

INFOSYS TENNIS RADAR

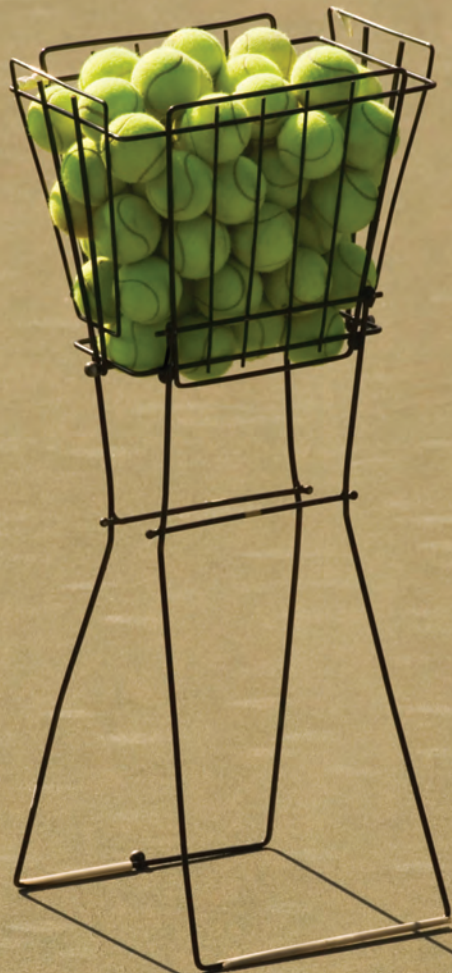
The Next Big Era



RETURN STATS

- SELECT YOUR TRAINING MODE
- SERVE
- RETURN

	YOU	WORLD #1
AVG. BALL SPEED (FOREHAND)	63 MPH	74 MPH
AVG. BALL SPEED (BACKHAND)	61 MPH	70 MPH
AVG. SPIN (FOREHAND)	713 RPM	2399 RPM
AVG. SPIN (BACKHAND)	1146 RPM	2389 RPM



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EXECUTIVE SUMMARY

In 2019, the Infosys Knowledge Institute conducted a worldwide study of tennis to answer the question, How can the proud sport of tennis, with its rich tradition, continue to stay relevant and be even more successful in a rapidly evolving world shaped by consumer experience and driven by technology?

We surveyed more than 3,000 tennis fans globally and interviewed 30 prominent stakeholders representing player, coach, event organizer, industry organization, and media perspectives.

A new era

Our analysis revealed insights at the intersection of analytics, experience, and inclusion. We found that new technologies and intertwined social forces are pushing tennis into a new era.

This new era is characterized by

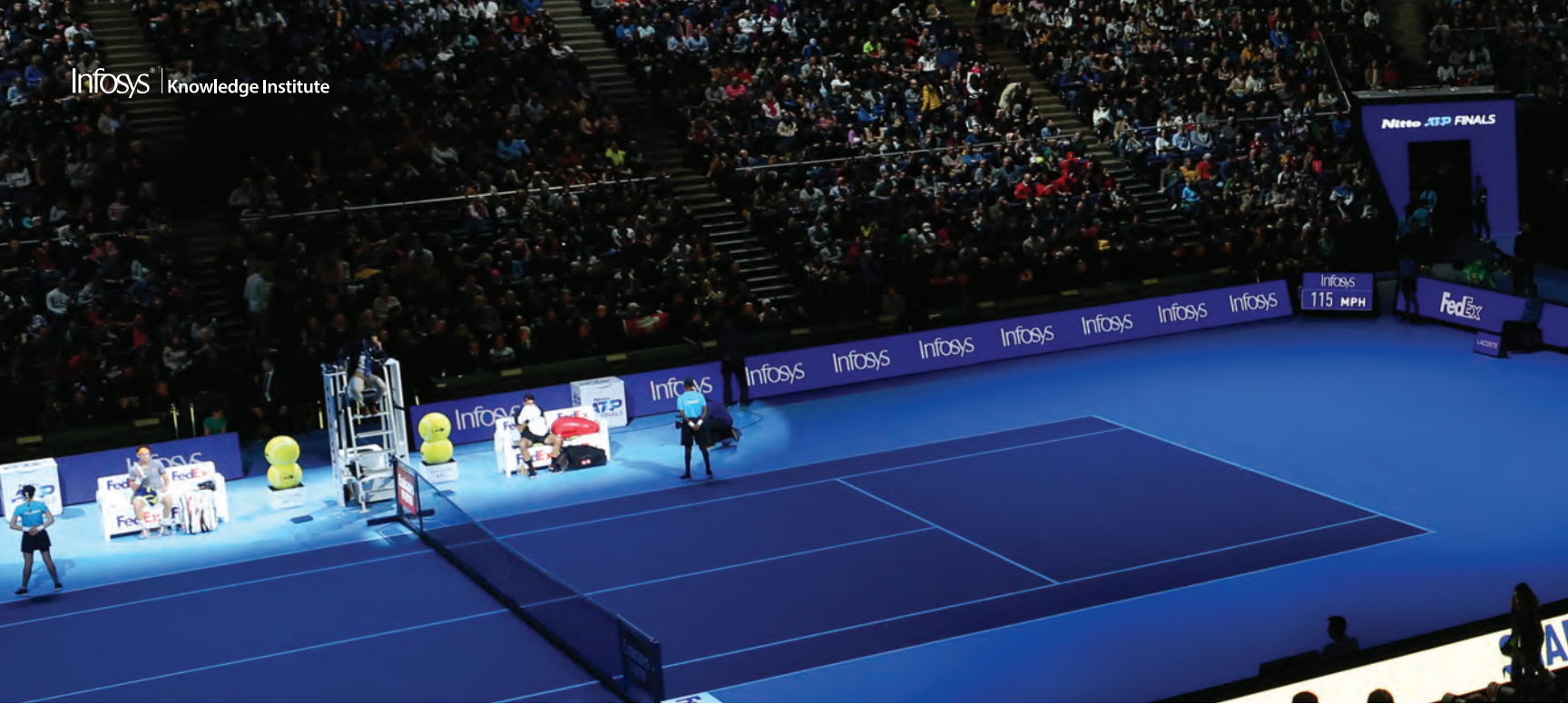
1. **Analytics- and technology-based experiences that improve fan enjoyment of the game.** Young people and people in emerging markets (India, China) score in the highest cluster (Enthusiasts) on our Analytics Experience Index. More than one third of Generation Z and Millennials are Enthusiasts. Easily more than half the respondents in India and China are Enthusiasts (64% and 57%, respectively), with very low percentages for the lowest scorers (Skeptics cluster; 3% and 2%, respectively).
2. **A new generation of fans with the attention span for a tennis match but who demand a tennis experience.** Tennis can hold the attention of younger audiences, contrary to common concerns about younger generations' attention spans, including by our

interviewees. All age groups in our survey answered roughly the same regarding match length: 85% of Millennials and 84% of Generation Z, Generation X, and Baby Boomers said match length is just right. Like all consumer products, tennis is no longer a discrete activity, it is an experience — consisting of dispersed, shareable micro-moments. Tennis-focused, tech-enabled experiences will help tennis reach and retain new fans.

3. **Inclusion, which dispels misperceptions that otherwise put tennis's future at risk.** Tennis has successfully expanded to the East and has reached new players and audiences. However, millions of people will never watch or play tennis because they think it is, as our interviewees said, "not cool," "an old person's sport," "exclusive," "a country club sport," "difficult to play," and "difficult to learn." Interviewees consistently stressed the need to show people that tennis is accessible to all. Tennis is becoming more accessible through experimentation at all levels, from grassroots to tournaments to technology like virtual reality, fantasy leagues, and esports that bring new people to tennis.

How can tennis embrace this new era?

- Experiment at every level
- Democratize data and analytics
- Focus on the social element
- Protect the human element



TENNIS IS ON THE VERGE OF A NEW ERA

Tennis, like all sports, has immense opportunities to use technology to reach more people. From social media to big data to the internet of things (IoT), people are connected to each other and to their world like never before. This is true in all industries, and it is true in tennis.

Tennis is a centuries-old sport that has evolved in step with technological advances and social change. “Real tennis” (see Figure 1), the precursor to today’s game, developed from a 12th century French handball game called “paume” and was mainly played by royalty. Over time, the game then added a glove, then a racket, moved from courtyards to courts, and became “lawn tennis”—commonly referred to now as “tennis.” The game also grew from Europe to the United States, with the first tournament in 1874 (three years before

the first Wimbledon tournament). The Open Era began in 1968, when the game became “open” to professionals to compete against amateurs.

Today, too, the game is evolving in parallel with the times (globalization, mobile phones, competition for consumer screen time, influence of social media, multiculturalism). Our interviewees echoed again and again the sentiment of prominent coach and ambassador Judy Murray: “The world is changing all the time and we have to be able to adapt to those changes, and that includes the way that people are watching or following tennis, which is completely different now.” The world does not look the same as it did at the beginning of the Open Era, and neither does tennis.

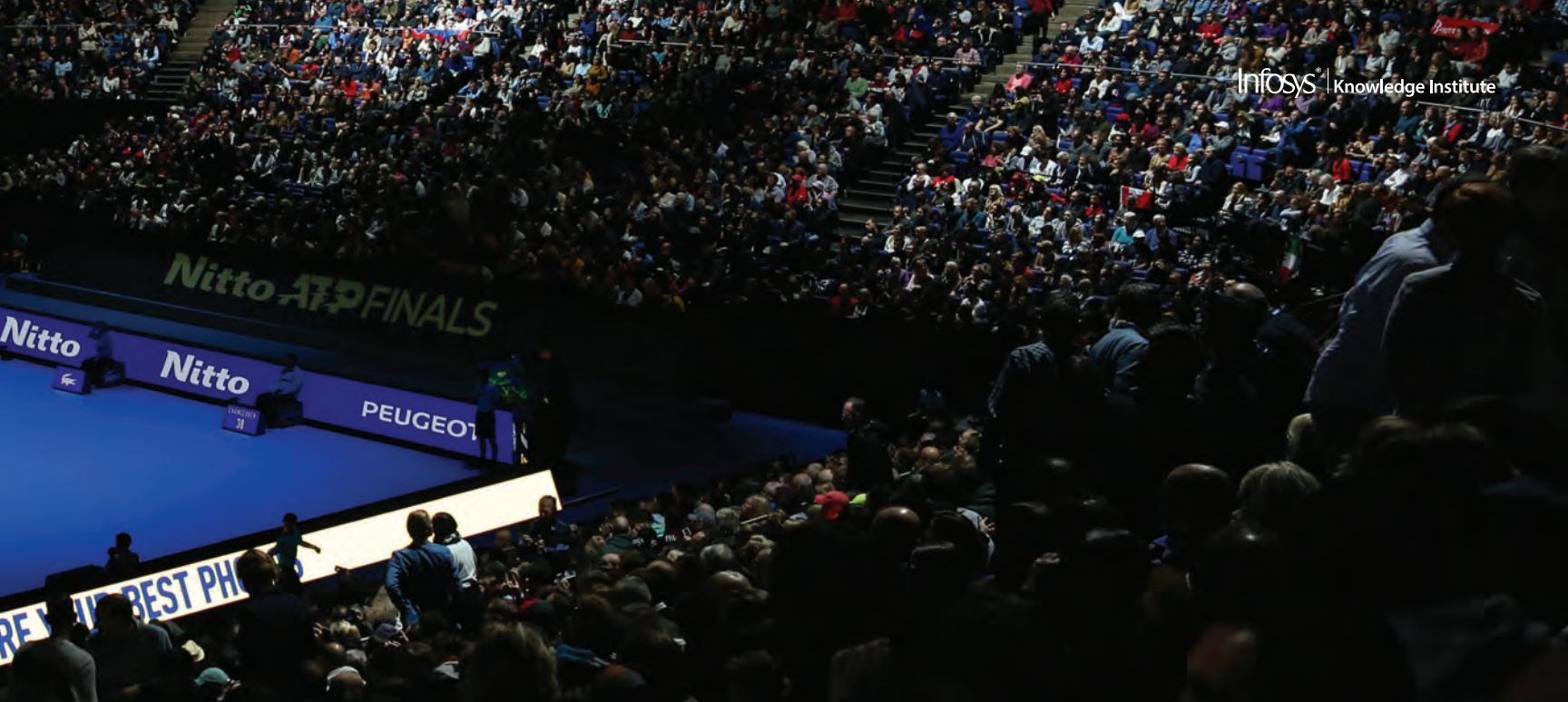
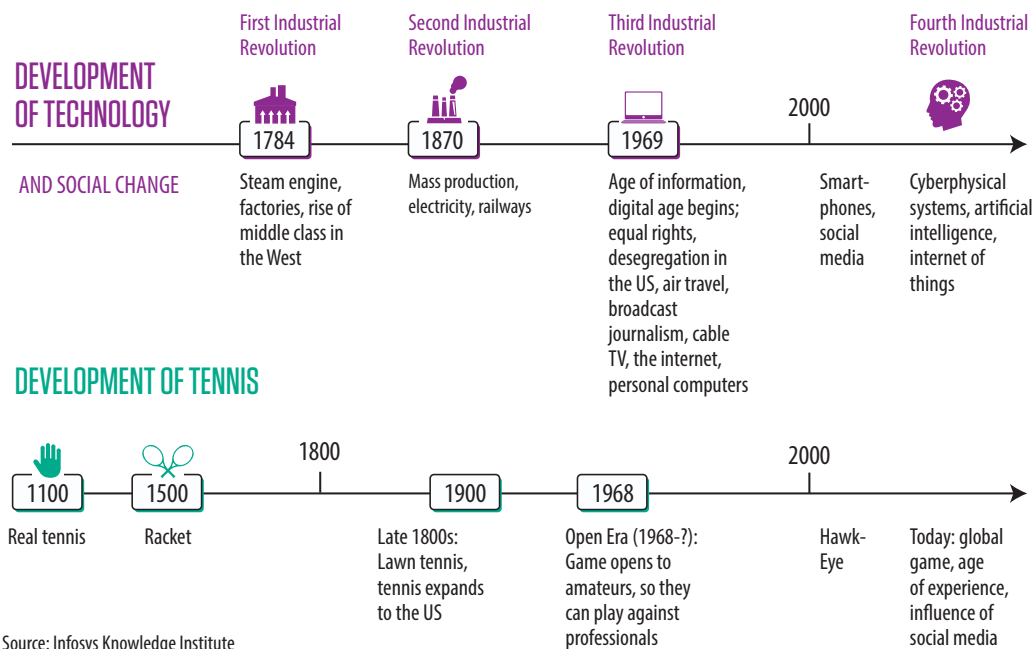


Figure 1. Tennis and technology evolve in parallel



Source: Infosys Knowledge Institute



THE TENNIS RADAR STUDY

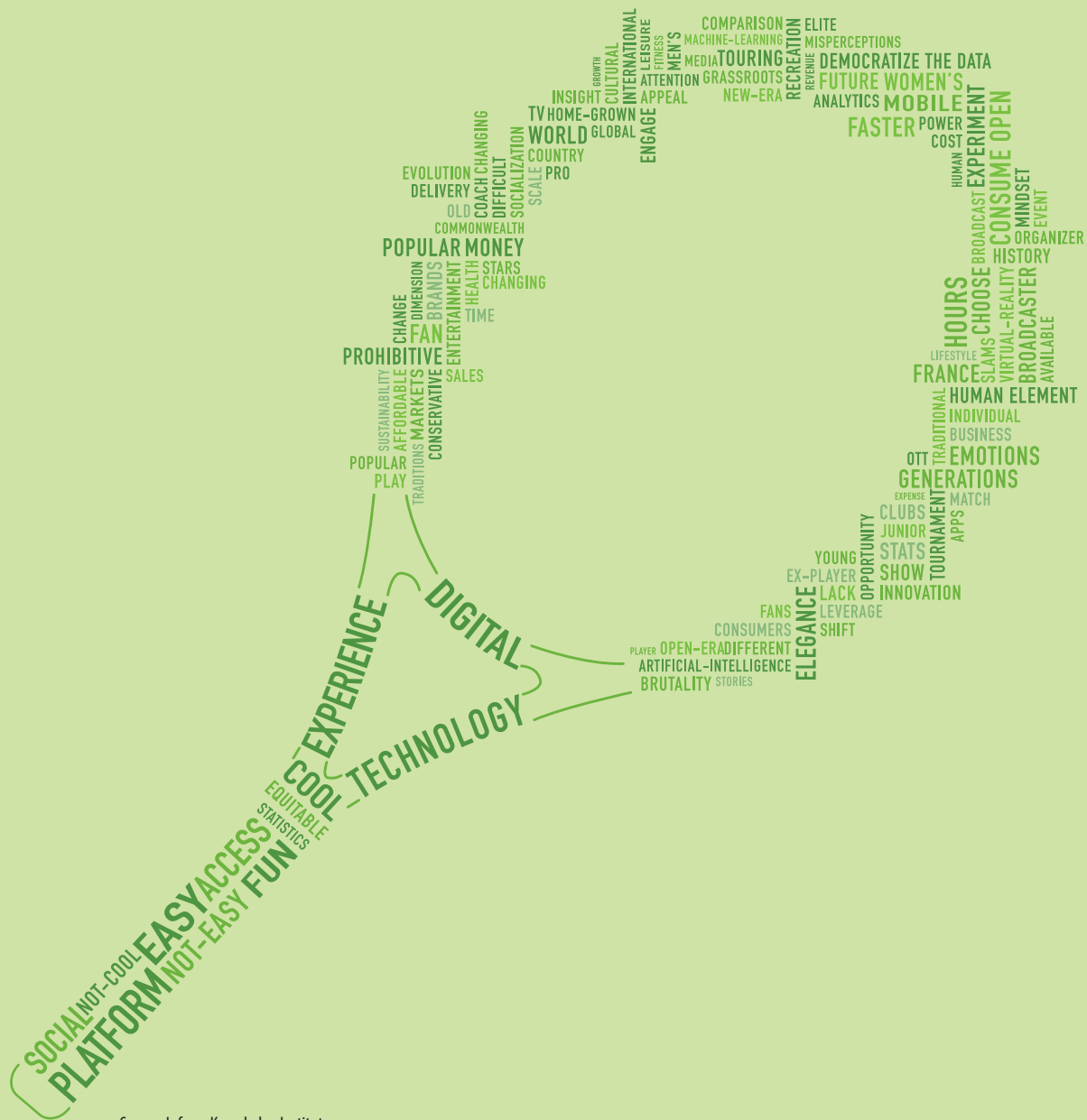
The Infosys Knowledge Institute conducted this study to explore the question: **How can tennis, with its rich tradition, continue to stay relevant and be even more successful in this rapidly evolving world shaped by consumer experience and driven by technology?**

Data for *Tennis Radar* includes 30 stakeholder interviews representing perspectives from prominent players, coaches, event organizers, industry organizations, equipment manufacturers, and media. Interviews explored the current state of the game as well as barriers and opportunities for growth. To bring in the consumer perspective, we surveyed over 3,000 tennis fans in eight regions about their attitudes toward tennis, including tennis technology, game and performance metrics, events, and viewing preferences.

This report draws on a comprehensive set of perspectives across the tennis ecosystem. We assess the current state of the game, covering everything from prize money at the elite levels to grassroots participation numbers. We then narrow our focus to discuss innovations in analytics and experience. Throughout, we identify challenges and opportunities (see Figure 2), as tennis reaches new markets and the next generation.

The heart of our argument is that tennis can become even more successful when it increases access to playing, watching, and understanding the game, and that technology — especially social technology and analytics-based experiences — will play a vital role as tennis enters the next big era.

Figure 2. Tennis faces challenges and opportunities in the times ahead



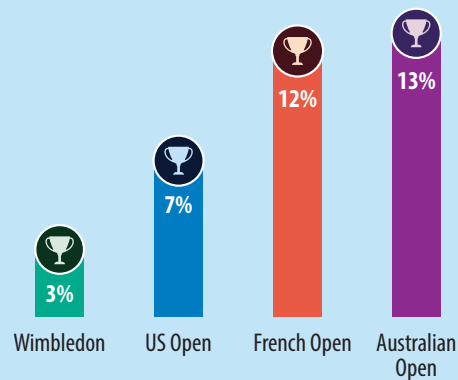
Source: Infosys Knowledge Institute

THE BEST OF TIMES, THE MOST COMPLICATED OF TIMES



The Grand Slams have never been better, as they reap the benefits of new technology. The 2019 US Open, Australian Open, and Roland-Garros (popularly referenced by media and fans as the French Open) had record attendance.^{1,2,3} Wimbledon's attendance was the second-highest in its history, up from 2017 and 2018.⁴ (See Figure 3.) As Brad Gilbert, renowned ESPN tennis analyst, coach, former pro player, and author, states, "Attendance is up. People are going. All the tournaments in summer, Canada, Cincy, the Open, Wimbledon — these tournaments are all packed. They're still on people's bucket lists."

Figure 3. Increased attendance at Slams, 2015-2019



Source: Infosys Knowledge Institute

Besides enhancing consumer experiences, technology has enabled new revenue sources and new challenges. This is true for all industries, including sports. Whether it's tennis, basketball, or Formula One, organizers can choose among traditional television broadcasts (and the sponsorship money that comes with them) and over-the-top providers. For instance, this year's Australian Open will be broadcast on television, and a live broadcast will also be integrated into Amazon's Alexa devices.

Event organizers are under pressure to sort out these new options — not just broadcast options but also the sponsorship and retail possibilities brought about by globalization and technology.

One interviewee talks about the tension between increasing participation and running an event: "Increasingly, as the world changes, those two businesses are extremely different in both skillsets and culture. The juxtaposition between increasing grassroots participation and a global entertainment business is very stark."

The French Tennis Federation (FFT), for instance, with its crown jewel Roland-Garros, develops tennis in France through local club participation. Both the FFT and Tennis Australia are sports federations, and as such have mandates to help more people play tennis. Tennis Australia's local club-level efforts include adding vending machines for rackets and balls to clubs. With reduced staff requirements, more small clubs can stay operational and meet the needs of their communities.



ATP UPGRADES EXPERIENCE

The Nitto ATP Finals in London has had record crowds since The O2 started hosting the ATP's marquee year-end event in 2009.⁵ According to the tournament's Event Director, Adam Hogg, the tournament has consistently maintained 95% occupancy (of 17,800 seats), with attendance regularly exceeding 250,000 of its 267,000 seats, year on year.

How does the tournament continue to bring in such a volume of premium-paying fans? The ATP added the kinds of experiences consumers expect — immersive and technology based, ranging from analytics experiences to

virtual reality (VR) to social technology. For instance, in 2016 Infosys and ATP created a 3D replica of the tournament's center court. The VR offerings have become so popular that Infosys continues to create more of them each year. Infosys reports that their most popular digital experience for fans at the ATP and Slams are VR experiences, which have engaged more than 125,000 onsite fans since 2015.

COME FOR THE MATCH, STAY FOR THE EXPERIENCE

At the Western & Southern Open, a summer tournament in Ohio, technology is key to keeping core fans and attracting new ones. The event's home town of Cincinnati doesn't have a beautiful ocean or mountains or desert to attract fans like a lot of other venues do. So the tournament instead works to create a premium experience, supported by technology. Organizers have built an event that includes a tennis tournament and other experiences. Those additional experiences, including adaptive tennis and fitness programs, family-focused events, and culinary exhibits, aim to make their tournament engaging to both core and new fans. Those efforts appear to have had an impact: Fans spend between six and seven hours per visit — the time equivalent of two football games.



THE CLUB MODEL EVOLVES

“Millennials are samplers, they want to have many experiences and not necessarily commit to be members of clubs,” says Jolyn de Boer, Executive Director of the Tennis Industry Association (TIA). Some clubs are changing drastically to adapt to these younger consumers. For instance, in Seattle, The Collective is a private club with “craft beer, hammocks, and a climbing wall,” and is owned by ClubCorp, “the largest owner and operator of golf and country clubs in the United States.”⁶

More traditional clubs are changing too. Jenny Dent, owner of The Birch Racquet and Lawn Club in Keller, Texas, says that her club doesn’t have a retail store due to online shopping, whereas retail stores used to be an essential element of the club experience — and revenue — in the past. Local clubs are also trying to meet the demands of shifting demographics.

Our research indicates that in Asia, tennis clubs are fewer and further between — supply is low but demand is high (see Figures 4a-4c).

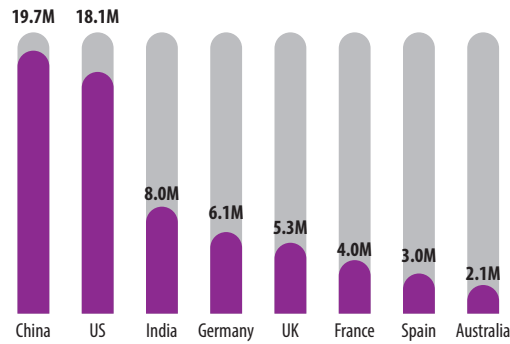
Duan Shaowu, owner of TT. Tennis club in Beijing, says that now that tennis is becoming popular in China, his club is bringing tennis to the masses. Its mission is to change

Chinese perception of tennis from a sport for the elite to one for the general public. After being a club serving all the employees of the government departments for five years, in 2016 it launched lessons and matches for the public and became a commercialized entity that regards promoting tennis as its top priority instead of generating a profit. It lowered the cost for people to learn and play tennis.

TT. Tennis is addressing the long-existing pain points that hindered the popularization of tennis in China: insufficient and expensive tennis courts and coaches, and lack of platforms and organization. TT. Tennis is expanding from Beijing to the entire nation by organizing group matches in Beijing-Tianjin-Hebei city clusters, the Yangtze River Economic Zone and Guangdong-Hong Kong-Macao Greater Bay Area, which are the three most developed areas in China.

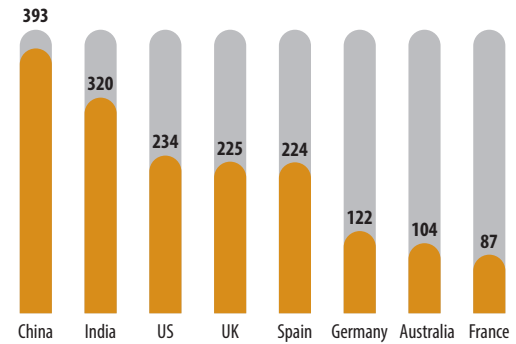
Duan’s club now has nearly 16,000 registered members, ages 5 to 80+, and spanning novices to professional tennis players. Over 65,000 people attended training courses or joined matches organized by TT. Tennis, and tournaments have been attended by players representing 28 provinces.

Figure 4a. Players per country: China and US lead the player pipeline



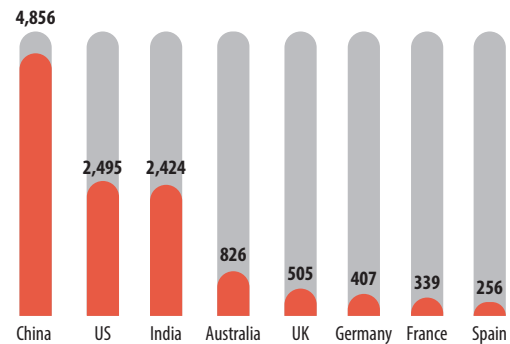
Global number of players = 87M. Data from ITF Global Tennis Report 2019.

Figure 4b. Players per court: Courts needed in China and India



Global average, players per court = 178. Data from ITF Global Tennis Report 2019.

Figure 4c. Players per coach: Coaches needed in China, followed by US and India



Global average, players per coach = 530. Data from ITF Global Tennis Report 2019.

THE HIGH COST OF COMPETING

At the elite level, tennis is arguably in a “Golden Age,” with some of the best players of all time currently playing: Roger Federer, Rafael Nadal, Novak Djokovic, and Serena Williams.^{7,8} “That we’ve had four of the greatest players of all time playing at the same time and nearly the same age has just been incredible,” says Brad Gilbert. Federer, Nadal, and Djokovic have won more majors than any other stars. Williams has more Slam titles than anyone in the Open Era, and many — including Roger Federer — say she is the greatest player of all time.⁹ “In Serena, you’ve got somebody who’s pushing the boundaries both on and off the court. She transcends the sport like no other,” says broadcaster Jason Goodall.

“Everywhere you go, people know who Roger Federer is, who Rafael Nadal is, who Serena Williams is. It’s amazing how big of a reach they have. I’m a huge fan of the NFL, but the reality is 99.9% of those players can walk anywhere around the world and nobody would know who they are,” says one of our interviewees.

However, many in the industry worry that these superstars disproportionately drive fan engagement and event attendance — and they are on the verge of retirement, with no clear successors.¹⁰

Purses at every level also continue to rise, with the \$14 million total prize money at the most recent Women's Tennis Association (WTA) Finals breaking both the men's and the women's records. At that tournament, in Shenzhen, China, winner Ashleigh Barty received \$4.4 million, compared with Stefanos Tsitsipas's \$2.7 million for winning the men's finals the same month in London. This pay imbalance, tilted toward women, is remarkable in a year where one of the biggest stories in sports was Megan Rapinoe's fight against the United States Soccer Federation for equal pay.¹¹ It is also remarkable that, on the heels of these tournaments, the World Economic Forum's annual "Global Gender Gap Report" was released, predicting that it will be almost 100 years until full gender equality is achieved across the world.¹²

Despite this seemingly good news, a recent deal valuation of the top 20 men's and women's players found that men's sponsorship portfolios are nearly three times that of women's.¹³ Further, outside the elite levels many players struggle financially. The average professional can't afford to travel to tournaments. In 2017, The New York Times reported that 60% of the top tennis prize money went to the top 1% on the Association of Tennis Professionals (ATP) and WTA tours. That is worth repeating: the top 1% of players won 60% of the prize money. Part of that is due to a small number of players consistently winning, but it also raises questions about increasing the prize money for other place finishers.

Indeed, many of our interviewees expressed concern about the financial aspects of playing tennis professionally, as well as the emotional toll traveling can take on young players. Indian men's touring pro Sumit Nagal, currently ranked at 130 worldwide, describes these difficulties: "It's not a cheap sport. You're spending a lot of money and you're always spending in dollars or euros. You're never going to Europe and spending rupees. My father's a teacher, whatever he makes goes in three, four days in Europe. How are you supposed to live like this?"

This sentiment held for every player we interviewed. Catherine Harrison, a top 300 Women's Tennis Association touring pro player based in Austin, Texas: "On the whole, tennis is an extremely expensive sport. I broke down costs for myself as a professional at the end of the 2019 season, and tennis-related expenses alone totaled out to be around \$60k. While I consider 2019 to be a very good year for results, rising 200 spots in the rankings, my total year-to-date winnings did not even cover half of my expenses." She describes how the costs increase exponentially as you start competing in tournaments. The real expense, she describes, is in the instruction necessary to advance. Private lessons can approach \$80 per hour, plus travel with flights, lodging, and meals. As a player advances his or her skill and ranking, the costs associated with playing also increase. While Harrison and other emerging U.S. pros are concerned with cracking the upper echelons, even the entry levels pose financial barriers to players in countries with fewer money tournaments.

ATP touring pro Australian Thanasi Kokkinakis, who has been ranked in the top 100, says, "The number one challenge is financial. Tennis is an expensive sport and if you want to be good, you have to travel a lot. It's not like when you're playing a team sport; your club pays for everything and your club pays for you to see to your own coaches. I think especially if you're not at the top, trying to get to the top is the tough part."

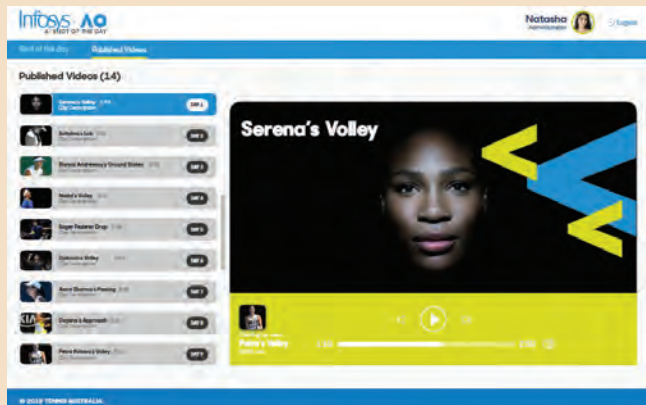
Ankita Raina, a WTA top 200 player from India, described the crucial role financial backing played for her starting out. "I come from a humble background and so it was a challenge to fund my trips. My first international tournament was when I was just 13 years of age, and I was able to play only due to getting sponsored by Dishman Pharmaceuticals." This small early financial boost paved the way to receiving support from other organizations, like the Lakshya Foundation from Pune and now Sports Authority of Gujarat since 2013.

PLATFORM TECH: ANALYTICS GAME CHANGER

Before 2015, tennis fans had limited access to data and analytics. That started to change when the ATP worked with digital services and consultancy Infosys to create a data platform specifically designed for tennis. The Infosys Tennis Platform (ITP) is perhaps the first of its kind to be developed for enterprise-scale and designed for the sport of tennis.

The ITP has pulled in more than 12 million data points going back to 1991, including every point recorded by ATP chair umpires, and five years of Hawk-Eye ball-tracking data. AI generates insights about players' strategies related to shot spins, speeds, and also scenarios like how their playing style is affected when they are behind. (See Figure 5.) Analyses using this platform revealed, for example, that in all of 2015, Roger Federer was able to win all 387 games when he led 40-0 and was able to come back to win games 36% of the time when he was behind 0-40. This new contextualization is exciting for ATP fans who have never seen point-level data analyzed like this.

Figure 5. AI generates new insights for fans



Source: Infosys AI Shot of the Day

With the Players and Coaches Portal, players can analyze their performance and that of their opponent (see Figure 6). The tool examines crucial match statistics and visual cues, and also uses sophisticated filters to generate video clips from more than 1,000 combinations. Data is collected from multiple sources — Hawk-Eye, statisticians, and chair umpires and then collated into a centralized source. Players and coaches can quickly find the clips of interest and then save them for future viewing.

Figure 6. Players and coaches can strategize using >1,000 stats combinations

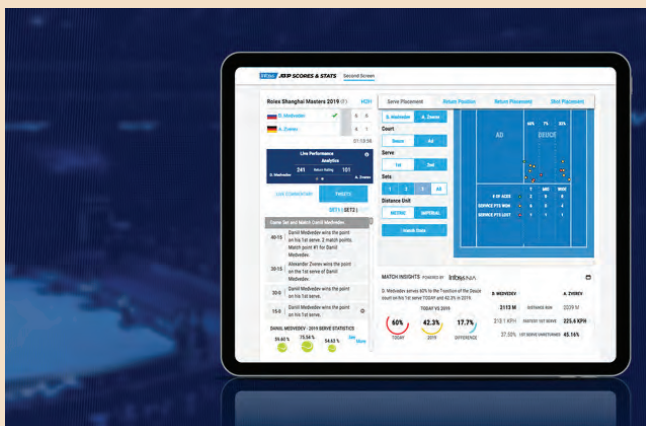


Source: Infosys Player and Coaches Portal

Second Screen is another digital product that delivers contextualized tennis analytics instead of a series of individual statistics. The tool provides live commentary and insights on parameters like serve locations, return positions, return placements, shot placements, fatigue indexes, and more — all within 2 seconds after a point is played, thanks to intelligent analytics and machine learning. Other innovations include technology that offers a bird's-eye view of the court and shows where each point was won, and Rally Analysis, which provides insight into playing styles.

With the technological prowess of large tech companies and a hardworking cottage industry of statisticians and analysts, tennis is starting to close the analytics gap¹⁴ with other sports — but it has yet to find its “Moneyball” moment.

One of the leaders of an emerging cottage industry is Craig O’Shannessy, strategy analyst for Team Djokovic from 2017 to 2019 and current analyst for Matteo Berrettini, Jan-Lennard Struff, Alexei Popyrin, and Tennis Canada. He also writes about tennis analytics for *The New York Times* and other leading publications, and created the strategy website braingametennis.com. After becoming a coach, O’Shannessy discovered the importance of analyzing data to improve performance. Analytics isn’t just the ability to calculate totals, it is the ability to selectively identify and efficiently review specific shots, patterns, and elements of interest better than the eye alone can, he says. “Without analysis, patterns of play get separated by time, sometimes minutes, so they don’t get linked closely enough,” causing coaches to miss relevant patterns.



Source: Infosys Second Screen

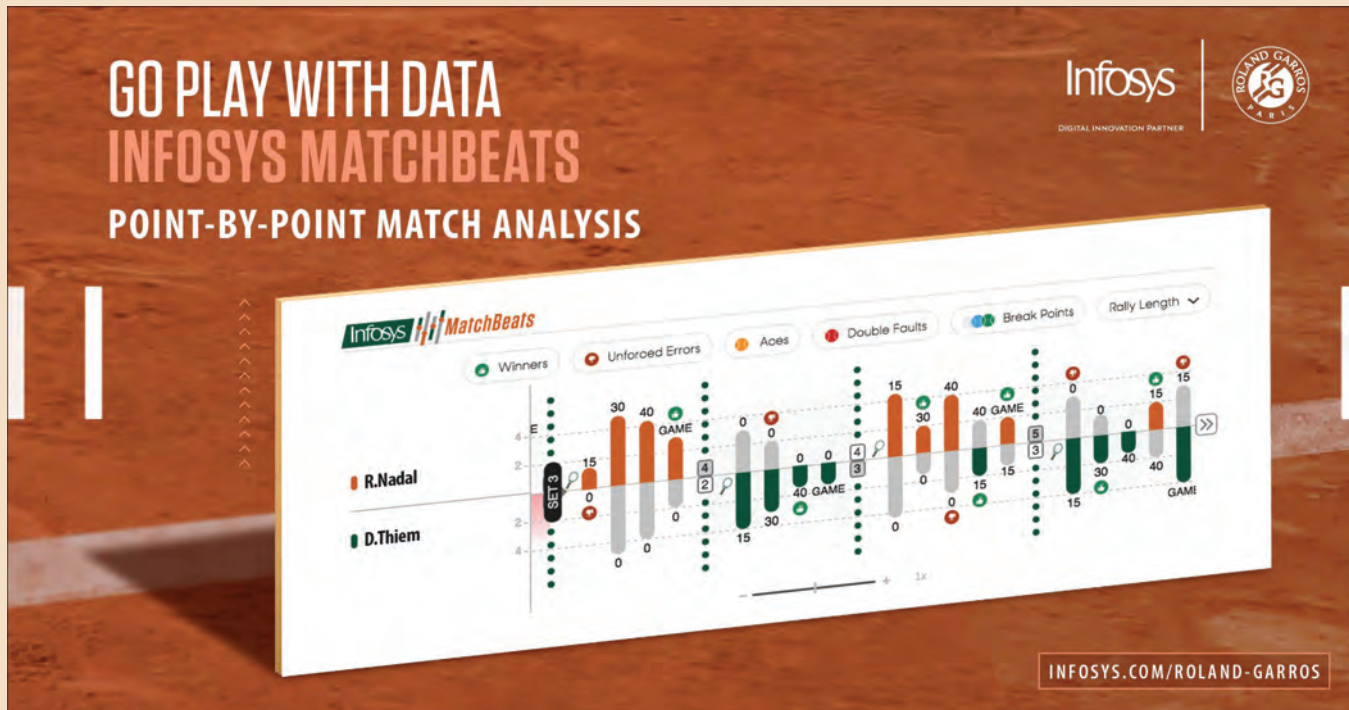
The first stage in O’Shannessy’s evolution in using analytics was sitting on the side of the court and tagging matches by hand. He noticed that he would always find something in the tagged match that his coaching eyes had missed: “I overlooked something or I didn’t realize the importance of it when the match happened.”

His approach to analytics evolved as technology evolved — he now uses the Infosys Tennis Platform to filter matches, creating customized videos that coaches and players use to analyze performance and strategize for upcoming opponents.¹⁵ He says, “I know for a fact that once I go to the analytics and the numbers, I’m going to find even more things that I missed.”

Does his approach work? Ask the Italian Tennis Federation. When O’Shannessy brought his analytics approach to its team in 2017, five Italian men played at Wimbledon. Two years later, in 2019, that number jumped to nine and the story was, “The rise of Italian tennis has been one of the themes of the ATP Tour in 2019.”¹⁶

While there is evidence that sophisticated analytics and strategy coaching makes a difference, it has so far remained out of reach for all but the elite players. Aussie touring pro Thanasi Kokkinakis points out that, in addition to covering travel expenses, funding is essential to access performance analytics and the coaching that brings them to life. “The higher up you are,” he says, “the more funds you have to bring someone on board for analytics.” Somebody playing the Challenger Tour, however, would “probably rather spend their money trying to get by on flights and accommodations rather than looking into the stats and analytics.”

O’Shannessy agrees: “At the Slams, all players get basic analytics, whether you’re on a show court or a TV court. But if you are on court 17 out back, you only get basic analytics of the match. To improve, step one would be that for every match, on every court, data capture and statistics are the same. Otherwise, if you’re a low-ranked player and play on an outside court, you’re not going to get the same match data to learn from and to improve as the players who are ranked higher. There’s a big disparity just from a learning standpoint, and an understanding of what’s going on between low-ranked players and high-ranked players at the same tournament, which I think is a little crazy. I think there has to be some parity there.”



Like O'Shannessy, Damien Spizzo is a former Aussie tennis player now living in Texas and coaching touring pros. Spizzo explains that his coaching style is a combination of experience as a U.S. collegiate champion and touring pro, along with his emphasis on analytics in the game. "Especially when dealing with higher-level professionals or high-level juniors, the data is huge, and numbers don't lie. As players progress and as the level of play gets higher, those little intangibles and knowing your stats can be the difference between losing and winning a match. I mean, I think a 6-4, 6-4 match on average is maybe a difference of five points or so. It's crazy that when you really try to help these players who are at that level, you're really working in that fine area, those few points." Spizzo describes using a combination of apps like Tennis Tracker, which records match statistics, and video analysis for his players.

At the college level, analytics remains mostly out of reach for coaches, according to Jason Brown, head coach of the men's tennis team at the University of Montana. If his team is up against a player they haven't met before, they "have to do an educated guessing game from watching a 10-minute warmup and the first three games of a match. I wish we had the ability to use analytics more directly at our level of college tennis, but it really hasn't become a factor yet." Brown has developed his own expertise in statistics and analysis, and has started to consult with professional players.

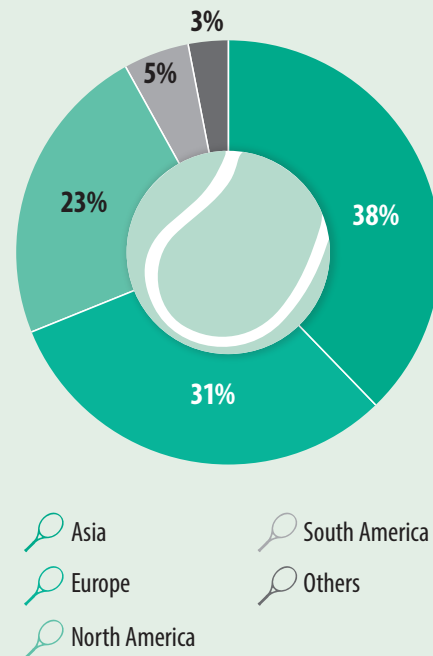
A GAME FOR ALL, GROWING GLOBALLY

At the grassroots level, the International Tennis Federation (ITF) reports both strong participation and strong gender parity — 87 million people worldwide play tennis and 47% of them are women. This ITF research also shows that between 50 and 60 nations had at least one male and one female player ranked in the Junior Top 100, in the Professional Top 100, in a Junior Grand Slam, and in a Grand Slam.¹⁷

Over the last 15 years, the sport of tennis has successfully expanded to the East. The ITF report shows that 37.9% of the world's tennis players are in Asia, followed by Europe at 31.2%, and North America at 23.2% (see Figure 7). By country, the top three nations by percentage participation are India (9.2%), the United States (20.7%), and China (22.5%). Note that China has nearly one quarter of the tennis players in the world — despite having only 10% of the world's tennis courts and only a few clubs.¹⁸ The China market is only expected to grow — the size of the China sports market was around \$56 billion in 2013 and is expected to increase to approximately \$194 billion in 2020 and \$470 billion in 2025.¹⁹

However, data show a steady decline in wholesale racket orders, from 4.53 million units in 2008 to 2.35 million units in 2017. There is a glimmer of hope: the Tennis Industry Association's (TIA) recent data show that at the end of 2019, U.S. manufacturers' wholesale shipments for rackets (in units) climbed 4%, with dollar shipments up 6.6%. Some worry, however; one interviewee says, "If you look at the suppliers and manufacturers of balls and rackets and shoes ... you know, Nike, for example, Nike's entire tennis sales are less than the sales of LeBron James shoes. Statistics like that worry me."

Figure 7. Asia has the largest proportion of tennis participants globally



Source: Infosys Knowledge Institute. Data from ITF Global Tennis Report 2019.

THE RIGHT RACKET MATTERS

Ron Rocchi, Advanced Innovation Manager, Player Insights and Global Tour at Wilson, helps develop tennis equipment to move the industry forward. He describes the two distinct types of rackets he develops: rackets for tour professionals and those for recreational players. The most recent result of his advanced innovation group is Wilson's new racket, the Clash, which debuted and became the top-selling racket in every market, Rocchi says. Most new rackets take multiple years of hard work and expertise to develop, and Clash was no exception: "We took the time to rethink everything, talk to everyone, and really get it right."

He says Wilson's goal is to make tennis a healthier sport for the next generation through their products, experiences, and athletes. He also discusses the difficulty of not having a fundamentally new equipment material. "Carbon fiber has been used in tennis since the early '80s. The real innovations have been in how the industry uses the fibers, what additive materials enhance performance, and advanced racket design."

His job at Wilson also involves working one-on-one with top players: "Roger, Serena, del Potro, Nishikori." He walks them through the racket process, making sure equipment they're playing with on court is optimized for that moment in time. "Any professional athlete whose career spans a decade or more changes physically and tactically over time." They change their approach to the game and their equipment has to adapt with that to maintain optimal performance levels." Also, new racket innovations are constantly being tested by professional athletes, but only at specific times of the year.

He describes the unique relationship between professional tennis players and their equipment, something he realized after talking with a colleague in the golf division at the Innovation Center. When his golf counterparts travel to a professional tournament, they will bring a prototype

of a new club the Innovation Center is working on, and almost every player will try it. "That blew me away," says Rocchi, "because if I go to the US Open with a prototype tennis racket, the players will actually run away from me." Professional tennis players rarely test new equipment during the season, usually only in the off season.

"The golf and tennis pro are both professional athletes, they're both at a major tournament, but the mindset is 180 degrees opposed to each other."

Rocchi also created and runs Wilson's International Stringing Team, an elite group of international technicians who string rackets for professional players on site at 12 prominent tournaments per year. We talked with Dustin Tankersley, captain of the 21-person stringing team for the 2019 US Open. The team's process is precise: "We all tie off strings on the same spot. All the machines are calibrated. Everything is exactly the same." It is also systematic and scalable: "Our way may not always be the best way, but we pride ourselves on being accurate, repeatable, and fast, so pros get what they want, when they want, how they want it."

Before their matches at an event, players come in to the stringing room, test two rackets with different tensions and figure out which tension they like. And then the stringing team duplicates that tension every time the pro leaves a racket, for the next two weeks. "And the players can feel the difference if it's not done right — even a single pound of tension difference," Tankersley says. The Wilson stringing team expectations are for each racket to feel exactly the same, regardless of the stringer.

During a match, if a player sends a racket in, from the time it enters the stringing room to the time it leaves the room is less than 18 minutes. "And that includes cutting the strings out, stringing the racket, putting the logo on the racket, and the racket leaving the room." This elite team strung 5,600 rackets for the 2018 US Open tournament, Tankersley says.



WATCHING COURTSIDE FROM YOUR COUCH

Starting with TV, screens bring amazing opportunities to deliver the sport. As ATP's Hogg describes, the big challenge facing tennis, and every sporting event, is that the quality of the product being produced for consumption on TV at home is so good that it poses a realistic challenge to convince fans to pay to attend the event in situ. "The live broadcast offering for fans at home has become increasingly compelling across all the various different camera angles, replays, statistics, as well as in-depth analysis. While you might miss the live experience, at the same time you think how comfortable it is to watch at home, and ten years ago, that wasn't the case. As such, events have to evolve to ensure that people still want to pay for tickets to attend live and enjoy the in-stadia experience that they cannot get at home."

Hogg adds, "It never really clicked for me before, even as a casual fan at Wimbledon, the speed of the game and the pure athleticism of it. You don't quite experience from TV

the brutality of the sport and its athleticism. At the Nitto ATP Finals I am fortunate to witness our top stars performing close up. Just seeing the speed at which they move and anticipate, the power and the effort they're putting in, shot after shot after shot."

Jason Brown, head coach of the University of Montana men's team in the Big Sky Conference, similarly notes, "I think the practice sessions at the pro level are so amazing to show the physical combat element. It's mind-blowing to me, even having been around tennis as much as I have been." He describes watching a pro player and his hitting partner literally shred a tennis ball after hitting forehands across the net "probably 200 times in a row, with more depth and pace than they would in a match, at nearly 100% maximum swing speed."



GAME, SET, MATCH: WINNING NEW TENNIS FANS

Fans of the game are aging, and the average age of tennis fans — in the West, at least — is higher than the average age of the population. The Sports Business Journal in 2018 reported that 70% of fans at the China Open were under age 40, versus the average age of WTA and ATP viewers in the U.S. being 55 and 61, respectively.²⁰

As any savvy marketer knows, reaching a younger segment often means shifting marketing strategies — different generations have different values and different lifestyles. Tennis, like all industries, is facing a common existential business question: How do you keep the core (older, in the case of tennis) market while expanding into new (younger) markets?

This challenge is especially acute for tennis, a sport our interviewees universally describe as being “traditional” and “conservative” when it comes to making changes. According to elite coach and broadcast network commentator Patrick Mouratoglou, “The whole system is made to be attractive to older people and nothing is made to be attractive to younger fans. When you reach a fan who’s 15, you’re going to keep them for 50 years.” And that is what has happened in tennis — many fans came of age during previous eras of tennis and they stuck with the sport.

Our interviewees also expressed concerns that the time commitments of playing and watching the game are barriers to attracting new, younger audiences. They also expressed concerns that even for older audiences, times have changed, and people do not have the time to spend hours at the tennis court anymore.

It is not only competing social demands that people must consider; new ways of delivering the game, be it streaming on mobile devices or tweeting about an amazing ace, have one thing in common: screens. Jolyn de Boer, executive director of the Tennis Industry Association, correlates the competition for people’s time with the rise of smartphones in 2008. A recent article in *The Economist* cites screen time and a world population boom as putting sports in the role where they must compete against each other for fans. People can “watch any game, at any time from anywhere.” Sports that are perceived to drag on for hours are “particularly vulnerable, as viewers impatiently resort to alternative entertainment on their smartphones — including clips of the highlights.”²¹



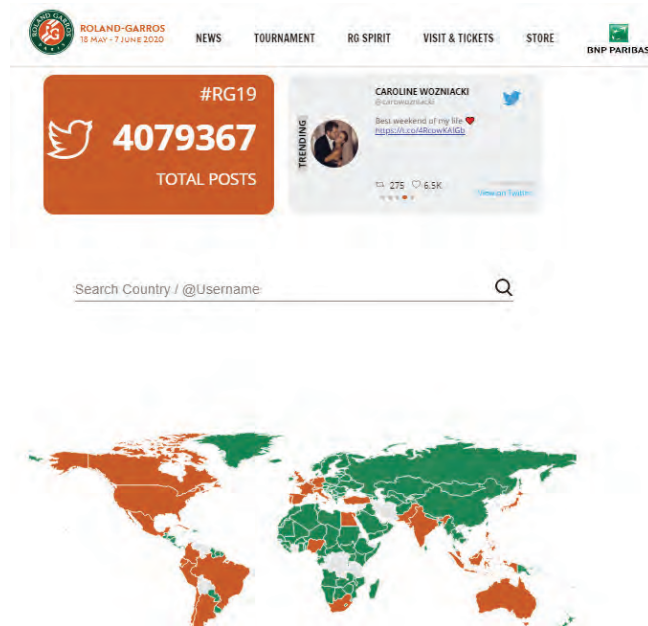
ADDING VIRTUAL REALITY

The experience of attending a Grand Slam event today is exponentially more interactive than a decade ago, and incredibly different from attending an event at the start of the Open Era 50 years ago. Today, fans can try out VR, share their experiences on social media, and understand matches better via apps that deliver insights from statistics and analytics as visuals, and take part in festival-type experiences like concerts and pop-up restaurants.

VR experiences include watching and playing tennis, shopping, and recently, social VR, in which fans use twin VR headsets to communicate with each other and with avatars in a virtual environment. They can also interact virtually with objects: for example, throwing and catching tennis balls. In 2019, 7,000 fans at Roland-Garros experienced what it was like to play, train, and socialize in VR.

VR possibilities are changing quickly, with more immersive experiences available to fans every year. In 2016, Infosys re-created the real spin and speed of the shots, and used the latest in hardware (HTC Vive and Alienware laptops) to make a VR tennis game. The next year, this VR experience was integrated with wearables, which displayed player heart rates along with the heart rate peaks at different times. It also included a VR retail experience in which fans could purchase official tennis merchandise directly from the virtual space. More than 100,000 fans engaged with this VR experience between 2016 and 2019. These innovations were celebrated as "ATP World Tour Finally Giving Fans Immersive Virtual Reality Experiences."²²

Figure 8. Fans share tweets to be featured on Roland-Garros website

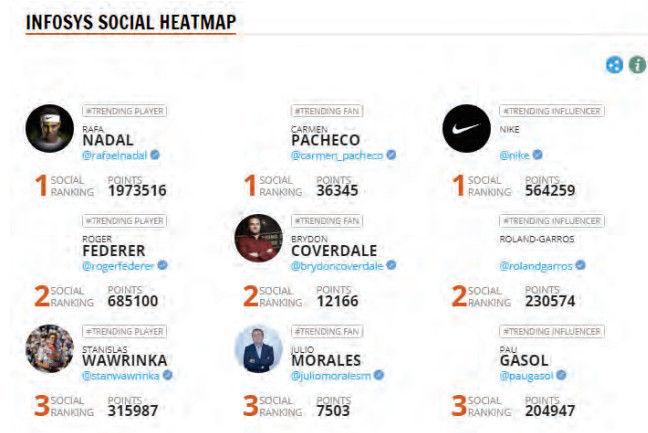


Source: Infosys Social Heatmap

Fans can use social heatmaps (see Figure 8) to feature themselves on the Roland-Garros website by sharing their tweets and appearing on the social leaderboard. Fans can also engage in Twitter battles to influence which athlete wins on social leaderboards (see Figure 9). New social technology also includes the ATP Fan Meter, so fans, the media, and broadcasters can track the loudest moments — providing a unique metric to measure fan engagement with a match.

In 2019, the ATP introduced a mobile app so fans can track matches, watch videos about their favorite players, set up news alerts, and read player bios. These types of technology-based enhancements helped draw fans: “Here in London, people have so many options: tennis, rugby, the theater, the ballet, the opera, or comedy. There’s so much going on, for the Nitto ATP Finals to get the amount of attendance and the viewers and the feedback that we get here, clearly, we’re doing something right,” says Hogg.

Figure 9. Fans battle it out to see which player wins on social leaderboards



Source: Infosys Social Heatmap



FANTASY GAME

powered by Infosys

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TENNIS EVENTS ADD FLAVOR

These digital-based efforts are helping to turn the tide and bring in a younger generation of fans. Guillaume Beroard, Sponsorship Coordinator at the FFT, points out that even though tennis is sometimes thought of as an old person's sport, "In reality, I think it's not true" because of Roland-Garros' success in reaching young people. The challenge in innovating, says Alice Jacques, FFT International Development Project Manager, is "keeping our name and DNA" while still reaching the new generation with new features.

Roland-Garros is moving into fantasy sports and esports to reach young fans — and having great success. The Fantasy Game had nearly 58,000 players in 2019, a 50% increase over 2018. It runs concurrently with the tournament and is available on the digital platforms (on the website and mobile). As in fantasy leagues, participants select a team (four men and four women) and earn points based on the

real results of players in the tournament. Prizes include tickets to the next year's Roland-Garros.

"The most dramatic thing is the shift between mobile and desktop. We have reached more than 80% of users on mobile" for the Fantasy Game 2019, says Florian Le Moigne, Head of Digital at the FFT. "Mobile is key on all digital platforms. We are more and more mobile first oriented."

"Tennis is a sport that is aging; we need to reach younger fans and players," Jacques says. Nearly three years ago, Jacques' team launched the Roland-Garros eSeries by BNP Paribas. 2020 will be the third edition of this tournament, which is played on the video game Tennis World Tour by Big Ben. The game allows players to hit the ball on the digital versions of Roland-Garros main courts. This competition is an opportunity to build the Roland-Garros brand and to develop a fan base of those between the ages of 12 and 25. Jacques describes a study that shows that one third of

Millennials and younger people would like to play sports. For this segment, then, esports is an entry point to target a group that is not easily reached but that holds a lot of opportunity for growth. Jacques' team found that 50% of the 278 participants in the first edition of the RG eSeries by BNP Paribas in 2018 were tennis fans and 50% were gamers — and now the French Tennis Federation is trying to increase the commonalities between the two groups. Jacques sees video games and esports as big opportunities to develop their fan base and reach new audiences.

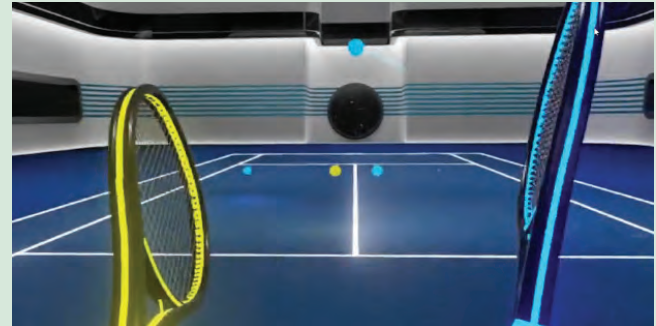
She also notes that except for the final, the eSeries is not held during Roland-Garros, which allows Roland-Garros brand identity to be visible internationally outside of the three weeks of the tournament. However, like in 2018 and 2019, the grand final will be held in Paris during the Parisian Grand Slam.

The Australian Open, in contrast, is hosting a \$500,000 Fortnite tournament this year, one of many examples of the AO pushing the experience component of tennis tournaments to its limits. The unique positioning of the Australian Open has enabled organizers to be bold in experimenting with fan experiences. It was a small Slam for a long time — but no longer. The organizers have built an event with tennis at its core, surrounded by a lot of other forms of entertainment. It is also built around the Australian summer to appeal to a wider set of people.

The Australian Open also has new possibilities for VR-based tennis experiences. For instance, in "Music and Tennis," fans will be able to put on VR gear and hit balls coming at them at record speed, set to the beat of fast-paced music (see Figure 10). Games like this are in keeping with the playful spirit of the Australian Open, as is the VR game "Tennis on the Moon." Fans can travel on hyperloop, "arriving" in full astronaut gear on the moon (see Figure 11). They experience the light gravitational pull from the moon, then enter a chamber with atmospherics re-created to be like the earth, and play tennis. When Infosys designers bring this game to the 2020 Roland-Garros, they will make modifications so that

it "fits the DNA" of the event, including changing the surface of tennis court in the game to clay to simulate the clay courts of Roland-Garros.

Figure 10. Playing tennis to a new beat



Source: Infosys Music and Tennis

Figure 11. Playing tennis out of this world



Source: Infosys Tennis on the Moon

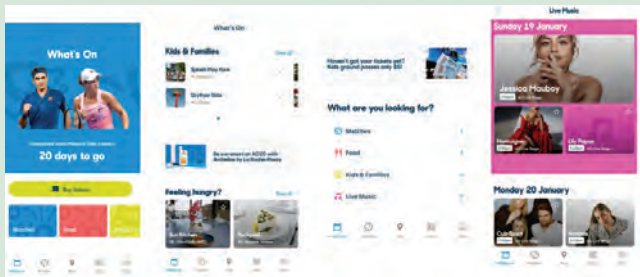
To help consumers navigate all these choices, a new app will guide the estimated 750,000 fans at the Australian Open as they explore the venue and take in all it has to offer. They can select the "What's on" feature to track who's on stage, and then use the guided navigation feature to find their favorite food and beverage, and reach the court of their choice to catch the tennis action. (See Figures 12-14.)

Figure 12. The AO app offers hyper-personalization



Source: Infosys

Figure 13. Fans use the AO app to select activities



Source: Infosys

Figure 14. Fans at the AO navigate to their favorite activities



Source: Infosys

Finn Bradshaw, Head of Digital Strategy, Tennis Australia, describes how they create experiences around three specific types of persona: the passionate tennis fan, the eventist, and families. The passionate fans are people who budget for and buy tickets as soon as they go on sale each year. The eventists are

those who come because they think the Australian Open is a great event. They will watch some tennis, but maybe the music or the food is equally part of their decision to attend. Finally, the options designed for the family consumer are aimed at making sure kids of all ages have activities on offer.

This approach to capturing fans through experience seems to be working. Thousands of young fans come to the Open for two weeks. These fans will have memories of coming to tennis and having a nice time, regardless of whether they watched much tennis. Later on, when they're older, memories of this fun experience might evoke nostalgia, and they might become a tennis fan or pick up a racket.

For these and other "future fans" attending the tournament, the AO digital team creates content for them that will engage them, not necessarily around which players won and lost. Instead, it might be a funny viral moment or an interview with a famous chef who runs a pop-up restaurant at the event. Or it might be about one of the bands that's playing. Some interviewees believe that the future for most major events, and for sports overall, is this convergence not only of viewing habits but of people's desire for experiences. The Australian Open is successfully doing this to reach new patrons.

From the free-spirited Australian Open to the glamorous big-city feel of the US Open, event organizers are experts at staying true to the history and character of the event while meeting demands of today's audiences. Wimbledon has strategically used technology, particularly social media, to reach audiences far afield. It balances WeChat, Snapchat, Facebook, and a new daily live program called "Wimbledon Coffee Morning" to "show its youthful and progressive side" while not losing the traditions of tennis on the green grass of England.^{23,24}

ANALYTICS MEETS EXPERIENCE

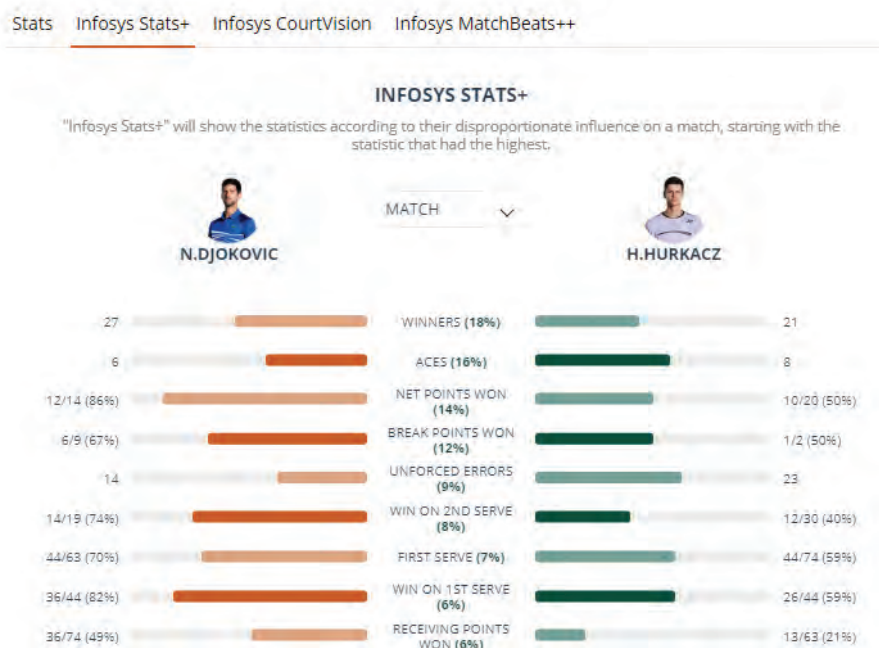
Technology companies, including Infosys, IBM, and SAP, have “totally changed” tennis analytics, as described in a recent article from Arizona State University.²⁵ These companies have brought changes to the way analytics are used not only by players and coaches but also by fans. Analytics, insights, and digital experiences have become an integral part of watching tennis.

For instance, Infosys’ Match Centre application suite integrates four new analytics and visualization products, taking users beyond scores and stats to experience the match as it unfolds. In many of these products, fans can filter by aces, break points, double faults, unforced errors, and rally length, and they can see which points played a pivotal role in the game (see Figure 15.) To keep up with their

favorite players, they can also analyze an individual player’s performance over the course of the tournament, or they can track stats through 3D graphics to visualize every point.

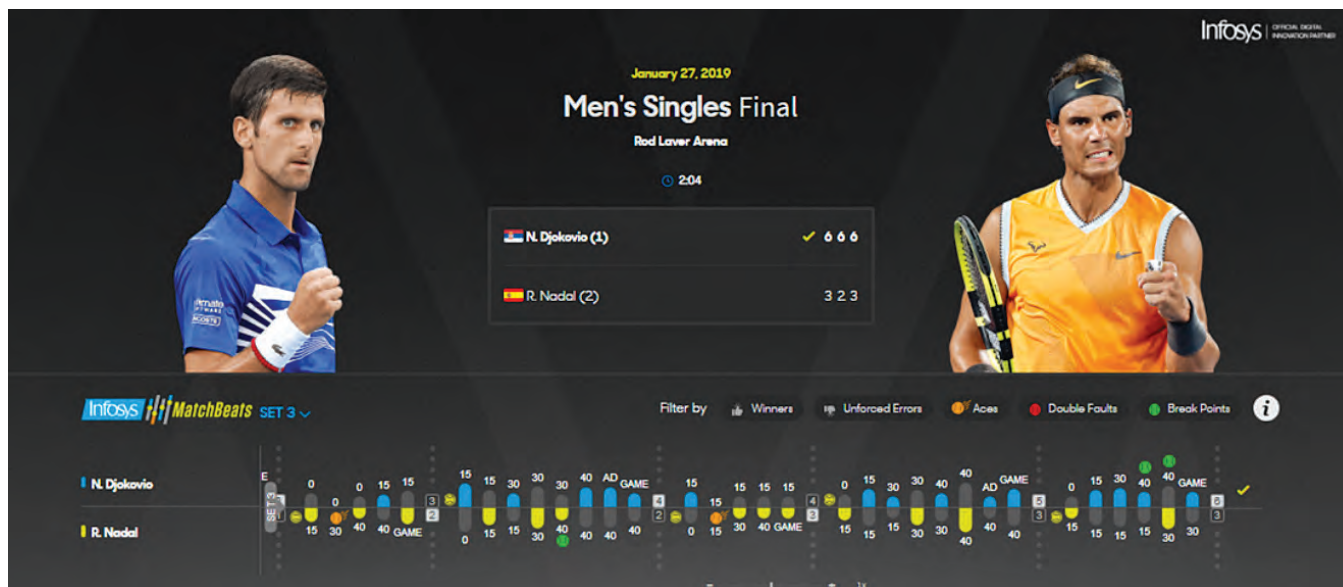
Infosys MatchBeats is a new way for fans to experience the game through live tennis scores. A quick glance and they can tell how the match flowed, where the ups and downs occurred, the increase and decrease in intensities during the match and where players served better, hit winners, committed errors and played long rallies (see Figure 16). This feature helped the AO fans follow every match’s progress in detail by showing them the point-by-point progress of every game, allowing them to filter the match by aces, winners, errors, break-points, and rallies.

Figure 15. With Match Centre, analytics gives fans new way to experience the game



Source: Infosys Stats+

Figure 16. Fans can follow every match's progress



Source: Infosys MatchBeats

Stats and analytics are also used in the world of sports betting, which increases awareness, interest, and knowledge of the game. Johnny Lee Smith, Tennis Manager at 5Dimes Sportsbook and Casino, describes the stereotypical “degenerate gambler” as just that, a stereotype. To the contrary, most of their clientele is “educated, with great incomes” and often become interested in tennis through betting on other sports. “A lot of the guys will come in for every other sport. They’ll bet on baseball, basketball, hockey, and eventually, they try tennis. And they love it. Points are crisply defined, short-interval activities, with information available for updated wagers within the few seconds between the umpire’s notation and the next serve. It is engaging and fun.”

He further explains, “These guys have never bet on tennis in their life, and a Grand Slam comes up, and they’ll say, I don’t know how this works, can you explain it to me? Even

if they’ve never played any tennis in their life, they keep hearing these names — Nadal, Federer, Djokovic, Serena — and they want to learn more.”

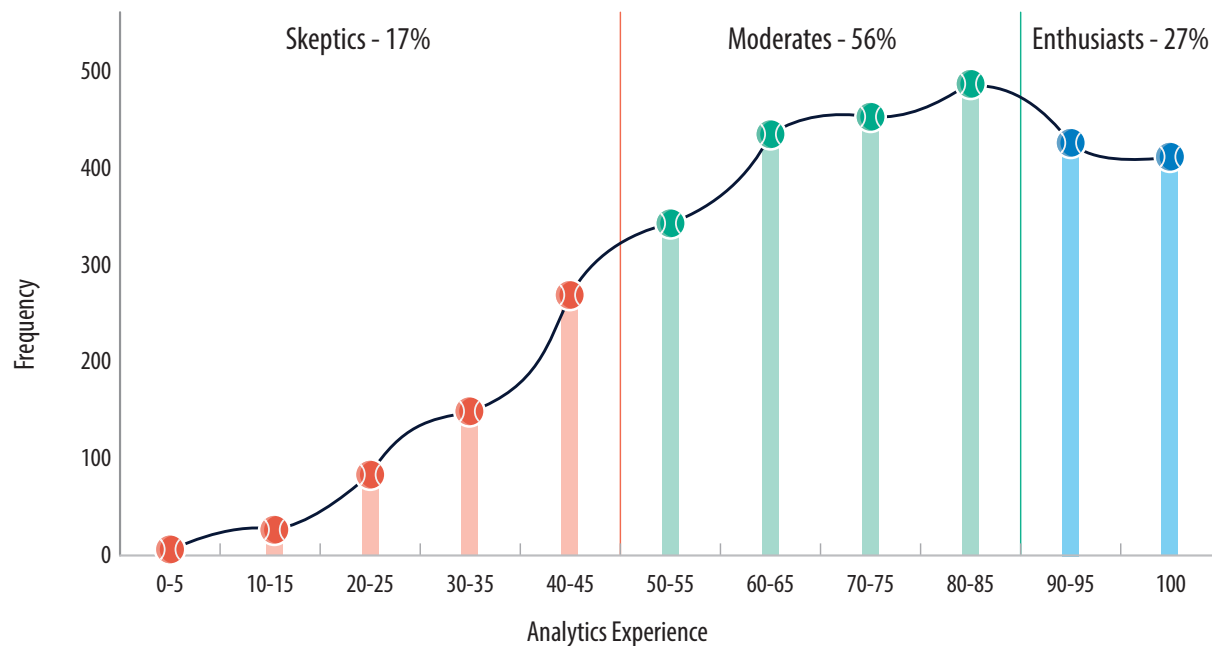
Smith cites that 5Dimes registered an increase in tennis betting of 4.5% for 2018 and 5% for 2019. Sports Business Journal predicted that betting would be an important data-driven trend, with betting companies developing content and focusing on user experiences, like any other company, to reach consumers.²⁶ Technology will also enable betting options to expand to, for example, VR tennis matches. This is more than a revenue source, it helps the governing player bodies help fund player development as well. The ATP has monetized their innovative, near zero-latency platform into a significant revenue source that ultimately funds the increased player financial support that will enable them to stay in the game, prosper, and provide fans a better experience in more tournaments around the world.

ANALYTICS EXPERIENCE INDEX

Analytics and experience are now fundamental to tennis. To better understand how these factors impact fan enjoyment, we asked fans multifaceted questions about match technologies, player statistics, and match statistics. We analyzed and scored their responses from 0 to 100, where a higher score indicates stronger positive feelings about analytics improving the game experience.

We developed this measure into what we have named the Analytics Experience Index. To our knowledge, this is the first index that quantifies how analytics and experience influence fan enjoyment of tennis. We divided fans into three clusters based on their scores: Skeptics (17% of respondents), Moderates (56%), and Enthusiasts (27%). (See Figure 17.)

Figure 17. The Analytics Experience Index assesses fans' enthusiasm toward analytics in tennis



Source: Infosys Knowledge Institute

We chose these labels based on how respondents answered our survey questions.

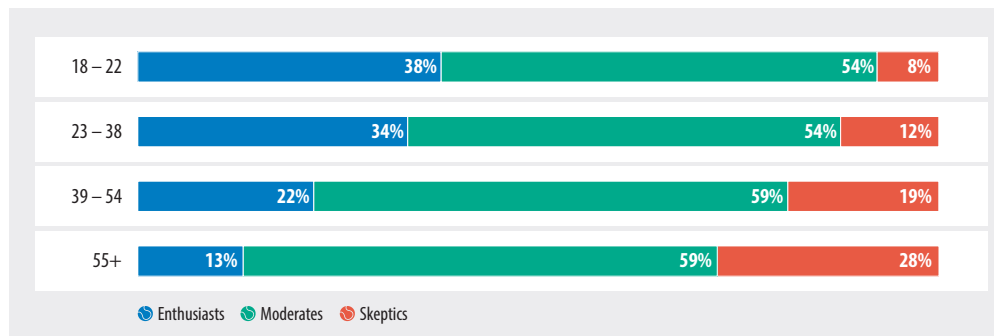
- Skeptics have a less-than-neutral opinion on analytics and analytics technologies, indicating less willingness to adopt new technologies and therefore engage in sports viewing or participation
- Moderates have a slightly positive view of analytics and analytics technologies; are likely to be mildly accepting of new technologies and ideas.
- Enthusiasts are more strongly positive in their attitudes for the questions that comprised the index, indicating high acceptance and enjoyment from analytics and associated technologies.

A higher percentage of younger fans are Enthusiasts (more than one third of Generation Z and Millennials), whereas a higher percentage of those age 55 and older are in the Skeptics cluster (28%). Across the board, slightly more than

half the respondents were in the Moderates category. However, when we look at stronger feelings about analytics at both ends of the spectrum — Enthusiasts and Skeptics — we see generational patterns of attitudes toward analytics and game enjoyment. Approximately one third of both Generation Z and Millennial respondents are enthusiastic about analytics. Further, the Enthusiast percentage steadily decreases by generation. Conversely, the percentage of Skeptics increases by generation — from less than 10% in Generation Z to nearly 30% for ages 55 and older. (See Figure 18.)

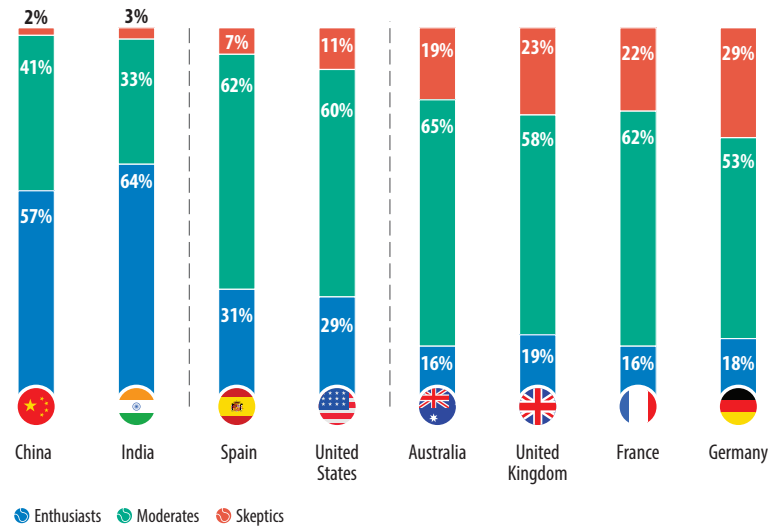
Well over half the respondents in India and China are Enthusiasts, with very low percentages for Skeptics (3% and 2%, respectively). (See Figure 19.) Most European countries cluster together, at about 16% to 19% for Enthusiasts, but Spain is an outlier, at 31%. European countries also have the highest rates of Skeptics, ranging from about 23% to 30%, with Spain again being an outlier, at 7%.

Figure 18. Enthusiast percentage steadily decreases by generation; Skeptics percentage increases



Source: Infosys Knowledge Institute

Figure 19. India and China lead in rates of enthusiasm for analytics



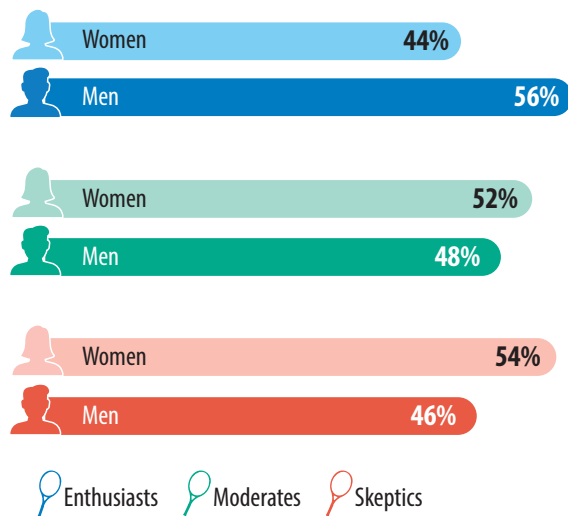
Source: Infosys Knowledge Institute

India and China also had highest rates of Enthusiasts across the board. Enthusiast percentages in India and China are as much as three times that of rates in Europe (excepting Spain) and in Australia. In fact, the percentage of Enthusiasts who were 55 and older in India and China was higher than in any age category in Australia and Germany. Breaking it down even further, the percentage of Enthusiasts who were 55 and older in India alone (51%) was higher than the percentage for any generation in any other country except Gen Z and Millennials in China and Generation X in India.

As shown in Figure 20, Analytics Enthusiasts are also more likely to be men; 44% of women are Enthusiasts, and 56% are men.

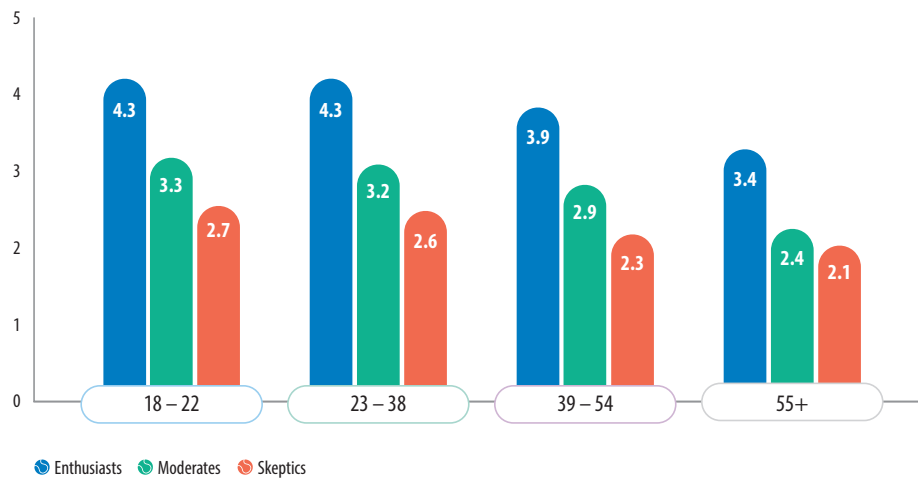
Our survey asked people about the number of gadgets they owned as a proxy for their tech savviness. People who scored highly on the index also tended to have a more diverse set of technological gadgets — wearables (e.g., Fitbit, Apple Watch) smartphones, smart assistant (e.g., Amazon Alexa, Google Home), smart home (e.g., smart lighting, security), AR/VR headsets, gaming consoles, ultra HDTV (4K), and robotic assistants (e.g., vacuum cleaners). (See Figure 21.)

Figure 20. Analytics enthusiasm skews slightly more toward men than women



Source: Infosys Knowledge Institute

Figure 21. Enthusiasts are tech savvy: Number of different gadgets owned

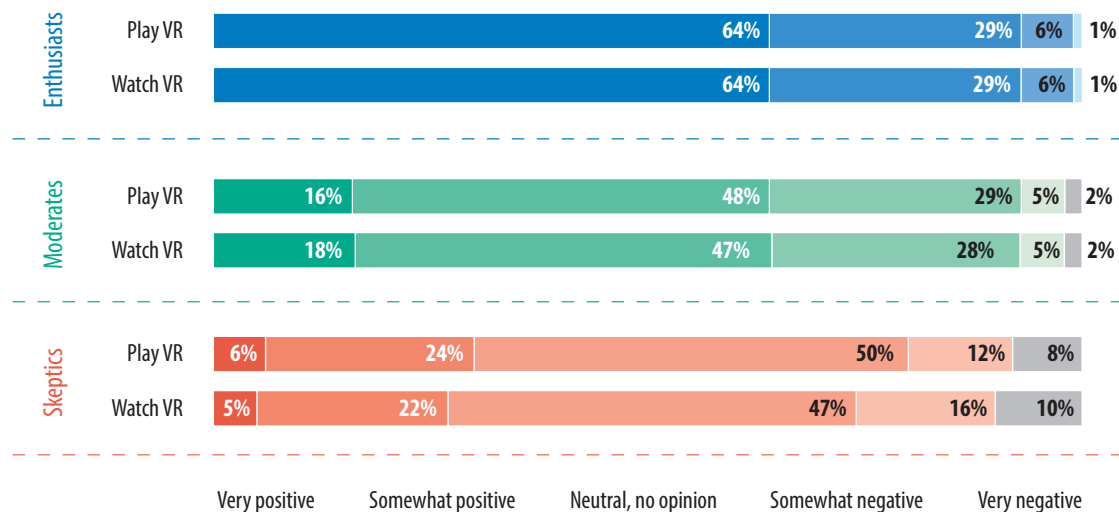


Source: Infosys Knowledge Institute

Over 90% of Enthusiasts reported having a somewhat positive to very positive reaction to products that would enable them to watch or play tennis in VR, as shown in Figure 22. This points to Enthusiasts' general willingness to adopt new technology, such as analytical and sensor-based mixed reality (AR, VR) immersive experiences, including VR Retail, Social VR, AR gaming (a tennis gaming solution ready for IOS devices), and esports.

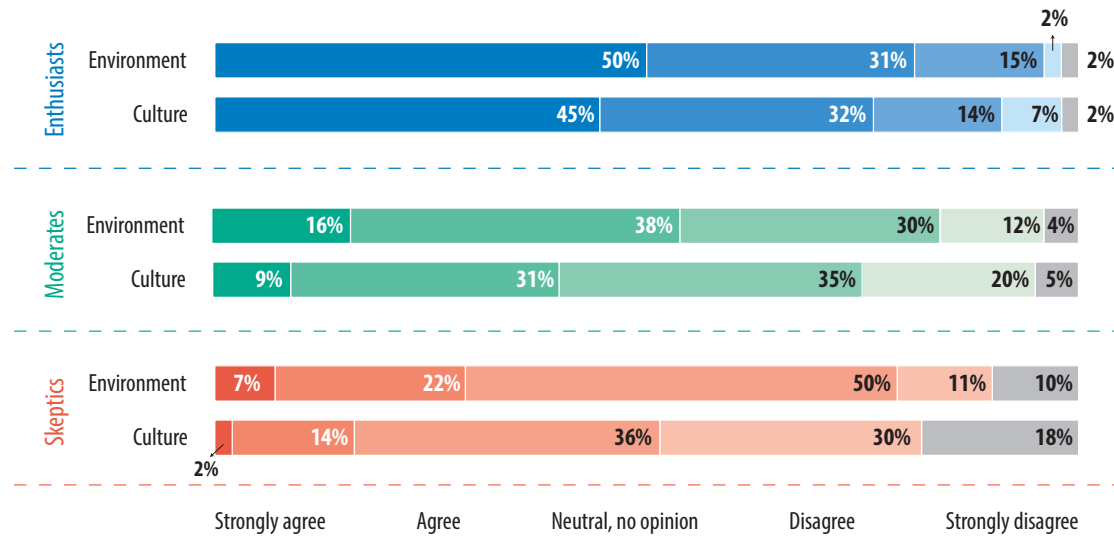
Analytics Enthusiasts were also more attentive to cultural and sustainable aspects of their tennis experience as well, as shown in Figure 23. They prefer to attend events paired with cultural activities (e.g., music, food, or art festivals). They also prefer to attend events that are sustainable. This is consistent with the French Tennis Federation's findings that tennis fans are attentive to current events.

Figure 22. Enthusiasts are more likely to have a strong positive reaction to watching and playing VR tennis



Source: Infosys Knowledge Institute

Figure 23. Analytics Enthusiasts are also enthusiasts about non-tech tournament experiences



Source: Infosys Knowledge Institute

Enthusiasts are more likely to be younger people, to own more gadgets, to prefer stadium or TV viewing equally, to be more open to other viewing preferences like laptops and smartphones, and to have a very positive reaction to watching or playing tennis in VR. See Figure 24 for an overview of cluster categorization by viewing preferences and opinions on watching and playing tennis in VR.

The trends outlined in this section — specifically, that younger generations and people who own many different types of devices are analytics Enthusiasts — illustrate the

ways technology influences how people live and see the world. Technology opens up a realm of new experiences to tennis fans. Older generations had two options for viewing tennis: live or via broadcast. Younger generations have grown up with technology, and it influences what they expect of tennis. Likewise, tech-savvy people have an array of digital experiences at their fingertips — literally. For these people, watching tennis is no longer a discrete activity — it is an experience, a dispersed activity consisting of shareable micro-moments.



Figure 24. Patterns of Enthusiasm

Cluster	Viewing preference	Reaction to watching VR tennis	Reaction to playing VR tennis
Enthusiast	Prefer in-stadium and television viewing equally. Most open to other viewing experiences like laptops and smartphones.	Very positive	Very positive
Moderate	Have a slight preference for TV over in-stadium viewing. Are more open to other viewing experiences than Skeptics but less than Enthusiasts.	Somewhat positive	Somewhat positive
Skeptic	Have a slight preference for TV over in-stadium viewing. Have the most dislike for smartphone viewing.	Neutral, no opinion	Neutral, no opinion

We followed the Pew Research Center methodology in categorizing generations: Generation Z (Gen Z; 22 years old and younger), Millennial (23-38); Generation X (Gen X; 39-54); Baby Boomer (55+).

THE FUTURE OF TENNIS

We conducted this research to better understand the current state of tennis and how technology and advancements in analytics were shaping the sport. In baseball, which has a longer history of using analytics, players and fans have questioned whether data and analytics are ruining the game.^{27,28} Likewise, the recent introduction of video review in football has sparked outrage among fans.²⁹ Although there has been some controversy in tennis over the use of Hawk-Eye, specifically over whether it should be used at Roland-Garros,³⁰ these issues are not as prevalent in tennis.

Our study confirms this: We consistently heard that the biggest threat to the future of tennis was not how technology was changing the game, the delivery, or the fan experience. Instead, the biggest threats revolve around issues of access.

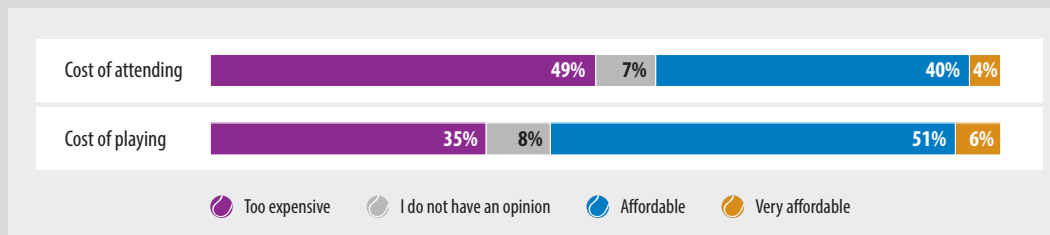
For professional players, traveling to tournaments is expensive, so not everyone has equal access to compete.

There is also unequal access to training, as well as to the technology that feeds statistics and analytics-based coaching.

Many of our interviewees discussed tennis being perceived as expensive to play and watch, and also difficult to play. Our survey backs up perceptions of tennis as being expensive and exclusive. More than one third (35%) of current fans find tennis expensive to play and nearly half (49%) find it expensive to attend (see Figure 25). If current fans find tennis expensive to play and attend, this reinforces expense, and exclusivity, as barriers to reaching new players and fans.

Tennis Industry Association’s de Boer describes the close connection between participation rates and tennis’ visibility — watching on TV, attending a tournament, seeing displays at mass merchants: “People emulate what they see. If you’re not exposed to it, if you don’t see it, you don’t try it.”

Figure 25. Current fans find tennis expensive, presenting a challenge for reaching new audiences



Source: Infosys Knowledge Institute



FANS SEEK STORIES

Star players that resonate with people are crucial to drawing in and keeping fans. People “need to relate to champions,” states Micky Lawler, president of the WTA.

Many of our interviewees mentioned the importance of having homegrown stars to inspire tennis fans and players. “All it takes is one player to come along and become a star,” says an event organizer. They describe that when Djokovic plays events, they notice how much stronger their television viewership is in Serbia.

Serbia’s population is about 7 million — imagine the impact a star player can have on the game in a country with 200 times that population, like India and China. Indeed, several interviewees mentioned the importance of Li Na in increasing popularity of tennis in China. Duan Shaowu, owner of TT. Tennis, explains: “As we see more and more professional Chinese players winning medals at the international tournaments, like Li Na did, when we see the rising of the flag of our country, we are very excited. We are proud to be a part of the Chinese tennis industry.” He also emphasizes that behind Li Na were a large group of people who were working in and contributing to the tennis industry in China. These role models have now helped spur

the next phase of tennis in China: growing popularity in the general public.

We heard this again and again: “That’s the only way to grow a sport in a country. If you have a champion from that country, then it will grow. You can bring a hundred tournaments there, and if people don’t know tennis well and they don’t have a star, they’re not going to go watch tennis,” says coach and commentator Patrick Mouratoglou.

Michael Tonge, Director of Hospitality, Sponsoring, and Ticketing, Roland-Garros: “The impact of having a homegrown talent progress in any sporting tournament is enormous and this ‘local hero’ effect has a very positive impact at a club level by generating more interest in tennis across France; it increases interest, interaction, and engagement across digital platforms; and it drives TV audiences due to the success of a homegrown, national icon. Nevertheless, France has Roland-Garros, a unique Grand Slam being the only one played on clay, which tests players like no other surface. The strength of the tournament and this brand is established on a global scale, and with or without the ‘local hero’ effect, attendance numbers, TV audiences, and digital platform audiences continue to grow, year on year.”

Ankita on Indian players: "Sania, Leander, Mahesh, and Rohan have not only inspired children but have also given them hopes of becoming world competitors." People see themselves in these tennis stars, or they want to. There is an element of national pride, and they identify with them because they share a national identity. They can read their stories as a nation.

Today's core tennis audience segment came of age when giants of the court were John McEnroe, Jimmy Connors, and Bjorn Borg. As Mouratoglou starkly describes it, the majority of tennis fans came of age watching these greats: "We were lucky to have had McEnroe and Connors, and those who brought so many people to tennis who have stayed in tennis. But if tennis were to start now, I tell you, we would be in trouble already."

Mouratoglou explains, "People watch sports for the same reason they watch a movie ... they want to feel emotions. So how can we give more emotions to the people and especially to people who are not tennis fans? They turn on the TV to tennis, and the show they see today is not a show. It's people hitting a ball, turning their back, maybe for a towel, choosing three balls, throwing back one and serving again and again. That's it. You don't get people emotionally involved when you have two robots playing on a tennis court. Our sport is complex. Unless you're a real tennis addict, that's the only thing you see, with a complicated way to count, like 15 or 30 and 40, and complicated rules. This is why I advocate for on-court coaching and a much lighter code of conduct as I believe it could partially solve those issues. We have to create a space where the players can express their emotions and show their personalities and passion. I am convinced that this would bring our sport to the next level."

It's a game that takes a long time to play, that is rigidly structured, and has a scoring system that is not intuitive. Star power is particularly important, and today's stars are interesting people. However, the current state of tennis makes it difficult for that charisma and human element to

be visible and reach fans, especially the vast majority not attending the event. To become engaged, fans need to get caught up in the story they are watching unfold on the tennis court.

By expressing his emotions, McEnroe challenged the status quo of tennis, and he challenged the long history of European elitism and polite society. As described by a Washington Post writer in 1979, "Scoffed one appalled gentleman after encountering a sticky-fingered McEnroe in the players' tearoom: 'The boy wonder is ... eating the traditional strawberries and cream without benefit of the traditional spoon.'"³¹

He drew people to the sport. He generated controversy. Some people tuned in for that, and for the great athleticism. Through the "superbrat's" explosions at polite society, he mirrored the turmoil of the times — the punk movement of the late 1970s and early 1980s in Britain and the U.S. and its ethos of social class warfare, the miners' strike in Britain in the mid-'80s, the U.S. recession of the '80s, and the loss of manufacturing jobs.

"I saw myself as part of punk," said McEnroe.³² His fans did, too — at least some of them — and the story of social class struggle they saw playing out on the court resonated with them. It was exciting, and they were rooting for him. Or they were rooting against him, shocked or dismayed at his lack of decorum as he shook up tennis.

Similarly in current times, Serena Williams pushed the boundaries of on-the-court conventions when she wore a black Nike catsuit on the court. She called it her "Wakanda-inspired catsuit" and her post on Instagram dedicated it to "all the moms out there who had a tough recovery from pregnancy." She said, "It feels like this suit represents all the women that have been through a lot to have confidence and to believe in themselves." When she was barred from wearing the suit, anyone who identified with Williams's story, including working mothers, had the opportunity to think to themselves, "I see myself in Serena's place, and tennis is not for me."



A NEW AUDIENCE FOR A NEW ERA

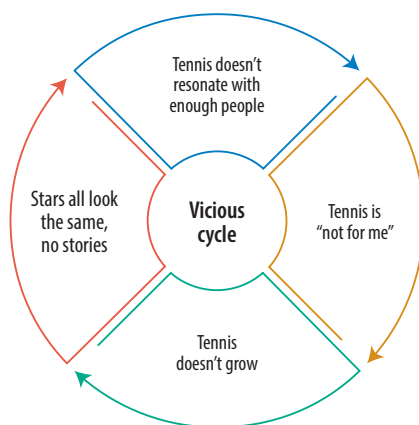
Tennis has tremendous opportunities to reach new audiences if the stars resonate with them, if they can see their own stories playing out on the court and having what they perceive as a positive outcome — David beats Goliath, outsider beats the establishment, women overcome the challenges of re-entering the workforce.

For every fan and player, there are millions more who will never watch or play tennis because they think it is, as our interviewees said, “not cool,” “an old person’s sport,” “exclusive,” “a country club sport,” “difficult to play,” and “difficult to learn.”

For these people, the inaccessibility of tennis becomes a vicious cycle (see Figure 26), and tennis doesn’t resonate. The experience of watching it doesn’t resonate, and they can’t see themselves playing.

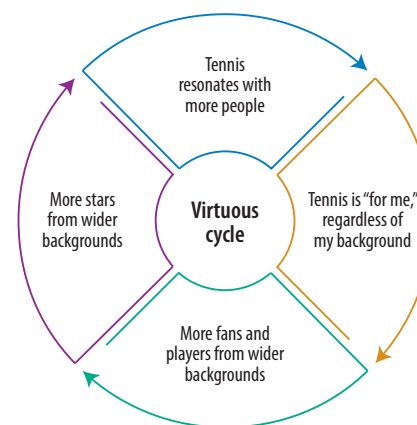
However, this cycle can reverse course, from exclusion to inclusion, when opportunities to increase access are seized upon, building momentum — and technology is a positive factor that feeds the cycle at each entrance point. (See Figure 27.)

Figure 26. The vicious cycle of exclusion



Source: Infosys Knowledge Institute

Figure 27. The virtuous cycle of inclusion



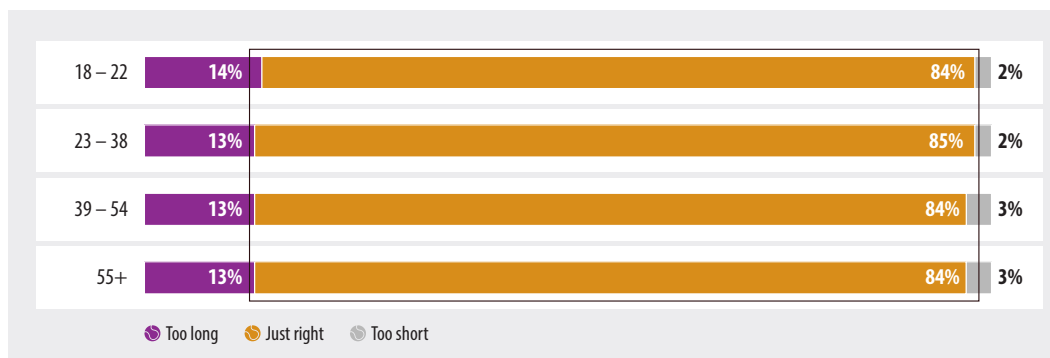
Source: Infosys Knowledge Institute

Increasing access to tennis is key to this virtuous cycle, making the game more diverse. Getting more fans who want to see players who look like them is what brings drama to the court and exploits “ideological opportunity.”³³ In other words, tennis has incredible opportunities to propel this cycle forward.

This virtuous cycle helps form a cultural strategy³⁴ in which fans identify with stars who look like them and have compelling stories. They can read their own stories into tennis and connect with tennis’s “deep historical and cultural undercurrents.”³⁵

Finally, despite the common conception that younger generations don’t have the attention spans to watch tennis, which many of our interviewees echoed as well, 84% of respondents in our survey found that match length is just right. Generation Z (84%) and Millennial (85%) fans scored nearly the same as Generation X and Baby Boomers (84%), as shown in Figure 28. In other words, tennis appeals to people of all ages, everywhere, it just needs to reach and retain them.

Figure 28. Majority of fans think match lengths are appropriate, regardless of age



Source: Infosys Knowledge Institute



TECH'S ROLE IN TENNIS'S NEXT BIG ERA

We asked the question, How can tennis, with its rich tradition, continue to stay relevant and be even more successful in a rapidly evolving world shaped by consumer experience and driven by technology?

Our research found that tennis can thrive in the future by increasing access to the game and by using technology to

1. Experiment at every level
2. Democratize data and analytics
3. Focus on the social element
4. Protect the human element

1. EXPERIMENT AT EVERY LEVEL

Challenges to access exist at every level — event organizer, player, coach, broadcaster, fan. At each of these levels, we saw innovations and experiments that increase access to the game. Experimentation is important to reach the next generation of fans.



Source: Infosys Virtual Reality

The Davis Cup, the Laver Cup, and as of 2020 the ATP Cup are experimenting with adding a team and coaching element to tournaments to try to reach new audiences and bring drama to the court. Brad Gilbert says that at the Laver Cup, when fans see the greats coach each other, they get to see a side of tennis they've never seen before. "I thought the access was great. I think that's something at ESPN that we've wanted to see for a while, because tennis is an individual sport so players are guarded." Likewise, the NextGen ATP Finals has innovated on and off the court, with player coaching at certain points in the match, video review, and free movement in and out of the stadium for fans.

Jason Goodall says, "Be innovative, try something new." He describes that "since the dawn of television," tennis is always viewed from camera one, high above the court, with the lower third of the screen being used for basic statistics. He questions why it is still the same. "Why have we not been able to find a better way of showcasing this sport? Use different camera angles, try a lower camera angle, get closer to the eye level of the players. Experiment. My message is to be open minded and try something new. There's so much data available now, so let's find a better way of incorporating that to enhance the experience for the fans."

Tennis is also experimenting with gamification to reach new fans, including VR and augmented reality (AR) games. For instance, fans at the Australian Open can play against the greatest tennis players in the world using Virtual Reality (VR) and Augmented Reality (AR) technology — in a simulation of Rod Laver Arena, the Australian Open's center court.

Similarly, because of successful experimentation in digital, Roland-Garros' social media reach went from 1 million to 4 million, and the live stream went from 62,000 views to 73,000 views. Their plans for the next year are to involve pros from esports within the Roland-Garros eSeries, to tighten the link between Roland-Garros and the people really involved in esports — especially those who have their own social networks.

Roland-Garros leaders had a note of caution about engaging in the right ways with esports: Engagement goes both ways. These are very engaged communities, as are Millennial fans, and if an esports star participates in, say, a Roland-Garros tournament that seems to be inconsistent with that star's profile and interests, fans will immediately disengage.

2. DEMOCRATIZE DATA AND ANALYTICS

Analytics delivered as experiences to fans, players, coaches, and the media (see Figure 29) bring a new understanding to the game and help new fans access the game — it can show fans a side of the game they don't know. Technology-driven game enhancements show the most resonance and growth potential in India and China and for the next generation.

Figure 29. Analytics delivered as insights bring a new understanding to the game



Source: Infosys Knowledge Institute

Tech and analytics bring an element of the live experience to fans not attending in person—it is a wholly new, not replicated, experience for them. Infosys tennis platform leaders developed their analytics using open-source software as a way to demonstrate a commitment to open

and democratic data-sharing. As the technology advances, this will enable more data-sharing and lead users to create additional compelling analytics. Those analytics will then spawn even more new experiences to attract and engage fans.

On the player and coaching side, it is important, and difficult, to access stats and analytics for coaching at most levels. As one interviewee says, “How do you add analytics to that next tier of events, the next 100 top players in the world? Those guys are good too, and they win events, yet lack the resources of the elite players.” The ATP is addressing this by continuing to invest in their platform and making performance data available, in better formats, to the touring pros. While not the same as having a \$100,000 a year statistician on call, it is another step to the democratization of data, and improving the tennis product.

The right data and technology exist to democratize analytics. Tennis is waiting for its own version of the “dividends of the smartphone wars,”³⁶ that is, when general tech proliferation drives down the cost of sophisticated data analytics to be made available to all.

In the meantime, entrepreneurial coaches and strategists like Damien Spizzo are finding their own workarounds, through apps and video. “For the teaching pros, at the end of the day, if you’ve been out there for eight hours and then you’ve got to sit in front of a computer and manually enter all the notes, it’s hard. As we move forward with technology, we need the tennis industry to also move forward.”

This is indeed beginning to happen, with programs like Players and Coaches Portal, which opens the door to data for more people.

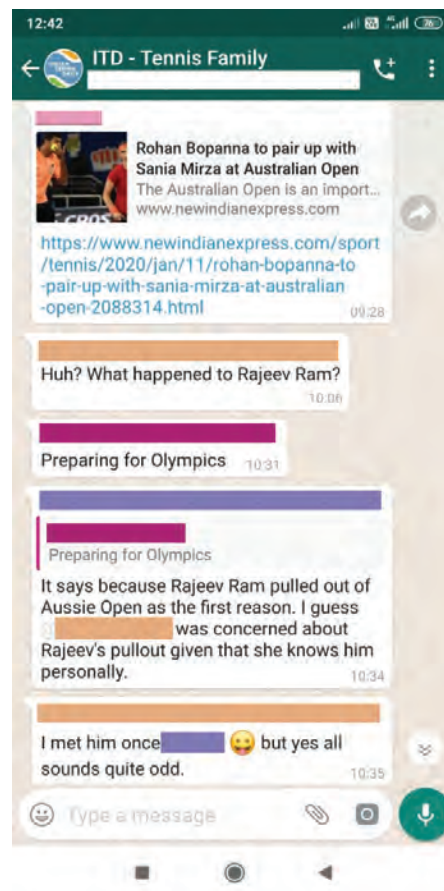
3. FOCUS ON THE SOCIAL ELEMENT

Our interviewees consistently emphasized the social aspects of the game and the promise of social technologies to connect people to the game and to each other. For tennis to grow, de Boer says, “It’s not that you need to know how to have that perfect stroke. That’s what our research is showing that people want. They want social. They want fun. We have to make it easy, social, and fun.”

And yet, the social part of tennis largely remains untapped. The methods of engagement with fans are largely limited to groups within existing social media sites. Smaller, selective groups exist, but the open, digital social world should connect tennis stakeholders so they can communicate, learn, and debate. For instance, one WhatsApp group of 250 global tennis fans operates like a formal entity, electing admins who serve specified terms, limiting the number of members to 250, and having no public-facing conversations (see Figure 30). The group includes weekly games for its members, with a year-end tournament, and the group interfaces with TennisDrawChallenge.com, an online tennis fantasy site.

Murray notes that it is usually the social aspect that keeps most people involved in tennis: “It’s about developing a workforce of pied pipers who make tennis fun and doable and who create a sense of belonging to a squad, a team, or a club. Fun, friends, and fitness are the three things that attract people into an activity and it’s the same three things that retain them.”

Figure 30. Social media groups increase engagement with tennis



Source: India Tennis Daily group. Used with permission of group.

4. PROTECT THE HUMAN ELEMENT

The paradox of technology in tennis is that while it allows the game to reach more people, media delivery at scale often obscures the nature of the sport — its elegance, beauty, and brutality. Instead, it is seen as “genteel” and “austere,” according to our interviewees. As Michael Tonge describes, “Clay court is a living, breathing, changing surface, which is a unique factor and which plays a crucial role in the theatre of our matches, where players battle for hours, one against one in the magnificent arena that is Roland-Garros.”

Technology can help bring these human elements back to the game by showing the human side of the sport and by getting more diverse groups involved. At the visible top end of the sport, the live action can be enhanced by allowing more expressive behavior while still observing some decorum — a little ‘bad boy’ behavior without the cringe factor. This mirrors life and increases entertainment without impacting the game. Looking at other sports like football, a major part of the experience is witnessing a raucous partisan crowd supporting certain teams or players.

Talent Pipeline

While Judy Murray is best known for her role in developing her Grand-Slam-winning sons Andy and Jamie, she is perhaps most proud of her role as tennis ambassador in her home country of Scotland and beyond. The Judy Murray Foundation is “quite small and basically a van full of equipment” that takes tennis into rural and disadvantaged areas of Scotland. Murray and team then stay in an area for three years, teaching locals how to deliver starter coaching and fun competitions in whatever spaces they have available. “We go back, and we keep going back, and we build a workforce in the local community and help them to create a development plan,” Murray explains. She helps spread the word that tennis doesn’t have to cost anything and that “it is absolutely the best family sport,” because it works for all ages, stages, and genders.

She is just as proud of the program’s “massive social impact”: “Sports can change lives, and our sport happens to be tennis. We are giving people opportunities to train for possible careers or part-time roles that they may not have otherwise had the chance to do, because we offer everything we do for free.”

Similarly, Jamie Capel-Davies, Head of Science and Technical Unit, ITF, describes the ITF’s efforts to develop the game by building a base of players globally so there is a continuous supply of talented individuals, of all genders, from various backgrounds, from various nations who are coming through and providing variety and diversity in the sport. In the process, they will create a stronger sport, “not reliant on a particular type of pathway or one or two nations.”

These programs are having an impact. As ITF’s Miguel Crespo describes, “Some of the players who started in the school tennis program have ended up playing for their national team, so that for us is great. Or cultures that started in our basic level program, and then eventually ended up being Davis Cup size.” When we talked to Crespo, he rattled off a list of ITF successes in many countries, like coach education in Cuba and Sri Lanka, and school tennis in Guatemala.

Crespo also emphasizes the importance of recreational tennis — the 87 million people who are not the superstars but who benefit from tennis. “We are absolutely, truly passionate about tennis at all levels of the game for everyone — all genders, playing standards, and physical abilities. Research has shown that tennis is one of the best sports for health.”

The TIA has worked with its industry partners in support of United States Tennis Association’s (USTA’s) mission to increase participation, showing people that it does not have to be expensive or exclusive. Executive Director Jolyn de Boer describes one of the industry-wide campaigns called “Try Tennis for Free,” where people could get an hour lesson just to try it out, followed by a six-week program “Play Tennis Fast” to get them to keep going: “Try, learn, play. Get

play. Get people to experience it.” USTA’s Net Generation has also worked to adopt rules, courts, equipment (red, orange, green balls) to better match youth — as other sports have done. She further describes, “We have to lower the barriers and perception that ‘it’s a country club sport’ or ‘it’s too hard to learn’ or ‘I don’t have the equipment,’ all those other misconceptions. How do we make it more accessible and how do we keep people engaged?”

The USTA has also made significant investment in players through its National Campus in Lake Nona, Florida, near Orlando. Many of the 100 courts use PlaySight or other instrumentation for immediate performance feedback. Players also can hone their performance for clay, hard, and acrylic courts. Lake Nona is emblematic of USTA player development efforts and its commitment to creating a robust talent pipeline.

China understands the calculus of supporting its players. Cui Wei, Associate Editor-in-Chief for Tennis World Magazine, the magazine of the China Tennis Association, describes China’s support of players. “We have a strong sports administration who is keen” to grow tennis and support players, he says. He also says, to relieve the players’ financial burden and encourage them to realize their maximum potential, Chinese players receive salaries and bonuses for wins, and the China tennis national team at the Grand Slams is large, with many coaches, many players and some officials. Now, he says, with the rising middle class, the paths for training professional tennis players have become more diversified. Some families pay for coaching, court fees, and international training for their children to play tennis. The tennis industry is growing in China, including growth of new tennis organizations and clubs. These clubs are on the lookout to sign young players and help pave their ways to the championship. One rising star is 18-year-old Wang Xiyu, winner of Girls’ Singles title at US Open 2018 and one of the Chinese up-and-comers; she has signed a contract with a tennis club in Beijing and has an IMG agent.

How can technology assist these efforts? de Boer suggests that social technologies can help tennis grow, including at the club level, mentioning apps like Foundation Tennis’s

PlayTennisConnect, Kourts, and several others, in which users can schedule courts, invite others to play, one-tap “I’m in,” and customize it. Similarly, Tennis Australia implemented the Book a Court and the FFT launched Ten’Up. People can reserve courts, find a club or competition, watch instructional videos, track match statistics, and connect with other people to play with.

Leadership

Murray also discusses the need for more women in leadership positions in tennis. She points out that if you look at the number of women playing tennis, the sport may appear equal, but if you look a little harder at gender equality in tennis further down the pyramid, “you will find that tennis is still, like many sports, dominated by men. The key decision makers are men.” So that means that anything happening in tennis is “looked at from the perspective of a man, and my feeling is that the governing bodies should include a female-focused development strand that is led by women, because women understand much better how to create environments in which women and girls can thrive within the game.” She says, “The women’s tour is dominated by male coaches.” Murray continues, “We need to have more female coaches, who understand the world according to girls and understand the importance of adapting your content, communication, and equipment to fit your audience. We lose many teenagers from sport through the high school years, where emotions and bodies are changing so much, and my argument is that if there were more female PE teacher/sports coach influence, we would retain more. If we don’t, we are going to continue to lose teen girls from all sports.

This problem mirrors what many businesses experience, especially the high-tech industry. However, tennis as a sport has separate men’s and women’s governing bodies, which further complicates the leadership pipeline. Each governing body, not just the WTA, can proactively promote women for leadership roles as they become available.^{37, 38}

In the next era, increasing access means that people see themselves in tennis players, coaches, and leaders.



TECH SHOWS THE WAY

Today's world demands that tennis keep up, and it is. Its big investment in cutting-edge digital technologies is paying off. Backing up some of our interviewees' statements about the impact of digital on reaching younger audiences, a recent study reported in *Sports Business Journal* found that the average age of women's tennis fans has gone down. The decrease was small — from 58 to 55 — but this incremental step is a good sign.

Technology is helping increase access to tennis and changing who plays tennis, how they play it, and how it is consumed. Tennis organizations and grassroots programs

are increasing access to the game for anyone, everywhere, across the globe.

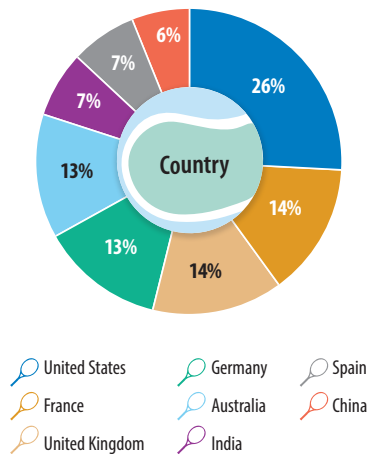
"Tennis is an amazing sport because it connects the world. I think that there's no other sport that has that kind of a diversity and that kind of reach," says one of our interviewees.

In fact, technology is as essential to this aspect of the game as it is to all other aspects. As summarized by Judy Murray, "So yes, technology. It's a huge part of young people's lives, so we must keep up with it, embrace it, and use it to help us showcase and teach our sport."

RESEARCH METHODOLOGY

In October 2019, the Infosys Knowledge Institute conducted an anonymous online survey of 3,085 tennis fans from eight countries — Australia, China, France, Germany, India, Spain, the United Kingdom, and the United States. (See Figures 31a-31c.) To enrich insights, we also conducted phone interviews with more than 30 stakeholders representing player, coach, event organizer, club owner, equipment manufacturer, media, and broadcaster perspectives.

Figure 31a. Survey responses by country



Source: Infosys Knowledge Institute

Figure 31b. Survey responses by age

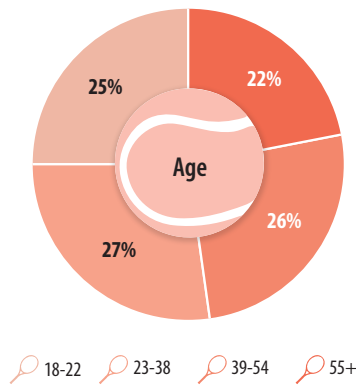
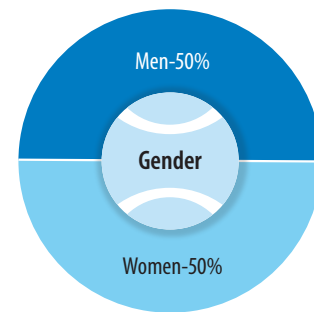


Figure 31c. Survey responses by gender



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