
How Digital Technologies Powered the Olympic Games



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Digital tools supercharged the creation, distribution and personalisation of content at Paris 2024.

The recently concluded Olympic Games in Paris hosted around 10,500 athletes from 206 National Olympic Committees (NOCs), with **over half** of the world's population tuning in to watch the action as it unfolded. To host a sporting event of this scale is notoriously expensive for the host nations, to the tune of **US\$28 billion** for Tokyo 2020 (exceeding the initial budget by nearly 80 percent).

A large portion of revenue collected from the Games comes from ticket sales, advertising and sponsorships, which all depend on the event's ability to attract eyeballs. This is becoming increasingly challenging due to the shift from traditional television broadcasting to online streaming, the rise of social media and heightened demand for high-quality, instantaneous and personalised content, among other factors.

How can the Olympic Games overcome these hurdles and meet the requirements of various stakeholders? What role do digital technologies play

in enabling its operations? We chart the actions of Chinese technology conglomerate Alibaba – one of the **15 Worldwide Olympic Partners** of Paris 2024, Tokyo 2020 and the Winter Olympics in Pyeongchang in 2018 and Beijing in 2022 – to share key lessons on digitalisation.

1. Digital can and should be 99.999 percent reliable

Many of us have experienced that moment of exasperation when your video freezes during an important Zoom call or your phone runs out of battery just as you're about to call a cab. These small yet inconvenient failures lead to a common frustration that digital technologies can disappoint us when we need them the most.

This is unacceptable for the Olympic Games. As we witnessed during the men's 100-metre race, American runner Noah Lyles won the gold medal by a **0.005-second margin**. Omega's technology must be extremely accurate and reliable to capture these results. The International Olympic Committee (IOC) set a nearly impossible goal: Essential technology services, including cloud services, should operate successfully 99.999 percent of the time.

How can a technology provider deliver on this near-perfect promise? The answer is redundancies. Alibaba established a number of redundancy measures to ensure the reliability and resilience of its services. First, it built sufficient back-up systems around its technologies, ranging from hardware to software. The company also deployed load balancers to distribute traffic to multiple back-end servers, cross-available zones and regions to support these multi-level redundancies.

Next, the Alibaba team optimised its processes specifically for the Olympics to maximise resilience. To fully ensure the stability of the Olympic cloud platform, it was locked down one month before the Opening Ceremony till the end of the Closing Ceremony. This helped avoid any changes that could lead to an unexpected impact on technology services. Alibaba also simulated different scenarios via end-to-end rehearsals, including three internal ones and two technical ones with the Paris 2024 Organising Committee (POC) and technology partners like Atos and Samsung.

Equally important, Alibaba committed key resources – dedicated “core teams” – to ensure ultra-high-quality deliveries. To enable early detection, the Alibaba Cloud on-site teams worked closely with the IOC and the POC, monitoring connected infrastructures and the cloud platform 24/7 during the

Games. Abnormalities were detected within seconds and automatically assigned to one of four severity levels, which triggered the required responses. This ensured that the relevant teams were quickly activated to fulfil the strict reliability requirements of the Games.

In addition to the on-site support teams, relevant expert teams were deployed to work closely with the IOC and each organising committee. The tasks started before the Games with migrating local systems to the cloud, supporting staff and volunteer training on the usage of various technologies including AI and building customised innovations.

Although back-end activities are often hidden from the public eye, these efforts helped ensure a nearly flawless 99.999 percent delivery.

2. Digital can offer instantaneous *and* high-quality content

While nothing compares to the sheer thrill of watching the Games live, streaming services can provide a higher-quality viewing experience. Live streaming can offer instant replays from multiple angles, digital illustrations, rich data analysis and a nearly 360-degree virtual rendition of critical plays. All this made Paris 2024 the first Games in which internet **live-streaming volume** surpassed any other distribution means including television broadcast, **according to** Yiannis Exarchos, the CEO of Olympic Broadcasting Services (OBS).

How did digital technologies enhance the viewing experience and make it more engaging? Traditionally, in addition to OBS, each broadcaster or media-rights holder (MRH) sends its own crew to record specific footage. This costly practice generates much waste, as proprietary videos and images captured are not usually shared with other broadcasters. The sheer number of recordings can take days or even weeks to sift through and can be difficult to fit into social media formats.

Cloud technologies help tremendously in this regard. Starting from Tokyo 2020, Alibaba worked with OBS and MRHs to **implement a new practice**. OBS invested in high-speed, high-resolution cameras to document the action, and recordings were centralised in the Alibaba Cloud. This reduced the need for each broadcaster to send a large team to the Games, freeing up their crew to focus on pre- and post-game coverage, behind-the-scenes features and exclusive interviews.

Paris 2024 marked an acceleration of this approach. OBS created a vault of all event recordings from multiple angles, and gave each MRH complete access. Once the content was centralised on the cloud, Alibaba added a **layer of AI**, including GenAI (generative AI), to help broadcasters select, edit and produce various content.

AI can provide high-resolution renditions of significant moments. Consider the men's 100-metre final, where American athletes Noah Lyles and Fred Kerley, and Jamaica's Kishane Thompson appeared to cross the finish line at nearly the exact same time - at least according to the naked eye. Almost instantaneously, the AI solution processed the images and videos captured by multiple cameras to create a 360-degree rendition of this moment. Digital technology presented a clear verdict - Noah Lyles was a nose ahead by 0.005 seconds. The freeze-frame, slow-motion replay served up high-quality and highly engaging content to online viewers.

Additionally, **AI can be used to edit** multiple camera recordings almost instantaneously. Thanks to facial recognition and object-tracking algorithms, the AI editor can speedily select the right recordings featuring specific athletes or highlighting certain plays. Exarchos **praised** the technology for pushing "the way we convey the stories of athletes [and] sports".

GenAI also significantly enhances real-time data analysis and graphic representation. A key feature that sets the streaming experience apart from on-site viewing is the richness of information, ranging from historical and live data to complementary graphics. At the recent Games, digital graphics displayed during swimming events highlighted the relative distance of each athlete to the leading swimmer in real time, as well as the trajectory of the ball after each play in tennis or table tennis.

The new generation of viewers are digital natives used to **consuming content** that is short, instantaneous and personalised. To address this demand, the Alibaba team **built an AI solution** that distils the most memorable moments from full-length footage into short video highlights within minutes.

The system uses advanced machine-learning algorithms to detect, classify and tag key events within video files - be it goals, fouls or standout plays - across different sports. Each influencer or broadcaster can provide the desired storyline, and the tool will custom-generate multiple versions of the highlights in required formats. This increases the efficiency and

effectiveness, as well as reduces the costs of customised distributions across different social media platforms.

This wide spectrum of high-quality and real-time content became a staple of Paris 2024. IOC president Thomas Bach **acknowledged** that the digital technologies used at the Games contributed to the record-high audience engagement.

3. Digital can make content more relatable across cultures

In addition to the two official languages – English and French at the recent Games in Paris – the **Olympic Charter** requires the use of four additional languages: Spanish, Russian, German and Arabic. The Olympic Channel, also available in Chinese, Hindi, Italian, Korean, Japanese and Portuguese, was broadcast to about half of the world’s population.

GenAI plays a critical role in content sorting and quick searching. Alibaba’s AI algorithm helped broadcasters – especially commentators – select, edit and distribute customised content for each country based on popularity and social media trends. Take the women’s singles badminton final between He Bingjiao of China and An Se-young of South Korea. In China, the match was broadcast by CCTV with tailored replay for He. Meanwhile, in South Korea, it was aired on KBS with tailored replay for An. In the future, GenAI could even translate voice commentary and text content into multiple languages.

Through customised content based on a single source, digital tools not only create a shared experience across cultures, but also enable moments of unity.

4. Digital can reduce complexity and uncertainty

With all these digital enhancements, surely costs would rise, no? In fact, these technologies have helped reduce costs. Consider the highly polarising Paris 2024 Opening Ceremony. Despite its many controversies, the event was indisputably unique. It broke the boundary of a single venue by integrating digital content with live performances, reimagining the Parade of Nations along the River Seine and having multiple stages across Paris. The need to synchronise everything and ensure a seamless audience experience presented significant logistical challenges.

All the **digital benefits** explained so far were at play. The cloud enabled organisers to effectively manage resources and logistics while providing

instantaneous analytics and feedback. AI supported real-time editing, providing high-quality content that was simultaneously transcribed and translated into multiple languages for local broadcasting. GenAI created the scenes in which the Minions stole the “Mona Lisa” and enriched the content with additional information and graphics to enhance visual impact. What’s more, selected video segments and still images were tagged and channelled through social media to fit the needs of different audiences.

The best part? This highly engaging content was offered at a lower cost and yielded a lower carbon footprint. The **prevalence** of digital, cloud and AI technologies significantly reduced the need for human resources. **OBS** produced **over 11,000 hours of content** at Paris 2024, a 15 percent increase from Tokyo 2020. OBS’ online content delivery platform (Content+), which is supported by Alibaba, was the primary method of delivering short-form and social media content to MRHs. The latter had access to more than 17,000 pieces of content, of which approximately 790 pieces were vertical content designed for social media.

Yet, the International Broadcast Centre’s physical space at Paris 2024 was 13 percent smaller than Tokyo 2020, and electricity consumption at Paris 2024 was 44 percent lower than Tokyo 2020. Additionally, the area used for broadcasting at sporting venues was reduced by 11 percent and power consumption was reduced by 29 percent as compared to Tokyo 2020.

As digital transformation continues to permeate both business and society, many leaders and business executives continue to wrestle with the question of whether and how digital can bring value. Paris 2024 provides a clear answer. Digital can improve both effectiveness and efficiency. It can boost engagement by providing high-quality, engaging and customised content, reduce costs and ensure stability and reliability.

If a high-stakes event like the Olympics can benefit from digital tools, high-performing businesses can apply these lessons to their digital transformation and drive value through these technologies.

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