

Capstone Project Report – Draft 1

CCSE Reservation Application

<https://sites.google.com/view/reservation2capstonegroup5/home>

IT4983 W01 – Team 2 Group 5

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Executive Summary

This application development project encompasses two critical aspects for CCSE (College of Computing and Software Engineering). First, it aims to create a reservation system for faculty and staff to book various physical spaces, including faculty hoteling areas, conference rooms, and specialized classrooms within the Atrium and Norton buildings at the Marietta campus. Additionally, it seeks to establish a system for faculty and students to reserve and borrow equipment from the college's inventory, such as laptops, desktops, and technical lab equipment. The goal of this project is to create a unified application for both of these reservation types. It is hosted in the CCSE Data Center on a Windows server, with security based on the college's NetID system.

The project itself is a webapp comprised of a database in MySQL to track the inventory and spaces, a backend written in C# ASP.NET to communicate between the database and frontend, and lastly a frontend client site written in JavaScript with the Vue framework. The team completing this task is a group of 5 IT students undertaking the project as part of a capstone course, and the languages and software stack used were up to the discretion of this team. These specific languages were chosen based primarily on each of the team members' prior experience as well as some research into potential webapp stacks such as those provided in Visual Studio (Microsoft, 2023).

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Background

Business and Project Background

Kennesaw State University, located in Kennesaw and Marietta of the suburbs of Atlanta, is the third largest university in Georgia (*About - Kennesaw State University - Kennesaw State University*, n.d.). KSU's website states that " Kennesaw State University's College of Computing and Software Engineering is one of the best in the country, with each of its degree programs being recognized nationally" (*College of Computing and Software Engineering*, n.d.). The CCSE Data Center is currently using a reservation system for equipment and physical spaces that is leaving them double booking physical spaces and unprecise data of the status of their equipment. Therefore, they have decided to update to a reservation application that will keep an accurate record of physical space reservations, and status of their equipment.

Scope, Objectives, & Deliverables

Kennesaw State University is looking to develop an application designed to be a reservation/check-out system. The application should have two parts. One is designed to handle the reservation of physical spaces such as faculty hoteling space, conference rooms, specialty classrooms and lab spaces in the Atrium and Norton buildings on the Marietta campus by faculty and staff. The second is designed to reserve and check out items such as laptops, desktops, consumables (keyboards, mice), monitors and other technical lab equipment by faculty and students.

The project is to focus on functionality over design. The sponsor is looking for the start of an application that performs the reservation and checks items out keeping proper inventory of what is

available and what is not available, and then will have another team to match it to the Kennesaw State University theme.

Coding language, database, and programs used was left up to the team as the sponsor did not have one chosen, but wanted to make sure that what was chosen was something easily used and understood for another team to build upon for the next level. Our objective is to get a functioning application with proper backend and frontend coding with proper interaction of the database that will be formed from a provided excel spreadsheet of inventory and physical spaces. The application will be uploaded into Kennesaw State University's VM platform with security based on a NetID system.

The final deliverable will be an application showcase fully loaded into the VM. There will be two other milestones to show project progression. The first is to give the application architecture. The second is to present a front-end demo and security policies. If a live meeting cannot be arranged, a recording of a milestone presentation will be provided to the sponsor.

Technical Background

Technical background needed includes knowledge of web development, HTML, MySQL, C#, and JavaScript. The team must be able to develop a working backend and frontend development of an application. The team will be working with a windows server and connecting with a VPN to access the server with a NetID. Visual Studio will be used for backend and frontend development. Code will be checked and collaborated on GitHub. MySQL Workbench will be used for the database. Background knowledge in all these tools will be needed for the project.

Project Outcomes & Achievements

Assessment of Outcomes

Since there isn't an application currently in place for KSU staff to reserve physical spaces and/or equipment, this implementation is a huge advantage for our school.

Technical Summary

Initially in planning, research was done into how the architecture would be laid out, as well as how the team working on the project would share their code during development. Part of this research included looking into setting up a self-hosted git server on the provided Windows server (Le, 2020; Polezhaev 2018), however, this research was ultimately abandoned when it was determined that using an already-available cloud host like GitHub would be a much simpler solution. This also provides the team with a streamlined way to manage merging changes and reviewing each other's code before merging.

Frontend: Utilizing JavaScript, the team designed an interactive UI that ensures a seamless experience for the staff. Real-time availability checks and immediate feedback mechanisms have been incorporated.

Backend: The C# backend acts as the backbone of the application. It processes the requests from the front end, interacts with the database, and handles all the business logic related to reservations. The choice of C# has provided a reliable and efficient foundation for our system's operations.

Database: Our MySQL database stores all the essential information. The schema has been designed to handle complex relationships between spaces, equipment, and users. Furthermore, stored procedures and triggers have been implemented to manage reservation logic, ensuring that there are no overlaps or conflicts in bookings.

Project Planning & Management Summary

Overview

Our aim from the onset was to address a pressing need within KSU: streamlining the reservation of spaces and equipment. We embarked on this journey with a clear roadmap, defined roles, and agile methodologies to ensure timely and efficient execution.

Project Process

In the beginning, we had our Kickoff meeting with our project sponsor, and she explained to everyone what was needed for this project, and when she needed the deliverables. We then have three Milestones, and each milestone has different deliverables. For Milestone 1, we needed to determine the application's architecture. For Milestone 2, we need to have a basic version of the application. For Milestone 3, we need to have the application finished and we need to present it to the department.

Team Contribution Summary

Frontend Team: Concentrated on crafting a user-centric interface, ensuring responsiveness across devices, and achieving seamless integration with backend functionalities.

Backend Team: Led the creation and maintenance of APIs, ensured efficient communication with the database, and resolved any potential reservation conflicts in real-time.

Database Team: Worked tirelessly to design a robust schema, implemented triggers, and ensured high availability and data integrity at all times.

Workload Summary

Research & Requirement Gathering: 40% of total man-hours, crucial in defining project scope and requirements.

Design & Development: Comprising 60% of our total workload, this was the most labor-intensive phase, with meticulous attention to detail.

Team Reflection on Project Experience

Project Success Factors: Our project success factors depend on a few different things. Individually, the success of our project depends on how well each member understands his or her part of the project. Each member also must have the knowledge to complete their part of the project. As a group the success of our project depends on how well we all work together. We must be supportive and helpful when another member needs us. Success also depends on how well we can all communicate with each other.

Team Collaboration & Communication Experiences: All of us have been a part of multiple team projects in the past. We are familiar with the different platforms of communication such as GroupMe and Microsoft teams. Since we are all familiar with these platforms, our communication is effective

Challenges: Some challenges we are facing are finding times we can all meet. Everyone in the group has other work and jobs, it can be a challenge to find a day we are all available to have meetings. Luckily, we all have time to work on our individual parts of the project, but finding time to gather and discuss as a group has been difficult.

Areas to Improve: Some areas we need to improve on are availability. Currently, it is difficult to schedule meeting times for all members to attend. Further down the line in the project, it will be imperative all members can attend. Our current solution is to host more than one meeting, as well as record the meetings so members that have missed the meeting can go back and watch to see what they need to do.

Appendix

Project Files List

No project files to report yet.

Progress Reports List

For our progress reports list, we currently have:

Weekly progress report file - explains team progress on the project as well as records time spent on the project for each team member

Gnatt Chart – file that has current Gnatt Chart

Project Plan – lays out the plan for the project

Milestone 1 Report – PowerPoint of our Milestone 1 deliverables

Final Project Report – rough draft of our Final Project Report

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