Quest Log

by

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ABSTRACT

Quest Log is an interactive mobile and web application that allows users to play a game of Dungeons and Dragons by using their phones and laptops. We accomplished this by allowing players to import their characters into the Quest Log application by allowing them to upload XML files. Additionally, it allows the players to view a map displaying their location along with the locations of other players and monsters. Quest Log allows the Dungeon Master to view the character information for all players as well as give him/her the ability to move characters and monsters. Quest Log was developed as a web and mobile application. This was done using Visual Studio and Xamarin in order to make the application for the web and Android devices. Quest Log aims to make playing Dungeons and Dragons require less paper and less time to set up.

1. PROBLEM STATEMENT

1.1 Introduction

Dungeons and Dragons (D&D) is a table-top role playing game with millions of players worldwide. A game of D&D is played by using dice, paper, and imagination. There is a large and diverse player-base for D&D. There are 2 distinct roles involved in D&D: the Dungeon Master (DM) is the person who is running the game, and the players are controlling their characters in the game. The DM must keep track of enemy positions as well as information pertaining to the "world" such as maps and non-player-controlled characters. The players need to keep track of information about their characters.

1.2 Project Description

We developed an application for mobile and PC platforms that allows players and DMs to keep track of the information they need. Our application is beneficial to players because it allows them to use their phones instead of keeping paper and dice with them. Additionally, it will be useful to DMs because it allows them to see the information on all the players. Our application allows players to import their characters from popular existing programs such as HeroLab. Additionally, since there are many different rulesets for D&D, our application focuses on the Pathfinder rule set and 5th Edition. Finally, Quest Log will allow players to move their characters on the map.

1.3 **Problem**

The problem that D&D players and DMs alike face is that there is a lot of paper that is involved in playing the game. This means that people can forget their character sheets or dice which can prevent a game from going smoothly. Additionally, there are many different programs that someone would need to use to play a paper-less game of D&D.

1.4 **Solution**

The solution to fix the amount of paper required to play D&D is to use Quest Log, which allows players to track their character information on a mobile device. Quest Log features the ability to import character information from many popular existing character creation utilities, eliminating the need for paper character sheets.

2 User Profile

Below is the user profile of Quest Log. It details our potential users and how the application will be designed for their needs.

Project Name:

Quest Log

Potential Users:

- D&D Dungeon Masters
- D&D Players

Software and Interface:

The users of Quest Log will be people who want to play a session of Dungeons and Dragons. Our application will allow the players to import their character information from a variety of popular sources such as Hero Lab into our mobile application to be viewed in an interface designed to be viewed on a small form factor device. If there is a map being used, the players will be able to move their piece around. The Dungeon Master will be able to view all of the characters information and control what the players see on their maps as well as moving non-player characters on the map.

Similar Experiences:

Our users would most likely be familiar to programs such as:

- D20Pro
- Hero Lab
- HeroSheets
- PCGen
- Roll20

Task Experiences:

Players should be able to import their character information from a variety of sources. The character information should be easily navigated so that the players can quickly find the information that they are looking for. The players should be able to see the parts of the map that are made visible to them by the Dungeon Master and move their character around. Dungeon Masters will be able to create a game and add players and resources such as maps, pictures, and documents to be made available during the game. The Dungeon Master should be able to bring up player and non-player character information at will. The Dungeon Master should also be able to move any character around the map as well as control what is visible to each player.

Frequency of Use:

Players:

- For the majority of a session
- A bit of time intermittently to update character information outside of game time

Dungeon Masters:

- A majority of a session
- Intermittently throughout the week to add resources in preparation for the sessions.

Key Interface Design Requirements:

- Easy to navigate interface for viewing on a mobile device
- Clean map interface so that it is clear what is going on
- Easy to add players to games
- Easy to find and quickly to join a game

Figure 1: User Profile

2.2 **Use Case Diagram**

The below figure shows the different actions that both types of users would take while using Quest Log.

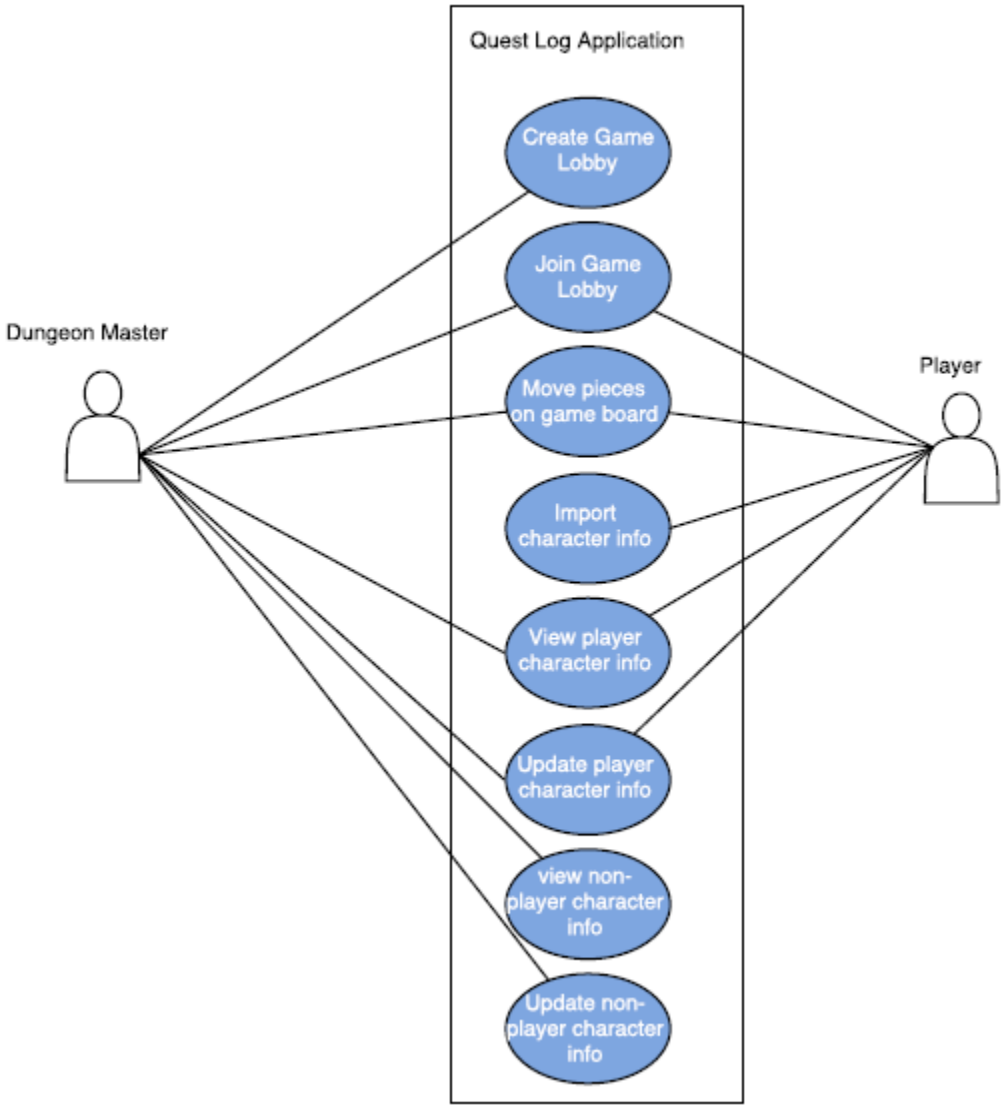

Figure 2: Use Case Diagram

3 Project Management

3.1 Objectives/Deliverables

In the following table, Table 1, we have laid out what our major milestones were for our project. Originally, we decided to focus on mobile first. However, over the course of the project we found that developing the web application first was the easiest way to develop our architecture.

MAJOR PROJECT MILESTONES (DELIVERABLES)				
Ideation Milestone	10/05/16		Database Milestone	1/1/17
Planning Milestone	10/17/16		XML Parse Milestone	2/1/17
Software Setup Milestone	10/19/16		Rooms Milestone	2/1/17
Hello World Milestone	10/21/16		Canvas Milestone	3/14/17

Table 1: Major Project Milestones

3.2 Budget

The following budget is merely a conceptualization of what it would cost if we were to develop this in industry. We researched what the median rate was for a software developer and estimated the amount of hours it would take to develop for the fall and spring semesters. Additionally, we included the cost for an Amazon Web Services server in hours and multiplied it by the unit price. For additional information, please see Table 2.

No.	Item	Quantity	Unit Price	Total
1	Labor	240	$30.00	$7,200.00
2	AWS	744	$0.02	$14.88
3	Android Tablet	1	$150.00	$150.00
4	Misc	1	$100.00	$100.00
	Total	-	-	$7,464.88

Table 2: Project Budget

3.3 Project Timeline

Below is a Ghantt chart that outlines our planned timeline for our project's development.

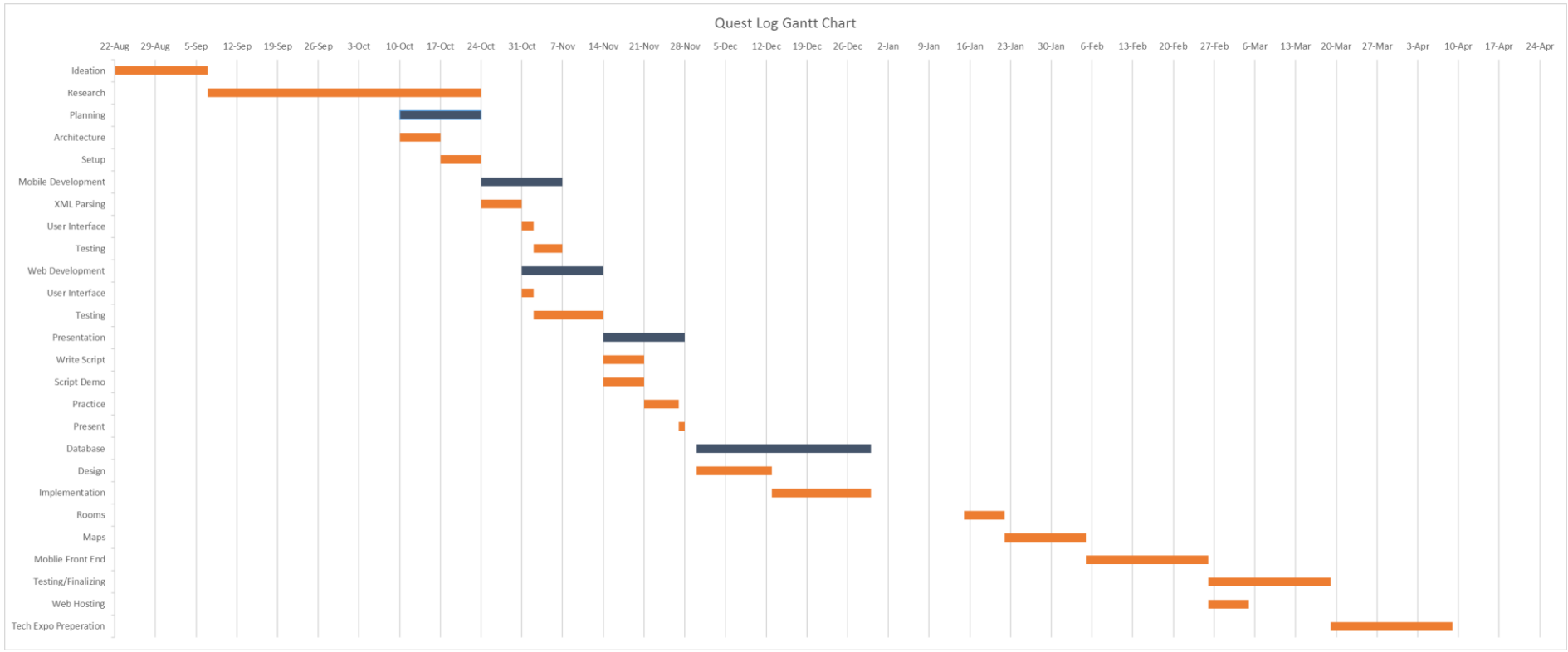

Figure 4: Gantt Chart

4 **Technical Elements**

4.1 **Web Server**

The web server will be used to host the web service on Amazon Web Services (AWS). The application that we're building will then pull the information from the web server and display it to the users.

4.2 **Software**

Our solution was built by using Visual Studio Community 2015, and SQL Server.

4.2.1 **Open Source Software**

The following open source libraries were used: Dapper, SignalR, Createjs, JQuery, JQuery Form Plugin, Bootstrap, and Github.

4.3 **Version Control**

Our application utilized UC's GitHub for our version control system.

4.4 **Hardware**

We used an Android device, a tablet, and a laptop.

5 Application

5.1 Application Architecture

The technology being used for this project includes Visual Studio, Xamarin, C#, and XML, SignalR, Dapper, and HTML. The project is a web application that pulls data from a database and uses it to populate a webpage. Additionally, the mobile application will pull data from the web server to populate the form via JSON. This application will then store the data locally in a database.

5.2 Backend Architecture

The backend uses SignalR to synchronize data from each player to all the other players. So, when one player makes an update to their character sheet, or if a player moves their character on the map, then the application sends the new information to the server which then sends the new data with the updated information to the players.

5.3 Frontend Architecture

The frontend is the web and mobile application that displays the information to the users. This was written in C# using Xamarin for Visual Studio.

5.4 Security

Security is a concern for this application because there will be a webserver required to send data back and forth. The application uses SQL to store the information needed to connect to a game session. Thus, precautions were taken to guard against SQL vulnerabilities such as an injection attack. This was done by using parameterized queries through dapper. Additionally, the passwords were encrypted using the Bcrypt algorithm. The character information was stored in the database as well.

5.5 User Interface

5.5.1 Dashboard View

This is the first view that a player sees and it displays options such as uploading a character sheet, viewing information about the application, and a link to more information about Pathfinder.

5.5.2 Character View

This is the second view that a player sees. Here they can see a list of characters that they have uploaded. They will be able to click on each character to view the information and make changes.

5.5.3 Map View

This is the third and final view for the players. This is the view that they see after the game has begun and it displays the map along with all the players and allows the players to tap their own character to return to their character view. Additionally, the players are able to tap on other player's characters to view a limited character information sheet.

5.5.4 DM View

This is the view only for the DM. This will be a map that shows all the characters and monsters. This view allows the DM to click on all of the characters for a detailed information sheet that they can edit.

6. Agile Development

Agile development is a relatively new development paradigm that is focused on breaking a large project into smaller, manageable pieces and then completing the pieces during "sprints". This is done by having ample communication amongst the team, and coordinating efforts. Each piece of the project should be completed in the time span allotted. Agile development focuses on iterative and continuous improvement. This means that after each sprint is completed, the result should be presented to the customers/users. Agile development has an advantage over more traditional methods such as Waterfall in that Agile is quick to adapt to the changing needs of the users.

7. Testing Plan

Below is a table with the details of our plan for testing our application. For our testing methodology we decided to use functional testing. We think that this is the best method for our application as it covers things such as integration testing and system testing. Below is a table with the tests that we will run on our finished application.

Test	Expected Result	Actual Result	Error?	Comment
Create User	Redirect to Login	Redirected to login		
Login	Redirect to Dashboard	Redirected to dashboard		
Import	Import XML character sheet and then display new character in view	Redirected to character info view		
View Character List	Display list of characters that belong to the logged in user	Displayed list of characters		
View Character	Display the character that corresponds to the one the user selected	Displayed character info view		

Edit Character Information	Save edits to database and update character information view	Saves to database and refreshes view		
Delete Character	Character should be deleted from the database based on the user logged in and character they selected	Character is deleted and no longer shows up in list.		
Create Room	Room created with password and name. Room information inserted into database.	Room is created and joinable.		
Join Room w/ correct password	Room joined and able to see others in room.	Able to join room and see other users.		
Join Room w/ incorrect password	Room access denied and redirected to room list.	Join fails and user stays on room list		
View Room list	Display list of rooms that the user isn't a part of.	Shows list of rooms		
Show Map	Should show the map for the correct user and character in the room	Map grid shows for everyone in room		
Leave Room	Should leave the room and remove from database.	User is removed from room.		
View profile	Show account information for the logged in user	Shows characters of the user		
Edit profile information	Edit user information and save to database.	User can change password		
Login with incorrect password	Deny login and redirect to login	Login fails		
Signout	Should log the user out and redirect to the landing page	Logs out user		

Table 3: Testing Plan

7. Conclusion

Quest Log is a solution that attempts to save time and resources. It allows people to use less paper while they play D&D, which means there will be less paper waste in the world. Additionally, there will be less time needed to set up a game since people won't have to look around for their character sheets. We accomplished most of what we wanted to for this project, but given more time we would like to add additional features to make it into a more comprehensive tool.

Bibliography

Stroh, Jason, and Sean Carew, interview by James Hamann, & Philip Casperson. Interview with Experts (October 5, 2016).