CSN - 254
Software Engineering
Requirement and Specification Document
Date - 12/03/2024
Version 1.0

Group-4

Name	Roll No	Contribution
Meet Sindhav	22114053	Reviewing and suggesting changes
Mohammed Haaziq	22114055	Providing inputs and feedback
Aditya Mundada	22114058	Refining and proposing modifications
Nayan Kakade	22114060	Discussion and final document preparation
Polasa Hariharan	22114068	Reviewing and suggesting changes
Roopam Taneja	22125030	Discussion, inputs and final articulation

BattleBlade: Smartphone console based gaming experience.

Project Abstract

The project entails developing a gaming application that enables smartphone-controlled multiplayer gameplay for BattleBlade: A fighting game on PC. By leveraging smartphones as controllers, users can seamlessly connect and interact with the game, eliminating the need for traditional hardware consoles and enhancing accessibility for casual gamers seeking immersive gaming experiences.

Document Revision History

Rev. 1.0 [12/03/2024]: Initial version.

Customer for the project

In a broader sense, the customer base for this software encompasses individuals who engage in casual gaming activities and value social interaction and entertainment through gameplay. This demographic could include people of various age groups and backgrounds who enjoy gaming as a leisure activity, particularly those who prefer multiplayer experiences. They may not necessarily be hardcore gamers but instead seek accessible and enjoyable gaming experiences to share with friends or family.

Dummy Customer

Customer: **Mr. X**

The dummy customer, Mr. X, represents an archetype of the target customer demographic. Mr. X is a student of the same branch, sharing a familiarity with gaming technology and preferences. As a casual gamer, Mr. X enjoys a variety of gaming experiences and possesses insights into user experience and preferences. His proactive engagement, including providing candid feedback, participating in testing, and suggesting improvements, ensures alignment between the project's objectives and the needs of the broader customer base.

Competitive Landscape

To evaluate the competitive landscape of **BattleBlade** we will compare it with three established multiplayer gaming solutions from different domains: Traditional consoles like PlayStation and Xbox, Mobile gaming applications and AirConsole

- **Traditional consoles like PlayStation and Xbox**:

  Strengths
  1. **Established Brand:** PlayStation has a strong brand presence and loyal user base, built over decades of successful gaming consoles.
  2. **Exclusive Titles:** PlayStation and Xbox often secures exclusive rights to popular game titles, attracting gamers who want access to unique content.
  3. **Reliable Hardware:** Consoles like PlayStation and Xbox are known for their reliable hardware and controller design, ensuring a consistent gaming experience.

  Weaknesses
  1. **Cost:** : Traditional consoles come with a high initial cost, which may deter casual gamers or those on a budget.
  2. **Lack of Accessibility or Availaibilty:** Gamers need to purchase the console and physical controllers, which may not be possible in remote areas
  3. **Limited Mobility:** Consoles are stationary devices, limiting gameplay to specific locations and environments.

- **Mobile Gaming Apps**:

  Strengths
  1. **Accessibility:** Mobile gaming apps are widely accessible to a large audience with smartphones, making it easy for users to download and play games
  2. **Low Barrier to Entry:** Many mobile games are free to play or offer low-cost options, making them accessible to a wide range of players.
  3. **Convenience:** Mobile gaming allows players to enjoy games on the go, offering flexibility and convenience.

  Weaknesses
  1. **Limited Graphics and Gameplay:** : Mobile games may have limitations in terms of graphics quality and gameplay depth compared to console or PC games
  2. **Lack of convenience :** Multiple players clicking buttons on the same screen can be quite inconvenient and spoil the gaming experience. Lags may further ruin the experience.
  3. **Battery Life:** Extensive gaming on mobile devices can drain battery life quickly, requiring frequent recharging.

- **Air Console**:

Strengths

1. **Cross-Platform Compatibility:** AirConsole allows players to use smartphones as controllers to play games displayed on a larger screen, offering a seamless cross-platform gaming experience.

2. **Convenience:** Separate devices as consoles enhance the experience of gamers and avoid the load on a single device by distributing it on different smartphones.

3. **Accessibility:** Players can easily access AirConsole through a web browser on their PC or smart TV, eliminating the need for additional hardware.

Weaknesses

1. **Paywall on many features:** Several features like access to all games, no ads and unlimited players can be unlocked only by a paid subscription which acts as a huge deterrent.

2. **Dependency on Internet Connection :** AirConsole requires a stable internet connection for gameplay, which may be a limitation in areas with poor connectivity.

3. **Potential Latency Issues:** Depending on internet speeds and connectivity, players may experience latency or lag during gameplay, affecting the overall gaming experience.

Comparison with BattleBlade

Strengths

1.**Seamless Smartphone Integration:** Utilizing smartphones as controllers offers convenience and accessibility to a wide audience of gamers who already own smartphones.

2.**Cost-Effective Solution**: Eliminating the need for specialized hardware consoles reduces the financial barrier to entry for players.

3.**Cross-Platform Compatibility:** If designed appropriately, the game will be compatible with various smartphone models and PC operating systems, increasing its accessibility.

Weaknesses

1.**Marketing and Brand Recognition:** Building awareness and recognition for a new gaming platform amidst a crowded market may require significant marketing efforts and resources, potentially hindering initial traction and adoption rates.

2.**Potential Latency Issues:** Depending on network conditions and the responsiveness of the software, players may experience latency or lag, affecting gameplay experience.

3.**User Adoption Hurdles:** Encouraging players to download and use a separate app for controller functionality may create friction and reduce adoption rates, particularly for casual gamers.

Product features that can create competitive differentiators include:

- Seamless smartphone integration

- High-quality graphics and immersive gameplay

- Accessibility and ease of use

Competitive barriers may include

- Latency issues affecting gameplay experience

- User Acquisition and Brand Recognition

- Intellectual Property Protection

System Requirements

- **Functional Requirements**:

  Gameplay Control
  1. Players should be able to control game elements (e.g., player movement, actions) using control inputs from smartphones
  2. Control inputs should include directional movements, action buttons, and any other relevant game commands.

  Real-Time Communication
  1. The system should establish and maintain a websocket connection between the game and external devices.
  2. Data exchanged over the websocket should be synchronized in real-time to ensure responsive gameplay.

  User Interface
  1. The system should provide intuitive and visually appealing user interfaces for both the webpage and mobile app control interfaces
  2. Control buttons should be clearly labeled and responsive to touch inputs on smartphones.

  Cross-Device Compatibility
  The system should be compatible with a wide range of smartphones and PC configurations, ensuring consistent gameplay experiences across devices.

- **Non-functional Requirements**:

  1. **Timing Constraints:** The system should maintain real-time responsiveness with minimal latency to ensure smooth gameplay experiences.

  2. **Security and Privacy:** Ensure the confidentiality and integrity of user data exchanged over the websocket connection, adhering to industry-standard security practices

  3. **Memory Requirements:** Optimize memory usage to ensure efficient resource utilization, particularly on smartphones with limited memory capacities.

  4. **Performance/Speed Requirements:** The system should deliver consistent performance across various devices, minimizing lag and ensuring smooth gameplay.

  5. **Data Capacity Requirements:** Ensure that the system can handle large volumes of data exchange without compromising performance or stability.

- **Acceptance Tests**:

  Scenario 1: Control Inputs: Test sending control inputs (e.g., arrow keys, action

buttons) from smartphone interface to the game and verify responsiveness.

Scenario 2: Real-Time Communication: Test establishing a websocket connection between the game and smartphone interface and verify real-time synchronization of game events.

Scenario 3: Cross-Device Compatibility: Test gameplay across different smartphone models and PC configurations to ensure compatibility and consistent user experience.

- **User Interface Requirements**:

  1. The webpage/mobile app interface should feature clear and responsive control buttons for gameplay control.

  2. Graphical elements should be visually appealing and easy to distinguish on both smartphone and PC screens.

- **External Dependencies**:

  1.The system will depend on internet connectivity for establishing websocket communication.

  2.Compatibility with various web browsers and mobile operating systems is required for cross-device compatibility.