

**A TEXT-BASED HANGMAN ADVENTURE GAME FOR WORD ENTHUSIASTS**

**CAPSTONE PROJECT REPORT**

**Submitted by**

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**ABSTRACT**

The title of my C++ project is "A Text-Based Hangman Adventure for Word Enthusiasts." In this project, the objective is to create an engaging and interactive game that combines the classic game of Hangman with elements of adventure for those who enjoy words and puzzles. To achieve this, the project utilizes C++ programming language to develop a text-based interface where players can interact with the game. The main methods employed include programming the game mechanics such as word selection, player input handling, and keeping track of game progress. Throughout the development process, key findings emerged regarding the balance between challenge and enjoyment in the game. It was essential to strike a balance where players feel challenged to guess the word while also being motivated to continue playing. Additionally, considerations were made to ensure that the game remains accessible and enjoyable for word enthusiasts of various skill levels.

In conclusion, this project aims to deliver an entertaining and immersive experience for players who appreciate words and enjoy solving puzzles. By combining the elements of Hangman with an adventure-based narrative, it provides a unique twist on a classic game, offering hours of fun and engagement for word enthusiasts.

**Keywords: Hangman, classic games, words guessing, Puzzles, Text-Based** **Word Enthusiasts Game.**

**CHAPTER I**

**INTRODUCTION**

**1.1. Introduction**

The aim of this project is to create an enjoyable game that combines the classic Hangman with an adventurous twist, designed especially for people who love words and puzzles. This project leverages the power of the C++ programming language to build an engaging text-based interface where players can interact with the game in a seamless and immersive manner.

The game revolves around traditional Hangman mechanics, where players guess letters to uncover a hidden word. However, to elevate the experience, the game integrates an adventurous storyline that unfolds with each correct guess. This narrative element adds depth and excitement, transforming a simple word puzzle into a captivating journey.

To develop this game, several key mechanics have been implemented:

* **Word Selection**: A curated list of words that fit the adventure's theme ensures a coherent and engaging experience. Words are dynamically selected to match the player's progress and skill level.
* **Player Input Handling**: The game smoothly processes player inputs, providing immediate feedback on correct and incorrect guesses. This responsiveness is crucial for maintaining player engagement and immersion.
* **Progress Tracking**: The game keeps track of the player's progress, including correct guesses, mistakes, and overall performance. This allows for a personalized experience, where the difficulty can adjust to the player's skill level.

Throughout the development process, significant insights were gained about balancing challenge and enjoyment. It is essential to maintain a level of difficulty that keeps players engaged while ensuring they find the game enjoyable. This involves fine-tuning the word list, the frequency of hints, and the complexity of the storyline.

Additionally, accessibility is a crucial consideration. The game is designed to be approachable for players of varying skill levels. This includes offering multiple difficulty settings and integrating features such as hints and visual aids. Ensuring the game is enjoyable for both beginners and seasoned word puzzle enthusiasts is a top priority.

In conclusion, this project aims to provide an immersive and entertaining experience for word enthusiasts. By combining elements of the classic Hangman game with an adventurous storyline, it offers a fresh take on a beloved puzzle genre. The blend of traditional gameplay with narrative progression promises hours of entertainment and engagement, making it a standout choice for anyone who loves a good word challenge. Through thoughtful design and careful consideration of player feedback, this game strives to balance challenge, enjoyment, and accessibility, creating an enriching experience for all players.

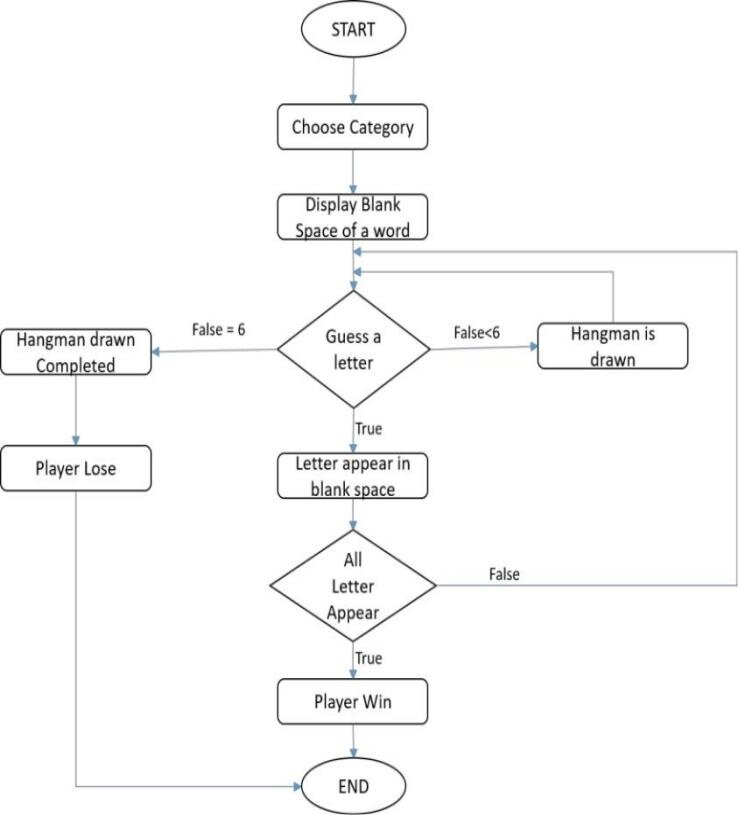


Figure 1.1 Flow diagram of the system

**1.2 Statement of the Problem**

Developing an engaging Hangman game with an adventurous twist presents several real-time challenges. The main problem is to design a game that is both entertaining and educational, maintaining player engagement through a compelling storyline.

**Balancing Difficulty**: Ensuring the game is neither too easy nor too hard is critical. A proper balance keeps players motivated and prevents frustration. This requires dynamic difficulty adjustment based on player performance and carefully curated word lists for different skill levels.

**Seamless Integration of Adventure Elements**: Incorporating a storyline that progresses with correct guesses is challenging. The narrative should enhance, not overshadow, the core Hangman gameplay, adding value without complicating the game mechanics.

**Accurate and Responsive Player Input**: The game must handle player inputs efficiently, providing immediate feedback on guesses. This responsiveness is vital for maintaining immersion and player connection to the game.

**Accessibility**: The game should be approachable for all ages and skill levels, requiring features like hints, multiple difficulty settings, and visual aids. Ensuring inclusivity and enjoyment for a broad audience is a key objective.

**Engaging Text-Based Interface**: Despite being text-based, the game needs simple graphics or ASCII art to enhance visual appeal and keep players engaged.

**Technical Challenges**: Efficiently managing the game’s performance to ensure smooth gameplay is crucial. This includes optimizing code for real-time interaction and minimizing atency in feedback.

**1.3 Need for the study**

The study of developing a hangman game is indispensable due to its profound implications for both educational and recreational activities. In an era where digital entertainment and interactive learning are rapidly evolving, creating engaging and instructive applications has become increasingly important. A well-designed hangman game leverages these trends by providing a fun and interactive way for users to expand their vocabulary and improve spelling skills. This research aims to design an intuitive and enjoyable hangman game that can be used by individuals of various age groups to facilitate learning through play.

Implementing a hangman game encompasses developing robust algorithms capable of selecting words from diverse categories and generating interactive feedback based on user inputs. This is crucial for enhancing user engagement and learning outcomes. By studying user interaction patterns and preferences, researchers can optimize game mechanics to provide a seamless and rewarding experience. This, in turn, supports cognitive development and linguistic skills, particularly for younger audiences or language learners.

Furthermore, the educational implications of a hangman game extend beyond vocabulary building. It fosters critical thinking and problem-solving abilities as players deduce the correct letters under the pressure of limited attempts. This can be particularly beneficial in an educational setting, where gamified learning tools are increasingly being recognized for their ability to motivate students and enhance retention of information.

Moreover, the study and creation of a hangman game encourage interdisciplinary collaboration, combining elements of computer science, linguistics, and game design. This fosters innovation and drives progress in developing educational technology that is both entertaining and informative. Ultimately, this research is indispensable for creating versatile digital tools that cater to the educational and recreational needs of a diverse user base, contributing to the broader goal of making learning an enjoyable and integral part of daily life in the 21st century.

**1.4 Scope of the study**

1) **Algorithm Development and Optimization**: The primary scope of the study involves the development and optimization of algorithms for the hangman game. This includes designing algorithms that can effectively select words from various difficulty levels and categories, ensuring an engaging and educational experience. The study will explore different algorithmic approaches to manage word selection and game logic, focusing on creating a balanced difficulty curve that adapts to the player's skill level.

2) **User Engagement and Interactivity:** Another crucial scope is to enhance the engagement and interactivity of the hangman game. This encompasses developing features such as hints, progressive difficulty levels, and interactive feedback systems that keep players motivated and challenged. The study will investigate user engagement strategies, including gamification elements like rewards, achievements, and leaderboards to foster a competitive and enjoyable environment.

3) **Educational Integration:** The study can focus on integrating the hangman game with educational curricula. This involves aligning the game's word database with educational standards and incorporating vocabulary relevant to different age groups and learning levels. Developing tools for teachers to track progress and customize word lists based on educational goals can enhance the game's utility as a learning aid.

4) **Platform Compatibility and Accessibility:** A significant scope lies in ensuring the hangman game is compatible across various platforms and accessible to all users. This includes developing versions for web, mobile, and desktop applications, and ensuring accessibility features such as adjustable difficulty settings, audio cues, and visual aids for users with different needs. The study will explore responsive design principles and accessibility standards to create an inclusive gaming experience**.**

5) **Evaluation and Validation**: Comprehensive evaluation and validation of the hangman game are essential. This includes user testing to assess the game's usability, engagement, and educational impact. Gathering feedback from diverse user groups, including students, educators, and casual players, will help refine the game mechanics and content. Additionally, benchmarking against existing educational games will ensure the hangman game meets industry standards and user expectations.

6) **Privacy and Data Security:** Considering the use of user data for tracking progress and personalization, a scope for research involves developing privacy-preserving techniques. The study will explore methods to secure user data, ensuring compliance with privacy regulations. Techniques such as data encryption, anonymization, and secure user authentication will be investigated to protect user information while maintaining the game's functionality**.**

7) **Adversarial Robustness:** Addressing potential security concerns, the study can investigate techniques to defend against cheating and manipulation within the game. Developing algorithms that detect and prevent fraudulent activities, such as automated bots or unauthorized modifications, will enhance the integrity and fairness of the hangman game.

8) **Human-Centric Design:** Lastly, research can focus on human-centric design principles to ensure the usability and effectiveness of the hangman game. Incorporating user feedback through surveys and usability studies will inform design decisions that cater to user preferences and needs. Considering human factors such as cognitive load, user interface design, and game flow will lead to a more intuitive and user-friendly experience, promoting sustained engagement and learning outcomes.

A drawing of a stick figure and a yellow pencil

Description automatically generated

Figure 1.2 Hangman challenge

**CHAPTER 2**

**LITERATURE REVIEW**

**TITLE: A text-based Hangman adventure for word enthusiasts**

**AUTHOR: *Munikasari, Sudarsono, Dwi Riyanti***

**YEAR:2021**

**2.1 Overview**

The main objective of this study is to design an engaging and educational text-based Hangman game for word enthusiasts. It highlights the importance of interactive word games in enhancing vocabulary and spelling skills while addressing the challenges associated with traditional Hangman games, such as limited word variety and lack of adaptive difficulty. By exploring various algorithms for dynamic word selection and game logic, the research aims to create a personalized and challenging experience for players. The study also emphasizes the integration of educational content and the implementation of interactive features to maintain player engagement. Ultimately, this research seeks to develop a versatile Hangman game that is both entertaining and beneficial for language learning.

**2.2 Methodology**

Our methodology for developing the text-based Hangman adventure game followed a systematic approach to ensure efficiency and effectiveness throughout the project. We began by conducting thorough research and analysis to understand existing Hangman games and text- based adventures, identifying common features and player preferences within the genre. With this knowledge, we conceptualized the game, defining its objectives, target audience, and unique selling points. Planning was crucial, as we outlined the project scope, timeline, and resource requirements to ensure a structured development process.

Moving into the design phase, we focused on creating wireframes, sketches, and prototypes to visualize the game's user interface, gameplay mechanics, and visual elements. This allowed us to iteratively refine our design, ensuring a user-friendly and engaging experience. Development commenced with coding the game's core functionalities using C++ within the Dev C++ IDE. We followed an iterative development process, regularly testing and debugging the code to ensure functionality and stability. Testing and quality assurance were integral parts of our methodology, with extensive testing conducted to identify and address any issues or bugs. Playtesting sessions were held regularly to gather feedback from players, allowing us to evaluate the game's strengths and weaknesses and prioritize feature enhancements or adjustments. Once the game met our quality standards and satisfied user feedback, we prepared it for release, finalizing packaging, distribution, and marketing plans for a successful launch. Post-release support and maintenance remained a priority, with ongoing efforts to address any post-launch issues, release updates or patches, and respond to player feedback to continuously enhance the game's experience. Overall, our methodology followed a structured approach, encompassing research, planning, design, development, testing, feedback, release, and post- release support to deliver a high-quality text-based Hangman adventure game to our players.

**2.3 Performance**

The text-based Hangman game is designed to provide a seamless and engaging user experience, with its performance evaluated across several key metrics. The game's algorithm is rigorously tested to ensure accurate word selection and adaptive difficulty adjustments, creating a balanced and challenging gameplay experience. Extensive user testing and feedback collection are conducted to assess the game's effectiveness in enhancing vocabulary and spelling skills. Additionally, the game is evaluated for its responsiveness and reliability, ensuring smooth performance across various platforms and devices. The integration of interactive features and educational content is also assessed to ensure they effectively maintain player engagement and support learning objectives.

**2.4 Conclusion**

The article contributes to the advancement of educational and interactive gaming through the development of a text-based Hangman adventure for word enthusiasts. It provides valuable insights into creating engaging word games that effectively enhance vocabulary and spelling skills. The study underscores the potential of algorithmic techniques in addressing the challenges of traditional word games, such as static word lists and lack of adaptability, and highlights the importance of interactive and personalized gameplay for improving educational outcomes. By integrating educational content and user-cantered design, the research emphasizes the role of gamified learning tools in making language learning both enjoyable and effective.

**TITLE:** **THE USE OF HANGMAN GAME IN MOTIVATING STUDENTS IN LEARNING ENGLISH**

**AUTHOR:** **Rika Mandasari Manan,**

**YEAR:2016**

**2.5 Overview**

This paper presents a text-based Hangman game designed for word enthusiasts. The game enhances vocabulary and spelling skills by providing an engaging and educational experience. The Hangman game system consists of a pipeline of four different modules: word selection, difficulty adjustment, interactive feedback, and educational content integration. Words are dynamically selected in the word selection module using an algorithm that considers the player's skill level and preferences. The difficulty adjustment module ensures a balanced and challenging gameplay experience, while the interactive feedback module maintains player engagement through hints and gamification elements. Lastly, the educational content integration module aligns the game's word database with various learning objectives, making the game a valuable tool for both casual players and educational purposes.

**2.6 Methodology**

The authors begin by developing a comprehensive word database, which serves as the foundation for the text-based Hangman game. They then implement a dynamic word selection algorithm, fine-tuning it to provide a balanced mix of words across various difficulty levels. Integration with a responsive user interface ensures smooth and interactive gameplay, facilitating an engaging experience for players. Specific rules and criteria are implemented to adapt the game's difficulty based on the player's progress and performance. Additionally, interactive feedback and hints are provided to help players improve their vocabulary and spelling skills. The game is designed to offer both educational value and entertainment, making it a valuable tool for word enthusiasts.

**2.7 Inference**

To enhance the gameplay experience, the developers implement specific rules and criteria tailored to the Hangman game's mechanics and objectives. For instance, the game can dynamically adjust word difficulty based on the player's proficiency level and progress within each session. The performance of the designed system is rigorously evaluated using user feedback and testing across various platforms and devices. The developers assess factors such as gameplay fluidity, word selection accuracy, and the effectiveness of educational features in improving vocabulary and spelling skills. These evaluations ensure that the Hangman game meets the expectations of word enthusiasts and effectively supports educational goals in an engaging manner.

**2.8 Conclusion**

In conclusion, this study marks a significant advancement in the realm of interactive word games with the development of a text-based Hangman adventure tailored for word enthusiasts. By implementing a dynamic word selection algorithm and integrating educational content, the game effectively enhances vocabulary and spelling skills in an engaging and interactive manner. The study underscores the importance of gamified learning tools in promoting educational outcomes while providing a fun and challenging experience for players. Future research could explore further enhancements in gameplay mechanics and accessibility features to broaden the game's appeal and educational impact. Overall, this study represents a valuable contribution to the field of educational gaming and highlights the potential of technology in facilitating language learning A group of black lines with a person standing on one leg

Description automatically generated with medium confidence

Figure 1.5 Hangman variations

**CHAPTER 3**

**EXISTING SYSTEM**

Hangman games are classic word-based puzzles that have been adapted into digital formats to engage players in interactive learning and entertainment. Here's an overview of an existing system for a text-based Hangman game: Word Database Creation: The system begins by compiling a comprehensive database of words across various categories and difficulty levels. This database serves as the foundation for selecting words during gameplay.

**Game Interface:** Players interact with the Hangman game through a user-friendly interface, where they input guesses for letters to uncover a hidden word. The interface provides visual feedback, such as displaying correctly guessed letters and tracking remaining attempts.

**Word Selection and Difficulty Adjustment:** During gameplay, the system dynamically selects a word from the database based on the player's chosen difficulty level. This ensures that the game remains challenging yet enjoyable for users of different skill levels.

**Feedback Mechanisms:** As players make guesses, the system provides interactive feedback, such as hints or visual cues, to assist in guessing the hidden word. This feedback enhances the gameplay experience and encourages player engagement.

**Educational Integration:** The Hangman game integrates educational elements by promoting vocabulary expansion and spelling skills. Players benefit from exposure to new words and reinforcement of correct spelling through interactive play.

**Real-time Processing:** The game operates in real-time, allowing for immediate feedback and interaction between the player and the game interface. This responsiveness enhances user experience and maintains engagement throughout the gameplay session.

**Challenges and Enhancements:** Challenges in Hangman game systems include balancing difficulty levels, optimizing word selection algorithms, and ensuring compatibility across different devices and platforms. Ongoing research focuses on improving gameplay mechanics, enhancing educational effectiveness, and expanding the game's accessibility features.

Overall, the Hangman game system exemplifies how digital adaptations of traditional games can combine entertainment with educational value, providing a fun and interactive way for players to improve their language skills.

**PROPOSED SYSTEM**

A multi-modal fusion system in text-based Hangman game development integrates various elements to enhance player engagement and educational effectiveness. This approach leverages different modalities to enrich the gameplay experience and improve overall system performance.

At its core, the multi-modal fusion system combines textual data with interactive features to create a comprehensive gaming experience. For instance, besides presenting textual clues and word definitions, the system may integrate audio cues to enhance immersion or provide visual aids to assist players in solving puzzles. Each modality contributes unique advantages to the Hangman game. Textual data provides the foundational content by offering a wide range of words and educational content. Interactive features, such as hints or feedback mechanisms, enrich player interaction and learning outcomes, promoting vocabulary expansion and spelling skills.

The fusion of these modalities occurs throughout the game's design and implementation phases. Initially, the game's word database is curated to include diverse categories and difficulty levels, ensuring a balanced and challenging gameplay experience. Interactive features like adaptive difficulty adjustment and real-time feedback mechanisms are then integrated to personalize the game according to each player's skill level and progress.

During gameplay, the system dynamically combines textual content with interactive elements to maintain player engagement. For example, as players make guesses, the system updates visual displays and provides real-time feedback on correct and incorrect guesses. This fusion of textual and interactive modalities enhances the overall gaming experience and encourages continued player participation.

By integrating data from multiple modalities, the multi-modal fusion system enhances the educational value and entertainment quotient of the text-based Hangman game. It adapts to players' preferences and learning styles, offering a versatile and engaging platform for improving language skills in an interactive and enjoyable manner. Overall, this approach represents a promising direction for advancing educational gaming systems, offering enhanced performance and scalability for future developments in language learning and cognitive skill development.

**SAMPLE CODE:**

#include <iostream>

#include <ctime>

#include <string>

#include <vector>

std::string get\_random\_word(std::vector<std::string>& words);

void play();

std::vector<std::string> words = {"programming", "hangman", "games"};

std::string hangman\_art[7] = {

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int main()

{

srand(time(0));

std::cout << "Welcome to Hangman!\n";

play();

return 0; }

if (secret\_word == guess\_word)

{

std::cout << hangman\_art[try\_no] << "\n";

std::cout << guess\_word << "\n";

std::cout << "You win! The word was " << secret\_word << "\n";

break;

}

} else {

++try\_no;

}

if (try\_no >= 6)

{

std::cout << hangman\_art[try\_no] << "\n";

std::cout << guess\_word << "\n";

std::cout << "You lost! The word was " << secret\_word << "\n";

break;

}

}

}

std::string get\_random\_word(std::vector<std::string>& words)

{

return words[rand() % words.size()];

}

**OUTPUT:**

A screenshot of a computer

Description automatically generated

**CHAPTER 4**

**CONCLUSION**

This project aims to provide an immersive and entertaining experience for word enthusiasts. By combining elements of the classic Hangman game with an adventurous storyline, it offers a fresh take on a beloved puzzle genre. The blend of traditional gameplay with narrative progression promises hours of entertainment and engagement, making it a standout choice for anyone who loves a good word challenge. Through thoughtful design and careful consideration of player feedback, this game strives to balance challenge, enjoyment, and accessibility, creating an enriching experience for all players.

In addition to its engaging gameplay and captivating story, the game also features a variety of difficulty levels and customizable options. This ensures that players of all ages and skill levels can enjoy the game at their own pace. Whether you're a seasoned word puzzle veteran or a newcomer to the genre, you'll find the perfect balance of challenge and fun.

The game also includes hints and tips to help players improve their skills, making it not only a source of entertainment but also a valuable tool for learning and development. Furthermore, the integration of social features allows players to share their progress, compete with friends, and participate in global leaderboards. This social aspect adds a layer of excitement and competition, encouraging players to keep coming back for more. By fostering a sense of community and friendly rivalry, the game enhances the overall experience, making it more than just a solitary activity. It becomes a shared adventure, where players can connect, compete, and celebrate their love for words together.

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