DIT

Software Requirements Specification

for

Biology Museum Information System (BMIS)

Release 1.0

Version 1.0 approved

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Revision History

Date	Version	Description	Author
02/11/15	1.0	Contains the basic specification for the Museum Information System	Pedro Tavares
05/11/15	1.0 revision	Specification Revision before going to analysis with the board.	Pedro Tavares
07/11/15	1.0 approved	Baseline following changes after analysis.	Pedro Tavares
08/11/15	1.0 signed	Baseline authorization and signed after approved.	Pedro Tavares

Declaration:

I declare that this work, which is submitted as part of my coursework, is entirely my own, except where clearly and explicitly stated.

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Pedro Mauricio Tavares

Table of Contents

Software Requirements Specification

1. Introduction

1.1 Purpose

The main purpose of Museum Information System (BMIS) is to help the museum's visitors better locate and view the necessary information about the range of artefacts within the museum, which includes pictures, frames, statues, etc. The users will be able to get more information about the items that are on display.

This document describes the functional and non-functional requirements, giving a detailed description for the release 1.0 of the BMIS. It is intend to demonstrate the main features and purpose of the system, what BMIS shall do, its constrains under certain circumstances. Indeed, the use of this document will be also by the member for the team that will implement the project and verifying the usability of the system.

1.2 Scope

This System will be a Web based System for a local traditional Museum. The System will be design to enhance the quality of information about the artifacts within the museum. Having said that, the system will be design to be simple and easy to use, without needs for training staffs or visitors in order to be used, containing a range of self-explanatory functions and features. Detailed descriptions of what is and what is not in the scope of the BMIS are grouped as follows:

1.2.1 In Scope

a. The System should be a "walk up and use" system for visitors, meaning that there is no need to have any kind of training in order to use the system, as stated earlier;

b. The System will track information about specific items based on their location within the museum, according to each floor plan;

c. The user will have the option to research for items by categories as date, origin, type, material, etc.

d. Multimedia based information as images and videos;

e. No need for user authentication for the visitors;

f. User authentication for stakeholders whom update, delete and insert information in the system;

g. Survey option for visitors to score or give their opinion about the system;

h. Relational Database of the System;

1.2.2 Not in Scope:

a . Use of maps;

b. Staffs opinions;

c. Gather information about the visitors;

d. Mobile app technology for the system;

1.3 Definitions, Acronyms, and Abbreviations

1.3. 1 Acronyms and Abbreviations:

BMIS: Biology Museum Information System.

GUI: Graphical User Interface.

SRS: Software Requirement Specifications

DBS: Data Base System.

CA: Computer Architecture.

DAO: Data Access Object.

IDE: Integrated Development Environment.

WB: Web Browser;

PC: Personal Computer;

DTD: Document Type Definition;

GLG: Graph Layout Generator.

UML: Unified Modeling Language.

1.3.2 Definitions:

Baseline: Milestone in the development that is marked by the delivery.

Requirement: Need or necessity in order to meet some criteria.

Data Base: Collection of all information stored in the system.

Visitors: Anyone whom is visiting the museum.

Developer: Someone who is involved in the project developing it.

Software Requirements Specification: is a description of a software system to be developed. Establishes the basis for an agreement between customers and contractors

Administrator: Someone responsible for the administration key tasks of the system as add and remove users, print reports etc.

1.4 References

Berardi, D.; Calvanese,D.; Giacomo,G.D.(2005). Reasoning on UML class diagrams, Artificial Intelligence, Vol.168, No:1–2, pp.70-118, ISSN 0004-3702, 10.1016/j.artint.2005.05.003.

Copeland, C. R. (2006). Out of our mines! A retrospective look at online museum collections based. Learning and instruction (1997–2006). Proceedings Museums and the Web 2006, Albuquerque, NM.

Hsu,F.-H.; Lin,Y.-T.; Ho,T.-K.(2012). Design and implementation of an intelligent recommendation system for tourist attractions: The integration of EBM model, Bayesian network and Google Maps, Expert Systems with Applications, Vol.39, No:3, pp.3257-3264, ISSN 0957-4174, 10.1016/j.eswa.2011.09.013.

Information Systems: Fundamentals and Issues ©1990-2008 John Lindsay, Kingston University, School of Information Systems.

Jon Holt Institution of Electrical Engineers (2004). UML for Systems Engineering: Watching the Wheels IET, 2004, ISBN 0-86341-354-4. p.58

Laudon, K.C. and Laudon, J.P. Management Information Systems, (2nd edition), Macmillan, 1988.

O'Brien, J A. (2003). Introduction to information systems: essentials for the e-business enterprise. McGraw-Hill, Boston, MA Grady Booch. Object-oriented design and programming. N.Y.: Prentice-Hall. (1990)

Wikipedia 2015: https://en.wikipedia.org/wiki/Data_model

1.4.1 Applicable Standards

IEEE Std 830-1993 IEEE Recommended Practice for Software Requirements Specifications.

IEEE Computer Society, 1993.

ASTM 1340-90, Standard Guide for Rapid Prototyping of Computerized Systems. America Society for Testing and Materials, 1916, Race Street, Philadelphia, PA 19103 USA.

IEEE Std 1074-1991, IEEE Standard for Developing Software Life Cycle Processes (ANSI).

IEEE Std 1058.1-1987, IEEE Standard for Project Management Plans (ANSI).

IEEE Std 982.1-1988, IEEE Standard Dictionary of Measures to Produce Reliable Software (ANSI).

1.5 Overview

Section 1 described the purpose of the Museum system, identified the scope and lists its definitions, acronyms and abbreviations as well as reference documents.

Section 2 gives an overall definition of the user requirement the functionalities. Functional requirements are given with uses cases. Nonfunctional requirements are also described and some assumptions and dependencies are also stated.

Section 3 shows, mainly in diagrams forms, how the system will interact with the environment. This is divided in block diagrams with a short description of each block.

Section 4 gives the requirements at which the System is to be deliver. This section is written mainly for the developers and describes in technical terms the functionality of the System. It also show the System model and the uses cases, including uses cases diagrams with start and end points.

Section 5 Brings a description of the major dimensioning characteristics of the system that impact the architecture and the target performance constraints.

Section 6 gives information about how to access the documentation of the system and the purposes of it.

Section 7 tell us about the future prospects of the BMIS.

2. User Requirement Definition

The main users of the Museum system are expected to be as follows:

Administrator: Will be responsible for the main administration of the system. The administrator will be the only user allowed to add, remove or edit other users, print reports about items and make backups of the database. The level of knowledge can be small and he (or she) will receive the proper training, which will require only one day, in order to do all these tasks. Documentation and help files will be available on the system for this user.

Staffs: The staffs will be the users responsible to insert, update and delete data of the system about the items of the museum. Each staff will need to have an authentication form in order to be able to use and manipulate data. The training for this tasks will be very straightforward and no more than one day is required.

Visitors: The visitors will be the main users of the system. They will be able to access the system in order to query for any kind of information about any item. Nevertheless, the visitors will have limitation to use the system. They will be able only to request information of the items. The visitors are not expected to have technical knowledge of computers in order to use the system as the system will be simple enough and the only requirement for the visitors are to be literary.

2.1 Functional Requirements

This section outlines the uses cases that BMIS should support. Below is a list according to a previous analysis:

Class	Use case	Description
Staff	Login.Staff	The Staff will login into the system in order to manipulate (insert, modify, delete) data into the data base.
Staff	Login.visitor	The staffs of the museum will make the login in order to make the system available to the visitor make the search the wish.
Staff	Add Items	The staff will add new items in the system
Staff	Modify Items	The staff will modify existing items in the System
Visitor	Select Language	Visitor can choose the language they want to use the system.
Visitor	Search	The system must support visitors with search tools allowing them to look for the items they want to get information about.
Visitor	Search.category	The system will allow the visitors to search items by certain category chose by tem.
Visitor	Search by Date	The visitor can search the item by date
Administrator	Add new user(staff)	The BMIS must have some features to allow the main administrator to add a new staff for the Museum;
Administrator	Modify staff	The BMIS must allow the administrator to modify existing staff from the Museum;
Administrator	Delete staff	The BMIS must allow the administrator to delete staff from the Museum;
Administrator	Print Reports	The System should provide detailed reports about information such as items (most and less seen), number of visitors(monthly, period), opinions from the visitors(about the museum and the BMIS)

See: Appendix 1

2.2 Non Functional Requirements

User Interface:

The BMIS should be implement to use on Web Browser Framework (Mozila);

The User should not navigate for more than 3 pages in order to access the item's information;

Product Requirement:

The System must be simple to navigate and self-explained, so that, excessive training will be avoided;

Initially the system can be used on Microsoft Windows operation System, however, as the System will run through a web browser, it can be used in different operations system, as long as the connection to its database is established;

System Performance:

The BMIS should be available during the working hours: Monday to Sunday, from 9 am to 8 pm;

The BMIS must accommodate up to 500 concurrent request during the pick times;

The BMIS must not take longer than 4 seconds to display the item information requested by the visitor;

Organization Requirement:

The System must not get any personal information about the visitors whom use it;

The System must be delivered before 17th November 2015;

The System must have a helper page with details in order to help staffs to use;

The System must be build using Java Language and SQL.

Security:

Staffs must authenticate themselves in the system using their credentials (Username and password);

Staffs should not be able to access the others staffs records as well as modify or delete information about them;

2.3 Assumptions and Dependencies

This section describes some assumptions and dependencies made while preparing this documentation and after some research and survey with the staffs and users that will interact and use the BMIS.

- The full functionality of the BMIS will depend on the availability of the Data Base System;
- The Database System will be running before the staff authenticate into the system and during the queries made by the visitors;
- The Staffs will not update the web Browser without previous authorization of the administrator of the system;
- The visitors will have some basic skills of how to use a computer and how to type;
- The private information about the users will be from responsibility of the Museum;

3. System architecture

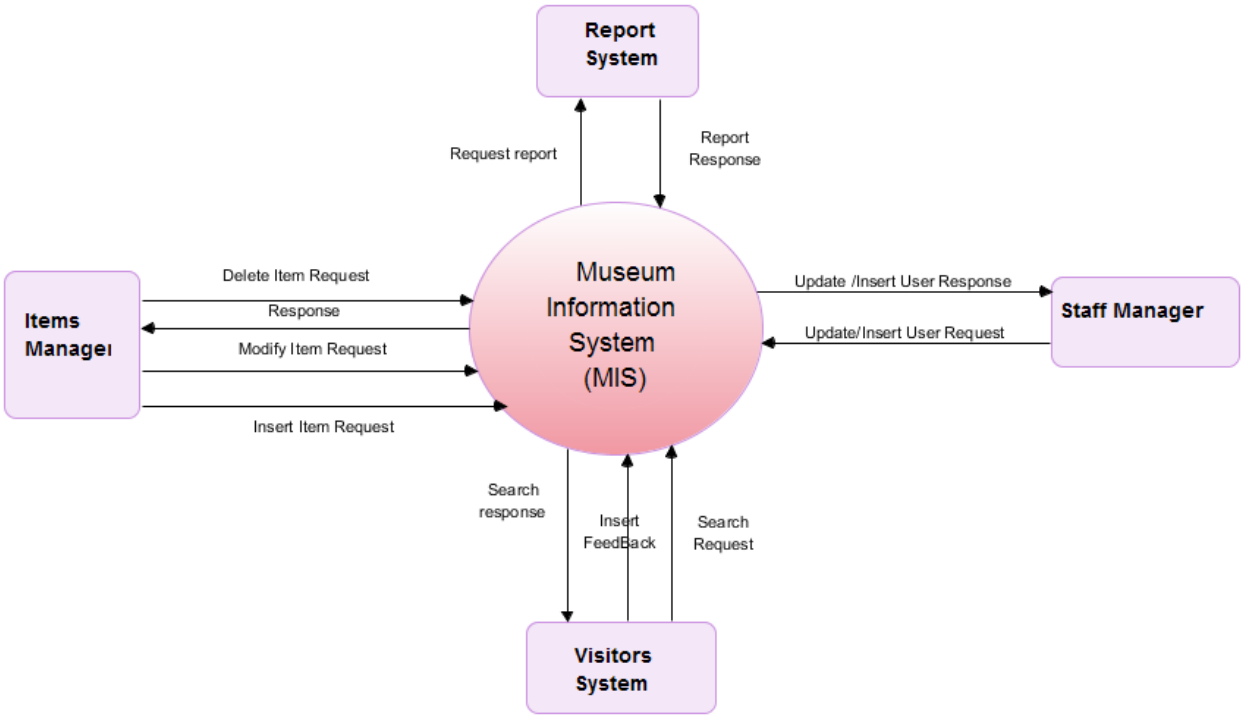


Figure 1
Context Diagram for release 1.0 of the Biology Museum Information System.

Staff Manager: The Museum Information System will have several staff who will be managed by the administrator. The administrator will be able to insert a new staff as well as update and delete an existing staff from the System.

Visitors System: All visitors will be able to use the system if they want to seek for certain item within the museum. The visitors will request some information about some item and will get a response. Furthermore, each visitor can leave a quick feedback about the things related to the museum, so that the manager will be able to analyze procedures and improve the services of the museum.

Items Manager: This will be managed mostly by the staffs from the museum. They will insert new items as well as update them, inserting new Images approved by the museum board and also videos.

Report System: This will be the queries made by the Administrator in order to gather reports and information from different aspects of the Museum.

4. System requirements specification

In this section, I will show in more detail some conditions for functional requirements of the BMIS. The logical structure of the Data is contained in section 4.1.1

Staffs

User Case Name:	Login.Staff
Reference	Section 2.1
Trigger	The staff submit the login in order to make the authentication into the system
Pre-condition	Data Base must be running
Path	The user makes sure the database is running, then click on the link to start BMIS
Post Condition	The user is normally authenticate into the system and is able to manipulate records
Other	After 30 min of inactivity, the user is automatically logged out of the system.

User Case Name:	Login.visitor
Reference	Section 2.1
Trigger	The staff submit the login in order to make the authentication into the system
Pre-condition	Data Base must be running
Path	The user makes sure the database is running, then click on the link to start BMIS
Post Condition	The user is normally authenticate into the system so that the visitors are able to search for items.
Other	The system will be running until the Museum is closed, after that, the session will expire and the users will be automatically logged out.

User Case Name:	Add Items
Reference	Section 2.1
Trigger	The staff access the option to add new items into the system.
Pre-condition	The staff has to be logged in.
Path	The staff click on the menu option to add new items, fill the form and click on the button add.
Post Condition	The new item is submitted. A message will be displayed on the screen, telling the staff that the item have been added.
Other	Some errors might occur due to duplicates items. A error message will show on the screen about the issue.

Visitors

User Case Name:	Select Language
Reference	Section 2.1
Trigger	The visitor click on the language of his (her) preference.
Pre-condition	Must be authenticated
Path	The user see the languages options on the screen and then click on one of them.
Post Condition	The next screen will appear, which will be the search screen.
Other	An option will be available is the visitor wants to change the language again. No need to come back to the main screen.

User Case Name:	Search
Reference	Section 2.1
Trigger	The visitor choose what he(she) is looking for and click on the search button
Pre-condition	Must be authenticated; required fields can't be left blank
Path	The visitor choose the options they want, click on the button to search, wait for the result.
Post Condition	A new screen is displayed with the result expected
Other	The visitors can search by group or individual

Administrator

User Case Name:	Add new user(staff)
Reference	Section 2.1
Trigger	The Administrator of the system submit a form to add new staff.
Pre-condition	Must be authenticate as an administrator
Path	The user clicks on the form link to access the form to be filled
Post Condition	The form is submitted and a new screen is shown.
Other	The administrator have to fill all the fields from the form.

User Case Name:	Print Reports
Reference	Section 2.1
Trigger	The administrator choose and report he (or she) wants to display.
Pre-condition	Must be authenticate as an administrator; the report must be valid
Path	The user goes to the menu reports, choose the report he wants to display, fill the conditions. Click on the button display.
Post Condition	De chose report is shown on the screen with the option to be printed
Other	The user is also able to save the report as a pdf file.

User Case Name:	Delete staff
Reference	Section 2.1
Trigger	The administrator choose the staff record to delete.
Pre-condition	Must be authenticate as an administrator; The record to delete must be selected
Path	The user clicks on the option to delete staff, choose staff, and then click on the button delete. Must say yes on the confirmation screen.
Post Condition	A new screen shows with a message.
Other	No other

4.1 System Models

In this section I outline various uses cases to show the functional requirements of the Museum Information System as well as the overall data Model.

4.1.1 Data Model

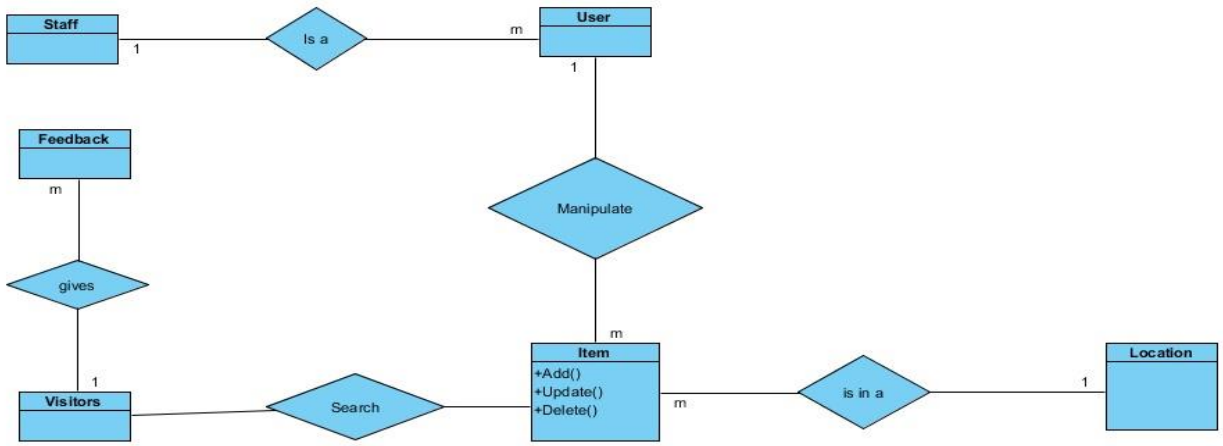
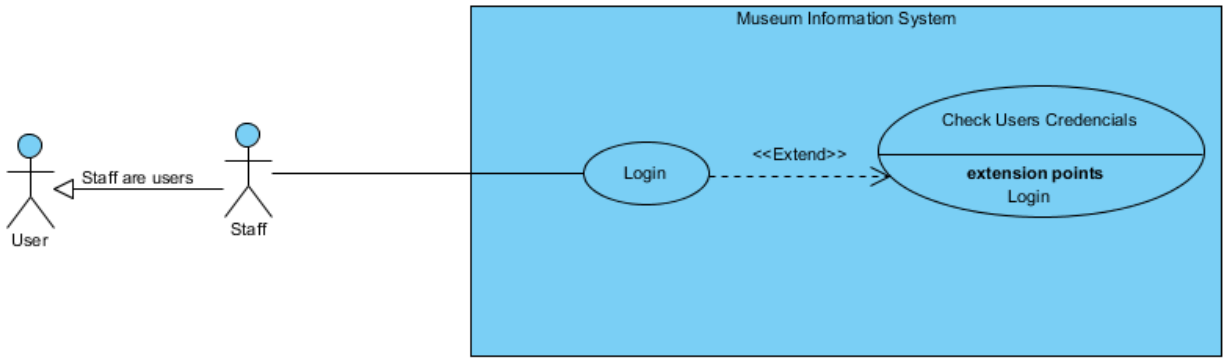


Figure 2: *Partial Data Model*

4.1.2 - Use cases Diagrams

4.1.2.1 - Detailed Uses cases:

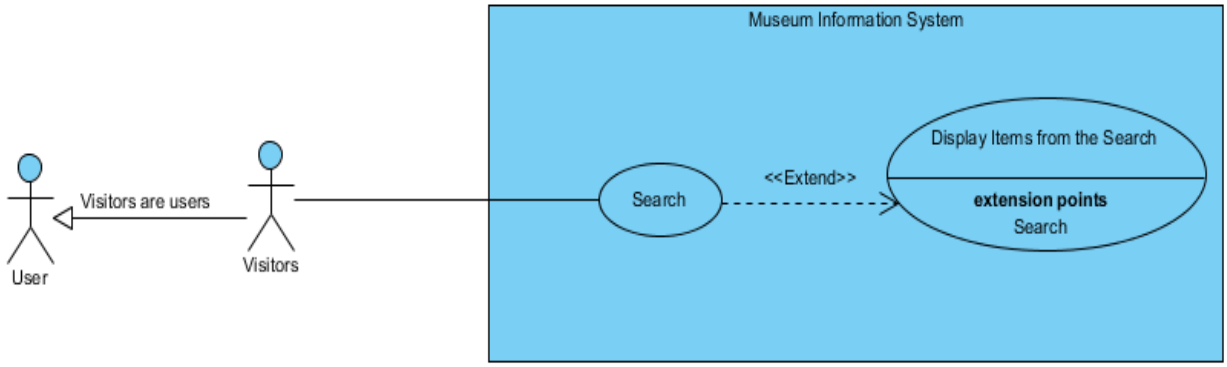
Use case 1: Login into the System



Primary Actor: User (staff)

Description: After the user starts the System, an authentication screen will appear asking the user to input a valid username and password. After the authentication is done, the system is ready to be used by the visitors.

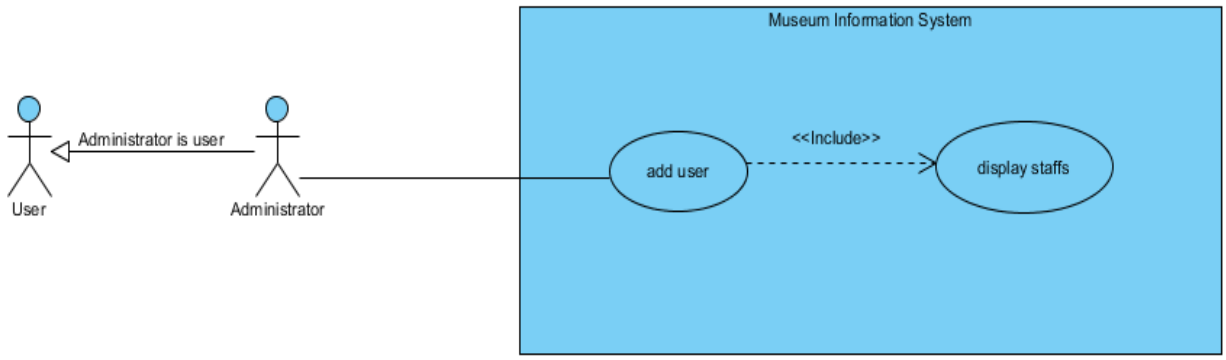
Use case 2: Search for items



Primary Actor: User (Visitors)

Description: The screen for the visitors to search for some item in the museum will be available. The visitors will have different options to search for a certain item, they can search by type, Material, age, origin.

Use case 3: Add new user



Primary Actor: User (administrator)

Description: When the museum have a new staff, the administrator is responsible to add all the information about the staff into the system.

4.1.2.1 - General Use cases:

5. Size and Performance

For the BMIS, the size can be bigger than 40mb, however, it must exceed 200mb. The Database must be robust and support up to 500 queries at same time. For storage purpose, because of the amount of records that the database will hold, the images files has to be up to 460 x 460 k each. The videos must not exceed 1mb. For each information request for the visitors, the system shall not take more than 4 seconds per request.

6. User Documentation and Help System Requirements

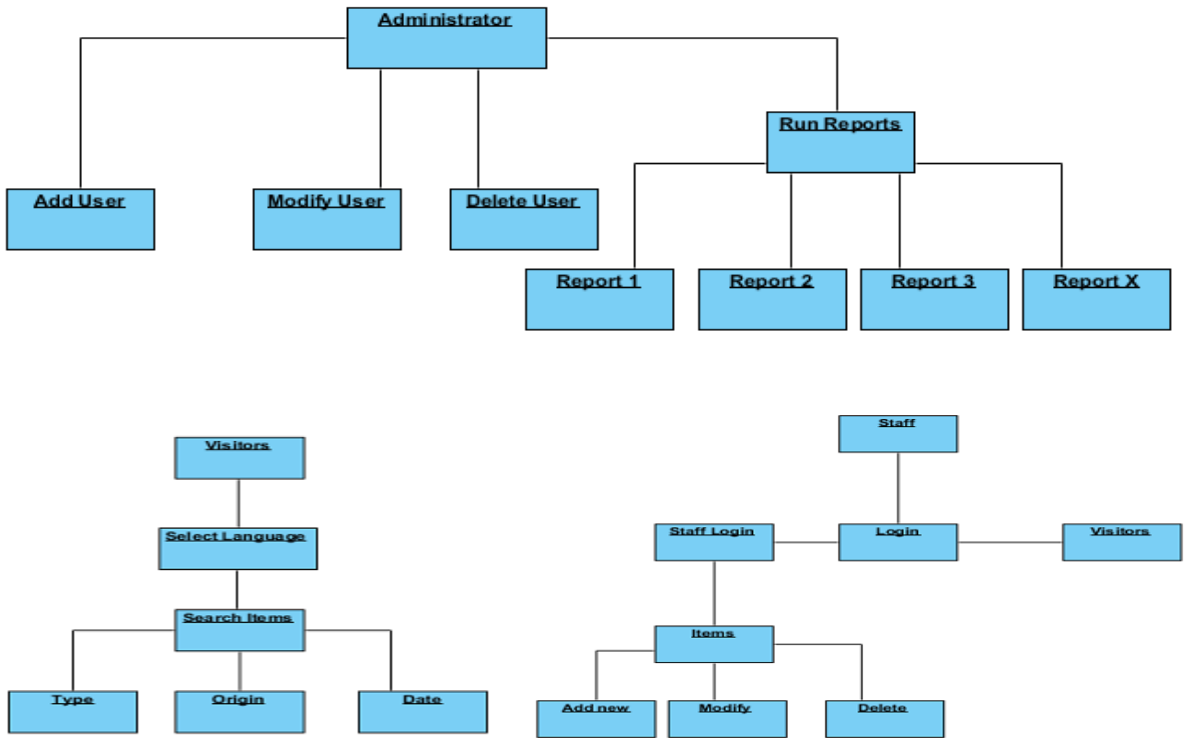
The system must have an embed help section, containing help files for the staffs and for the administrator. The users should be able to visualize the files and seek for help by topic or section.

7. System evolution

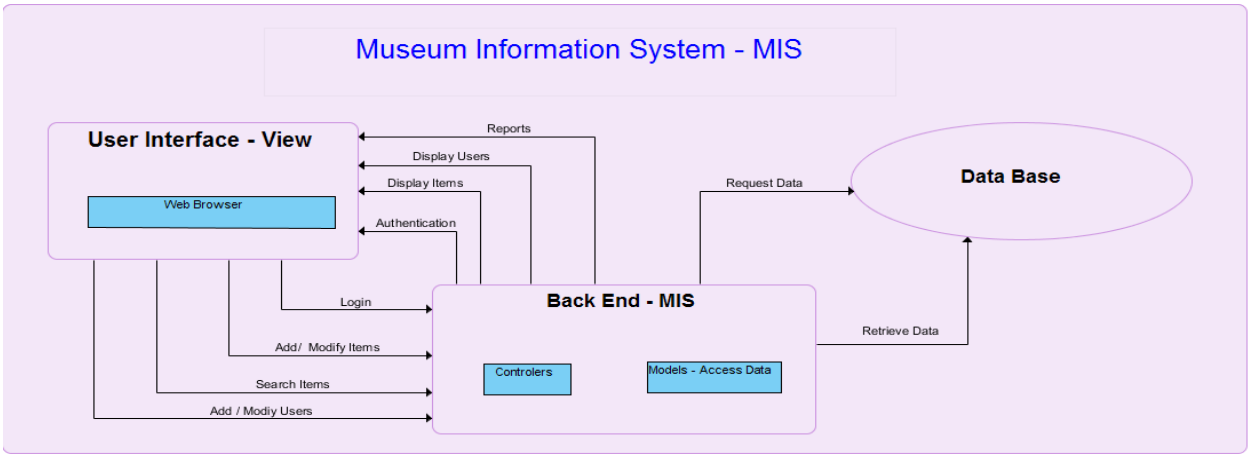
Initially, the BMIS is design to run only on determined hardware. A future perspective is expected, when the BMIS will run in different hardware as tablets and smart mobile phones. The system will remain with its “walk up and use” feature, nevertheless, will be able to support bigger files, which will increase the quality of the images and videos.

8. Appendices

1 - Functional Requirements



2 – **Museum Information System Environment**



3 **– Authentication Screen:**

4 – **Data Model**