Human Needs in a Digital World

dentsu AEGIS network

Digital Society Index 2019

Contents

Foreword by Tim Andree

Executive Chairman and CEO, Dentsu Aegis Network

The digital economy is the defining trend of our time. Thirty years on from the establishment of the world wide web, the legacy of that breakthrough is extraordinary. The proliferation of digital technologies has powered economic growth, created jobs, lifted millions out of poverty, put information into the hands of people the world over and grown access to cheaper products and services. It's hard to imagine a facet of everyday life that has not in some way been touched by digital. For people, businesses and society as a whole, it has been a massive source of growth.

However, with growth comes change. And change is not always easy. With that thought in mind, two years ago we established the Digital Society Index program of research. The analysis recognizes that the digital economy has been a hugely positive source of change around the world. It also recognizes that securing these benefits in the future requires a longer view on how technological innovation can best serve people's needs.

Our findings this year show that progress is mixed. People in many countries—particularly those in high-growth emerging economies—are hugely positive about their futures in the digital economy. But at the same time, many people do not feel as if their digital needs are being met. Whether that's the impact of digital technologies on health and well-being, or the skills that are needed to thrive in a rapidly changing labor market, many people do not feel as optimistic or well-prepared as we would want.

Today, we also see the emergence of new digital consumers. They are digital natives and use digital products and services across a range of activities. But they're also digitally savvy and have learned to manage the online world on their own terms: limiting the amount of data shared and time spent online; installing ad blockers; deactivating social media accounts. The web has grown up—and so has its users. Adapting to their behavior is a huge opportunity for brands to build better, more trusted relationships.

We need to develop a digital economy that works for all in society. That's a guiding principle at Dentsu Aegis Network, both commercially and as a good corporate citizen. We create long-term business value for clients by helping them build trusted relationships with their consumers and audiences, putting people at the heart of their digital transformation. Through our Social Impact strategy, we take a leadership role in developing the digital skills of future generations and supporting a new wave of female entrepreneurs.

It's a common soundbite that what's good for society is good for business. But it happens to be true. The digital economy gives us the power to be better versions of ourselves. Capitalizing on this means harnessing digital in the right way—with human needs placed squarely at the center. By doing so, we can build better brands, better businesses and a better society.

Let's make it real.

Tim Andree

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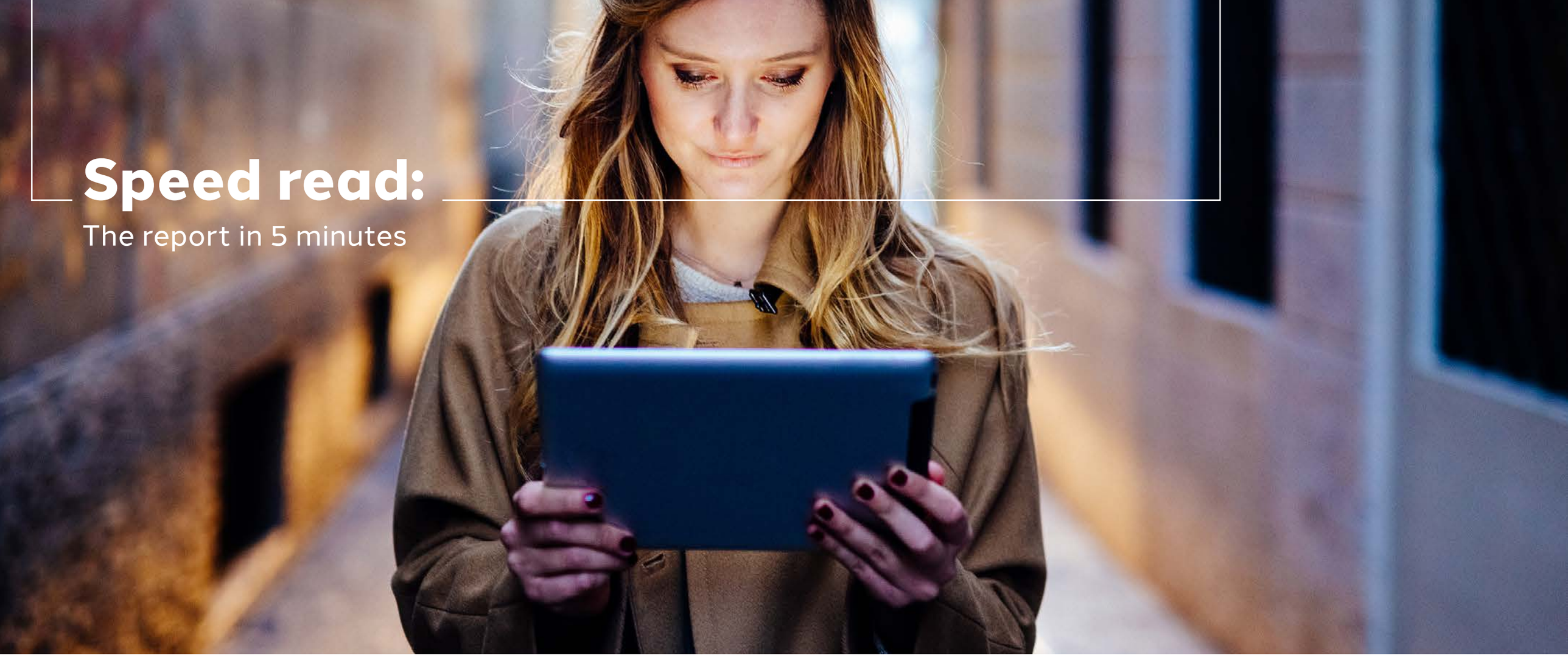

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The report in 5 minutes

Innovation will always fail unless it meets people's needs and wants.

Brands must ensure that digital products and services address those needs. By doing so, not only can brands build better relationships with their consumers and audiences—they can also help safeguard the long-term benefits of a digital economy that works for all.

That's one of the central messages that emerges from the Digital Society Index 2019. Developed in collaboration with Oxford Economics, it combines a primary survey of more than 43,000 people across 24 countries with economic and statistical analysis.

The year since our survey first started in 2018 has seen a collapse in trust in the use of digital technologies. Trust in big tech is falling, with misuse of personal data the number one cause of distrust, according to our survey. Stronger regulation of technologies like artificial intelligence is being mooted. And social media has been blamed for both political polarisation and misinformation. Thirty years on from the birth of the world wide web and against a longer-term trajectory of growth and prosperity brought about by the digital economy, 2018 has been a tough year.

Within that context, the Digital Society Index puts people at the heart of the digital economy to examine how trust can be rebuilt to deliver sustainable growth.

A new needs model for the digital age

To that end, we've also developed a new needs-based framework. Taking inspiration from the seminal model of Abraham Maslow, we've updated his original "hierarchy of needs" concept for a digital age. However, the research shows that in most of the 24 countries we analysed, these needs are far from being adequately addressed.

- **Basic needs:** Access to digital infrastructure has always been a necessary condition to engage with the digital economy. But now, in addition, trust in data use is part of the foundation on which digital products and services must be built. Only 49% of people globally believe their basic needs are being met, although Western economies tend to perform strongly here.

- **Psychological needs:** Digital technologies can help enhance users' sense of good health and well-being. However, globally, just 38% of people believe this need is being met. Asian countries tend to perform poorly on this measure—out of all the countries analysed, Singapore ranks lowest on psychological needs.

- **Self-fulfilment needs:** The extent to which people feel they have the right digital education, skills and opportunities for fulfilling work can offset concern about automation and the impact of artificial intelligence. However, only 45% of people globally score positively on this measure, with under-utilisation of digital skills by employers a challenge. For example, in Denmark, less than four out of ten people with average or above average digital skills agree that their employer makes it possible to use the full range and depth of their tech knowledge.

- **Societal needs:** This is about people's broader optimism that digital technologies will be a force for good overall, helping to create jobs and solve societal challenges. Overall, less than half (49%) of people believe in digital's role here, although people in Asia tend to be much more positive about the potential of digital to enhance society.

The demographics of these trends show clear anomalies. Women score lower than men across all aspects of the model except basic needs. In some countries, the gap is particularly stark. For example, in the Netherlands, 42% of men are optimistic about the societal impact of digital, but this falls to 30% for women. And in terms of age, it is younger people who score lowest on psychological needs, reflecting those studies that show how higher usage of digital technologies is negatively impacting young people's mental health and well-being.

We need to take people with us

Furthermore, while technological development accelerates, many people around the world feel left behind by digital growth. This sentiment cuts across differences in economic development, tech maturity and culture. It's not just a first-world problem: it's a whole-world problem, with three major elements:

- **Skills are not keeping pace with needs**—digital technologies are reshaping the jobs of tomorrow, but one in three people globally can't remember the last time they did any digital training (or never have done any).

- **The pace of technological change causes anxiety**. In countries such as China, India and Brazil, more than 80% of people feel the pace of tech change is too fast.

- **The future is not evenly spread**—while many countries perform strongly on our index in terms of delivering a digital economy that works for all—Singapore, the United States and China top our rankings in 2019—many countries are pursuing an imbalanced digital growth strategy.

Belief in digital drives the business case for action

Why is this analysis important for businesses and brands? Because digital needs influence consumer behaviour.

The more positive people are about the digital economy's wider impact on society and their own digital skills, the more likely they are to engage with digital products and services. In other words, give people belief in digital and they will be more likely to use digital products and services. There's not just an ethical case for delivering a digital economy that works for all—there's a strong business case too.

The new digital consumer: Hardest to reach but most valuable

The research also introduces us to the new digital consumer. She is a digital native and fully engaged in terms of what the digital world can offer: shopping online, using apps to take a taxi and streaming music. But she's also taking actions that, for many businesses, might seem problematic. As our analysis shows, she's installing ad blockers, reducing data-sharing and deactivating social media accounts.

This is creating significant implications for brands, businesses and governments in how they engage with consumers through digital products and services. The people who are hardest to reach are also the most commercially valuable. Increasingly, this means brands will need to find new ways to maximise the value of precious moments of interaction with consumers, moving beyond reach to creating more meaningful moments of engagement.

How to respond to the new digital needs

The changing needs and awareness of consumers calls for a more balanced and creative approach to engaging people in digital products and services. It is no longer enough for organisations to rely on increasing access and extending the user base—that effort must be matched by innovation in developing a meaningful relationship with consumers. Based on our analysis, we have three recommendations each for brands, businesses and governments:

For brands

- **Segment consumers and audiences by motivation and needs:** Traditional demographic approaches to segmenting consumers are insufficient. Looking at customers through the lens of digital needs can help brands find ways to increase positive engagement with digital products and services, as well as help test new services with more sceptical user groups.

- **Focus on engagement, not reach:** The most valuable consumers are reducing the amount of data shared online, installing ad blockers and limiting their time online. That means working harder to maximise the value of interactions that will often be initiated by consumers themselves.

- **Help people undertake their own digital detox:** Enabling people to have a healthier relationship with digital may mean sacrificing access to data, but over the long-term it will lead to a better relationship based on trust.

For businesses

- **Compete on openness:** Transparency around data usage can be a source of differentiation. With misuse of personal data the number one driver of distrust in the tech industry today, any business ignores it at their peril.

- **Make better use of digital skills:** Understand the digital skills that your employees have and constantly re-imagine work processes and organisational design around the full spectrum of their abilities.

- **Showcase digital's societal potential:** Promote the ways social impact programmes and commercial offerings can help meet people's needs and wants.

For governments

- **Develop a balanced scorecard of digital development:** Metrics should focus on inclusion and trust alongside growth of digital industries.

- **Give people more control over digital innovation:** By involving people in a more deliberative process of debate and discussion, governments can help shape a shared understanding of what is and what is not acceptable in terms of technology development.

- **Harness technology to enable effective learning:** Ongoing training and immersive learning experiences will help leverage skills and unlock the potential of digital technologies.

Give people belief in digital and they will be more likely to use digital products and services

1. What's digital ever done for us?

What's digital ever done for us? Fans of Monty Python will get the reference. But most people will recognise the sentiment. Thirty years on from the birth of the world wide web, the digital economy has been a hugely positive force in the world, helping to lift millions out of poverty, access essential services, find jobs, learn new skills and make new connections... But despite these opportunities, our survey shows that many people today feel that digital is changing their lives for the worse.

That paradox explains why it's crucial to understand the drivers of positive engagement with digital technologies to ensure they meet peoples' fundamental needs. The potential benefits of digital to people and society are huge. Yet these benefits risk being undermined by a lack of trust and the unaccountability of technological development. As brands continue to utilise digital products, services and channels, it is essential that they are attuned to changing sentiment to ensure meaningful engagement.

Building the Digital Society Index

We have been working with Oxford Economics since 2017 to understand those changing relationships more fully and to examine how well countries are developing a digital economy that works for all in society. For our latest report, we've combined a major primary survey covering more than 43,000 people across 24 countries with economic and statistical analysis. By measuring country-level performance across three dimensions—**dynamism** (the strength of the core digital sector), **inclusion** (the breadth of access people enjoy to the benefits created by the digital economy) and **trust** (the extent to which people have trust in data use as well as broader optimism about the future)—we have created a unique people-centric view on the digital economy.

Our research reveals a mixed picture of progress. A number of countries are striking a healthy balance between dynamism, inclusion and trust, helping to safeguard the long-term benefits of the digital economy. But at the same time, in many countries people do not feel that their digital needs are being met. This has implications for the sustainability of digital growth models in those parts of the world. But it also has implications for how people behave as consumers and how brands engage with them.

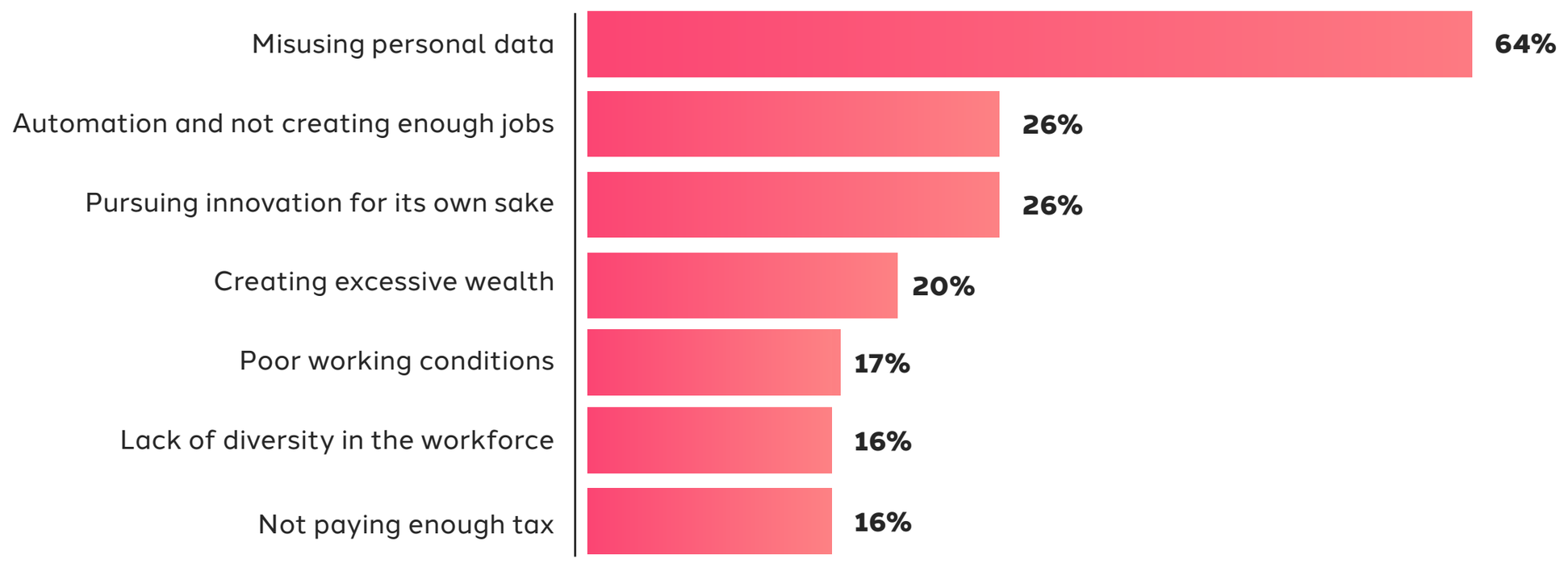
A deficit of trust

The twelve months since our initial report have seen unprecedented levels of scrutiny of the business models of digital companies. This scrutiny and some of the issues around data transparency that it has revealed has provoked fierce political discussion. There are widespread calls for the need for tighter regulation of the technology sector, amid growing anxiety about the development and use of artificial intelligence. Trust in technology is in steep decline among the informed public around the world, according to Edelman's Trust Barometer. Social media in particular has been cited as a cause of political polarisation and the spread of misinformation.

As a result, in 2019 the research shows we are facing tough questions about whether digital technologies truly serve people's best interests. Figure 1 shows that for the majority (64%) of people we surveyed, concerns around the misuse of personal data are undermining trust in the tech industry as a whole, followed by anxieties about automation and the pursuit of innovation for its own sake. These concerns are unlikely to stop at the door of the tech industry itself—all businesses deploying digital products and services find themselves under similar scrutiny.

Figure 1: Misuse of personal data is the #1 driver of distrust in the tech industry globally

What do you believe are the main causes of distrust in the tech industry as a whole? (% agreeing)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

Six out of ten people in our survey believe that not enough is being done to ensure digital technologies benefit everyone in society

Beyond the misuse of personal data, there are also some hot-button issues in specific countries. People in the United Kingdom are the most likely to cite tech companies not paying enough tax (36%) and creating excessive wealth (28%) as drivers of distrust. While people in India are the most likely to identify automation and not creating enough jobs (36%) as well as a lack of diversity in the workforce (34%) as reasons for a loss of faith in the tech industry.

A challenge to democracy?

The last year has opened up a lot of debate about the influence of social media on political discourse. It has been argued that social media is instrumental in creating an echo chamber of entrenched positions, leading to more polarised views and vitriol. Awareness has grown of 'fake news' and the potential risks of public debate being poisoned by misinformation, leading some commentators to suggest that digital technologies pose an existential threat to democracy. Six out of ten people in the United States that we surveyed believe that social media is having a negative impact on political discourse in their country (second behind Germany at 62%). The lowest response is seen in Russia, where just a quarter of people believe social media is having this effect.

We need to take people with us

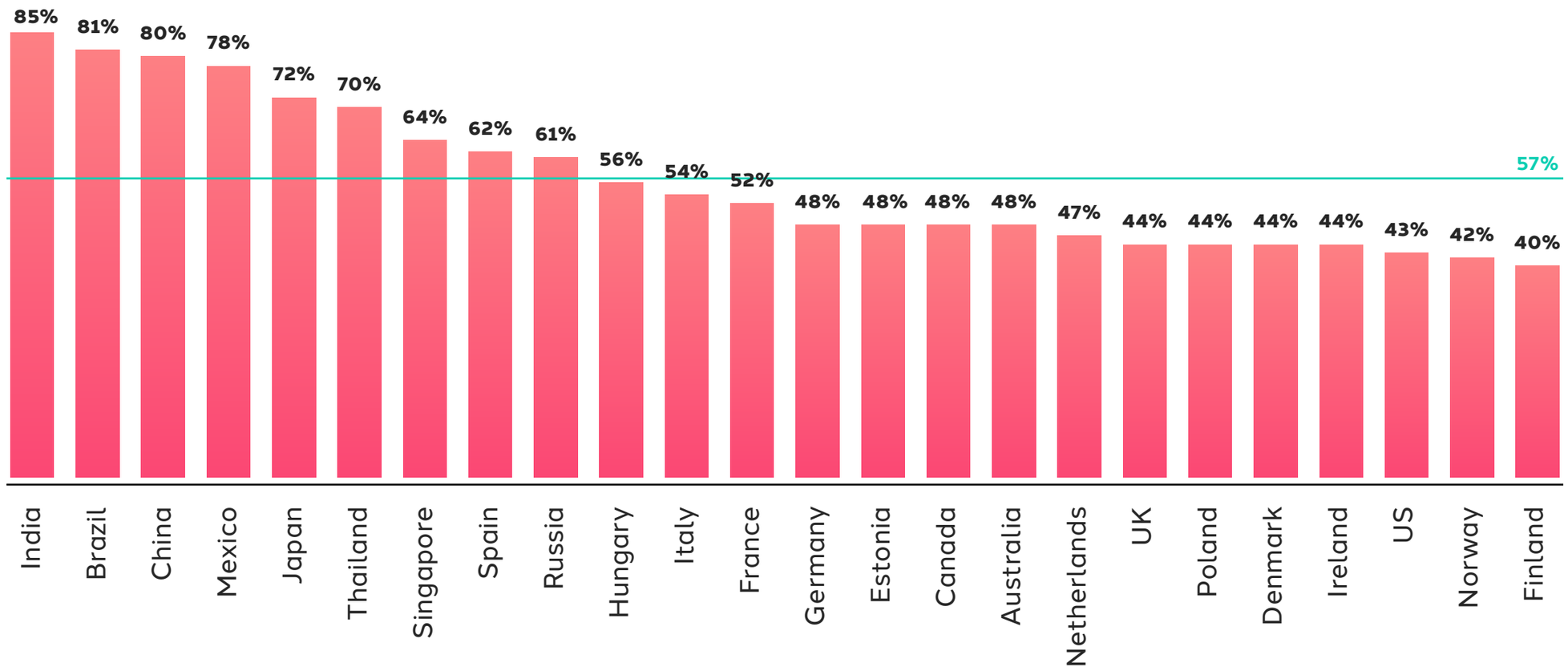
It is not just the direction of technological development that is unsettling people. It is also the pace of change. Take India, Brazil and China. In these countries, more than 80% of people believe that the pace of technology change is too fast today. Across the 24 countries in our analysis, more than half (57%) of people believe this to be the case (see Figure 2). Even in Singapore, one of the most competitive economies in the world that ranks top of our index (see 'Spotlight: Delivering a balanced approach to digital growth'), nearly two-thirds of people believe the pace of tech change is too fast.

Of course, there have probably been few moments in history when people haven't been worried about the pace of tech change. There is plenty of research to show that human nature tends to over-estimate the short-term impact of change, while under-estimating its long-term impact. But, given what we know about the scale and pace of change brought about by digital in many walks of life, this finding articulates a sense of helplessness in the face of relentless disruption.

One corollary of this statement is that six out of ten people in our survey believe that not enough is being done to ensure digital technologies benefit everyone in society—and based on the original ten countries in our 2018 analysis, that proportion is increasing.

Figure 2: People feel the pace of tech change is too fast

To what extent do you agree or disagree that the pace of technology change is too fast today? (% agreeing)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

Breaking the innovation cycle

Much of the recent debate can be understood in the context of the innovation cycle. If technological change gets too far ahead of consumers' needs it risks a backlash. It's then that policymakers may seek to step in and protect consumer interests through common standards and regulation. We've already seen that unfold in the context of personal data. We are also seeing debates about potential regulation of artificial intelligence.

The race to deliver greater digital capability has not always taken full account of fundamental human needs.

Understanding precisely how well digital growth is addressing people's needs is the focus of the next section, in which we introduce our own model of 'Maslow for a digital age' that offers a new way of looking at people's relationship with the digital economy. In section 3, we examine how those digital needs are driving consumer behaviour. And, last, in section 4 we offer some recommendations for brands, businesses and governments to help address the digital needs of their audiences, consumers and citizens.

Spotlight: Delivering a balanced approach to digital growth

The Digital Society Index measures how successfully countries are developing a digital economy that works for all. It examines performance across three key dimensions.

- **Dynamism**: the strength of the core digital sector, which involves indicators including size and growth of the Information and Communications Technology (ICT) sector, spending on research & development and the availability of top quality tech universities and talent.

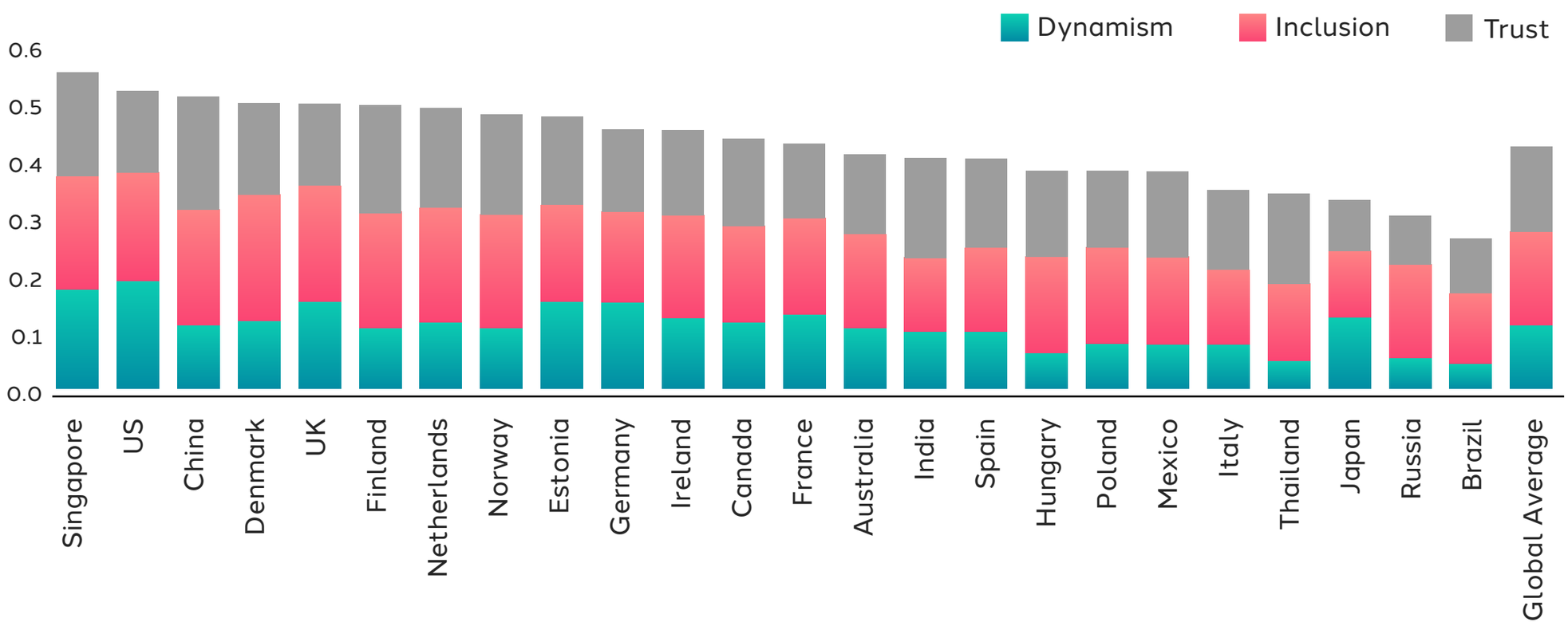
- **Inclusion**: the breadth of access people have to the benefits created by the digital economy. This dimension encompasses indicators that include access to digital infrastructure as well as the quality of tech-related education.

- **Trust**: a measure of the extent to which people have confidence in data use as well as broader optimism about the future. 'Trust' takes account of indicators such as cybercrime readiness, data protection legislation and transparency of data use by businesses and governments. (For a more detailed overview of the research methodology, please see page 39).

The 2019 results are set out in the table below. By aggregate score, Singapore ranks first overall, followed by the United States and China (see Figure 3).

Figure 3: Countries demonstrate different strengths across the three dimensions of the Digital Society Index

DSI scores



Source: Dentsu Aegis Network Digital Society Index Survey 2018

Figure 4: 2018 vs 2019 top ten rankings

	2018	2019*
1.	United Kingdom	Singapore
2.	United States	United States
3.	China	China
4.	Germany	Denmark
5.	France	United Kingdom
6.	Australia	Finland
7.	Spain	Netherlands
8.	Italy	Norway
9.	Japan	Estonia
10.	Russia	Germany

Source: Dentsu Aegis Network
Digital Society Index 2018

The United Kingdom falls to 5th after ranking in top spot in 2018, while the Nordic economies dominate the top ten, following the expansion of the index from 10 to 24 countries (see Figure 4). The reason for the UK's decline is not only because of a more competitive peer set in 2019. Declining consumer sentiment around the future impact of digital technologies on society and falling trust in data use largely account for its lower ranking.

Beyond these aggregate scores, the relative performance across the three dimensions provides telling insight. This analysis reveals imbalances in the way countries ensure that the benefits of digital growth can be enjoyed widely, underpinned by trust.

For example, the United States performs strongly on dynamism but less so on trust, a finding that reflects a year in which there have been well-publicised and damaging congressional testimonies by the leaders of both Google and Facebook. This imbalance signals a wider trend that sees other Western markets such as Australia, France, Germany and the United Kingdom in the bottom half of the sample for trust, fuelled by a lack of optimism about the future of the digital economy and its impact on peoples' lives.

By contrast, China appears to be still relatively under-powered as far as dynamism is concerned, but performs well in terms of the breadth of access and opportunity that the digital economy provides, reflecting a trend seen among other emerging economies.

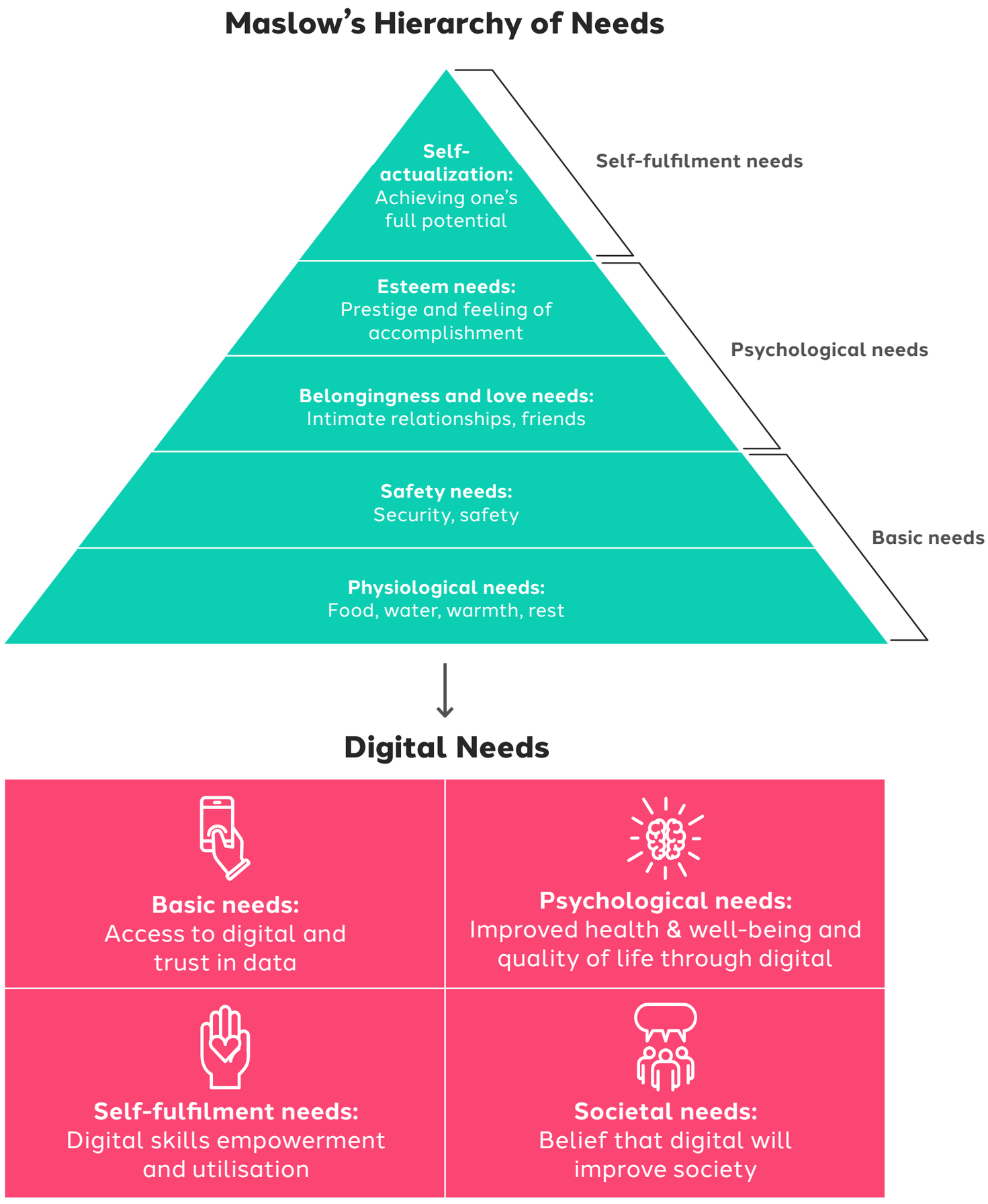
A third trend sees the Nordic economies do well on inclusion and trust, but perform less well as far as the dynamism of their digital industries is concerned.


The race to deliver greater digital capability has not always taken full account of fundamental human needs

2. A new model of digital needs

Safeguarding the long-term benefits of the digital economy—across employment, education, healthcare and the environment, for example—demands laser focus on meeting people's needs. We have developed a framework that can examine people's needs in the digital economy through four perspectives: basic needs, psychological needs, self-fulfilment needs and societal needs. We've taken inspiration from Abraham Maslow's seminal work on the hierarchy of needs, but it's important to point out that our framework is not a hierarchy, but a series of building blocks. Except for basic needs, which are the necessary foundation on which the others are constructed, different needs will be emphasised in different contexts (see Figure 5). The following paragraphs describe each need, how we've measured it and why it's important.

Figure 5: Our digital needs framework



Source: Maslow, A Theory of Human Motivation, 1943; Dentsu Aegis Network analysis

Less than half (49%) currently believe their basic digital needs are being met

Basic needs

Basic needs are the necessary pre-condition for people to engage with digital products and services. We define and measure basic needs in terms of access to quality digital infrastructure (fixed internet and mobile networks specifically) as well as the trust that people express in businesses and governments to use their data responsibly in terms of privacy and security. Lack of trust is destabilising digital's success. Without trust, the full potential of digital will never be realised.

Based on our survey of more than 43,000 people around the world, less than half (49%) currently believe their basic digital needs are being met (see Figure 6). In countries such as Brazil, where that figure is only 35%, infrastructure is a key source of concern. While in Japan, where just 29% of people report that their basic needs are being met (the lowest out of the countries we analysed), trust in data use is the overriding anxiety. People in emerging markets such as China (69%) and India (67%) are much more content as far as their basic needs are concerned, reflecting the speed with which digital infrastructure has been deployed in those markets as well as greater trust in businesses and governments to use personal data responsibly.

Figure 6: In many countries, people's digital needs are not being fully met

	Basic needs	Psychological needs	Self-fulfilment needs	Societal needs
China	69%	27%	62%	76%
India	67%	27%	69%	74%
Hungary	64%	52%	40%	43%
Netherlands	63%	34%	36%	36%
Thailand	59%	27%	63%	75%
Denmark	59%	38%	40%	42%
Singapore	58%	25%	53%	56%
Norway	56%	37%	39%	41%
Finland	56%	48%	41%	43%
Estonia	53%	52%	41%	43%
UK	48%	40%	37%	40%
Canada	47%	34%	44%	44%
Poland	46%	54%	42%	52%
Spain	46%	36%	41%	46%
Mexico	44%	39%	66%	64%
Germany	44%	42%	38%	34%
Ireland	43%	39%	42%	39%
US	43%	41%	46%	44%
France	41%	36%	38%	43%
Australia	41%	37%	37%	38%
Italy	41%	41%	40%	50%
Russia	37%	58%	48%	48%
Brazil	35%	44%	53%	62%
Japan	29%	26%	21%	32%
Global avg	**49%**	**38%**	**45%**	**49%**

Source: Dentsu Aegis Network Digital Society Index Survey 2018

Many businesses are already playing a role to meet people's basic needs in digital. For example, electronics company Panasonic is putting basic needs at the heart of its ambitious CityNow initiative by building a "smart city" infrastructure in Colorado, US.

With the goal of turning 400 acres of empty land into a smart city by 2026, Panasonic has not only installed free Wi-Fi but also LED street lights, a solar-powered microgrid, pollution sensors and security cameras and is even preparing the area for autonomous vehicles.

Psychological needs

While digital technologies can help connect people and foster a sense of community, the ‘always-on’ nature of social media and smartphones can have a negative impact on personal well-being.

Achieving a healthy balance of personal technology use is becoming a key need of the digital economy, with a number of businesses now helping consumers actively manage their screen time. In June 2018, for example, Apple launched a range of new digital wellbeing tools to reduce the time people spend online. The new Screen Time app provides a dashboard for iPhone and iPad users to understand their activity, from how much time they spend on which apps to how often they pick up their device, as well as to set daily time limits for individual apps. It will enable parents to access their children’s activity and understand their browsing habits.

As part of our survey, we asked people about the impact of digital technologies on their health and well-being, as well as on their overall quality of life. A clear trend in the results is the extent to which Asian countries tend to perform poorly on this measure. Singapore, which tops this year’s Digital Society Index rankings, ranks lowest with just 25% of people surveyed believing that their psychological needs are being met. The next bottom five scores are all registered from people in Asian economies.

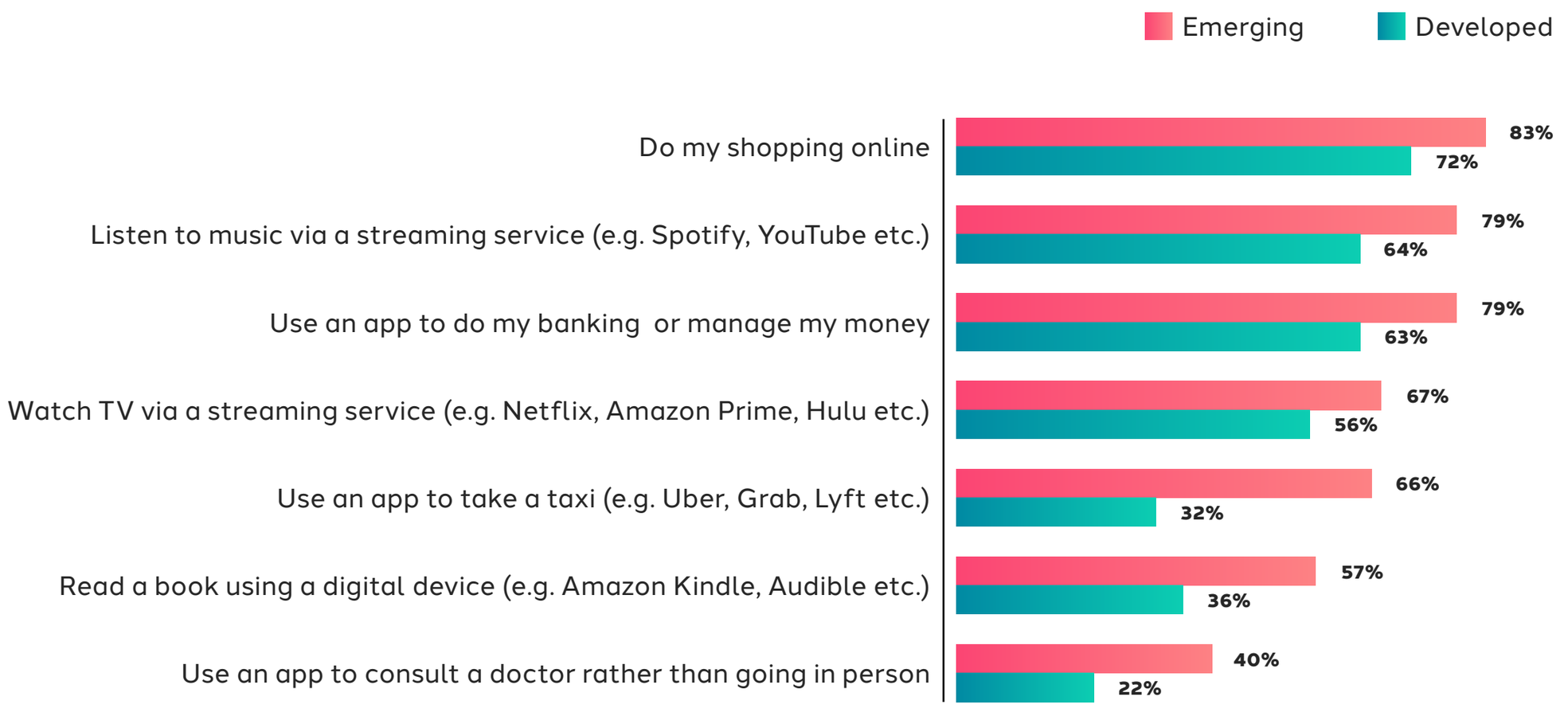
This finding, and particularly the low score of India and China on this measure, belies the stereotype that digital health is an issue only in developed economies. As emerging markets embrace digital technologies rapidly, often leapfrogging developed markets and their legacy infrastructure, they are perhaps more aware of the sudden impact digital can have on their well-being.

Our research shows that people in emerging economies are also much more likely to engage with digital products and services than those in developed countries (see Figure 7).

Though these populations embrace digital rapidly, the usage appears to have sharper impact on their sense of well-being.

Figure 7: Emerging markets are driving the adoption of digital products and services

Compared to last year, are you more or less likely to do the following? (% likely)



Source: Dentsu Aegis Network Digital Society Index Survey 2018
Note: Emerging and developed markets are defined as per International Monetary Fund classification

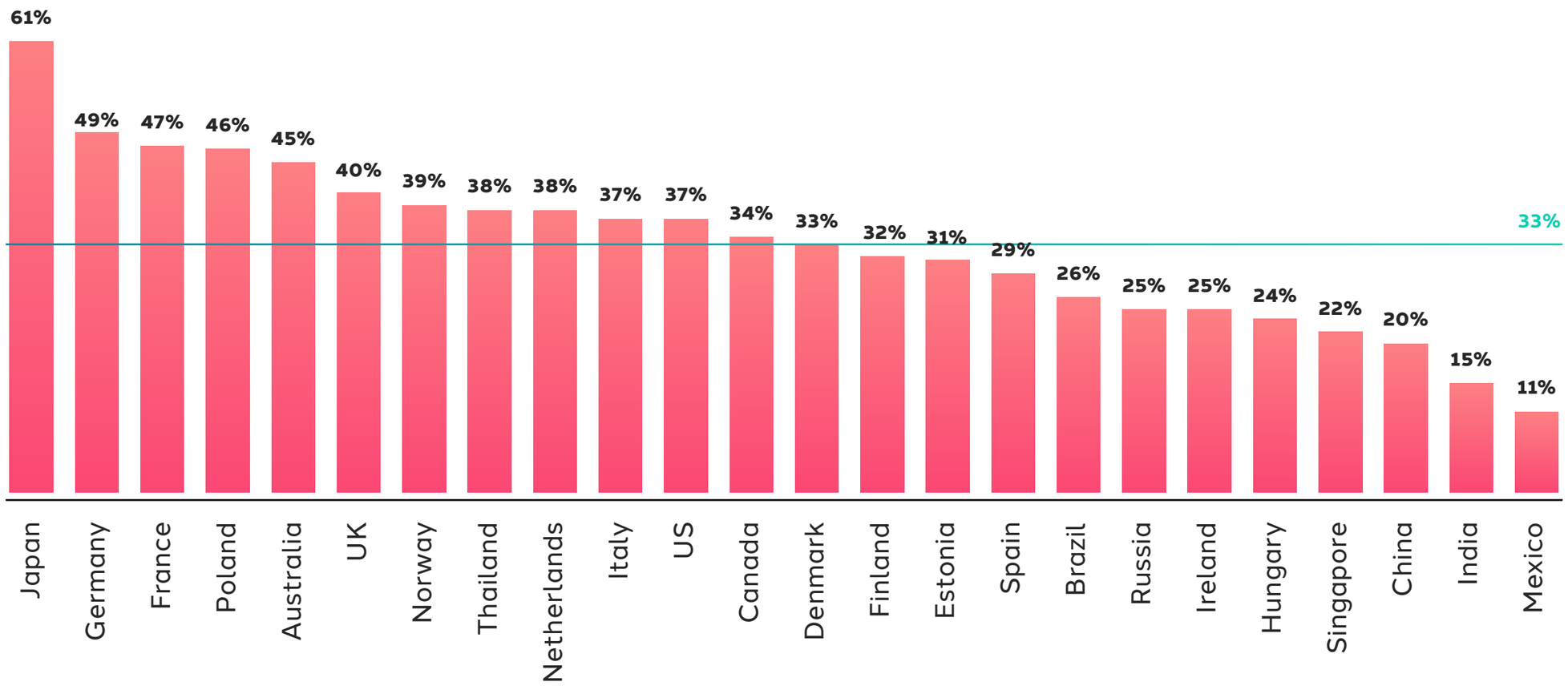
Self-fulfilment needs

Achieving individual potential and fulfilment in the context of the digital economy means having the skills, education and opportunities to find rewarding work. With much uncertainty around the potential impact of digital technologies (such as artificial intelligence) on jobs, having confidence in your ability to manage future change is a critical determinant of optimism and individual happiness. Our measure of this need factors in the extent to which people feel their education has prepared them for a tech future, their self-assessed level of digital skills and the extent to which employers enable them to utilise fully their digital skills.

Only 45% of people globally score positively on this measure. Learning remains an area of significant weakness: globally, one in three people can't remember the last time they did any digital training (or never have)—see Figure 8. Perhaps counter-intuitively, people in the developed markets of Japan, Germany and France are most likely to say they do not remember when they last had any digital training, or never have. People in the emerging markets of China, India and Mexico are least likely to agree with this statement.

Figure 8: Globally, one in three people can't remember the last time they did any digital training (or never have)

When was the last time you undertook any digital training? (% responding either can't remember or never have)



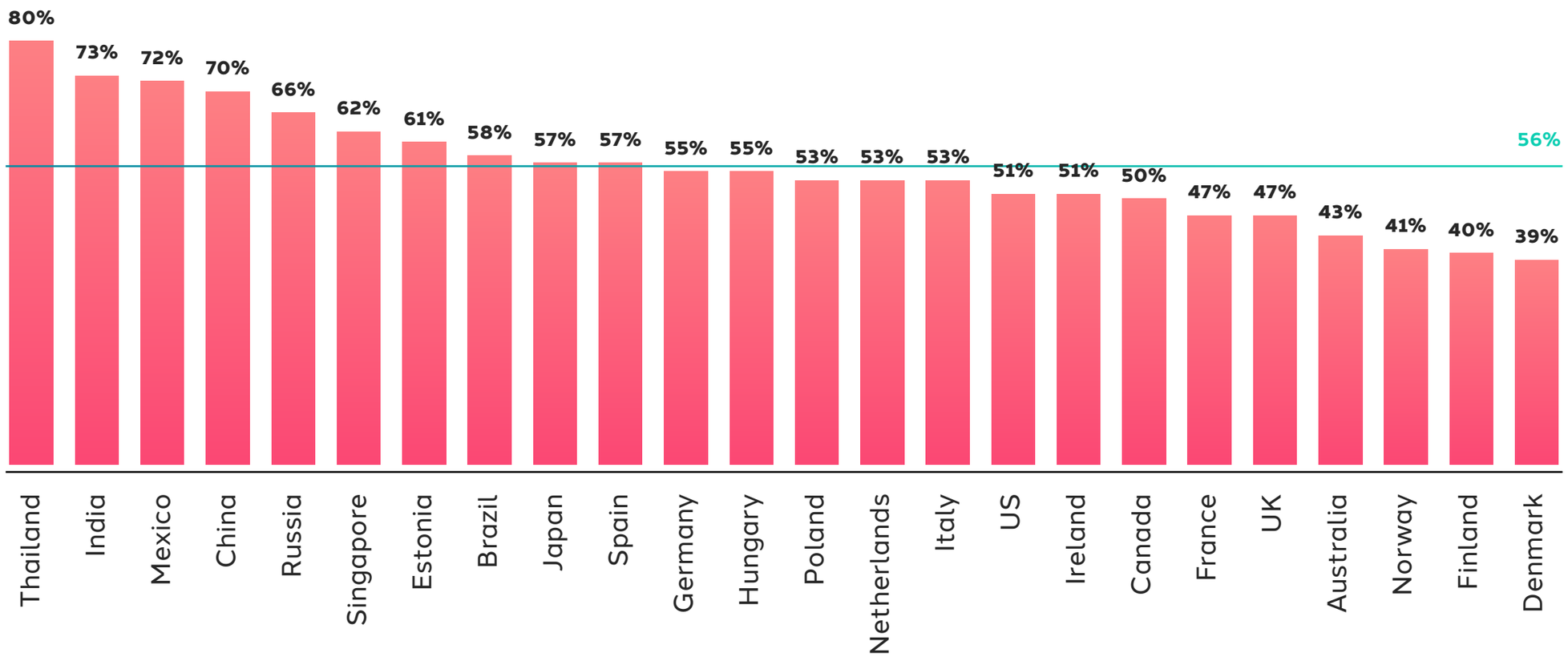
Source: Dentsu Aegis Network Digital Society Index Survey 2018

Skills utilisation is also an area where people's needs are not being met. Surprisingly, it's in the Nordic economies where this appears to be a particular challenge. Denmark, Finland and Norway make up the bottom three countries when people were asked if their employer utilises their digital skills (see Figure 9), with around four out of ten people in those countries believing this to be the case.

Some corporations are responding directly to this need. Lloyds Banking Group is addressing people's self-fulfilment needs by tackling the skills gap head on. As part of its Helping Britain Prosper plan, the UK bank has committed to providing digital skills training, including training on internet banking, for 2.5 million individuals, SMEs and charities to build people's digital skills and employability.

Figure 9: Employers are failing to utilise digital skills

To what extent do you agree or disagree that your employer makes it possible for you to use the full range and depth of your digital technology skills as part of your job? (average % of consumers with strong or very strong skills agreeing)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

Societal needs

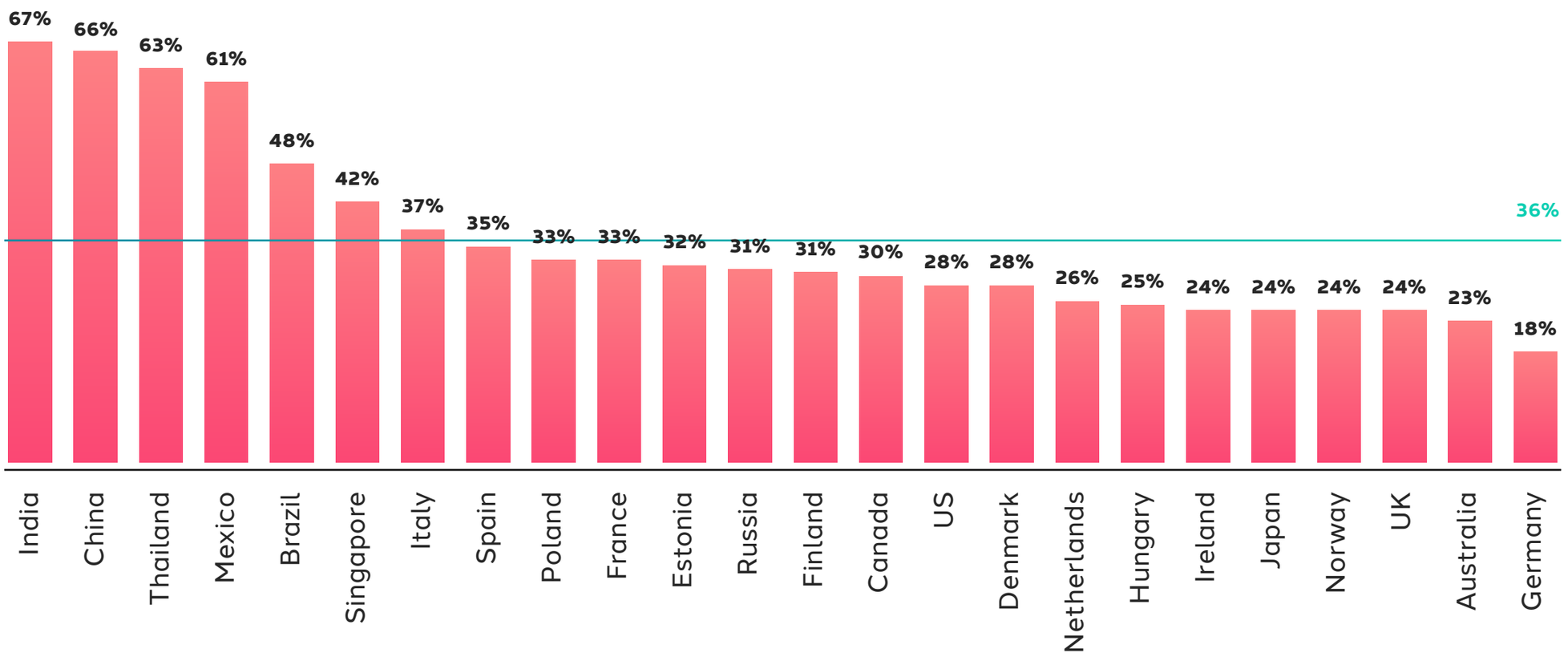
In an age of complex societal challenges and a growing divide between the haves and the have nots, there is enormous potential for digital technologies to play a critical enabling role in closing the gap. Across a range of challenges, from eradicating poverty to improving access to healthcare and education, we're seeing the impact that digital can have in closing inequalities and delivering a fairer society.

Ensuring that digital is able to fulfil this potential relies in part on people sharing this optimism and trusting that digital can be a force for positive change. Hence we measure societal needs (which we called 'digital engagement' in our 2018 report) in terms of how optimistic people feel about the ability of digital technologies to enhance society overall as well as solve key global challenges and create new jobs. In 2019, just less than half (49%) of people believe this need is being met, with emerging markets markedly more positive than developed. China tops this measure with 76% while Japan is bottom with 32%.

Reflecting this overall trend, people are especially pessimistic about the potential of digital technologies to create jobs—apart from in a handful of emerging markets (see Figure 10). This is likely informed by the many scare stories about the potential impact of AI and robotics on jobs, which have generally varied between the uncertain and the unpalatable. These fears are likely to be felt in more mature markets, while emerging markets remain optimistic, despite the potential impact on manufacturing jobs in particular.

Figure 10: Only one third of people globally believe digital technologies will create jobs

To what extent do you agree or disagree that emerging digital technologies, such as artificial intelligence and robotics, will create career opportunities for you in the next 5-10 years? (% agreeing)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

At 36%, the overall proportion of people believing digital will create jobs has increased from 2018, when just 29% of people believed this. However, this increase is partly explained by the increase in geographic scope from 10 to 24 countries. Based on a like-for-like comparison, 32% of people in our original 10 countries believe digital will create jobs, signalling a slight improvement in optimism.

The inequalities of need

Our research highlights the extent to which people believe their digital needs are not being addressed—but also that there is significant variation across the countries we've analysed.

People in emerging markets tend to feel more satisfied that their needs are largely being met, but have greater concerns about the psychological impact of digital technologies. People in developed markets are generally positive as far as their basic and psychological needs are concerned, but much less so in respect of the capacity of digital to meet self-fulfilment and societal needs.

The framework also reveals differences by gender and age. While globally women are more positive than men in terms of digital meeting basic needs, across the other three building blocks there is a significant gap. For example, in the Netherlands, the perception of the digital economy positively impacting societal needs scores 42% among men but that falls to 30% for women. Most likely, much of this reflects educational gaps whereby STEM subjects are generally under-represented by girls and women from school through to higher education.

Furthermore, the tech industry is notoriously male-dominated (see 'Spotlight: Women in Tech') which may further compound negative perceptions among women about the wider potential of digital technologies in society.

Looked at in terms of age, it is significant that younger people score lowest on the measures for psychological needs.

This trend appears to reflect how higher usage of digital technologies is seen to be taking its toll on young people's mental health and well-being. Brands, businesses and policymakers alike should be hugely concerned by this growing crisis. Many governments around the world are taking measures to address this—for example, by setting up digital detox camps of the type seen in China. But are brands stepping up to the plate too?

Overall, a more balanced view of how well people's digital needs are being met can help improve our understanding of how to engage them as users and consumers. The personas on the following pages bring some of these considerations to life, which we then explore further in the next section.

> **Younger people score lowest on the measures for psychological needs**

Spotlight: Women in Tech

The tech industry doesn't have a great reputation for gender diversity. Our own survey shows that of the c. 3000 people working in IT, the gender split is broadly 35:65 in favour of men. The lack of gender parity within technology—and STEM jobs, in general—has brought women in tech into the spotlight and onto government and business agendas. Universities the world over have bursaries and programmes for women interested in technology, like Adobe India's Women in Technology scholarship programme, and charities which encourage girls to learn digital skills are abundant, like Girls Who Code which has an alumni of over 90,000 students.

However, according to our framework, the gender gap is going in the other direction as far as women in tech is concerned. Women in IT have high self-fulfilment need scores (86%)—higher than their male counterparts (see Figure 11) and way above the industry average of 63%. 81% of women in IT believe their education gave them the right digital skills for the workplace, but at 72% men in IT are less convinced. And in terms of societal needs, again women (81%) are more positive than men (75%) about the potential impact of digital. While it's hard to provide a definitive interpretation of these numbers, perhaps they represent the impact of programmes designed to increase female participation in the sector by companies such as Google. However, women in IT have one of the lowest psychological need scores at just 19%, the only dimension on which they score lower than their male co-workers.

Figure 11: How women and men in the IT sector believe their digital needs are being met

	Basic needs	Psychological needs	Self-fulfilment needs	Societal needs
Women	74%	19%	86%	81%
Men	62%	26%	81%	75%

Source: Dentsu Aegis Network Digital Society Index Survey 2018

Raj

Basic
67%

Psychological
27%

Self-fulfilment
69%

Societal
74%

Age: 28

Occupation: Operations Technician

Location: New Delhi, India

Archetype: Mindful Optimist

Raj is confident that technology can change society in India for the better and solve global problems—or at least get him a job one day! The operations technician is ahead of the game and able to make full use at work of the tech skills that he learnt at school.

Happy with his new Samsung and its connectivity, Raj now has more apps on his phone than he knows what to do with. Need a taxi? A doctor? He's got it all. And with all the data regs out there these days, he trusts that businesses know what they're doing.

However, Raj is a bit concerned that a lot has changed very quickly. He worries that, deep down, the impact of digital isn't making him happy—in fact, quite the opposite. Taking time for himself offline to hang out with family or play with his local cricket team in south Delhi seem to be better for him. He's even got rid of Facebook and Snapchat—he figures his real friends have his number.

What does this mean for brands?

Improving digital infrastructure is fast increasing Raj's use of digital goods and services. Some developing countries are leapfrogging more mature markets in terms of technology and user friendliness, unencumbered by legacy systems. This enables brands to engage consumers like Raj by utilising the latest technologies to offer engaging, personalised and innovative consumer experiences to differentiate themselves. Furniture store Ikea, which opened its first store in India in 2018, created immersive showrooms using virtual reality technology where products can be viewed in 3D. As part of the store's opening to drive interest, customers were also provided with VR glasses to give a virtual tour of the store and Ikea plans to open more stores in India in 2019.

However, now that Raj is limiting his time online due to digital's negative effect on his well-being, brands have an opportunity to address this need through the way they engage with consumers like him. For example, as part of Google's Digital Wellbeing Initiative, YouTube has introduced a feature to remind users to take a break from watching videos and enables its users to track the time they have spent on YouTube over the last week with the aim of helping users to track their digital habits and curb device addiction.

Jan

Basic
63%

Psychological
34%

Self-fulfilment
36%

Societal
36%

Age: 43

Occupation: HR Manager

Location: Maastricht, Netherlands

Archetype: Experienced Cynic

Jan can barely remember a world without technology. He makes the most out of his quick Wi-Fi with his nightly Netflix binges and uses apps for everything from reading to his weekly food shop. Thankfully, 4G makes it so easy and Jan trusts (just about!) that his data is safe and secure. Besides, it's not like Jan has a choice. He's become dependent on doing things with one click of the button. Why fight the crowds when he can do it all online?

Despite this dependency, Jan thinks that he's been around technology long enough to know that it actually does more harm than good. He can't see tech fixing world problems like climate change—he can't even see it getting him a promotion! Jan keeps hearing about all these exciting innovations, but he's never been offered any digital training at work.

And what's more, Jan knows that technology isn't good for him personally. Constantly looking at his phone was becoming a nasty habit, so his New Year's resolution this year was to spend much less time online—and more time having fun!

What does this mean for brands?

Having access to a high-quality infrastructure means that Jan engages with brands mostly online, but views them dispassionately as selling a product and nothing more. Brands which fail to create a meaningful connection with consumers like Jan run the risk of being abandoned when a cheaper or quicker competitor comes on the scene. Educating or upskilling consumers can build customer trust and engagement. Brands that can bridge the digital skills gap felt by people like Jan may greatly strengthen their relationship with their customers.

Jan's doubts that technology can solve the world's most pressing challenges would enable a brand to set themselves apart by showcasing the societal impact digital can have. Outdoor clothing company Patagonia has an impressive record of amplifying its social initiatives through social media. In February 2018, it launched Patagonia Action Works, a digital recruiting platform which informs people of local environmental activism opportunities. Through its strong sense of purpose, Patagonia's customers are engaged by not just its products, but with the brand itself; as of 2018, Patagonia is now approaching $1 billion in sales annually.

Lucia

Basic
35%

Psychological
44%

Self-fulfilment
53%

Societal
62%

Age: 21

Occupation: Student

Location: Curitiba, Brazil

Archetype: Frustrated Newbie

Lucia is fairly hopeful for the future that technology could create. About to graduate from the Federal University of Paraná, the 21-year-old student feels more or less prepared for the modern workplace and believes that new technologies may open the door to future career opportunities or, at least, make the world a better place.

Lucia is nervous about how quickly her country is changing though and wonders a little bit whether all this technology is good for her self-esteem. She never cared what others thought of her before she got Instagram. Although some things can't change quick enough—her Wi-Fi has dropped five times in the last month and her download speeds are so slow, she can't even stream music.

Moreover, Lucia doubts whether businesses in Brazil—or even the government—are keeping up with all the change. She recently switched banks because her last bank suffered a data breach; it's put her off sharing too much online and she still prefers to shop in-store, just in case.

What does this mean for brands?

Lucia's digital needs indicate that she is expectant but frustrated. As well as ensuring the brand experience in-store is as compelling and personable as it is online, brands should pay attention to customers who experience low connectivity or are in remote locations. Brazilian retail company Magazine Luiza has seen rapid growth in its e-commerce service, but has been careful to cater to the needs of Brazilians who are still acclimatising to the digital economy. In many rural areas, Magazine Luiza is the only department store available and has repurposed many of these stores to include distribution centres to increase efficiency. It realises that having a physical store nearby (for picking up and returning products) is critical for a population new to e-commerce. Its methods have kept competitors like Amazon at bay and the company reported a net income in Q1 2018 of $41.5 million, up 152% from a year earlier.

To avoid losing customers like Lucia, brands must also prioritise their customers' trust in data security and privacy. By being transparent about how customer data is being used and handled, brands can reassure customers. In October 2018, Apple launched a portal that enables customers to see exactly what data the company holds on them. This step follows on from its Privacy Icon launched earlier in the year, allowing its users to see what information the company gathers using applications.

3. The impact on consumer behaviour

The digital needs framework can help businesses better understand their audiences and consumers. Having a more nuanced view of individuals and their attitudes towards the digital economy can help craft communications and marketing strategies and shape the testing and roll-out of digital products and services. For example, by prototyping new services across populations that score both high and low across each level of the needs model, businesses can develop stronger insights on adoption. But how else can this framework help shine a light on consumer behaviour? A number of insights emerge.

Belief in digital drives the business case for action

It is clear that the more positive people are about digital's wider impact on society and on their own skills, the more likely they are to engage with digital products and services. We examined a range of digital consumer activities—from online shopping and banking to using an app to order a taxi—and correlated these against the building blocks of digital needs. The strongest correlations existed for self-fulfilment and societal needs, while the relationship with basic and psychological needs is markedly weaker.

For example, in the United States, just 23% of people with below-average digital skills are more likely to use digital products and services in the following year. That proportion increases to 62% among people with above average digital skills. A similar picture is seen in France, where the population (52%) with above average digital skills is more than twice as likely to use digital products and services than people with below average skills. A similar difference emerges between people whose societal needs are being met and those who are not.

This means that brands, businesses and governments cannot just look at consumers in isolation from the wider digital context shaping their future. Give people belief in digital and they will be more likely to use digital products and services. Ensure they have the skills to chart their own destiny and they will engage more with online commerce. This means that there's not just an ethical case for meeting digital needs and delivering a digital economy that works for all—there's a strong business case too.

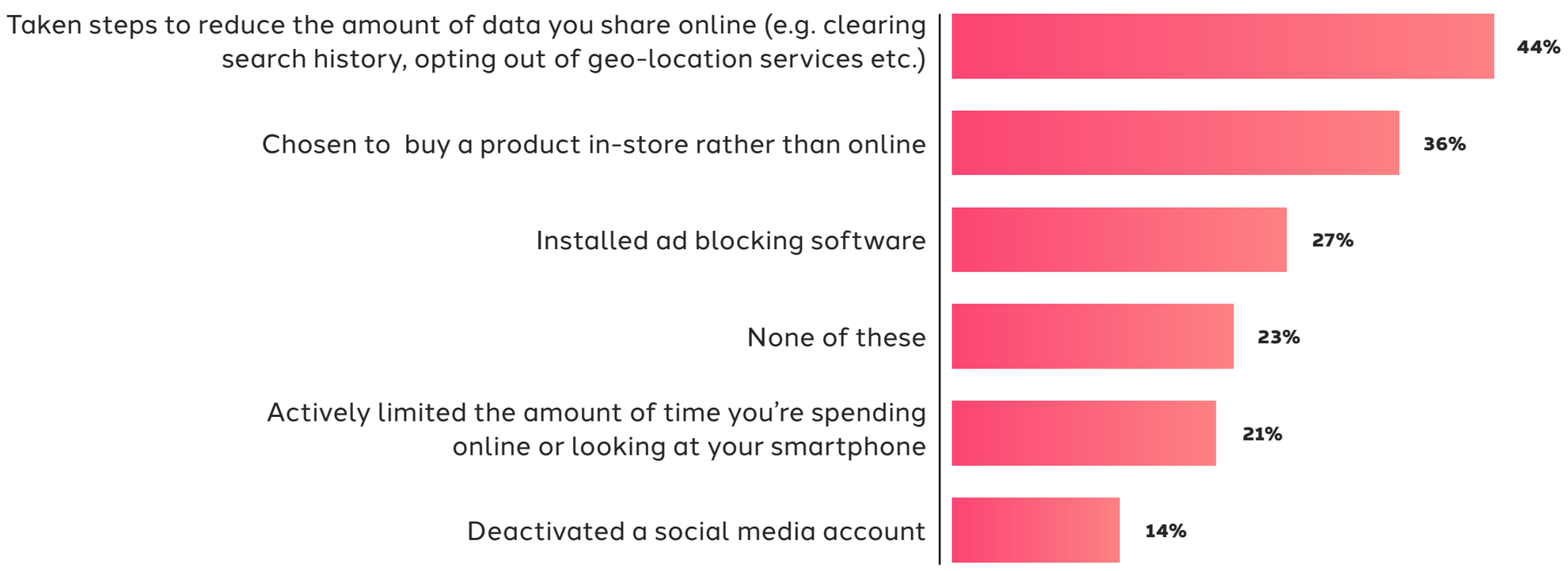
The new digital consumer: Hardest to reach but most valuable

Our research also introduces us to a new breed of digital consumer. She is a digital native and is taking actions to limit or control her online footprint that may appear problematic in commercial terms for businesses. For example, she's installing ad blockers that make it harder to ensure digital ads are being seen by target audiences. She's also reducing the amount of data she shares and time spent online, making it more difficult for businesses to personalise products and services. As Figure 12 shows, these are all actions that people in our survey took in the 12 months leading up to it (i.e. from July/ August 2018 to twelve months before).

Paradoxically however, as our analysis shows, this digital consumer is also the most likely to shop online, use an app to take a taxi or stream music. In other words, today's digital consumer is doing things that businesses might perceive to be negative, but are in fact the most positive as far as their propensity to buy digital products and services is concerned. In fact, across seven online activities (shopping online, using an app to order a taxi, banking online, streaming music, watching TV, downloading a book and consulting a virtual doctor), people are more likely to do these over the next 12 months if they have installed an ad blocker versus those who have not (see Figure 13).

Figure 12: People around the world are taking actions to limit their online footprint

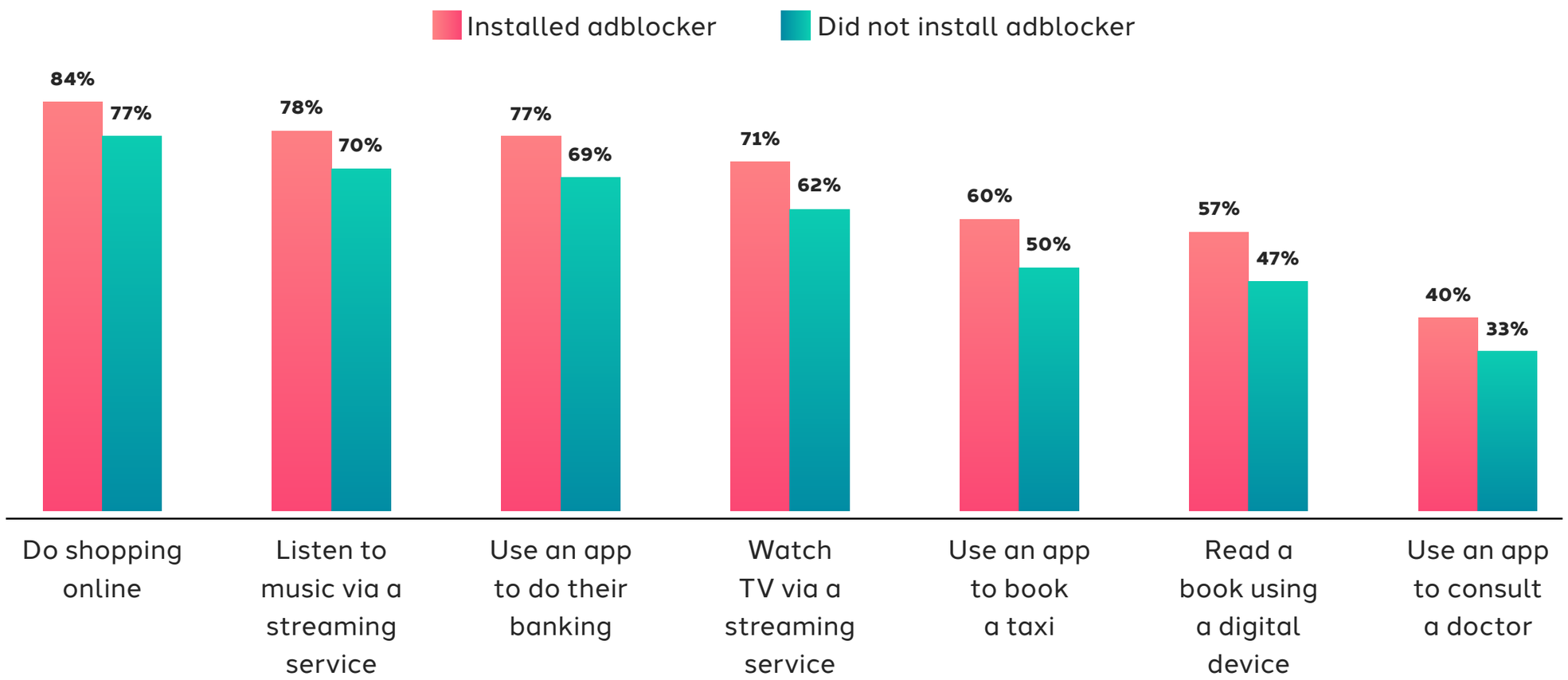
Have you taken any of the following actions over the last 12 months?
(% choosing each option)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

Figure 13: People are more likely to use digital products and services if they have installed an adblocker

Compared to last year, are you more or less likely to do the following? (% who did/did not install adblockers over the last year)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

In some instances, these gaps are particularly stark. For example, less than half (47%) of people who did not limit the amount of time they spent online are likely to download an e-book. For people who have limited their time online, this proportion increases to 60%. Similarly, while two-thirds of people who have not reduced the amount of data they share online are likely to use an online banking service, this proportion increases to 77% for those who have taken steps to limit their data footprint.

The research indicates that people are learning to manage the digital economy on their own terms, taking back control and reducing their online footprint. But they're doing so in a positive way—selecting and maintaining the online services they want. This is particularly common among young people. Across all the measures we have explored that relate to taking back control, it is people in the 18-24 or 25-34 age brackets that are most likely to employ them. For example, 61% of 25-35-year-olds in Estonia have taken steps to reduce the amount of data shared online, while in Canada nearly half (47%) of 18-24-year-olds have installed ad blocking software over the last year.

Overall, this trend is creating significant implications for brands, businesses and governments in terms of how they engage with consumers through digital channels. Increasingly, they will need to work harder to earn consumers' attention and find new ways to maximise the value of consumer interactions that may be increasingly fleeting.

Consumers have ‘red lines’ that businesses must not cross

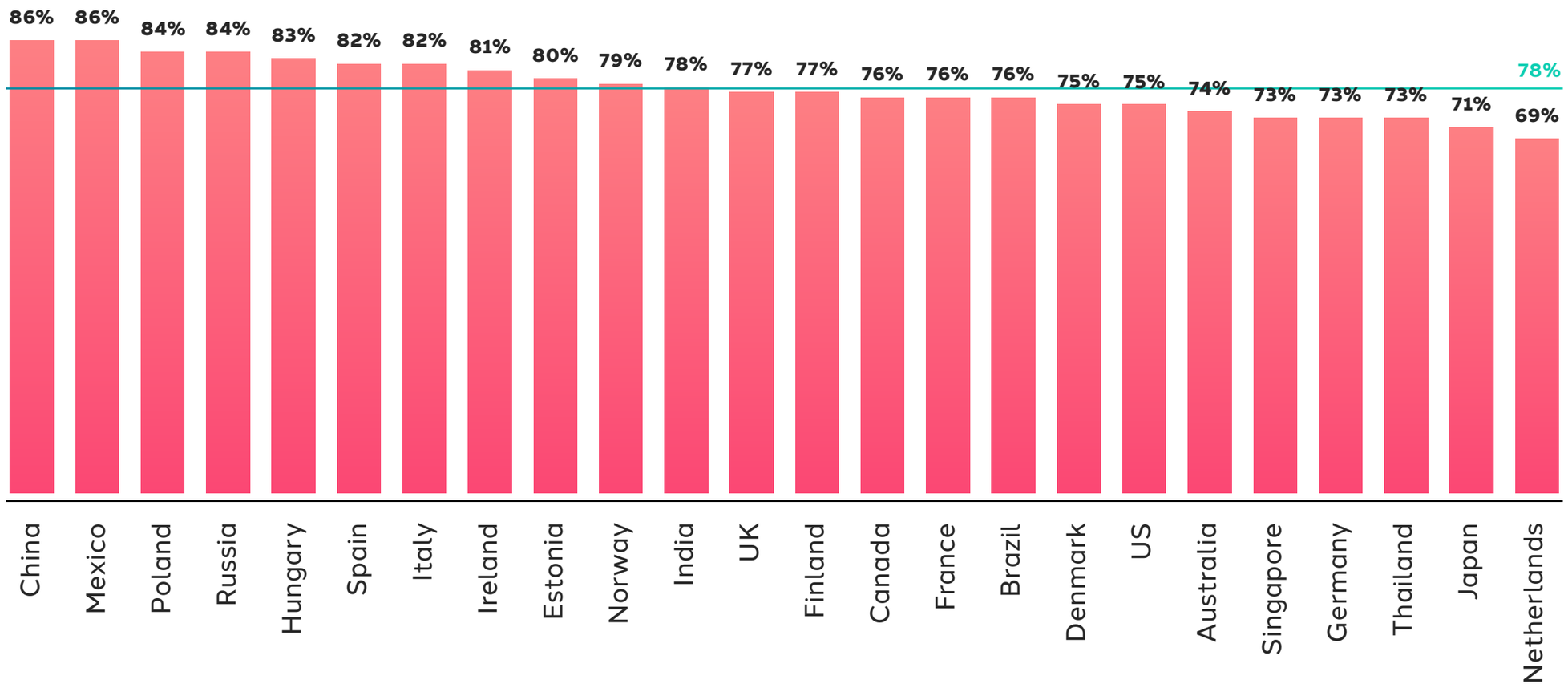
While just a couple of years ago, consumer understanding of how digital businesses used personal data was generally poor, today there are fewer hot topics. Misuse of personal data is the number one driver of distrust in the tech industry, according to our research, and as Figure 14 shows consumers will not do business with brands they don’t trust with their data. Data use has become a red line for consumers that businesses transgress at their peril.

These trends should inform how digital innovation is managed by businesses and organisations. As other issues relating to corporate use of digital technologies begin to impact the consumer decision-making process—the extent to which companies are automating their workforce? A lack of transparency around AI-generated algorithms?—businesses must respond to people’s needs in the process of service and product design.

Based on our analysis, two problematic truths emerge. First, people’s digital needs are not being met. And second, this has a significant bearing on their behaviour as consumers. The steps that organisations can take to address the gaps in digital needs and strengthen their relationship with consumers is the focus of the next section.

Figure 14: Eight out of ten people globally would stop doing business with an organisation that misused their data

To what extent would you be likely to stop doing business with an organisation that lost some of your data or used it irresponsibly? (% either likely or very likely)



Source: Dentsu Aegis Network Digital Society Index Survey 2018

4. Recommendations for brands, businesses and governments

The Digital Society Index provides a nuanced view of how effectively countries are delivering a digital economy that works for all. It also helps to reveal the extent to which people feel that these efforts are working. While there has been much debate recently about the negative impacts of digital, the long-run trend is one of huge benefit to people and the wider economy.
It is clear that making the process sustainable will rely on addressing people's needs in digital, rather than pursuing innovation for innovation's sake.

In response to the many challenges identified in our analysis, we've proposed a separate set of recommendations for brands, for businesses and for governments. These all have the aim of meeting digital needs more effectively, ensuring better relationships between brands and consumers as well as healthier digital societies overall. Given the complexity of the challenge, these recommendations are not exhaustive. They are intended to kick-start a discussion around practical action.

For brands

Segment consumers and audiences by motivation and needs: Traditional approaches to segmenting consumers by demographic characteristics are insufficient. By using a model like the digital needs framework to understand motivations for engaging with products and services, brands can tailor their strategies with far greater precision. The approach a brand might take to engage a consumer with a very low score on psychological needs might be very different to the approach they would take for someone whose self-fulfilment needs are largely being met. Similarly, when it comes to prototyping new digital products and services, it might make sense to target a cohort with low levels of digital literacy or limited belief in the societal impact of digital. By recognising and engaging with these potentially marginalised groups, brands can ensure they are developing more inclusive products and services that can more effectively be deployed across multiple markets.

Focus on engagement, not reach: The consumers most likely to use digital products and services are also reducing the amount of data they share, installing ad blockers and overall managing their digital footprint on their terms. This places a premium on brands' ability to maximise the value of the interactions they earn from consumers. For example, to celebrate its thirty-year partnership with the Boston Athletic Association and the release of a new running shoe edition, Adidas created a personalised video for each of the 30,000 runners who took part in the Boston Marathon in April 2018. Each video was created using high-tech chips attached to race bibs, street mats that transmitted radio signals and a 20-person camera crew and was emailed to runners mere hours after the marathon was over. Capitalising on a popular event, Adidas' media campaign proved very effective; from the brand's year-to-date baseline, its email open-rate for the campaign was up 113% and its actual product sales garnered per email increased by 1,189%.

Help people undertake their own digital detox: With many consumers taking steps to reduce the amount of data they share and time spent online, there is a loyalty premium in helping them interact with digital products and services on their own terms. If brands can put consumers' needs first by supporting their healthy engagement with the digital world, they will strengthen their customer relationships. Apple and Google have both unveiled features to encourage their users to "digitally detox" and even the dating app Bumble now offers its 40 million customers a snooze mode for them to take a one-day, one-week or indefinite break from the app.

For businesses

Compete on openness:
Make transparency around data usage a positive source of differentiation. With use of personal data the number one driver of distrust in the tech industry, any business ignores it at their peril. Australasian bank ANZ, in partnership with digital agency Isobar, has set itself apart from the competition by transforming its loan application process to be seamless and transparent for the customer through its Banker Desktop, a unified shared screen experience enabling customers to take charge of their financial health. Simplifying the process for customers and bankers alike, the Banker Desktop only asks for the most necessary data from the customer and by focusing on transparency within the customer experience, ANZ has been able to reduce its application time by 83%, giving the company back around 1,660 hours daily across Australia.

Make better use of digital skills:
Understand the digital skills that your employees have and constantly re-imagine work processes and organisation design around the full spectrum of their abilities. One company keen to determine its employees' skills is multinational conglomerate AT&T. As part of its Future Ready initiative to reskill its employees in technology skills, AT&T has created an AI-powered Career Intelligence portal which charts employees' personalised road map, taking employees' career journeys from where they currently are to where they want to be. The portal enables employees to map the jobs in demand within the company and the long-term skills required. It then creates a curriculum for employees to acquire these skills. The initiative aims to have retrained 100,000 of its employees by 2020.

Showcase digital's societal potential:
Find meaningful ways to reinforce understanding of the power of digital technologies to improve society and meet people's needs and wants. In late 2017 in partnership with digital agency 360i, National Geographic released the first-ever voice-powered meditation app, the Bravo Tango Training App, for veterans to address mental health problems in their community. Meditation exercises range from breathing and focus to visualisation and muscle relaxation. The app recognises over 40 moods—including anger, loneliness, fatigue, sadness and fear—to pair users to an appropriate exercise based on their feelings. Since its launch, the app has gained over 10,000 new users and the average time spent on the app in the first month of its launch was 10 minutes.

For governments

Develop a balanced scorecard of digital development: Metrics that measure digital transformation should incorporate measures of inclusion and trust alongside growth of digital industries. In 2018 Denmark came first in the biennial UN E-Government Survey, a ranking of the world's best-performing digital governments, as a result of its digital-first strategy, which mandates that all citizens must use public services online and receive email, rather than physical post, from the government. The system highlights the importance of safeguarding public trust in this environment by a transparent commitment to making these services safe and secure for citizens and businesses alike. Denmark's digital strategy includes efforts to support new business opportunities for the private sector and to encourage businesses' digital transition through improved framework conditions. New public-private partnerships and efforts to make more public-sector data available to businesses also drives innovation.

Give people more control over digital innovation: Governments can take a lead by involving people in the process of deciding what is ethical and in their interests, particularly as it relates to the ethics around use of personal data. In Spain, the DECODE project aims to build a trustworthy digital society by creating tools harnessing blockchain and cryptography technologies to give people back ownership of their data. It is currently working with Barcelona City Council and its civic technology platform Decidim.org to enable citizens to have their say while simultaneously having control over their personal data. Decidim will integrate with DECODE to provide citizens with a dashboard view of their personal data— from healthcare data to administrative open data—where they can control its use, such as in informing policy proposals.

Harness technology to enable more effective learning: Make it easier for people to update their skills over the course of their lifetime, leveraging the potential of digital technologies to create more immersive learning experiences. In Singapore, the government has utilised Virtual and Augmented Realities to create engaging learning modules and training for first- and second-year medical students at the National University of Singapore. Its VR system—Virtual Interactive Human Anatomy—enables its users to explore the anatomy and manipulate different parts and structures using a VR headset and hand-held controllers, as well as take part in situational exercises that would be difficult to replicate in real life. As of 2018, the system accounts for 15% of the curriculum and the University is looking to expand the system to nursing and postgraduate students and to create more complex interactive virtual training scenarios.

Final word

Despite some of the scare stories, digital technologies can enable us to be more connected, more creative and more human. But much of this potential remains untapped. In the rush to grow a digital economy, we have neglected to design it around our fundamental needs. Our digital needs model provides a framework around which new strategies can be built. The need to be connected through trusted networks; the need to enjoy a balanced sense of personal well-being; the need to be fulfilled in our work; the need to look positively to the future. For societal and economic reasons, we must ensure these needs become the guiding principles for future technological development.

Thirty years on from the birth of the world wide web, we are at a critical point in the development of the digital economy. We still have the capacity to re-orient it more closely around those human needs. But do we have the will? Our research indicates that the future of the digital economy depends on the answer being yes.

Methodology

Dentsu Aegis Network believes in the importance of developing a digital economy that works for all. That's why we embarked on this programme of research back in 2017, in collaboration with Oxford Economics, in order to understand how well countries are shaping that aspect of their development.

This is the second edition of the Digital Society Index research and our approach to building the index rests on the same three key dimensions:

Dynamism: the extent to which economies are driving growth through a dynamic Information and Communications Technology (ICT) sector (i.e. in terms of gross value added)

Inclusion: how well economies are sharing prosperity by gaining access to the digital economy (i.e. in terms of access to infrastructure, digital skills and jobs)

Trust: the extent to which the right enablers are in place to drive growth (i.e. in terms of appropriate privacy and security regimes, as well as the broader belief in the future of the digital economy).

This model captures the speed of growth (dynamism), the breadth of growth (inclusion) and the enabling environment that supports growth (trust).

Data collection and analysis

Fieldwork was conducted in July-August 2018 using proprietary Dentsu Aegis survey capabilities. We surveyed more than 43,000 people across 24 countries: Australia, Brazil, Canada, China, Denmark, Estonia, Finland, France, Germany, Hungary, India, Ireland, Italy, Japan, Mexico, Netherlands, Norway, Poland, Russia, Singapore, Spain, Thailand, United Kingdom and the United States. Sample sizes were adjusted according to population size to ensure they were representative.

Secondary data has been sourced for the most recent year available and from the most credible data providers to ensure robustness and international comparability. In constructing the index, equal weightings have been applied across all indicators. A detailed overview of the index structure, data indicators and sources is included on pages 40-42.

Index Structure

Pillar	Dimensions	Detailed title	Source	Year
Dynamism	**Strong ICT sector**	Value added by ICT hardware and services sector	**Oxford Economics**	**2017**
		GVA Growth of ICT hardware and services sector between 20067-2017 period	**Oxford Economics**	**2007-2017**
		R&D Expenditure as a share of GDP	**World Bank**	**2015**
	Elite cadre of digital specialists	Number of world-class STEM universities	**QS Ranking**	**2018**
		STEM graduates as percentage of total graduates	**OECD/China national Stats/Singapore National Stats**	**2015**
		Prominence of ICT-related job listings in overall job listings (last 12 months)	**Google Trends**	**2018**
	Focus on frontier technologies	Open Data Barometer score	**Open data barometer**	**2016**
		Quality of laws relating to ICT	**WEF - Network Readiness Index**	**2016**
		Computer Science journals H-Index	**Scientific Journal Rankings**	**2017**
Inclusion	**Widespread digitalisation**	Consumption of digital assets and services by non-ICT sectors as a share of GVA	**World Input-Output Database/Singapore National Stats/OECD**	**2014/ 2011**
		Share of ICT capital compensation in GDP	**Total Economy Database**	**2016**
		Share of people who feel their personal use of technology has not had a negative impact on their wellbeing	**Dentsu Aegis Network Index Survey**	**2018**
		Online advertising expenditure as share of total advertising spend	**Dentsu Aegis Network Ad Spend forecasts**	**2018**
	Opportunities for digital work	Quality of teacher training in ICT to produce an educational outcome	**The Web Index**	**2014**
		Government expenditure on education as a share of GDP	**UNESCO/National Stats China**	**2014**
		Share of people who have received training within the last three months	**Dentsu Aegis Network Index Survey**	**2018**
		Share of people with above average levels of digital skills	**Dentsu Aegis Network Index Survey**	**2018**
		Share of people with ICT skills who make effective use of them in their job	**Dentsu Aegis Network Index Survey**	**2018**
		Share of people whose education has provided the digital skills required for digital jobs	**Dentsu Aegis Network Index Survey**	**2018**
		Impact of ICT on the ability of women and girls to claim and demand their rights	**The Web Index**	**2014**

Index Structure

Pillar	Dimensions	Detailed title	Source	Year
Inclusion	Access to digital services	Fixed Broadband Subscription per 100 people	ITU	2016
		Mobile Broadband Subscription per 100 people	ITU	2016
		Share of internet connections above 15 Mbps	Akamai	2017
		E-Participation Index score	United Nations	2018
		Number of connected devices per person	Google Barometer	2018
		Ratio of Fixed-line monthly broadband cost to GDP per capita	ITU/OE	2014
		Availability of policies that promote free and low cost internet access	The Web Index	2014
		Share of people with good and excellent fixed internet speed	Dentsu Aegis Network Index Survey	2018
		Share of people with good and excellent mobile internet speed	Dentsu Aegis Network Index Survey	2018
		Share of people with good and excellent fixed internet coverage	Dentsu Aegis Network Index Survey	2018
		Share of people with good and excellent mobile internet coverage	Dentsu Aegis Network Index Survey	2018
		Share of people who think that fixed internet affordability is good and excellent	Dentsu Aegis Network Index Survey	2018
		Share of people who think that mobile internet affordability is good and excellent	Dentsu Aegis Network Index Survey	2018
		Absolute distance from equality (difference between the percentage of daily internet usage by milennials and older cohorts)	Google Barometer	2018
		Absolute distance from equality (difference between the percentage of internet usage by male and female)	Google Barometer	2018
		Share of individuals using the internet	ITU	2016

Index Structure

Pillar	Dimensions	Detailed title	Source	Year
Trust	Security	Number of secure Internet Servers per 1 million people	World Bank	2016
		Global Cyber security Index Score	ITU	2017
		Effective legal protection from cybercrime	The Web Index	2014
		Share of people who believe they can trust businesses to keep their personal data secure	Dentsu Aegis Network Index Survey	2018
		Share of people who believe they can trust governments to keep their personal data secure	Dentsu Aegis Network Index Survey	2018
	Privacy	Strength of data protection laws	DLA Piper	2018
		Quality of legal or regulatory framework for protection of personal data in countries	The Web Index	2014
		Share of people who trust businesses to protect the privacy of their personal data	Dentsu Aegis Network Index Survey	2018
		Share of people who trust government agencies to protect the privacy of their personal data	Dentsu Aegis Network Index Survey	2018
		Share of people who believe that businesses are transparent in the use of their personal data	Dentsu Aegis Network Index Survey	2018
		Share of people who believe that governments are transparent in the use of their personal data	Dentsu Aegis Network Index Survey	2018
	Future Outlook	Price to Earnings ratios for technology stocks	Bloomberg	2018
		Forecasted investment by ICT sector 2028 as a share of the sector's GVA	Oxford Economics	2028
		Index score relating to innovation capabilities	INSEAD,WIPO,Cornell	2018
		Share of people believing that the positive impact of technology will outweigh the negative impact over next 5-10 years	Dentsu Aegis Network Index Survey	2018
		Share of people who agree that emerging digital technologies will create job opportunities over the next 5-10 years	Dentsu Aegis Network Index Survey	2018
		Share of people who agree that technology will help solve the world's most pressing problems	Dentsu Aegis Network Index Survey	2018

About Dentsu Aegis Network

Part of Dentsu Inc., Dentsu Aegis Network is made up of ten global network brands—Carat, Dentsu, dentsu X, iProspect, Isobar, mcgarrybowen, Merkle, MKTG, Posterscope and Vizeum and supported by its specialist/multi-market brands. Dentsu Aegis Network is Innovating the Way Brands Are Built for its clients through its best-in-class expertise and capabilities in media, digital and creative communications services. Offering a distinctive and innovative range of products and services, Dentsu Aegis Network is headquartered in London and operates in 145 countries worldwide with more than 47,000 dedicated specialists.

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