AA Gymetrics

Arin Aihara

CST-451 Capstone Project Proposal

Grand Canyon University

Professor Mark Reha

Revision: 1.0

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**ABSTRACT**

In modern times, mental health of individuals has been on the decline. As more people are diagnosed with a variety of mental and emotional disorders, more attention comes to what can be done to improve mental health. As a result, many people turn to a variety of methods to cope, both healthy and unhealthy. One outlet that many turn to is working out. As a healthy alternative to many unhealthy forms of coping, working out regularly, promotes the advancement of physical health while also supporting a healthy form of self-care, which can in-turn, improve mental health and wellbeing.

As GCU expands, more students are on campus, leading to higher numbers of students utilizing the fitness centers on campus. Although there are quite a few fitness centers available, each individual may have preferences due to machines or tools and their availability in the gym. As aforementioned, with higher numbers of students, there are also certain times with higher concentrations of students working out simultaneously. This project aims to provide students with up-to-date information of the number of students currently in each fitness center. There are a number of students who complain about the crowded gyms on campus. With the high unlikelihood of GCU building more dedicated fitness centers, the hope of this project is to allow regular gym-goers to know in-real time, how crowded a gym is to help them make a decision on when and where to go to work out.

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| History and Signoff Sheet |

**Change Record**

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| --- | --- | --- |
| **Date** | **Author** | **Revision Notes** |
| 9/13/22 | Arin Aihara | Initial draft for review/discussion |
| 9/21/22 | Arin Aihara | Changed capstone idea, more realistic and within reach |
| 10/7/22 | Arin Aihara | Update features to more accurately describe application |
| 11/30/22 | Arin Aihara | General updates |
| 4/5/23 | Arin Aihara | Updates for final revision |

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| **Overall Instructor Feedback/Comments** |

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| **Overall Instructor Feedback/Comments** |

**Integrated Instructor Feedback into Project Documentation**

Yes  No

**Project Approval**

Professor Mark Reha

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Project Overview and Project Objectives

**State the Problem and Background**

With the rapid expansion of GCU, there is a proportionately larger number of students utilizing the fitness centers. For many people who use the fitness centers it is an outlet and a healthy form of expression that can benefit mental and physical health. Due to the increase in student population, the fitness centers have become crowded often. To avoid the crowd some people will decide to go to different fitness centers or go during less popular hours. If there were a resource to provide real-time metrics on how busy a fitness center, it can help students avoid running the risk of going to a gym that’s already packed.

**Christian Worldview**

N/A

**Project Objectives**

* Utilize MongoDB to create RESTful API to send requests for website data.
* Website dynamically updates and refreshes to show live metrics from database-linked API
* Display metrics across all gyms on campus in one, easy to read table/visual for users to quickly glean info without needing to login
* Provide authorized logins for fitness center employees. Employees will be able to check students in and out, which will update the database and update the website dynamically.
* Prevent non-workers from logging in, meeting them with an error and warning message.
* Provide a pleasant user experience with attractive themes and colors as well as smooth navigation

**Challenges**

* Dynamic and reactive site is likely going to require JS. With some unfamiliarity with JS this could pose issues for dev team.
* Creating an attractive UI can also be a problem given that the dev team’s strong suit is backend development.
* With a new framework, some issues that come with a learning curve are to be expected.
* Utilizing a barcode scanner can be a challenge, since the hardware is new to the dev team

**Benefits and Opportunities**

* Bring attention to a possible change to enhance the gym experience for some
* Utilizing a Vue.js will give valuable experience in an industry standard language and framework for future use

Project Scope

1. Give a clear, concise statement that states the scope of the project. This should also include items that are to be out of scope.

Features in scope:

* Employee Login
  + Employee login using existing login credentials
    - Validated user input
    - Error handling
  + Ability to check students in and out (using ID #)
  + See student information as they check in
* Landing page
  + Display all gym metrics on page
  + Metrics include number of people and density % of each gym
  + Display time of last table update
  + Navigation button for about page
* Utilize ID barcode for check in using a barcode scanner

Features out of scope:

* Breakdown of trends in busiest times
* Cloud hosted

1. List the work breakdown required to satisfy the project objectives. Identify teams and other resources that may be required to successfully complete the project.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Work Breakdown Structure | | | | | | | | | | |
| ID | Task | Dependencies | Status | Effort Hours | Cost | Start Date | Planned Completion | Estimate to Completion | Actual Completion | Resource |
| 1 | Project proposal | N/A | In-progress | 5 | N/A | 9/13/22 | 9/18/22 | 9/21/22 | 9/24/22 | N/A |
| 2 | Purchase Udemy course for Vue | N/A | Not started | .25 | ~ $21 | 9/16/22 | 9/16/22 | 9/16/22 | 9/17/22 | Udemy.com |
| 3 | Complete Udemy course | Successful purchase of course | Not started | 56 | N/A | 9/1/22 | 11/10/22 | 11/10/22 | 11/20/22 | Udemy.com |
| 4 | Complete User stories | Completion of planning phase | Not started | 4 | N/A | N/A | 10/14/22 | 10/10/22 | 10/10/22 | NA |
| 5 | Develop backend and API | Completion of Vue course | Not started | 20 | N/A | N/A | 452 week 5 | 452 week 5 | 12/19/22 | NA |
| 6 | Develop frontend | Completion of Vue course | Not started | 20 | N/A | N/A | 452 week 7 | 452 week 7 | 12/23/22 | NA |
| 7 | Populate Database | Web app skeleton done | Not started | 2 | TBD | N/A | 452 week 3 | 452 week 3 | 12/16/22 | MongoDB |
| 8 | Buy and interface scanner | N/A | Not started | 16 | N/A | N/A | 452 week 10 | 452 week 10 | 11/15/22 | Amazon |
| 9 | 452 Week 5 milestone | N/A | Not started | N/A | N/A | N/A | 452 week 5 | 452 week 5 | 452 week 5 | NA |
| 10 | 452 Week 10 milestone | N/A | Not started | N/A | N/A | N/A | 452 week 10 | 452 week 10 | 452 week 10 | NA |
| 11 | 452 Week 15 Benchmark | Project completion | Not started | N/A | N/A | N/A | 452 week 15 | 452 week 15 |  |  |

Project Success Measures

To measure my project completion, I will use a number of milestone criteria. First off, I want to make sure that the information being loaded onto the website is up to date and accurately displaying the metrics of each gym. Another milestone that I will be looking for is that the website is dynamically updated and is reactive when being used by the “employee” end. I also want to ensure that a functioning, secure login is made for employees, and employees alone. Another criterion for my project’s completion is to be able to utilize a barcode scanner to also sign in students.

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| Project Completion Criteria |
| 1 – Up-to-date metrics on gym population |
| 2 – Dynamic |
| 3 – Functioning authorized registration and login for employees |
| 4 – Barcode compatible for check-ins |
|  |

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| --- | --- | --- | --- | --- | --- |
| Assumptions and Constraints | | | | | |
| ID | Description | Comments | Type | Status | Date Entered |
| 1 | Database will support API functionality |  | Assumption | High control | 9/23/22 |
| 2 | Vue limits the desired functionality of my app |  | Constraint | Medium priority | 9/23/22 |
| 3 | Vue course will be ample resource for usage of Vue |  | Assumption | Medium Control | 9/23/22 |
| 4 | JS proves to be too difficult to utilize |  | Constraint | High priority | 9/23/22 |
| 5 | Scanner input doesn’t work as intended |  | Constraint | Medium priority | 9/23/22 |

Project High-Level Solution

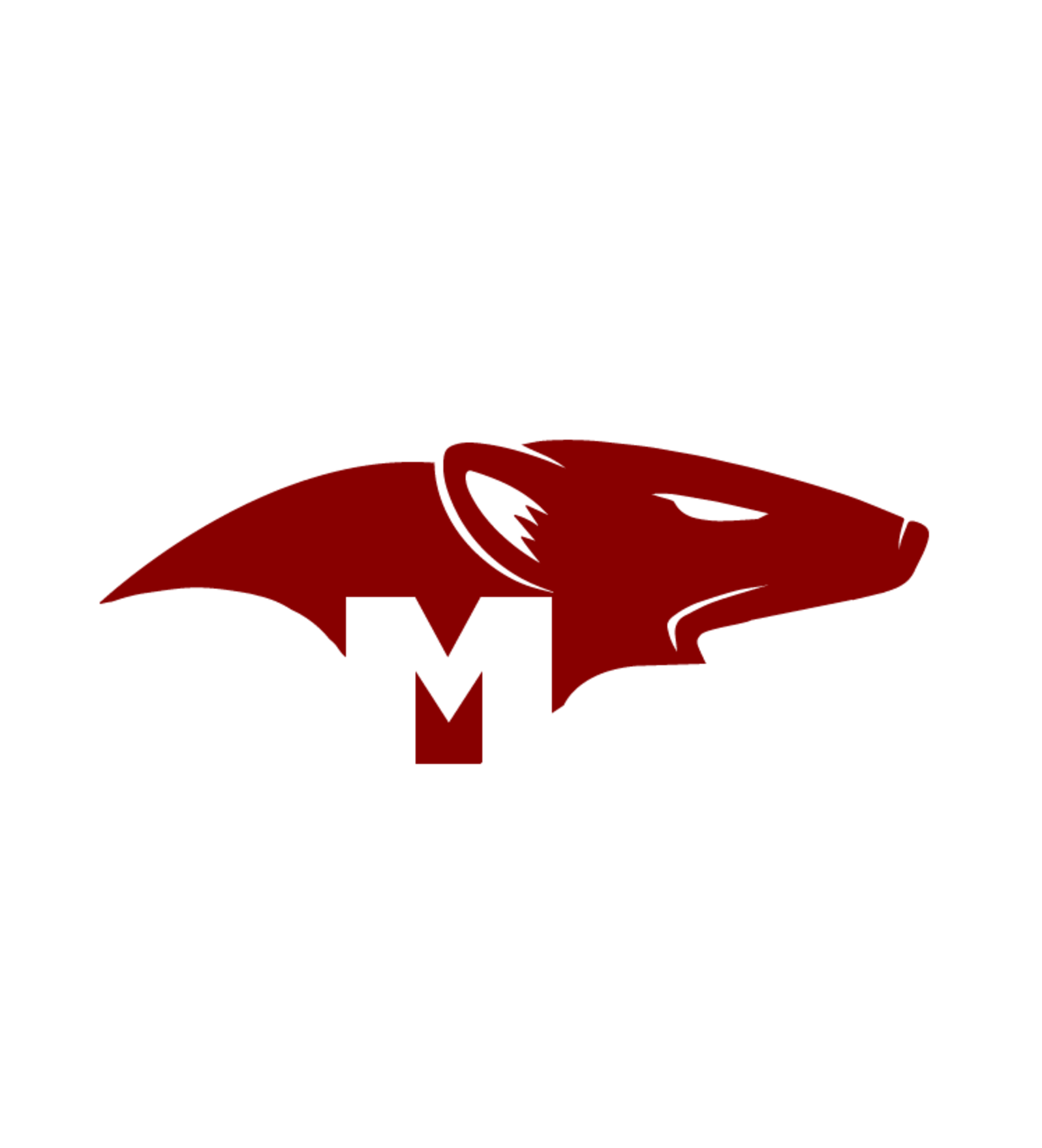
**Introduction**

With the increase in on-ground students at GCU, a corresponding higher number of students are actively utilizing the university’s fitness centers. For those who like to work out without bumping shoulders with people or waiting for a machine to free up, this can pose a problem. As of now, there is no system of keeping track of the live metrics of people in each gym, which can make working out a guessing game when deciding which gym to go to, and at what time. GCU currently employs camera systems in the campus restaurants to keep track of the line, but there is no similar system in the gyms. For obvious reasons, a camera system would pose privacy issues, but there is no reason to completely leave gym-goers in the dark on how busy and crowded a given gym is. Given that everyone has varying schedules, there is no reason that there isn’t a time that wouldn’t work for someone to use the fitness center when it isn’t crowded. The problem is, knowing when that time is, and which gym the time applies to. To solve this, the development team proposes AA Gymetrics.

**Solution**

Attached below is the proposed solution, utilizing a combination of JS technologies such as Node and Vue, as well as utilizing MongoDB as my database services.

Icon

Description automatically generatedA picture containing logo

Description automatically generatedGraphical user interface

Description automatically generated

As seen in the image above, the development team will be utilizing a number of technologies to provide a solution to the issue mentioned before. AA Gymetrics will be designed to provide information to students to help students decide when and where to go to work out an any given time. A single page app for non-employees will display metrics for each gym on campus, allowing students to stay in-the-know regarding the crowd and current “headcount” (so-to-speak) of each gym. For employees, a secure login will be provided to show another page which allows them to check students in and out of the gym, which will update and reflect the changes in the headcount in real time. The coding environment being used will be Visual Studio Code v1.73.0. Utilizing JavaScript in the context of the Vue v3 framework as well as Tailwind v3.1.8 for CSS purposes, will allow for a reactive and dynamic frontend experience for users. Axios v1.2.0 will be used in the Vue application to communicate with the Node backend application. Node v16.17.1 will also be utilized for the backend services, with Express v4.18.2 and Mongoose v6.8.0 being used as means of connecting to the MongoDB database. Postman v10.1.0 will be used to test the API services that will be utilized for the CRUD functions required for this project. Finally, MongoDB and MongoDB Compass v1.33 will be used to house the database and tables required to support the project’s need for data storage. **Project Controls**

1. Use the template to define the risk and list the steps to prevent the risk from occurring or the steps to minimize the chances of it happening. The contingency plan describes alternative solutions to reduce the impact of the risk. An example of a contingency plan is to provide the customer a temporary web server if there are delays in delivery/completion. If the risk has already happened, then provide an entry in the issue log.

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| --- | --- | --- | --- | --- |
| Risk Management | | | | |
| **Event Risk** | **Risk Probability**  **(high, medium, low)** | **Risk Impact** | **Risk Mitigation** | **Contingency Plan** |
| Lack of experience in Vue leads to downfall | Medium | Catastrophic | Finish Udemy course and do further research | Prepare to carry out project in a different framework |
| Time management | High | Medium to high impact depending on project phase | Setting personal milestones to complete certain steps | Shut out outside distractions, including social events and extracurricular |
| Scanner technology could be harder than anticipated to integrate | Medium | Medium to high | Research in-depth on barcode tech integration to JS | Put scanner technology as an out of scope feature |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Issues Log | | | | | | | | |
| **ID** | **Description** | **Project Impact** | **Action Plan/Resolution** | **Owner** | **Importance** | **Date Entered** | **Date to Review** | **Date Resolved** |
| 1 | What is the issue? | How will this impact scope, schedule & cost? | How do you intend to deal with this issue? | Who manages this issue? |  |  |  |  |
| 2 | Some components won’t function and reusable components | Will not affect much other than implementation | Stepped away from making them separate components and just implemented them in the other components | Arin | Mild | 1/9/22 |  | 1/9/22 |
| 3 |  |  |  |  |  |  |  |  |

1. All projects have either anticipated and planned or unexpected changes. Describe any issues in management or change management due to the anticipated and planned or unexpected changes. Use the template to list anticipated and planned or unexpected changes.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Change Control Log | | | | | | | | | |
| **ID** | **Change Description** | **Priority** | **Originator** | **Date Entered** | **Date Assigned** | **Evaluator** | **Status** | **Date of Decision** | **Included in Rev. #** |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |

Project Cost and Schedule

1. Create a spreadsheet of costs related to the scope of the project, with all necessary material and elements required to accomplish it effectively, and the allocated resources. Note: If the project being designed will not require any cost calculations, please state that here.

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| --- | --- | --- | --- | --- |
| Cost and Schedule | | | | |
| **Product/Service** | **Cost** | **Purpose** | **Other Requirements** | **Notes** |
| Udemy Vue.js course | ~$21 | Learn Vue.js framework to utilize for | VSCode |  |
| Barcode Scanner | $14 | Utilize barcode technology for check in | N/A |  |

1. See work breakdown structure

Appendix A – References

Masae, I. (2021, August 27). *Creating a Modal Dialog With Tailwind CSS*. Section. Retrieved April 5, 2023, from https://www.section.io/engineering-education/creating-a-modal-dialog-with-tailwind-css/

Appendix B – Copyright Compliance

After checking available domains, checking with the copyright office, and utilizing exact match Google searches, the development team determined that there are no current copyright issues. The team will continue to monitor these resources to ensure that there are no infringement issues as the project progresses.