Assignment 2: Software Requirements Specification

Team: Visible Softworks (Group 3)

Project Title: MathWiz!

## Members:

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| **Meetings date** | **Participants** |
| 09/25/2024 | Everyone |

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| **Stakeholders** | **Requirements** |
| Children aged 11-12 (6th grade) | NR1: Reusability  NR2: Fun moment-to-moment gameplay  NR3: Engaging plot  FR1: Cutscenes |
| Parents/Guardians/teachers | NR4: Portability  NR5: Educational content  NR6: Safe tone & content |
| Platformer Enthusiasts | NR7: Solid level design  FR2: Themed weapons and Bosses |
| All | NR8: Performance  NR9: Safety  NR10: Dependability  NR11: Appealing Visuals  NR12: Appealing Sounds  FR3: Pause menu  FR4: Robust Menu System  FR5: Graphics Loading Systems  FR6: Level Select  FR7: Level Loading System  FR8: Themed Levels  FR9: Audio Systems  FR10: Projectile System  FR11: Collision Detection  FR12: Weapon Swap system  FR13: Damage System  FR14: Triggers  FR15: Particle System |

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| **FR1. Cutscenes** | | |
| Goal: The game should feature animated scenes of characters explaining concepts. | | |
| Stakeholders: Children | | |
| Cutscenes are the only surefire way to explicitly describe the applications of mathematical concepts. They will be used to explain concepts and invest the player in the plot. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 3 |

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| **FR2. Themed Weapons and Bosses** | | |
| Goal: The game should feature Bosses with specific mathematical themes, and weapons that match. | | |
| Stakeholders: Children | | |
| Following the *Mega Man* model, our game should have a boss at the end of each stage that embodies a relevant topic. Each boss should, upon defeat, render to the player a weapon/ability that mimics the abilities exhibited by the boss. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 3 |

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| **FR3. Pause menu** | | |
| Goal: There must be a pause menu during normal play. | | |
| Stakeholders: All | | |
| There are many reasons a player may need to temporarily halt game operations. A menu should appear when such an option is taken, allowing the player to resume play or quit playing. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR4. Robust Menu System** | | |
| Goal: The game should have a system to load menus that the player can use to navigate. | | |
| Stakeholders: All | | |
| Our game has many facets. To navigate these, a menu system will be needed to load other functions. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR5. Graphics loading systems** | | |
| Goal: The game should be able to load graphics. | | |
| Stakeholders: All | | |
| The game must have graphics of some sort. It should be able to load images for the in-game tiles and characters at a high resolution without hindering system performance. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR6. Level Select** | | |
| Goal: The game should allow players to progress through the game in the order they wish. | | |
| Stakeholders: Customers | | |
| Our game is modeled after *Mega Man* titles, and will continue the tradition of allowing players to choose from a variety of stages at the start of the game. This will require an interface that allows for the choice of level. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR7. Level Loading System** | | |
| Goal: The game should be able to load levels from input data | | |
| Stakeholders: All | | |
| Loading levels is critical for gameplay. A system must be put in place to load levels from outside data so that they don’t have to be programmed by hand. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR8. Themed levels** | | |
| Goal: There should be multiple themed levels for the player to complete. | | |
| Stakeholders: All | | |
| The game should feature multiple levels, most with a theme matched to a particular math concept and others with more generic theming as a climax to the game. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 3 |

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| **FR9. Audio Systems** | | |
| Goal: The game should be able to play audio. | | |
| Stakeholders: All | | |
| Regardless of how nice the audio sounds, it must actually be able to play in the first place. Systems should be able to play both short sound effects and long/looping background music tracks, all with CD-quality. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **FR10. Projectile system** | | |
| Goal: The game should have a projectile class that can be used for various ranged attacks. | | |
| Stakeholders: All | | |
| Our game is about wizards. We’d be remiss not to include at least a few long-ranged magic attacks. There should be a class of game object used as a foundation for all projectiles, allowing for sharing of code. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 1 |

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| **FR11. Collision Detection** | | |
| Goal: The game should be able to detect when objects are touching each other or the terrain and react accordingly. | | |
| Stakeholders: All | | |
| For the player to traverse interesting terrain, the game must be able to see when the characters are touching the ground/walls/ceiling. A system should be developed that, with reasonable accuracy, can determine if and where a character is touching the terrain, and affect the character’s position so the character is not phasing through the terrain. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 1 |

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| **FR12. Weapon Swap System** | | |
| Goal: The player should be able to swap between weapons that they have unlocked. | | |
| Stakeholders: All | | |
| When unlocking new weapons, the old ones should not become inaccessible. Instead there should be an in-game menu to allow players to swap weapons on the fly. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 3 |

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| **FR13. Damage system** | | |
| Goal: In-game entities should be able to lose and recover health points. | | |
| Stakeholders: All | | |
| HP (or, “Health Points”) is a standard mechanic in many games. HP is lost whenever the player character is hurt, and can often be regained with pick-ups (typically medical supplies or foodstuffs). The mechanic should be used in our game. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 1 |

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| **FR14. Triggers** | | |
| Goal: The game should have objects that will trigger events if a given criteria is met (i.e. they are entered). | | |
| Stakeholders: All | | |
| Often times, and effect must be dependent on a given condition being true (end the level if the boss is defeated, close the door if player is within collider, erase objects according to saved data, etc.). A dedicated object to explicitly check conditions will allow level designers to more easily reuse assets (boss entities could be reused for a boss rush without ending the level on the defeat of each) and create levels. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/24 | Priority: 2 |

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| **FR15. Particle System** | | |
| Goal: The game and it’s component objects should be able to spawn small visual effects, or, “particles”. | | |
| Stakeholders: All | | |
| Small visual effects such as sparks and dust will most likely not need to have all the same logic as a character in the game. A new gameobject subclass should be designed to handle such effects with comparably low computational overhead. | | |
| Origin: Point was discussed asynchronously after the first meeting. | | |
| Version: 1.0 | Date: 10/01/2024 | Priority: 1 |

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| **NR1. Reusability** | | |
| Goal: The game should be replayable. | | |
| Stakeholders: Children, Parents/Teachers | | |
| The game should both encourage replay with quality design choices and be able to run multiple times without effect. It would be a pretty bad game if it stopped working after the first run, wouldn’t it? It is also important for the game to be replayable if a teacher wishes to run the game for multiple class bodies. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR2. Fun moment-to-moment gameplay** | | |
| Goal: The game should be fun to play. | | |
| Stakeholders: Children | | |
| The gameplay should be rewarding and fun to play consistently. This will include fine-tuning to maximize game feel, leveling the difficulty curve, and implementing satisfying noises to desired actions. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR3. Engaging Plot** | | |
| Goal: The game should keep the player interested in its plot. | | |
| Stakeholders: Children | | |
| If the plot isn’t interesting, the player may lack motivation to finish the game. The plot should therefore be engaging enough to entertain the player and keep them playing. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 3 |

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| **NR4. Portability** | | |
| Goal: The game should run on any modern Windows computer. | | |
| Stakeholders: Parents | | |
| Parents should not have to have a high-end graphics card or multi-core processor to run a simple 2d platformer. We should make sure our game runs at a reasonable framerate on any modern computer running the Windows family of operating systems. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR5. Educational Content** | | |
| Goal: The game will teach players about mathematics. | | |
| Stakeholders: Parents | | |
| The main goal is to educate players via a fun game. We will organically introduce math concepts, converting simple projects into level mechanics. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR6. Safe Tone & Content** | | |
| Goal: The Game should be unoffensive and kid-friendly. | | |
| Stakeholders: Parents | | |
| If a parent does not feel safe allowing their child to experience our product, we will lose a potential customer. The game’s content should be such that it does not scare away parents, teachers, or guardians. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR7. Solid level design** | | |
| Goal: The game should feature level designs that challenge the player but not harm the user experience. | | |
| Stakeholders: Platformer Enthusiasts | | |
| Players will lose interest if the gameplay is not interesting in the long term. Levels should have interesting gimmicks and difficulty that challenges but is not inordinate. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 2 |

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| **NR8. Performance** | | |
| Goal: The game should run well. | | |
| Stakeholders: All | | |
| If the game is running at a low framerate, it will damage user experience by making gameplay more buggy and less fun. Performance must be kept in mind. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR9. Safety** | | |
| Goal: The game should in no way pose a threat to the users’ computer. | | |
| Stakeholders: All | | |
| This is a game, not a computer virus. It should not cause harm to the users, their systems, or their data. | | |
| Origin: Point was discussed in first meeting. | | |
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| **NR10. Dependability** | | |
| Goal: The game should not cease function during play. | | |
| Stakeholders: All | | |
| A player could easily lose progress and get upset if the game stops functioning midway through. Crashes and halts should be prevented at all costs. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 1 |

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| **NR11. Appealing Visuals** | | |
| Goal: The game’s visual style should be appealing. | | |
| Stakeholders: All | | |
| Nobody likes looking at truly ugly stuff (reference: *Concord* and its’ $400,000,000 budget for a 65% on Metacritic). Our game’s visuals should be unique but appealing to players. | | |
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| **NR12. Appealing sounds** | | |
| Goal: The game should have a pleasing soundscape. | | |
| Stakeholders: All | | |
| Much like visuals, sounds must be appealing as to not repulse players. Music compositions should be nice to listen to, and sound effects should be fitting and easy on the ears. | | |
| Origin: Point was discussed in first meeting. | | |
| Version: 1.0 | Date: 09/25/2024 | Priority: 3 |