

Tennis and technology are a perfect match

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The ancient Egyptians, Persians and Greeks all had various ways of competing in friendly combat, bringing societies closer together and creating new rules of engagement on the playing field. The history of sport is as old as mankind. While the basics haven't changed much, technology has introduced a level of sophistication to sport commensurate with how we interact with games of all kinds, both virtual and physical.

When I played amateur circuit tennis in my younger days, there was always controversy over the reliability of line calls and how they could determine a match. Young players from all over the world emulated Bjorn Borg (or in some cases John McEnroe) and how they responded to a call from the umpire's chair.

Today's athletes and the crowds that fill tennis stadiums have come to rely on advances in technology to dissolve the doubt inherent in human eyesight and decision-making in judging calls. Off the court, technological training tools enable competitors to better assess how the human body behaves and thus train more intelligently.

For the upcoming Mubadala World Tennis Championship in Abu Dhabi, umpires will utilise sophisticated imaging software in judging the game; athletes will rely on digitised training equipment and medical tools to build endurance; and trainers will employ highly developed motion capture and sensor technology to maximise player agility.

Technology first came into mainstream tennis with the introduction of the Cyclops at the 1980 Wimbledon Championship. This system utilised a simple yet effective series of infrared "eyes" - lasers projected towards a service line - to determine whether a ball was in or out of play. Though the Cyclops performed well, the introduction of its successor, the Hawk Eye in 2006, changed forever the way we view the sport.

The combination of high-speed cameras and sophisticated software provides accurate data on the location of the ball, its speed and trajectory throughout game play. Not only has this transformed the umpiring of tennis, it has also transformed the fan experience. In addition to watching the match, audiences can now engage through three-dimensional renderings of play and a dizzying array of statistics available in real-time. And for young people who have grown up in a digital age, these technologies can make tennis more attractive and get them involved in a healthy sport they can play for their entire lives.

Modern tennis is increasingly reliant on the availability of technology to minimise human error. Tennis, like advanced technology, has become a science of millimetres, precision and accuracy. That is why Advanced Technology Investment Company, owned by the Abu Dhabi Government, is the technology sponsor of this year's Mubadala championship.

Off the court, players and their coaching staff have come to depend on advanced technology to increase endurance, agility and improve performance. Tennis, like other sports, has developed in that it is not just won through intelligence and strength, aerobic or anaerobic prowess alone. It is rather the delicate development of all these traits in balance with an understanding of the physical limits of the body that enables an athlete to excel throughout a match. It is technology that helps athletes to develop their leading edge.

One of the tools of the tennis tech trade is the heart rate monitor. The heart rate monitor is a straightforward device that measures the electrical signal used to make your heart beat. The proper application of the monitor provides a real edge to competitors looking to achieve the perfect aerobic-anaerobic balance. More complex technologies, including 3D motion analysis, enable the computation and displacement of data associated with movement to be broken down on a scientific level. This provides critical feedback for the world's top players in honing their form and improving the accuracy and precision of their stroke-play.

The future of tennis's relationship with technology looks brighter than ever. Internal gyroscopes and accelerometers are likely to advance motion capture technology, to allow for more detailed scientific analysis while using less equipment. Researchers have even suggested the possibility that this technology might one day become small enough and powerful enough to be worn by players in match-play situations, giving us an even deeper understanding of the skill involved in the game of tennis at the highest level.

Was the ball in, or was it out? That question is as old as tennis itself. Thanks to the close relationship between advanced technology and the game's development, this is one of many questions we can rest assured will be answered at this year's World Tennis Championship.

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