Information Systems Project

MSIS 720L

UPS Inventory Management System - Milestone2

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Introduction:

Within the dedicated IT and Network team at Marist, we currently possess a valuable tool designed to address the critical realm of Uninterruptible Power Supplies (UPS). These UPS systems stand as essential guardians, ensuring that our networking infrastructure maintains a resilient battery backup in the face of power disruptions. Leveraging the power of SNMP, we actively monitor these UPS devices, providing us with real-time insights into their operational status, including their response to power failures.

Our team already has an established system in place, granting us a comprehensive overview of all UPS units across our network. This system equips us with fundamental information, such as serial numbers, installation locations, and battery installation dates. However, our primary project objective revolves around the development of an application tailor-made for our team's needs. This application will serve as a knowledgeable advisor, guiding us precisely on when to replace UPS batteries or the entire chassis.

Adhering to industry standards, UPS batteries are typically slated for replacement every two years, while the entire unit should undergo replacement every five years. Our envisioned application will not merely collect data but will become a proactive tool, generating insightful reports and issuing timely alerts. Our aim is to enhance asset management efficiency and bolster the reliability of our IT and network infrastructure here at Marist.

Functional Requirements:

1. Inventory Management:
    - The application should maintain an inventory of UPS units, including their details such as name, manufacturer, model, building name, LAN room, serial number, type of battery installed, battery model, battery count, and room temperature.
    - Users should be able to add new UPS units to the inventory.
    - Users should be able to delete UPS units from the inventory.

2. Maintenance Status Indication:
    - The application should display the maintenance status of each UPS unit in the inventory, highlighting them with green if maintenance is up to date, yellow if maintenance is due in 15 days, and red if maintenance is overdue.
3. Budgetary Advisement:
    - The application should provide budgetary advisement for UPS maintenance.
    - It should display the name of the UPS, type of service required, date of service, date of the last service, and the price of the service.
    - The advisement should be organized by year and return the estimated yearly maintenance cost.
4. User Permissions:
    - Implement user permission controls to restrict access.
    - Administrators and select staff members should have full access rights, including the ability to edit and delete records.
    - Students should have view-only access.
5. User Interface Enhancement:
    - The application should have an improved user interface compared to the existing system.
    - Enhance sorting and reporting capabilities to provide a user-friendly experience.
6. Data Modification:
    - Allow for seamless updates to the UPS database, including the ability to add new UPS units, retire outdated ones, and modify existing entries.

Non- Functional Requirements:

1. Performance:
    - The application should respond quickly to user interactions, ensuring a smooth and efficient user experience.
2. Reliability:
    - The application should be reliable and available at all times to meet the critical needs of UPS management.

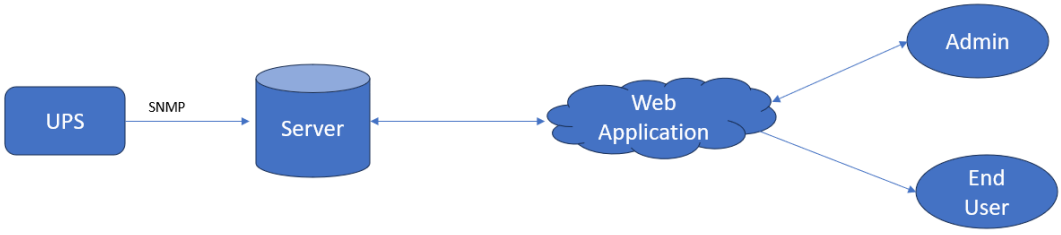
3. Security:
    - Ensure data security and confidentiality, particularly for student users.
    - Protect user data from unauthorized access or breaches.
4. Scalability:
    - The application should be scalable to accommodate future growth in the number of UPS units and users.
5. Compliance with Industry Standards:
    - The application should adhere to industry standards for UPS maintenance, such as replacement schedules (2 years for batteries, 5 years for the entire unit).
6. Usability:
    - The user interface should be intuitive and user-friendly to enhance user satisfaction and usability.
7. Maintainability:
    - The application should be easy to maintain, allowing for updates and modifications to the UPS database.
8. Reporting:
    - The application should generate insightful reports for UPS management, enhancing decision-making capabilities.
9. Integration:
    - Ensure that the application can integrate with existing IT and network infrastructure at Marist seamlessly.
10. Documentation:
    - Provide comprehensive documentation for the application's usage, maintenance, and troubleshooting.

System Architecture:

Our application system architecture is comprised of four key components: Uninterruptible Power Supplies (UPS), Servers, a Web Application, and Users. Each UPS unit is assigned a unique IP address, and we utilize SNMP (Simple Network Management Protocol) to collect and store battery and UPS status data in a database hosted on our Servers.

Once this data is collected, it is seamlessly integrated into a web application. This web application serves as a user-friendly interface where users can access real-time insights regarding the operational status of the UPS units. It provides critical information such as their response to power failures. Users can also interact with the system through the web application's user interface, enabling them to make modifications and access the latest data.

Furthermore, it's important to note that our system has implemented user role-based access control, ensuring that each user is granted specific roles and responsibilities, thus maintaining the security and integrity of the system.

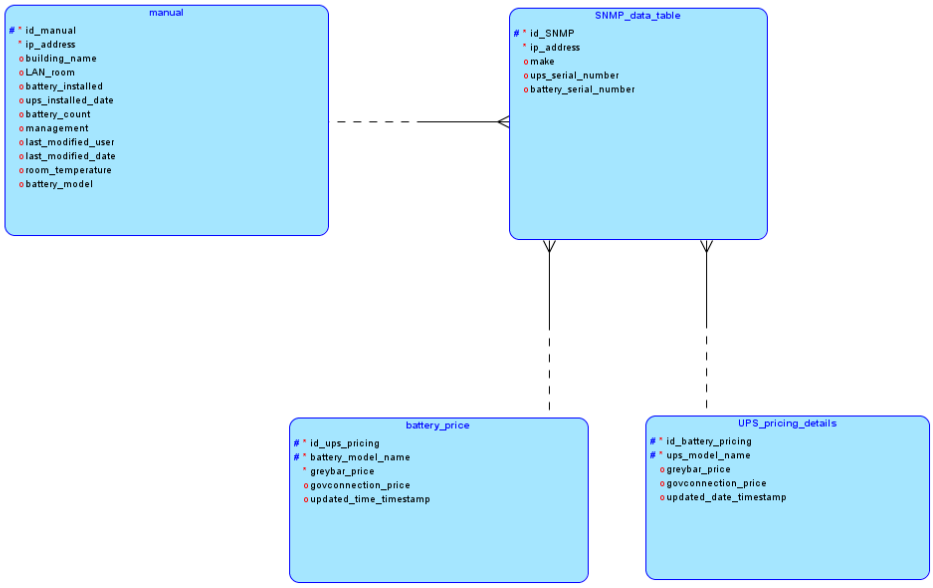


Data Design:

Our application's primary objective is to provide users with accessible battery and UPS information through a customizable User Interface. Additionally, we aim to display pricing details sourced from Graybar and Gov Connection vendors. To realize these goals, we rely on a relational database that houses various data points such as UPS model, installation date, count, installation location (including building name and LAN room), IP address, battery model, battery serial number, UPS serial number, date and time of the last update, room temperature, and user information, including usernames and their last update times, as we actively track changes over time.

Furthermore, we handle both live data, which continuously updates, and static data that requires annual or periodic updates. To manage this, we maintain two types of tables: one for manual entries, which are not updated daily, and another for SNMP data, which updates frequently and represents real-time information. This design was chosen to optimize data retrieval performance, especially when dealing with heavier data loads. Additionally, for pricing information, we have

segregated data into two distinct tables for UPS and batteries, allowing us to fetch and consolidate pricing data from both vendors efficiently.

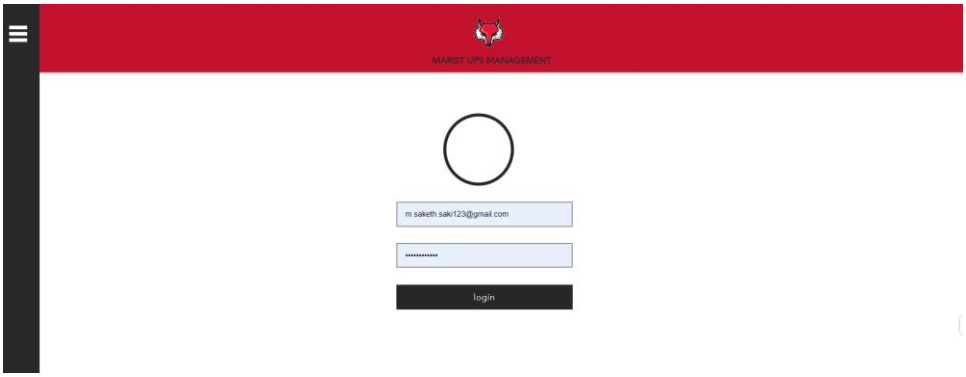


ER Diagram

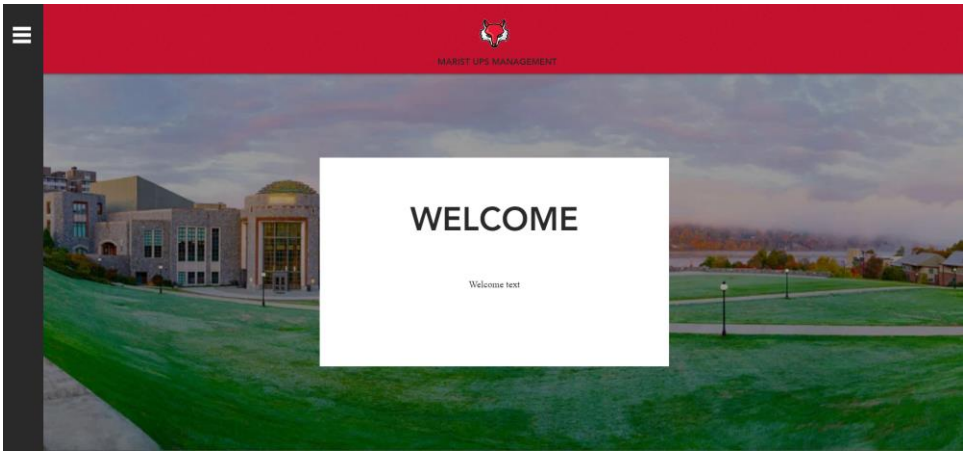
Interface Design:

Here is the Login page for our application. Enter the Username and password and hit the login button

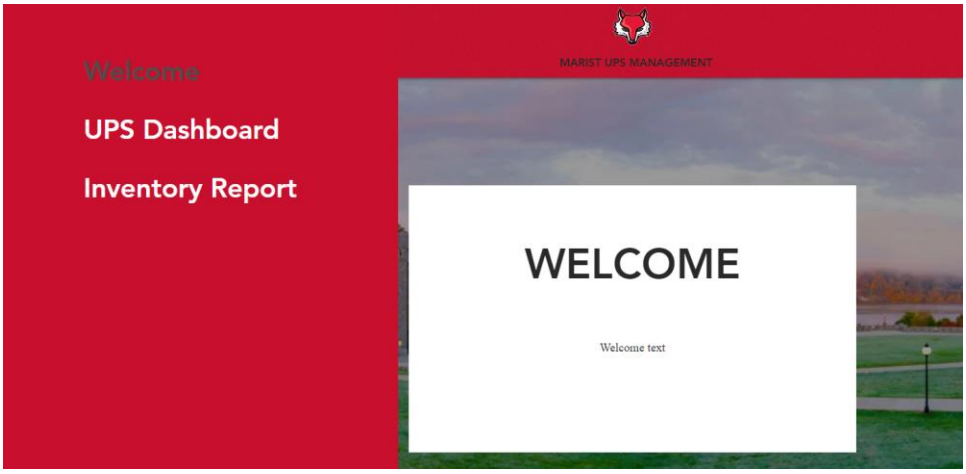
Note: Login page is same for both Admin and End user.



Once after clicking the login button, you will see the welcome screen. And at the left side of the screen, you see a three-line bar which is a navigation for the reports.

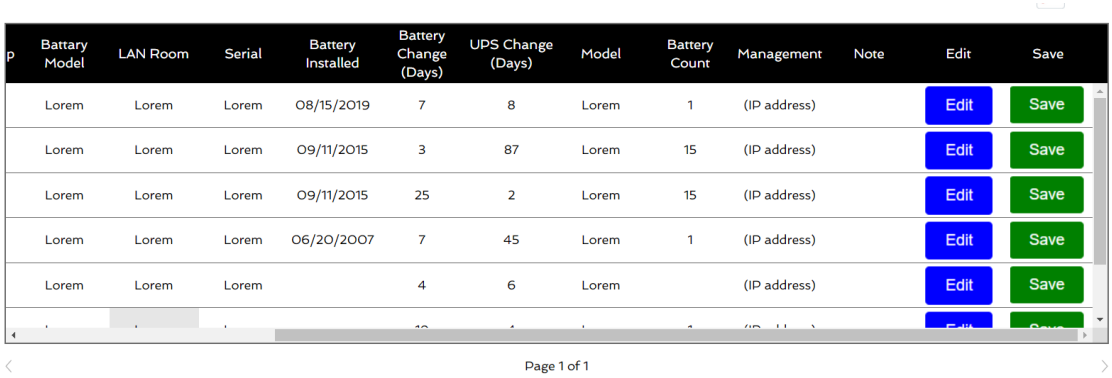


You can see the list of the reports. Currently we have two reports, UPS Dashboard and Inventory Report.



When you select the UPS Dashboard you will see two insights which talk about UPS and Battery count to be replaced.

Within the same dashboard, as you continue scrolling down, you will encounter a comprehensive UPS Information report. This report includes a column labeled "Battery Change," which displays the number of days. The color-coded representation of these days corresponds to the status indicators described in the Server Status section.



Battary Model	LAN Room	Serial	Battery Installed	Battery Change (Days)	UPS Change (Days)	Model	Battery Count	Management	Note	Edit	Save
Lorem	Lorem	Lorem	08/15/2019	7	8	Lorem	1	(IP address)		Edit	Save
Lorem	Lorem	Lorem	09/11/2015	3	87	Lorem	15	(IP address)		Edit	Save
Lorem	Lorem	Lorem	09/11/2015	25	2	Lorem	15	(IP address)		Edit	Save
Lorem	Lorem	Lorem	06/20/2007	7	45	Lorem	1	(IP address)		Edit	Save
Lorem	Lorem	Lorem		4	6	Lorem		(IP address)		Edit	Save

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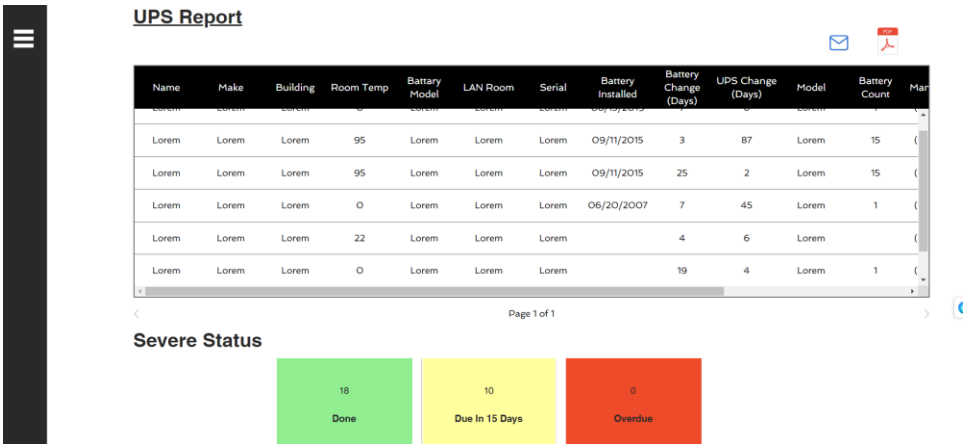
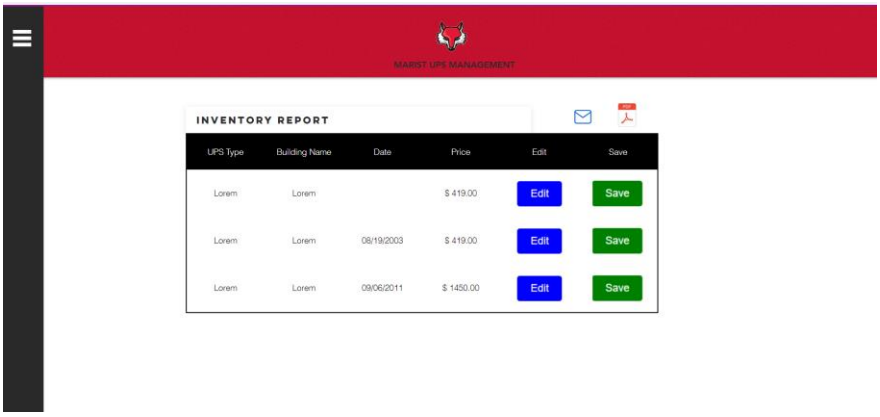


And in the Inventory report you will see the pricing details of UPS type.



And the Admin user can Edit and save the information from the application. Whereas End-user can only view the information and can export data

UI design Click Here

ER Design