

GAME QUALITY FORUM GLOBAL 2024

QUALITY ASSURANCE | LOCALIZATION | COMMUNITY & SUPPORT

25TH JUNE 2024 – 27TH JUNE 2024
HOTEL NOVOTEL AMSTERDAM CITY,
AMSTERDAM, THE NETHERLANDS

GAMING REVOLUTION: UNVEILING THE GLOBAL IMPACT OF ARTIFICIAL INTELLIGENCE IN THE GAMING INDUSTRY

AI has quite literally been a game-changer for the gaming industry. Developers are benefiting from AI technologies before games are released into markets across the globe – and once games are being played, AI is playing an increasing role in community management and support.



STARTING

ChatGPT in particular has emerged as a pivotal topic. Dr Daniel Zhang, Senior Lecturer in AI and ML, Falmouth University, says ChatGPT has “revolutionised interactive capabilities, outshining many previously acclaimed AI technologies and evolving at an astonishing pace.”

“After over a year of optimisation and refinement, ChatGPT has emerged as the most powerful generative AI product to date, featuring key updates in versions GPT-3.5 and GPT-4, with applications spanning quality assurance, localization and community support,” says Dr Zhang.

“This revolutionary change has led to an exponential increase in AI’s application, paving the way for the creation of gaming experiences that were once thought to be unachievable,” says Nanda Ramaiah, CTO, GameCentric.

Legal and ethical considerations remain an ongoing challenge for gaming industry stakeholders, especially as AI use becomes more commonplace across a range of functions. Collen Clark, Lawyer and Founder, Schmidt & Clark, says these considerations “go beyond bias and include data privacy, manipulation and consent, which are complex issues that need to be carefully considered and regulated.”



KEY TRENDS AND PROJECTIONS IN THE GAMING INDUSTRY

According to Statista, the number of gamers worldwide is projected to reach 3.3 billion by 2027. With United Nations data projecting a 2027 global population of 8.3 billion, 39.8% of all people could be gamers within three years. With big numbers comes big money – by 2027, the global esports market alone is projected to be worth \$3.86 billion, compared with \$1.38 billion in 2022, a Research and Markets report found. Figures for video gaming spiked during the COVID-19 pandemic, dropped back slightly after lockdowns were lifted, but continue to be worth in the tens of billions across multiple regions.

Growth markets, especially in APAC and Europe, will correlate to a growing need for strong community management and localisation efforts, while still maintaining game quality amid high demand for new products. In November 2023, Research and Markets reported that while the US video games market was worth \$42.8 billion in 2022, China is forecast to hit a projected market size of \$71.4 billion by 2030. The report cited Japan and Canada as “noteworthy” markets, with growth forecast at 2.9% and 4.1% respectively between now and 2030, and within Europe, Germany is expected to grow at around 3.5% CAGR in the same period.

The major players in gaming include Chinese-based Tencent, which leads the market worldwide in terms of revenue, along with household names, such as Sony, with its PlayStation consoles and platform; Microsoft, with Xbox and Game Pass; Nintendo, with a strong focus on its Switch console.

SONY

Nintendo

Microsoft

A growing number of independent publishers are making a major impact on the industry too, with key players, including Electronic Arts and Ubisoft, holding multibillion-dollar valuations. American game developer Take-Two acquired mobile game developer Zynga for \$12.7 billion, known for popular titles, such as FarmVille. Sega, creator of Sonic the Hedgehog, has acquired Rovio, the maker of Angry Birds, for \$776 million.

In terms of trends and challenges across the industry as a whole, the projected growth is making a powerful impact on companies, and this is not always a positive. Job losses have been a trend, reflecting tough economic times around the world.

“Many companies invested heavily in trying to capitalise on that growth and invested heavily in growing their teams and product output,” says Callum Godfrey, Head of Third Party Publishing, N Dreams. **“But as the pandemic boost has faded and we return to more traditional levels of engagement, affected by the cost-of-living situation globally, the industry has seen something of a retraction in terms of staffing and we have seen tens of thousands of very talented people lose their jobs of late.”**

However, the industry remains dynamic, with AI powering new innovations in game design and development, QA and community management, according to Leon Gordon, CEO of Onyx Data: **“The future is set to be a monumental experience of hyper-personalised gaming experiences, immersive worlds where you can interact with AI-driven characters, and environments that learn and grow with the players.”**



US VIDEO GAMES MARKET WAS WORTH \$42.8 BILLION IN 2022.



CHINA IS FORECAST TO HIT A PROJECTED MARKET SIZE OF \$71.4 BILLION BY 2030.

QUALITY ASSURANCE (QA)

A 2023 Game Developers Conference survey highlighted concerns among gaming industry QA employees, with 22% reporting layoffs and 57% unionising, up from 53% in 2022. As noted, a combination of factors have contributed to the job losses, and it is uncertain if there will be more fallout in the year to come. Yet, with new technology comes opportunity and potential need to adapt and evolve the traditional employee skill set.

"QA emerges as a critical facet of gaming success, often outweighing playability and complexity as any glitches can significantly impact user experience," says Dr Zhang. "QA involves multiple aspects of testing, such as functional testing, performance testing, stress testing, and compatibility testing, among others – many tasks in the QA process have specific and rigorous behavioural inputs and expected outputs."

However, Dr Zhang cautions that the strict input-output mapping involved does not always need the powerful capabilities of Generative AI models because traditional AI and even classic automation tools are "entirely capable." He says this is because "QA processes inevitably encounter unforeseen problems and bugs, while big AI models often produce unpredictable output."

"This not only means that these scenarios may be unknown to the model, but more importantly, it shows that it is impossible to exhaustively list all the edge cases that need to be tested during the data collection phase and build a comprehensive training dataset," Dr Zhang explains.

Lokesh Agarwal, Founder of MindSync AI, is enthusiastic about the role of AI in QA, describing it as "the future of game-testing", improving efficiency, improving decision-making, testing game mechanics, assessing player behaviour, and ensuring higher levels of accuracy in identifying potential issues. He says that Generative AI is "making waves in software testing by automating tasks", including bug detection and test case creation. For example, Slay The Spire, developed by US independent Mega Crit, is a game that uses Generative AI to enhance replayability by randomising levels.

Ahmed Sharif, Chief Technology Officer, Sandsoft, adds that there has been "much discussion of how large language models, such as ChatGPT, can create more dynamic and interactive conversations with non-playable characters."

With exciting technological advances, and the scope for greater efficiency in QA testing, companies will likely have to look at ways they can grow their skill sets to adapt to potential shifts.

LOCALIZATION

According to Dr Zhang, localization is "another promising avenue for large language models (LLMs)", such as ChatGPT, although he adds that they may require "a little bit more human input" compared to community support applications.

"Precise contextual comprehension by AI models enables proficient handling of most localization tasks, often surpassing human speed and accuracy," Dr Zhang explains. "Nonetheless, areas necessitating human intervention, such as contexts rich in slang terms and nuanced language structures, persist."

However, Dr Zhang adds that specialised models that have been trained on domain-specific corpora may achieve near-perfect accuracy, even with fewer parameters: **"Such models not only require less training time and lower energy consumption but enhance adaptability to specific localization scenarios."**

Agarwal says that an AI agent can be implemented in the code base of a game file without the developer downloading large vocal files: "This means a game can automatically detect the language of the country

or state in which it is being purchased, registered and played – this will not only save our disk space, but it will localise games by auto-detecting the vocals and initialising it in the game on start-up.”

“For localization, the ability to train transformer-based models on local datasets provides an opportunity to create game narratives and dialogues that accurately reflect specific regions and cultural nuances,” adds Sharif.

The international nature of the gaming industry, with companies seeking to make inroads across different geographical markets, means that localization, aided by AI solutions, will continue to be a vital consideration for developers.

Particularly when dealing with cultural sensitivities, the human touch will still be important, alongside AI, as Ramaiah explains: “As the gaming world embraces AI, it must account for the intricate web of cultural differences.”

“Games that travel beyond their country of origin enter a maze of varying customs and laws, so a game feature that’s innocuous in one culture may stir up controversy or legal challenges in another,” Ramaiah continues. **“Navigating these cultural intricacies is essential, so AI must be carefully calibrated to respect regional traditions and regulations. This cultural adaptation is more than a technical hurdle; it’s a vital step that could make or break a game’s international acclaim.”**

PLAYER COMMUNITY AND SUPPORT

“Community support can now be significantly facilitated by generative LLMs, reducing the need for manual intervention,” says Dr Zhang. “Similarly, question-and-answer models, leveraging AI and machine learning techniques, have been widely deployed across various industries before the advent of LLMs like ChatGPT – the swift responsiveness, high accuracy, cost efficiency and scalability of these models render them particularly suited for gaming community support scenarios.”

Additionally, Ramaiah highlights the immense benefits of in-game assistance from AI, which offers strategic hints and facilitates greater accessibility for players with disabilities.

Gamers themselves may drive greater use of AI for player and community support functions. Users of Helpshift, a gamer support platform, were surveyed, with 73% expressing openness towards using AI-powered bots for self-service gaming support.

However, just as localization means that games can be adapted to be appropriate for different regions, the need to address cultural sensitivities remains key to human intervention. In the context of community support, especially with many games being played

across borders, this function will continue to require human interventions, rather than AI replacement for the foreseeable future.

Rather than being overlooked, game quality forum teams should proactively ensure games align with community preferences. This should enhance player experience by facilitating developer-player interaction, addressing feedback on functionality, interface, and resolving issues, such as loopholes and bugs. Serving as a vital bridge, these teams play a key role in retaining players by maintaining a strong connection between developers and the gaming community.

A WebHelp report on bridging the player experience gap says that Generative AI-powered chatbots can “understand complex queries and provide personalized responses, making the support interactions feel more intuitive and less robotic.”

Functions, including advanced troubleshooting, personalized recommendations, player behavior analysis and self-help functions, such as FAQs, can make the work of human-based teams easier. However, the report still advises that it is important for game developers to “find the right balance

between technology and people.”

“Tools can bring many advantages to your player support operations, but over-doing automation will lead to more frustration with both players and support reps,” the report found.

The report concluded that while technology brings “speed and consistency ... the value of the human touch when interacting with players is something that can’t be simulated – at least, not for now.”

A WORLD OF VARYING REGULATIONS

Clark explains that globally, AI policies and regulations have an impact on the gaming industry. He says that in the US, for example, federal AI governance is shaped by different entities, including the White House, Congress and various federal agencies: “These organisations collaborate to develop a comprehensive policy that governs the use of AI in a variety of fields, including gaming.”

In contrast, Clark says the EU takes a more prescriptive approach, such as passing the Artificial Intelligence Act, which prohibits or limits certain high-risk AI applications. He adds that this act “is intended to protect individuals from the potential harm caused by AI.”

Beyond North America and Europe, Clark says that other countries, such as the UK, Canada and Singapore, have “unique strategies and laws concerning AI that reflect the unique cultural, political, and economic contexts of these countries.”

Alana Gibson, Chief Operating Officer at DGR Legal, agrees, comparing the EU’s “strong focus on data protection and privacy, governed by the General Data Protection Regulation (GDPR)” with the “more decentralised framework, focusing on specific applications of AI, rather than overarching legislation” in the US.

In the gaming industry, Gibson explains that regional differences in policy “often stem from varying priorities, such as consumer protection in the EU versus promoting technological innovation in the US.” Overall, she says these differences often reflect broader societal views.

“In European countries, there’s a significant emphasis on transparency and the ethical use of data, leading to stricter guidelines on AI’s role in creating personalised gaming experiences,” she continues. “Conversely, in markets with less stringent data protection laws, the ethical focus might be more on the content moderation side of AI, such as preventing hate speech or ensuring fair play.”

However, Godfrey points out that companies across the world tend to take an “individualistic approach to how they use AI.” He says that companies typically aim to “stay inside the laws that govern copyright law or considerations, such as the age rating of the game and its appropriateness for customers on a country-by-country basis, working to the lowest common denominator to be cautious and not have to tailor a game and its content too much by region because of the logistics issues and costs this could incur.”



REGIONAL PERSPECTIVE: EUROPE

A 2023 report by the European Games Developer Federation on the state of the European games industry called on the EU to develop a “future-proof framework” to ensure the continent’s game developer studios “stay among the forerunners in using AI in the creative process.” The report warned that if onerous regulation hinders the use of AI in the EU, the result will be “a clear competitive advantage for non-EU countries that allow it to be used up to its full potential.”

“The European Union has prioritised transparency and oversight when using AI – this approach is intended to ensure that AI is used in a way that protects individual rights and freedoms,” says Clark.

“The emphasis has been on providing transparency and oversight when deploying AI, which is intended to ensure that individuals understand how AI is used and have the ability to challenge AI-made decisions.”

“In Europe, the AI Act will apply to AI tools used in game development and those implemented in-game mechanics, and game developers will be classified as ‘deployers’,” says Gordon. The combination of the bloc’s GDPR regulation with the AI Act creates an EU focus on individual rights and data protection that Ramaiah says will “translate to stricter ethical frameworks for AI in gaming, emphasising consent, transparency, and user control over data.”



REGIONAL PERSPECTIVE: NORTH AMERICA

North America’s ongoing contribution to the global gaming market cannot be understated, with a November 2023 Technavio study estimating that the region will contribute 44% to worldwide growth between now and 2028. This is expected to lead to increased regulation.

“Countries like the US, as well as India, are looking to implement general AI regulations to address concerns such as data privacy, consumer protection and fairness,” says Ramaiah.

The US Federal Trade Commission released guidelines regarding the use of AI, which Clark says aim to “prevent unfair or deceptive trade practices”, with the focus on “accuracy, accountability, transparency and fairness.” Additionally, privacy laws passed by

US states require companies to provide people with opt-out rights for AI-powered decision-making and profiling to “give individuals more control over how their data is used.”

As well as trying to keep up with AI developments via regulation, the US is taking an industry-based approach to improving player experience, but this self-regulation focus is in its infancy.

“Industry initiatives such as the Entertainment Software Rating Board in the US and consumer advocacy groups are doing their part to provide guidelines and advocate for responsible use of AI in gaming, but we are yet to have any clear roadmap on how various ethical considerations are monitored and addressed in the gaming world,” says Ramaiah.

NORTH AMERICA’S ONGOING CONTRIBUTION TO THE GLOBAL GAMING MARKET CANNOT BE UNDERSTATED, WITH A NOVEMBER 2023 TECHNAVIO STUDY ESTIMATING THAT THE REGION WILL CONTRIBUTE 44% TO WORLDWIDE GROWTH BETWEEN NOW AND 2028. THIS IS EXPECTED TO LEAD TO INCREASED REGULATION.



REGIONAL PERSPECTIVE: APAC

Within the Asia-Pacific region, China will continue to play a prominent role in AI use and development, including in the gaming industry. Dr Zhang says that while regions worldwide are expanding their investments in AI “in anticipation of securing a leading edge” with the US leading the way, he adds that “Europe and Asia, particularly China, are vigorously pursuing advancement in this field.”

“This assertion finds validation in the daily news cycle, where the latest developments in AI are showcased,” says Dr Zhang. “Apart from renowned entities like OpenAI, Microsoft, Google, Amazon, and Apple, Chinese companies, such as Baidu, Tencent and Huawei, have sequentially introduced and persistently refined LLMs tailored to their specific markets – the competition in this arena is poised to intensify continuously.”

Gibson says that in the APAC markets, especially China and South Korea, regulations that directly address AI in gaming have been introduced, focusing on issues such as addiction and the use of AI in loot boxes.

Strengthened regulations in Singapore and likely regulatory updates in China could help with issues such as data privacy, gaming addiction and financial concerns, according to Ramaiah: “Singapore’s Model AI Governance Framework offers guidelines for ethical AI development and deployment across various sectors, including gaming, while it is understood that China is developing specific industry regulations for AI to possibly address concerns, like excessive monetisation through AI-driven microtransactions or unfair gameplay advantages through AI-powered characters.”

“South Korea seems to be taking a risk-based approach, whereas Singapore and China are addressing sector-specific concerns,” Ramaiah says. **“In China and India, where concerns about social harmony and addiction are high, regulations for AI in gaming could focus on limiting playtime, controlling microtransactions and promoting positive social values.”**



FUTURE OUTLOOK

AI developments in the gaming industry are constantly evolving, and so it can be hard to predict what new use cases will come from different experimentation. The future of regulation for AI in gaming can be difficult to predict, although many experts hope that regulators and policymakers can keep up with changes while still promoting innovation and entrepreneurship.

"In the context of QA, Generative AI can simulate player behaviour across thousands of gameplay scenarios to test and identify potential bugs or unbalanced game mechanics," says Sharif. "With appropriate tolerance modelling, I expect to see a future where AI self-reports bugs when stumbling across unexpected game behaviour."

Sharif also expects further developments in the use of AI for community engagement, support and monitoring: "Chatbots and AI-driven tools, such as Rasa, are handy open-source tools for engaging a community with conversational AI, but tools in this area are still maturing and require development to be applicable at scale, but the potential is certainly there."

"As we explore the ability to do more with AI because of the rapid recent developments in technology, and its availability to game makers, we will see a step change in its use and the ability for it to help us make better games, faster development speeds and with more efficient teams," says Godfrey.

Dr Zhang sees big opportunities for leveraging AI and automation to enhance community support and localisation in particular, adding that "further investigation into QA methodologies, including Generative AI for rapid database construction, holds promise."

"I eagerly anticipate witnessing AI's continued integration in gaming and related fields, augmenting human intelligence and enhancing practitioner efficiency," he concludes.

"We now face the new wave of AI capabilities that start to empower not just data-driven decisions, but as tools to increase creativity and productivity – this is where a lack of any real national guidance is absent and it seems to be on a company-by-company basis as to what extent AI is leveraged, with companies taking a different stance based on the legalities and ethical considerations of doing so," says Godfrey, reflecting on the global gaming market overall and the lack of gaming-specific regulations for the ethical use of AI.

With companies focused on the bottom line, Godfrey adds that he can see a future where AI plays a "huge part in the marketing of video games, allowing marketing teams to create a greater variety of assets to see what appeals to and resonates best with players to entice them into the game itself and, combined with data and machine learning, they may be able to try many more permutations of different creative options faster and cheaper."



CONCLUSIONS

AI holds a valuable position within the post-development gaming cycle and each individual function, with this skyrocketing in recent years. Previously, the industry depended on scripted behaviours and pre-programmed responses for characters and game systems. With the emergence of online gaming and data-driven decision-making, the Machine Learning subset of AI has gained prominence, allowing game development teams to analyse industry trends, recognise opportunities, and make micro-decisions in the game. Consequently, AI can help refine player behaviour and reactions, improving the gaming experience and staying in line with the creative vision of the game.

Gordon sums up how AI has improved multiple aspects of game development and experience: **"We have seen significant development, particularly in game development, player experience and security. Integration within the gaming landscape is well documented with a key focus on personalised gaming experience and even understanding marketing and profit management."**

However, concerns about humans being replaced by AI in the QA space and working in different regulatory environments across different markets will continue to challenge the industry. The impact of cultural and regional nuances cannot be overstated when it comes to ethical frameworks for AI in gaming. Gibson says that countries with a "high degree of regulatory oversight tend to incorporate ethical considerations into legal frameworks, demanding greater accountability from game developers and publishers."

"In contrast, regions with a more laissez-faire approach to regulation might see ethical considerations driven more by industry standards and community expectations rather than formal legislation," she adds.

Companies that do not adopt new AI solutions because of caution surrounding legality, ethics, and the replacement of humans will be at a financial disadvantage because they will not be able to react quickly to player needs, Godfrey stresses: "Companies that take a more mercenary approach will be able to gain an advantage over those who do not."

However, the rise of AI does not mean the end of human involvement in game development, according to Sharif: "Our next generation of programmers and engineers are becoming highly familiar with AI, so it will be interesting to see the prevalence of AI in gaming projects to come."

"Societies that place a high value on collectivism tend to prioritise the greater good when developing AI systems – this could mean putting societal benefits ahead of individual rights – while individualistic cultures may place a premium on personal freedom and privacy," Clark concludes. "These cultural influences can influence how AI is perceived and used in gaming, resulting in different ethical concerns and regulatory frameworks, with these differences highlighting the importance of taking cultural and regional nuances into account when developing and implementing AI systems in gaming."

GAME QUALITY FORUM GLOBAL 2024

QUALITY ASSURANCE | LOCALIZATION | COMMUNITY & SUPPORT

25TH JUNE 2024 – 27TH JUNE 2024
HOTEL NOVOTEL AMSTERDAM CITY,
AMSTERDAM, THE NETHERLANDS

REFERENCES

Zhang, Daniel Dr. Senior Lecturer in AI and ML. Falmouth University. Accessed February 2024.
<https://www.falmouth.ac.uk/staff/dr-daniel-zhang>

Ramaiah, Nanda. Interview by Georgia Lewis. 19 February 2024. GameCentric. Accessed February 2024.
<https://gamecentric.io/>

Clark, Collen. Interview by Georgia Lewis. 13 February 2024. Lawyer and Founder, Schmidt & Clark. Accessed February 2024. <https://www.schmidtandclark.com/>

Statista. "Number of Video Game Users Worldwide from 2017 to 2027 (in billions)". Accessed February 2024.
<https://www.statista.com/statistics/748044/number-video-gamers-world/>

Worldometer. "World Population Projections, United Nations Data". Accessed February 2024.
<https://www.worldometers.info/world-population/world-population-projections/>

Research and Markets. "Global Esports Market (2022-2027) by Streaming Type, Revenue Stream, Platform, and Geography, Competitive Analysis, Impact of Covid-19 with Ansoff Analysis". Accessed February 2024.
<https://www.researchandmarkets.com/reports/5601650/global-esports-market-2022-2027-by-streaming>

Godfrey, Callum. Interview by Georgia Lewis. 15 February 2024. Head of Third Party Publishing. N Dreams. Accessed February 2024. <https://ndreams.com/>

Gordon, Leon. Interview by Georgia Lewis. 13 February 2024. CEO of Onyx Data. Accessed February 2024.
<https://onyxdata.co.uk/>

Game Developers Conference Survey. "Layoffs Hit One-Third of Game Developers in 2023: Survey Shows Devs Rally for Unionization, Questions about AI, Blockchain Tech". Accessed February 2024.
<https://www.alsahm.com/news/content/layoffs-hit-one-third-of-game-developers-in-2023-survey-shows-devs-rally-for-unionization-questions-about-ai-blockchain-tech-2024-01-20>

Agarwal, Lokesh. Interview by Georgia Lewis. 15 February 2024. Founder of MindSync AI. Accessed February 2024. <https://mindsync.ai/>

Sharif, Ahmed. Interview by Georgia Lewis. 16 February 2024. Chief Technology Officer, Sandsoft. Accessed February 2024. <https://sandsoft.com/>

Gibson, Alana. Interview by Georgia Lewis. 12 February 2024. Chief Operating Officer at DGR Legal. Accessed February 2024. <https://www.dgrlegal.com/>

European Games Developer Federation. "The State of the European Games Industry in 2023 Report". 20 February 2023. Accessed February 2024. <https://www.egdf.eu/the-state-of-the-european-games-industry-in-2023/>

Technavio. "November 2023 Technavio Study, Artificial Intelligence (AI) in Games Market North America, APAC, Europe, South America, Middle East and Africa – US, China, Japan, UK, Germany – Size Forecast 2024-2028" Accessed February 2024. <https://www.technavio.com/report/ai-in-games-market-industry-analysis>

Helpshift State of Player Support Survey, November 2023. <https://www.prnewswire.com/news-releases/survey-reveals-gaming-industrys-achilles-heel-lack-of-modern-support-for-console-301973614.html>