



SITE PERFORMANCE NAVIGATOR

Polytechnic University of Puerto Rico
Electrical & Computer Engineering and Computer Science Department
Capstone Design Project WI-24
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INTRODUCTION

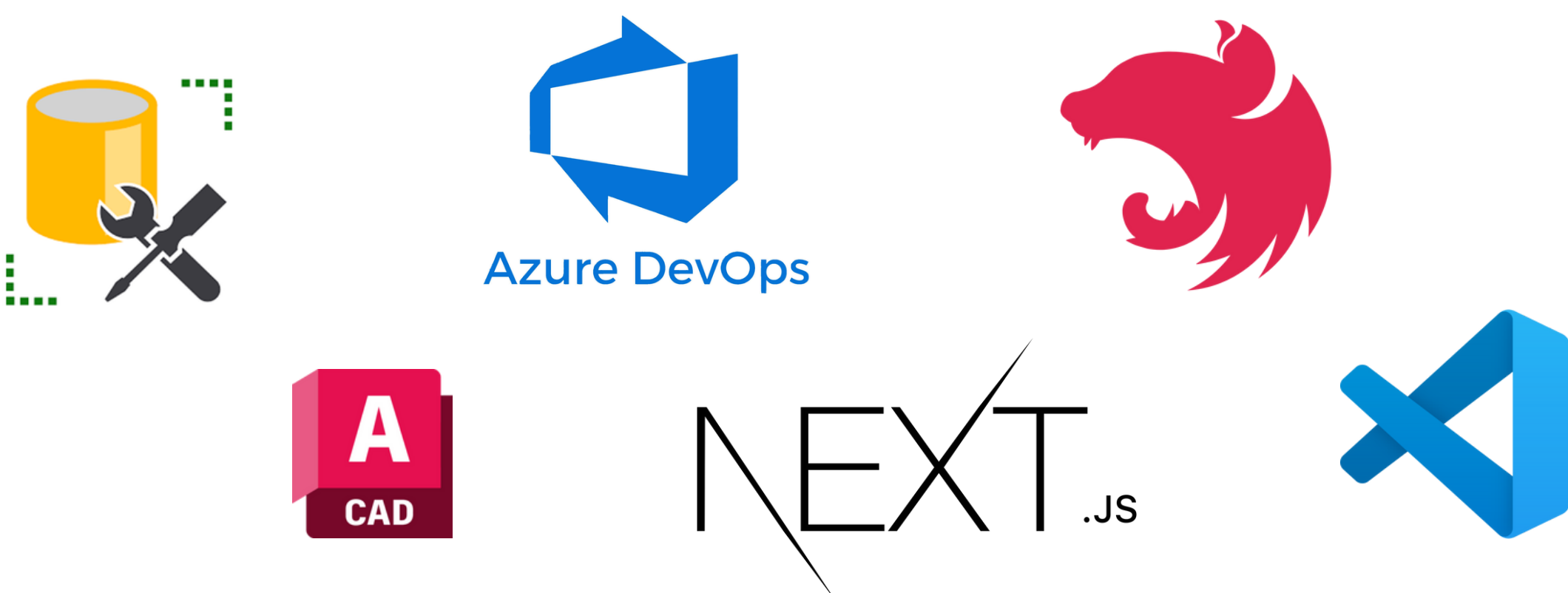
The Site Performance Navigator is a software solution developed to improve communication and operational awareness at the Bristol Myers Squibb Manatí plant. It provides a centralized platform where employees can input notifications and updates that other employees can access in real time. It includes features such as an interactive 2D map and an activity feed for information sharing.

PROBLEM

The BMS plant lacked a centralized platform to consolidate real-time operational data. Critical performance and notification information was scattered across multiple disconnected systems, making it difficult for employees to access a clear and unified view of the plant's status. Our solution provides an interactive map and activity feed that displays real-time and categorized notifications. This enhances decision-making, and overall plant performance by ensuring that employees have immediate access to relevant and organized information.

SOFTWARE AND TOOLS

The Site Performance Navigator was developed using NestJS for backend functionality and Next.js for frontend development. SQL Server Management Studio was used for data storage and management, while the development process was carried out in Visual Studio Code. Additionally, AutoCAD was utilized to design the plant maps. Azure DevOps facilitated version control and team collaboration, streamlining the development workflow.



USER INTERFACE DESIGN

The team developed a web-based app that allows users to manage notifications and related additional resources in an interactive 2D map of the BMS plant and in an activity feed.

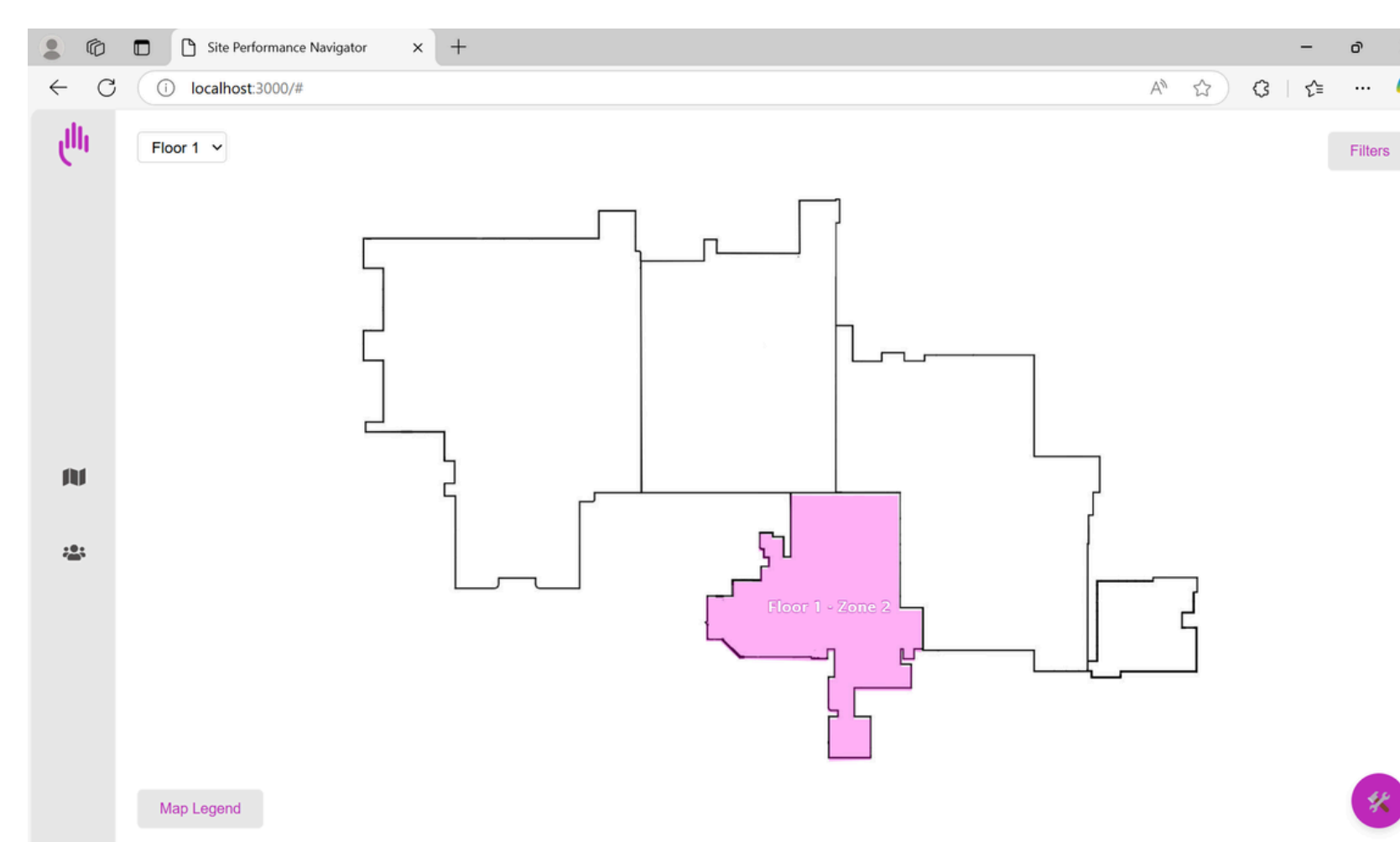


Figure 1: Home - Floor 1 Zones Map (Plant Site)

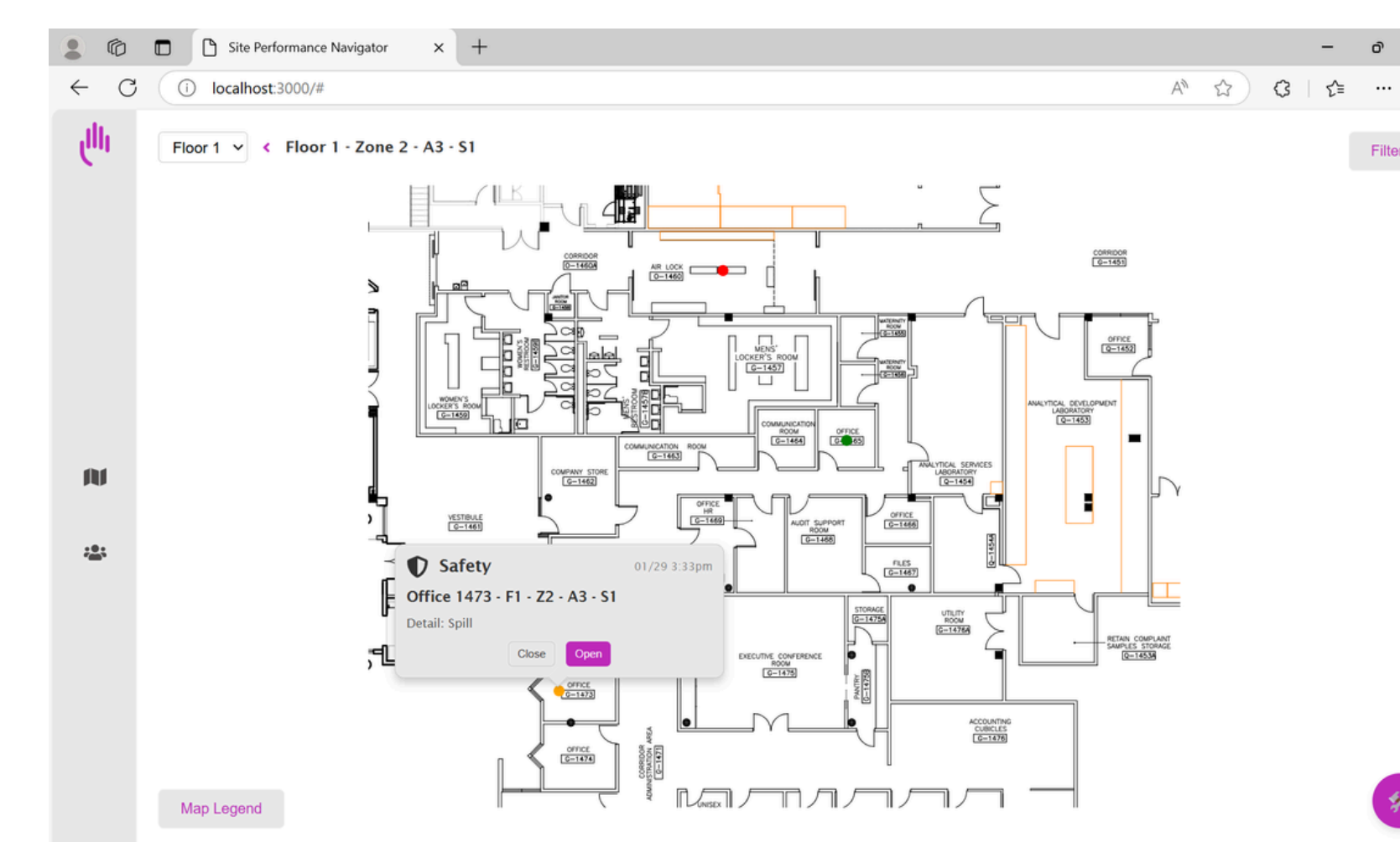


Figure 2: Notification Tooltip

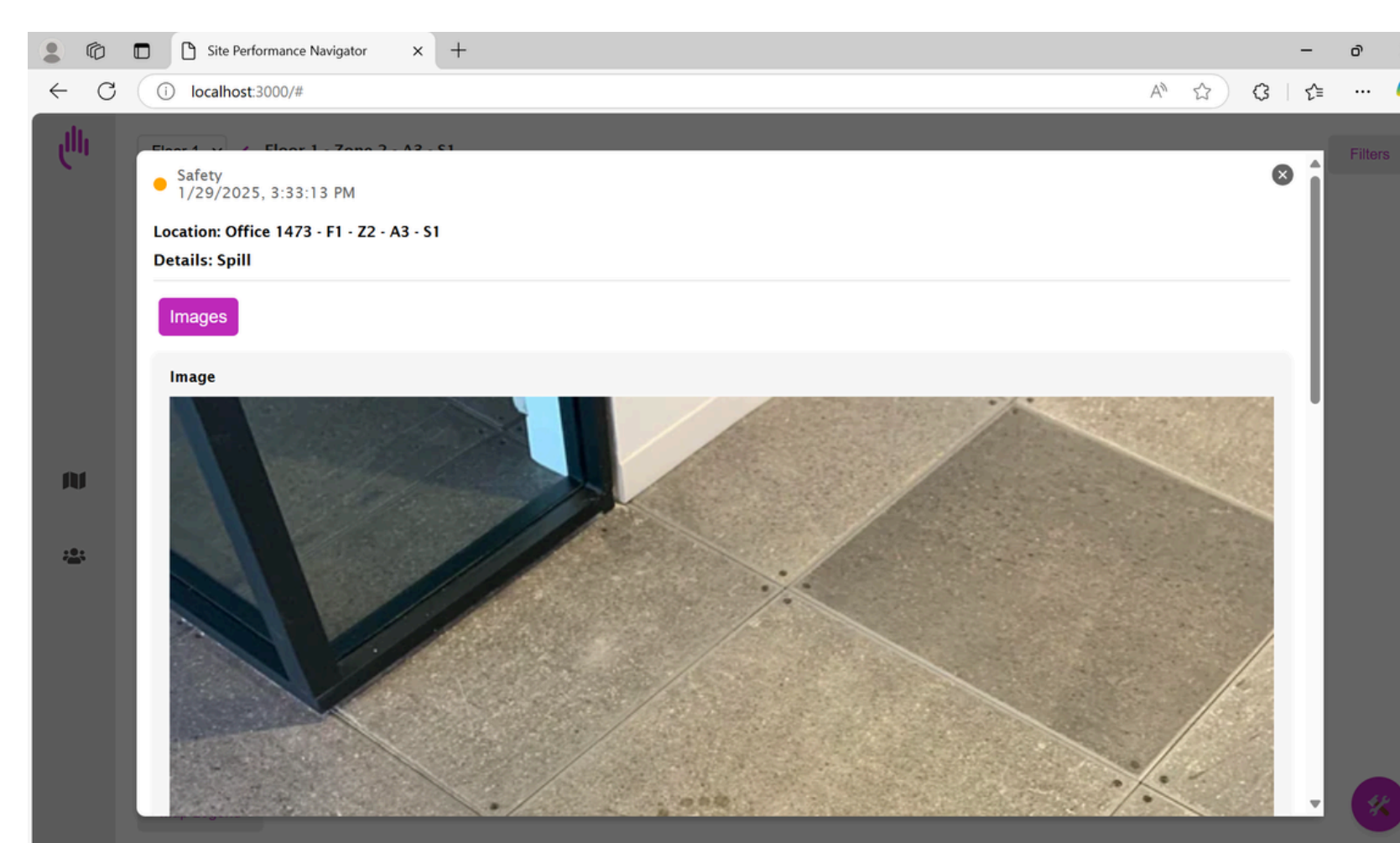


Figure 3: Notification Details and Additional Resources

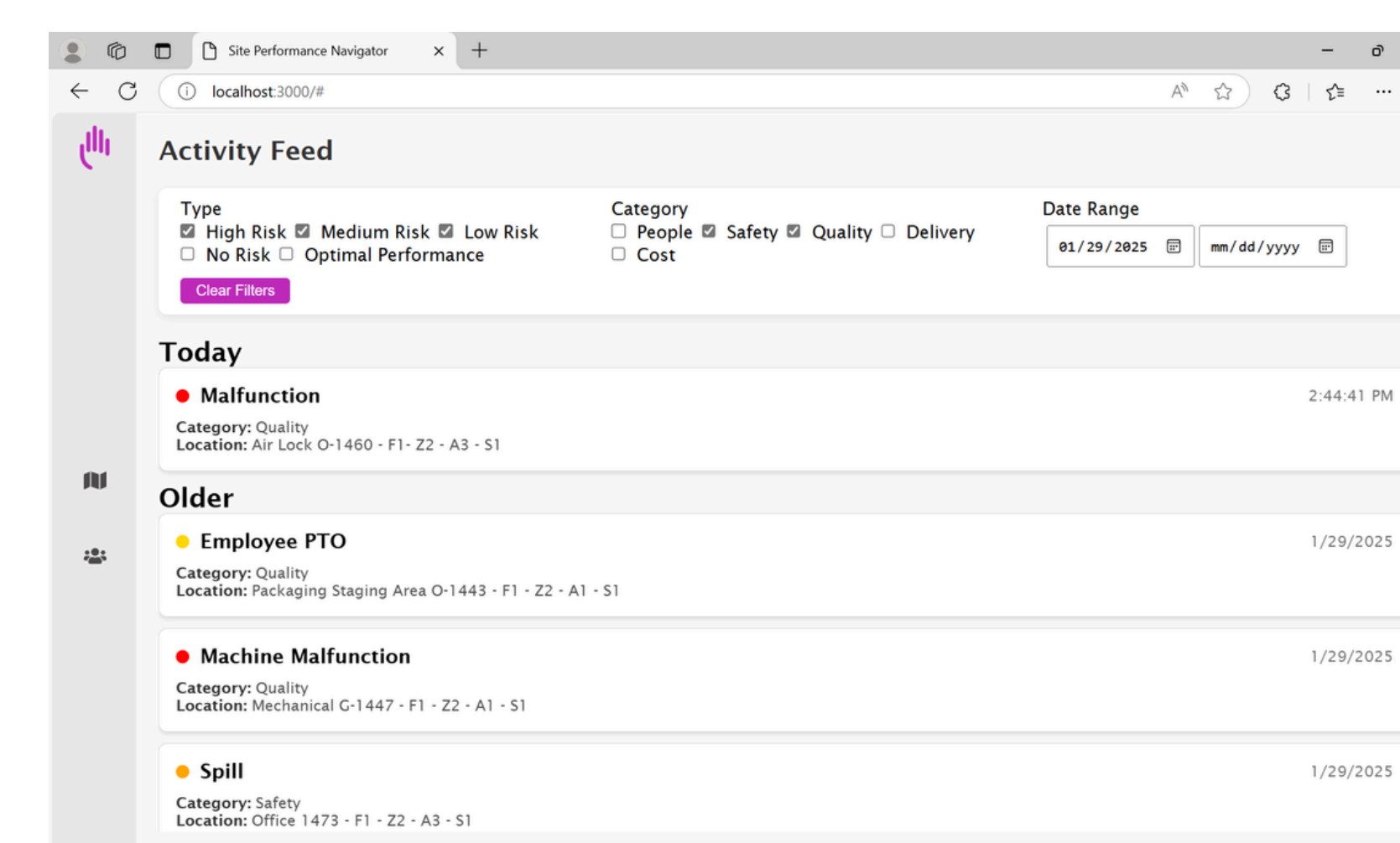
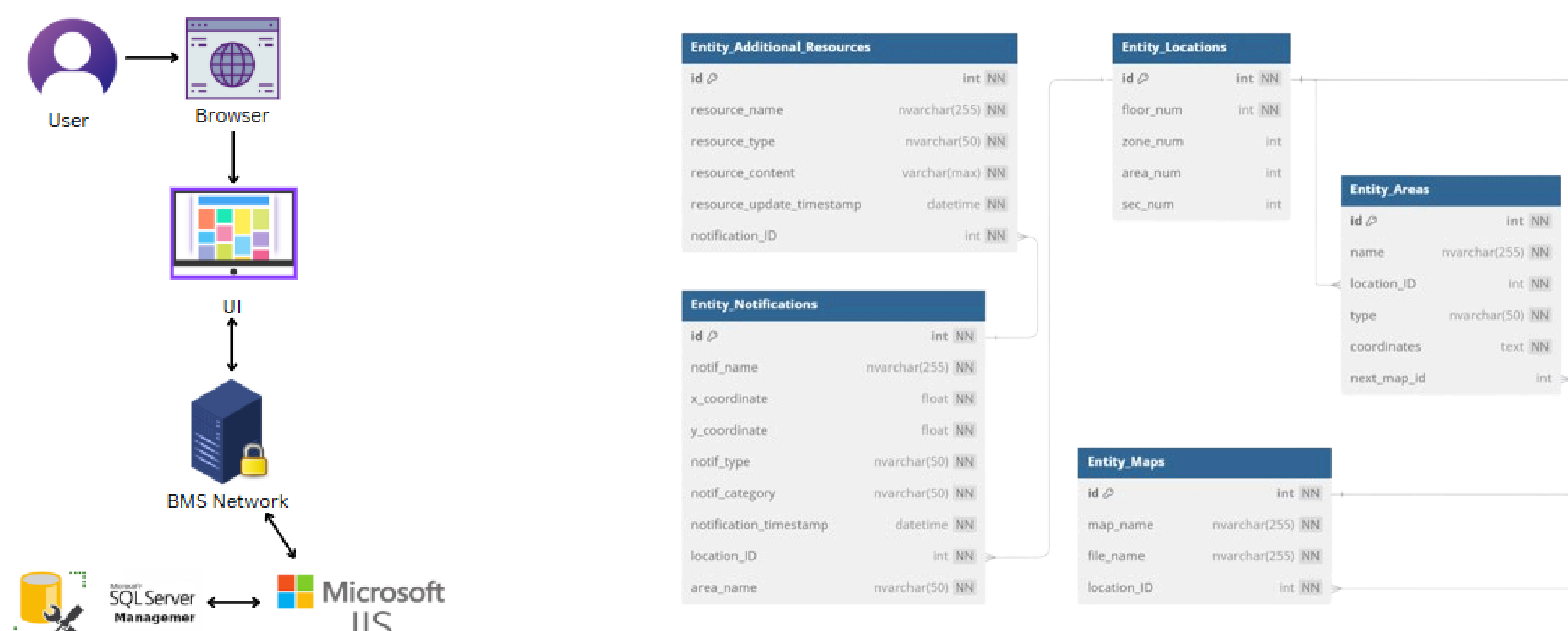


Figure 4: Activity Feed

SOFTWARE ARCHITECTURE DESIGN

The Site Performance Navigator operates on a dual-server architecture within the secure BMS network, with one server handling front-end and back-end operations through IIS, while the other manages structured data via SQL Server.



CONCLUSION

The Site Performance Navigator project was a learning experience that involved overcoming several challenges, such as reformatting plant maps by zones and navigating administrator permissions for network access. Additionally, working with an older version of Node.js added complexity, as we were unable to use existing libraries to simplify the coding process. These obstacles tested our problem-solving skills and teamwork.

FUTURE WORK

The Site Performance Navigator project has a strong foundation for enhancing communication and operational awareness at the BMS Manatí plant. Future work on the platform could include the integration of automated notifications and real-time performance monitoring to further streamline operations. Expanding data visualization options, such as dynamic charts or performance dashboards, could also provide additional insights for decision-making.

ACKNOWLEDGMENTS

We would like to express our gratitude to the BMS OpEx Director Eduardo Soto and Josue Soto for providing us with the invaluable opportunity to pursue this project. Additionally, We would also like to thank Dra. Joanne Brenes Catinchi for her dedicated mentorship throughout this process. Her commitment to keeping us aligned with our timeline and deliverables has been essential in the completion of this Project.

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