

# Preliminary Design

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## *Virtual Network Device Mapping System*

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# Introduction

The Virtual Network Device Mapping System is being developed at the request of Mr. Eric Crossman and Mr. Ken Swarner. The system will allow for a web-based, graphical organization and easy access to information about the devices on the network in the School of Science. This document will outline the preliminary design of the solution system.

## Section 1: External Design Specifications

### 1.1 User Displays

#### Login Screen:

**Virtual Network Device Mapping System**

The Virtual Network Device Mapping System is a web-based application which graphically represents the layout of network devices within the Siena College School of Science. It gives the user a bird's eye view of individual floors, allowing them to select a room from that floor and view a detailed layout of the network devices in that room. Individual devices can then be selected to display comprehensive information about them.

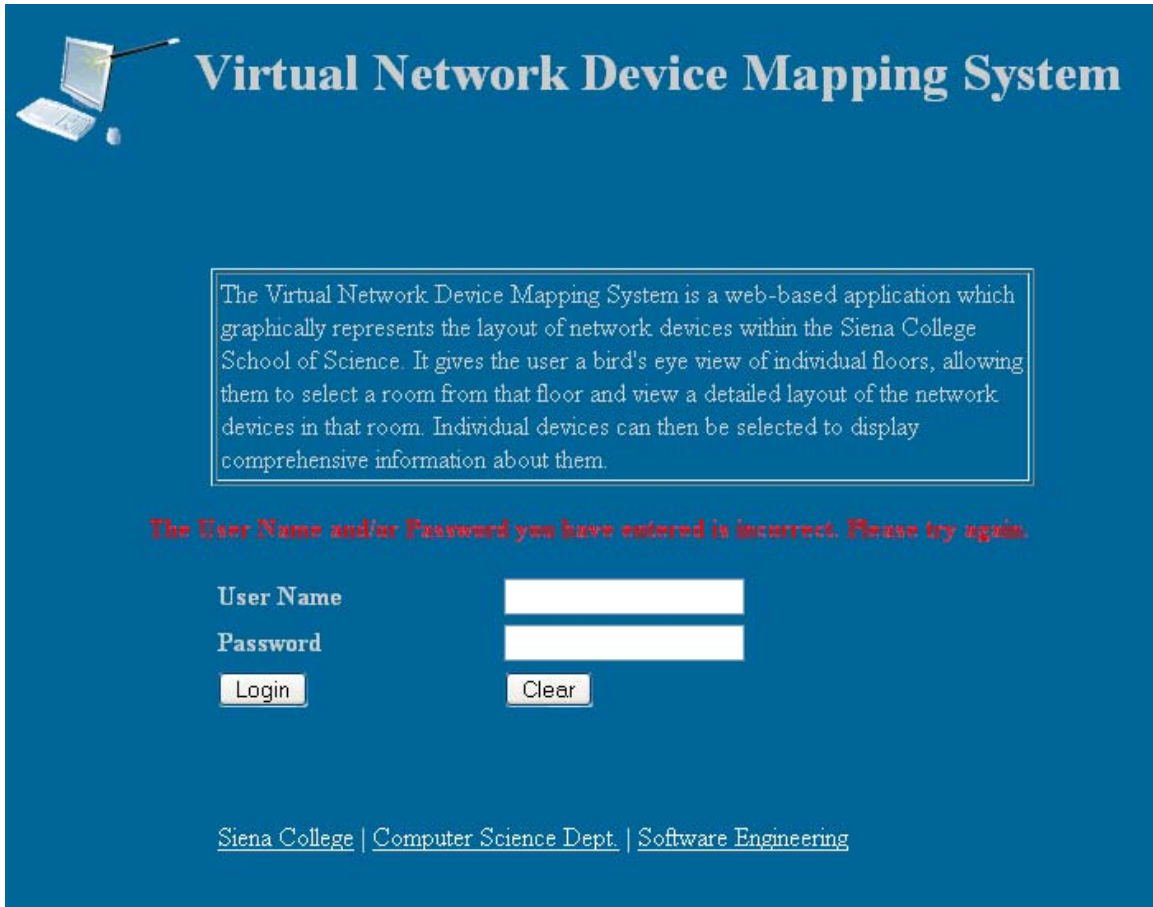
User Name

Password

[Siena College](#) | [Computer Science Dept.](#) | [Software Engineering](#)

This is the first page that all users see when accessing the program. It gives a short description of the purpose of the program, followed by the login dialogue. This page also links to the websites of Team MAJIK via the team logo link, Siena College, the Computer Science Department, and the Software Engineering course. It is the same for all users.

## Failed Login:



The screenshot shows a web-based application interface for the Virtual Network Device Mapping System. The background is a solid blue color. In the top left corner, there is a small icon of a laptop with a pen pointing to it. The main title, "Virtual Network Device Mapping System", is displayed in a large, white, serif font. Below the title, a white-bordered box contains a paragraph of text describing the system's functionality. A red error message is centered on the page, indicating a failed login attempt. Below the message is a login form with two input fields for "User Name" and "Password", and two buttons labeled "Login" and "Clear". At the bottom of the page, there is a footer with three links: "Siena College", "Computer Science Dept.", and "Software Engineering".

# Virtual Network Device Mapping System

The Virtual Network Device Mapping System is a web-based application which graphically represents the layout of network devices within the Siena College School of Science. It gives the user a bird's eye view of individual floors, allowing them to select a room from that floor and view a detailed layout of the network devices in that room. Individual devices can then be selected to display comprehensive information about them.

**The User Name and/or Password you have entered is incorrect. Please try again.**

User Name

Password

[Siena College](#) | [Computer Science Dept.](#) | [Software Engineering](#)

If a user enters an incorrect User Name and/or an incorrect Password, they are presented with a message informing them of their error.

## Logged In:

The screenshot shows a web interface with a dark blue background. At the top right, there is a "Control Panel" button and a link to "Logout from Administrator". On the left, a white-bordered box titled "Using the Search Feature" contains instructions on how to use the search function. On the right, another white-bordered box titled "Welcome" provides a general overview and instructions on how to select a floor to view. Below these boxes, there are two columns of building names with corresponding floor selection links. The first column is for "Roger Bacon Hall" with links for 1st, 2nd, 3rd, and 4th floors. The second column is for "Morrell Science Center" with links for 1st, 2nd, and 3rd floors.

[Control Panel](#) [Logout from Administrator](#)

**Using the Search Feature**

To access the Search feature simply click the link in the heading above. Or, to do so from any other page, click the "Search" button in the upper right-hand corner.

Devices can be searched for using any of the categories of information stored. Please note that although all of the categories are displayed, you do not have to fill in all of them. Whatever categories you fill in will be used, and those left blank will not be. This is meant to give you the greatest amount of flexibility possible in finding a device.

Search results are displayed with abbreviated information. The Device Name, Building, Room, IP address, MAC address, and Equipment Type of each device matching the search criteria are displayed. Selecting the Device Name will display the Room Layout view of the room that the device is located in, with the full device information in the dialog box below the layout.

**Welcome**, to the Virtual Network Device Mapping System. In order to get started, you have two options. You may either use the Search feature, as described in the box on the left, or select a floor from below.

To select a floor, first decide which building you wish to view, and then select a floor number from below it to display that floor plan. The floor plan will load on a new page which will give you the layout of the rooms on that floor and further directions. On all subsequent pages, you will be able to select floors from dropdown menus in the upper left-hand corner of the page. If you have any further questions, please visit our [HELP](#) page.

**Roger Bacon Hall**  
[1st Floor](#)  
[2nd Floor](#)  
[3rd Floor](#)  
[4th Floor](#)

**Morrell Science Center**  
[1st Floor](#)  
[2nd Floor](#)  
[3rd Floor](#)

This is the first page a user will see after logging in. On this page, and all others after it, they will have the option to logout. They can do this by clicking the link in the top right hand corner of the page. This area also displays the User Name that they are logged into. Administrative users will see the Control Panel link as displayed, and all other users will not. Otherwise, the page displays the same for all users. Additionally, the page gives directions for use of the program and the option of choosing a floor to view or using the Search feature.

## Floor Plan:

Roger Bacon Floor #  Morrell Floor #  [Control Panel](#) [Search](#) [Logout from Administrator](#)

**Roger Bacon Hall - 3rd Floor**

Rooms colored **yellow** may be clicked to display a detailed "Room View" which will show the layout of network devices in that room. Rooms colored **blue** are not viewable.

The Floor Plan page indicates the building and floor currently displayed. For the purposes of this prototype it is Roger Bacon Hall, third floor. Immediately below, the physical layout of that floor is graphically displayed. Users can select individual rooms in order to be brought to a closer view. On this, and subsequent pages, there are dropdown menus at the top allowing users to quickly move to different floors in the two buildings. There is also a link to the Search page present.

## Room Layout:

Roger Bacon Floor # 1 Morrell Floor # 1 Control Panel Search Logout from Administrator

[Zoom Out to 3rd Floor View](#)

**Roger Bacon Hall - 3rd Floor - Room #306**

**Legend**

- Computer:
- Wall Box:
- Printer:
- Wireless Access Point (WAP):
- Door:

**Room Notes**

-Classroom used for Computer Science labs.

IP Address: 12.345.67.890  
MAC Address: 10-0C-F1-56-98-AD  
- Classification  
User Name: sxx0000  
User Type: Student  
Department: Computer Science  
| Inventory  
Comments: n/a  
-----

The Room Layout page gives a close-up view of an individual room. It displays the location of all network devices in the room graphically. The devices are displayed as symbols which are defined in a legend to the left of the Room Layout image. Each device can be selected by a user, causing information pertaining to that device to be displayed in a dialogue box at the bottom of the page. The Room Notes that an Administrator user has saved for the room through use of the Control Panel are displayed on the right side. Also, a link is displayed allowing a user to quickly zoom out to the Floor Plan they were viewing before selecting that room.

## Detailed Device Information:

```
IP Address: 12.345.67.890
MAC Address: 10-0C-F1-56-98-AD
- Classification
  User Name: sxx0000
  User Type: Student
  Department: Computer Science
- Inventory
  Asset Tag #: 21095
  Priority: M
  VP Code: VPAA
  Building: Roger Bacon
  Room #: 306
  Manufacturer: Dell
  Model: Dimension 4xxx
  Equipment Type: PC
  Monitor Type: CRT
  Purchase Year: 200x
  Installed Date: 200x
  Purchase Order #: 4185906
  CPU: Pentium 4
  Speed: 1.3 GHz
  Disk: 20 GB
  Memory: 1 GB of RAM
  Serial #: 418A48D3C
Comments: None.
-----
```

The Room Layout image shows the device info partially abbreviated. This image shows off all information fields possible for a network device. The values given are meant as examples and may not follow the exact format of real data.



## Search:

Roger Bacon Floor #  Morrell Floor #  [Control Panel](#) [Logout from Administrator](#)

### Search

Device Name:	<input type="text"/>	Asset Tag #:	<input type="text"/>
User:	<input type="text"/>	User Type:	<input type="text"/>
MAC Address:	<input type="text"/>	IP Address:	<input type="text"/>
Building:	<input type="text" value="Roger Bacon"/>	Room:	<input type="text"/>
Equipment Type:	<input type="text"/>	Manufacturer:	<input type="text"/>
Model:	<input type="text"/>	VP Code:	<input type="text"/>
Monitor Type:	<input type="text"/>	Purchase Year:	<input type="text"/>
Installed Date:	<input type="text"/>	Purchase Order #:	<input type="text"/>
CPU:	<input type="text"/>	Speed:	<input type="text"/>
Disk:	<input type="text"/>	Memory:	<input type="text"/>
Department:	<input type="text"/>	Serial #:	<input type="text"/>
Priority:	<input type="text" value="L"/>		

Devices can be searched for using any of the categories of information stored. Although all of the categories are displayed, only one is required to perform a search. Any categories filled in will be factored into the search, and those left blank will not be utilized. This is meant to give the greatest amount of flexibility possible in finding a device.

## Search Results:

Roger Bacon Floor #  Morrell Floor #  [Control Panel](#) [Logout from Administrator](#)

### Search Results

Device Name:	<a href="#">RB352-seb3</a>
Building:	Roger Bacon
Room:	352
IP Address	12.345.67.890
MAC Address	10-0C-F1-56-98-AD
Equipment Type	PC
-----	
Device Name:	<a href="#">RB352-seb4</a>
Building:	Roger Bacon
Room:	352
IP Address	82.435.97.860
MAC Address	15-BC-F1-56-98-AE
Equipment Type	PC

Search results are displayed with abbreviated information. The Device Name, Building, Room, IP address, MAC address, and Equipment Type of each device matching the search criteria are displayed. Selecting the Device Name will display the Room Layout view of the room that the device is located in, with the full device information in the dialog box below the layout. Multiple results are displayed one below the other.

## Control Panel:

The screenshot shows a control panel interface with a dark blue background. At the top, there are two dropdown menus for "Roger Bacon Floor #" and "Morrell Floor #", both set to "1". To the right are "Search" and "Logout from Administrator" buttons. The main heading "Control Panel" is centered. Below it are three menu items: "Passwords", "Permissions", and "Room Notes". Each menu item has a corresponding description below it.

Roger Bacon Floor # 1 Morrell Floor # 1 Search Logout from Administrator

### Control Panel

**Passwords**

Provides for the alteration of any User's password. Users can be selected from the dropdown menu, and then a new password entered. A confirmation page will be displayed after the "Confirm" button has been selected.

**Permissions**

Allows limitation of what network devices individual users can view. The Administrator first searches for devices, which loads a new page. Then, devices can be chosen via a checkbox on each result. Once the devices are selected, the Administrator can choose a user from a dropdown menu and set the user's permission for those devices to either "Read" or "Restrict." After the "Confirm" button is selected, the original Permissions page is displayed.

**Room Notes**

Notes pertaining to specific rooms can be saved here. They will be displayed for all users alongside the layout of that room. Enter a room number, then enter the desired text in the box and press "Save." A confirmation page will be displayed.

This page contains a menu detailing Administrative tasks. It can only be accessed by an Administrative user. Three Control Panel options are displayed; the ability to change passwords, edit permissions, and add room notes. Below each menu option is a short description and brief directions. Selecting a Control Panel menu item will load a new page.

## Passwords:

Roger Bacon Floor # 1 Morrell Floor # 1 Search Logout from Administrator

### Control Panel

Passwords Permissions Room Notes Wall Boxes

#### Edit Passwords

User Name Administrator  
New Password  
Confirm Clear

This screenshot shows the 'Edit Passwords' form in a control panel. At the top, there are two dropdown menus for 'Roger Bacon Floor #' and 'Morrell Floor #', both set to '1'. To the right are 'Search' and 'Logout from Administrator' buttons. Below the 'Control Panel' header are four buttons: 'Passwords', 'Permissions', 'Room Notes', and 'Wall Boxes'. The 'Edit Passwords' section contains a 'User Name' dropdown menu set to 'Administrator', a text input field for 'New Password', and two buttons: 'Confirm' and 'Clear'.

The User Name is selected from a dropdown menu, and a new password is entered. The change is complete when the “Confirm” button is selected. A new page is loaded displaying a confirmation message. That page is displayed below.

## Password Change Confirmation:

Roger Bacon Floor # 1 Morrell Floor # 1 Search Logout from Administrator

### Control Panel

Passwords Permissions Room Notes Wall Boxes

#### Edit Passwords

Password successfully changed. [Click Here](#) to edit another password.

This screenshot shows the 'Password Change Confirmation' message. The layout is identical to the previous screenshot, including the floor selection dropdowns, search and logout buttons, and the control panel buttons. The 'Edit Passwords' section now displays a confirmation message: 'Password successfully changed. Click Here to edit another password.' The 'Click Here' text is a blue hyperlink.

## Permissions Device Search:

Roger Bacon Floor #  Morrell Floor #   [Logout from Administrator](#)

### Control Panel

### User Permissions

#### Search for Devices

Device Name:  Equipment Type:   
Building:  Room #:

Allows limitation of what network devices individual users can view. The Administrator first searches for devices according to Building, Room, Device Name, or Equipment Type. Generally, the Administrator will be searching for a group of devices. After entering the proper search criteria, the “Search” button is selected and a new page is loaded.

## Permissions Selection:

Roger Bacon Floor #  Morrell Floor #   [Logout from Administrator](#)

### Control Panel

### User Permissions

<input type="checkbox"/>	Device Name:	<a href="#">RB352-seb3</a>
	Building:	Roger Bacon
	Room:	352
	IP Address:	12.345.67.890
	MAC Address:	10-0C-F1-56-98-AD
	Equipment Type:	PC
-----		
<input type="checkbox"/>	Device Name:	<a href="#">RB352-seb4</a>
	Building:	Roger Bacon
	Room:	352
	IP Address:	21.543.76.089
	MAC Address:	1A-0D-E1-5C-98-BD
	Equipment Type:	PC

User Name:	<input type="text" value="User1"/>
Permission:	<input type="radio"/> Read <input type="radio"/> Restrict
<input type="button" value="Confirm"/>	

On the left, the search results are displayed. Devices can be chosen via a checkbox on each result. Once the devices are selected, the Administrator can choose a user from the dropdown menu on the right and set the user's permission for those devices to either "Read" or "Restrict." Read will allow the user to see that device and all information regarding it, and Restrict will prevent the user from viewing any information about the device. After the "Confirm" button is selected, the original Permissions page is displayed.

## Room Notes:

The screenshot shows a web interface with a dark blue background. At the top, there are two dropdown menus for "Roger Bacon Floor #" and "Morrell Floor #", both set to "1". To the right are "Search" and "Logout from Administrator" buttons. Below this is a "Control Panel" section with four buttons: "Passwords", "Permissions", "Room Notes" (which is highlighted), and "Wall Boxes". Underneath is the "Room Notes" section, which includes a "Building:" dropdown set to "Roger Bacon Hall", a "Floor #:" dropdown set to "1", and a "Room #:" input field. Below these is a large white text area for "Notes:" and a "Save" button at the bottom.

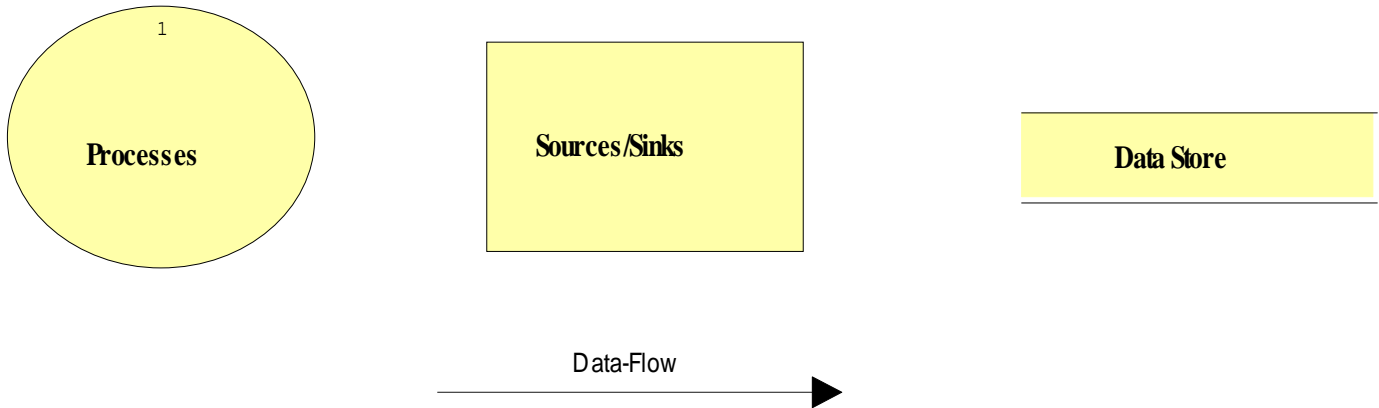
Notes pertaining to specific rooms can be saved here. They will be displayed for all users on the Room Layout screen. The Administrator first selects a building, and a floor within that building. Then, they enter the number of the room they wish to save a note about. Finally, the Administrator types in whatever notes they want saved about the room and selects “Save.” The Room Notes Confirmation page is displayed.

## Room Notes Confirmation:

The screenshot shows the same web interface as above, but the "Room Notes" button in the "Control Panel" is no longer highlighted. The "Room Notes" section now displays a confirmation message: "Room Note saved successfully. [Click Here](#) to add another note."

## 1.2 Data Flow Diagrams

Legend



Legend for icons used in the Data Flow Diagrams.

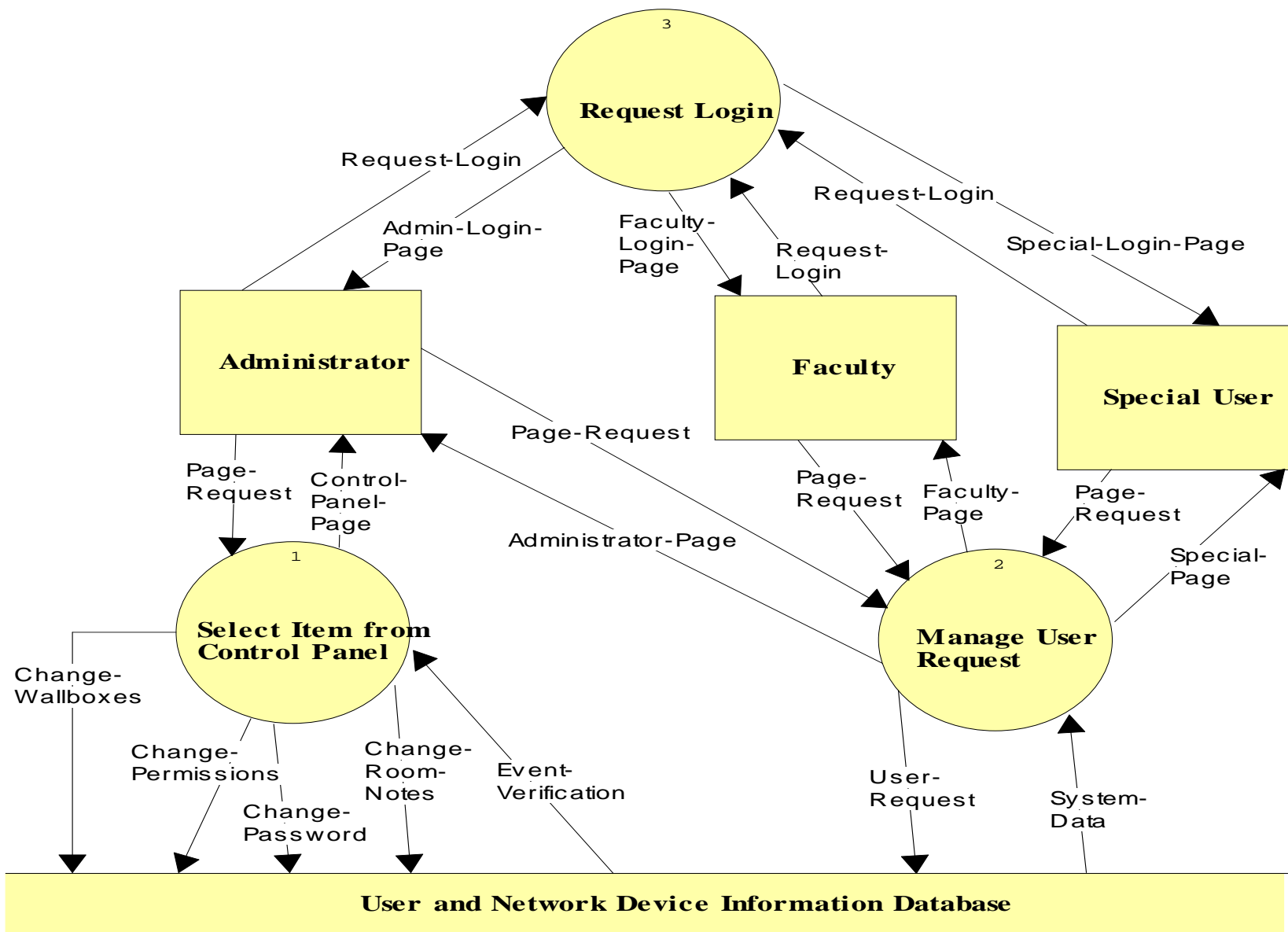


## Context Diagram



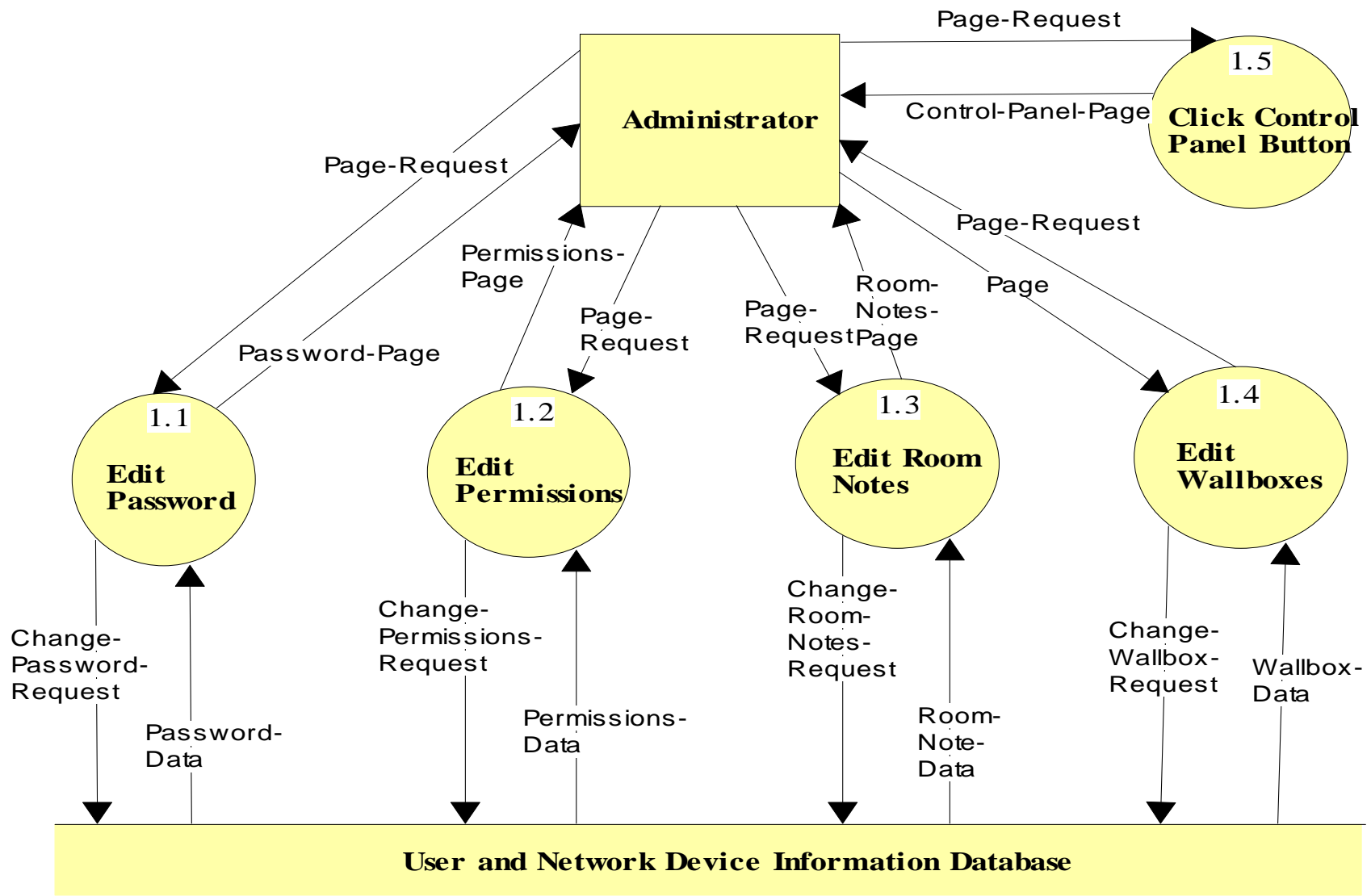
**Context Diagram:** It is the most basic diagram that shows the interaction between the user and the system.

Level 0 Diagram

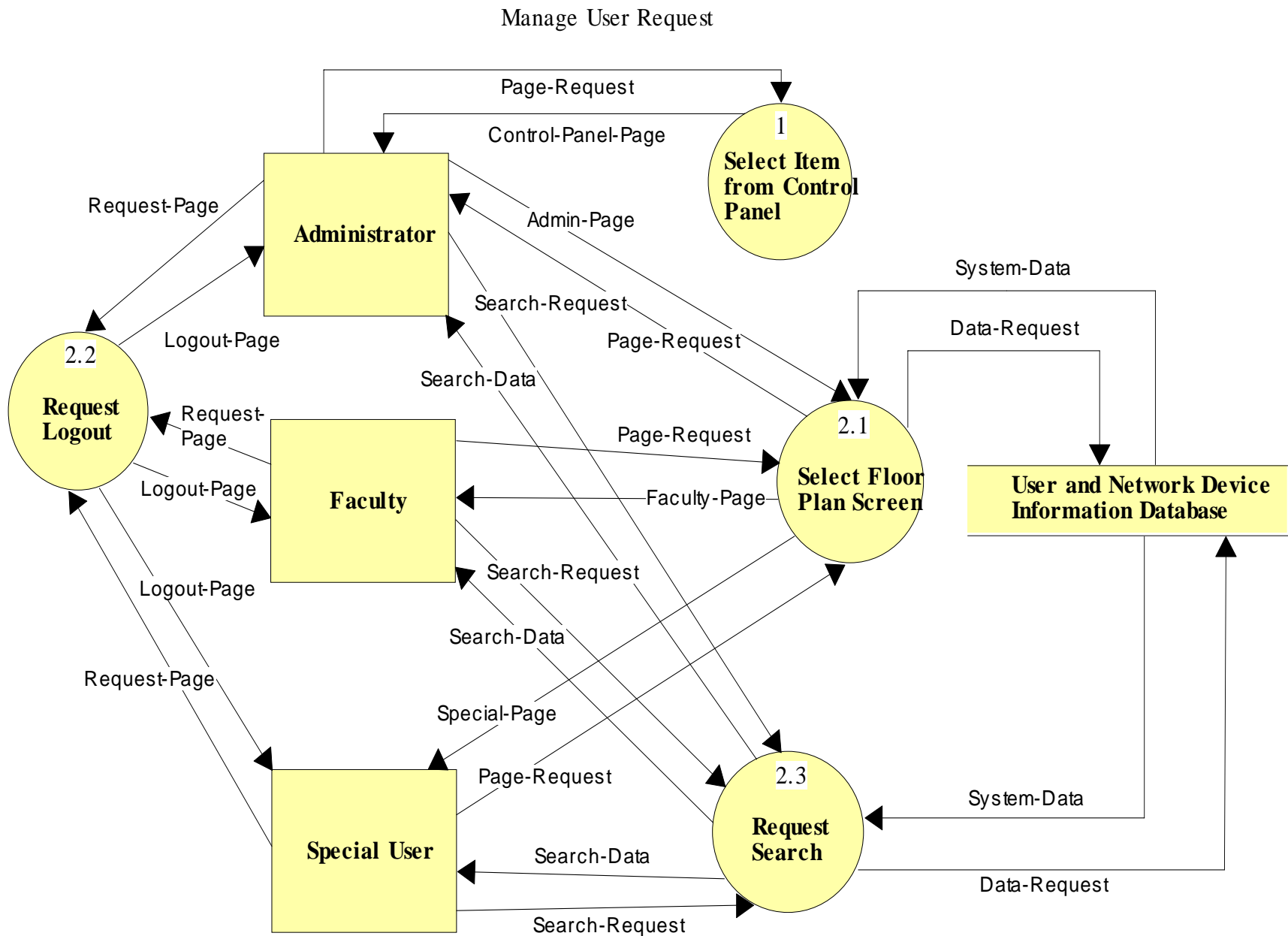


Level 0 Diagram: This is an expansion of the “Virtual Device Network Mapping System” that was shown in the Context Diagram.

## Select Item from Control Panel

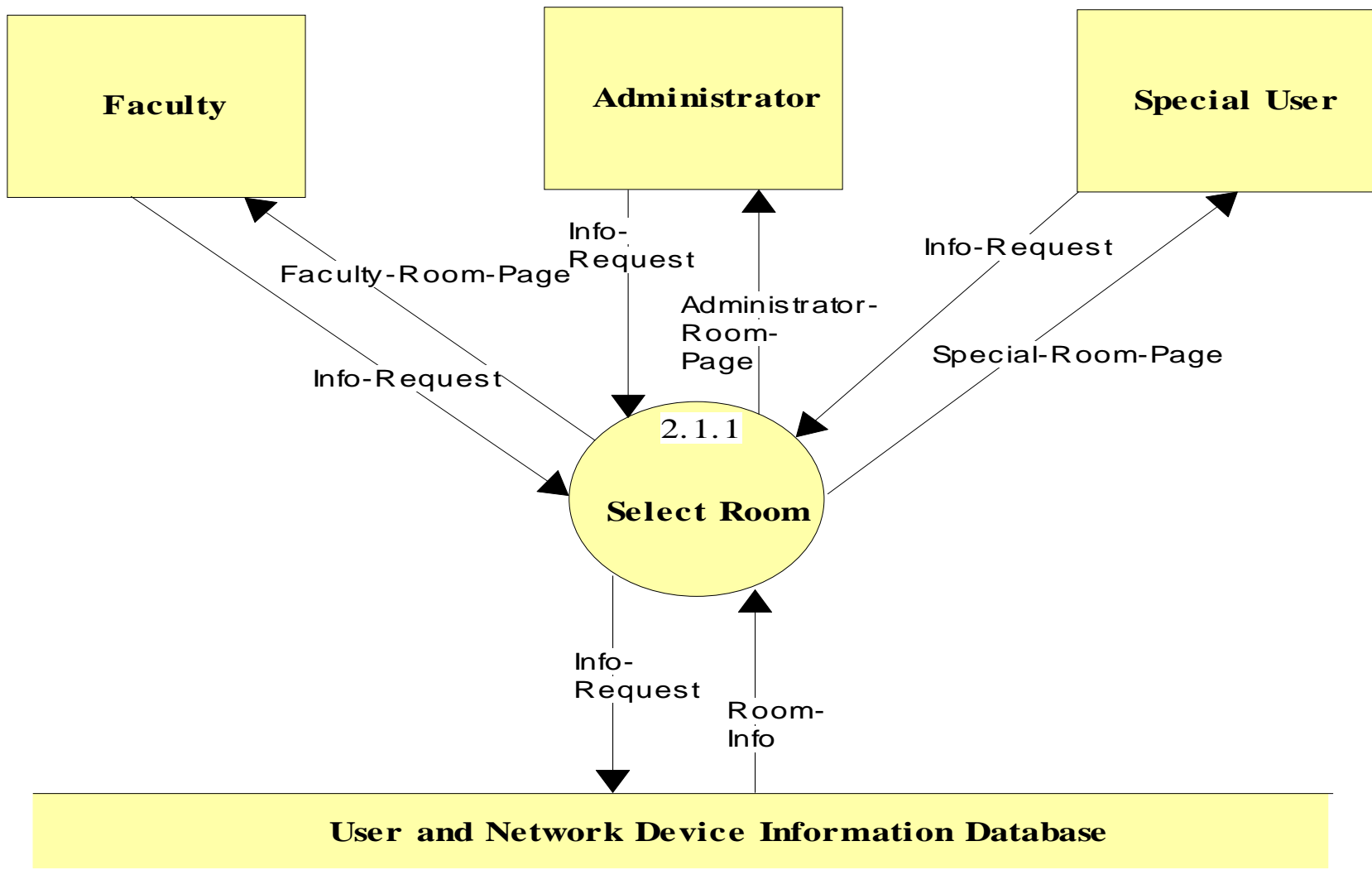


The Select Item from Control Panel diagram is a Level 1 Diagram. It shows the processes an Administrator can perform.



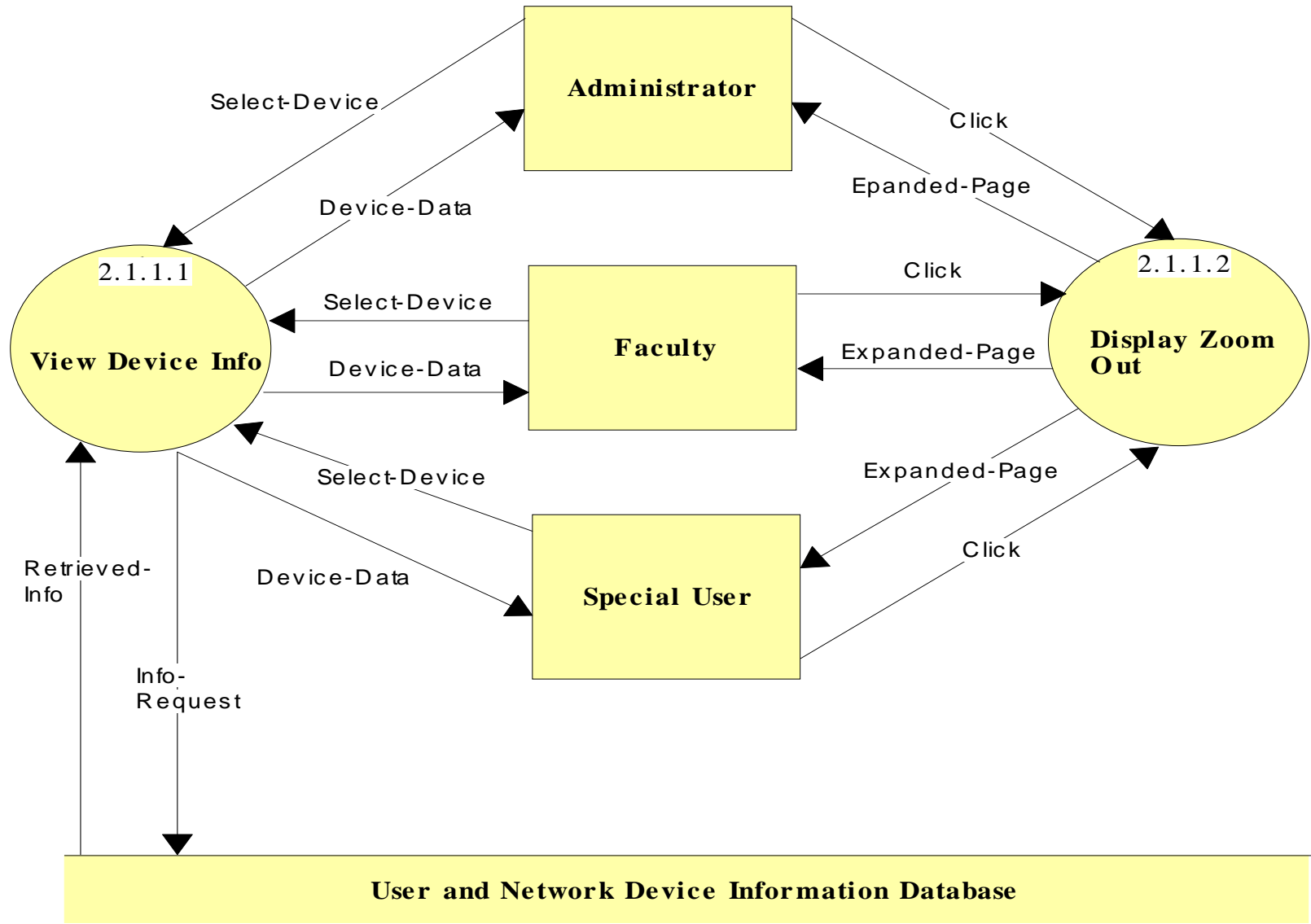
Manage User Request: This is a Level 2 diagram that shows the processes for all the different users.

# Floor Plan Screen



Floor Plan/Permissions Screen: This is shows the process of selecting a room after a floor has been selected.

# Room Select Screen

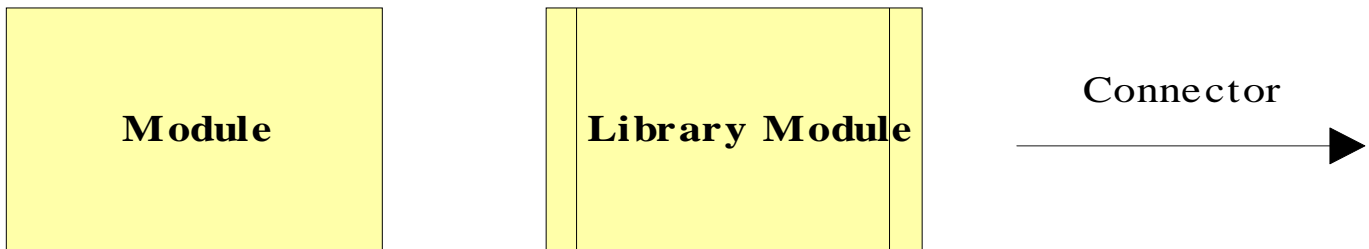


Room Select Screen: This shows the processes of selecting a device for information or going back to a higher level of display.

## Section 2: Architectural Design Specification

### 2.1 Structure Diagram

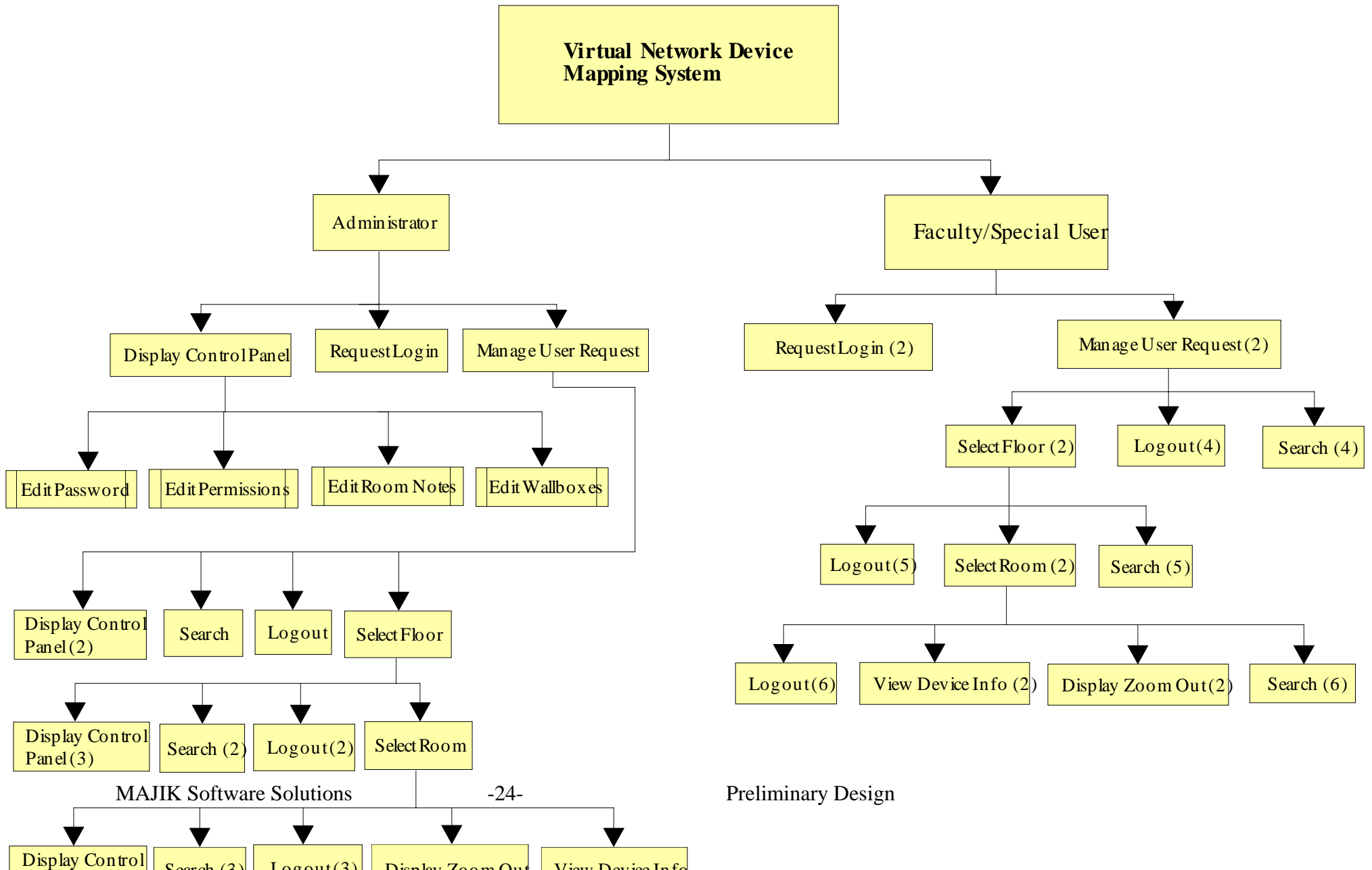
#### Legend



A **Module** represents an instruction that carries out an operation.

A **Library Module** behaves in the same manner every time that it is called upon.

# Structure Diagram





## **2.2 Use Cases**

The Virtual Network Device Mapping System will service three users.

The Administrator user will have full access to all features of the software, including the ability to view and edit all information regarding each device on the network. The Administrator user will manage all other user accounts.

A Faculty/Staff user will only have the option to view information about devices pertaining to them (i.e. their office and/or classrooms, etc.). The Faculty/Staff user will have no editing capability.

The Special user's use of the system will vary. The Special user will be granted use of certain features of the system by the administrator as needed, including extended view of information about devices and possible editing capabilities.

## **2.3 Functional Requirements Inventory**

The following list outlines the required functionality to be included in the final solution. The requirements are listed according to user case and then by screens the user will view.

### **General:**

The Virtual Network Device Mapping System is web-based.

### **Administrator User:**

The Administrator user will have an account.

The Administrator user will have a username and password.

The Administrator will establish usernames and passwords for other users.

### **Login Screen:**

The user will log in with correct username and password.

An incorrect login will provide an appropriate error message.

### **Welcome Screen:**

The user will have access to a control panel on the welcome screen.

The user will be able to perform a search for certain devices or a specific device based on indicated search criteria.

The user will be able to select a floor of Roger Bacon Hall from a menu to view a floor plan layout.

The user will be able to select a floor of Morrell Science Center from a menu to view a floor plan layout.

The user will be able to logout from the welcome screen by clicking the "Logout" link.

**Control Panel Index Screen:**

The user will be able to change user passwords in the control panel.

The user will be able to change user permissions for devices in the control panel.

The user will be able to insert notes pertaining to a specific room or devices within a room.

The user will be able to log out from the control panel index screen.

**User Control Panel Screen:**

The Administrator user will be able to choose a user for which the password is to be changed.

The Administrator will enter a new password for the chosen user.

The Administrator will submit changes.

A message will appear indicating a that a change has been accepted.

The Administrator user will be able to log out from the user control panel screen.

**User Permissions Control Panel Screen:**

The Administrator will be able to choose a user for which the permissions are to be set.

The Administrator will be able to search for or choose a device or set of devices for which the user's permissions are to apply to.

The Administrator will be able to choose the permission level for the user with reference to the chosen device(s): read or restrict.

The Administrator will submit the changes.

A message will appear indicating that a change has been accepted.

The Administrator user will be able to log out from the user permissions control panel screen.

**Room Notes Control Panel Screen:**

The Administrator user will be able to choose a building and floor for which the room is in.

The Administrator will be able to enter a room number for which to add notes.

The Administrator will be able to add notes into a text box for the chosen room.

The Administrator will submit the changes.

A message will appear indicating that a change has been accepted.

The Administrator user will be able to log out from the room notes control panel screen.

**Floor Plan Screen:**

A floor plan for the chosen floor will be displayed on the screen.

The building name and floor number will be displayed on the screen.

The Administrator user will be able to access the control panel from this screen.

Administrator user will be able to view information about all rooms and devices on the floor.

The Administrator will be able to choose a room from the floor plan to view a detailed room layout.

The Administrator user will be able to log out from the floor plan screen.

The Administrator user will be able to choose a different floor of either Roger Bacon Hall or Morrell Science Center from a drop down menu.

**Room Layout Screen:**

A room layout will be displayed for the selected room.

The existence and location of devices within the room will be indicated in the layout.

The building name, floor number, and room number will be displayed on the screen.

The Administrative user will be able to zoom out to the floor level diagram to which the room belongs.

The Administrator user will be able to choose a device within the room to view the information pertaining to that device.

The information for a specific device will appear below the room layout in a text box.

Any available notes for the selected room will be displayed on the screen for easy reference.

A legend will be displayed below the layout to denote the meaning of symbols in the layout.

The Administrator user will be able to log out from the room layout screen.

**Search Screen:**

The Administrator user will be able to search for a device on the following criteria:

- Asset Tag Number
- Priority
- User
- User Type
- Department
- VP Code
- Building
- Room
- Manufacturer
- Model
- Equipment Type
- Monitor Type
- Purchase Year
- Installed Date
- Purchase Order Number
- CPU
- Speed
- Disk
- Memory
- MAC Address
- Serial Number

Summarized search results will be displayed on the same screen.

Search results will be selectable to view more detailed results.

When selected, detailed search results will be displayed in the room layout view.

**Faculty/Staff User:**

The Faculty/Staff user will have an account established by the Administrator.

The Faculty/Staff user will have a username and password.

**Login Screen:**

The user will log in with correct username and password.

An incorrect login will provide an appropriate error message.

**Welcome Screen:**

The user will be able to perform a search for certain devices or a specific device based on indicated search criteria.

The user will be able to select a floor of Roger Bacon Hall from a menu to view a floor plan layout.

The user will be able to select a floor of Morrell Science Center from a menu to view a floor plan layout.

The user will be able to logout from the welcome screen by clicking the "Logout" link.

**Floor Plan Screen:**

A floor plan for the chosen floor will be displayed on the screen.

The building name and floor number will be displayed on the screen.

Faculty/Staff user will be able to view information about limited rooms and devices on the floor.

Rooms available for viewing will be highlighted so a Faculty/Staff user is aware of which rooms can be selected.

The Faculty/Staff will be able to choose a room from the floor plan to view a detailed room layout.

The Faculty/Staff user will be able to log out from the floor plan screen.

The Faculty/Staff user will be able to choose a different floor of either Roger Bacon Hall or Morrell Science Center from a drop down menu.

**Room Layout Screen:**

A room layout will be displayed for the selected room.

The existence and location of devices within the room that will be indicated in the layout.

The building name, floor number, and room number will be displayed on the screen.

The Faculty/Staff user will be able to zoom out to the floor level diagram to which the room belongs.

The Faculty/Staff user will be able to choose certain devices within the room to view the information pertaining to that device.

The information for a specific device will appear below the room layout in a text box.

Any available notes for the selected room will be displayed on the screen for easy reference.

A legend will be displayed below the layout to denote the meaning of symbols in the layout.

The Faculty/Staff user will be able to log out from the room layout screen.

**Search Screen:**

The Faculty/Staff user will be able to do a search for a device on the following criteria:

- Asset Tag Number
- Priority
- User
- User Type
- Department
- VP Code
- Building
- Room
- Manufacturer
- Model
- Equipment Type
- Monitor Type
- Purchase Year
- Installed Date
- Purchase Order Number
- CPU
- Speed
- Disk
- Memory
- MAC Address
- Serial Number

Search results will be limited to what the user has permissions to view.

Summarized search results will be displayed on the same screen.

Search results will be selectable to view more detailed results.

When selected, detailed search results will be displayed in the room layout view.

## Special User:

The Special user will have an account established by the Administrator.

The Special user will have a username and password.

The Special user will have access to any feature the Administrator user grants them, up to and including administrative functions.

## **2.4 Logical Data Dictionary**

### Faculty-Room-Page

Locations:

Level 2.1.1

Destination: Faculty User

Source: User and Network Device Information Database

### Administrator-Room-Page

Locations:

Level 2.1.1

Destination: Administrator User

Source: User and Network Device Information Database

### Special-Room-Page

Locations:

Level 2.1.1

Destination: Special User

Source: User and Network Device Information Database

### Admin-Login-Page

Locations:

Level 0

Destination: Administrator

Source: Request Login

### Faculty-Login-Page

Locations:

Level 0

Destination: Faculty

Source: Request Login

### Special-Login-Page

Locations:	
Level 0	Destination: Special User Source: Request Login
Special-Page	
Locations:	
Level 0	Destination: Special User Source: Manage User Request
Level 2.1	Destination: Special User Source: Select Floor Plan Screen
Faculty-Page	
Locations:	
Level 0	Destination: Faculty Source: Manage User Request
Level 2.1	Destination: Faculty Source: Select Floor Plan Screen
Administrator-Page	
Locations:	
Level 0	Destination: Administrator Source: Manage User Request
Level 2.1	Destination: Administrator Source: Select Floor Plan Screen
Control-Panel-Page	
Locations:	
Level 0	Destination: Administrator Source: Select Item from Control Panel
Level 1.1	Destination: Administrator Source: Click Control Panel Button
Level 2.1	Destination: Administrator Source: Select Item from Control Panel
System-Data	
Locations:	
Level 0	Destination: Manage User Request Source: User and Network Device Information Database
Level 2.1	Destination: Select Floor Plan Screen Source: User and Network Device Information Database
Level 2.1	Destination: Request Search Source: User and Network Device Information Database



Logout-Page		
Locations:		
Level 2.1		Destination: Administrator Destination: Faculty Destination: Special User Source: Request-Logout
Search-Data		
Locations:		
Level 2.1		Destination: Administrator Destination: Faculty Destination: Special User Source: Request Search
Device-Data		
Locations:		
Level 2.1.1.1		Destination: Administrator Destination: Faculty Destination: Special User Source: View Device Info
Retrieved-Info		
Locations:		
Level 2.1.1.1		Destination: View Device Info Source: User and Network Device Information Database
Password-Page		
Locations:		
Level 1.1		Destination: Administrator Source: Edit Password
Permissions-Page		
Locations:		
Level 1.1		Destination: Administrator Source: Edit Permissions
Room-Notes-Page		
Locations:		
Level 1.1		Destination: Administrator Source: Edit Room Notes
Page		
Locations:		
Level 1.1		Destination: Administrator Source: Edit Wall boxes
Password-Data		

Locations:	
Level 1.1	Destination: Edit Password Source: User and Network Device Information Database
Permissions-Data	
Locations:	
Level 1.1	Destination: Edit Permissions Source: User and Network Device Information Database
Room-Note-Data	
Locations:	
Level 1.1	Destination: Edit Room Note Source: User and Network Device Information Database
Wall box-Data	
Locations:	
Level 1.1	Destination: Edit Wall box Source: User and Network Device Information Database

## **2.5 Logical Data Stores**

The following information presents a preliminary description of the data stored in the Virtual Network Device Mapping System database. The data is presented in a layout of the table structure. Primary Keys are underlined.

### **Table: User**

Fields:

- Lname: CHAR(12)  
-User's last name
- Fname: CHAR(12)  
-User's first name
- Building: CHAR(3)  
-name of the building which the user's office or room is located
- Room\_Num: VARCHAR(5)  
-number of the room which the user's office or room is located

### **Table: Room**

Fields:

- Num: VARCHAR(5)  
- The room number
- Building: CHAR(3)  
- The building the room is found in
- Department: CHAR(15)  
- The department the room is used by
- Type: CHAR(10)  
- The type of room; i.e. lecture, lab, etc...
- EEC: CHAR(1)

- Indicates if the room is an Electronically Enhanced Classroom - Y/N

## Table: Machine

### Fields:

Id: INTEGER

- A unique identifier

Host\_Name: VARCHAR(30)

- The hostname of the machine

IP\_Address: VARCHAR(15)

- The IP Address of the machine

MAC\_Address: VARCHAR(20)

- The MAC Address of the machine

Asset\_Tag: INTEGER

- The IT&S Asset Tag value

Serial\_Num: VARCHAR(20)

- The machine's serial number

Department: CHAR(15)

- The department to which the machine belongs (the sub-network)

Building: CHAR(3)

- The building in which the machine is located

Room: VARCHAR(5)

- The room in which the machine is located

CPU: VARCHAR(6)

- The CPU type

Speed: VARCHAR(6)

- The speed of the processor

Disk: VARCHAR(5)

- The disk size

Memory: VARCHAR(5)

- The memory size

User: CHAR(12)

- The name of the primary user

User\_Type: CHAR(15)

- The type of primary user; i.e. student, faculty, etc...

Priority: CHAR(1)

- Priority level; L-low; M- medium; H-High

PO\_Num: VARCHAR(15)

- Purchase order number

VP\_Code: CHAR(4)

- Always VPAA for Vice President of Academic Affairs

Manufacturer: CHAR(15)

- The name of the manufacturing company

Model: VARCHAR(15)

- The model number of the machine

Equipment\_Type: CHAR(20)

- The type of equipment; i.e. PC, Mac, Laptop, Wireless Access Point, etc.

Monitor\_Type: CHAR(5)

- The type of monitor; i.e. LCD, CRT
- Purchase\_Year: DATE
- The date the machine/equipment was purchased
- Installed\_Date: DATE
- The date the machine/equipment was installed
- Comments: VARCHAR(100)
- Comments about the machine/equipment

## ***2.6 Design Environment Information***

The machines we will be using to do our development work, and their specifications, as well as the software that we will be using to develop our programs are listed here.

### **Server:**

Oracle, version 10g  
Mysql, version 4.1.14  
PHP, version 4.3.11  
Apache, version 2.0.46

### **Browser Environment:**

Microsoft Internet Explorer version 6.0.2800.1106  
Mozilla Firefox version 1.0 preview release  
Mozilla Firefox version 1.0  
Apple Safari 1.2

### **Software:**

Adobe Acrobat version 5.0.5  
Adobe Reader version 6.0.0  
Microsoft Office Word 2000 9.0.4402  
Microsoft Office PowerPoint 2000 SR1 9.0.3821  
WinSCP version 3.1.0 (Build 165)  
Putty Release 0.53b  
Macromedia Dreamweaver MX Education Edition 6.0  
Macromedia Fireworks MX Education Edition 6.0  
Visible Analyst Education Edition version 7.5.5  
Microsoft Project 2000 9.0.2001.0219SR1  
Microsoft Windows 2000 5.00.2195 Service Pack 3  
Microsoft Windows XP Professional Version 2002 Service Pack 2

**Systems:**

Dell Dimension Dim4550  
Intel Pentium 4 2.40 GHz  
512 MB of RAM

Macintosh iMac  
2.0GHz Intel Core 2 Duo  
1GB of RAM

**Section 3: Testing Requirements**

To test the system, we will perform four testing stages. The first is unit testing where each component is tested individually for errors. The second stage is integration testing where we will ensure that components interact correctly to perform higher functions. System testing, the third stage, involves ensuring that all the features of the system meet the functional requirements previously defined in the Requirements Specification. Finally, acceptance testing will be carried out to ensure that the delivered system meets all of the requirements as specified by our clients.

### 3.1 Unit Test Example

## MAJIK Software Solutions

### Virtual Network Device Mapping System

#### Unit Test Catalog

Test Result	Test Number	Unit Test Name
P F	1	Login Screen
P F	2	Administrator Welcome Screen
P F	3	Faculty/Staff Welcome Screen
P F	4	Roger Bacon Floor 1 Layout Screen
P F	5	Roger Bacon Floor 2 Layout Screen
P F	6	Roger Bacon Floor 3 Layout Screen
P F	7	Roger Bacon Floor 4 Layout Screen
P F	8	Morrell Science Center Floor 1 Layout Screen
P F	9	Morrell Science Center Floor 2 Layout Screen
P F	10	Morrell Science Center Floor 3 Layout Screen
P F	11	Room View Screen
P F	12	Administrator Control Panel Index Screen
P F	13	Manage Users Control Panel Screen
P F	14	Permissions Control Panel Screen
P F	15	Room Notes Control Panel Screen
P F	16	Search Screen

P = Pass

F = Fail

# MAJIK Software Solutions

## Virtual Network Device Mapping System

### Test Number 1 - Login Screen Test Cases

Number	Test Case Name	Description	Input	Expected Result	Actual Result/Comments	TestResult (Pass/Fail)
1.1	Index Page Loads	Correct page load.	N/A	Index page loads and all components are displayed on the screen.		
1.2	Correct Login - Administrator	Log in with valid administrator account and password.	Administrator username and password	Welcome screen for administrators loads.		
1.3	Correct Login - Faculty/Staff	Log in with valid faculty/staff account and password	Faculty/Staff username and password	Welcome screen for faculty/staff loads.		
1.4	Incorrect Username Login	Login with invalid username.	Username	Message generated indicating invalid username.		
1.5	Incorrect Password Login	Log in with invalid password.	Password	Message generated indicating invalid password.		
1.6	Login with Empty Fields	Login with username and password fields empty.	N/A	Message generated indicating invalid username or password.		
1.7	Click Clear Button	User clicks clear button.	N/A	Username and password field are cleared of contents.		
1.8	Click Link to MAJIK Website	User clicks link to the MAJIK website.	N/A	MAJIK Team website loads.		
1.9	Click Link to Software Engineering Website	User clicks link to the Software Engineering website.	N/A	Software Engineering website loads.		
					Summary of Tests for this Unit	P

## **3.2 Acceptance Test**

The acceptance test will ensure that all features of the functional requirements are met as follows.

### **General:**

The Virtual Network Device Mapping System is web-based.

### **Administrator User:**

The Administrator user will have an account.

The Administrator user will have a username and password.

The Administrator will establish usernames and passwords for other users.

### **Login Screen:**

The user will log in with correct username and password.

An incorrect login will provide an appropriate error message.

### **Welcome Screen:**

The user will have access to a control panel on the welcome screen.

The user will be able to perform a search for certain devices or a specific device based on indicated search criteria.

The user will be able to select a floor of Roger Bacon Hall from a menu to view a floor plan layout.

The user will be able to select a floor of Morrell Science Center from a menu to view a floor plan layout.

The user will be able to logout from the welcome screen by clicking the "Logout" link.

### **Control Panel Index Screen:**

The user will be able to change user passwords in the control panel.

The user will be able to change user permissions for devices in the control panel.



The user will be able to insert notes pertaining to a specific room or devices within a room.

The user will be able to log out from the control panel index screen.

**User Control Panel Screen:**

The Administrator user will be able to choose a user for which the password is to be changed.

The Administrator will enter a new password for the chosen user.

The Administrator will submit changes.

A message will appear indicating a that a change has been accepted.

The Administrator user will be able to log out from the user control panel screen.

**User Permissions Control Panel Screen:**

The Administrator will be able to choose a user for which the permissions are to be set.

The administrator will be able to search for or choose a device or set of devices for which the user's permissions are to apply to.

The Administrator will be able to choose the permission level for the user with reference to the chosen device(s): read or restrict.

The Administrator will submit the changes.

A message will appear indicating that a change has been accepted.

The Administrator user will be able to log out from the user permissions control panel screen.

**Room Notes Control Panel Screen:**

The Administrator user will be able to choose a building and floor for which the room is in.

The Administrator will be able to enter a room number for which to add notes.

The Administrator will be able to add notes into a text box for the chosen room.

The Administrator will submit the changes.

A message will appear indicating that a change has been accepted.

The Administrator user will be able to log out from the room notes control panel screen.

**Floor Plan Screen:**

A floor plan for the chosen floor will be displayed on the screen.

The building name and floor number will be displayed on the screen.

The Administrator user will be able to access the control panel from this screen.

Administrator user will be able to view information about all rooms and devices on the floor.

The Administrator will be able to choose a room from the floor plan to view a detailed room layout.

The Administrator user will be able to log out from the floor plan screen.

The Administrator user will be able to choose a different floor of either Roger Bacon Hall or Morrell Science Center from a drop down menu.

**Room Layout Screen:**

A room layout will be displayed for the selected room.

The existence and location of devices within the room will be indicated in the layout.

The building name, floor number, and room number will be displayed on the screen.

The Administrative user will be able to zoom out to the floor level diagram to which the room belongs.

The Administrator user will be able to choose a device within the room to view the information pertaining to that device.

The information for a specific device will appear below the room layout in a text box.

Any available notes for the selected room will be displayed on the screen for easy reference.

A legend will be displayed below the layout to denote the meaning of symbols in the layout.

The Administrator user will be able to log out from the room layout screen.

**Search Screen:**

The Administrator user will be able to search for a device on the following criteria:

- Asset Tag Number
- Priority
- User
- User Type
- Department
- VP Code
- Building
- Room
- Manufacturer
- Model
- Equipment Type
- Monitor Type
- Purchase Year
- Installed Date
- Purchase Order Number
- CPU
- Speed
- Disk
- Memory
- MAC Address
- Serial Number

Summarized search results will be displayed on the same screen.

Search results will be selectable to view more detailed results.

When selected, detailed search results will be displayed in the room layout view.

**Faculty/Staff User:**

The Faculty/Staff user will have an account established by the Administrator.

The Faculty/Staff user will have a username and password.

**Login Screen:**

The user will log in with correct username and password.

An incorrect login will provide an appropriate error message.

**Welcome Screen:**

The user will be able to perform a search for certain devices or a specific device based on indicated search criteria.

The user will be able to select a floor of Roger Bacon Hall from a menu to view a floor plan layout.

The user will be able to select a floor of Morrell Science Center from a menu to view a floor plan layout.

The user will be able to logout from the welcome screen by clicking the "Logout" link.

**Floor Plan Screen:**

A floor plan for the chosen floor will be displayed on the screen.

The building name and floor number will be displayed on the screen.

Faculty/Staff user will be able to view information about limited rooms and devices on the floor.

Rooms available for viewing will be highlighted so a Faculty/Staff user is aware of which rooms can be selected.

The Faculty/Staff will be able to choose a room from the floor plan to view a detailed room layout.

The Faculty/Staff user will be able to log out from the floor plan screen.

The Faculty/Staff user will be able to choose a different floor of either Roger Bacon Hall or Morrell Science Center from a drop down menu.

**Room Layout Screen:**

A room layout will be displayed for the selected room.

The existence and location of devices within the room that will be indicated in the layout.

The building name, floor number, and room number will be displayed on the screen.

The Faculty/Staff user will be able to zoom out to the floor level diagram to which the room belongs.

The Faculty/Staff user will be able to choose certain devices within the room to view the information pertaining to that device.

The information for a specific device will appear below the room layout in a text box.

Any available notes for the selected room will be displayed on the screen for easy reference.

A legend will be displayed below the layout to denote the meaning of symbols in the layout.

The Faculty/Staff user will be able to log out from the room layout screen.

**Search Screen:**

The Faculty/Staff user will be able to do a search for a device on the following criteria:

- Asset Tag Number
- Priority
- User
- User Type
- Department
- VP Code
- Building
- Room
- Manufacturer
- Model
- Equipment Type
- Monitor Type
- Purchase Year
- Installed Date
- Purchase Order Number
- CPU
- Speed
- Disk
- Memory
- MAC Address
- Serial Number

Search results will be limited to what the user has permissions to view.

Summarized search results will be displayed on the same screen.

Search results will be selectable to view more detailed results.

When selected, detailed search results will be displayed in the room layout view.

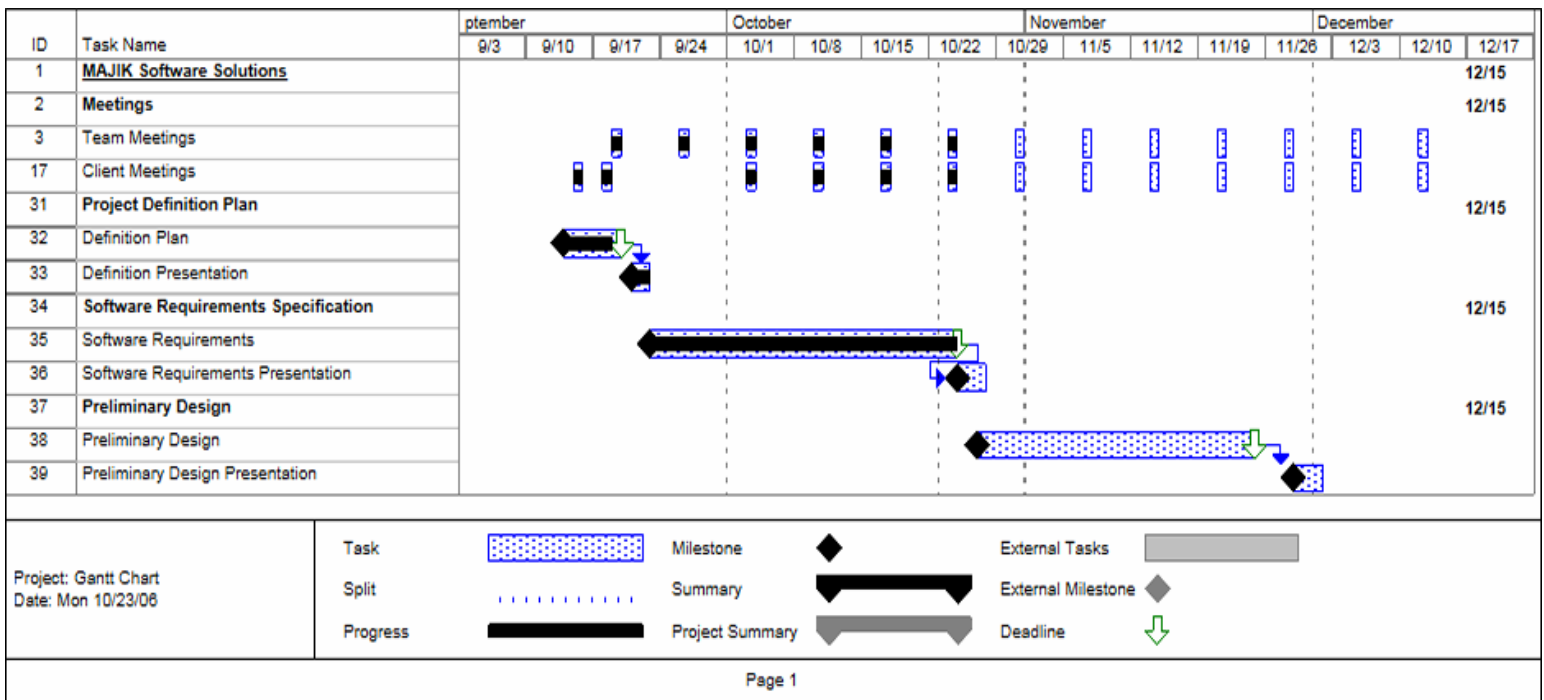
**Special User:**

The Special user will have an account established by the Administrator.

The Special user will have a username and password.

The Special user will have access to any feature the Administrator user grants them, up to and including administrative functions.

## Section 4: Gantt Chart



## Section 5: Glossary of Terms

*CPU* - Central Processing Unit – The processing component of a computer to process data.

*Data Flow Diagram* - A graphical breakdown of the processes and major flows of data that occur in the system.

*Database* – A collection of data organized to be readily available for use.

*Gantt Chart* - A chart that displays progress over time, in this case used to keep track of a project.

*Linear Sequential Model / Classic Waterfall Model* – A systematic, sequential approach to software development that progresses from this Software Plan to Requirement Specifications, Preliminary/Detailed, and finally Acceptance Tests.

*MAC address* - Media Access Control address, given to a device in a network. It consists of a 48-bit hexadecimal number (12 characters). The address is normally assigned to a device, such as a network card, when it is manufactured.

*Network Device* - A computer, peripheral or other related communications equipment attached to a network.

*PHP* – A scripting language useful in the creation of dynamic web pages.

*Prototype* – A rudimentary depiction of the design of the final product.

*Virtual* - Something which is a representation rather than the ‘real’ thing, thus ‘virtual reality’.