GENERATIVE AI – THE NEW GAMECHANGER IN GAMING

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The gaming industry is one of the first industries to adopt AI. In the early days of gaming, **AI was limited to IBM's Deep Blue, a chess-playing expert system, that challenged the Grandmasters of the late 90s and became the first computer to win a match against a reigning world champion.** Then AI made its way into games, in the form of in-game enemies, bots, non-playable characters (NPCs), etc. From being limited to generic characters, enemies, etc., **AI has slowly made its way into the creation of intelligent and responsive gaming assets that can alter game experience** and in-game stories based on player interactions.

As games start to move more towards realism with beautiful environments, realistic player interactions, and in-game assets, AI/Generative AI (GenAI) has the potential to push gaming to the next level by helping developers build very realistic gaming environments and dynamic/adaptive gaming content for a customized gaming experience. **In short, AI and GenAI can create games that players would love to live in.**

This report gives a sneak peek at the adoption of AI technology in the Gaming domain. It provides the landscape of AI/GenAI in the gaming industry and elaborates on how leading console makers, game developers, and tech companies are planning to implement AI.

IMPLEMENTATION OF AI AMONG CONSOLE LEADERS

The gaming market would have turned out dull and unenthusiastic without the presence of consoles. The leading console brands like Sony, Microsoft, and Nintendo have always stayed on top of new technology to improve their consoles, services, games, and gaming experience of players. In an effort to leverage the AI/GenAI trend, Microsoft (Xbox) and Sony (PlayStation) were quick to include AI in their future strategy.

XBOX

Partnership with Inworld:
On November 6, Microsoft announced its partnership with Inworld AI which includes an "**AI design copilot" system that can be used to create detailed scripts**/narratives, dialogue trees, quest lines, etc.

Microsoft utilizes AI tools to enhance Xbox moderation efforts:

Microsoft is harnessing the power of artificial intelligence (AI) to improve its Xbox moderation efforts, aiming to **automatically detect and flag inappropriate content** without reliance on player reports.

PLAYSTATION

PlayStation acquires iSIZE:

On November 2, 2023, Sony announced the acquisition of UK-based company iSIZE which aims to **deliver bitrate savings and quality improvements for the media and entertainment industry.** It allows video to be streamed at a lower bitrate and uses AI to upscale to higher quality.

PlayStation implements AI in Gran Turismo:

Gran Turismo Sophy (GT Sophy) is a **racing AI agent that had mastered Gran Turismo Sport (PS5 game) to race against and elevate the experience of Gran Turismo drivers.** It was launched as a test for a month in February 2023 and it raced against the world's top Gran Turismo drivers. The audience voiced strong support for adding it into the game as a permanent feature, which helped it achieve a full Global Release in November 2023.

PlayStation has a breadth of patents that emphasize the use of AI/GenAI in games:

PlayStation currently has six patents that relate to AI. The patents and their uses are listed below:

- Technology that **creates a default play profile for each user, develops AI behavior that mimics their playstyle,** and can be tagged-in to help beat hard levels or used as a substitute.
- An AI that **makes games more accessible to the visually impaired, by facilitating audible description of scenes** and providing feedback to the player through the DualSense controller.
- Use of machine learning that would **analyze user behavior and determine if punishments like warnings, chat suspensions, or bans are necessary.**
- An AI system that will provide estimated completion times for in-game tasks based on player skill level/equipment and offer tips to help players complete levels more quickly.
- **Personalizing game narration and context to make each player unique using AI** and tweak the difficulty based on the experience level of the player.
- **AI that can change the art style of a video game** in real-time which can be used as an accessibility tool for gamers to add more easily discernible visuals and **give gamers the ability to completely change art styles on a whim.**

NINTENDO

Currently Nintendo has the least involvement in the adoption of AI/GenAI.

BIG TECH BRANDS FACILITATE THE USE OF AI FOR GAMING

Technology brands have become the starting point of the AI trend, as they are the ones who research AI and bring it into the market through applications like Google Bard, Amazon Alexa, Cortana, etc. They have a wide range of offerings (cloud & tools) that facilitate the use of AI to improve the efficiency of game development/testing and offer a better gamer experience.

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GOOGLE

Google plans to use AI for automated game testing:

Google has published a patent for **a system that would allow AI to handle game testing.** This new system would create a gameplay model for a character within a game and would then train that character to perform the actions created.

Google's AI-powered gaming mouse – Project Game Face:

A new open-source **hands-free gaming mouse that enables people to control a computer's cursor using their head movement and facial gestures.** People can raise their eyebrows to click and drag, or open their mouth to move the cursor, **making it possible for anyone to pursue gaming.**

Google's Vertex AI:

Vertex AI offers a diverse range of proprietary and open foundation models for teams to learn from and create with, all in a secure and robust enterprise environment, perfectly suited to game development.

AMAZON/AWS

Amazon's ML services such as Amazon SageMaker, Amazon Rekognition, etc. can be **used to improve player experiences with ready-made intelligence, protect players from toxic behavior, remove language barriers, improve accessibility, and personalize discovery.**

For developers ready to build production tools for content creation and testing, or player-facing models utilizing reinforcement and deep learning to power dynamic stories, environments, and NPCs, AWS has training programs, tools, and proprietary ML silicone.

AWS use cases:

With AWS, Rovio (Angry Birds Developer) uses **machine learning to predict the difficulty of game levels faster and delivers the perfect level of fun for players.**

CAPCOM (developer of popular titles such as Resident Evil and Street Fighter) was able to **reduce the burden on skilled workers to create well-balanced levels** and build fun games at high velocity on AWS.

GAME BRANDS (CREATORS, DEVELOPERS & GPU COMPANIES) EXPLORE THE USE OF AI IN DEVELOPMENTWHAT IS AUTOML

In the world of gaming, game development is expected to benefit the most from GenAI as it can help in building realistic game environments, dynamic levels, realistic/customized non-playable characters, effective game testing, etc. Game developers are eager to incorporate GenAI into their development process.

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ACTIVISION BLIZZARD

AI to moderate voice chats:

Activision partnered with Modulate to bring "in-game voice chat moderation" to their titles. It uses an AI tech called **ToxMod, which will identify behaviors like hate speech, discrimination, and harassment** in real-time.

Activision Blizzard secures two patents that use GenAI for game development:

The company secured two AI patents, one for an **AI system that can generate enhanced non-playable characters** (NPCs) by leveraging real player behavior and providing heightened realism, interactivity, and difficulty. The second patent highlights **AI-generated artwork** (to use as in-game assets) **where the AI is fed with pre-existing images and is instructed to create new images** in the same vein as the art style presented.

Blizzard Diffusion:

Blizzard Diffusion is an internal **AI tool that has been trained as an image generator on Blizzard's own titles.** It can be used to help generate concept art for game environments, characters, intelligent in-game NPCs, procedurally assisted level design, AI-assisted voice cloning, and game coding.

ELECTRONIC ARTS (EA)

AI Learns How to Play Battlefield 1:

EA's deep learning division, Search for Extraordinary Experiences Division (SEED), was able to create AI that was smart enough to teach itself to play Battlefield 1's multiplayer.

EA has a variety of patents that showcase how the company could use AI in the future:

Electronic Arts has four AI patents under its belt. The company is expected to use AI for the following:

Teach gamers a foreign language via automated (AI-driven) system that generates mini puzzles from game content.	Populate large virtual worlds with different structures or map items.
Catch and Punish gamers who unfairly partner up with opposing teams.	Automate the testing of video games by observing a quality assurance (QA) tester or other players and imitating them.

UBISOFT

Ubisoft unveiled a new **AI tool called Ghostwriter that generates dialogue for in-game characters which is expected to streamline development** and aid writers in handling more mundane or repetitive aspects of video game dialogue, such as phrases and sounds uttered by Non-Playable Characters (NPCs)

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NVIDIA

Nvidia demonstrated the potential for gamers to interact with non-player characters in new ways with the Nvidia ACE and Nemo SteerLM which **allows developers to build and deploy customized conversations and animation AI models** in their games, thereby bringing intelligence to non-playable characters (NPCs) through AI-powered natural language interactions. Nvidia has also created an **artificial neural network to teach select gaming systems to enhance images during gameplay.**

OTHERS

Unity Software launched AI technology that will simplify the creation of three-dimensional assets and animations.

Roblox has launched an **AI tool that will let players create in-game assets by typing a few words, without the need for traditional coding skills.**

Straight4 Studios previewed a new driving game, GTRevival, which is set to use AI chatbots to provide AI-generated personalized commentary and engineer chatter.

NetEase launched a multiplayer title (Justice Mobile) that features in-game responses (characters' voices and expressions) from AI characters trained in a model based on Song dynasty literature.

THE OTHER SIDE OF THE COIN – CONTROVERSIES & BACKLASH:

The use of GenAI for game development has attracted significant negative sentiments among critics, game developers, and the gaming community as it is believed that using AI for game development will lead to loss of jobs for game designers, voice actors, concept artists, etc. and may lead to unwarranted use of creative assets of original artists/creators.

AI/GenAI has sparked controversies and lawsuits:

The first divide between AI and the gaming industry occurred when asset stores were flooded with AI-generated assets and images. **Many graphic designers protested the use of AI by taking down their artworks and replacing them with 'Say No to AI' banners.** Below are some pushbacks from the gaming community:

Steam, the biggest PC game distribution platform, **banned games using AI-created art assets** (if submitters can't prove they have rights for the assets used to train the algorithms).	The Last of Us (PlayStation exclusive) voice actor Troy Baker was criticized for partnering with a company that used AI to create in-game tokens of actors' voices.	Squanch Games' 2022 shooter High on Life used Midjourney to create artwork for the game and caused pushbacks from artists for consent-less use of artwork

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Lawsuit against AI in game development:

AI art tools Stable Diffusion and Midjourney were targeted with copyright lawsuits – **a trio of artists claimed that Generative AI art tools used by these companies violate copyright law by scraping artists' work from web without their consent.**

COURSE5'S POINT OF VIEW:

The use of AI/GenAI for game development can save development costs and time. With games of high visual capability becoming costlier to develop (such as the recent PlayStation exclusive 'Horizon: Forbidden West' -~$200 Mn) companies will be eager to use GenAI. As an added perk, AI can also be used to restrict toxic behavior, spamming, etc.

Though GenAI has its drawbacks, it could exponentially increase the number of independent developers and responsible implementation of AI could be a win-win for both game-makers and gamers.

To address the ethical issues around the use of GenAI/AI and ensure unhampered gaming experience, game companies could do the following:

- Enforce clear usage policies.
- Create a marketplace where developers can purchase the assets from the original artists.
- Limit the use of AI to repetitive or mundane tasks
- For AI tech that helps gamers in decision-making, it can be an option that can be toggled on or off based on preference.

Applications, drawbacks, and strategies aside, it will be exciting to see how AI/GenAI will revolutionize the gaming industry.

Sources: The Verge, Financial Times, Story Pick, CNBC, Economist, Tweak Town, NME, Verge, Screen Rant, GameRant, Game Rant, GameRant, Game Rant, Eurogamer, IGN, Stealth Optional, GameRant, PC Gamer, MetaVerse Post, True Achievements, The Verge, PRNews Wire, Exputer, Tech times, PC Gamer, Gamespot, Beyond games biz, The Verge, NY Times, Google, Google Cloud, Forbes

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