International Journal of Scientific Research & Engineering Trends
Volume 12, Issue 2, Mar-Apr-2026, ISSN (Online): 2395-566X

Ranger's Bad Luck: A Review on the Development of a 3D Arcade Game

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Abstract- This paper reviews the design and development of Ranger's Bad Luck, an arcade-style 3D video game built using agile methodologies. The game incorporates real-time graphics, a physics engine, and immersive sound effects to enhance the player experience. This review evaluates the advantages, limitations, and technological choices made during development, while situating the project within the broader context of game design practices. The findings indicate that the integration of agile development methods and modern tools such as Unreal Engine and Blender enabled efficient prototyping and implementation, though limitations regarding performance and scalability remain.

Keywords – Ranger's Bad Luck game, 3D arcade game development, Agile game development, Real-time game graphics.

I. INTRODUCTION

The video game industry has witnessed exponential growth, with both 2D and 3D games occupying significant market segments. Developing high-quality games, however, is resource-intensive, requiring strong coordination between design, programming, art, and testing. Agile methodologies have increasingly been adopted in game development to reduce costs and improve adaptability.

This review focuses on Ranger's Bad Luck, a 3D arcade game project, analyzing its development process, tools, and challenges. The case study demonstrates how agile methods can be effectively applied in small-scale indie development.

II. VIDEO GAME DEVELOPMENT OVERVIEW

Game development involves multidisciplinary roles including designers, artists, programmers, sound engineers, and testers.

Two major categories dominate the industry:

- 2D Games (side-scrolling, top-down, parallel projection, 2.5D)
- 3D Games (fixed perspective, first-person, third-person)

Ranger's Bad Luck belongs to the latter, designed with a focus on engaging mechanics, realistic physics, and replayability.

III. ADVANTAGES OF VIDEO GAMES

Research indicates multiple benefits of video games:

- Educational Value – Gamified learning enhances cognitive and creative skills.
- Hand-Eye Coordination – Action games improve reflexes and multitasking ability.
- Therapeutic Applications – Used in physiotherapy and pain management.
- Imagination Booster – Encourages creative problem-solving.
- Problem-Solving Skills – Challenges players to strategize and adapt.

In Ranger's Bad Luck, these aspects are emphasized through puzzles and chance-based mechanics.

IV. DISADVANTAGES OF VIDEO GAMES

Conversely, excessive gameplay poses risks:

- Behavioral and mental health issues (violence, isolation).
- Academic and social neglect.
- Physical health problems (sedentary lifestyle, obesity, eye strain, insomnia).
- Cognitive stagnation when gameplay becomes addictive.

This review acknowledges that while games like Ranger's Bad Luck can enhance skills, responsible usage is necessary.

V. LIMITATIONS OF RANGER'S BAD LUCK

- No online or multiplayer functionality.
- Hardware-dependent performance (processor-heavy, battery drain).
- 30 FPS cap affects fluidity.
- Compatibility issues with certain components.
- No cloud save system

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These limitations restrict scalability but are acceptable within the scope of an academic prototype.

VI. TOOLS AND TECHNOLOGIES

The development utilized a robust set of technologies:

- Game Engine – Unreal Engine (C++ support, real-time rendering).
- Modeling Tools – Blender, 3D Studio MAX, Adobe Mixamo (skeletons/animations).
- Audio Tools – Adobe Audition, FL Studio.
- Programming – C# for REST APIs.

The choice of Unreal Engine was critical, offering pre-built frameworks and faster prototyping.

VII. IMPLEMENTATION AND DESIGN

The project incorporated:

- Input mapping (mouse, keyboard, controller).
- Animation systems (walking, crouching, sprinting).
- Environment and level design assets.
- Physics-based movement and interactions.
- Basic save system (local storage).

Visual and structural elements were supported by ER diagrams, class diagrams, and use-case/activity diagrams.

VIII. DISCUSSION

The agile approach facilitated incremental progress, with frequent testing and iteration. Compared to traditional waterfall methods, agile allowed the team to refine mechanics and address challenges quickly. However, the lack of multiplayer, scalability, and optimization highlights the trade-offs between rapid prototyping and full-scale development.

IX. CONCLUSION

This review of Ranger's Bad Luck demonstrates how agile methodologies and modern toolchains enable the creation of an engaging 3D arcade game within limited resources. While the game has strong core mechanics and immersive features, future improvements should address performance, online capabilities, and broader compatibility. The project exemplifies how student-driven development can contribute to the growing body of knowledge in indie game design.

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