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Original Contribution

Indie Game Alchemy: Crafting Success with C# and Unity's Dynamic Partnership

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This piece digs into the mutually beneficial relationship between the C# programming language and the Unity game creation engine, examining the vital role that both components have played in transforming the development process of independent video games. The powerful pairing of Unity and C# has enabled developers to create engaging gaming experiences by combining the variety and accessibility of Unity with the elegance and efficiency of C#. The evolution of Unity, the influence of the Unity Asset Store, and the general-purpose capabilities of C# are all topics that are discussed in this article. This article delves deeper into the seamless integration of C# with Unity, highlighting the benefits of event-driven programming. The essay addresses the issues that developers are facing and offers insights into the future trends of this powerful alliance. It does this by highlighting the concrete impact of this collaboration through case studies of successful independent video games. The article says that the synergy between C# and Unity will continue to be a cornerstone, fueling creativity and attracting audiences worldwide as the development of independent video games continues to progress.

INTRODUCTION

In the ever-expanding realm of digital entertainment, the mutually beneficial relationship between the C# programming language and the Unity game creation engine has emerged as a revolutionary force, particularly for independent game producers. This dynamic pair, which is comparable to a dance that has been well-choreographed, has not only made game production more accessible to more people but has also driven a boom in creativity (Baddam & Kaluvakuri, 2016; Baddam et al., 2018). This has enabled creators to overcome technological limitations and concentrate on creating gaming experiences that are engaging and immersive.

Throughout its existence, Unity has seen a remarkable transformation, becoming a name that is synonymous with adaptability and accessibility. Unity has evolved from its humble beginnings as a game engine into a comprehensive ecosystem that enables developers to generate content across various platforms. Unity's humble origins were comprised of a game engine. As a result of its intuitive user interface and capacity to deploy games seamlessly across multiple devices, including personal computers, gaming consoles, and mobile devices, it has become the program of choice for developers looking for a unified and effective development environment (Deming et al., 2018; Fadziso et al., 2019; Kaluvakuri & Amin, 2018).

The Unity Asset Store is a dynamic marketplace that has become the lifeblood of many independent game projects. It is one of the elements that distinguishes Unity from other game development platforms. The production durations have significantly been accelerated thanks to this repository of assets, which includes everything from 3D models and textures to audio clips and pre-built scripts. Additionally, the entry barriers for ambitious developers have been significantly reduced.

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The expansive collection of assets at one's disposal exemplifies the Unity community's cooperative nature, which helps create an atmosphere where information and resources are freely exchanged (Baddam, 2017; Baddam, 2020).

The C# programming language has become essential in game production, complementing Unity Software's capabilities. The programming language C# has evolved beyond its roots to become a general-purpose language particularly well-liked among game developers. It is well-known for its readability, adaptability, and ease of use. Because its syntax, influenced by C and C++, balances power and simplicity, it is an excellent option for novice and experienced programmers.

The ability of C# to ease difficult programming jobs is the source of its elegance, which extends beyond the language's syntax. Because it is a language that supports object-oriented programming ideas, C# makes it easier to create game code that is both modular and maintainable. This is an essential feature in game development's iterative and collaborative nature. In addition, C# has capabilities such as automatic memory management through garbage collection, which relieves developers of the complex memory management concerns that are sometimes encountered with other languages.

While exploring the complex relationship between Unity and C#, it becomes abundantly clear that integrating these two languages is technical and philosophical. Unity's scripting application programming interface (API) includes C# seamlessly, providing developers with a comfortable and robust environment to bring their creative ideas to life. As a result of this symbiosis, developers can concentrate on the complexities of gameplay, user interaction, and story rather than having to struggle with the intricacies of low-level programming.

As part of this investigation of the dynamic combination, we will delve into the technical complexities of integrating C# and Unity. Throughout our cooperation, we will peel back the layers, beginning with the fundamentals of scripting in Unity using C# and progressing to the complexities of event-driven programming. Real-world examples and case studies will be utilized to shed light on the tangible impact that this relationship has had. These will demonstrate the variety and efficiency that C# and Unity bring to independent game production.

In addition, we will discuss the difficulties that independent developers encounter, guiding overcoming obstacles and using the community's support throughout the process. By analyzing successful independent games created with C# and Unity, we aim to extract the core features that contributed to their success and offer conclusions applicable to aspiring game developers.

I invite you to explore the nuances of this collaboration, witness the tangible outcomes in successful indie games, and envision the future landscapes that this dynamic duo is poised to shape in the ever-evolving world of digital gaming. As we embark on this journey through the emotional realms of C# and Unity in developing independent video games, we invite you to explore these nuances.

THE RISE OF UNITY IN INDIE GAME DEVELOPMENT

The world of independent game development has seen a dramatic transition, with Unity emerging as a prominent force that has democratized the creation of fascinating and inventive games. Unity's ascent to prominence in the independent game development industry is a testament to the technical capabilities of the software but also to the user-friendliness of its interface and its dedication to making tools available to creators of all skill levels (Kaluvakuri & Lal, 2017; Lal & Ballamudi, 2017; Vadiyala et al., 2016). As part of this investigation, we look into the primary elements that have contributed to the rise of Unity in the field of independent game production and investigate the influence that it has had on the gaming industry.

- **Evolution of Unity:** Unity's capacity to remain flexible and sensitive to the ever-changing requirements of game developers is demonstrated by the fact that it has gone from being a specialized game engine to a widely used platform. Unity was initially released in 2005, and it quickly gained popularity due to its user-friendliness and cross-platform capabilities. These characteristics enabled developers to create games that were compatible with a variety of operating systems and devices. Unity has steadily developed into a comprehensive ecosystem throughout its existence, integrating features tailored to meet the varied needs of independent software creators.

- **Accessibility and User-Friendly Interface:** The fact that Unity is so easy to use is one of its most characteristic characteristics. It has become possible for developers with varied degrees of expertise to bring their ideas to life thanks to the user-friendly interface and the development environment focused on visual programming. "What you see is what you get" (WYSIWYG) is an

approach that Unity takes that enables developers to rapidly visualize the impact of their code and design decisions in a real-time 3D environment. This accessibility has been a game-changer for independent developers since it has eliminated steep learning curves and enabled them to concentrate on creativity rather than struggle with details (Sharp & Sharp, 2017).

- **Cross-Platform Development:** One factor contributing to Unity's extensive popularity is its capacity for development across several desktop platforms. The resources necessary to target several platforms individually are frequently unavailable to independent developers. Streamlining the development process and enabling creators to reach a wider audience without needing extensive platform-specific adjustments is one of the benefits of Unity's "write once, deploy anywhere" philosophy. Independent game developers need this versatility to maximize their game's possible reach without sacrificing the development process's efficiency.

- **Unity Asset Store:** It is a credit to the spirit of collaboration throughout the Unity community that it continues to exist. As a treasure trove of pre-built assets, plugins, and tools, the Asset Store has become an invaluable resource for independent software creators. To facilitate the acceleration of development timelines and the development of a sense of community-driven innovation, Unity has established an ecosystem that allows creators to use each other's work. This ecosystem is developed by providing a marketplace for developers to exchange and sell assets.

- **Indie Success Stories:** The popularity of Unity in the independent game development market has been further spurred by the success of a large number of independent games that were produced using Unity. Not only have games such as "Hollow Knight," "Crossy Road," and "Monument Valley" received critical praise, but they have also found economic success. This demonstrates that independent game makers can prosper on the Unity platform. Aspiring developers can draw inspiration from these successful examples, which show that Unity offers a feasible avenue for them to deliver their creative concepts to an audience worldwide.

- **Community Support and Learning Resources:** Unity's dedication to supporting its community is significant in the company's climb to prominence. There is a variety of tools available to developers who are navigating the Unity environment. These resources include comprehensive documentation, tutorials, and an active community forum. Independent developers have been given the ability to improve their skills and overcome obstacles thanks to the availability of learning resources. This has helped cultivate a community where the exchange of knowledge is essential.

The rise of Unity in the field of independent game production is a story of community collaboration, accessibility, and empowerment. Unity's transformation into a comprehensive game production ecosystem, emphasizing user-friendly design and cross-platform capabilities, has positioned it as a revolutionary force for independent game developers worldwide. As we explore the ever-changing realms of Unity, it becomes clear that its rise is not solely about technology but rather about offering a canvas on which creativity may blossom. This makes the ideal of independent game production more attainable than it has ever been before.

UNVEILING THE POWER OF C# IN GAME DEVELOPMENT

Regarding the complex world of game creation, the C# programming language stands out as a powerful instrument that has become synonymous with effectiveness, readability, and versatility. C#, the foundation for many popular video game titles, is essential in conceiving the dynamic and immersive experiences that attract players worldwide. During this investigation, we look into the distinctive characteristics of C# that make it a formidable tool for game development. Additionally, we investigate the influence that C# has on the production of game code that is modular, manageable, and performance-driven.

- **C# as a General-Purpose Language:** Simplicity, type safety, and scalability were the primary motivating factors for the development of C#, which was initially presented by Microsoft in the year 2000. Throughout its existence, it has developed into a robust language that can be used for various purposes, and it has found an exceptionally comfortable home in game creation. Its syntax, influenced by C and C++, strikes a balance between power and simplicity, making it accessible to developers with various backgrounds and degrees of skill (Liang et al., 2014).

- **Readability and Elegance:** One of the most notable characteristics of C# is the elegance and readability of the language. The language's grammar is straightforward and expressive, making writing functional and understandable

code easier. This quality is of the utmost significance in game development, characterized by collaborative efforts and code maintenance as essential elements of the development lifecycle. Because of the clarity of C# code, developers can readily grasp, alter, and expand upon existing codebases. This helps to encourage a development process that is more streamlined and collaborative (Ohaneme et al., 2012).

- **Simplifying Complex Programming Tasks:** The computer language C# is particularly effective in facilitating difficult jobs. It provides developers with higher-level abstractions, which reduce the need for intricate low-level operations. Due to the fast-paced and iterative nature of game development, where rapid prototyping and experimentation are essential, this proves to be highly effective. The developers can devote more attention to implementing game logic and features when they have access to capabilities such as automatic memory management through garbage collection. This helps them alleviate issues connected to memory leaks and manual memory allocation.

- **Object-Oriented Programming (OOP) Principles:** Using Object-Oriented Programming (OOP) principles, the programming language C# offers developers a solid foundation to create modular and reusable code. The requirements of game development, which require complicated systems to be broken down into manageable, self-contained items, are perfectly met by this approach, which matches those requirements perfectly. Object-oriented programming (OOP) intrinsic characteristics are encapsulation, inheritance, and polymorphism. These characteristics help the development of code that is not only modular but also extendable, thereby establishing the groundwork for scalable game structures (Adamovic et al., 2014).

- **Memory Management and Performance:** In game situations that require a lot of resources, efficient memory management is necessary. C# uses a garbage collector to manage memory, automatically recovering memory that is not utilized and lowering the risk of problems connected to memory. Even though some developers might be concerned about the possibility of performance overhead, the developments in the C# runtime have helped reduce these worries. Additionally, C# has techniques for optimizing efficiency, which enables developers to fine-tune crucial areas of code whenever it is required to do so.

- **Cross-Platform Development:** The programming language C# is not restricted to a particular platform, and this flexibility allows it to accommodate the requirements of contemporary game creation easily. C# has become a versatile choice for developers who want to deploy their games on various systems, including personal computers, consoles, and mobile devices, due to the introduction of cross-platform gaming. Because of this flexibility, not only does the amount of effort required for development decrease, but it also expands the potential audience for independent developers by enabling them to communicate with players on various platforms.

As we continue to peel back the layers of C# in the realm of game creation, it becomes increasingly clear that the value of this language rests not only in its technical capabilities but also in its capacity to empower developers, streamline collaboration, and improve the overall experience of game production (Vadiyala, 2021; Vadiyala & Baddam, 2017; Vadiyala & Baddam, 2018). C# acts as a conductor in the dance of collaboration between game developers and game developers, coordinating the production of games that work without any hiccups and resonate with players on a profound level. In the ever-changing landscape of game production, C# stands tall as a testament to the idea that a clever programming language can catalyze innovation and creativity, promoting a new era of interactive and immersive gaming experiences. C# is a programming language that has existed for some time.

SEAMLESS INTEGRATION: C# AND UNITY WORKING IN HARMONY

It is often the case that the key to unlocking the full potential of creative vision is to achieve seamless integration between a programming language and a game engine. This is because the world of game development is filled with constant change. This type of synergy is shown by the combination of C# and Unity, which provides developers with a cohesive environment in which the sophistication of C# code elegantly combines with the robust capabilities of the Unity game development engine. This investigation explores the complexities of integrating C# with Unity. We will investigate the benefits, practical applications, and real-world examples that demonstrate the efficacy of this dynamic partnership.

- **C# Scripting in Unity:** It is the scripting application programming interface (API) of Unity that serves as the bridge between C# and the game engine. This API gives developers a robust way of

controlling and manipulating game elements. Scripts written in C# are the fundamental components of gameplay logic, user interface, and general functioning in Unity. Thanks to its seamless integration, developers can take advantage of the expressive syntax of C# to write compelling and easy-to-maintain scripts (Epure & Iftene, 2016).

- **Advantages of Using C# in Unity:** Various benefits of utilizing C# in Unity go beyond syntax preferences. A multitude of features, such as strong typing, automatic memory management, and support for modern programming paradigms, are brought to the Unity development environment by the programming language C#. As a result of these characteristics, the development workflow is enhanced, resulting in faster iteration, fewer errors during runtime, and an overall improvement in the code quality.

- **Code Examples Demonstrating Synergy:** Understanding the synergy between C# and Unity is best accomplished using real code examples. Developers can transform their ideas into code seamlessly, which immediately affects the behavior and presentation of the game. This can range from simple script structures to intricate interactions between game elements. The expressive nature of C# makes it easier to translate design concepts into practical code. This is true whether the task at hand is to manage in-game events, build physics simulations, or control the movement of characters.

Example C# script showcasing an event-driven pattern in Unity

```
public class GameManager: MonoBehaviour
{
  // Define an event for game completion
  public delegate void GameCompleted();
  public static event GameCompleted OnGameComplete;

  void Update()
  {
    // Check for game completion condition
    if (IsGameComplete())
    {
      // Trigger the event when the game is complete
      OnGameComplete?.Invoke();
    }
  }

  bool IsGameComplete()
  {
    // Logic to determine if the game is complete
    // ...
  }
}
```

- **Event-Driven Programming in Unity with C#:** The production of interactive games relies heavily on event-driven programming, and C# makes it possible to apply this type of programming in Unity seamlessly. Developers can respond to user inputs, collisions, or other dynamic changes inside the game world by defining events, triggers, and callbacks in C# scripts. This gives developers the ability to create interactive games. This strategy, which is driven by events, improves the responsiveness of games, producing a user experience that is both dynamic and entertaining (Garnier et al., 2017).

- **Real-World Examples of Event-Driven Design Patterns:** Various gaming scenarios can benefit from implementing event-driven design patterns in Unity, powered by C#. For instance, implementing a responsive user interface that reacts to the player's actions, managing in-game animations triggered by particular events, and orchestrating complicated gameplay sequences based on user inputs are all examples. Developers can create games that are interactive, dynamic, and alive by exploiting the event-handling features of C# (Pérez & Sánchez, 2017).

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            // Trigger the event when the game is complete
            OnGameComplete?.Invoke();
        }
    }

    bool IsGameComplete()
    {
        // Logic to determine if the game is complete
        // ...
    }
}
```

The developers find a harmonious rhythm in the delicate dance between C# and Unity, which enables them to bring their ideas to life and build games that resonate with players on a profound level. It is not only technical cooperation that the seamless integration between C# and Unity is; it is a creative relationship that gives developers the ability to weave storylines, construct immersive worlds, and make experiences that transcend the borders between imagination and reality (Kaluvakuri & Vadiyala, 2016; Maddali et al., 2019; Lal, 2015). The symphony of C# and Unity continues to be a testament to the unlocked potential when a powerful programming language and a dynamic game engine work in perfect harmony. We continue to investigate this as we explore the world of game creation (Simončič et al., 2016).

CASE STUDIES: INDIE GAMES THRIVING WITH C# AND UNITY

In the ever-expanding environment of independent game production, the collaboration between C# and Unity has created many successful titles that have captivated audiences worldwide. Case studies like these provide a look into the myriad of ways in which independent game developers use the dynamic combo of C# and Unity to create games that are not just unique but also engaging and economically successful.

"Hollow Knight" by Team Cherry

- **Genre:** Action-Adventure.
- **Release Date:** February 24, 2017.
- **Platform:** Personal Computers, Consoles, and Nintendo Switch

Integration of C# and Unity:

- The complex and ethereal world of Hollow Knight was mainly crafted through C# scripting, which was an essential component.
- The characters and environments of the game were brought to life through the use of Unity's animation system, which was effectively coupled with C# scripting.
- Team Cherry acquired essential materials through the Unity Asset Store to expedite production. These assets included sound libraries and visual effects.

Impact:

- Critics praised Hollow Knight for its captivating gameplay, deep narrative, and breathtaking hand-drawn artwork.
- The game's success demonstrated that a tiny independent company equipped with C# and Unity could produce a play on par with mainstream releases in terms of quality and popularity.

Crossy Road" by Hipster Whale

- **Genre:** Endless Arcade Hopper.
- **Release Date:** November 20, 2014
- **Platform:** The mobile platform (iOS and Android) is supported.

Integration of C# and Unity:

- The game's dynamic and dynamically generated environments were made possible through C# programming.
- The physics engine of Unity, which was managed seamlessly by C# scripts, was a contributor to the highly realistic movement and interactions of the characters.
- The little team at Hipster Whale could iterate quickly during the development process thanks to the ease of use and readability of the C# programming language.

Impact:

- Over two hundred million copies of Crossy Road have been downloaded worldwide, making it a viral phenomenon.
- Through the popularity of the game, it was proved that C# and Unity have the potential to enable independent developers to build experiences that are both accessible and addicting and that resonate with a large number of people.

Monument Valley" by two games

- **Genre:** Escher-inspired puzzles.
- **Release Date:** April 3, 2014.
- **Platform:** The mobile platform (iOS and Android) is supported.

Integration of C# and Unity:

- Through the use of C# scripting, development of sophisticated level designs influenced by M.C. Escher's works was made possible.
- To bring the game's bizarre surroundings to life while maintaining a focus on aesthetics, the rendering capabilities of Unity, which were controlled through C# code, were utilized.
- The Unity Asset Store allowed Ustwo games to acquire visual assets and tools that perfectly match the game's one-of-a-kind artistic style.

Impact:

- Critical acclaim was bestowed upon Monument Valley because of its forward-thinking design, stunning visuals, and emotionally gripping narrative.
- The game's success demonstrated how C# and Unity could be utilized to facilitate the creation of experiences that are both visually attractive and emotionally engaging. This achievement established a new standard for independent games in the mobile sector.

Undertale" by Toby Fox

- **Genre:** Independent Role-Playing Game.
- **Release Date:** September 15, 2015.
- **Platform:** personal computers and gaming consoles

Integration of C# and Unity:

- Using C# scripting allowed for the development of Undertale's one-of-a-kind combat system and its narrative branching.
- Unity's audio system, managed seamlessly by C# scripts, produced the game's unique soundtrack and sound effects.
- The ease of use of C# was a factor that helped the development of the game's modding community, which enabled players to extend and change the game.

Impact:

- Undertale has garnered a devoted fanbase and critical acclaim due to its novel approach to storytelling and the gameplay options it provides to players.
- The popularity of Undertale brought to light the fact that C# and Unity have the potential to enable independent game developers to build games that challenge the conventional conventions of their genre and elicit an emotional response from players.

The combination of C# and Unity in independent game creation is demonstrated by these case studies, which highlight the variety and strength of the combination. Independent game creators continue to thrive by utilizing the seamless integration of C# and Unity to bring their creative visions to life (Maddali et al., 2018; Vadiyala, 2017; Vadiyala, 2020). This is true whether they construct atmospheric landscapes, implement new gameplay systems, or deliver emotionally gripping narratives. Small teams can now compete worldwide and make an indelible mark on the gaming industry due to the success of these products, which not only showcases the technical prowess of the dynamic duo but also stresses the democratization of game production.

THE FUTURE OF C# AND UNITY IN INDIE GAME DEVELOPMENT

The relationship between C# and Unity is positioned to play an even more central role in influencing the future of independent game production. This is because we are on the verge of entering a new age in technology and game development. The dynamic pair has already demonstrated its worth by providing developers with the ability to create game experiences that are both immersive and unique. In this investigation, we look at the developing tendencies, technologies, and community-driven initiatives that will continue to thrust C# and Unity to the forefront of independent game production in the future.

- **Advanced Graphics and Realism:** As hardware's capabilities progress, it is expected that C# and Unity will adopt cutting-edge graphics technology to limit visual realism in independent video games. Incorporating advanced rendering techniques, like ray tracing and complex lighting models, will allow independent developers to create visually spectacular and immersive worlds on par with those produced by AAA games.

- **Virtual Reality (VR) and Augmented Reality (AR):** There is a direct correlation between the immersive experiences that virtual reality and augmented reality technology provide and the future of independent game creation. By committing to cross-platform development, C# and Unity have become significant players in the rapidly expanding virtual and augmented reality ecosystems. Using these technologies, independent developers can create fascinating and interactive experiences, bringing virtual and augmented worlds to life in ways previously thought to be the domain of larger companies (Watts, 2012).

- **Procedural Content Generation:** Using procedural content generation capabilities in Unity, powered by C# scripts, will become increasingly widespread as game environments become more complicated. This method allows developers to build dynamic and different materials, ranging from landscapes to missions, providing players with distinctive and unpredictable experiences. The combination of the adaptability of C# and the procedural technologies of Unity will make it possible for independent game creators to construct game environments that are huge and constantly changing.

- **Cloud Gaming and Streaming:** The proliferation of cloud gaming services and game streaming platforms will significantly impact the future landscape of independent game production. C# and Unity are vital tools for developers who want to reach consumers through cloud-based gaming because of their adaptability to various platforms compared to other programming languages. Due to this transition, Independent software developers can concentrate on content creation while offloading resource-intensive chores to cloud services, which may also lead to developing new collaboration models.

- **Enhanced AI and Machine Learning:** Incorporating advanced artificial intelligence and machine learning frameworks into C# and Unity will catalyze the development of non-player characters (NPCs) and game mechanisms that are more complex and responsive. Independent game developers will utilize these features to create games that can adapt to players' actions, thereby providing players with individualized and dynamic gaming experiences (Roy et al., 2019).

- **Community-Driven Development:** The thriving communities surrounding C# and Unity will continue to play a significant role in determining the future trajectory of independent game production. Open-source efforts, collaborative forums, and sharing assets and expertise through platforms like GitHub will all contribute to developing a culture that values innovation and welcomes all individuals. Community-driven resources will become increasingly important for independent developers as they seek to overcome obstacles, share best practices, and speed up development speeds.

- **Educational Initiatives and Onboarding:** Educational efforts focused on cultivating the next generation of independent developers will significantly use the user-friendly interfaces that C# and Unity provide. Aspiring game developers can confidently enter the independent game development scene by accessing intuitive learning tools, tutorials, and initiatives that simplify onboarding. This will further diversify the talent pool (Jiang, 2011).

The future of software development for independent video games using C# and Unity is a landscape filled with infinite options. Independent game makers will find themselves at the vanguard of innovation as technological developments unfold. This will be made possible by combining a powerful and flexible programming language and game engine. Rather than being only a snapshot of the present, the synergy between C# and Unity is a dynamic cooperation that will continue to expand. This collaboration will allow independent game creators to build games that push the frontiers of artistic expression, storytelling, and technical development. The voyage of independent game production using C# and Unity promises to be an exciting and transforming odyssey where creativity knows no limitations and the community's collaborative spirit leads the way for ground-breaking experiences that captivate gamers worldwide. As we look ahead, we are excited about this trip.

CONCLUSION

The dynamic interplay between C# and Unity has transformed indie game creation and opened the door to innovation, creativity, and limitless possibilities. As we examine this dynamic team's evolution, integration, and success stories, it becomes evident that C# and Unity's cooperation is more than a technical collaboration but a catalyst for revolutionary gaming experiences. Indie developers use C# and Unity to realize their creative concepts. Unity's platform and C#'s versatility and elegance have democratized game production, allowing small teams and solitary devs to compete globally. C# and Unity remain adaptive to new technology and trends in the game business. C# and Unity may help indie developers push the limits of innovation in cloud gaming, procedural content generation, and immersive experiences. In the future, C# and Unity will continue collaborating, creating a landscape where indie developers thrive, and consumers may enjoy various intriguing games. C# and Unity's compatibility is more than just a toolset; it's a testament to indie developers' ability to push the limits of interactive entertainment with a powerful language and flexible engine. Every line of code in independent game creation with C# and Unity has the potential to create a masterpiece that captivates gamers worldwide.

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