

# iBYTES

## Technology and the Olympics

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# Use of IT in the London 2012 Olympics



IT was everywhere at the London 2012 Olympics and Paralympics. Below are just some of the ways that IT was utilised to maximise the Olympic experience:

- Results were collated and sent out to score boards by computers, using OVR (on venue results)
- Public announcements and the 'big screen' enabled audiences to view the events and find out results
- Tickets could be checked and queries dealt with using IT
- The mobile phone networks supported a huge amount of data
- Social networking sites sent results, comments and photographs around the world in seconds
- Apps on mobile devices kept the public up to date with schedules, results and the medal table
- And, of course, the scoring and time keeping systems were more accurate than they had ever been
- IT was also used for security, in CCTV and by the emergency services

## The Olympic Experience – George Smith and his grand-daughter Georgina

George and Georgina are huge fans of the Olympics – they love the atmosphere and competition and they each have their favourite events. George loves the rowing and remembers when Great Britain won two gold medals at the event in 1948; Georgina loves the cycling and all the excitement of the velodrome. But both George and Georgina enjoy watching the athletics events together and some of the highlights for them both were the 10,000m and 5,000m men's final and the women's heptathlon. George recalls that in 1948 the athletes ran through a tape at the finishing line and times were recorded using stop watches; but in 2012 a laser is used to



assist in determining the winner, when often it is only the breadth of a vest that is the difference between gold and silver.

George was 82 when the London 2012 Olympics were held. He remembers the excitement of the 1948 London Olympics when he was a teenager, though he didn't attend any of the events. His family lived outside of London, in the Midlands, so they couldn't receive a television signal to watch the Games – this was only possible if you lived in London. And even if they could have received a TV signal, his family, like many others, couldn't have afforded a television in 1948. So to listen to the events broadcast, George's family huddled round a huge valve radio that couldn't even be moved from one room to another. On one occasion, George remembers his father took him to the local cinema to watch a Pathé newsreel of some of the events. But mostly, George found out the results of the events by reading his father's newspaper the day after an event had taken place.



In 2012, George has an HD digital TV to watch all the live coverage for the 16 days of the Olympics as well as a DAB (digital audio broadcasting) radio to listen to around the home. As well as

watching some of the events on TV with her grandfather, Georgina has a smartphone and a laptop and keeps up-to-date with all the latest news from the Olympic events using social networking sites and the official BBC Olympics app. She watches events on the go on her smartphone or listens to the commentary using the radio app on her smartphone; she often texts her grandfather the latest news and her views on these. As well as visiting the official Facebook page of the 2012 Olympics, Georgina visits sites such as Flickr to see photographs of the athletes.

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## The London Olympics: 1948 to 2012

The 1948 London Olympics followed a period of economic hardship, much like the London 2012 Olympics, the 1948 Olympics were known as the austerity olympics because of this. The cost of staging the 1948 Olympics was £750,000 (approximately £23 million in today's money) compared with £11 billion to stage the 2012 Olympics.

Another huge difference between the two Olympics is the impact of IT on the Games – both on the way we watch them and on the athletes themselves.

The 1948 Olympics were the first to be televised into homes, with about 500,000 people being able to watch. The previous Games, the 1936 Olympics in Berlin, were the first to be televised, but broadcasting was not into homes but to television halls in Berlin, built for the occasion.

In 1948, 60 hours of the Olympic sport was broadcast compared with a 5,000 hours in 2012. Whilst most people in 1948 would have listened to the coverage gathered around a radio that wasn't even portable, in 2012 we watched and listened to the 5,000 hours on digital TVs, on our computers, our mobile phones and our tablets, often on the move away from our homes. Access to television in 1948 was very limited (if you lived outside London in 1948 there was no reception, even if you could afford to buy a TV) and people often found out the results the next day by reading the newspaper – which puts the controversy over delayed viewing in the US in 2012 in perspective!

According to BBC statistics, 51.9 million people watched the Olympics on their TVs, whilst 12 million watched them on a smart phone or tablet.

Requests for video from the BBC on mobiles and tablets accounted for 12 million of all video requests.



## The impact of technology on the athletes from 1948 to 2012

In addition to differences in following the Olympic coverage, George also notes differences in the athletes themselves, between those competing in 1948 and 2012. In Georgina's favourite event, cycling, the kit they wear is very different from that in 1948: cyclists then wore shorts and T-shirt, a basic helmet, and shoes. Cyclists today will probably have had a full body scan to determine the best fit to make them as aerodynamic as possible, the kit they wear is skin-tight and the helmets designed to streamline their shape and make them even more aerodynamic. In addition, they will have used battery-powered 'hot pants' to warm their leg muscles just prior to a race, a new innovation which was trialled for 18 months prior to these Games. Similarly, athletes in George's favourite event, rowing, will today wear kit especially designed and fitted to give maximum performance.



There are some Olympic events where technology has had a huge impact in recent years – cycling, sailing and rowing for example, where the kit used by athletes has been evaluated, tested and perfected to give optimum performance.

An event that first marked the origins of the Paralympics was held on the day of the Opening Ceremony for the 1948 Games. An archery competition for soldiers with spinal cord injuries was held at Stoke Mandeville and this was the forerunner of today's Paralympics. In 2012, the Paralympics are bigger than ever with over 4,000 athletes taking part. Technology has meant that great advances have been made here as well as. One of the highlights of the 2012 Olympic Games was seeing Oscar Pistorius, the South African disabled sprinter known as the 'Blade Runner', running against able-bodied athletes in the 400 m and 4 x 400 m relay. Along with the athlete from Great Britain, Jonnie Peacock, he also competed at the Paralympics where Peacock beat his hero, Pistorius, in the 100m to become Paralympic champion.



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Oscar Pistorius wasn't allowed to run at the 2008 Olympics against able-bodied athletes, as there were claims that the biotechnology used to produce his prosthetic legs meant he used 25% less energy than the other athletes, therefore making him faster. This claim was later rejected which made it possible for him to run at both the Olympic Games and the Paralympic Games in 2012.

IT is used in training to help a range of athletes: boxers train with overhead cameras that record their movements and enable them to see how to improve their performance. And divers receive feedback on their ipods during training as computers measure the angle of their bodies in the air.



### Virtual imaging

Virtual imaging has given us the 'world record line', changing the way we watch sport. We saw it in the pool at the Aquatics Centre and on the lake at Eton Dorney for the rowing. This yellow line, which first appeared at the 2000 Sydney Olympics, is directly connected to the electronic timer and shows on the viewer's screen as a line representing the current world record.



Virtual imaging is also used to display a submerged flag of the swimmers in the lanes of the pool or lake, so the viewer can see clearly which country is in which position.



### Time keeping and scoring

The first move towards automated timing systems at the Olympic Games was at the 1964 Tokyo Games, when a new automated system was introduced, which had the starting pistol linked to a timer and photo-finish equipment. This was in contrast to previous Olympics where stop watches were used.

At the London 2012 Games, there were 450 timekeepers, supported by about 800 trained volunteers, using equipment that included 390 scoreboards, 180km of cables and the most up-to-date timekeeping and data-handling technology.



For track events at London 2012, the starting pistol was electronic and integrated with a quantum timing system which enabled timing of races to be calculated to the nearest one thousandth of a second. The starting pistol sent an electrical current to the starting blocks, which then started a quartz oscillator in

the timing console. The sound of the shot was amplified through speakers on each starting block, to ensure every athlete heard the shot at exactly the same time.



The starting blocks had pressure pads incorporated in them to detect false starts and at the finish line a laser was used and, when an athlete crossed the line, a signal was sent to the timing console to record the time. A digital video camera was also used at the finish line to determine a photo-finish.



At the Velodrome, radio transponders were used on the tyres of the bicycles which emitted identification codes to the start and finish lines. In the pool at the Aquatics Centre, touch pads were used to detect when a swimmer dived into the pool and when they touched the pad at the finish. In the Taekwondo event, players had sensors fitted in their kit, linked to an electronic scoring system.



### The Big Screen at the 2012 Olympics

BT was the official communications services partner for the 2012 London Olympics and Paralympics. To enable the communications systems to work, BT built 80,000 connections, laid 4,500 km of cabling and created 1,800 wireless access points, to support an average 6GB of multimedia data per second. This was to allow every sports report, every visit made to the London 2012 Olympics website, every voice message, text and email sent.

Of course, the success of the big screens at BT London Live events was also down to BT, who broadcast live in Hyde Park, to people without tickets to see events. This event was then moved to Trafalgar Square for the Paralympics at the end of August.



### The impact of social networking

Some people have called the London 2012 Olympics the 'Socialympics' or the 'Twitter Olympics': like most aspects of our lives in the 21st century, the Olympics has had a massive following on social networking sites. According to Twitter, 150 million tweets were generated by the Olympics, with 10 athletes generating more than a million tweets of their own, including Usain Bolt, Michael Phelps, Tom Daley and Andy Murray.



Facebook had an official Olympics page, keeping followers up to date with results and photographs from both the Olympics and Paralympics, on their computers, smartphones & tablets.

Photo galleries are also available on Flickr, with an official IOC account.

A disadvantage of social networking, of course, is that for people who couldn't watch events live the results were often known before they had chance to watch the event, because of 'spoilers' on Twitter, Facebook or other social media. This happened not least in America, where the coverage was delayed to prime viewing times.



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# Teacher's Guide

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