Department of Computer Science and Engineering
The University of Texas at Arlington

Padawan Programmers

Mavs Assistant Reporting System

Team Members:
Bernae Tull
Calvin Hovsepian
Bruce Derou
Thang Le
Minglu Wang

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1 Project Overview

1.1 Product Description

M.A.R.S. (Mavs Assistant Reporting System) will automate the tracking of hours, etc. of UTA College of Engineering undergraduate class assistants. Assistants will able to login via a mobile app to clock in/out. The clock in/out process will be verified with facial recognition. Assistant's clock in/out location and time will automatically be tracked using a QR code, generated by a locally installed program on certain computers, to provide a seamless way for assistants to generate their timesheet. Additionally, this system will include a website for administrators to view and manage various information.

1.2 Project Oversight

The team has agreed on completing assignments at least 3 days before the official syllabus dictates, so that the team has more time available to have the documents reviewed by several people before officially submitting them. The tasks are broken down into the smallest possible working units, providing the team the ability to easily understand each one of them. Tasks will be delegated according to the individual's strengths.

For documentation, the team is using Google Drive and GitHub, to enable version control of each document. The team has a group chat, which enables real time communication among all the team members, where every concern or topic is discussed or the time for a meeting is established.

1.3 Roles and Responsibilities

Below is the breakdown of our team's responsibilities by team members.

Team Member	Roles	Responsibilities
Thang Le	Application Lead Web Server Lead Web developer	Manage app development Manage web server Admin website developer
Calvin Hovsepian	Database Lead	Design database Manage database Manage queries
Bruce Derou	Application Developer	Application developer Admin website developer
Bernae Tull	Document Master Website Lead	Document formatting Admin website developer Manage website development
Minglu Wang	Team Leader Scrum Master	Delegate tasks Keep project/team on track Facilitate meetings with team and product owner
Dr. David Ewing	Product Owner	Provide requirements Provide feedback on project

1.4 Project Constraints

The following are a list of constraints that could potentially affect the outcome and/or quality of this project. We have deemed them to be unavoidable at the present time, and as such we will not go into detail about how to resolve them:

- **Limited Time**: We will have 2 semesters, roughly 9 months including winter, to see this project through to completion. This means that we will have to plan accordingly and use our time effectively. In order to make sure the important features are completed and delivered we will prioritize the most critical features over non critical features.
- **Limited Budget**: The budget set for this project is $800. Our product does not have any hardware components; therefore, we will not need to spend our budget on materials. We will however, need to purchase an API in order to make face recognition functional. This constraint could limit the quality of our face recognition feature in the application.

Additionally, any service that we use which requires payment on a monthly basis (such as a server to host our website) will eventually be lost.

- **Limited Knowledge**: The scope of this project is limited to Android, iOs, and web development. While our team possesses a vast set of skills, it does not contain any experts in any of the above listed fields. Additionally, we have limited knowledge with combining all these systems. Our limited knowledge in one or several areas could potentially affect the outcome of this project.
- **Limited Materials**: A big constraint we foresee is our limited access to iOS development tools. The product's iOS app will be much harder to develop without a Mac laptop.
- **Other Obligations**: Every member of this team has obligations outside of this project. These obligations include other classes, work, family, and personal relationships.As such, it is understood that team members will not be able to dedicate all of their focus at all times to this project. As a team, we will be flexible enough for occasional meetings.

1.5 Project Assumptions

The following are assumptions identified by the group. They may pose a risk to the successful development of the project and will need further evaluation and validation during subsequent project process phases. They are listed below:

- **Team Effort**: All members of the team will put in as much effort as required in order to see the project through to completion.
- **Communication**: Team members will communicate effectively and will respond to each other in a timely manner.
- **Team Meetings**: All team members will do their best to arrive promptly for meetings and to be prepared to be productive in meetings once they have started.

2 Project Scope Management

2.1 Project Scope

Generally speaking this project will be limited to/be comprised of a website, phone application(s), desktop program/module, and database, all interlinked. It is not any one of these entities, rather the culmination of all of them. The dedication of time required for development will be all class time made available, as well as any and all time team members are capable of dedicating to the project per sprint, over the course of the academic year. Most of the necessary research will be completed early on in the academic year and will comprise most of the early sprints. The main resources necessary will include cloud based storage(servers, etc), programming development tools, and an allotted amount of finances($800). The scope of skills regarding this project will include mobile and desktop app development, website and database development, implementation of biometrics.

2.2 Scope Management Process

- The scope will be derived from the product backlog which will be adjusted/updated throughout the project development cycle.
- The scope of each sprint will then be derived from the overall scope and requirements. At the end of each spring verification of the proper maintenance of the scope will be done by interacting with the sponsor.
- The estimation of the amount of work that can be completed each sprint will be obtained from assessing the time availability of group members for that sprint, as well as the difficulty of the backlog items that are being considered.
- If a team member of sponsor feels project development has at any time deviated from the predefined scope a meeting will be called to either adjust the development processes, adjust the predefined scope, or to deem the concerns as unwarranted.

3 Change Management

3.1 Change Management Plan

Potential Changes

- Switch of development tools.
- Change of location of local and non-local storage devices & systems.
- Adjustment of biometric verification techniques used.
- Addition or deletion of system features and/or modules
- Swapping of team member development roles.
- Adjustment of product backlog.

Potential Causes of Above Changes

- Difficulty of use, inability to perform desired tasks, and/or lack of skill with the current toolset
- Financial constraints, potential latency issues, technical shortcomings (of lack of) of pre-installed software/tools on said devices or systems.
- Difficulty implementing, over demanding of resources, inability to implement on both platforms, lack of API support, regarding the initially desired biometric verification.
- Time constraints, resource constraints, technical incompatibility between modules/other features.
- Difficulty completing assigned tasks, certain tasks introduced later on may be better suited for other team members, time/resource constraints experienced by member(s) during sprints.
- Merging, breakup, or deletion of certain tasks based on the change of requirements and/or scope.

3.2 Roles and Responsibilities

Product Owner: David Ewing

Establishes the initial-general product requirements. Consulted at the end of each sprint to insure adherence to the scope and original product requirements. Also can be consulted during sprints if unsure about a certain aspect of the products requirements or scope.

Scrum Master: Minglu Wang

Ensures team cohesion. If changes are made regarding any elements of the projects she make sure all members are aware during development. Keeps tabs on members during each sprint to insure role adjustments are made if necessary.

Project Team: All other developers

Implement any changes made that affect the development process. Make the scrum master & other members aware if there are any difficulties/complications in the development process that could affect the scope or requirement. Make the scrum master & other members aware of discovers that could affect project resources.

Other Stakeholders/Customers: Teaching Assistants, admins, etc.

Voice satisfaction, dissatisfaction, or ideas regarding deliverables to team members so that changes can potentially be made.

3.3 Change Management Process, Implementation and Artifacts

Change is measured largely through the use of requirements traceability, analysis, and elicitation. If changes are made to requirements (which ultimately affect the product backlog) changes of equal magnitude are made to the development process. The effectiveness of this change is then measured at the end of next sprint by analyzing its adherence to the adjusted backlog items and requirements.

The process of change begins at the end of a spring when deliverables are introduced to the sponsor. Once changes are proposed and agreed upon with the sponsor team

members then use the next Sprint Planning Meeting to address any changes that need to be made to the product backlog and what affect that has on completed items, resources, and potential impact on technical implementations. If is discovered (at the Planning Meeting) that the proposed changes could have a notable impact on any resource the sponsor is made aware. If it is deemed that the magnitude of the impact is such that it has a vastly negative effect on resources or conflicts with requirements these issues are presented to the sponsor before the next spring begins.

4 Risk Management

4.1 Purpose of Risk Management

Risk management is a continuous process that is analyzed during, before, and after each sprint. Separate processes are in place for each of these scenarios in the case that a risk arises.

4.2 Roles and Responsibilities

- ***Product Owner: David Ewing***

  Notifies the development team if he/she feels at any point there is a risk that needs to be addressed. He/she may also propose ideas to mitigate or avoid the particular risk entirely.

- ***Scrum Master: Minglu Wang***

  Analyzes the development progress of each member in case a risk scenario arises during the sprint. Is also the first person address if a team member believes a notable risk needs to be made aware of / addressed. Calls group meetings in the case that everyone needs to be made aware of said risk.

- ***Project Team: All other developers***

  Constantly on the lookout for potential risks, this includes during, before, and after each sprint. Team members report risk directly to the scrum master. Members are also responsible for minimizing potential risks via their development techniques.

4.3 Risk management Process

- **Risk Minimization**

  Risk management is a continuous process. The first step is making all team members aware of potential risks at the beginning of a sprint. The second step is assigning tasks to members which feel most confident in their ability to implement the task. The last step is

the practice of secure & mindful development by team members to reduce the possibility of risk arising down the line.

- **Risk Analysis**

  We currently have no automated systems in place to analyze risk, other than those integrated into our development tools. Analysis is largely done by all individuals involved in the product development. This is largely dependent on the fact that all members are acutely aware of all potential risks regarding their development. It is the scrum master's job to discover any risks that could arise from the integration of individual items being completed during the sprint.

- **Risk Mitigation**

  If a team member comes across an issue or a risk during the development process (during the sprint) he/she introduces the scrum master to the risk. A meeting is called to address the risk. Team members then introduce ideas to mitigate the risk. If these ideas involve adjustment to the sprint or product backlog (such as inclusion or deletion of items) the sponsor is made aware at the end of the sprint.

5 Project Management Methodology

5.1 Agile and Scrum

We start from the small parts of the product, and slowly combine every piece together, it can reduce additional work if there are anything changes after.

5.2 Scrum Meetings

Daily scrum meeting is conducted whenever through the online app GroupMe, everyone talks about the progress and constraints, and the meeting information will be saved on the history. For sprint backlog meeting, it will be take place in class as the syllabus suggested, and then the develop team will meet with the product owner, and finalize the sprint backlog. Sprint retrospective also takes place as the syllabus schedule, we chat on the GroupMe, then we use Google Drive and the whole team would work on the retrospective presentation slides. Sprint Review happens after every sprint, an overview of sprint review will run once before demonstrating to the professor, and then we will hold another meeting with product owner for the sprint deliver and achievement, also we will ask questions and get advice from the product owner.

5.3 Scrum Artifacts

Using online application to keep the whole development group in touch is a great idea, everyone can see the message history, and it's easier to push other teammates to work on stuff after seeing some progress happening. A shared Google Drive is also an important scrum artifact, the team has access to the shared document, and everyone can be able to work on one document at the same time.

5.4 Supporting Information

Our product and sprint backlog are updated at every sprint, and we will mark it as complete whenever we finish doing it, and if it's not complete, we will mark it at the end of every sprint. Our definition of done is when we don't need to go back and change anything of that particular

item. Product design is finalized through meetings with the product owner after initialized by the development team.