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BETA Universe Systems Initiative Table Application

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Abstract/Summary

In tabletop role-playing games, players can be burdened by extraneous calculations and ordering, which disrupt the flow and narrative of the game. The BETA Universe Systems Initiative Table is a mobile-optimized web application that aims to digitize and streamline gameplay components from the tabletop role-playing game "BETA Universe Systems." Players could sign up and sign in to an account, manage characters profiles, and join a game session started by the gamemaster. The gamemaster could sign up and sign in to an account, manage the non-player character profiles, and manage game sessions. The app would embed all the main components of player combat for the game and maintain a real-time chat log during game sessions. The chat log would record the current events that occurred in the session, allows players to message each other, and signifies the order in which the players in the session take their subsequent actions.

Project Description

Main goals and objectives

The main purpose of this project is to streamline the turn-taking process. This will eliminate or reduce the overall disruptions that occur through calculations and turn ordering. The significance of this project is that players can enjoy the role-playing aspect of the game without being disrupted by whose turn it is and if their attack successfully connected or if it failed. An additional goal for this project is to build a quality product that meets the specifications of our advisor.

Main functionality and characteristics

The Initiative Table app provides a host of quality-of-life features that handle many of the administrative and organizational aspects of the BETA Universe System. Through the app, players can create sessions--instances of a game in progress--and invite other players to play in real-time. If an account is registered with the app, players can create and use characters within different sessions. Within each session, the app will manage several aspects of play, the most notable of which is the Initiative Table, a system that determines whose turn it is at any given point in the game. Player initiatives within the BETA Universe System are highly dynamic yet rigidly deterministic. Player actions can influence other players' initiatives, and the degree of influence is governed by a few different equations, depending on the action in question. The Initiative Table helps speed up these calculations and provides order to the game.

The app will make use of a graphical user interface optimized for both the web and for mobile devices, as the preferred method of play is in-person rather than online. A database and login system will be implemented so that players can save their characters, weapons, and skills to be used across various sessions. Features like computer-generated dice rolls and automatic calculation of attack damage, stat changes, and initiatives will eliminate the tedious and unproductive aspects of the game so players can spend more time thinking about their next actions.

Intended audience

The BETA Universe System is meant to be played by a general audience, of all ages and levels of expertise. Players are free to choose their own settings, characters, and stories to use throughout their sessions; the system is only there to keep things grounded and procedural. Normally, players are expected to have some sort of understanding of the rules and processes of the game, which may vary wildly from session to session. Through the Initiative Table app, many of these rules are abstracted away into the user interface, making the game very accessible to newer or younger players. Experienced players may also benefit from this system as it allows for custom characters, weapons, and skills to be used in whatever setting the session host deems fit.

Key usability goals

In tabletop role-playing games, players can be burdened by extraneous calculations and ordering, which disrupt the flow and narrative of the game. These disruptions can be reduced or eliminated entirely by using a turn and a calculation tracker. This project is a potential solution to this problem because it will track the turn order and sum calculations that the players have given.

Potential for further development/product enhancements

This project solution is a part of a suite of other applications that merge together to make the role-playing game by BETA Universe Systems more efficient and enjoyable. Due to this project being a part of a suite, the enhancements can be a connection to the overall suite and a more streamlined UI that will have the ability to send that information to other suite applications.

Challenges and obstacles

Some of the challenges that are expected in this project's development include the average experience of the team with the technology being used, translating the complexity of role-playing tabletop game rules into a simple and easy to use format, and demonstrating the use of the application in a way that is both clear and efficient.

Most of the team does not have much experience with web development and the technology stack being used to develop the project. This is both a challenge and an opportunity for the team to work on personal, professional development. Another potential challenge will be the design of a user-friendly web application that streamlines the complex game rules inherent in tabletop role-playing games. Tabletop role-playing games require a high degree of randomness and mathematical calculations to determine the course of the game and contribute to the narrative. The challenge is to develop a design that runs the calculations necessary to progress the game without becoming too complicated to overshadow the gameplay. By nature, tabletop role-playing games involve imagination, known as, 'Theatre of the Mind". While this aspect is one of the great appeals of the game genre, it will be challenging to demonstrate the use of the application while not playing the game.

Technology description

The BETA Universe Systems Initiative Table technology stack will consist of a client (front-end) and server (back-end). The application's front-end will be developed using Vue.js, an open-source front-end JavaScript framework for building user interfaces. The main languages that Vue.js uses consist of Javascript, HTML, and CSS. A Vue.js library that we will be using to speed up development and produce a clean user interface is Vuetify, a material design framework that provides pre-made components to integrate. In addition, we will be using the Axios library for making AJAX requests to the ASP.Net web APIs.

The back-end of our application will consist of Microsoft's ASP.NET Core framework; it is a cross-platform, high-performance, open-source framework for building modern Internet-connected apps. We will use its web APIs to persist our data to a Microsoft SQL Database. The programming language used will be C#. Two libraries that we will be making use of within ASP.NET Core are Entity Framework and SignalR. Entity Framework provides us with an easy-to-use object-relational mapping framework to work with the SQL database data in the form of objects without concerning ourselves with the underlying database tables and columns where this data is stored. SignalR will enable us to establish a real-time connection with our database and client application.

Team overview

The following table provides an overview of each team member's background, specific skills, and expected involvement in the project.

Team Member Name	Description (Background, skills, involvement)
Jacob Gayban	College student pursuing a BS in Computer Science and Engineering. Considering a career in web development, particularly the backend. Skills include knowledge with C++, HTML/CSS/JS, Node.js, and React.js. Expected to be involved in all aspects, but would like to focus on the backend.
Mark Graham	College student pursuing a diploma in computer science and engineering. Interests in game development, computer graphics, virtual/augmented reality, and artificial intelligence. Skilled with C++, C#, game development, and Role-Playing Games (RPG). Expected to be involved in all aspects of design and development.
Andy Alarcon	College student born and raised here in Reno pursuing a BS in CSE. Interested in a career as a full-stack web developer. Skills include C#, HTML, CSS, JS, SQL, and Vue. Expected to be involved in every aspect of design and development along with serving as a learning resource for the team.
Jacob Tucker	Military veteran pursuing computer science as a path towards a new career. Interests in games, game development, physics engines, simulations, web development, and UI. Skilled with C++, game design, visual design, RPGs. Expected to be involved in all aspects of design and development.
Griffin Wagenknecht	A college student double majoring in computer science and statistics. Will be pursuing a career in statistics after receiving a doctorate in statistics. Interests are gaming with proficiencies in C++ and RPGs. Expect to be involved in all aspects of the design and development.

Overview of each team member

Advisory overview

Our advisor John Molt is the owner and creator of the "BETA Universe Systems" tabletop role-playing game. In addition, John is a professional full-stack developer as his primary profession. His experience ranges from working in the companies like Ticketmaster and even being a Senior Programmer Analyst Manager at TMCC. For several years, he and his wife have been developing full-stack web applications for the Reno Police Department and other agencies like UNR Police through their own company, "Blue Cover Six." Our advisor John Molt has a passion for the project and a professional technical background.

Professional growth

This project will have a significant effect on the team's professional growth through the research of unfamiliar technologies for most of the group as well as adding a sizable project to the team's portfolios and resumes. Web development is a huge field and in high demand. Learning these technologies will strengthen the team's competitiveness in the job market as well as provide more tools to find solutions across all disciplines of work. A completed project of this scope will also appeal to each team member's personal summary of experience, thus contributing to professional development and reputation.

Market Potential

Market analysis

The market value for new tabletop RPGs is staggering. The industry and its popularity have significantly grown with the pandemic. With the growing presence of tabletop RPGs in mainstream media, for example, in Stranger Things, the genre has become more popular than it once was. In April 2020, according to the Business Research Company, "The global role-playing games market reached a value of nearly $15,793.3 million in 2019, having increased at a compound annual growth rate (CAGR) of 6.84% since 2015, and is expected to grow at a CAGR of 9.22% to nearly $22,471.3 million by 2023," (Business Research Company)." Tabletop RPGs have the basic rules accessible to nearly anyone who wants them. The rules are yours to create, which makes it very versatile for storytelling and entertainment. It is a versatile system that will allow any genre of play with the same rules. This is something the current systems lack; they are all stuck in one genre.

Competitive analysis

There are similar products consisting of Roll20 and D&D Beyond. Roll20 provides an interactive map and a chat service for the players to connect to and use. They also utilize a dice roller and ambiance music of your choice. D&D Beyond is a character creation service as well as a rules compendium for D&D. Our application will make the game automated while their services just help you run the game. Ours will allow players to streamline the gameplay instead of having to learn an online service on top of the game itself.

Competitive advantage

Our application will make the game automated while their services just help you run the game. Ours will allow players to streamline the gameplay instead of having to learn an online service on top of the game itself. All of the game applications can be run through our application, where currently you would need a dice roller, character sheet, map, and a voice or chat function. Ours will eventually roll all of those into one application so the user doesn't have to keep switching from one to another.

Time Worked on Project Concept

The table below shows the amount of time spent by each team member on each activity. Thus far, the team has spent the same amount of time on each activity listed.

	Andy Alarcon	Jacob Gayban	Mark Graham	Jacob Tucker	Griffin Wagenknecht
Meeting with our advisor to learn game rules and discuss the project	4	4	4	4	4
Team meetings	3	3	3	3	3
Researching Web Development	3	3	3	3	3
Working on Project Assignment 1	2	2	2	2	2
Meeting with teaching team for project approval	0.5	0.5	0.5	0.5	0.5
Total	12.5	12.5	12.5	12.5	12.5

References

https://www.thebusinessresearchcompany.com/report/role-playing-games-market
https://roll20.net/
https://www.dndbeyond.com/