# Requirements and Specifications

## 1. System Features

### 1.1 Map and Scene Switching

**Description and Priority:**

GMs will be able to switch between individual battle maps and role-playing scenes at which will display the saved elements created previously by the GM. The feature is high priority because this function is required to allow multiple role-playing scenes and battle maps to be created without creating a cluttered user-interface.

**Functional Requirements:**

* **FR1-1:** The app must allow a GM to switch between individual battle maps and role-playing scenes.
* **FR1-2:** The app must allow a GM to create a new battle map or role-playing scene instance and after making the initial settings switch to it.

### 1.2 Tokens

**Description and Priority**

GMs will be able to create tokens to represent characters on battle maps which contain a character’s stat block, condition indicators, health points, size, and name. GMs can drag these tokens across a battle map and set health points and conditions based on what happens in a TTRPG battle. This feature is high priority as without tokens, the maps would just be images that does not help immerse the players in a battle scene and cause confusion on where characters are located and what they can do.

**Functional Requirements**

* **FR2-1:** The app must allow a GM to create a new token that requests the GM to paste a stat block, give a name, token size, and optionally upload an image.
* **FR2-2:** The app must allow a GM to edit a token’s stat block, name, token size, and image even after creating the token.
* **FR2-3:** The app must allow a GM to paste a stat block text which finds health points and dice rolls.
* **FR2-4:** The app when a GM pastes a stat block text must store the heath points and apply it as the token’s health point maximum when creating a new token.
* **FR2-5:** The app when a GM pastes a stat block text must create a button for dice rolls on the stat block.
* **FR2-6:** The app must allow a GM to access a token’s stat block by right clicking on the token and left clicking on “stat block” in the token’s menu which displays the stat block.
* **FR2-7:** The app must allow a GM to change a token’s health points by entering a number and clicking either “Heal” or “Damage.”
* **FR2-8:** The app should have a checkbox that can apply health over the health point max.
* **FR2-9:** The app must allow a GM to select a condition indicator to apply to a token which appears on the token.
* **FR2-10:** The app must allow a GM to remove a condition indicator from a token.
* **~~FR2-11:~~** ~~The app must scale the visual size of a token to the grid overlay on a battle map based on the chosen size of the token of either small, medium, large, and giant.~~
* **FR2-12:** The app could allow a token to have multiple health point bars where a bar is displayed on the token until it reaches zero.
* **FR2-13:** The app could connect to a browser extension that connects to dndbeyond.com to retrieve a player character’s picture and apply it to the associated token.

### 1.3 Battle Map

**Description and Priority**

Battle maps display a GM uploaded image to use as a map where tokens can be moved onto to visually represent a battle. The GM can adjust how the image is displayed with zooms and scrolling. Shapes can be created and dragged onto battle maps to indicate areas that are affected by game actions like explosions or spells. This feature is of high priority with it only second to tokens as battle maps is the most complex and development intensive feature of the project. Tokens are of a higher priority because tokens are necessary for the battle map feature to be fully implemented.

**Functional Requirements**

* **FR3-1:** The app must allow a GM to create a new battle map.
* **FR3-2:** The app must allow GMs to upload an image to represent a battle map.
* **FR3-3:** The app must allow GMs to upload images to be displayed on a token.
* **~~FR3-4:~~** ~~The app must allow GMs to zoom in and out on battle maps.~~
* **~~FR3-5:~~** ~~The app must allow GMs to scrolls vertically and horizontally on battle maps.~~
* **~~FR3-6:~~** ~~The app must allow a square grid to be overlayed on a battle map that tokens are able to snap into.~~
* **~~FR3-7:~~** ~~The app must allow the GM to adjust the size of the square grid overlay.~~
* **FR3-8:** The app could allow a hexagonal grid to be overlayed on a battle map that tokens are able to snap into.
* **~~FR3-9:~~** ~~The app must allow a GM to move a token across a battle map.~~
* **FR3-10:** The app must allow a GM to create and drag shapes including circles, cones, squares, and rectangles onto the map which have adjustable sizes.
* **~~FR3-11:~~** ~~The app must allow a GM to delete shapes created by the GM.~~
* **FR3-12:** The app should allow a GM to measure the distance between two points by clicking and dragging across the map.
* **FR3-13:** The app should allow a GM to determine what amount of distance a single unit on a grid represents with it defaulting to five feet.
* **FR3-13:** The app should determine distance measurements based on the GM defined distance a single unit on a grid represents.

### 1.4 Turn Menu

**Description and Priority**

The Turn Menu provides GMs with a menu to easily keep track of the turns of players and non-player characters in a battle map or scene. It provides simple automation in calculating and adjusting the turn order of non-player characters. The Turn Menu is of low priority as turn order can be kept track of in other manual methods that are already simple. Its implementation would provide more convenience to the GM but is not necessary for the basic functionality of the project.

**Functional Requirements**

* **FR4-1:** The app should have a Turn Menu that shows the turn order of tokens in relation to each other.
* **FR4-2:** The app should allow tokens to be added and removed from the Turn Menu.
* **FR4-3:** The app should allow tokens in the Turn Menu to have their turn order adjusted lower or higher in relation to other tokens.
* **FR4-4:** The app should allow tokens in the Turn Menu to roll a TTRPG System specified dice for each token to determine turn order.
* **FR4-5:** The app could allow the GM to automatically roll dice to determine turn order for all non-player characters.
* **FR4-6:** The app should have the Turn Menu accessible in both battle maps and role-playing scenes.
* **FR4-7:** The app could automatically remove conditions applied to tokens if the condition’s max turn duration has been reached.

### 1.5 Role-Playing Scene

**Description and Priority**

Role-playing scenes display images or videos to help a GM immerse their player’s into the scene they are currently playing. GMs will have the option to further embellish role-playing scenes with visual effects and real-time subtitles. The priority of role-playing scenes is low as the basic implementation of uploading an image with zooming functionality is the same as the battle map’s image functionality. The additional features for role-playing scenes are helpful but not necessary to the basic functionality of the project which makes it a low priority.

**Functional Requirements**

* **FR5-1:** The app must allow a GM to create a new role-playing scene.
* **FR5-2:** The app must allow GMs to upload an image to represent a role-playing scene.
* **FR5-3:** The app could allow GMs to upload a video to represent a role-playing scene.
* **FR5-4:** The app must allow GMs to zoom in and out of role-playing scenes.
* **FR5-5:** The app could play a video in a role-playing scene on loop.
* **FR5-6:** The app could allow a user to upload a visual effect to overlay onto a role-playing scene.
* **FR5-7:** The app could connect to an AI to create a looping video from an uploaded image.
* **FR5-8:** The app could display subtitles when connected to the GM’s microphone.

### 1.6 GM and Streaming Modes

**Description and Priority**

GM and Streaming Modes are a feature that provides GMs with the ability to view different elements from their players to better run battles, scenes, and surprise players. GM Mode shows everything to the GM including hidden tokens and dice rolls. Streaming Mode shows players only elements a GM wants them to see and hides everything else until the GM deems appropriate. The priority for this feature is medium as it is not as explicit to a user to it’s functionality as battle maps or tokens but it is still important to help a GM run a TTRPG game. Furthermore, this feature has functionalities that will need more development time than other low priority features such as connecting two separate browser windows.

**Functional Requirements**

* **FR6-1:** The app must create a new window in Streaming Mode when prompted by the user.
* **FR6-2:** The app must detect when a Streaming Mode or GM Mode window has been closed.
* **FR6-3:** The app must have a GM Mode that shows all tokens, map elements, dice rolls, stat blocks, and tokens hidden in Streaming Mode.
* **FR6-4:** The app must have a Streaming Mode that shows only tokens, map elements, dice rolls, stat blocks, and tokens set as visible by the GM.
* **FR6-5:** The app must have a game log that records all dice rolls made by the GM which the DM can decide whether to show in Streaming Mode.
* **FR6-6:** The app should allow a GM to determine what battle map or role-playing scene should be shown in Streaming Mode separate from GM Mode.

### 1.7 Game Log and Dice Rolling

**Description and Priority**

Game Log and Dice Rolling are features that provide a GM with quick and easy dice rolls as well as keeping track of them. These features are low priority because these features will not take significant development time to implement.

**Functional Requirements**

* **FR7-1:** The app must have the game log display a token’s picture if the roll was made using a token’s stat block.
* **FR7-2:** The app must allow a GM to click buttons associated with each type of dice and roll them.
* **FR7-3:** The app must display any dice rolls made by the GM in the game log.
* **FR7-4:** The app must have a game log displayed when a condition has been applied.
* **FR7-5:** The app could connect to a browser extension that connects to dndbeyond.com to read the game log and copy it into the app’s own game log.

### 1.8 Audio Controller

**Description and Priority**

The Audio Controller is a feature that allows GMs to upload audio files to use as sound effects or background music during their TTRPG games. Audio can played and manipulated as the GM needs. This feature is of low priority because audio is not required to help a GM arbitrate rules and is simply an enhancement to setting an atmosphere.

**Functional Requirements**

* **FR8-1:** The app should allow GMs to upload an audio file.
* **FR8-2:** The app should provide a menu that lists a user’s uploaded audio files.
* **FR8-3:** The app should allow GMs to play, pause, fast forward, and rewind an audio file.
* **FR8-4:** The app should allow multiple audio files to play at the same time.
* **FR8-5:** The app should allow a GM to remove an audio file that was previously uploaded.

### 1.9 Voice Effects

**Description and Priority**

Voice Effects allow a GM to change their voice heard through audio channels while running a TTRPG game that provides better immersion to players. GMs can choose from presets or adjust individual settings to create the voice they want to sound like. This feature is low priority because it is not required to help a GM arbitrate rules and is only an enhancement to setting an atmosphere.

**Functional Requirements**

* **FR9-1:** The app could allow GMs to their microphone and Discord to interact with the audio menu that provides settings to adjust like volume, pitch, voice effects, and filters.
* **FR9-2:** The app could provide preset voice effects to GMs to choose from.

### 1.10 Campaign File Saving

**Description and Priority**

Campaign File Saving allows GMs to keep the state of tokens, battle maps, role-playing scenes and more from when they last saved on this app. It provides more convenience to a GM especially because TTRPG sessions can often occur over multiple sessions that a GM has to prepare for in advance. The priority for Campaign File Saving is high because it is fundamental to the user experience that provides convenience and has to interact and save all the features previously discussed.

**Functional Requirements**

* **FR10-1:** The app must allow GMs to save their tokens, battle maps, role-playing scenes, game log, and audio files into a file onto their computer.
* **FR10-2:** The app must allow GMs to upload a previously saved VTT file and load the file’s tokens, battle maps, role-playing scenes, game log, and audio files.
* **FR10-3:** The app must embed images into the saved file.
* **FR10-4:** The app must save the links to videos in the file to locations like cloud storage services.

## 2. Non-Functional Requirements

### 2.1 Performance

* **NF1-1:** The app when creating a new campaign file should load quickly within 2 seconds.
* **NF1-2:** The app when loading a previous campaign file should load quickly within 5 seconds.
* **NF1-3:** The app when switching between battle maps and role-playing scenes should load within 2 seconds.
* **NF1-4:** The app in Streaming Mode must reflect changes made in GM Mode within 2 seconds.
* **NF1-5:** The app when displaying images should display them in their native resolution and never lower.
* **NF1-6:** The app when displaying videos should display them in their native resolution or a maximum resolution of 1080p.
* **NF1-7:** The app when performing a dice roll should take less than 1 second before the result appears on the game log.
* **NF1-8:** The app when should play audio less than 1 second after the GM clicks the play button.
* **NF1-9:** The app when should pause audio less than 1 second after the GM clicks the pause button.
* **NF1-10:** The app when prompted by the user to create a shape should take less than 1 second to create and display the shape on the battle map.
* **NF1-11:** The app when in the Turn Menu switches to the next token should indicate the next token in less than 1 second after a user clicks the “Next” button.
* **NF1-12:** The app should take less than 1 second to open a sub-menu when prompted by the user.
* **NF1-13:** The app when saving a campaign file should take less than 5 seconds to save to the user’s chosen location.
* **NF1-14:** When the GM moves a token across the battle map, the map should reflect the change in less than 1 second.
* **NF1-15:** When the GM pastes a stat block into a token, the app should take less than 3 seconds to parse it and create buttons for dice rolls.

### 2.2 Software Quality Attributes

* **NF2-1:** The app should be maintainable and easily able to be updated in the feature.
* **NF2-2:** The app should be intuitive with its usability for GMs to learn and use.
* **NF2-3:** The app should be reliable in providing GMs with the ability to save their campaign files and upload them.
* **NF2-4:** The app should be testable to easily identify where issues are occurring and how to fix them.
* **NF2-5:** The app should be traceable to find where requirements have been designed, implemented, and tested throughout the development process.
* **NF2-6:** The app should be interoperable across different web browsers such as Google Chrome and FireFox.
* **NF2-7:** The app should be efficient with computer resources.