



Booster-PAC for CS Admin Discord

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Introduction

The Programming Assistance Center is for providing help to students in programming classes. Other than a paper sign in sheet, there was no system to track the students within the center.

Our Booster PAC created a system with a Discord bot to check in students as well as submit questions, and a webapp to track both live and historical analytics for PAC employees.

We implemented the system by adopting a microservice architecture to ensure adaptability and easy maintenance for future administrators. Within the existing Discord server hosted by the CS Department at UNH, the bot will be accessible to all students. When a question is submitted, it will be added to the queue of questions for PAC Consultants to assist students in a more efficient way.

Functional Requirements

A discord bot, for students to request help

The discord bot will allow students to check into the PAC and request help by entering a queue by asking questions.

The discord bot will be able to automatically pair PAC consultants to students based on their expertise, informing both parties and specifying contextual information (course, question, where the student is, who the consultant is).

A web app, for PAC staff to be able to access PAC records

The web app will be able to display relevant information, including -

- The current queue of help requests
- How many questions are asked for each course
- How many questions are asked during any time frame

Non-Functional Requirements

Usability

- The overall system will be simple for PAC-goers to use, so that it will enhance the PAC experience.

Flexibility

- The system will be flexible, if the CS department moves away from Discord, it will be able to be adapted simply.

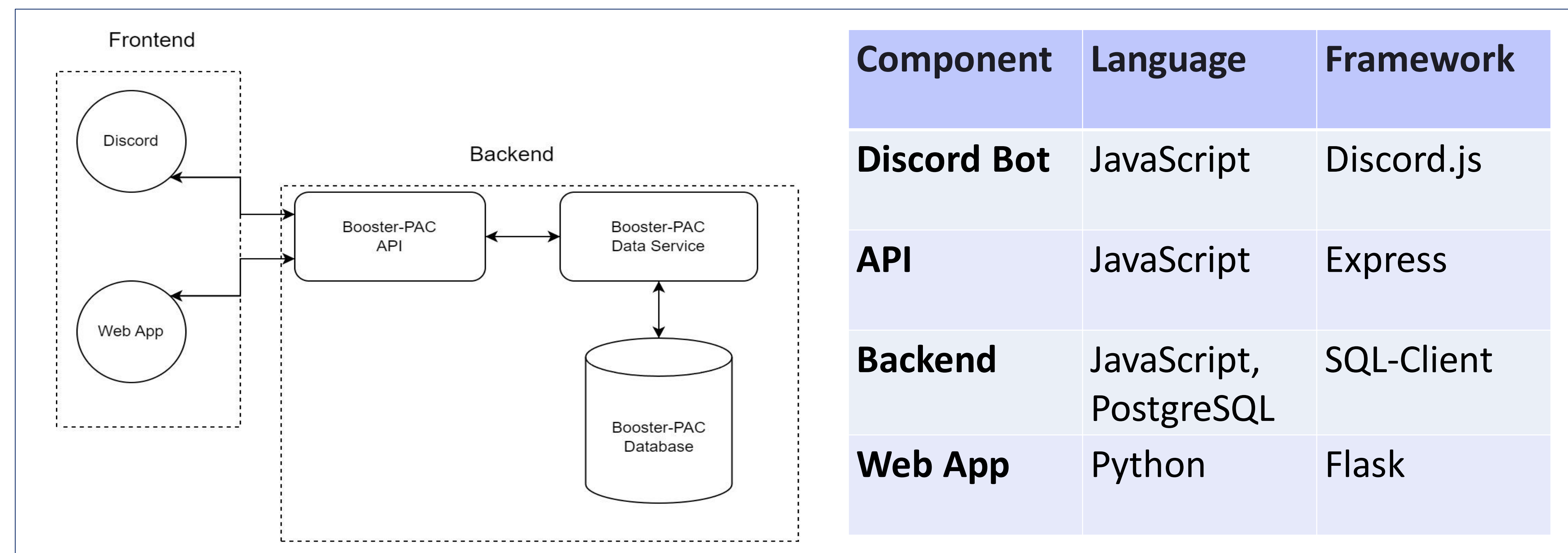
Maintainability

- The system will not be complex, so that when this iteration the project finishes, it can be maintained by the UNH CS system administrators and other future developers.

Security

- The system will carry standard protections against common attacks such as denial of service attacks and SQL injection.
- Data security will be handled by exterior systems, including the existing UNH CS Discord service as well as Discord itself.

System Architecture



Component	Language	Framework
Discord Bot	JavaScript	Discord.js
API	JavaScript	Express
Backend	JavaScript, PostgreSQL	SQL-Client
Web App	Python	Flask

Discord Interface

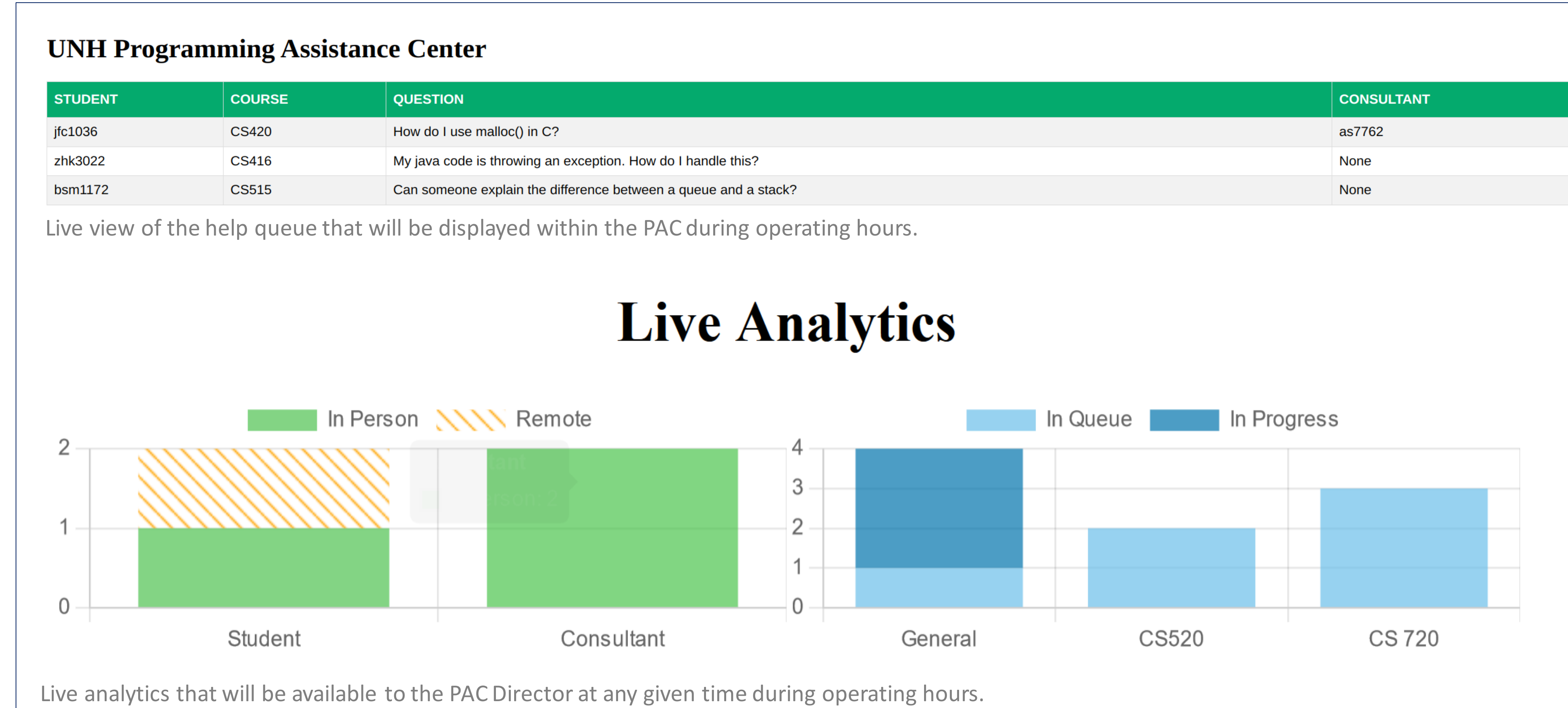
Student View

Students can easily check into the PAC and submit a help request using the Discord slash commands.

Consultant View

Consultants can use slash commands to view the next question in the queue, including all relevant information regarding the help request.

Dashboard Design



Testing and Results

Implementation

The backend and API components rely on unit testing to validate system behavior. Tests were written in the Jest framework with support from the *Supertest* library for running asynchronous tests.

Manual testing was performed for UI components.

Criteria

Backend tests ensure correctness of database operations

API tests ensure proper HTTP response codes and data for both valid and invalid requests.

Discord Bot Testing checks for proper error handling.

Conclusions

This project needs to provide the PAC director with live analytics about PAC usage to be successful. This includes the number of students and consultants in the PAC at any given time and the list of questions currently waiting to be answered in the queue.

This project also needs to provide historical data, such as the average response time for help requests, instantly upon request. This needs to be delivered by May of 2024 while fulfilling all functional and nonfunctional requirements.

The final product must have adequate documentation so it may be maintained by another team in the future.

Deliverables

- Discord Bot Interface
- Backend Queue Manager
- Analytics Database
- Web Application

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