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Tweet, Set, Match: Negotiating the Boundaries of Digital Technologies in Elite Tennis

**VIDYA SUBRAMANIAN, MARIANNE NOEL and
HARMONY PAQUIN**

This article attempts to examine the highest tier of elite tennis through a technological lens in order to understand the several imbrications of tennis and technology in Grand Slam events. Using qualitative and quantitative methods, this article studies the version of tennis that exists today—replete with RFID chips, screen interfaces, more powerful racquets than ever before and the ubiquity of social media. As the relationship between players and fans, organisers and visitors, and even gameplay and umpiring have evolved to allow the use of several technologies, Grand Slam tennis has embraced the era of social media and technologically mediated sport. This article views this transformation through the lens of Science Technology and Society in order to better understand the influence that technologies have in shaping the relationships between spectators, players, matches, tournaments and indeed the sport itself.

Keywords: Tennis, grand slam, technology, information and communication technologies (ICT), social media

Introduction

THIS ARTICLE ATTEMPTS to view elite tennis through the lens of certain technological interventions, in order to critically analyse what tennis as a sport has become. With the influx of technology in almost every aspect of the game, the game has become faster, more focussed on increasing spectatorship and entertainment value, and more and more dependent on big data and analytics. As tennis has become more technology-heavy, the boundaries between player and fan; between real and virtual; between spectator and consumer—all appear to have become blurred. This article focuses on technological mediations in every step of the Grand Slam experience

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for spectators and how the entire experience is mediated through and enabled by technologies—from Radio-frequency identification (RFID) chips tracking visitors to umpiring technologies such as Hawk-Eye on court.

The spectator's experience of tennis is incomplete without social media engagement. From the organisers of Grand Slam events to players themselves and from spectators to advertisers, social media is as vital a component of the Grand Slam experience as the ubiquitous presence of advertisers within the stadium. We concentrate on the influence of this technology in the Grand Slams in particular since they are the most visible, most prestigious and the tournaments with the maximum money invested in them out of all ATP (Association of Tennis Professionals)/WTA (Women's Tennis Association) tournaments.

Today the tennis season starts in January and ends in November. Tournaments spread over eleven months without interruption. There are four Grand Slam tournaments in a year beginning with the Australian Open in January. The French Open in June, and Wimbledon in July make up the middle; and the US Open, in August–September, is the last Grand Slam of the year. Players come from all over the world (Johnson, 2019). In terms of players, winning a grand slam tournament fetches a player 2,000 points (in both ATP and WTA systems); making them the most prestigious tournaments of the yearly calendar for players. In terms of money, the Grand Slams have the highest turnover and the highest prize monies, and the highest revenues of all tennis tournaments. The revenues for the four Grand Slam tournaments in the recent past have been the following (Carter, 2016):

Australian Open (2015): \$174,631,000
French Open (2015): \$204,719,000
Wimbledon (2014): \$240,548,000
US Open (2013): \$253,000,000

The same trend is true for fan attention on social media sites such as Twitter and Facebook, television viewership and visitors to the tournaments as well. Tennis is one of the truly 'global' sports, having massive audiences even in those countries in which major tournaments are not played. For instance, tennis is a massive urban draw in India, in spite of the fact that very few Indian players are in the top 100 rankings both in the ATP and the WTA. In France, which is the only non-Anglophone country to host a Grand Slam event, tennis is the most popular individual sport. In 2015, there were 7,854 clubs with 31,699 courts, 17,654 tournaments and 2,009,452 official matches (Fédération Française de Tennis, 2018). This is reflected in the rankings as well, given that in 2016, there were twelve French men and four French women in the top 100 (ATP/WTA).

The world governing body of tennis is called the International Tennis Federation or ITF. It was founded in 1913 in Paris as the International Lawn Tennis Federation by twelve national associations, and as of 2016, is affiliated with 211 national tennis associations and six regional associations. The ITF partners with the WTA and the ATP to govern professional tennis.

Background

Unsurprisingly, a large amount of academic literature on technology in tennis revolves around performance altering technologies, such as improvements in rackets, balls and surfaces, and the physical performance of tennis players and sports medicine. Some literature also explores the implications of technological enhancements within the game, especially in umpiring technologies (Collins & Evans, 2008, 2012) and the manner in which the game adapts to enhanced technologies (Miah, 2000). The use and proliferation of umpiring technologies such as Hawk-Eye is of particular interest, since it is also a tool that has been incorporated into game play in other sports, such as cricket, rugby, badminton and football.

Studies, such as that by Lüschen (1980), provide a broad framework to show how sport, originally an institution of social behaviour that possessed at its core a sense of competition that is based on skill and strategy, has today grown to extend into education, economics and even mass media. Faure and Suaud (2015) have argued that sports constitute a privileged standpoint for understanding the way in which the social world is literally incorporated and not only, as with Mauss, the way in which society shapes the body. Mauss' (1950 [1923–1924]) concept of 'total social fact', which has been used to describe countless social phenomena, is the cornerstone of Pulman's (2013) ethnographic account on the French Open. This empirically rich analysis presents the myriad of actors and skills that are needed to orchestrate a mega-event such as Roland-Garros (RG),¹ and simultaneously sheds light on the modalities of their interweaving. The 'cement' that binds each professional group and the collaboration between them are carefully described. Technologies are omnipresent in the book, but their contribution is not specifically conceptualised. Our ambition in this article is to place them in a central position.

French sociologists began to develop critical perspectives on tennis in the late eighties, in line with Pierre Bourdieu's work and his program for a sociology of sports (Bourdieu, 1990). Around the habitus concept, part of this research focused first on the correspondence between sports practices and social position, with an emphasis on the stratifying dimensions of tennis. This line of work was coupled very early on with attention to the central place of the body (and bodily techniques), taking into account the specific characteristics of the game. Preferring another entry point (that of sports facilities), Waser (1995) describes the world of French clubs and practices in detail in a context (late 1980s) where the number of members was decreasing considerably. This seminal monograph sheds light on the forms of socialisation and the institutions that make sport a social phenomenon. Using a transnational comparative approach, Christophe Cazuc describes the paths that lead to the profession of tennis player: from school sacrifices to the uncertainties inherent in the player's enrolment in an elite tennis player circuit, as well as the organisation of the daily life of a professional player (Cazuc, 2001). The professional and international tennis space that is the ATP circuit contributes to imposing a certain dynamic that homogenises behaviour, time management, the need for a

coach, etc.; but diverse playing styles bring heterogeneity to a profession made up of an agglomeration of individualities.

As almost all parts of our lives become mediated through technology, it is no surprise that so much of sport is also engaged with online, in real time and through various screens and websites. It is not simply those who make a living off the sport such as players, coaches, organisers of tournaments and those who bet on games who use technology; a very important part of the ecosystem of any sport is the audience. The audience for a sport event includes all the people who watch the sport in the stadium, on TV screens—in their homes, in restaurants, bars and other social viewing platforms, follow the score live on websites or mobile phone apps, tweet about the games, follow the players, and take part in fantasy leagues and other related experiences. This fragmented, non-unified ‘crowd’ belongs to what Paul Virilio has called the ‘city of the instant’ (Redhead, 2007). This ‘city’ is a virtual space in which almost everyone, everywhere in the world can be watching an event ‘live’—even if it is separately and individually. This ‘crowd’ is markedly different from a ‘physical’ crowd, comprising of a number of people assembled in the same physical space, usually for a single common purpose; yet it is still similar; leading us to conjecture that the ‘city of the instant’ may be a virtual being, but in many ways can still be called a ‘crowd’.

A ‘crowd’ when united in purpose has the potential to become what Gustave Le Bon has called a ‘psychological crowd’ in *The Crowd: A Study of the Popular Mind* in 1895. This ‘psychological crowd’ is a ‘provisional being’ created in certain moments and made up of ‘heterogeneous elements, which for a moment are combined’ to produce, he suggests, a being different from each individual that forms it. He compares it to a living body that is comprised of several wholly different cells that come together to form the organism (Le Bon, 1896 [2001]). A crowd is not formed by the accidental accumulation of human beings in any particular place ‘without any determined object’, he posits:

To acquire the special characteristics of such a crowd, the influence is necessary of certain predisposing causes... Thousands of isolated individuals may acquire at certain moments, and under the influence of certain violent emotions—such, for example, as a great national event—the characteristics of a psychological crowd.

Viewers of sport today, while not always able to assemble in the same ‘physical’ space, occupy a large ‘virtual’ space on the internet, on social networking and micro-blogging sites such as Twitter and Facebook. In interviews with fans of football and cricket in urban India, we² found that many interacted with WhatsApp groups of friends dedicated to the discussion of matches and fantasy leagues.

As advertisers and publicists have discovered, the sporting arena is one of the most effective ways of ‘grabbing eyeballs’ in the modern world. The spectacle of sport—be it individual sports like tennis, or team sports like football, or even endurance sports like the Tour de France—are all much loved and much viewed spectacles that make them excellent platforms for those seeking to be seen. Piggybacking on

the popularity of the spectacle, in exchange for financial support to organisers, players and the sport, advertisers have managed to successfully convert the sporting 'arena' into a 'platform' (Subramanian, 2012).

Another much discussed aspect of sport is the commerce behind the spectacle. Other studies have analysed the political economy of sport (Barget, 2006), the globalisation of the sports economy (Andreff, 2008; Brohm, 1976 [1992]), and the domination within sport of countries with the financial wherewithal to engage in intensive and focused training, recruiting, and not least, television and marketing (Gupta, 2004). Whannel (2009), for instance, has discussed how sport played an important role in the growth of television in the 1970s and 1980s. He discusses the importance of sport for television, and also, in many ways, the importance of television for sports. Televised broadcasts, along with commercial sponsorship, transformed professional sport, bringing in 'significant new income and prompting changes in rules, presentation, and cultural form'.

In the later decades of the previous millennium, it was television that altered the form of sport, by allowing the bringing in of bigger financial stakes. The first couple of decades of this new millennium has seen a further transformation within the culture of sport and indeed in all public spectacles—be they democratic elections or a royal wedding—through the magic of information and communication technologies (ICTs). The widespread and immediate nature of online social media, the presence of tracking and surveillance technologies such as RFID, and the vast improvements in player technologies such as training (e.g., physiotherapy) and gameplay (e.g., materials for rackets and stringing) have created a new kind of sports. Tennis has not been immune to these changes either.

We also borrow from Haraway (2018) who proposes the notion of 'techno-sport', through which contemporary sport unfolds, based on a socio-history of the trajectory of the 'techno-athlete' Lance Armstrong. Techno-sport is anchored in the assemblages of laboratories, materials, bodies, knowledge, institutions, sponsorships and so on. In line with this approach, we contend that the relationship between tennis and technology is far more intimate than has been argued by the existing literature. Our argument is the very nature identity of tennis seems to have undergone a rupture of sorts, inaugurating a transformation within the internal biology of the game itself. ICT are the empowering interlocutors in tennis analysis, engagement and game play.

It is our intention to study this transformation and enable a better understanding of the contexts of tennis in this new millennium. There are numerous social worlds that technologies encompass. To capture a 'transnational' object, we take a multi-layered itinerary. We first discuss technologies and the game itself for players and umpires and examine the unique presence of Hawk-Eye in the tennis universe. Next, we focus on technologies of media and digital communications for Grand Slam organisers and partners. We then address the place of emerging digital sport media forms (in particular social media) in the interactions between players, fans and journalists.

The empirical materials we draw upon mix quantitative and qualitative methods. A field visit was conducted at the French Open 2017 at RG to experience the

Grand Slam first-hand.³ Twitter is also used as a source of insight as its existence highlights important changes in both the production and consumption of media content (Hutchins, 2011). Considering the tennis arena as a platform, our goal is to challenge the notion that technology is something that exists organically in the sport; we contend that such technology also merits a socio/cultural/anthropological analysis. We will insist on the heterogeneity of elements that are combined in the notion of crowd that is elaborated above.

Meeting the Digital Face to Face

Watching tennis, anywhere outside the confines of the stadium—and very often inside it too—involves the use of a screen and mostly, an internet connection. Given television broadcasts are digital too, there is no escaping ICTs if one is to watch sport. But how much of it must we use in the actual physical stadium? As we discovered, quite a bit. From racquet technologies and Hawk-Eye to Twitter and RFID chips on wristbands for spectators, ICTs, we found, are the overpowering interlocutors in tennis analysis, engagement and game play.

The first brush with ICTs at the French Open is the entrance ticket. Since there is no way to buy a ticket at the gate, the ticket was purchased online and a confirmation was received via email. The court itself is a site of many technologies that act together to bring us the experience of the tennis match. The first and most overwhelming presence outside of the physical court itself is the big screen. Displaying the score and the match clock, it is a big change from the manual scorecards of the pre-technological era.

Presiding over the court is the Chair Umpire, who is responsible not just for calling out the score but also orchestrating activities of about fifteen people on court: ball boys and girls, line umpires (up to nine) and sweepers cleaning the clay, and of course players. ‘The Chair Umpire is much more than just the person who sits in a high chair and announces the score. They are the guardians of the Rules of Tennis and enforce them to ensure a match is played in a spirit of fair play’ says the IFT website.⁴ He/she usually speaks in French and also uses the old-fashioned ‘Mademoiselle’ when referring to an unmarried female player.

The Chair Umpire also has the best seat in the house. Not only are they closest to the action, but preside over the game, regulating it and keeping it moving. To aid in this function, the chair is equipped with a small screen, which is used to record the score, etc.—this is the official history of the match. The seat of the umpire is also one of the most visible artefacts on the tennis court, making it an excellent space for advertising. At RG, the seat was covered in the insignia of the brand Perrier (see Burnier, 2013).

The flood of sponsorship money into sport has obviously played a large role in determining its trajectory. The influx of money has also encouraged research and development in sporting technologies such as racquets, physical training, sports medicine, etc. Sometimes this technology-aided movement of the game stands

at odds with that, which has been seen as ‘great’ or ‘good’ in the past, creating a sort of tension between what is seen as ‘tradition’ and what may perhaps be called ‘modernity’. The example of racquet technology is illuminating.

In 2006, when Roger Federer was at the height of his ascendancy and had just won his third consecutive Wimbledon title, *The Atlantic* published an article which began, ‘Roger Federer should not exist’ (Perotta, 2006). The article goes on to say:

It’s not the pace of his victories, however, that makes Federer such a marvel; it’s how he wins—with perfectly placed serves, a devastating forehand, a flowing one-handed backhand, timely volleys, and feet as nimble as any the game has known. He’s the sort of versatile player that the modern power game supposedly had snuffed out for good.

The point the author is trying to make here is that the artistry of Federer’s sublime game should have been obsolete because of the power that new racquets could bring to the sport. In the 1980s, it was feared that the more power the players brought to the game, the more boring the game would become, losing the finesse and artistry that had been a hallmark of the sport thus far. Analysis of the standing height of Wimbledon winners for the last 100 years shows a gradual increase in average height, particularly since the 1960s (Wood, 2016). Tom Perotta writes ‘Top players were becoming bigger, rackets more powerful, and, as the aces piled up, matches would become monotonous and the sport would die’.

Toni Nadal, uncle and long-time coach of the champion tennis player Rafael Nadal echoed the sentiment when he said (Nadal, 2016):

If nothing is done, we will soon be witness to the almost total domination of speed and power to the detriment of skills and tactics. Tennis will just become a matter of brute force, rather than a sport in which players need to work on improving their skills, reflect on the game, and apply intelligent strategies.

If the trend continues, those of us who are involved in the game will have to adapt: we’ll have to leave our principles to one side and pursue a new kind of training that ignores reflection and leads to what the wise men of Greece rejected centuries ago: the separation of sport from the cultivation of the spirit.

It remains to be seen if the artistry of a Federer survives the pure power game that newer racquets and gruelling training regimens have created.

The Magic of Hawk-Eye

One of the big changes in game play in the history of tennis has been the introduction and use of Hawk-Eye to resolve line call challenges. The system, in the *Hawk-Eye Innovations* handbook, claims to ‘dismantle a tennis controversy in a

matter of seconds, but spectators get to watch replays right along with the players. It's fun, lightning-quick and decisive, absolutely clearing the air for the ensuing point' (Green and Irwin, 2016, p. 2).

On the court, the introduction of Hawk-Eye, the video assistance that settles disputes right away, has changed the face of the job of the Chair Umpire. Angry flare-ups by the players directed at the umpire have reduced, but have certainly not vanished altogether (Mitchell, 2018). The use of this technology tends to move responsibility of a decision away from the human umpire to the Hawk-Eye technology. On clay courts, such as in RG (where the ball track is relied upon to provide the requisite proof), there is a lot more pressure on umpires, since Hawk-Eye is not used in game play.

And since TV broadcasts do incorporate Hawk-Eye, there is that much more pressure on umpires. Combined with immediate social media reactions, a wrong (or perceived wrong) decision can prove very controversial for the umpire. 'We can get severe reprimands before we even finish the game. For a referee, turning his phone back on after a game gone wrong can become hell, says Franck Sabatier, an official in the arbitral body at the FFT' (Burnier, 2017).

Many players, including two-time French Open champion Maria Sharapova, and the top-ranked doubles team of Bob and Mike Bryan, have been vocal in asking for Hawk-Eye at the French Open (Robson, 2013). 'You can see how marks can be interpreted different ways', Bob Bryan has been quoted as saying.

While the use of such technology has been applauded by players, experts and laymen alike, several questions about its accuracy have also been raised. Roger Federer has been, in the past, an outspoken opponent of the system, having been at the wrong end of an obvious error by the machine during the Wimbledon finals of 2007. Harry Collins and Robert Evans have discussed the advertised margins of error by the company that provides Hawk-Eye technology, and conclude that since the advertised margin is an 'average' of 3.6 mm, it stands to reason that there are occasions when the margin of error can be much greater (Collins & Evans, 2008).

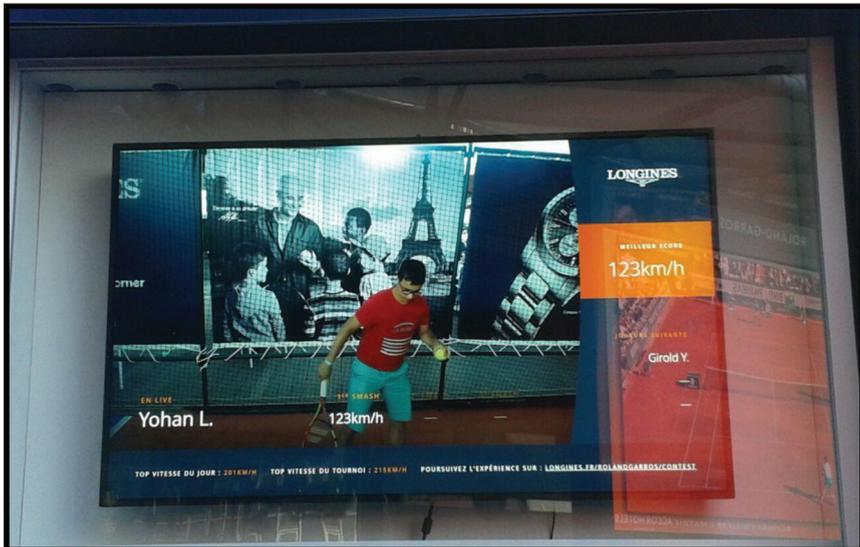
This technology has also been adapted into another sport—without, some critics argue, enough testing (Collins & Evans, 2008). That sport is cricket, where lbw (leg before wicket) decisions are aided by Hawk-Eye technology. Collins and Evans' paper notes that for lbw (leg before wicket) decisions, for several years after the introduction of Hawk-Eye into television broadcasts of cricket, 'cricket commentators would simply remark on what Hawk-Eye showed on the screen, giving the impression, perhaps inadvertently, that the virtual reality represented exactly what would actually have happened had the pad not been struck'. The authors focus on the public understanding of the technology and provide insight into the eventual acceptance of the technology as an improvement over the on-field umpire due to a lack of deeper understanding in audiences of the nuances of the technology.

Technologies of Media and Digital Communications for Grand Slam Organisers and Partners

The most overwhelming presence at the event, as expected, was of the sponsors. There was very little in the stadium to show who actually organised the event, but the presence of sponsors was ubiquitous. Large French companies (BNP Paribas, Orange, Peugeot, Accor, Engie, Perrier) all had a visible presence. The other most prominent presence was of screens of various sizes—both interactive consoles and non-interactive videos and images essentially created the interface for the event.

Screens are everywhere: in corporate lounges, in front of the Philippe Chatrier Court, where deck chairs are available when the weather is fine. Crowds can be large there when tickets are sold out, which is the case when approaching the finals. Even if they are not in the stadium, the spectator has the feeling that they are participating in something exceptional (Pulman, p. 17, p. 211), as part of a sensory experience. Score screens also carry sponsors that have a long-term partnership with RG: BNP Paribas (involved in sponsorship since 1973), IBM (the ICT partner since 1985) and Longines. IBM is the prime contractor for the websites of the four Grand Slam tournaments, which therefore have a relatively similar structure (Pulman, 2013, p. 281). The Swiss luxury brand company and the official timekeeper of the tournament (since 2007), Longines also set up a space inside the stadium equipped with speed sensors, in which the service speed of amateurs is measured (see Figure 1).

FIGURE 1
Screen at the Longines Off-court Area. The Board Displays the Speed of the Ball (123 km/h) Served by the Visitor (A Young Player Named Yohan, in Red)



Source: The authors.

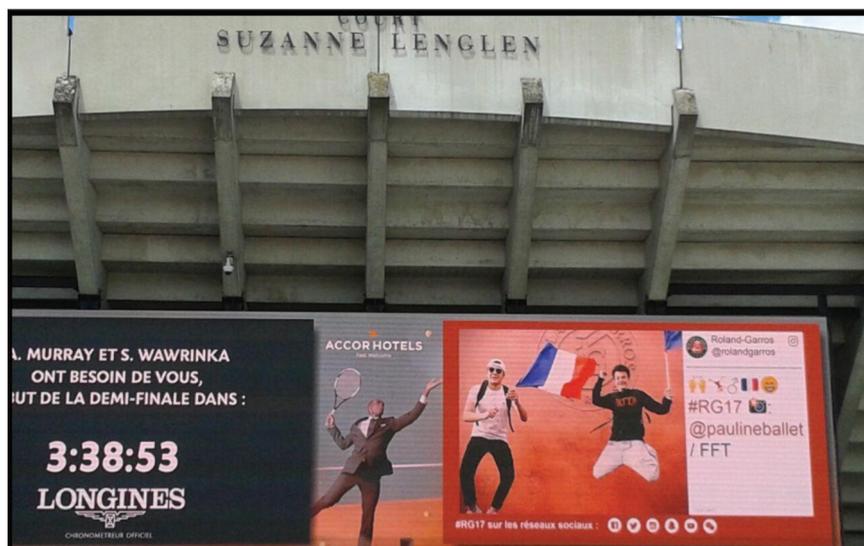
As illustrated in Figure 2, the screen in front of the Suzanne Lenglen Court (the second largest court) is emblematic of the coexistence of business (Longines, the French multinational company Accor Hotels—the business man playing tennis in costume), social media and fans. There is a countdown (sponsored by Longines) to the start of the semi-final on the left of the picture. The text reads ‘Murray and Wawrinka need you. Beginning of the semi-final in 3h58min65s’. On the right, a tweet by the official RG account (@rolandgarros) includes emojis and #RG17 hashtag, and mentions Pauline Ballet, a sports photographer. This shows how all these devices (whether they measure time or service speed) become the basis of shared meanings between the actors (between players and fans, between players and sponsors, between fans and social media, etc.) of what tennis is or should be.

Within the RG stadium, everything is organised to encourage the use of mobile phones. One cannot miss *l'Arbre à vent*® (the Wind Tree), an 8-m steel tree designed by a French start-up (New Wind) with seventy mini wind turbines in the form of leaves to capture wind energy. It feeds four electrical charging terminals of eight telephones each (thirty-two in total), which are freely available to RG visitors. These solar-powered stations for mobile phones are set up by the French company Engie, with the support of its foundation.

Experiencing Technology...and Tennis

One of the most interesting side events at the venue was the RG Lab experience. This ‘experience’ promises visitors a ‘range of interactive tennis applications’. A

FIGURE 2
Screens in Front of the Suzanne Lenglen Court



Source: The authors.

FIGURE 3
Screen at the RG Lab, Encouraging Visitors to Join the #RG17 Community on Social Media



Source: The authors.

visitor entering the RG Lab received an RFID tag tied around their wrist that could be carried as a card. Aside from the Lab's information, visitors could take photographs of themselves (selfies), record their scores or answer quizzes at the exhibit or in the alleys. They are encouraged to upload their photos, scores, experiences, etc. to social media platforms using the #RG17 hashtag (Figure 3). Large mosaic screens are placed on the Lab's walls, where images scroll and where you can have a chance to see your portrait if the control room so decides.

It is also intended to allow the visitor to take part in immersive applications (become a tennis commentator, take photos and answer a quiz on the new RG stadium) and even to take data for later analysis. The collected information could be retrieved at home from a 'personalised' website linked to the RFID tag. Following the visit, we received reduced-fare ticket proposals for the Rolex Paris Masters and questionnaires to complete.

At the RG Lab, various activities—aided by various technologies—are brought together: virtual reality devices (sponsored by BNP Paribas), Holotennis, a solution developed by a French technology company, Emissive (in partnership with Orange). The Lab includes stringing space and techniques (Babolat), a zone to experience padel-tennis, and also a mock-up of the new RG stadium.

As emphasised, companies are everywhere in the stadium and in particular in the Lab. In the virtual reality zone, Yannick Noah—who remains the last and most recent Frenchman to have won the French Open men's singles title (1983)—appears with a contract in his hands (see Figure 4). The text reads 'In a world that changes, if you like tennis, with BNP Paribas, it will love you back'. Noah is known as a wise

FIGURE 4
Advertising Panel by BNP Paribas in the RG Lab (Virtual Reality Zone)



Source: The authors.

businessman and is the captain of the French Davis Cup team. He is still France's highest ranked player since the introduction of rankings in 1973.

In the same location, the prevalence of ICTs contrasts with the permanent historical exhibition of the French Federation of Tennis, which was born from the desire to celebrate French tennis and its heroes in the very heart of the stadium. The use of Noah's image (or, in another place, the Four Musketeers, a quartet of French players who dominated the game in the second half of the 1920s) is part of a strategy to build a mythology around national icons. It was felt that the area was quite empty, and while it can fit up to '400 visitors at a time', there were only some children and teenagers taking part in this extravaganza of 'connected tennis and new technologies'. This could have been because the weather was very good, and some excellent matches were on outside, and the draw of the machine was outweighed by the presence of some actual tennis outside.

After signing up at the RG Lab welcome desk, a mobile app (MyRG) is downloadable to help visitors find their way, consult the schedule of the day and the results, know training hours of players, get promotional offers, etc. In a way, being connected with the app makes the visit easier. Conditions are in place to create what Hutchins and Rowe call the 'intensification of media content production, acceleration of information flows, and expansion of networked communication capacity' (Hutchins & Rowe, 2013, p. 17)

Social Media for Players, Fans, Journalists

The spectacle of sports gained significantly with the emergence of social media (Paquin, 2016). As already mentioned, a large number of firms rely on the attention

of the general public to fuel their business, sell their products, etc. A lot of serious efforts have been put into retaining that attention, and TV broadcast has to face ever fiercer competition with leading social networks (Facebook, YouTube, Twitter, Instagram, etc.):

All tournaments have a Facebook page and a Twitter account, it's essential. It's the same for us, we'll organise a tournament in two months, when we'll be closer we will tweet 'X is here'.

—Roger, journalist in a free magazine/website dedicated to tennis in Paris, France

This study found that during the 2016 Australian Open (18–31 January 2016), their official hashtag (#AusOpen) was mentioned 1.3 million times on Twitter, the tournament was the subject of more than 3 million tweets, the Facebook page had 1.7 million fans, there were 84 million views on Snapchat, a site visited by more than 2 million visitors and more than 1 million downloaded apps. The numbers are of the same order of magnitude at the French Open (1.41 million followers on Twitter, 1.77 million 'likes' on Facebook the same year).

According to the Global Sport Media Consumption Report 2014, in the USA, 96 per cent of fans watch sport spectacles on TV (Perform Group, Kantar Media and Sport Business Group, 2014a). In total, 68 per cent consume sport online, 70 per cent follow sports on Facebook. In France, 65 per cent of the adult population claim to follow sports (approximately 33.3 million). In total, 20 per cent of the French fans are active and connected in stadiums, sport programs are the most commented on TV (Perform Group, Kantar Media and SportBusiness Group, 2014b). In total, 53 per cent of fans follow sports online while 30 per cent consume sports on mobile. Whilst declines have been observed in print and radio consumption, the increase in online and mobile observed in previous years have accelerated. There has also been notable growth in the consumption of sport via social networking platforms (21 per cent of fans in 2014).

Decoupling offer from demand is not easy. The Australian Open promoted its main event hashtag (#AusOpen) throughout both court side and around the grounds. There was a major focus on encouraging tennis goers to generate buzz about the event on social media in the form of user generated content using the various event hashtags. One of the big changes in 2016 was the number of platforms in which they were encouraging fans to do this on (Vine, Periscope, Weibo, Wechat and Snapchat had been added to their social media presence platform promotional strategy). The organisers were providing visitors with the opportunity to enjoy a VIP experience at Hisense Arena in the #AOSocialSuite. For a chance to win this upgrade one had to take a photo of oneself at the Australian Open and upload it to Twitter or Instagram using the #AOSocialSuite hashtag. In her blog post, Loren Bartley explained she not only 'received a comfy seat to watch the match, but was also fed, watered and given a bag full of goodies to take home' (Bartley, 2016). Among them, the wireless phone charger 'was by far [her] favourite part of the prize stash'.⁵

Gantz (2013) argues that ‘Social media facilitates sports-related expression, competition, attention, fun, and connectivity. They are likely to supplement primary relationships, enhance one’s sense of social worth, reinforce one’s commitment to sports, and contribute to feeling part of a meaningful community’. With social media, becoming your own marketer is legitimated and more than that, encouraged. All is done to make the experience in the stadium and outside, unique.

Professional athletes are undoubtedly important actors of the crowd. They have engaged in social media at a fast pace: ‘Players are very active on social media, they all have a Twitter account, run by themselves or other people’ [John, journalist at l’Equipe, France].

Players are very much present on Facebook, Twitter and Instagram. In the men’s top 20 (23 May 2016), all players have a Twitter account. Only two players (Gilles Simon and Roberto Bautista Agut) do not have Facebook account, Simon being the only one not using Instagram. In the women’s top twenty, all players use Instagram and Twitter, only Svetlana Kuznetsova and Carla Suarez Navarro do not use Facebook.

Almost all players have personal websites. But websites have limits, ‘they are more or less well done, that depends on the players. At the same time, I don’t really know what can be improved, we get bored very fast’ [John, journalist at l’Equipe, France].

Players do not favour websites. When looking at websites of the top five players of 2016 (Novak Djokovic, Andy Murray, Roger Federer, Rafael Nadal and Stan Wawrinka), we notice the usage of the third person singular, which means a certain distance with the public. A few players, including Jo-Wilfried Tsonga, use the ‘I’. In both cases, the official website is a reference tool where fans and journalists find authoritative information: biographies, track records and official announcements. It also gives the name of sponsors that are highlighted. At least, most websites include a contact form that allows you to send a message to the player. The address is sometimes given to ask for an autograph.

Restricted to messages with 140 characters, Twitter offers the potential of facilitating their connections with fans in a way that never existed before:

Social media gave player a direct contact with fans, helped them to build his image (...) It works well when he manages this by himself, more than having his agent posting for him. It’s an increasingly important tool that gave the players a direct voice [Sophie, independent sports journalist]

In the line of Pegoraro (2010) work, a corpus is produced to follow the tennis players’ activity online. Athletes (four men and four women) have been chosen for their rich and successful track in the competition. Content was analysed during the two weeks of the Australian Open 2016 (18–31 January 2016). The content of each tweet was coded according to the following category definitions:

- Training, for any comments that refer to their training, game preparation...
- Matches, for any comments that refer to their matches

- Tournament, for any comments that refer to their participation in Australia Open
- Sponsors, for any comments that refer to sponsoring
- Charities, for any comments that refer to charity organizations
- Other players, for any comments that refer to other tennis players
- Other sports, for any comments that refer to another sport or athlete
- Showing behind the scenes, for any comments that refer to their personal life
- Giving opinion, for any comment that express their points of view
- Engaging fans, for any replies to comments their fans or non-fans have sent them (acknowledgements, encouraging people...), plus responses to partners or family members and sports journalists
- Sharing pictures

Table 1 details the analysis of a corpus of 216 tweets.

The players chosen were all active on Twitter during the tournament, with attitudes differing among them: the one on the top (Novak Djokovic, Serena Williams) were less inclined to tweet than the lowest ranked. There may be multiple reasons for this: no time available, a need to concentrate on preparation and matches... One tweet on three includes visuals. Using the same categories, we enlarge the corpus to their presence on Facebook and Instagram. Content classification is given in Figure 5 for the female players.

What the enlarged analysis makes clear is the large part accorded to sponsors. Social media are spaces of brands' business and development. For male players, 11 per cent of the posted messages are linked to the brands they represent (16 per cent for women). These results are consistent with those of Lebel and Danylchuk (2012), which show that while athlete image construction was found to be largely similar between genders, male athletes were found to spend more time in the role of sport fan while female athletes spent more time in the role of brand manager. One message out of four (a ratio equivalent for male and female players) is specifically linked to the game (training and preparation, matches, references to the tournament).

The increased importance of social media is subject to varying interpretations. For David, a journalist at *L'Equipe* (the most important French sports newspaper), there is an injunction from the professional body (the ATP):

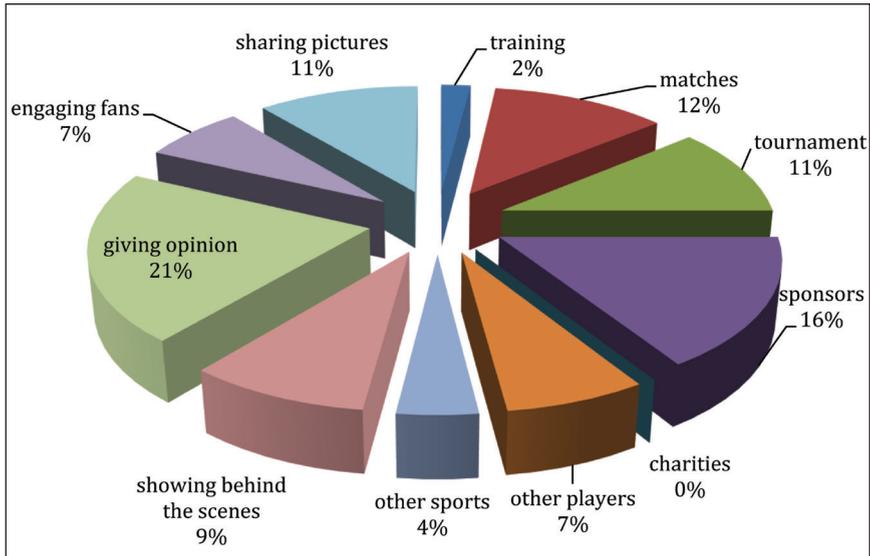
I personally think that ATP asks players to post on social media. What is of interest now is storytelling, to improve the relationship between fan and player. I know that, for ATP even the more anonymous or less recognised player has to become more human, to tell stories, to show pictures of him/her. So yes, for players it's important. Some of them do so voluntarily, best is Karlovic, Berdych recently stopped. Haven't you noticed, he couldn't support it even if he was the best. It was funny but this is work, always the same, you need ideas, you need to take the picture, to send it... Murray is good in using it, but yes, for them it's important. I don't really see excesses. Stakovsky it's funny, well funny... it's personal. [David, journalist at *L'Equipe*].

TABLE 1
Analysis of a Corpus (216 Tweets) of Eight Players During the Australia Open 2016

	N. Djokovic	J.-W. Tsonga	M. Raonic	D. Goffin	S. Williams	V. Azarenka	K. Mladenovic	D. Gavrilova
Country of origin	Serbia	France	Canada	Belgium	USA	Belarus	France	Australia
Ranking	#1 (ATP)	#7 (ATP)	#10 (ATP)	#13 (ATP)	#1 (WTA)	#5 (WTA)	#28 (WTA)	#39 (WTA)
Registration date	2011	2011	2009	2013	2009	2009	2012	2012
Nb of followers (June 2016)	6,6M	826k	2,66k	18,9k	6,15M	744k	73,7k	23,9k
Traming	1	1	1	1	0	2	0	0
Matches	0	3	3	5	0	1	7	6
Tournament	5	0	12	1	0	7	0	6
Sponsors	7	0	0	0	3	5	5	3
Charities	1	0	0	0	0	1	0	0
To other players	0	0	9	1	0	4	3	0
Other sports	0	0	2	0	0	3	0	3
Showing behind the scenes	2	2	3	3	3	5	1	2
Giving opinion	5	0	21	0	0	9	1	12
Engaging fans	5	2	9	1	0	1	3	2
Sharing pictures	-	1	4	0	0	3	1	3
Total	26	9	64	12	6	41	21	37
Text only	2	0	0	0	0	3	3	7
Including pictures/videos	6	9	27	0	2	14	3	4
Including external links	2	0	0	0	3	11	3	2
Including RT/share	16	0	0	0	0	14	12	22
Hashtag	#NoLeFam	#TeamTsonga	#TeamMilos	#AusOpen	-	-	-	-
Language	English	English	English	French, English	English	English	French, English	English

Source: The authors.

FIGURE 5
 Categorisation of Online Content on Social Media During the Australia Open 2016 (Four Female Players)



Source: The authors.

Players are urged to show themselves in the best possible light: funny, sporty, as winners but also supporting fair-play. In a press conference, when Novak Djokovic said that he played a ‘difficult match’ against a ‘solid opponent who has caused lots of problems’ after winning 6/0 6/1 6/0, it is questionable whether the player is sincere or not.

The use of social media by athletes can be problematic for sports organizations. Problems can arise with tweets related to the private lives of players or the disclosure of certain types of information. Sport organisations can face critical hits. French player Edouard Roger-Vasselin publicly critiqued the FFT on Twitter for not informing him that he did not get a wild-card at RG 2016 (Happy to hear about wild-cards by Twitter... #thankstothe Fed)⁶.

While athletes share daily events largely, others try to set a limit. In both cases, players must be prepared to receive messages of support or critics: ‘They need to carry a shield because they do not receive love messages only’ [Sophie, independent journalist, very active on Twitter, France].

Often judged on their results, players may be heavily critiqued when they lose. French player Paul-Henri Mathieu answered his detractors on Twitter, after receiving insults following defeats: ‘Tired of receiving insulting messages every week... Gentlemen bettors, get your nerves over me when loosing, thanks!’⁷

Tennis players must be prepared to receive any kind of message and are supposed to ignore negative messages. This is not always possible. A Canadian professional player, Rebecca Marino, ended her career after five years, while journalists admit

her considerable potential. She declared suffering depression, probably accentuated by harassment on social media. ‘People told me I had to die, other insulted me in a vulgar manner, that’s a small overview of what I heard. Instead of avoiding reading, I searched on them continuously on social media and internet’ (Ezdra, 2013). Since then, she closed all her accounts.

Concluding Remarks

Tennis is as new and evolving as it is classic and historical. It is true that it no longer is the game of guile and grass from the seventies; but it is also true that it is not quite the power-only dystopia that people have been worried about (Nadal, 2016). Tennis is something that most other sports in our time are, it is a marketing gimmick and a television ratings attractor. It is as much a platform for advertisers as it is a battle of titans. A lonely game, played by individuals and a test of endurance and speed; tennis is also catered to by teams of people that stand behind the player on the court—nutritionist, coach, publicist, physiotherapist, manager.

Mediated at every step from training to coaching to playing to broadcast and fan interaction, it has become—like most other things at the highest level—a multi-centred event. We have, in this article, attempted to test an analysis using mixed methods—a qualitative approach (based on interviews and observation at events) and a quantitative analysis mainly based on the exploration of a Twitter corpus.

In this article, we have studied this intermingling of tennis and technology through the lens of Science Technology and Society. Through an analysis that included a visit to one of the Grand Slam events of the year—the French Open at RG in Paris; and an analysis of various other technological mediations in the sport of tennis, we have attempted to show how the edges of where the sport begins and where technology ends have become rather blurred.

In focussing on the technological mediation within the sport at the elite level, we may have given the impression of a ‘technology steamroller’. However, it is clear from the study of the French Open that as a sport with a strong history of tradition and a certain amount of pride in upholding those traditions, tennis has attempted to resist and perhaps slow down, to some extent, the technological influxes. One of the more delightful examples of this analogue insistence is that there is still a prominent scoring table at the entrance, which is updated after every match by a professional painter with a brush (Figure 6).

Tennis is a complex game—both physically and psychologically, as well tactically and strategically. Taking into account the heterogeneous elements that we have discussed in this article, it appears that there is an urgent need to look more carefully at the role of the organising bodies within the game that set the rules and specifications of play.

Given the influx of social media technologies into the way the game is viewed, discussed, analysed and engaged with (be they Twitter or Instagram, web interfaces for ball-by-ball coverage or even in-stadium contests displayed on screens);

FIGURE 6
Contribution of a Painter to Update the Scoreboard



Source: The authors.

it becomes important to understand the influence that such technologies have in shaping the relationship of the fan with players, matches, tournaments and indeed with the sport itself. Contemporary sporting identities—be they of the player as a brand or of a Grand Slam tournament trying to beat its own viewership records of last time—they all become subject to the same vagaries that a social media market based consumption model of sport eschews.

It is clear that the beast that elite tennis is, is an edifice of technologically mediated experiences. The social life of the player has become just as important as her/his prowess on the court. It is this mingling of life on and off court, richly interspersed with moments of coaching, racquet testing, string tension, the latest improvements in shoe technology and the incessant tweets of organisers, fans, brands, and players that make tennis what it is. As boundaries of technology and life blur in real life, so does the mingling manifest in the tennis universe.

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NOTES

1. The French Open is organised by the French Federation of Tennis (FFT), a not-for-profit body that employs 350 persons and owns the Roland-Garros brand. More than 10,000 people work on the site during the tournament (Pulman, p. 27). The success of the tournament has boosted tennis in France: all the benefits of the French Open (from 0.3 million euros in 1980 to 151 million euros in 2011) go to its development (Pulman, p. 216).
2. Interview conducted during PhD field work (VS, 2015).
3. Visit to the Roland-Garros event (MN, 2017).
4. Retrieved March 2019, from <http://www.itftennis.com/officiating/officials/on-court-officials.aspx>
5. See Loren Barley's tweet where she thanks the organisers for providing a charger. Retrieved March 2019, from <https://twitter.com/Impactiv8/status/690454882906738688/photo/1>
6. Retrieved March 2019, from <https://twitter.com/ERogerVasselin/status/730809519857672192>
7. Retrieved March 2019, from <https://twitter.com/PHMofficiel/status/300990314112487426>

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