

# Doctoral Management System

**CS486 - Capstone Experience:** School of Informatics, Computing, and Cyber Security

**Group Members:** Adam Larson, Eddie Lipan, Brandon Shaffer

**Sponsors:** Gretchen McAllister and Michele Benedict

**Faculty:** Michael Leverington, Daniel Kramer

TEAM WHAT'S UP DOC



# Introduction

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## Meet the Team:

- Adam Larson
  - Team Lead, connections and back end developer
- Brandon Shaffer
  - Repo manager, chief editor, front end developer
- Eddie Lipan
  - Front end developer
- Special thanks to mentor Daniel Kramer and CS Faculty Member Dr. Michael Leverington

## Meet the Client:

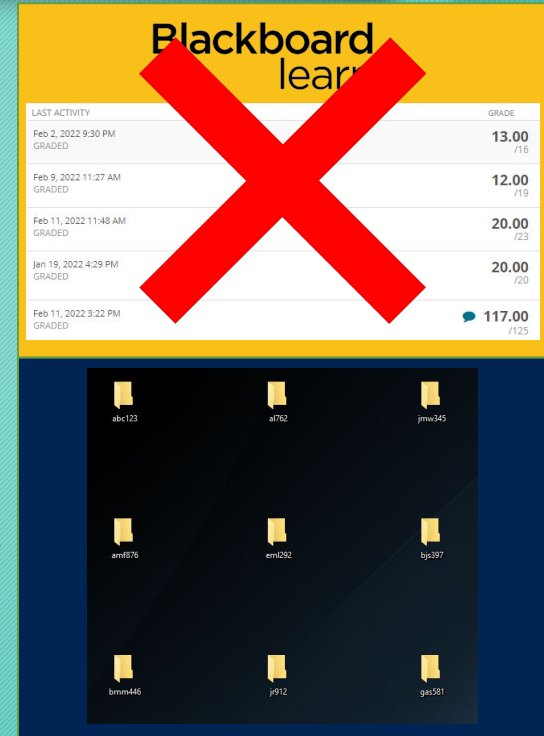
- Dr. Gretchen McAllister, Ph.D., Coordinator of the NAU Curriculum and Instruction (C&I) doctoral program
  - Aided by Michele Benedict, Administrative Services Assistant



# Problem Statement

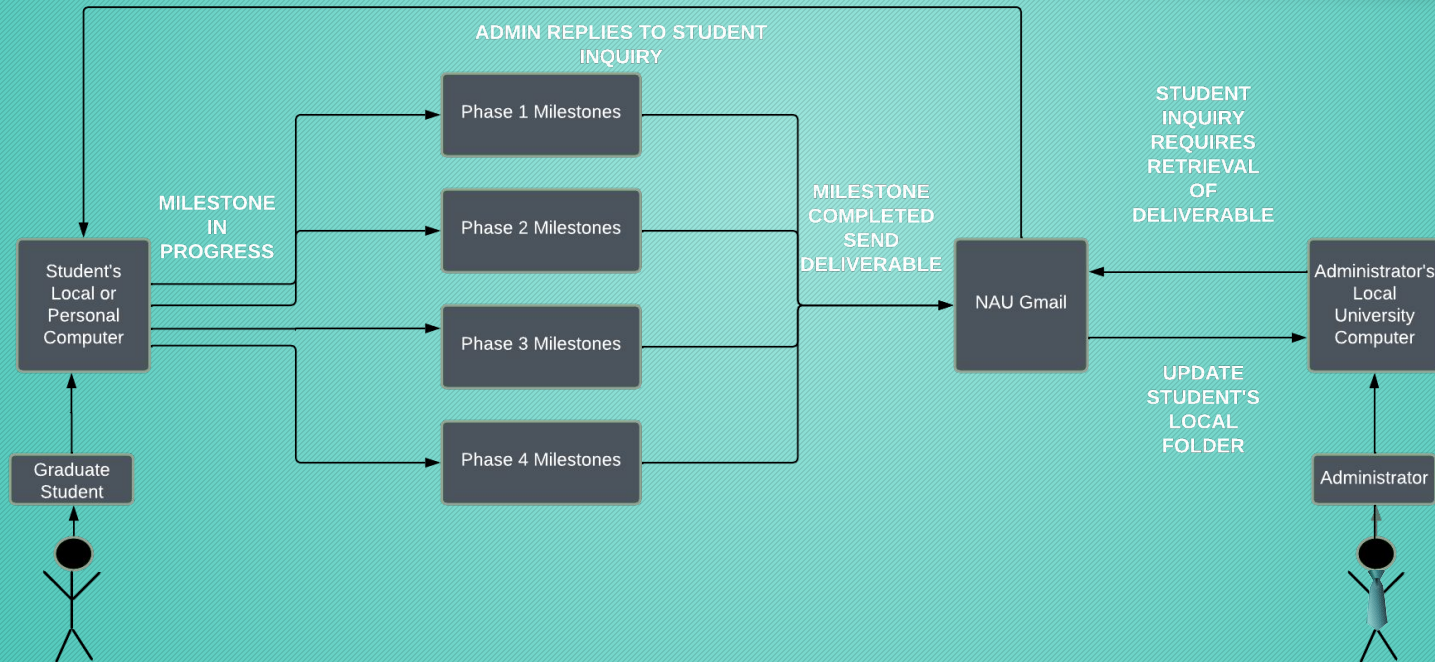
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- Learning Management Systems (LMS) such as **Blackboard Learn** or **Canvas** are generally used to manage undergraduate classwork and grades.
- As graduate work becomes less quantifiable, managing and tracking the program through a standard LMS becomes less feasible.
- The NAU C&I doctoral program's current workflow is **inefficient**.





## 4



Phase 1: Coursework    Phase 2: Qualitative Research Project/ Comprehensive Exams    Phase 3: Proposal and Prospectus    Phase 4: Research and Dissertation

Initial Program of Study: Completed 12/01/2022!

Residency Plan Form: Completed 12/01/2022!

Student Self-Evaluation 1: Completed 12/01/2022!

**Initial Program of Study**

Upload Download

Microsoft Word - dottie ... 1 / 6 90%

**Appendix C: C&I PhD Program Continuing Student Evaluation Form**

**NAU NORTHERN ARIZONA UNIVERSITY**

College of Education

**Curriculum and Instruction Ph.D. Program Continuing Student Evaluation Form**

During the spring semester, following a student's admission to the Curriculum and Instruction Doctoral Program, the faculty will evaluate the student's progress in the program based upon the criteria identified below. Each faculty member will complete the feedback form prior to the meeting and follow the google form process. In the google forms, if someone has worked with a student this past year as an administrator, faculty, or in another capacity, they will be prompted to complete the form.

Each student will be reviewed at the annual meeting and the advisor will generate a summary based on the feedback given which they will share with the student in an advising meeting. Every student currently enrolled will be required to meet with the advisor after this process. Students will also self-reflect annually which will be part of the meeting with the advisor. The summary and the student reflection will be placed in the digital student file.

If a student exhibits a weakness (rating of needs improvement or unacceptable) in any of the criteria, the student's advisor and student, in consultation with the Program Coordinator, will develop a Professional

Delete

Sign-Out



Add/Remove Students    Phase Review    Student Progress Viewer

| New User Edit User Delete User Copy CSV Excel PDF |           |            |                     |                 |                   |                 |
|---|-----------|------------|---------------------|-----------------|-------------------|-----------------|
| Show 10 entries                                   |           |            | Search:             |                 |                   |                 |
| userID  | Last Name | First Name | Advisor (Last Name) | Term Activation | Enrollment Status | Admin Status    |
| al762   | Larson    | Adam       | Donaldson           | fall2016        | fullTime          | false           |
| amf867  | Figurski  | Alana      | Breen               | fall2018        | partTime          | false           |
| bjs397  | Shaffer   | Brandon    | Hall                | spring2018      | fullTime          | false           |
| eml292  | Lipan     | Eddie      | Lindsey             | fall2019        | fullTime          | false           |
| Showing 1 to 4 of 4 entries                       |           |            |                     |                 |                   | Previous 1 Next |

# Solution Overview

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- Intuitive, browser based, website application
- Students can:
  - Track their own progress within the graduate program
- Administrators can:
  - Add/edit/delete users
  - Analyze how students are doing in each phase of the graduate program

# Requirements

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## Functional

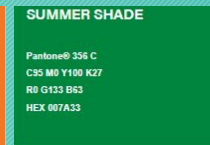
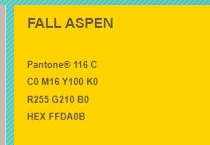
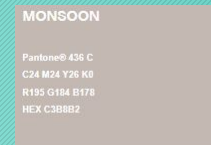
- Student and administrative access to documents
- Interactive GUI to promote student engagement

## Performance

- Optimized server reliability

## Environmental

- NAU colors to relate it to the university
- Accessibility to all students





# Architecture and Implementation

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## Website

- HTML based website with CSS formatting
  - jQuery and DataTables used to display data
- JavaScript supported functionality and communication

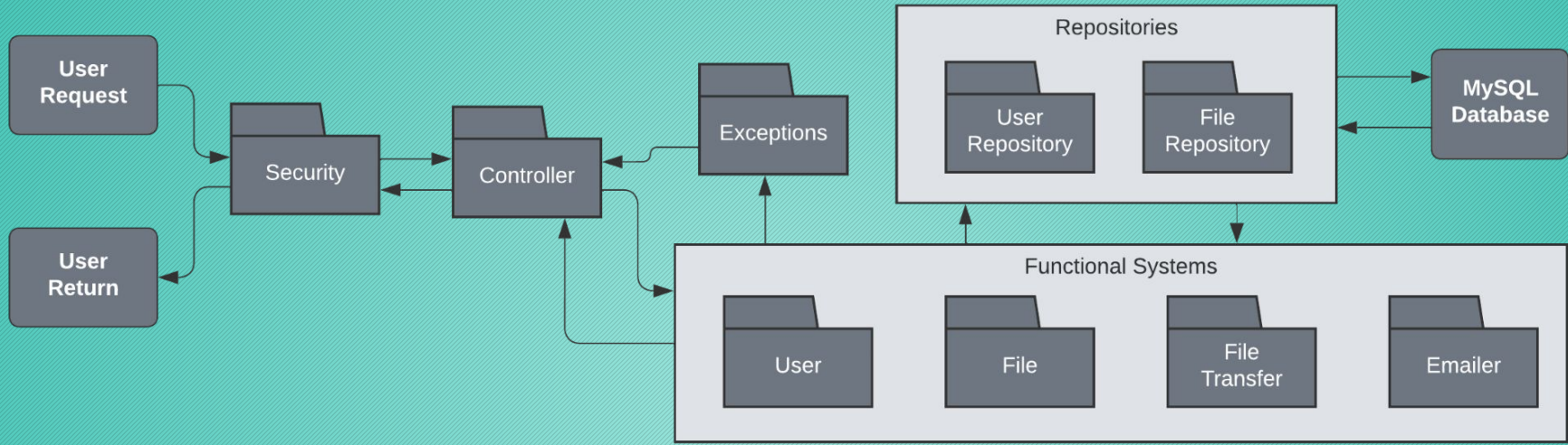
## Server

- Java based using the Spring framework to run server communications
- Connections to database using a Java Persistence API (JPA) module

## Database

- MySQL



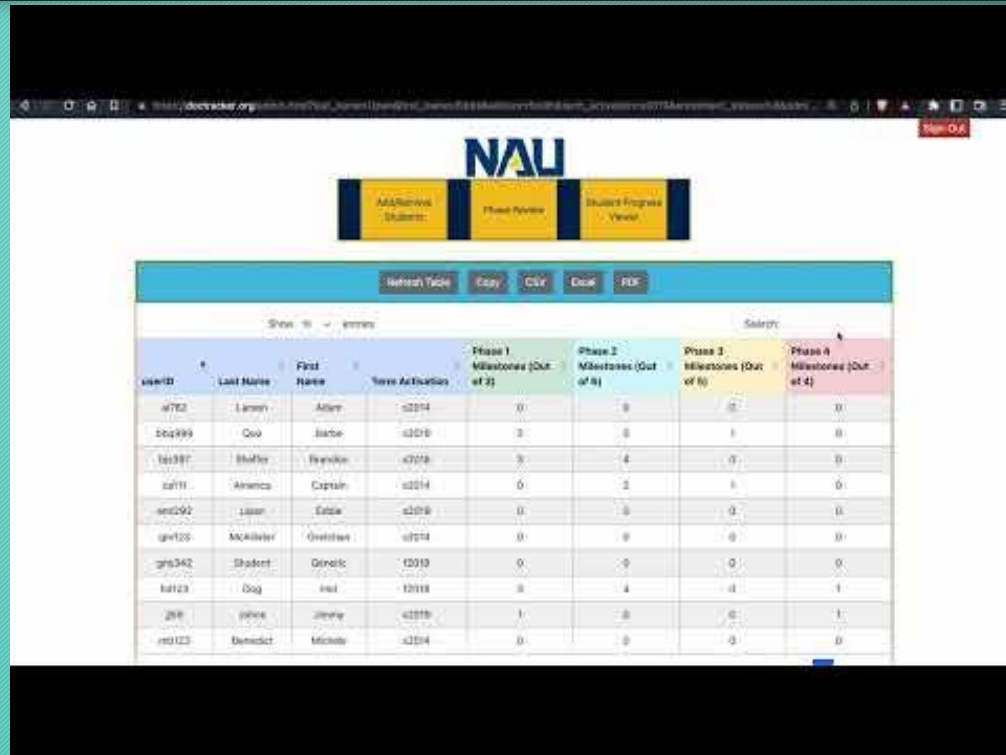


# Architecture and Implementation



# Prototype

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NAU

All Active Students Phase Active Student Progress View

Refresh Table Copy CSV Download PDF

Show 10 items Search

| userID | Last Name | First Name | Term Activation | Phase 1<br>Milestones (Out<br>of 3) | Phase 2<br>Milestones (Out<br>of 8) | Phase 3<br>Milestones (Out<br>of 6) | Phase 4<br>Milestones (Out<br>of 4) |
|--------|-----------|------------|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| st702  | Larson    | Adam       | s2014           | 0                                   | 0                                   | 0                                   | 0                                   |
| stq999 | Cox       | Jarbo      | s2016           | 3                                   | 6                                   | 1                                   | 0                                   |
| stq987 | Shaffer   | Brandon    | s2016           | 3                                   | 4                                   | 0                                   | 0                                   |
| st111  | Amesca    | Captain    | s2014           | 0                                   | 2                                   | 1                                   | 0                                   |
| stc292 | Lison     | Estela     | s2016           | 0                                   | 0                                   | 0                                   | 0                                   |
| gst123 | McKister  | Overton    | s2014           | 0                                   | 0                                   | 0                                   | 0                                   |
| gst342 | Shadert   | Genetic    | s2016           | 0                                   | 0                                   | 0                                   | 0                                   |
| bst123 | Dog       | red        | s2016           | 0                                   | 4                                   | 0                                   | 1                                   |
| st5    | police    | Jimmy      | s2016           | 1                                   | 0                                   | 0                                   | 1                                   |
| stq123 | Benedict  | Michale    | s2014           | 0                                   | 0                                   | 0                                   | 0                                   |

# Challenges and Resolutions

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## Challenges

### Server Hosting

- NAU or offsite
- Server, Database, and security certificates

### Time

- Overestimation

### New Technologies

- Research
- Practicality

## Resolutions

### Server Hosting

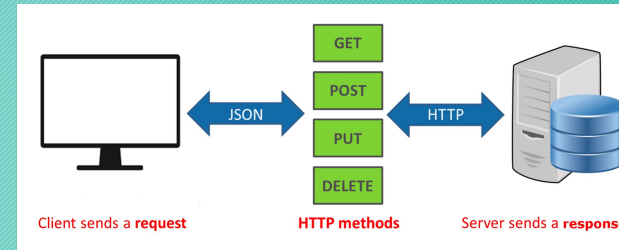
- Offsite - AWS
- Can manage all needs

### Time

- Limiting requirements

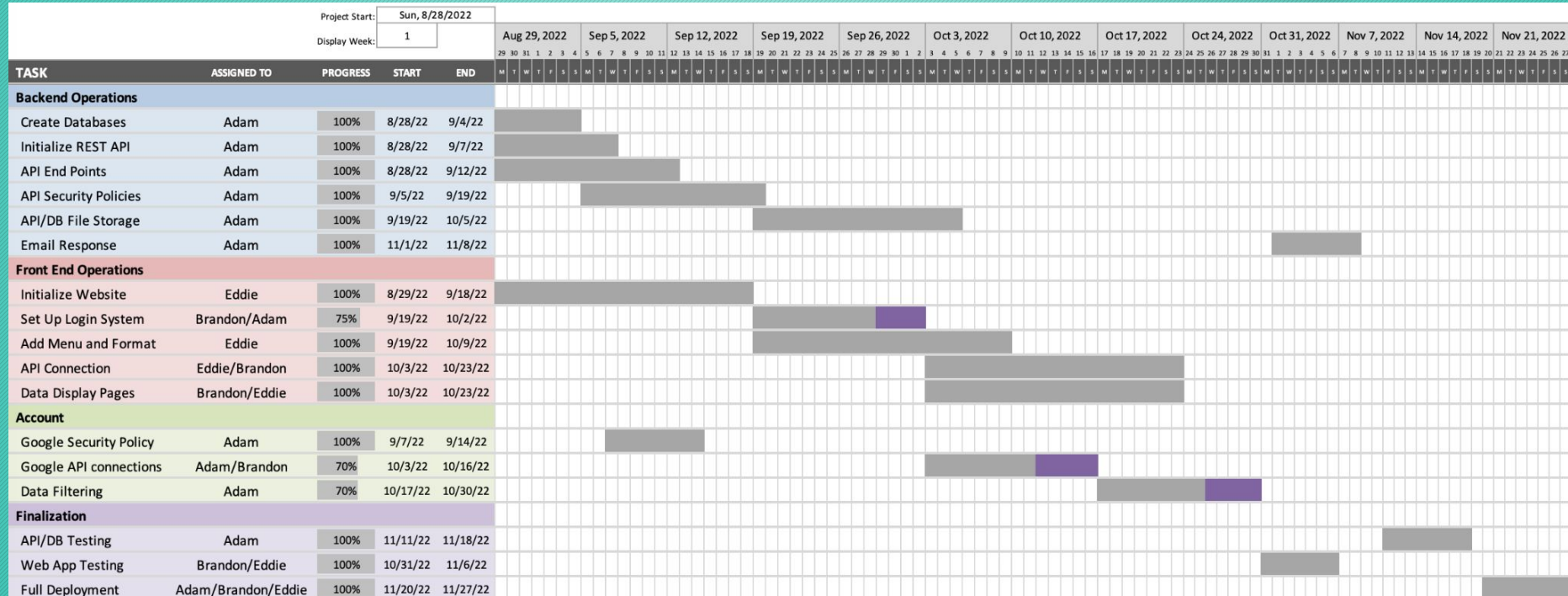
### New Technologies

- Focus on core systems
- Solutions that fit with moderate familiarity



# Schedule and Testing

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# Schedule and Testing

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## Testing

### Website

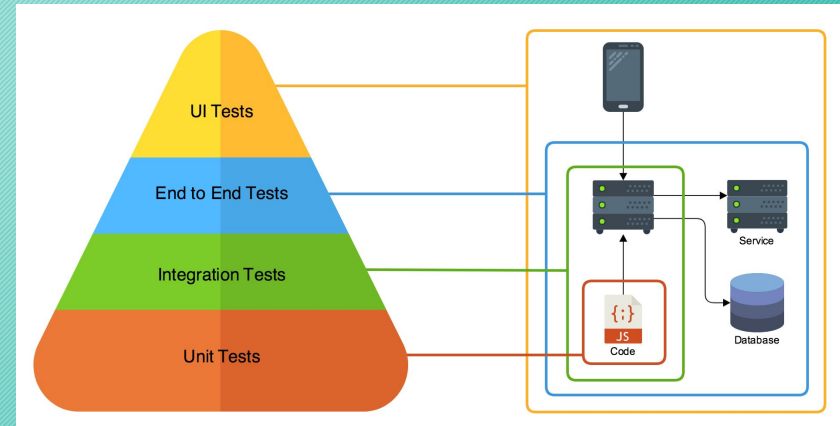
- Manual iterations of viewable and interactive components

### Server

- Automated
- Functionality of individual components and full systems

### Database

- Manual testing of basic requests



# Future Work

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## Permanent host migration

- Offsite or long-term NAU host
- NAU adoption

## Login system functionality

- Add unique user system for practical student use
- Adjust interface and server to accommodate unique users

## Extensibility to other college programs

- Create college customizable options
- Primarily interface related



Sign in with Google

# Conclusion

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## Problem

- Tracking/managing the C&I graduate program through a standard LMS is not feasible

## Web App Solution Features

- Saves files (with download)
- Allows visualized progress
- View uploaded files

## Implementation

- ~80% project completion
- Login system token exchange requires further development

## Impact

- Clients are satisfied with the scalability, style, UI, and functionality of the project



**Thanks to our Clients:** Dr. Gretchen McAllister and Michele Benedict

**Thanks to our Faculty:** Dr. Michael Leverington and Daniel Kramer