentication

- * The users have to have an account in order access the application; this will provide the users with a username and password. These associated pieces of information are important as they will be required for the authentication process i.e. logging. – A user will have to provide his or her username as well as their associated password in order for them to be logged in and for a session to be created for them

- Integrity

- * Information captured will be encrypted before sent to the database.
 - * The images that are captured on the device, should be checked if they were altered before they are uploaded to the server.

- Authorization

- * Tokens(Access Controls) will be assigned to each user, irrespective of the sort of account that they may hold. The tokens determine the users privileges, they also determine what the user is allowed to read e.g view all the cases or just specific ones.

Tokens	Privileges
1	Administrator
2	Forensic Practitioner
3	Forensic Officer
4	Students
n	Guests

- * – System users will have different permission.
 - Information stored by forensic officers will not be edited after the submission.

- **Auditability**

- The system should record all the changes made to the data stored, by showing whom, when and what was changed.
 - It will also show old and new values.

- **Scalability**

- The web hosting server supports 500GB traffic.
 - It should allow additional templates.

- **Performance**

- The system should process all the reports within 10 seconds.
- It should send the information to the server within seconds.

- **Reliability**

- The system should be up and running all the time.
- Easy and fast access to the database.

- **Usability**

- Users should be able to use the system without prior training.
- The system will be in English.

- **Maintanability**

- The system will be maintained every time the client needs new changes.

4.3 Integration requirements

- Database will be created from scratch.
- The android application will be connected to the web service and the web service connected to the server.

4.4 Architecture constraint

- The device that will be used is Asus nexus 7
- Android SDK
- MySQL
- HTML5,PHP,apache(Afrihost)
- Java, JavaScript
- Ajax, jQuery
- The mobile client must be running on an android application.

5 Software Architecture Documentation

5.1 Architecture requirements

1. Architectural scope

The database will run on Afrihost

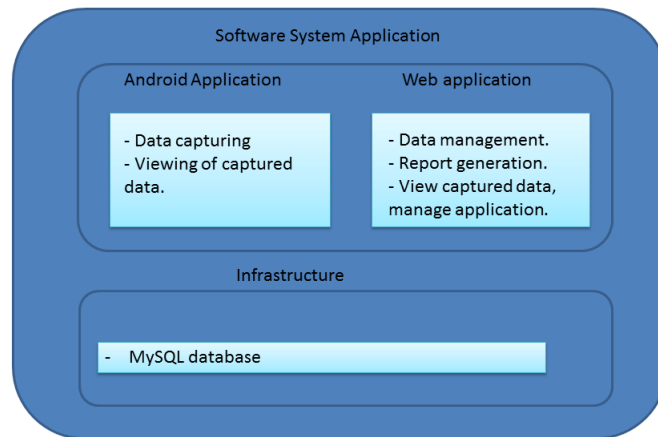


Figure 2:Architectural Scope

Android app - The android application will be used to capture information on death scenes. Also used to view information based on clearance.

Web app - will be used for data management, report generation, and system administration.

Infrastructure - Data storage, MySQL database on Afrihost.

2. Quality requirements

Security - Only authorised people should be able to have access to the system. Only administrator should register people.

Auditability - Any change made to data stored should be recorded. The system should record what, who and when changes were made.

Performance - Data should be sent in real time e.g. from forensic officer to forensic practitioner should receive it within 10 seconds.

Reliability - The server should run all the time (24 hours a day) and the connection should always be active.

Usability - All the users should be able to use the system without any prior training.

3. Integration and Access channel

Access Channel - Accessible by humans through the following channels: web application through web browsers and mobile application through android tablet device.

Integration Channel - The new SQL database will be created in Afri-host.

4. Architectural constraints

The system will use the following constraints: - Android SDK and REST web services. The system will be deployed in Asus Nexus 7 OS Android 4.1 jelly bean.

Technologies to be used: - Java, PHP, HTML, JavaScript, MySQL, JQuery, CSS

5.2 Architectural Pattern

The Architectural pattern Looking at the nature of both applications: android and web application. We decided to choose a Three layered Architecture and Model View Controller(MVC) design pattern.

- Motivation for Three layered Architecture

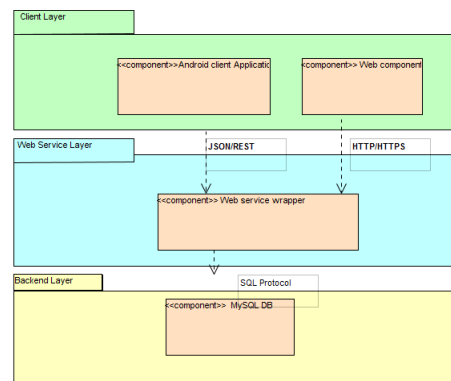


Figure 3: Architectural layered pattern

- Provides access to humans - Client
- Provides Functionality and objects required to client layer - Web service
- Host database - Backend layer

- Motivation for MVC design pattern

- caters for extensible views and provides easily reusable code

The communication protocol are also shown. They include: - HTTP/HTTPS from the browser to the web module. Provides Functionality and objects required to client layer - Web service JSON/REST/HTTP/HTTPS for the web services between the Android application and the database.

5.3 Use of reference architectures and frameworks

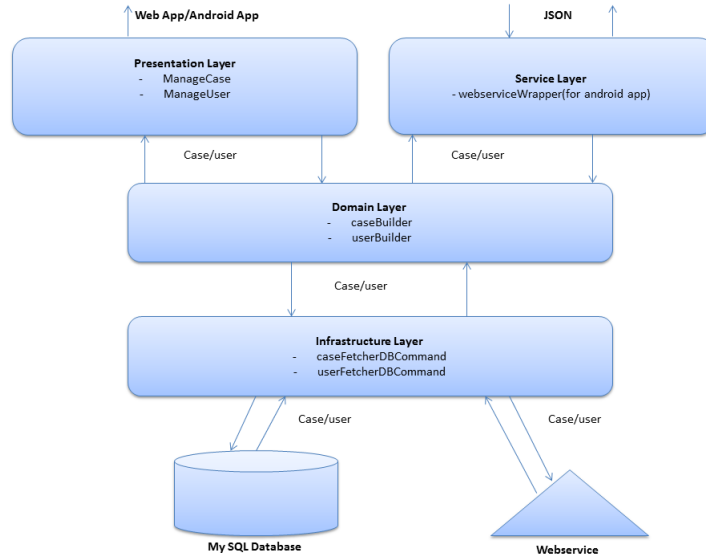


Figure 4:

Three Layer Architecture

Presentation Layer - This User interface Layer. The UI is responsible for creating and displaying the user interface and handling user interaction. It's going to be in Android App and Web App. It gets data from Domain layer.

Service Layer - This is the Web Service Layer. Responsible for showing web service API and returning method results as JSON. It gets data from Domain Layer.

Domain Layer - This is the Business logic, it is responsible for business logic of the application. All functions and objects used are going to be modeled here. It gets data from Infrastructure layer.

Infrastructure Layer - It is responsible for querying database, calling web service and send emails.

6 Functional Requirements

6.1 Introduction

This section introduces the detailed functional requirements of the proposed system. It also shows the use case diagrams for each sub system and the lower level processes that needs to be included to complete the functionality of the sub systems.

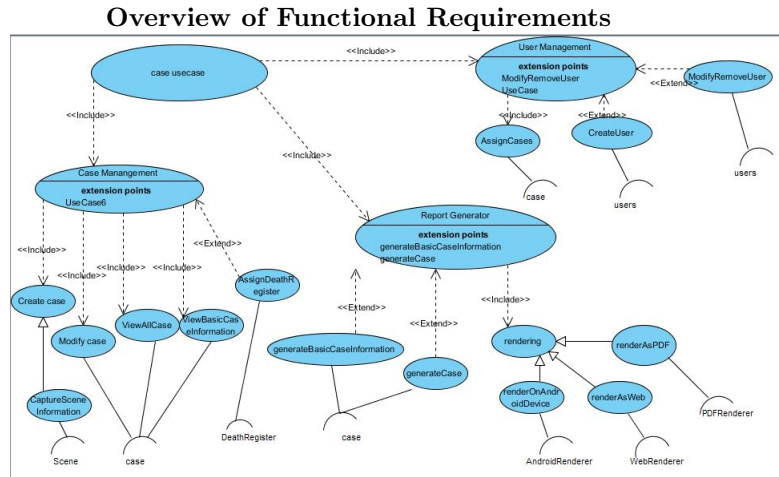


Figure 5: Functional Requirements Overview Use Case

6.2 Required functionality

1. User Management functionality

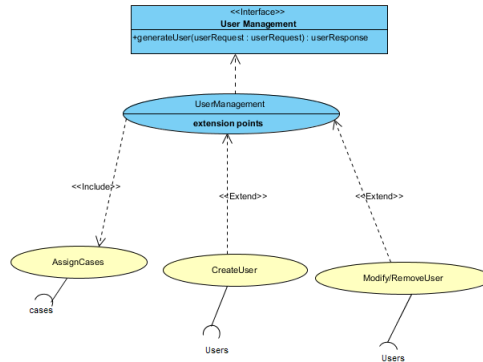


Figure 6: User Management Use Case

- The user management functionality should allow the administrator to assign cases to students.
- Allows the administrator to add new users and assign access controls.
- Allows the administrator to modify user information (cellPhoneNumber, userPassword and other user personal details).
- Allows the administrator to remove users, in the form of deactivating their access to all the applications.

2. Case Management functionality

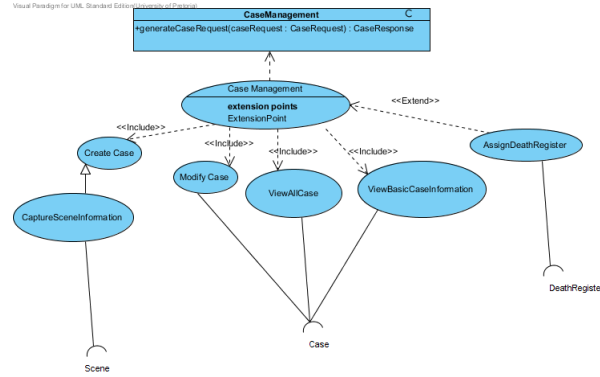


Figure 7: Case Management Use Case

- The case management functionality should allow the Forensic Officers to create new cases.
- Allows the Forensic Officers to view basic information of the case they created after submission.
- Allows the Forensic Practitioner to modify/add additional information on the case.
- Allows the Forensic Practitioner to view all cases.
- Allows the Forensic Practitioner to assign a death register to non-natural cases.
- Allows Masters and Honours students to view all cases they are assigned to.

3. Reporting functionality

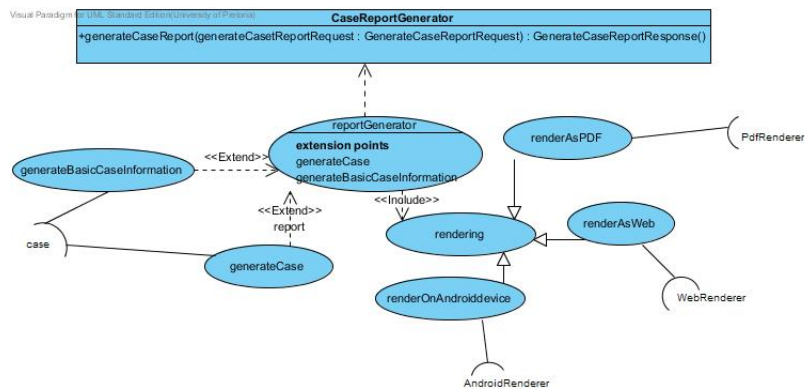


Figure 8: Case Report Generator Use Case

- The reporting functionality should allow different users to generate reports about cases, users and audit logs.

- It allows users to generate a report rendered on the web.
- It allows users to generate a report rendered on the android device.
- It allows users to generate a report rendered to pdf file.

4. Domain Objects

(a) Overview

The main domain objects are

Persons – This may be assigned forensic officers, forensic practitioner, administrator and students with respect to different responsibilities and access level.

Cases - it can be aggregated into different type of scenes and different type of cases (e.g. natural and un-natural)

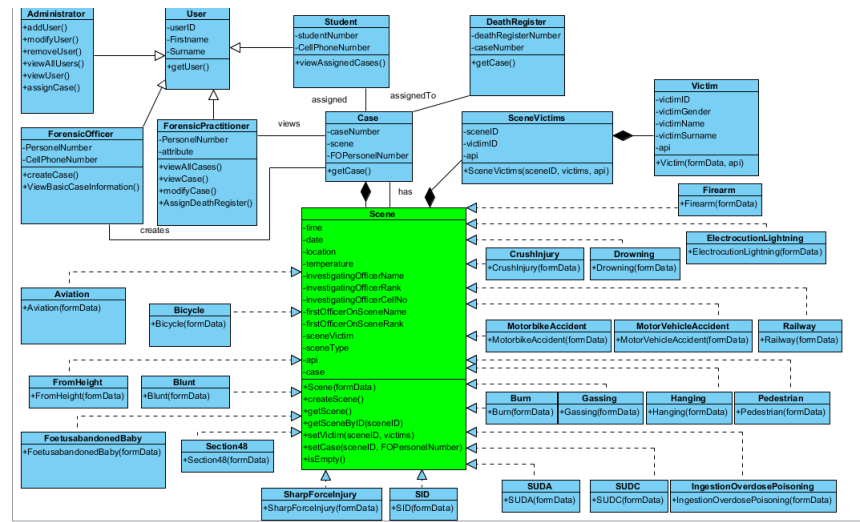


Figure 9: Overview of data structures and relationships for the core domain objects

(b) Users

All users are going to be registered in the database and authentication will be done against the database.

The registered user's information will include the name, surname, portfolio and its details, roles and responsibility, personnel ID and access rights.

The user class will be identified by a unique role of a user.

The administrator will be able to add, remove and edit the users in the system. Every change that is made will be recorded in the audit log. The administrator should also be able to assign cases to user in the system e.g. assign 50 students to a hanging case for research.

(c) Cases

Cases can be either natural or un-natural. Forensic officer can decide whether the case is natural or un-natural. And for unnatural case, every case will be assigned a different death registry and will be stored in a special registry of un-natural cases.

Every case has a scene and scenes are divided as follows:

- Sudden and unexpected death
 - Sudden unexpected death of an infant (SUDI)
 - Sudden unexpected death of a child (1 – 18 years)
 - Sudden unexpected death of an adult/found dead
- Foetus / Abandoned baby
- Section 48 death –surgical case
- Road traffic accidents
 - Pedestrian vehicle accident
 - Bicycle accident
 - Motorbike accident
 - Motor vehicle accident
- Railway accident
- Aviation accident
- Fall/push/jump from height
- Crush injury
- Firearm discharge/gunshot wound
- Sharp force injury/stab injury
- Blunt force injury/assault
- Drowning
- Gassing
- Hanging
- Ingestion/overdose/poisoning
- Burns
- Lightning/electrocution

6.3 Use case prioritization

1. Login(critical) All the system functionality should be accessible by users who are logged in.
2. Case management(critical) The system should be able to create a case, modify, view and assign a death register number; because this are the core functionalities of the system.
3. User management(important) The system must be able to allow only specific users to view specific information, this will ensure that the system is secured and privacy is maintained.
4. Reporting It will be useful for accountability and auditability.

6.4 Use case/Services contracts

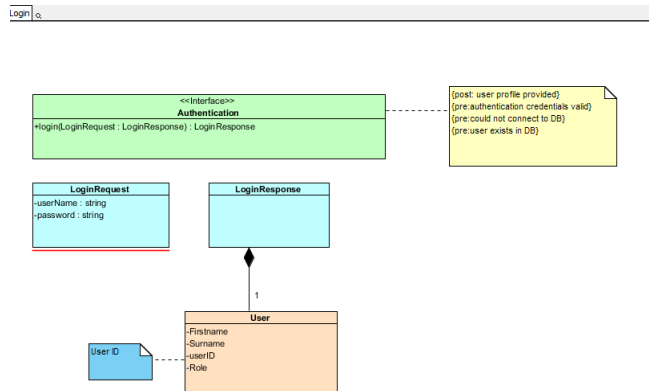


Figure 10: Login Service Contract

6.5 Process Specification

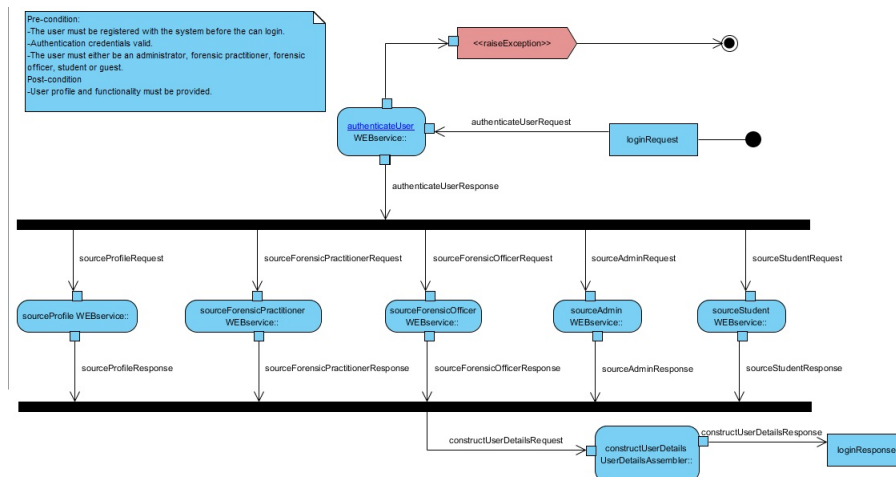


Figure 10: Login Activity Diagram

7 Open Issues

8 Glossary

Forensic officer (FO) – a specially trained crime scene officer that collects the finding evidence that will be analyzed back at the lab by forensic scientist or forensic practitioner.

Forensic practitioner (FP) - also referred to as crime scene investigators and forensic science technicians examine pieces of evidence to provide crucial support in criminal investigations. Their professional expertise is sought in laboratories, crime scenes and courtrooms.

GB - gigabyte

Stakeholders - is anybody who can affect or is affected by an organization, strategy or project. They can be internal or external and they can be at senior or junior levels.

Students – honors and masters students who are doing research as part of their studies.

MySQL MySQL (Structured Query Language) is an open-source relational database management system.

PDF Portable Document Format - is a file format for capturing and sending electronic documents in exactly the intended format.

UML Unified Modeling Language is a general-purpose modeling language in the field of software engineering. It provides a set of graphic notation techniques to create visual models of object-oriented software-intensive systems.