

# Project Management Report

Due Monday, February 17, 2020, before class

Team 3 Owen, Gracie, Abby, Ben, Brad, Katie, Ana

## Introduction:

This report describes Team 3's management plan for its project to develop a mastery system gradebook dashboard for Davidson College.

### 1. Expected Level of Effort in Person-Months

We anticipate our final project will contain 800-1200 LOC. According to the COCOMO II model, the project will take **1.566** person-months to complete. Given our team of 7 people, a prototype of the professor-side interface and a functioning student side interface is feasible for us to complete by the end of the semester.

### 2. Overall High-Level Schedule for the Project

Assuming a start date of February 22, the project is estimated to take approximately 2-3 months. This is longer than the COCOMO II model suggested, but since we are a team of students and we are not working full time, we think this is a good estimate of our schedule. We intend to work in 3 teams: one for the student side (2 people), one for the professor side (3 people), and one team managing the database (2 people).

Two deliverables:

1. a application interface for the student
2. a application interface for the professor

Assumption:

- Our software deliverable will be the foundation for an eventual deployment of our application

We estimate 12 weeks to develop our deliverables. We will break up the 12 weeks into 5, two week sprints and leave two weeks and then end for final testing and catching up. We continually will modify our schedule depending on professor feedback and our class schedule. Our tentative schedule is as follows:

SPRINT 1 Weeks 1 - 2: Initial meetings with professor(s) to explore requirements, staff planning with our team, and an R/Shiny "bootcamp" to get everyone on the team up to speed

SPRINT 2 Weeks 2 - 4: Determine initial requirements and create UI/UX mockups, design and implement the database schema, set up the structure of the application to satisfy the separation of MVC, and begin working with R to produce a basic application

SPRINT 3 Weeks 4 - 6: Receive initial feedback, iterate on application, perform tests

SPRINT 4 Weeks 6 - 8: Receive secondary feedback, iterate on application, perform tests

SPRINT 5 Weeks 8 - 10: Receive tertiary feedback, iterate on application, perform tests

Weeks 10 - 12: conduct final testing and make final changes

### **3. Quality Plan**

By the end of the semester, we hope to develop an appealing and functional interface for students to access their grades. Additionally, we hope to develop an easy-to-use interface for professors to input data and visualize progress and trends across the class as well as information on specific students. Our goal is to prevent as many errors as we can while developing through pair programming. Additionally, our goal is to detect errors by iteratively testing our application and giving our application to users to find any bugs.

### **4. Risk Management Plan**

- Security/confidentiality of student data
  - probability of happening: high
  - loss to project if it occurs: high
    - Compromising the confidentiality of student grade data would be detrimental to our application and would betray the trust of students. Additionally, if students had the ability to manipulate their own grades in our system, it would cause major issues for the professors and the school. To ensure the security of our application, we will consult T&I and figure out the best way to keep student data encrypted. We will also severely limit the student's access to the database to prevent them from modifying grades. We will be sure to test the confidentiality and security of our application extensively.
- Reliability of student and Professor data transactions
  - probability of happening: medium
  - loss to project if it occurs: medium
    - We want to ensure that students are seeing the most up to date information and that there are no discrepancies between the student side and the professor side of the application. We will mitigate this by using one database to store all of our information.
- Scheduling conflicts between team members and with professors during planning/developing
  - probability of happening: medium
  - loss to project if it occurs: medium
    - At Davidson, it is often difficult to schedule meetings with other students and professors. We hope to meet with Dr. Smith to gather requirements for our application, but we are aware that it may be difficult to spend a

lot of time working with her. By splitting up the development of our application between three teams, it will be easier for us to meet with each other and with other professors. Also, we will be able to share knowledge with our team members within the small groups so that not everyone has to be at every meeting.

- Compatibility issues between tools and technologies
  - probability of happening: medium
  - loss to project if it occurs: high
    - We hope that all of the tools we are using will work well together, but there is always a chance of running into bugs and technical difficulties!

## **5. Project Monitoring Plan**

We will create functionality milestones to track our progress as we develop our application. Here is an initial list of milestones:

1. Create document of initial requirements for the application and turn them into user stories
2. Create a database schema
3. Create UI mockup for professor side
4. Create UI mockup for student side
5. Link database to front end
6. Implement basic data entry on professor side
7. Implement basic data retrieval on student side
8. Design and implement a user-friendly UI for professors to input data and design their own gradebook
9. Design and implement a user-friendly UI for students to visualize all of their grades
10. Add additional features to professor side (calendar, tracking progress, etc.)
11. Add additional features to student side (calendar, tracking progress, etc.)
12. Create a login system for students and professors

At the beginning of each sprint, we will decide what features we want to accomplish and what milestones we want to complete. At the end of each sprint, we will see which milestones we have successfully completed, which will allow us to see whether or not we are on track with our goals.

If we are not on track with our goals, we will reconsider the feasibility of our milestones and create a new approach that will work better with our schedule. We want each feature we complete to be fully functional and do not want to rush our development, so we are not afraid to take a step back and reconsider what we need to accomplish.

## 6. Detailed Scheduling

We estimate 12 weeks to develop our deliverables. We will decide the length of each sprint depending on professor feedback and our class schedule. Our tentative schedule is as follows:

SPRINT 1 Weeks 1 - 2: Initial meetings with professor(s) to explore requirements, staff planning with our team, and an R/Shiny "bootcamp" to get everyone on the team up to speed

All teams will do research...

- team 1 (professor side): meet with professors to get an idea of what they would want this application to look like
- team 2 (student side): meet with students in classes using the mastery grading system to see what they would want in an application
- team 3 (database management): learn how to connect MongoDB with R/Shiny

SPRINT 2 Weeks 2 - 4: Determine initial requirements and create UI/UX mockups, design and implement the database schema, set up the structure of the application to satisfy the separation of MVC, and begin working with R to produce iterations of the application

All teams will work together to write up a document of requirements (checkpoint 1).

Additionally, each team will plan and design their interfaces.

- team 1 (professor side): design a UI (checkpoint 3) and create a basic application (checkpoint 6)
- team 2 (student side): design a UI (checkpoint 4) and create a basic application (checkpoint 7)
- team 3 (database management): design a database schema (checkpoint 2) and connect database to UI (checkpoint 5)

SPRINT 3 Weeks 4 - 6: Receive initial feedback and iterate on application

All teams will try and meet with Dr. Smith to show her our initial application and receive feedback from her. Then, each team will use that feedback to iterate on our application.

- team 1 (professor side): expand on basic application and implement more UI features
- team 2 (student side): expand on basic application and implement more UI features
- team 3 (database management): expand on basic application and implement more features

SPRINT 4 Weeks 6 - 8: Receive secondary feedback and iterate on application

Repeat process of weeks 4-6.

SPRINT 5 Weeks 8 - 10: Receive tertiary feedback and begin initial testing

We will give our current application to professors and students for testing purposes. The users will use our application and provide feedback about functionality and user-friendliness.

- team 1 (professor side): use feedback to fix bugs and improve UI
- team 2 (student side): use feedback to fix bugs and improve UI
- team 3 (database management): Conduct unit tests for each feature of the application

Weeks 10 - 12: conduct final testing

All teams will work together to wrap up our application and extensively test all features. We will fix bugs as we find them and continue to improve our application. However, we hope to be done with adding new features at this point.

- team 1 (professor side): take final notes and make final adjustments
- team 2 (student side): take final notes and make final adjustments
- team 3 (database management): take final notes and make final adjustments