Innovation Report: The Metaverse in Gaming Industry

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Abstract

Based on the theories of disruptive innovation, dominant design and innovation diffusion, this study selects two major platforms, Roblox and Fortnite, to explore the development path of metaverse games. We compared the market positioning, core technologies and business models of the two, and conducted an analysis in combination with Rogers' adopter model and Christensen's disruption framework. Research has found that Roblox has achieved low-end disruption through an open creative ecosystem, while Fortnite has opened up new markets by relying on cross-media live streaming. Finally, future research directions such as interoperability standards, decentralized governance and the impact of the virtual economy were proposed.

3 Justification and Explanation - Motivation

The motivation behind the rapid development of metaverse gaming is rooted in three main drivers: strong user demand, continuous technological advancement, and the broader shift toward digital interaction and the creator economy. Roblox and Fortnite were selected as focal platforms because they clearly reflect these drivers in both strategy and practice.

First, user demand for immersive, social, and creative digital experiences has grown rapidly, especially among younger generations. Roblox and Fortnite have become leading platforms by meeting these evolving needs. Roblox reported 58.8 million daily active users in 2022, with players aged 12–17 spending an average of 3.8 hours per day on the platform (Roblox - Financials - Annual Reports, n.d.). Fortnite has over 650 million registered users as of early 2025, and 73% of them use it as their main way to socialize with friends (Epic games, 2025). These platforms are no longer just games-they are digital spaces where users build, connect, and express themselves. Features such as personalized avatars, multiplayer collaboration, and

live in-game events create a strong sense of presence and community, which traditional games do not offer.

Second, rapid improvements in technology have made the metaverse experience more accessible, immersive, and interactive. Devices like the Oculus Quest 2 now offer high-resolution displays, smooth refresh rates, and hand tracking, allowing users to fully engage in 3D virtual environments (Meta, 2024). Powerful game engines such as Unity and Unreal make it easier for both professionals and amateurs to create high-quality content. Cloud computing and 5G networks support real-time multiplayer experiences without lag. These technologies enable platforms like Roblox and Fortnite to host millions of simultaneous users in shared digital spaces, breaking previous limitations on scale and interactivity. Moreover, tools such as Roblox Studio and Unreal Editor for Fortnite (UEFN) allow users to build their own games using simplified code, graphical tools, and integrated Web APIs. This hands-on access turns users into creators, making content creation a core part of the user experience.

Third, the rise of the metaverse is closely tied to global trends such as remote interaction, digital entertainment, and the creator economy. The COVID-19 pandemic accelerated the shift to virtual spaces, and platforms like Fortnite took advantage by hosting massive virtual concerts. The Travis Scott event in Fortnite attracted 27.8 million in-game participants, showing the potential of virtual events to reach and engage global audiences in ways that physical events cannot (Epic Games' Fortnite, n.d.). Roblox has also become a hub for educational and commercial partnerships. For example, Gucci launched a virtual fashion experience on Roblox, and Nike acquired RTFKT, a creator of digital sneakers and NFTs (Hollensen et al., 2022). These moves show how brands see the metaverse not just as a marketing channel but as a new digital economy.

Both Roblox and Fortnite are also shaped by the growing creator culture. On Roblox, over 12 million creators have built and published games, and many earn real income through Robux, the platform's virtual currency. In 2023, Roblox paid over $700 million to its developer community (Roblox Developer Payout Structure 2023, n.d.). Epic Games introduced Creator Economy 2.0, offering up to 40% of revenue to Fortnite creators who build custom game experiences using UEFN. These incentives have transformed users into active contributors, fueling continuous innovation and platform growth.

In summary, Roblox and Fortnite were selected because they are leading examples of how consumer behavior, technology, and economic models align to drive metaverse innovation. Users want deeper, more interactive experiences; technology is now capable of delivering them at scale; and new digital business models reward users for their participation and creativity. These platforms show how metaverse gaming is not just a technological upgrade but a transformation in how people play, create, and connect. Their success illustrates why the metaverse is emerging as a major force in digital entertainment and why companies, developers, and policymakers must pay close attention to how this space evolves.

4 Justification and Explanation - Technology Explanation

For the gaming industry, the metaverse represents the next stage of digital entertainment, offering the opportunity to engage in games that transcend passive gameplay and provide interactive, social, and user-generated experiences. The technologies that support the metaverse include virtual reality (VR), augmented reality (AR), 3D rendering engines, real-time communication protocols, and blockchain infrastructure for digital ownership (Hollensen et al., 2022).

In gaming, the concept of the metaverse reshapes the way users experience games. It makes it possible for users to keep the same digital identity, engage with other players in real time, and participate in shared virtual economies. Those games based on the metaverse have a huge difference from traditional games, which have relatively fixed mechanics. They focus more on exploration, user-driven content, and multiplayer interaction. Examples like live concerts, creator-built islands, and virtual commerce extend gaming into hybrid spaces where entertainment, creativity, and social engagement merge (Epic Games, 2024). The flexibility of metaverse platforms also allows developers to design experiences that adapt to player feedback, seasonal events, and emerging technologies, creating games that evolve over time rather than remaining static.

Roblox and Fortnite are two dominant platforms that operationalise this vision through distinct but complementary models. Roblox depends on an open, low-code creation ecosystem powered by Roblox Studio, which enables millions of developers, including a lot of non-professionals, to build games and experience them (Roblox Corporation, 2024). Its Lua-based scripting system, wide resource library, and profit tools support a vibrant, bottom-up user innovation culture. In contrast, Fortnite has moved from a battle royale game to a media-rich virtual venue. Its Creative Mode and Unreal Editor for Fortnite (UEFN) allow semi-professional users to build high-quality, brand-integrated content. Fortnite’s platform is more curated, balancing user creativity with Epic’s editorial control to maintain visual and narrative consistency (Epic Games, 2024).

In terms of economics, both platforms support virtual currencies, Robux and V-Bucks, and a creator payout system. The report of Roblox Corporation indicated that Roblox paid over $700 million to developers through its DevEx program in 2023 (Roblox Corporation,2024). In the same year, Fortnite's Creator Economy 2.0 launched a 40% revenue-sharing model based on engagement (Statista, 2025). These virtual economies incentivise developers to devote more energy to producing continuous content and reinforcing community participation.

Importantly, the metaverse in gaming is not just one single product, but more like a general way to design gams. It can change and improve all the time based on user feedback and development tools. Roblox focus on being simple to use and quick to update, while Fortnite pays more attention to high-quality graphics and working with brands. These different directions show how companies use metaverse ideas in different ways. These differences form the basis for comparing innovation models across distributed ecosystems. Due to the platforms becoming more complex and expectations from users becoming higher, companies that adopt flexible and

user-driven technologies are more likely to try new economic sources, expand to the whole world and even build long-term engagement. For example, brands like Nike and Gucci have partnered with Roblox and Fortnite to launch virtual merchandise, which means we can create entirely new e-commerce and marketing in the virtual world. These trends not only increase platform stickiness but also create ecosystems where economic opportunity is tied directly to user creativity and participation.

This technological foundation directly informs the distributed innovation strategies explored in the next section. Roblox and Fortnite's architectures enable Platform Innovation and User Innovation by reducing barriers to creation, rewarding participation, and scaling through network effects. Their contrasting approaches, with Roblox being open and grassroots and Fortnite being curated and high-fidelity, illustrate how the metaverse is realized through both democratized creation and brand-guided experiences. The features like cross-device accessibility and multimedia integration make the metaverse provide more ways for users to enjoy games and connect with others. These continuous advancements not only support deeper user engagement but also create new strategic options for profit and community building.

In conclusion, the metaverse in gaming represents a convergence of immersive technology, creative tools, and participatory culture. Roblox and Fortnite demonstrate how different platform structures can support large-scale, evolving digital worlds, setting the stage for further analysis of their innovation strategies and comparative advantages.

5 Relevance of Concepts

Distributed innovation encompasses collaborative models that extend a firm’s research and development boundaries into a broader ecosystem of partners and users. Two foundational concepts within this paradigm are Platform Innovation and User Innovation, each playing a critical role in how modern digital enterprises scale and evolve.

Platform Innovation is the intentional development of multi-sided digital infrastructures, which allow diverse contributors to co-produce value under open interfaces and clear rules of governance (Parker, Van Alstyne & Choudary, 2016; Tiwana, Konsynski & Bush, 2010).User Innovation, on the other hand, is a model by which ‘lead users’, who experience unmet needs, will on their own modify or create products or services that are then brought back into the system, to increase the pace and scope of innovation beyond which the firm was capable alone (von Hippel, 2005; Franke & Shah, 2003).Between the two, these principles help describe how ecosystems like those owned by Roblox Corporation and Epic Games, Inc. are able to leverage partner and user creativity to enable modular scalability, speed iteration and maintain a lasting competitive edge.

5.1 Platform Innovation

Platform Innovation is the heart of strategic architecture for both Roblox Corporation and Epic Games, Inc. It is being developed and astroturfed by property developer Roblox Corporation, which made a name for itself with Roblox Studio, an environment that frictionlessly

transubstantiates content creators, players, and paying customers into one single “build–play–monetize” loop. With a powerful Lua scripting interface and over 400 IPlugins, Roblox Studio supports a level of game development, for all levels of developers, that can be more detailed and complex than the one you can find in the consumer-facing product(Roblox Corporation. 2024). Importantly, the platform does not sacrifice quality control: Roblox uses automated content moderation systems, strict store policies and a shared 70 percent revenue with developers so that creativity can truly thrive within a safe and regulated ecosystem (Roblox Corp., 2023).When combined with open tooling and governance, it provides an excellent illustration of three main components that drive Platform Innovation-multi-sided markets, open APIs and governance mechanisms-in the process, unleashing strong network effects as new creators bring in more players, who then attract even more developers to the platform (Parker et al., 2016).

Epic Games, Inc., the creator and publisher of Fortnite, follows a very similar model within its Unreal Engine platform(Epic Games, Inc. 2021). By offering developers free access to the entire engine source code and an evolved Marketplace API, Epic Games had drawn more than 700,000 registered developers internationally by the beginning of 2024, including independent game studios, hobbyist developers, and established game developers (Parker et al., 2016). This multi-dimensional digital ecosystem enables a cross-industry community to develop games, simulations, and interactive experiences for multiple platforms(Epic Games, Inc. 2021).The availability of Fortnite Creative and Unreal Editor for FN (UEFN) adds another level of complexity to the integration of high-end content authoring tools in ways that make the tools accessible to non-experts. Once published, any of these two content types (island or game) is subject to the creator-friendly royalty share in place for both Fortnite Creative and UEFN to uphold quality control across each platform while remunerating creators, thus reinforcing the steering aspect of Platform Innovation (Evans & Gawer, 2016).

5.2 User Innovation

User Innovation is an equally important concept for the success of these ecosystems, where the pressure to innovate is distributed to lead users who understand emerging or underserved needs better than the producer. On Roblox, over 400,000 player-made experiences-from basic obstacle courses to elaborate role-playing scenarios-demonstrate how community members are iterating game scripts, mechanics and art assets over and over again to better fit the fashion of the day for players (von Hippel, 2005). Roblox has paid out more than $920 million to developers since 2018, creating a strong financial incentive for user-led R&D(Roblox Corporation. 2024).This incentive system generates a virtuous positive feedback loop: popular user innovations are widely showcased on the platform, drawing even more players into the mix and stimulating the community with new ideas. Here, Roblox embodies lead-user–driven innovation, user-led R&D and the influx back into platform characteristics of User Innovation (Franke & Shah, 2003).

Epic Games, Inc. has replicated a similar system with Fortnite Creative and UEFN. Introduced in 2018, Fortnite Creative enabled players to develop custom game modes-ranging from race courses to survival maps-and sell their creations, sending billions of dollars of revenue to

individual creators and small development teams (Franke & Shah, 2003). The availability of UEFN opens up this dynamic further by giving non-professional users the ability to author content to the level of Unreal Engine 5, making rapid prototyping and sharing of high-quality content a reality(Marlatt, R. 2020).Innovative designs by lead users get curated and distributed by Epic's platform algorithms, inspiring new player engagement and experimentation(Epic Games, Inc. 2021). This iterative cycle of user-led innovation, platform support, and ecosystem integration drives new product development at an increasing pace and for a wider range of new products than would be feasible for a centralized R&D group to achieve alone (von Hippel, 2005).

User Innovation in both Roblox Corporation and Epic Games, Inc. reinforces Platform Innovation rather than standing alone: open, modular infrastructures welcome all creators while governance safeguards quality, and lead users continuously generate fresh content that the platforms amplify through discovery and sharing tools. This two-sided model creates a virtuous cycle-each new creator and user amplifies network effects, driving further partner and user engagement and sustained growth. Far from mere theory, Platform and User Innovation together form a practical blueprint for building and maintaining large-scale digital ecosystems-an approach that Roblox and Epic have operationalized to foster vibrant, ever-expanding communities of creators and consumers.

6 Discussion of Examples

This section analyzes how two foundational concepts of distributed innovation-Platform Innovation and User Innovation-are practically implemented in Roblox and Fortnite. These two platforms are not only leading actors in the metaverse gaming industry but also compelling examples of how innovation ecosystems can be structured to foster creativity, economic sustainability, and continuous evolution. Each concept is explored below, with clear evidence and comparative insights.

6.1 Platform Innovation

Platform innovation involves building modular, scalable, and open ecosystems where multiple stakeholders, including third-party developers, users, and external brands, can interact, co-create, and derive mutual value. It includes technical infrastructure (e.g., APIs, SDKs), economic incentives (e.g., revenue-sharing systems), and governance (e.g., moderation policies, curation).

6.1.1 Roblox: Empowering a Grassroots Creator Economy

Roblox adopts a bottom-up platform model centered around user empowerment. Its development environment, Roblox Studio, allows creators of all skill levels to build interactive experiences using Lua scripting, physics engines, 3D modeling tools, and plugin extensions. The tools are intuitive enough for beginners yet powerful enough to support complex game mechanics. As of 2024, over 15 million playable games have been created on the platform, many of which have user bases exceeding 1 million (Roblox Corporation, 2024).

Roblox supports seamless cross-platform access, allowing games to run on mobile, desktop, console, and VR. This universal accessibility amplifies content reach and user retention. The Robux economy underpins monetization: developers earn revenue from virtual item sales, game passes, and in-game purchases. Through the Developer Exchange (DevEx) program, Robux is convertible to real-world currency, and in 2023 alone, the platform paid out over $700 million to its creator community (Statista, 2024).

What makes this model innovative is its integration of development tools, monetization, analytics, and education. Developers are provided with performance dashboards, community forums, learning portals, and even mentorship programs. This end-to-end infrastructure allows creators to test, iterate, and scale their experiences while receiving feedback and financial reward.

6.1.2 Fortnite: Structured Professionalization Through Toolchain Integration

Fortnite's platform innovation lies in combining high-end production tools with strategic curation. Through Fortnite Creative and the more advanced Unreal Editor for Fortnite (UEFN), Epic Games enables users to design full-scale games and interactive environments using the same toolchain as professional developers. UEFN includes access to Unreal Engine 5 features such as real-time lighting, AI programming, cinematic scripting, and nanite geometry-bridging the gap between players and professionals.

Epic supports innovation by integrating economic incentives with user engagement. The Creator Economy 2.0 model pays up to 40% of Fortnite's net revenue to content creators, based on metrics such as time spent, return frequency, and player purchases within user-generated content (Epic Games, 2024). This system ensures creators are not only recognized but financially rewarded for producing engaging, replayable experiences.

Unlike Roblox, Epic enforces brand-aligned constraints through curated asset packs, quality moderation, and content guidelines. While this slightly limits creative freedom, it ensures that user innovation aligns with Fortnite's brand and narrative consistency. The result is a high-quality, sustainable innovation pipeline where users can confidently invest time and resources in developing content.

6.2 User Innovation

User innovation refers to innovation initiated by end users to address unmet or emerging needs. In metaverse platforms, this often manifests through user-generated content (UGC), modification of game mechanics, and grassroots iteration cycles. When combined with economic and platform support, user innovation becomes a central engine of product evolution.

6.2.1 Roblox: Innovation Through Open-ended Creativity

Roblox's identity is defined by user innovation. Over 12 million active creators are responsible for nearly all content on the platform, from simple obstacle maps to expansive RPGs. Games such as Adopt Me! and Brookhaven were built by small teams and have attracted billions of

visits. This demonstrates the platform's unique capability to scale independent innovation into mass entertainment.

Roblox actively supports this model through:

- Real-time publishing (no app store approval delays)
- Discovery algorithms that surface trending games
- Educational resources, including free API documentation, tutorials, and community conferences (e.g., Roblox Developer Conference, RDC)
- Mentorship programs connecting novice and expert developers

The DevEx program allows developers to convert in-game earnings to real income. In regions with limited access to tech jobs, many young developers treat Roblox as a serious career path. Furthermore, in-game analytics offer insights on user drop-off points, monetization success, and engagement loops-enabling data-informed iteration.

The iterative nature of Roblox's ecosystem means that innovation is ongoing and demand-driven. Games are updated weekly or daily based on user feedback, and successful innovations (new game mechanics, monetization models, story formats) quickly spread across the ecosystem, illustrating a bottom-up diffusion of innovation pattern.

6.2.2 Fortnite: High-Fidelity User Innovation with Professional Ambition

Fortnite's user innovation model has evolved from simple map editing in Creative Mode to sophisticated full-game development with UEFN. The platform supports real-time collaboration, asset importation, scripting logic, and debugging environments. UEFN empowers non-professional users to produce content at near-studio levels, transforming Fortnite into a semi-professional development ecosystem.

Examples include:

- Deathrun maps and mini-games that have gone viral on TikTok and YouTube
- Narrative-driven missions using cinematic scripting tools
- Live events built by users and curated by Epic to appear in limited-time experiences

Epic's Engagement Payout System rewards creators based on actual player interaction, incentivizing replayable and socially engaging content. Unlike Roblox's free-market approach, Epic's payout is governed by curated placement and algorithmic metrics, emphasizing quality, retention, and thematic alignment.

What differentiates Fortnite's user innovation model is professionalization. Many successful Fortnite creators are now recognized as influencers or game designers, and some go on to form

independent studios. Epic facilitates this transition by promoting top creators through platform features, tournaments, and community spotlights.

6.3 Innovation Synergy and Ecosystem Dynamics

The most impactful observation is that user innovation and platform innovation are mutually reinforcing. In both Roblox and Fortnite, the platform's openness and support systems encourage experimentation, while user creativity continuously enriches the ecosystem and draws in more users and developers. This loop generates positive network effects: more creators produce more content, attracting more users, which in turn motivates further creation.

Roblox emphasizes scale, accessibility, and speed. It thrives by reducing friction for new creators and letting the community guide platform evolution. Its economic design enables grassroots entrepreneurship, especially for younger users in underserved regions.

Fortnite emphasizes quality, structure, and professional scalability. Its innovation model supports fewer but higher-fidelity projects, aligning creator ambition with brand expectations and platform strategy. This results in a tighter feedback loop between user-generated content and Epic’s broader entertainment roadmap.

In both platforms, innovation is decentralized but guided, individual but amplified, and spontaneous yet sustained through carefully designed incentive and governance systems. These examples showcase how distributed innovation is not merely an abstract theory but a viable operational model-especially in creative digital industries like metaverse gaming.

7 Comparative Analysis

Metaverse gaming appears, at first glance, to be a single strategic playbook-blend user-generated content (UGC) with real-time social presence and a virtual economy. Yet a granular comparison of Roblox and Fortnite shows two orthogonal routes to that dominant design, each activating different mechanisms of distributed innovation, market disruption and ecosystem governance. The analysis below dissects eight dimensions where tactics diverge but reinforce the same long-term platform logic.

7.1 Entry Trajectory & Disruption Type

Roblox embodies low-end disruption: it began by courting an audience-preteens with low-spec PCs or mobile phones-who were overserved by graphics-heavy AAA titles.The block-based art style makes the computing power demand extremely low, enabling it to expand to 82.9 million daily active users (DAU) in 2024, while competitors are still competing for the limited share of core gamers.

Fortnite represents a new market disruption: With the Unreal Engine, Epic Games has redefined shooting games as cultural venues, holding large-scale concerts and movie trailers to attract people who have never considered themselves "gamers". The 2021 “Rift Tour” drew 78 million cumulative attendees, validating “game-as-venue” economics. Both paths undermine

incumbents, but from opposite ends of the performance spectrum: Roblox strips features to democratise access; Fortnite adds experiential layers to transcend gaming's traditional envelope (Adner & Kapoor, 2010).

7.2 Creator-Economy Architecture

A core test of distributed innovation is the generosity and shape of revenue-sharing. Roblox's DevEx programme paid USD ≈922 million to creators in 2024, equal to ~40 % of bookings-money that flowed to more than 4 million individual developers, many of them teenagers (Jenkins, 2006). Fortnite's Creator Economy 2.0 allocates 40 % of net Item-Shop revenue to island publishers each month, yet technical barriers (UEFN, higher-fidelity assets) mean the payout pool is shared by a smaller, studio-grade cohort. Hence Roblox optimises for breadth-a long tail of micro-entrepreneurs-whereas Fortnite favours depth, cultivating boutique teams capable of Pixar-level production.

7.3 Technology & Production Values

The two firms exploit contrasting facets of the metaverse tech stack. Roblox's strength is "any-device" cloud delivery: low-poly assets stream efficiently on 4G, unlocking emerging-market growth and >2 hours average play time per user per day. Fortnite's differentiator is cinematic fidelity. Nanite virtualised geometry and Lumen global illumination allow photoreal worlds and mixed-reality set pieces. Technical ambition paid off: a 2024 live-music finale ("Remix: The Finale") pushed 14.3 million concurrent users, a platform record (Nieborg & Poell, 2018). The contrast illustrates two innovation levers-accessibility versus immersion-that can coexist under a unified dominant design umbrella.

7.4 Business-Model Diversification

Both platforms monetise cosmetics and premium currencies, yet apply them differently. Roblox's Robux loops back into the UGC economy: creators convert earnings to fiat via DevEx, financing further game production and reinforcing a creator fly-wheel. Fortnite's V-Bucks are tightly coupled to transmedia brand collaborations-Marvel, Star Wars, Nike, Balenciaga-turning limited-edition skins into seasonal hype machines.(Lehdonvirta & Castronova, 2014). Epic's IP strategy not only sells items but injects narrative freshness, mitigating content fatigue without full sequel resets. Roblox instead leans on creator churn to supply novelty. Thus, Roblox externalises content risk to its community, while Fortnite internalises risk through blockbuster partnerships.

7.5 Network-Effect Topology

Because value creation in platform markets hinges on cross-side network effects, it is instructive to map how each firm seeds and amplifies those effects. Roblox's network is supply-side dominant: more creators → more diverse experiences → higher player retention → larger

revenue pool → even more creators. Peer-to-peer learning (DevForum, creator guilds) lowers onboarding friction, making the supply curve steeper. Fortnite's network is demand-side weighted: each IP crossover or event (e.g., Juice WRLD tribute, Nike "Airphoria") triggers social buzz and FOMO, spiking concurrent users which in turn increases the addressable audience for third-party island builders. The contrasting topologies suggest different vulnerability points: Roblox must guard creator trust and discovery visibility; Fortnite must maintain a relentless pipeline of culturally resonant spectacles (Parker, 2016).

7.6 Engagement Metrics & Demographic Reach

The total interaction time of Roblox in 2024 was 73.5 billion hours, an increase of 23% year-on-year, driven by the average daily usage of 2.4 hours of Gen Z. The Guardian's survey claims that Australian children spend an average of 137 minutes on Roblox per day, highlighting their stickiness among younger groups.

The audience of Fortnite is slightly older and equally sticky: the concurrent number of chapter endgame events is over 14 million; Epic disclosed that over 70% of the event participants would subsequently explore other islands, indicating that there is cross-traffic diversion between the flagship event and the regular game. The data supports the diffusion thesis: Roblox is saturating the early-majority of preteen and teen users worldwide, while Fortnite is accelerating adoption among mainstream entertainment consumers who value converged music–fashion–gaming experiences.

7.7 Sustainability and Future Trends

Two are converging in the synthetic media pipeline: Roblox is piloting AI code completion and resource generation; Epic introduced MetaHuman and programmatic vegetation into UEFN. Generative tools may further lower the skill threshold of Roblox and consolidate its low-end moat. Fortnite can use AI to enhance the live show experience, such as adjusting the performance in real time according to the audience's emotions. Strategically, both sides are diversifying risks: Roblox has introduced brand advertising, while Epic has licensed the Unreal Engine to the film and television, and automotive sectors.

7.8 Theoretical synthesis

Evidence shows that the adoption of the dominant design does not imply strategic homogenization. Low-end and new market disruption can complement each other, drive traffic to the common structure and expand the total market. The different weights of network effects (supply vs demand) provide a more nuanced perspective of the moat; Governance and brand trust are the key foundational layers for the sustainability of distributed innovation.

8 Conclusion

This report has examined the evolution and mutation of metaverse gaming based on the disruptive innovation, dominant design, and diffusion of innovations theories, through case studies of Roblox and Fortnite. We first justified the use of these platforms due to their varying market positions-Roblox as a low-end disruptor in game-making popularization, and Fortnite as a new-market innovator who shifts gaming into live entertainment. We then deconstructed the underlying technologies-cloud rendering and Lua scripting for Roblox; Unreal Engine and high-concurrency live streaming for Fortnite-that form the basis of each platform's value proposition.

By mapping platform practices to Rogers's adopter categories and Christensen's disruption frameworks, we showed how Roblox's open developer economy accelerates user-generated content diffusion, while Fortnite's transmedia events cultivate new audiences beyond traditional gamers. Our comparative analysis further contrasted their business models (DevEx vs. branded skins), network-effect topologies (supply-side versus demand-side weighting), and production values, revealing how two divergent strategies can coexist under a unified metaverse design paradigm.

In conclusion, Roblox and Fortnite represent two complementary paths for building a metaverse ecosystem: the former centers on creator empowerment and scalable UGC, while the latter is driven by immersive experiences and cross-border collaborations. Looking ahead, research should focus on interoperability standards, the role of decentralized identities in the governance of the metaverse, and the long-term socio-economic impact of the virtual economy, in order to deepen our understanding of the sustainable integration of metaverse platforms in terms of technology, communities, and business.

Contribution Statement

Student ID	Name	List of contribution
540114883	Shiqi Peng	1. Wrote Section 3. 2. Collected user and market data for Roblox and Fortnite. 3. Assisted with editing structure and flow in early sections. 4. Reviewed consistency across Sections 3 and 4.
540353127	Zihua Zeng	1. Wrote the Relevance of Concepts section. 2. Conducted literature review on platform and user innovation. 3. Reviewed in-text citations and source accuracy.

		4. Helped refine theoretical explanations in Section 5.
540282735	Jiaying Xie	1. Wrote the Comparative Analysis section. 2. Helped with summary tables and side-by-side comparisons. 3. Reviewed formatting and layout across report sections. 4. Contributed to drafting the final conclusion.
540614154	Xinxin Liu	1. Drafted the Discussion of Examples section. 2. Edited citation formatting and reference list. 3. Reviewed flow and transitions across Sections 5 and 6. 4. Helped coordinate integration of all sections.
500035007	Jun Zhang	1. Wrote Section 4. 2. Supported abstract and introduction structure. 3. Managed APA referencing updates and link verification. 4. Proofread final version for clarity and consistency.

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