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Emerging Technology in Sports
Reimagining the fan experience

Spotlight on Germany

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Research objectives, scope, and methodology
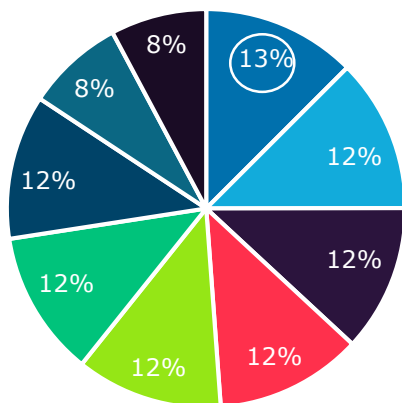
Research objectives

- Analyze fans' use and perception of emerging technologies inside and outside the stadium

- Assess fans' satisfaction levels with their overall experience and especially with technologies

- Ascertain emerging technologies' benefits to fans, players and sports organizations, e.g.:
  - Fan engagement
  - Increased spend on merchandise or subscriptions

- Identify consumer pain points (digital and overall) when it comes to viewing/ consuming experiences, both inside and outside the stadium

- Explore how sports organizations can leverage cutting-edge technologies to remain relevant and ensure growth
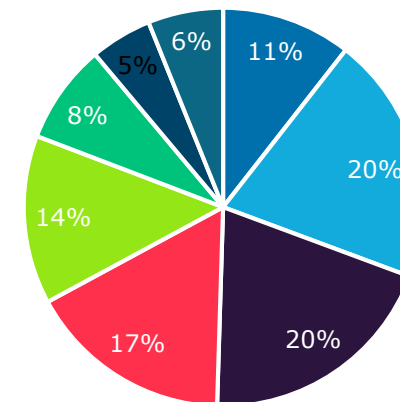
Research Methodology

We surveyed over 10,000 fans who regularly watch and follow top sports globally. We also interviewed over 20 athletes, coaches, experts from sports organizations and tech in sport startups.

Fans by country

- Germany 13%
- France 12%
- United States 12%
- United Kingdom 12%
- Canada 12%
- Australia 12%
- India 12%
- Singapore 8%
- Hong Kong 8%

Fans by income

- Less than $20,000 11%
- $20,000–$39,999 20%
- $40,000–$59,999 20%
- $60,000–$79,999 17%
- $80,000–$99,999 14%
- $100,000–$119,999 8%
- $120,000–$139,999 5%
- $140,000 or more 6%

Fans by type of residence

- Urban 52%
- Suburban 35%
- Rural 13%
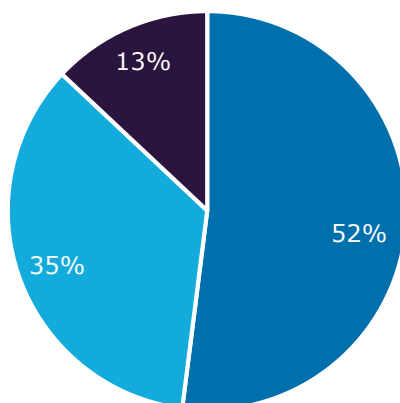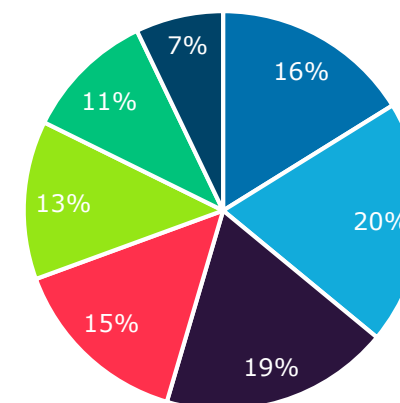
Fans by age

- 18–27 years 16%
- 28–35 years 20%
- 36–43 years 19%
- 44–51 years 15%
- 52–60 years 13%
- 61–70 years 11%
- Above 70 years 7%

Tech is a key part of how fans consume sports, inside and outside the stadium

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More than 60% of fans in Germany agree that the use of emerging technologies has enhanced their viewing experience both inside and outside the stadium

Emerging technologies have enhanced the fan experience across countries

Share of fans who feel that the use of emerging technologies in sports has enhanced their overall viewing experience

India	Singapore	Canada	United States	Australia	Hong Kong	Germany	France	United Kingdom	Average
89%	75%	70%	68%	68%	66%	66%	62%	59%	69%
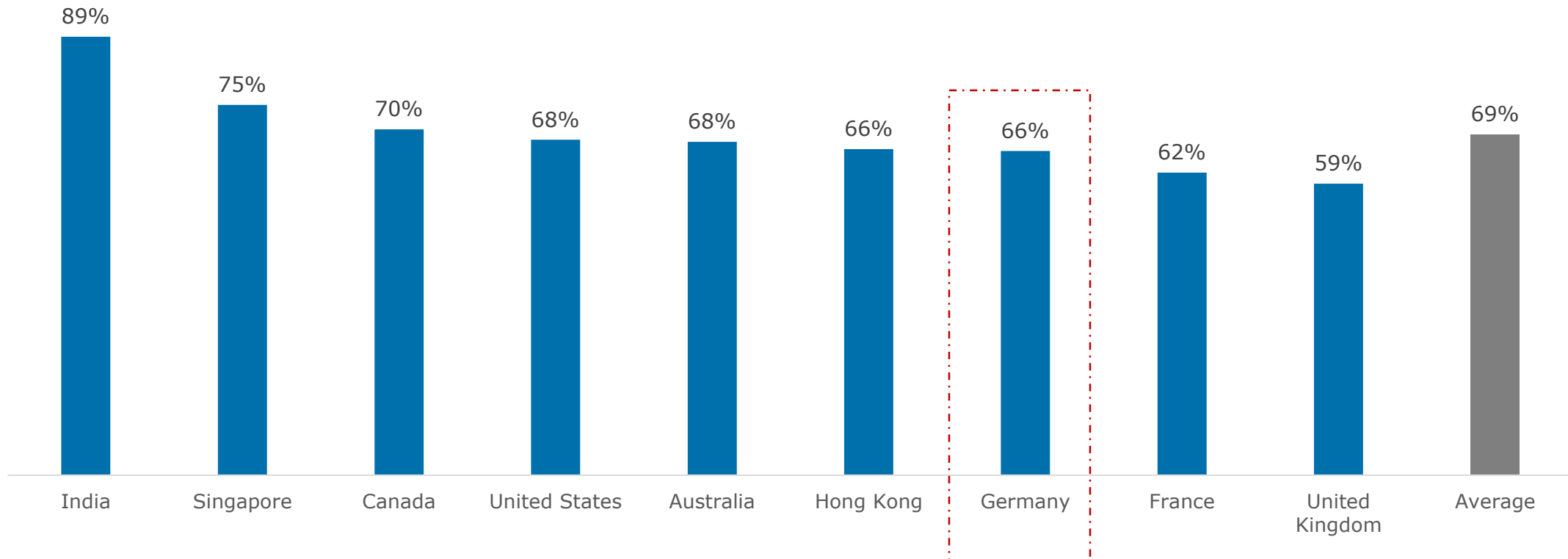
Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.

Most common **in-stadium** experience for fans in Germany is accessing player information, insights and live stats by pointing at players during a match

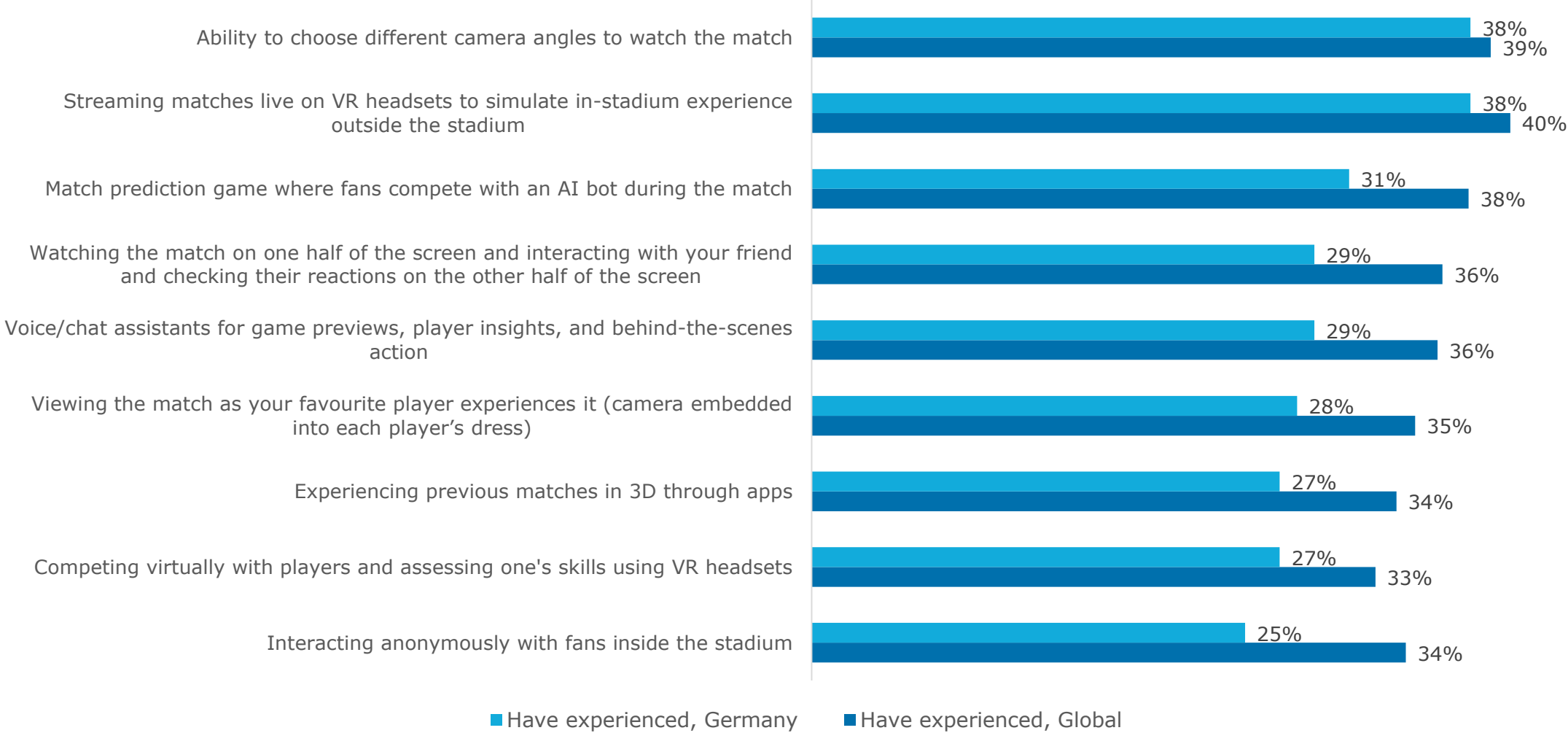| Experience	Have experienced, Germany	Have experienced, Global
Player information and insights, live stats by pointing at players during a match	46%	47%
Regular match updates on mobile app while watching the match live (notification for offside for football, no ball for cricket, goal for hockey, specific fun facts – 1,000th touchdown/ball/goal/run)	44%	50%
Wearable devices like hand bands which act as an electronic ticket for access to the event	43%	47%
Use biometrics (fingerprint/face recognition) to enter the stadium instead of paper or mobile ticket	43%	46%
Access to high-speed Wi-Fi to share updates on social media	39%	48%
Order food and beverages online and get them delivered at your seat	39%	48%
Identify enthusiastic fans and show them on big screens in stadiums by using sensors or in-app interaction levels	38%	43%
Wearable devices like hand bands to pay for concessions	36%	41%
Smart wearables to feel the simulated sensation of on-field action (e.g. interception, touchdown or fumble during a football game), to offer player perspective video feeds	35%	39%
Host mini-matches on the actual field/court with friends or other attendees during half-time using augmented reality software on phone	35%	38%

■ Have experienced, Germany   ■ Have experienced, Global

In Germany, the most common experience that fans have had with technology **outside the stadium** is the ability to choose different angles to watch the match

Experience	Have experienced, Germany	Have experienced, Global
Ability to choose different camera angles to watch the match	38%	39%
Streaming matches live on VR headsets to simulate in-stadium experience outside the stadium	38%	40%
Match prediction game where fans compete with an AI bot during the match	31%	38%
Watching the match on one half of the screen and interacting with your friend and checking their reactions on the other half of the screen	29%	36%
Voice/chat assistants for game previews, player insights, and behind-the-scenes action	29%	36%
Viewing the match as your favourite player experiences it (camera embedded into each player's dress)	28%	35%
Experiencing previous matches in 3D through apps	27%	34%
Competing virtually with players and assessing one's skills using VR headsets	27%	33%
Interacting anonymously with fans inside the stadium	25%	34%

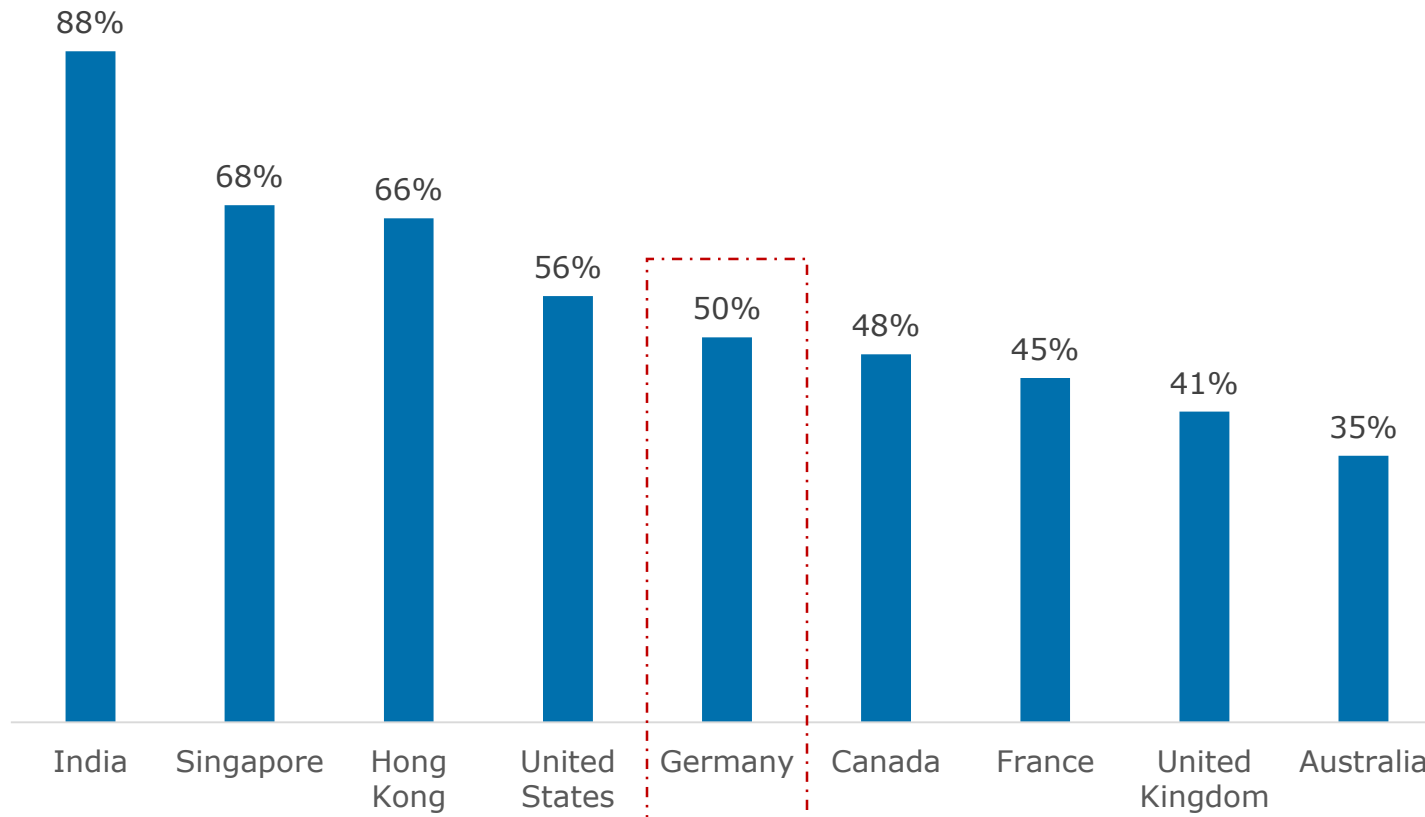■ Have experienced, Germany   ■ Have experienced, Global

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany.

Asian fans are much ahead in adoption and acceptance of the use of technology in sports as compared to fans in Germany

Fans from Asia are much more likely to have experienced emerging technology in the stadium

Share of fans who have experienced emerging technology during their recent visit to the stadium, by country

Bar chart values:
- India: 88%
- Singapore: 68%
- Hong Kong: 66%
- United States: 56%
- Germany: 50%
- Canada: 48%
- France: 45%
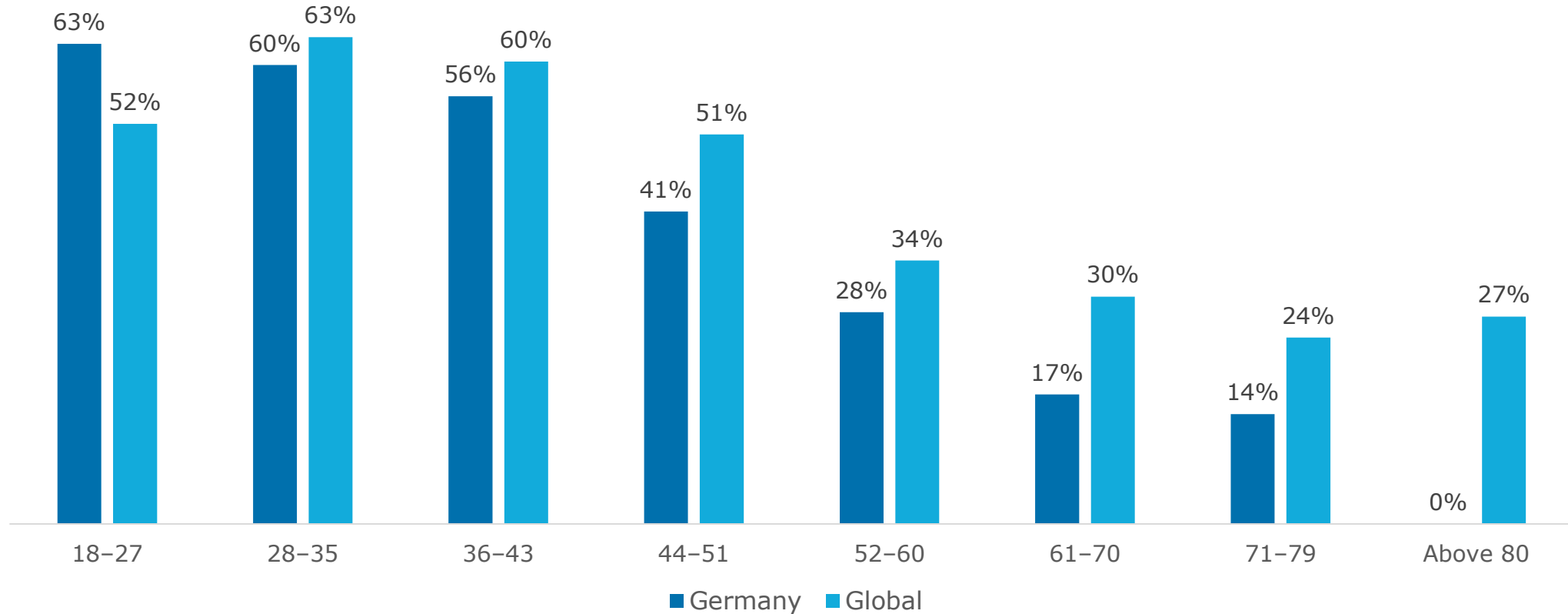- United Kingdom: 41%
- Australia: 35%

- *80% Asians prefer to watch sports over digital devices (such as smart TVs and laptops), compared to just 60% of European fans.*

- *Over three-quarters fans from Asia (78%) feel that the use of various technologies in sports has enhanced their overall viewing experience (compared to 66% of North American fans and 62% of European fans).*

- *71% Asians would be willing to pay more if new technologies enhanced their stadium experience, as compared to 40% of North American fans, 34% of European fans, and 33% of Australian fans.*

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 868 fans from Germany who have experienced emerging technologies in the stadium.

Globally and in Germany, younger fans visit the stadium more often…

Share of fans who visit the stadium often

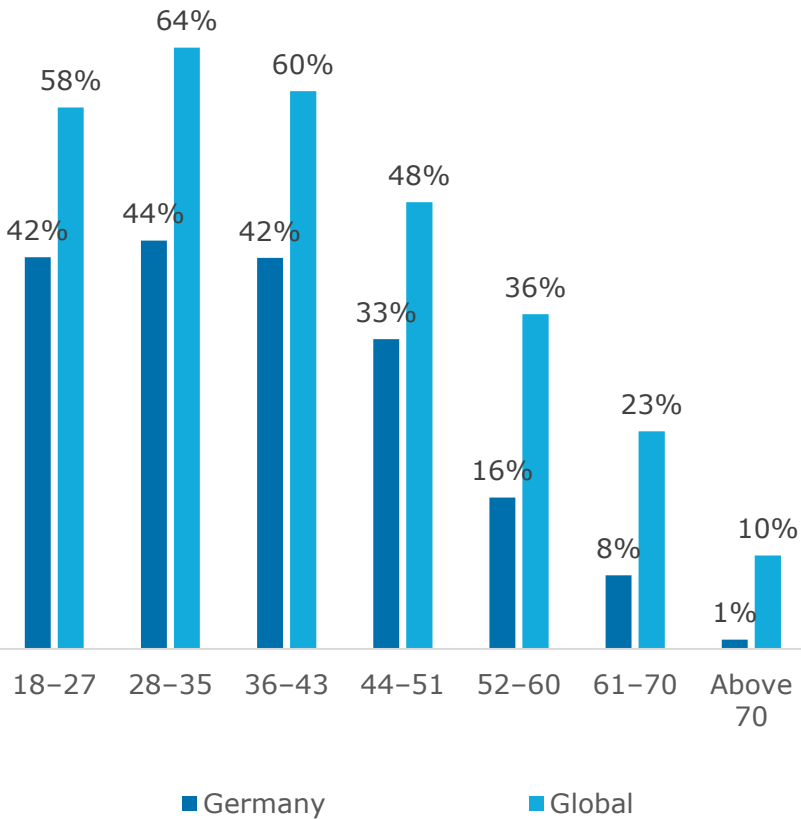| Age group	Germany	Global
18–27	63%	52%
28–35	60%	63%
36–43	56%	60%
44–51	41%	51%
52–60	28%	34%
61–70	17%	30%
71–79	14%	24%
Above 80	0%	27%

■ Germany ■ Global

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.
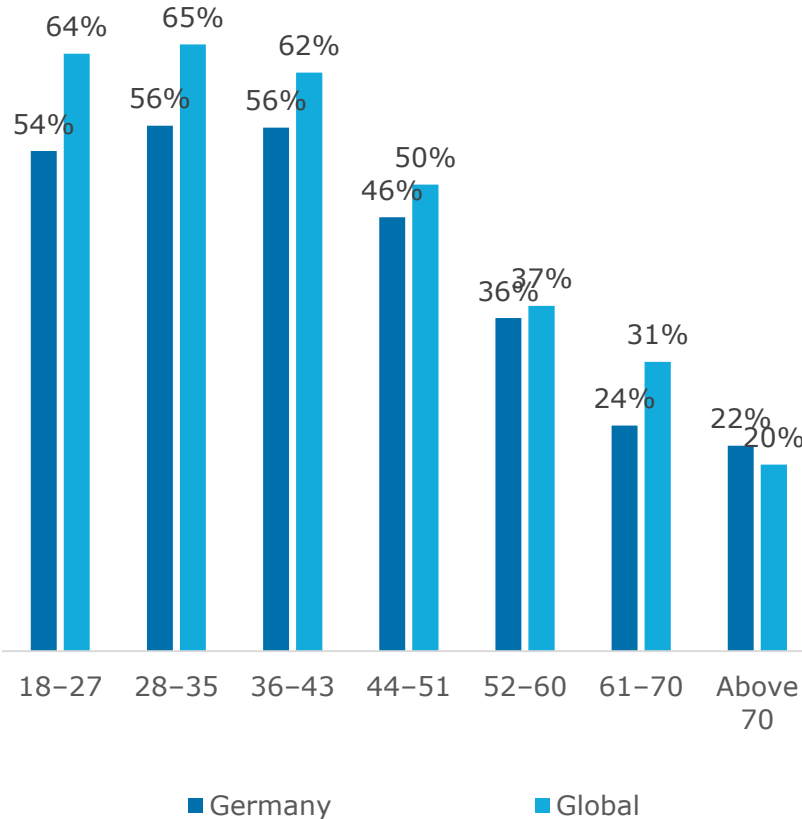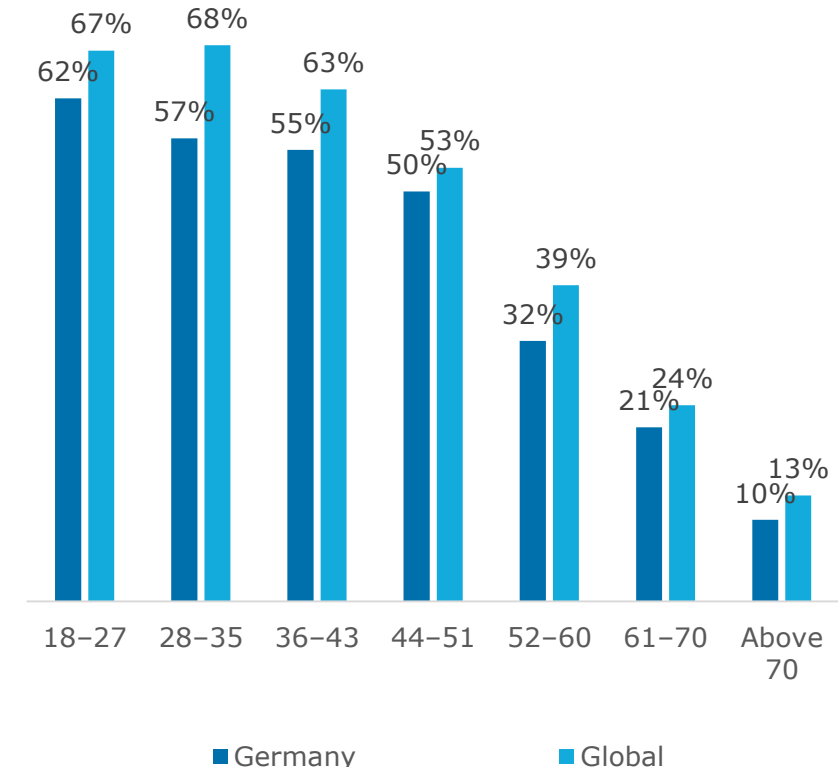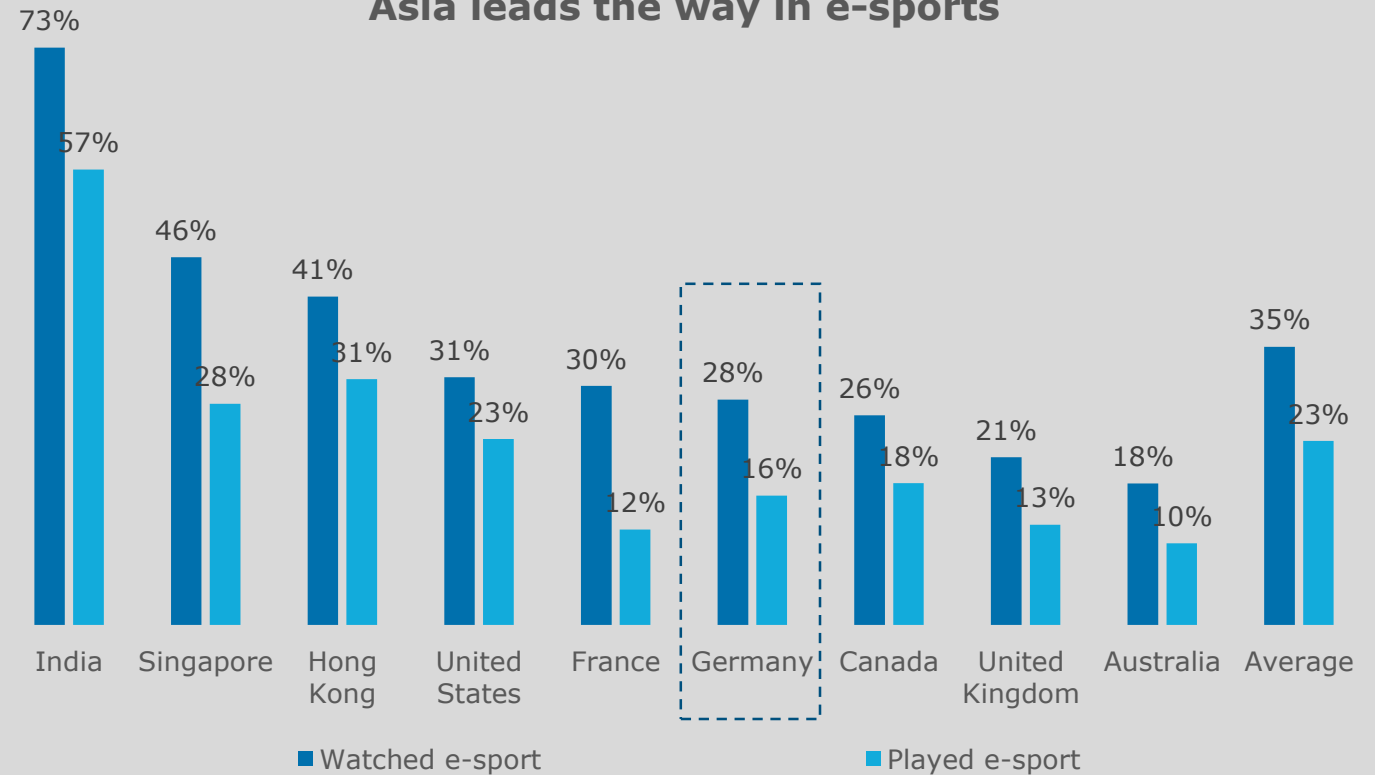
… and use smart devices extensively to watch sports

Share of fans consuming sports content on over-the-top streaming platforms

- 18–27: Germany 42%, Global 58%
- 28–35: Germany 44%, Global 64%
- 36–43: Germany 42%, Global 60%
- 44–51: Germany 33%, Global 48%
- 52–60: Germany 16%, Global 36%
- 61–70: Germany 8%, Global 23%
- Above 70: Germany 1%, Global 10%

■ Germany ■ Global

Share of fans consuming sports content on mobile apps by sports bodies/third parties/ pay TV providers

- 18–27: Germany 54%, Global 64%
- 28–35: Germany 56%, Global 65%
- 36–43: Germany 56%, Global 62%
- 44–51: Germany 46%, Global 50%
- 52–60: Germany 36%, Global 37%
- 61–70: Germany 24%, Global 31%
- Above 70: Germany 22%, Global 20%

■ Germany ■ Global

Share of fans consuming sports content on social media

- 18–27: Germany 62%, Global 67%
- 28–35: Germany 57%, Global 68%
- 36–43: Germany 55%, Global 63%
- 44–51: Germany 50%, Global 53%
- 52–60: Germany 32%, Global 39%
- 61–70: Germany 21%, Global 24%
- Above 70: Germany 10%, Global 13%

■ Germany ■ Global

On average, only 34% of sports fan have watched an e-sport, and 23% have played one

Asia leads the way in e-sports

- *The share of fans who have watch e-sports increases to 53% amongst the younger fans aged 18-35 years, and decreases drastically to 11% for fans above the age of 50*

  - *Out of the ones who watch, 73% of them watch it on video streaming platforms like Twitch, YouTube, ESPN, Mixer*

- *Younger fans feel the impact of e-sports on traditional sports more strongly than the older fans*
  - *Nearly 50% of younger fans below the age of 35 feel that e-sports has increased their engagement with traditional sports. This average falls to 19% for fans above the age of 35*

Country	Watched e-sport	Played e-sport
India	73%	57%
Singapore	46%	28%
Hong Kong	41%	31%
United States	31%	23%
France	30%	12%
Germany	28%	16%
Canada	26%	18%
United Kingdom	21%	13%
Australia	18%	10%
Average	35%	23%

■ Watched e-sport   ■ Played e-sport

- *E-sports is a way of allowing more people to be involved in a sport because traditional sport, especially something like Rugby Sevens, is limited on certain physical factors. So e-sports take that barrier to entry out and you are allowing people who otherwise wouldn't be involved in sports to be involved. However, with the rise of e-sports, the question of what values are there beyond winning and losing would also arise. And there is also the threat that young people will pull people away from traditional sports." - Tom Mitchell, Team Captain, England Sevens.*

- *"There would be crossover between e-sports and traditional sports. One of the biggest things about team sport is group cohesion, group dynamic, and the ability to work well together under pressure in different environments. With e-sports, you could put a team in an e-sports environment, where they can try and hone their ability to work together as a unit and be tested in a pressurized environment." - Ben Gollings, Team Coach, England Rugby Sevens.*

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.

Effective use of emerging technology in sports represents a significant brand value and growth opportunity

Fans in Germany are watching more number of matches thanks to increased usage of tech

"On having a good experience with technology in sports inside and outside the stadium, I have…"

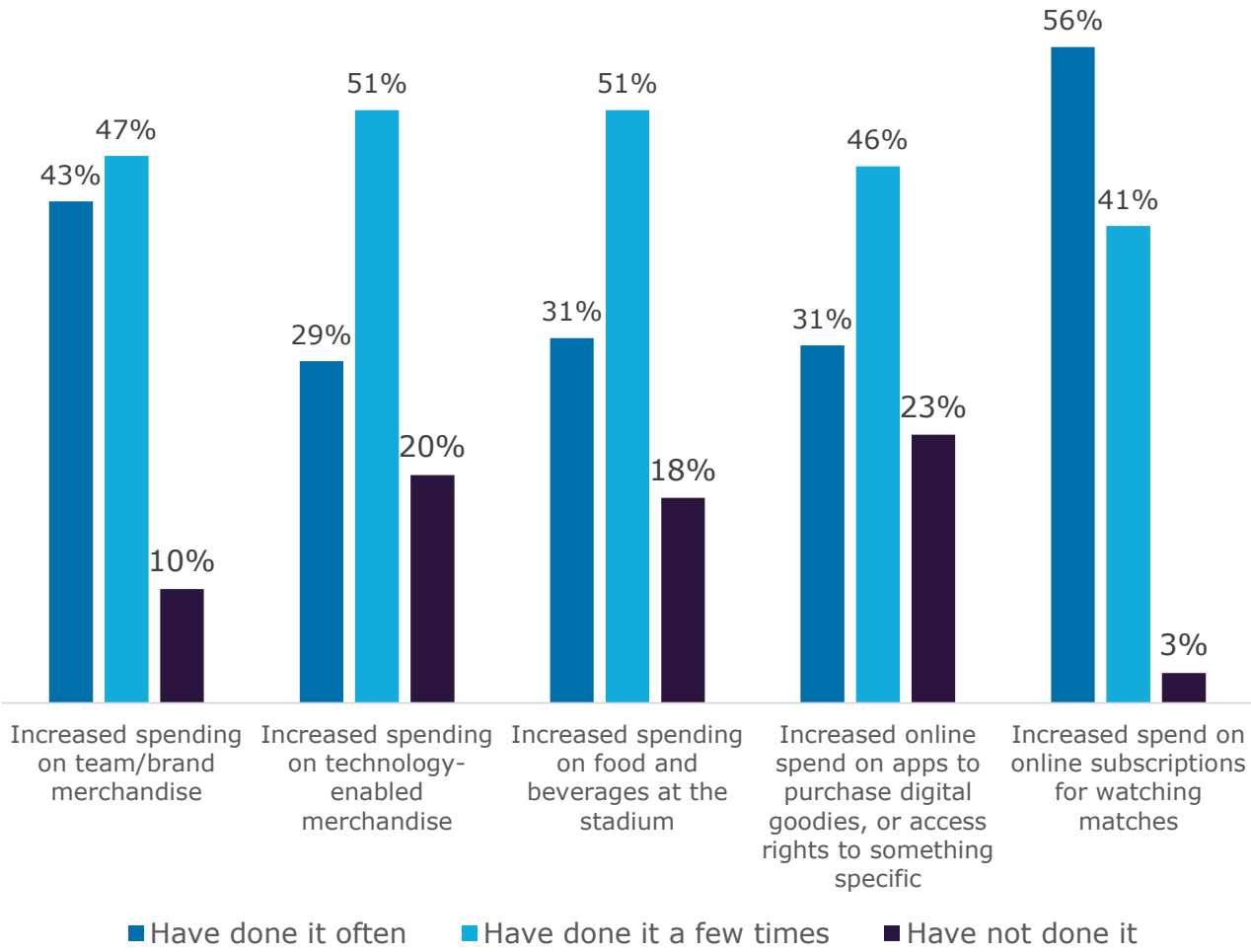| Statement	Germany	Global
Increased the number of matches I watch on traditional TV channels	60%	66%
Increased the teams/players updates I follow on websites and social media	55%	60%
Increased the number of matches I attend in a stadium for the sports that I usually follow	55%	56%
Increased the number of matches I stream online	52%	60%
Increased use of sports apps created by different sports organizations	48%	53%
Encouraged my friends/family to attend more matches in the stadium	47%	54%
Share the in-stadium positive experience in social media	47%	51%
Increased my interaction with other sports fans	46%	53%
Started going for matches in a stadium for the sports that I don't follow	44%	47%
Tried additional technologies/demos at the stadium	42%	45%

■ Germany ■ Global

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.
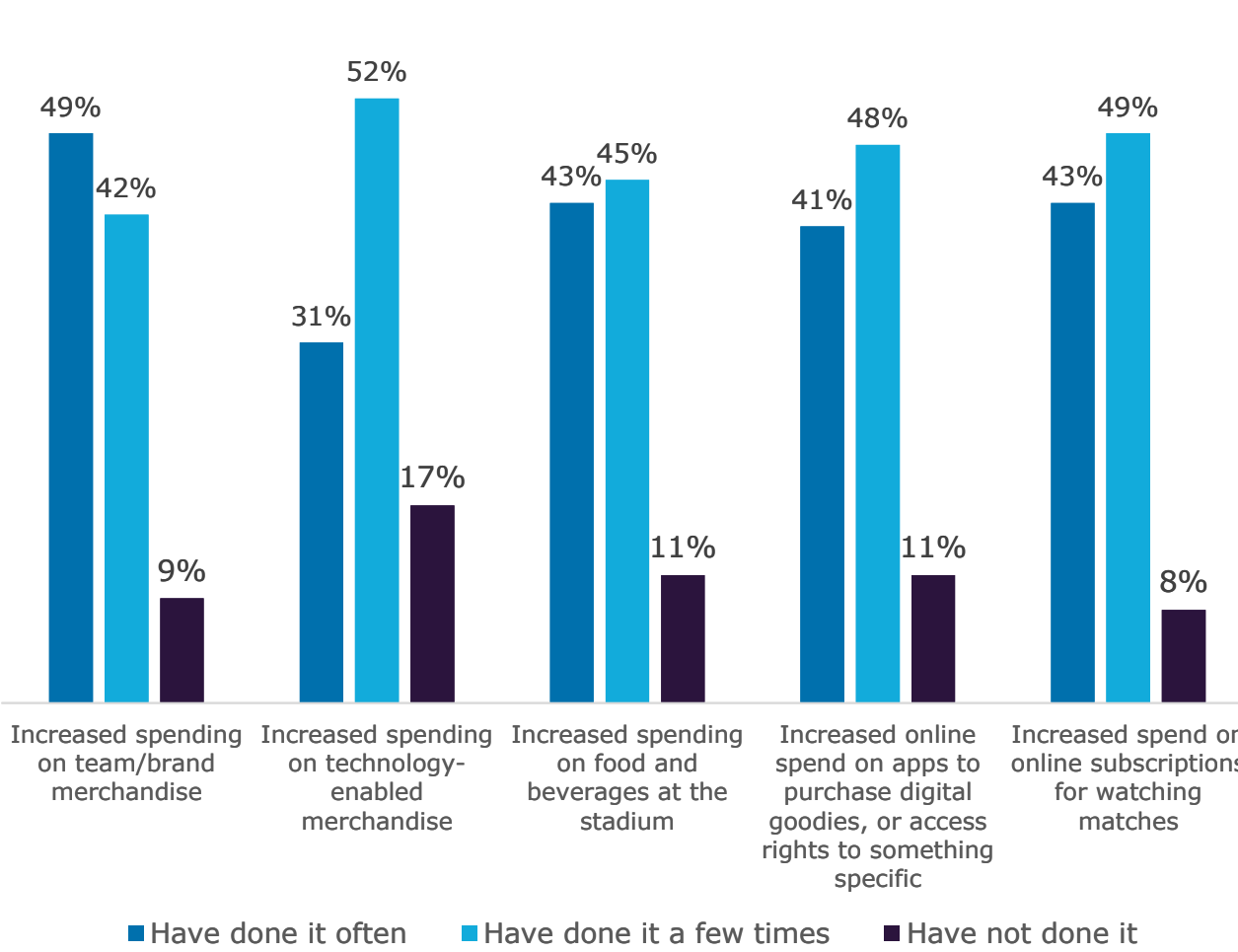
Increased use of technology has led fans globally and in Germany to often increase their spending inside and outside the stadium

"On having a good tech-enabled experienced I have..."
Germany

"On having a good tech-enabled experienced I have..."
Global

Germany:
- Increased spending on team/brand merchandise: 43%, 47%, 10%
- Increased spending on technology-enabled merchandise: 29%, 51%, 20%
- Increased spending on food and beverages at the stadium: 31%, 51%, 18%
- Increased online spend on apps to purchase digital goodies, or access rights to something specific: 31%, 46%, 23%
- Increased spend on online subscriptions for watching matches: 56%, 41%, 3%

Global:
- Increased spending on team/brand merchandise: 49%, 42%, 9%
- Increased spending on technology-enabled merchandise: 31%, 52%, 17%
- Increased spending on food and beverages at the stadium: 43%, 45%, 11%
- Increased online spend on apps to purchase digital goodies, or access rights to something specific: 41%, 48%, 11%
- Increased spend on online subscriptions for watching matches: 43%, 49%, 8%

■ Have done it often ■ Have done it a few times ■ Have not done it

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.

Emerging technologies help in player performance analyses and player safety (1/2)

"In athletics, the use of tech has been very useful. Earlier, a coach would tell you what you were supposed to do on the basis of your age or ability. Through the use of tech, a system can run advanced tests, analyze, and share increasingly accurate outputs about what you can and cannot do. Athletes can trust this more because this is more factual."
Amanda Ouedraogo, athlete

"The use of virtual reality in reviewing training sessions and matches can have a big impact on sports. At the moment, we use a very simple video analysis. However, if you can put yourself in a given situation instead of just reviewing a match by watching a video, then the learning and reviewing experience becomes much more real. If you are able to be in that situation again, either through VR or another technology, it would be a massive step up in terms of the reviewing and learning experience."
Tom Mitchell, team captain, England Rugby Sevens

"With performance capture technology, I was able to work more independently without relying too much on my coach, especially when it came to accuracy. I was able to use gather feedback on my accuracy for every single shot through the data provided by the system."
Jasmine Yeong-Nathan, former national ten-pin bowler, Singapore

"Technologies such as VR/AR should help athletes train in game conditions. The focus shouldn't only be on sight sense but also on touch (gripping the ball), sound (atmosphere in the stadium) and smell (humidity, grass, etc.) sense."
Jonathan Laugel, Rugby Sevens athlete, France

"I think the biggest thing that has massively progressed in the women's game over the last probably five to six years is the GPS. Being able to track a player just gives you a real insight into your training intensities and whether you are able to sustain certain training levels as high as you would need in a match. Previously, I remember my stats would come to me in a bit of paper, where somebody had just watched the game and written tallies down next to what I had done involvement wise. But, you could never measure distance or speed or impacts and it is those factors that tell the story for you in terms of performance."
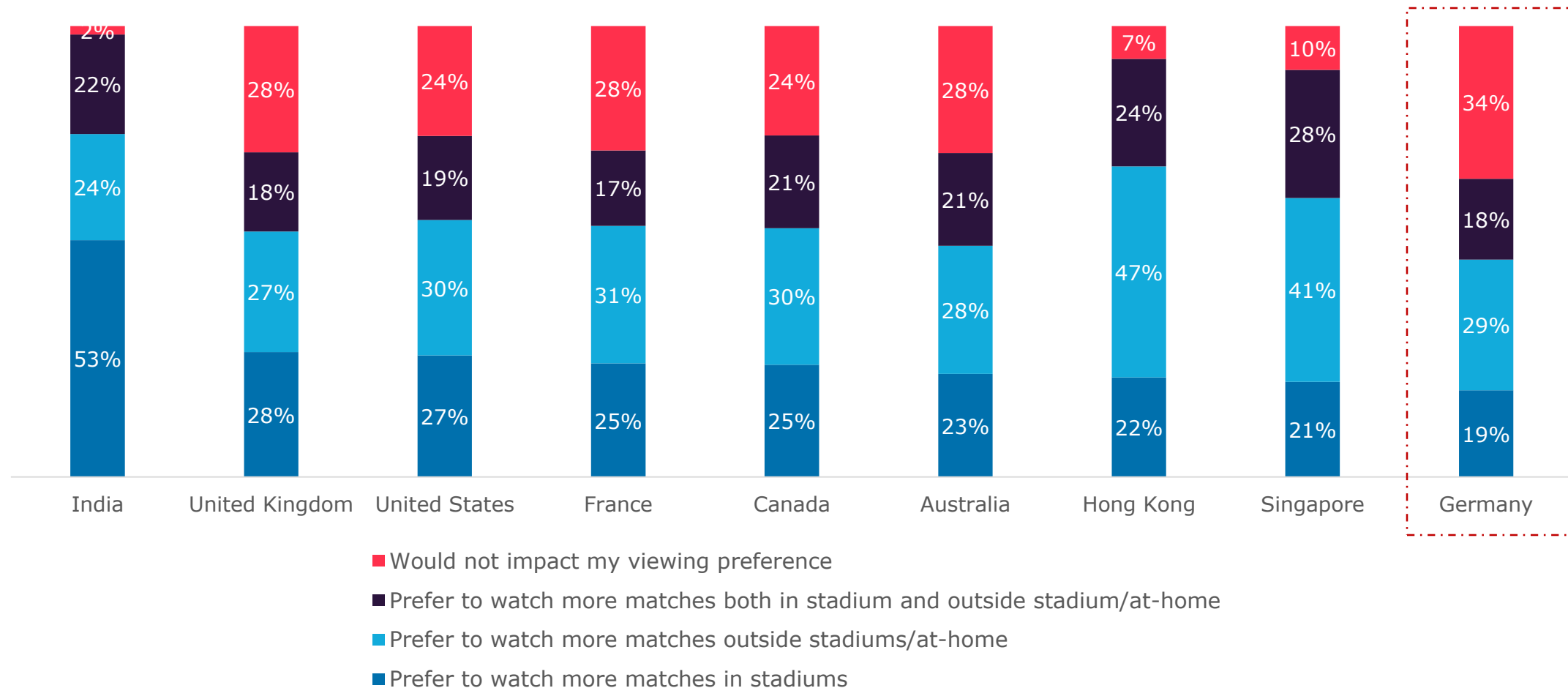Rachael Burford, English Rugby Union player

"I think IoT and the use of data is really going to be the key in the next few years. These innovations will have a huge impact on athlete performance and will forever change the standard and the way we define professional sport. This is a new step that will allow players to train more efficiently, anticipate the injuries and have a better recovery between competitions."
Pape-Phillipe Amagou, professional basketball player, France

A good experience with technology – either in or out the stadium –has a positive knock-on effect on fans overall engagement

	India	United Kingdom	United States	France	Canada	Australia	Hong Kong	Singapore	Germany
Would not impact my viewing preference	2%	28%	24%	28%	24%	28%	7%	10%	34%
Prefer to watch more matches both in stadium and outside stadium/at-home	22%	18%	19%	17%	21%	21%	24%	28%	18%
Prefer to watch more matches outside stadiums/at-home	24%	27%	30%	31%	30%	28%	47%	41%	29%
Prefer to watch more matches in stadiums	53%	28%	27%	25%	25%	23%	22%	21%	19%

- ■ Would not impact my viewing preference
- ■ Prefer to watch more matches both in stadium and outside stadium/at-home
- ■ Prefer to watch more matches outside stadiums/at-home
- ■ Prefer to watch more matches in stadiums

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.

Unlocking the value of emerging technologies in sports: match-winning strategies
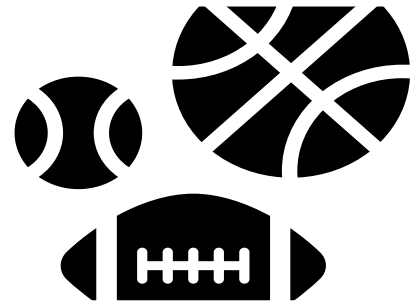
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Globally, how can sports organizations unlock the value of emerging technologies in sports
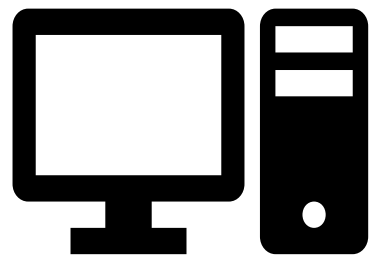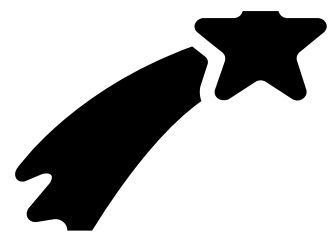
Reassure fans on the use of personal data

Identify user needs before investing in and deploying new tech

Convert more fans to 'avid' fans

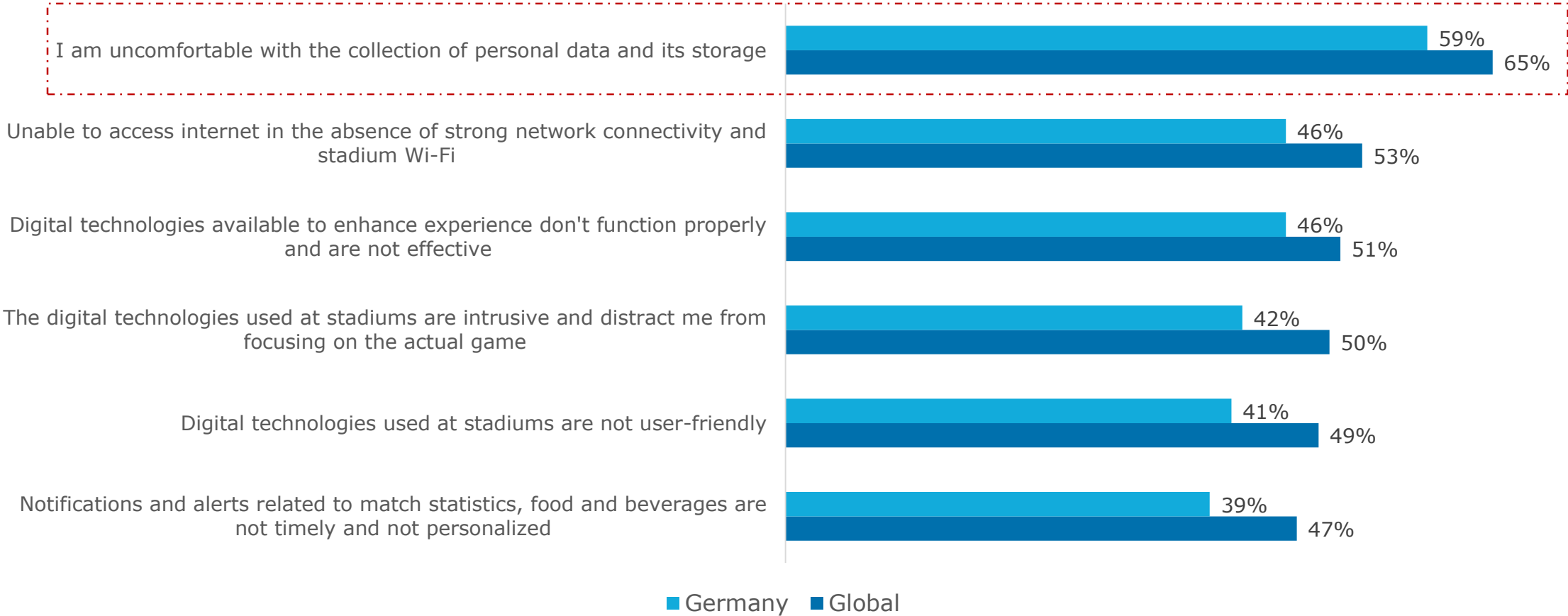**Build digital practices, capabilities, and transform organizational culture**

>> *Reassure fans on the use of personal data*

Globally and in Germany, fans are beginning to worry about indiscriminate usage of personal data for enhancing experience inside the stadium

What are the challenges you face in your digital enabled experience inside the stadium?

I am uncomfortable with the collection of personal data and its storage
- Germany: 59%
- Global: 65%

Unable to access internet in the absence of strong network connectivity and stadium Wi-Fi
- Germany: 46%
- Global: 53%

Digital technologies available to enhance experience don't function properly and are not effective
- Germany: 46%
- Global: 51%

The digital technologies used at stadiums are intrusive and distract me from focusing on the actual game
- Germany: 42%
- Global: 50%

Digital technologies used at stadiums are not user-friendly
- Germany: 41%
- Global: 49%

Notifications and alerts related to match statistics, food and beverages are not timely and not personalized
- Germany: 39%
- Global: 47%

■ Germany ■ Global

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 1,296 fans from Germany, 1,082 fans from Germany who have visited the stadium.

Sports organizations and stadium operators thus need to focus on building consumer trust

Seek consumer consent where applicable

While seeking consumer consent may not be universally a legal requirement, it is evident that it goes a long way in building consumer trust. In case of deploying biometrics or collecting personal identifiable information, organizations are encouraged to seek consumer consent and provide for alternative options, as applicable.

Be transparent about the use of consumer data

Be transparent about the use and protection of consumer data and share with fans the steps that are being taken to protect their data. This also involves building consumer awareness on the kind of data being collected and how it is used.

Demonstrate the value that consumers stand to gain with this data exchange

Our previous research found that consumers expect organizations to incentivize them for sharing their personal data. The report found that, on an average, more than seven out of ten consumers expect incentives in the form of better deals/offers and priority services. Sport organizations could also to explore incentivizing sports fans in exchange for their data. Capgemini Research Institute, "The Secret to Winning Customers' Hearts With Artificial Intelligence: Add Human Intelligence," August 2018.

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 9,008 fans who have visited the stadium.

>> *Identify user needs before investing in and deploying new tech*

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Deploy technology on the basis of how it meets fans expectations and helps athletes

Nearly 1 in 4 consumers expressed that the use of tech for enhancing fan experience fell short of their expectation

Inside the stadium, fans reported highest dissatisfaction in their experience in the use of biometrics to enter the stadium (35%), followed by the use of cryptocurrency to unlock player content, access behind the scene videos etc. (26%)

Outside the stadium, fans reported highest dissatisfaction in their experience of streaming matches live on VR headsets to simulate in-stadium experience (31%), and viewing the match as your favorite player experiences it (25%)

- *"The best way to utilize technology has to be simple, and it has to match with the consumer expectation and trends."* Frédéric Longuépée, chairman and CEO at Girondins de Bordeaux, a professional football club playing in the top French football division, Ligue 1

- Pape-Phillipe Amagou, professional basketball player from France said that, *"You have to find the right balance between using technology in your professional athlete life and the natural way of playing your sport. What makes a coach good is the feeling that he has, and technology can't replace a real coach. So, the challenge will be finding the right balance between using technology for the athletes, trainers, head coaches, and still keeping the basics of professional sports."*

5G offers a significant opportunity

Inside the stadium, 78% said they were satisfied with access to high-speed Wi-Fi and the ability to therefore share updates on social media. The deployment of 5G in stadiums could be key to transforming the fan experience. It could enable, for example:
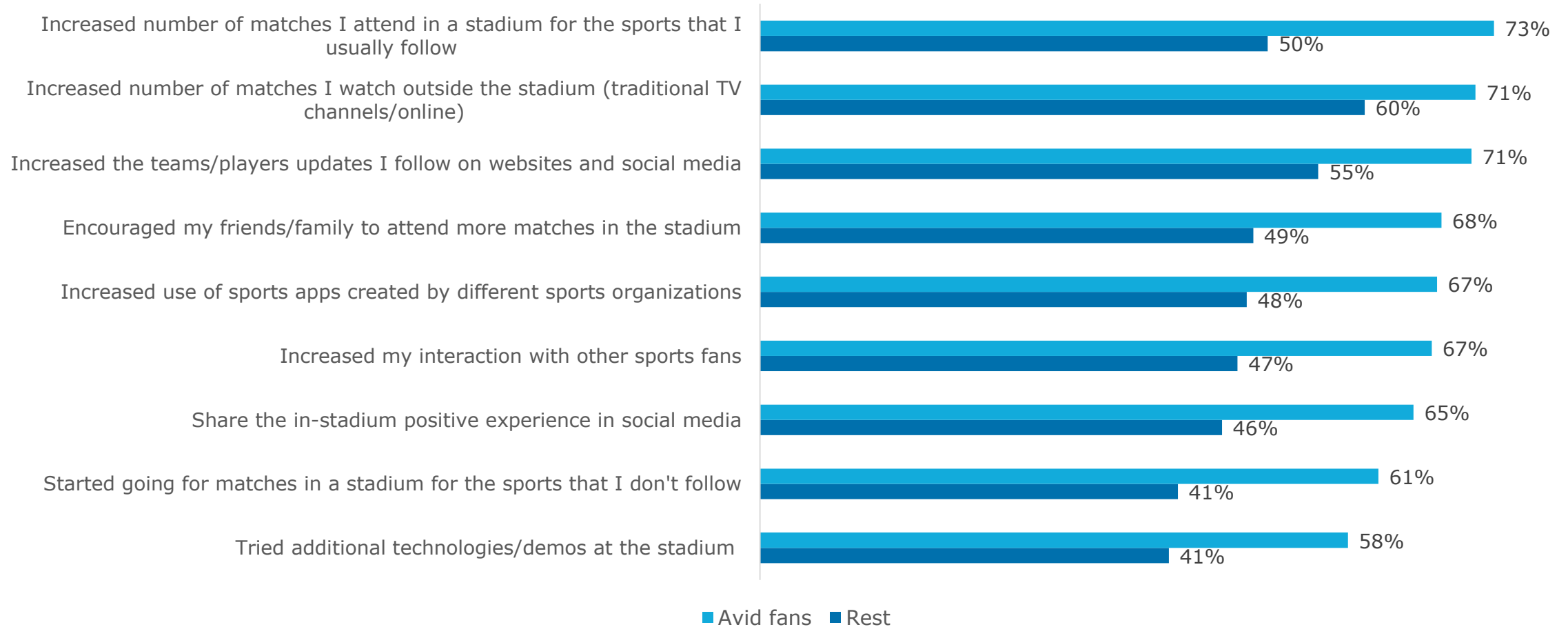- *Better VR capabilities, which are seen today as being of limited quality*
- *Enhanced in-stadium infrastructure allowing for fans to sign up to new micro-services*
- *Increased social media traffic driving greater online engagement.*

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 9,008 fans who have visited the stadium.

Avid fans increase their engagement with the sport to a greater extent than the rest of the fans

Engagement level, Avid fans vs Rest

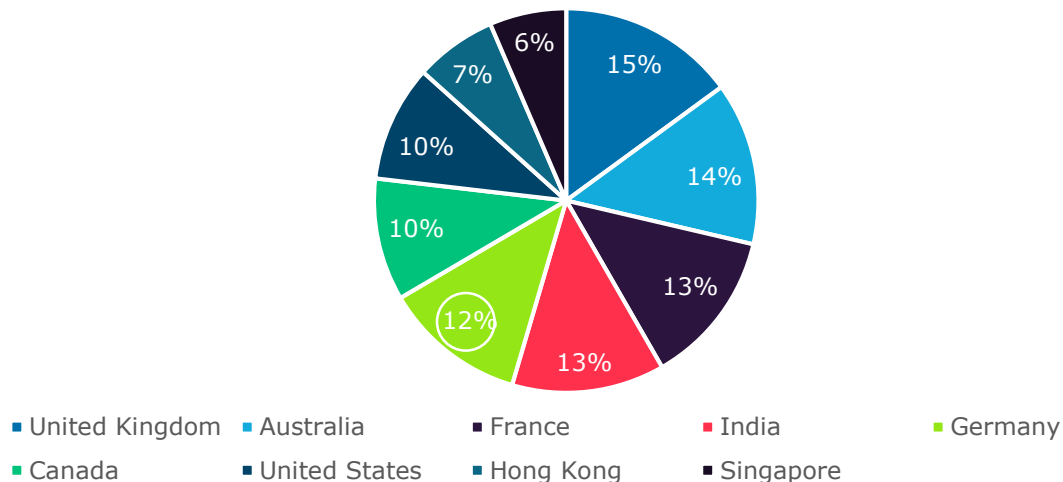| Statement	Avid fans	Rest
Increased number of matches I attend in a stadium for the sports that I usually follow	73%	50%
Increased number of matches I watch outside the stadium (traditional TV channels/online)	71%	60%
Increased the teams/players updates I follow on websites and social media	71%	55%
Encouraged my friends/family to attend more matches in the stadium	68%	49%
Increased use of sports apps created by different sports organizations	67%	48%
Increased my interaction with other sports fans	67%	47%
Share the in-stadium positive experience in social media	65%	46%
Started going for matches in a stadium for the sports that I don't follow	61%	41%
Tried additional technologies/demos at the stadium	58%	41%

■ Avid fans ■ Rest

We define an avid fan as the one who follows a sport regularly, watches nearly all matches of the sport he/she follows, and visits a stadium often to watch matches.
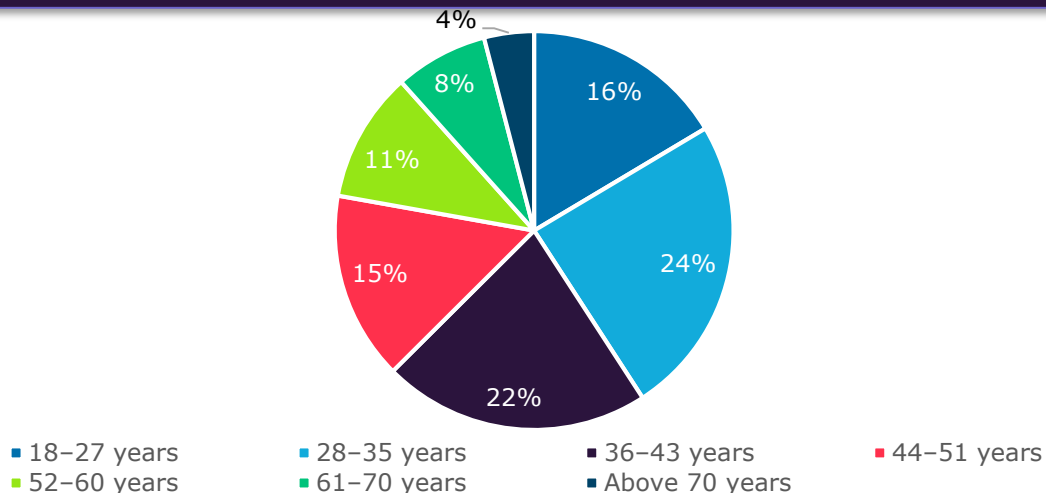
Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 2,816 avid fans.

12% of avid fans belong to Germany

Nearly 40% of avid fans belong to Europe

Pie chart:
- United Kingdom: 15%
- Australia: 14%
- France: 13%
- India: 13%
- Germany: 12%
- Canada: 10%
- United States: 10%
- Hong Kong: 7%
- Singapore: 6%

Legend:
- United Kingdom
- Australia
- France
- India
- Germany
- Canada
- United States
- Hong Kong
- Singapore

More than 60% of avid fans are under 44 years old

Pie chart:
- 18–27 years: 16%
- 28–35 years: 24%
- 36–43 years: 22%
- 44–51 years: 15%
- 52–60 years: 11%
- 61–70 years: 8%
- Above 70 years: 4%

Legend:
- 18–27 years
- 28–35 years
- 36–43 years
- 44–51 years
- 52–60 years
- 61–70 years
- Above 70 years

Avid fans are well versed with technology
- *Ninety percent of avid fans are well versed in technology, out of which 41% are extremely tech savvy and keep themselves updated about the latest technologies*
- *Avid fans are more comfortable with the use of emerging technologies technology inside and outside the stadium*

Nearly three-fourth of avid fans watch a match in the stadium when their favorite team is playing. 35% of them go to the stadium every time the matches are being held in their city.

Apart from watching matches, avid fans engage with their favorite sports team/players by:
- *Following their updates on a mobile app (64%)*
- *Purchasing their favorite team's merchandise (49%)*
- *Engaging with other fans and sharing opinions in online discussion forums/social media (49%)*

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans; 2,816 avid fans.

>> *Build digital practices, capabilities, and transform organizational culture*

Organizations should align themselves and build capabilities and culture to embrace emerging technologies

Invest time and resources in supporting the shift towards a technology/digital-driven culture, and upskill employees

Share information across sports organizations for greater innovation and better decision making

Think about how data is collected, stored and combine it with emerging technologies to explore new business models

Source: Capgemini Research Institute, Emerging Technologies in Sports Research, Fan Survey, December 2019, N=10,363 fans.