The European connected consumer:

A life lived online

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Foreword

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Except for the tiny minority who eschew the internet and go 'off grid', we are, all of us, to a greater or lesser extent, connected consumers.

If you want to know what it is to experience life before the internet, then maybe try a digital detox for a few days. As refreshing as the change from looking at your phone screen may at first seem, the fact is that modern life relies on us being connected, online and plugged in. I'd expect that you would soon be back and as connected as ever.

As the birthplace of the World Wide Web, Europe has benefited massively, with so many activities that were previously analogue now taking place online or in a connected way. From health apps and virtual consultations to 3D printing at home or the use of augmented reality for business and pleasure, so many of our recent advances rely on consumers being connected.

And yet, as you will see from our findings, some doubts persist. Balancing privacy and the provision of services or products is a challenge every organisation must face. At Osborne Clarke, we don't see this debate going away any time soon as public and private organisations live through GDPR, privacy shield and the next major data breach. Added to this is the changing perception of consumers in relation to business use of their data.

Europeans, considered the paragons of a free market consumer lifestyle, want businesses to provide for their needs and reassure them about how these devices will fit safely into their everyday lives. Underlying this there are various nuances and differences in opinions on connected devices between those surveyed in each country.

YouGov conducted this Connected Consumer research for us. A nationally representative sample of 2,000 respondents per country across eight markets – Belgium, France, Germany, Italy, The Netherlands, Spain, Sweden and the UK – were asked the same questions during October and November 2017.

The findings will help businesses understand the key issues and distinctions that exist in these markets and how they can develop future strategies that incorporate this knowledge.

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Key data

46%
of Europeans would consider using an app to undertake an initial diagnosis of a minor health complaint rather than consulting a doctor

66% in Italy would consider using an app to undertake an initial diagnosis of a minor health complaint rather than consulting a doctor

26%
of Europeans would prefer a virtual health consultation over a face-to-face appointment with their doctor
(38% in 2016)

32% in France would consider using an app to undertake an initial diagnosis of a minor health complaint rather than consulting a doctor

28%
of Europeans have faith in the accuracy of the diagnosis they would expect from a virtual health consultation
(43% in 2016)

43% of Spanish consumers would prefer a virtual health consultation over a face-to-face appointment with their doctor
(50% in 2016)

15% of Belgians would prefer a virtual health consultation over a face-to-face appointment with their doctor
(28% in 2016)

26%
of Europeans have used specific knowledge of their consumer rights to complain/get compensation rather than complaining generally

16% in Belgium have used specific knowledge of their consumer rights to complain/get compensation rather than complaining generally

56%
of Europeans say it would not make a difference if a product was made with a 3D printer

91%
in Europe are aware of 3D printing

Key: higher than in any other market surveyed

18%
of Europeans use a personal digital assistant (PDA)

23%
in Europe who would use a PDA for any function in future, would use one to make purchases for them in accordance with general instructions, but without a specific prompt from them.

29% of Italians use a PDA

33% in Spain who would use a PDA for any function in future, would use one to make purchases for them in accordance with general instructions, but without a specific prompt from them.

34%
in Europe share privacy concerns over using a PDA or other connected devices

81%
of Europeans would be concerned about fraud if mobile payments completely replaced cash in the future
(12% increase from 2016)

76% of Europeans would be concerned about sharing too much personal data if mobile payments completely replaced cash in the future (25% increase from 2016)

60% in Sweden would be concerned about sharing too much personal data if mobile payments completely replaced cash in the future

66% in Europe would be concerned about the technology not working if mobile payments completely replaced cash in the future (26% increase from 2016)

48% in Europe would be concerned about running out of battery on their mobile device if mobile payments completely replaced cash in the future
(14% increase from 2016)

68%
of Europeans would stop buying products from a company if news broke of a data breach that affected their personal data

47% of Europeans are aware of augmented reality (AR)

58% in Spain are aware of AR

34% in The Netherlands are aware of AR

12% of Europeans have used AR

51%
of Europeans would stop buying products from a company if news broke of a data breach that did not affect their personal data

fewer than in any other market surveyed

Chapter one

Digital doctors

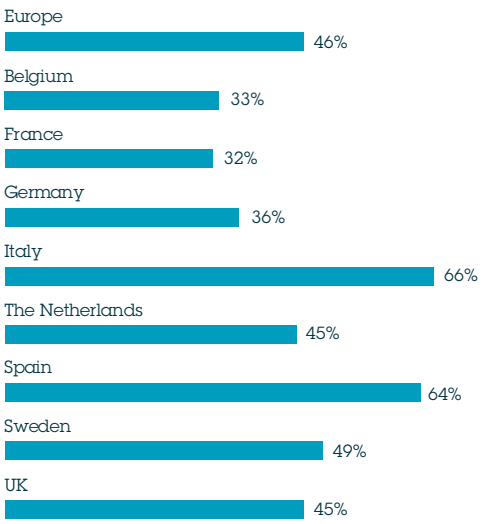
Health apps for diagnosis?

Around one half of Europeans (46%) would consider using an app to undertake an initial diagnosis of a minor health complaint rather than consulting a doctor. Italy (66%) and Spain (64%) stand out with the majority saying they would consider using an app for this purpose. Around one half in Sweden (49%), the UK (45%) and The Netherlands (45%) would consider doing so. The least willing are those in Germany (36%), Belgium (33%) and France (32%).

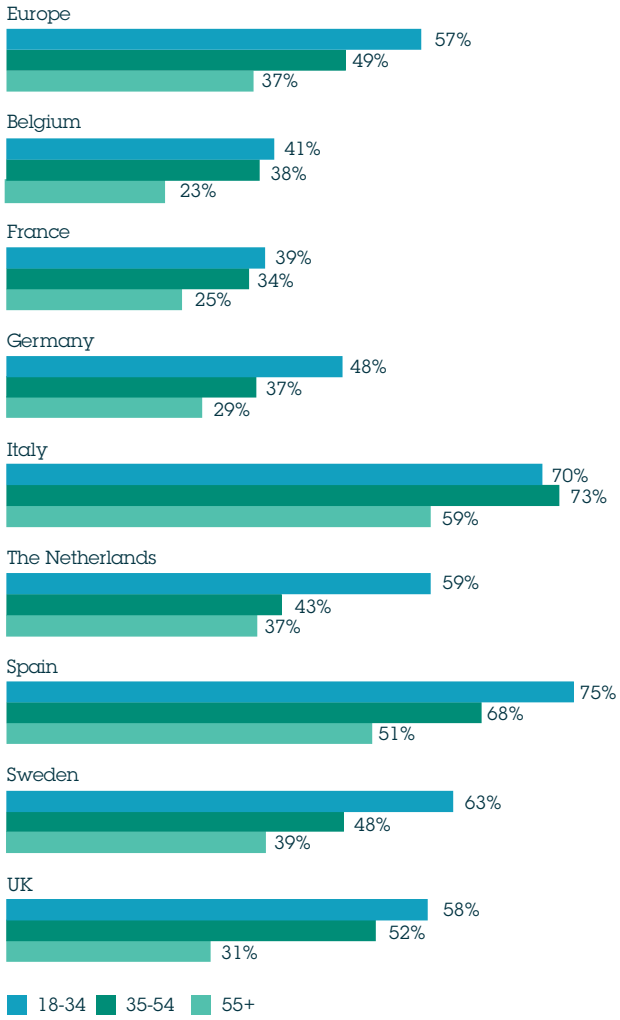
Consideration is driven primarily by the millennial age group in most markets, with an average of 57% across Europe. In Italy, though, it is the 35 to 54 year old age group that is most willing (73%) to use an app to undertake an initial diagnosis of a minor complaint and over one half of those aged 55 and over in Italy (59%) and Spain (51%) would consider using an app for this purpose.

Other than making a health diagnosis, prescription ordering is the task that the majority of Europeans (52%) would use a health app for. Perhaps unsurprisingly, six in ten in Italy (61%) and Spain (58%) would also use a health app for real-time health monitoring. One half in Spain (50%) and Italy (49%) would use the health app for health alerts, which is higher than in any other market.

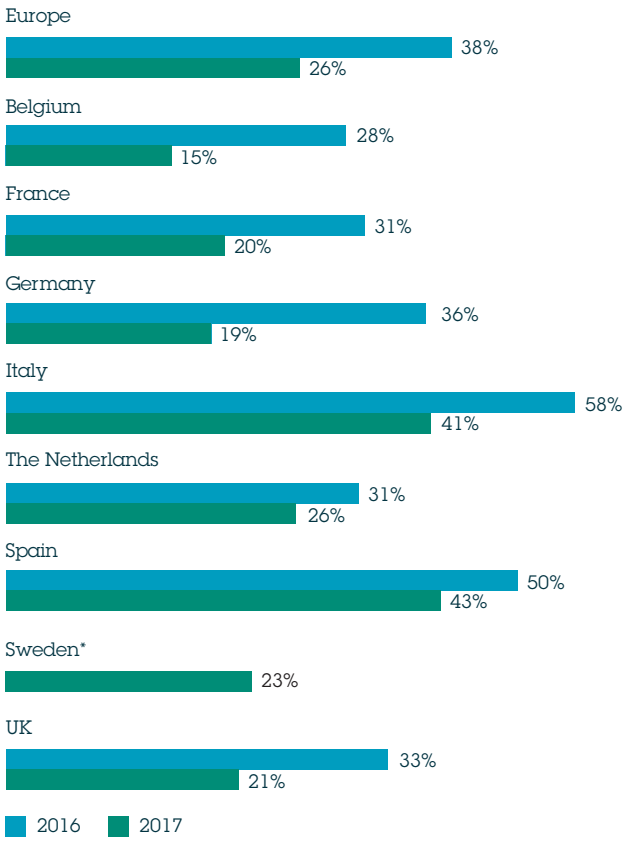
Would consider using an app to undertake an initial diagnosis of a minor health complaint



Would consider using an app to undertake an initial diagnosis for a minor health complaint (by age group)



Preference for using a virtual health consultation



*2016 result unavailable

"Italy and Spain stand out as the two countries that are most willing to have a virtual health consultation, though, overall, both would still prefer a physical consultation with a doctor over a virtual one."

A greater awareness of privacy?

In 2016, *Retail Week* and Osborne Clarke Connected Consumer research found that over one third (38%) of Europeans would prefer a virtual health consultation over a physical consultation with their doctor. However, in 2017 only one quarter (26%) said that they would prefer a virtual health consultation. This apparent dip in confidence is surprising given that around one half of Europeans would consider using an app to undertake an initial diagnosis of a minor health complaint. One explanation may be a greater awareness of privacy issues with the incoming GDPR in the context that the digital health sector is in its relative infancy and represents a revolution in how consumers use digital means to enhance their health and receive treatment.

Reservations about virtual health consultations are greatest in northern European markets.

Again Italy and Spain stand out as the two countries that are most willing to have a virtual health consultation, though, overall, both would still prefer a physical consultation with a doctor over a virtual one. There is little preference for a virtual health consultation in Belgium.

Millennials: early adopters

As with the use of an app for an initial diagnosis of a minor health complaint, preference for a virtual health consultation is driven by 18 to 34 year olds in most markets. The only two countries that deviate are Italy and France, where 35 to 54 year olds show a stronger preference. However, even in the millennial age group, preference for a virtual consultation fell in this survey across Europe (from 46% in 2016 to 34% in 2017). The greatest fall in millennial preference is in the UK, which fell by 26% (from 52% to 26%), and Italy, which fell by 23% (from 60% to 38%).

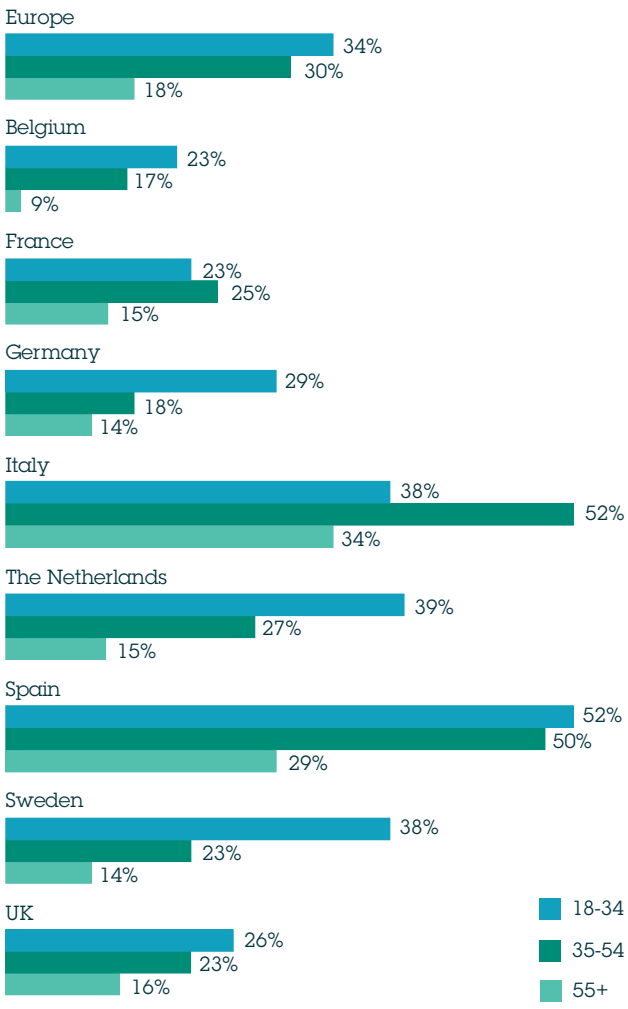
Interestingly, over one quarter of those aged 55 and over in Italy (34%) and Spain (29%) prefer a virtual health consultation, higher than in any other market.

Quicker diagnosis

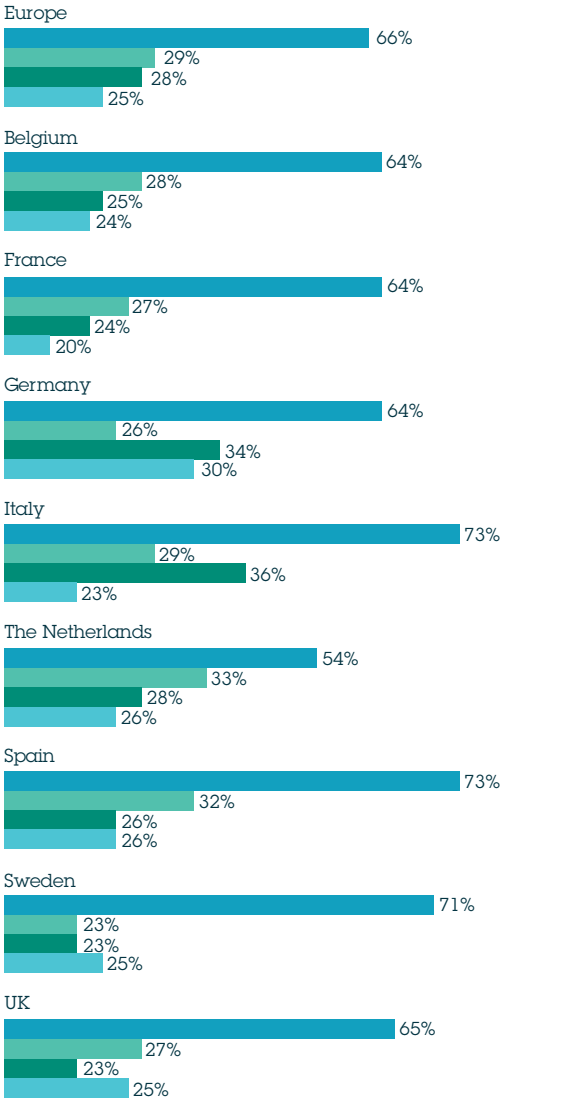
What drives preference for virtual health consultations over regular doctor appointments? As in 2016, the majority of people who say they prefer a virtual health consultation in all markets (and 66% across Europe) prefer the timeframes in which they can receive a diagnosis compared to arranging an appointment with a doctor. Avoiding the embarrassment of disclosing medical issues is the second most popular reason overall, with 29% of Europeans saying this is why they prefer a virtual health consultation over a regular appointment with their doctor.

Of those that say they prefer a virtual health consultation, it is those in Italy (73%), Spain (73%) and Sweden (71%) that are keenest on the perceived speed benefit of receiving a diagnosis, and although this is the main reason in other markets, it is not as prominent. And it is in The Netherlands and Spain where most (33% and 32% respectively) would prefer a virtual health consultation to avoid the embarrassment of disclosing medical issues. One third in Italy and Germany (36% and 34% respectively) say they would expect a more accurate diagnosis and one quarter in all markets would be more honest with a computer than a human.

Preference for having a virtual health consultation over a regular consultation with a doctor (either face to face or remotely, e.g. by video)



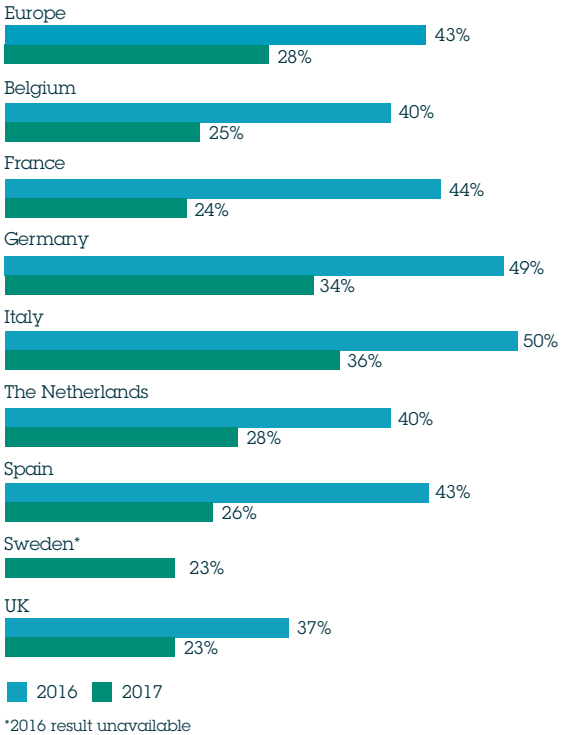
Reasons for preferring a virtual health consultation



Accuracy in question

The survey suggests a softening in consumer confidence in Europe in 2017 compared to 2016 in the accuracy of the diagnosis they would expect to receive from a virtual health consultation. In the context of a revolution in the provision of healthcare, fluctuations in confidence are to be expected and will serve to encourage Digital Health providers to improve their services still further.

Would expect a more accurate diagnosis from a virtual health consultation than a doctor



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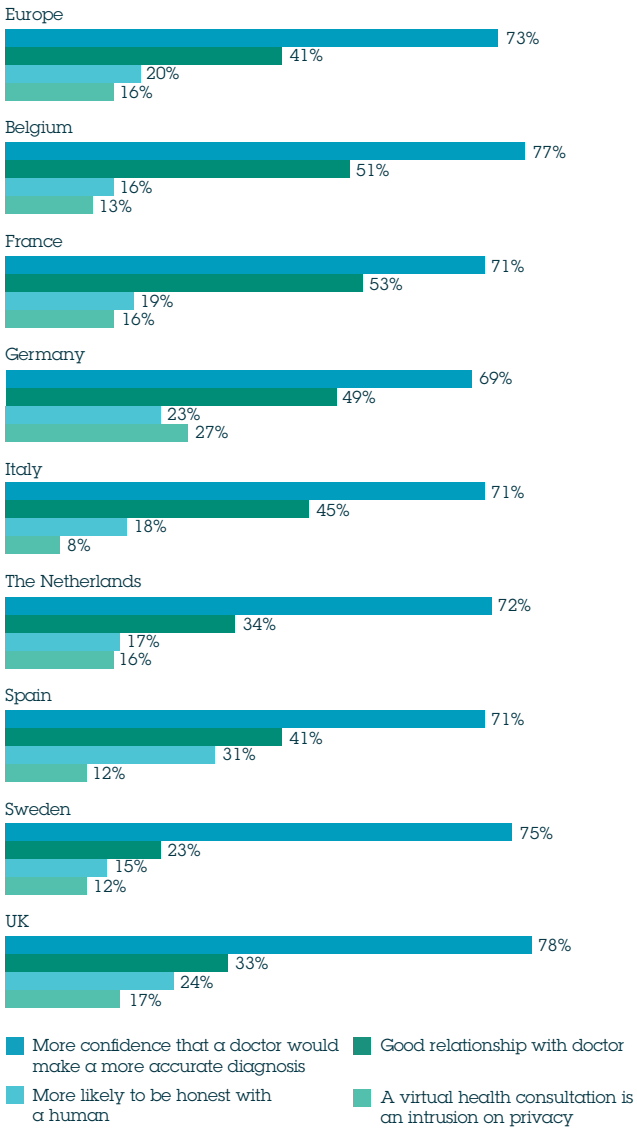
This year is seeing two realities. The first reality is that the improved user experience and the use of artificial intelligence is revolutionising how patients interface with digital doctors – in the same way that the improved user experience revolutionised e-commerce (e.g. eBay), transport (e.g. Uber) and accommodation (e.g. Airbnb).

The second reality is the economic necessity in all corners of the globe – healthcare needs to become more cost-effective. Hence Berkshire Hathaway embarked on a digital healthcare JV with Amazon and JP Morgan in January 2018 and Warren Buffett can call US healthcare costs "a hungry tapeworm on the economy". Jack Ma, the co-founder and executive chairman of Alibaba Group, a multinational technology conglomerate – who has called most digital trends correctly – has said that 'Big Health' will create the next richest man in the PRC.

People are placing more trust and confidence in their relationship with their doctor. Of Europeans who would prefer a regular consultation with a doctor over a virtual health consultation, 73% say they "have more confidence that a doctor would make a more accurate diagnosis".

Confidence that a human doctor would make a more accurate diagnosis is a key reason for those preferring a regular consultation with a doctor in all markets. A good relationship with their doctor is important to those in France (53%). Those in Spain (31%) feel they can be more honest with a human than a computer. In Germany, 27% of consumers would find a virtual health consultation an intrusion on their privacy – more so than in any other market.

Reasons for preferring a regular consultation with a doctor



Chapter two

Enthusiasm for 3D printing

3D printing has revolutionised the manufacturing of products and the potential benefits for consumers are huge. For the first time ever people are able to 'print' their own products at home instead of purchasing them online or in-store.

"Awareness of 3D printing in Europe (91%) is near universal."

Formula 1 3D-printed race car parts

Formula 1 race cars need to be constantly tweaked to help cars perform at top speed. But getting these specialised parts can take weeks. McLaren Racing Limited is using 3D printing to modify the parts on its race car, taking a fraction of the time of traditional methods. The team travels to races with a 3D printer, their ultimate goal being to print parts out of carbon fibre so that they can be immediately put on a car at the race site.

Source: CNN Tech April 2017

Universal awareness

Awareness of 3D printing in Europe (91%) is near universal and 56% of Europeans say that it would not make a difference if a product they were considering purchasing was made using a 3D printer rather than by traditional manufacturing methods.

A seemingly small minority of Europeans (20%) say that it would make a difference if a product was made using a 3D printer. However, the relatively high proportion of those who say they "don't know" in all markets except Italy suggests there may be varying degrees of understanding of the technology itself. Italy has the highest proportion of those who say it would make a difference if a product was made with a 3D printer (36%) and also the lowest proportion of those who say they "don't know" (15%), indicating perhaps a more discerning view of the technology.

Clearly there is work to be done here for manufacturers to convince European consumers of the benefits of 3D printing.

Would it make a difference to you if a product you were considering purchasing was made using a 3D printer rather than by traditional manufacturing methods?

	Yes	No	Don't know
Europe	20%	56%	24%
Belgium	19%	55%	25%
France	24%	52%	24%
Germany	15%	60%	25%
Italy	**36%**	**49%**	**15%**
The Netherlands	21%	54%	26%
Spain	19%	60%	21%
Sweden	16%	52%	**32%**
UK	**12%**	**64%**	24%

Highest category percentage

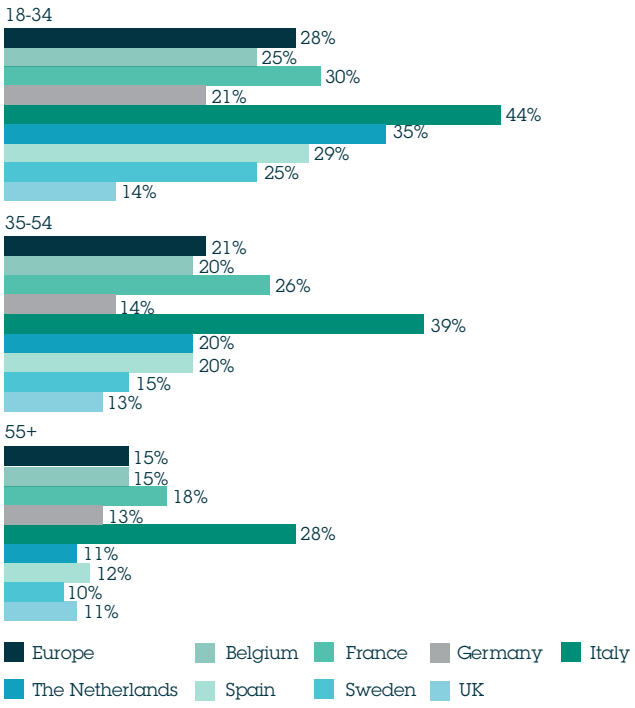
Lowest category percentage

Majority support

While there is a small but significant minority that share concerns over 3D printing, the majority are accepting of or enthusiastic about the future of the technology. Around one half in all countries say it does not make a difference if products are made using 3D printers.

Intriguingly, it is the older age group (55 and over) for whom fewer said it would make a difference if a product they were considering buying was made using a 3D printer rather than traditional manufacturing methods. Few UK consumers (of any age) said that it would make a difference if a product is 3D printed.

Would it make a difference to you if a product you were considering purchasing was made using a 3D printer rather than by traditional manufacturing methods? %YES



Andiamo orthoses

Andiamo is a start-up in the medical devices sector that combines body imaging techniques with 3D printing to make orthoses – external body braces for people with conditions such as cerebral palsy, stroke and diabetes. The orthoses fit closely to the body like braces or corsets. Traditional manufacturing is done on the basis of hand measuring and can take up to six months for delivery of the finished product.

For children, this lead time can be particularly difficult – they may well have outgrown the device by the time they receive it. Andiamo concentrates on paediatric devices and has reduced product delivery to less than two weeks.

Source: BBC News magazine March 2017

Home printing

For the 56% of Europeans who say it does not make a difference to them if products are 3D printed, the majority (74%) would print their own if they had the capability. They named self-sufficiency, cost saving and convenience as the biggest benefits.

Quality concerns

Concerns over the product quality and a preference for traditional manufacturing are the main reasons why it would make a difference to 20% of Europeans if a product they were considering buying was made using a 3D printer.

A major concern in Italy among those who said it would make a difference if a product was made with a 3D printer (36%) is the responsibility for product faults, which at 32% is significantly higher than all other markets.

Reasons for printing at home (most important reason)

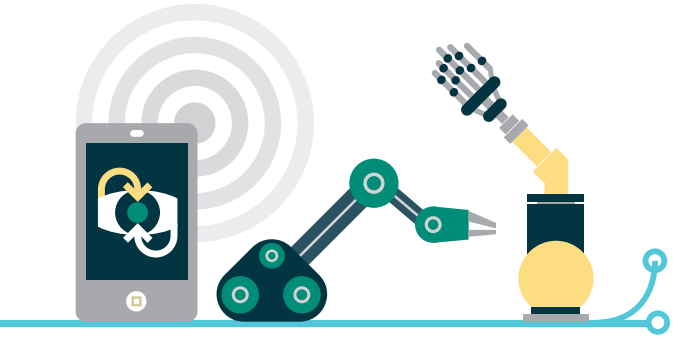
	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
Ability to print own products	53%	53%	52%	56%	50%	57%	47%	56%	52%
Cost saving	31%	33%	30%	30%	29%	27%	33%	30%	33%
Convenience	31%	28%	31%	27%	34%	32%	31%	34%	32%
Trustworthy 3D printing file	25%	18%	18%	25%	25%	24%	29%	27%	27%
Time saving	20%	21%	22%	21%	22%	15%	22%	17%	17%

1st reason 2nd reason 3rd reason

Reasons why it would make a difference if a product was made with a 3D printer (most important reason)

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
Concerned about the product quality	37%	38%	38%	38%	34%	37%	43%	39%	37%
Prefer traditional manufacturing methods	30%	33%	31%	28%	23%	31%	33%	31%	36%
Concerned about the impact on jobs	28%	27%	30%	32%	24%	27%	30%	25%	33%
Don't know enough about the technology	27%	25%	27%	29%	28%	27%	24%	25%	31%
Concerned about responsibility for a product fault	26%	24%	25%	22%	32%	22%	26%	24%	18%
Don't trust the technology	17%	24%	22%	16%	11%	14%	16%	15%	22%

1st reason 2nd reason 3rd reason



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One of the main concerns expressed in the study about 3D printing was issues around quality and responsibility for any product fault. However, for 3D printed products, the primary responsibility for quality and safety rests with the company under whose brand or trademark the design file or the printed product is produced. Companies producing design files will need to be confident that the printed products will meet all compliance requirements.

This includes any labelling requirements and any obligations to CE mark the product. Producing a design file also does not obviate the requirements to ensure the printed product will be safe. Companies can meet this obligation by safety testing a sample of printed products. However, consumers must equally ensure that they are purchasing design files or printed products from reputable sources, otherwise they may well face personal liability for putting an unsafe product on the market.

"While there is a small but significant minority that share concern over 3D printing, the majority are accepting of or enthusiastic about the future of the technology."

A lack of understanding of the technology makes a difference to consumers in all markets. Of those who said it did make a difference that products are 3D printed, a quarter in all markets say that they do not know enough about the technology. This is a significant proportion of consumers and potentially this lack of knowledge is impeding their judgement of the technology.

Age is a key differentiator when it comes to why it makes a difference to consumers that products are 3D printed. Of those who said it did make a difference, 45% of those aged 55 and over in Spain, 39% in Belgium and 30% in Italy show the greatest preference for traditional manufacturing methods. It is the 18 to 34 year olds in Sweden (36%) and France (32%) who prefer the traditional way of making products.

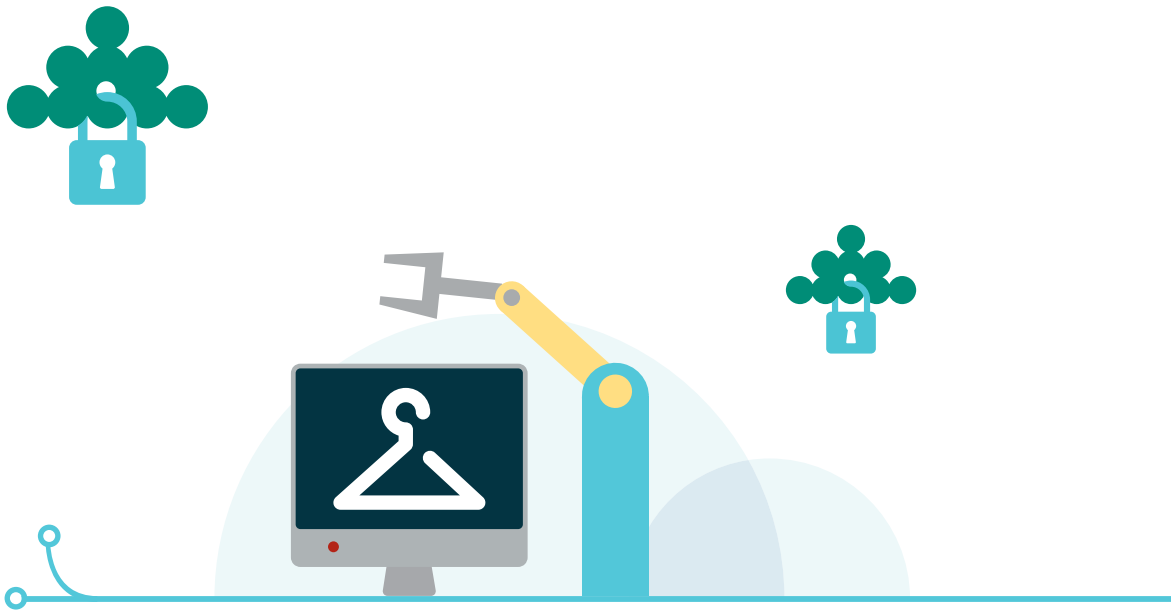
Potential cost savings and quality are key considerations; any technology that keeps more cash in consumers' wallets while providing them with high-quality products is likely to be popular.

Adidas 3D-printed shoe

Adidas unveiled its latest 3D-printed shoe, the Futurecraft 4D and plans to sell more than 100,000 pairs by the end of 2018. 3D printing allows design modifications, for example different points of density throughout the midsole.

To achieve this with regular shoes, manufacturers need to glue together different pieces of foam with varying densities. But with 3D printing, all it takes is a tweak of a design file to make a pair more springy or stable. Adidas sees a future where everyone will be able to have their own customised 3D-printed shoe.

Source: TechCrunch April 2017



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The rapid spread of 3D printing also gives rise to a myriad of legal issues and situations that had been previously unheard of. It is important to keep in mind that any object, even complex and sophisticated devices, can be replicated simply by using two things, 3D computer-aided design (CAD) files of the product and a 3D printer. CAD files and objects are often protected by intellectual property rights, but under the current IP regime, such protection does not seem to deter customers from printing off their object of desire for their own personal use. Trends in technology and other industries point to the fact that 3D printing is here to stay, compelling brand owners to rethink their IP protection and enforcement strategies. The good news is that 3D printing cannot compensate for the experience of buying a luxury product in a shop and a being part of a brand's philosophy.

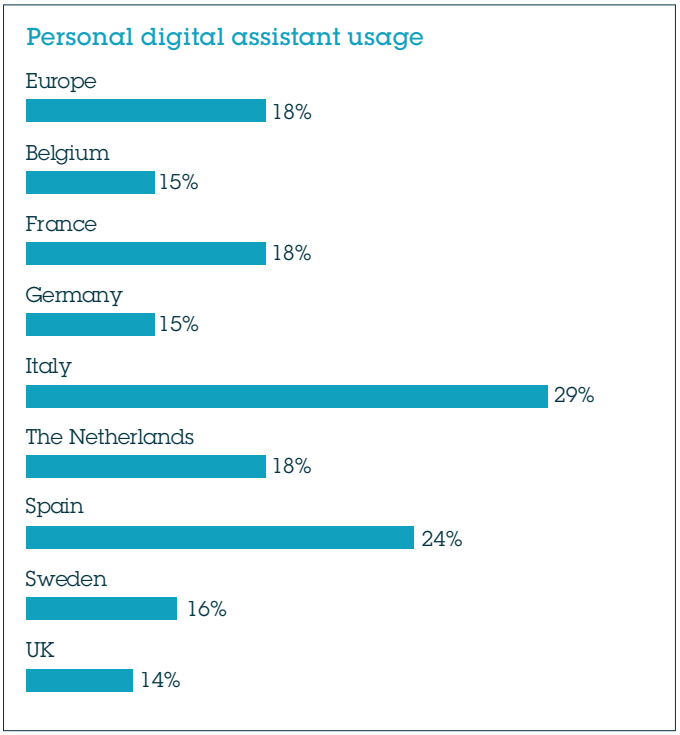
Chapter three

Artificial intelligence and data security

Personal digital assistants (PDAs) have already made dramatic changes to the way people live and connect in the home. Leading brands such as Amazon's Alexa and Google's Home have surged into European households in the past year. Consumers are attracted by their relatively low price and potential to control all of their home's devices. Yet, despite this growth, overall usage in Europe remains relatively low and only 18% of Europeans claim to use one. Even in the most connected market (Italy at 29% usage), we are still a long way from connected homes.

Interestingly, PDA usage is driven by 18 to 34 year olds across all markets, except the UK where usage is highest among those aged 35 to 54 (18%).

Europeans currently use PDAs for largely the same reasons. Primarily, this is "making suggestions to me when prompted based on tasks/requests that the device has done for me before".



However, in Spain and the UK there are key differences. In Spain, 36% use a PDA to make purchases for them when prompted – twice as many as any other country. In the UK, 29% gave other reasons for using it: foremost were listening to music and assisting with cooking.

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The current crop of personal digital assistants are really just scratching the surface of their potential in relation to the connected home. Low household penetration rates belie a slow and steady underlying growing trend in their use.

To date manufacturers have offered these devices at a substantial discount on the basis that they provide a superb information and habit-gathering platform – in short, PDA devices need to be "always on" to respond. It is this surveillance aspect or more specifically consumer trust in mass personal data collection that manufacturers need to address in order to allay fears and increase adoption.

As they become more and more sophisticated and the services that you can obtain through them become more diverse, I predict that we will see an increasing collision with sector-specific regulation, especially when these devices are perceived as providing advice. What will be the situation if, for example, Amazon's Alexa makes a medical diagnosis or recommends a particular financial product for you?

Consumer trust also needs to extend to the use of the data collected by these devices. Listening to a machine respond to your voice commands is a beguiling experience. Ultimately, however, we do need to understand that the cost of their usage is more than merely monetary.

Which of the following do you use a personal digital assistant for?

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
Making suggestions to you when prompted based on tasks/requests the device has done for you before	52%	51%	44%	47%	61%	52%	63%	50%	35%
To monitor your location, diary and interaction history to provide 'real time' suggestions (such as travel arrangements, restaurants and activities)	40%	42%	37%	39%	42%	42%	51%	27%	29%
Making suggestions to you without being asked based on tasks/requests the device has done for you before	23%	17%	24%	22%	24%	28%	34%	14%	11%
To make purchases for you when prompted	18%	17%	16%	14%	17%	14%	36%	11%	9%
Other (please specify)	9%	11%	8%	9%	5%	5%	1%	14%	29%

1st reason 2nd reason 3rd reason

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There's a risk that PDAs making unprompted, automated purchases for us could have a significant impact on choice and competition. This will, in part, depend on how commercial relationships develop.

Will my PDA only refill my fridge with milk from one supermarket, or only from its own shopping channel? Will I have a choice of where to buy my groceries, or will it be driven by commercial exclusivity deals – maybe by my PDA provider or even by my fridge brand? If I ask my PDA to turn on the news, will it offer me a choice of TV channels or default to its own service or a preferred partner broadcaster?

As more of our consumer choices become automated and influenced by our PDAs, there may be a trade-off between convenience and choice. We have to expect that the competition authorities will take an interest in the overall impact on consumer choice and value of automated Internet of Things shopping, since it could make retail competition much less dynamic across a very wide range of products and services.

"Over a quarter of respondents across all markets would, in the future, be willing for the device to make purchases for them…"

Which of the following would you use a PDA for in the future? (among those who would use a PDA for any function)

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
To manage and control all of your connected devices so as to enable you to control all devices through one channel (such as monitoring the fuel level in your car, controlling the heating in your home or managing access controls in the home)	51%	50%	49%	49%	55%	47%	52%	51%	58%
Making suggestions to you when prompted based on tasks/requests the device has done for you before	48%	47%	38%	41%	51%	50%	51%	46%	50%
To monitor your location, diary and interaction history to provide 'real time' suggestions (such as travel arrangements, restaurants and activities)	36%	38%	23%	38%	33%	40%	38%	40%	39%
To make purchases for you when prompted	30%	27%	25%	27%	27%	25%	35%	33%	37%
To make purchases in accordance with general instructions, but without a specific prompt (e.g. order food when the fridge is empty)	23%	21%	22%	21%	21%	18%	33%	21%	21%
Making suggestions to you without being asked based on tasks/requests the device has done for you before	20%	15%	21%	17%	24%	17%	27%	18%	22%

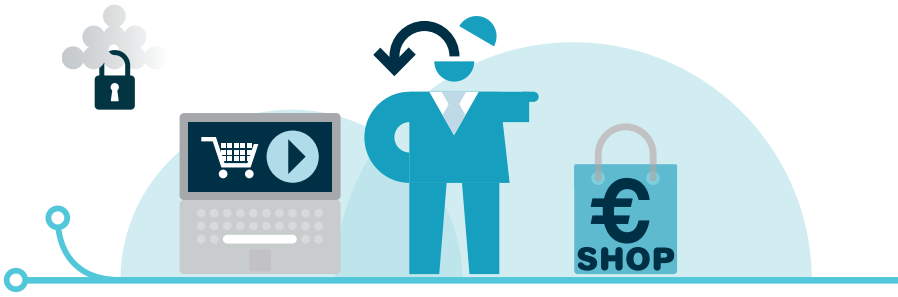
1st reason 2nd reason 3rd reason

Future buying habits

How do consumers envisage using PDAs in future? The main difference is that they see the device becoming the hub for all of their connected devices.

Among those who would use a PDA for any function in the future, one in five in all markets (and one third in Spain) would in the future use a PDA to make purchases for them in accordance with general instructions, but without a specific prompt from them.

Over a quarter of respondents across all markets would, in the future, be willing for the device to make purchases for them when prompted to do so. This is higher than the number of those currently using a PDA to make purchases for them and perhaps indicative of a potential recent growth in trust in the device.



Building trust to increase usage

Trust is the primary barrier that is preventing widespread adoption and usage of PDAs in Europe. This manifests itself in concerns over maintaining privacy (34%) and data security (33%) and trusting the device to make the right decisions (30%).

This may explain the current reluctance among consumers to use their PDA to make purchases for them. Without adequate trust that the device will carry out their instruction as intended and without a potential security breach, the number using their PDA to fulfil this function is unlikely to increase. Coupled with that, given the spate of hacking scandals that have occurred over the past year, data security and privacy are now issues that are at the forefront of consumers' minds.

It is vital that businesses are sensitive to the heightened concerns around data security and privacy. They need to ensure that the increased drive for convenience and functionality does not alienate people already feeling a loss of control of their personal data and information online.

Mark Taylor
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The introduction of the General Data Protection Regulation (GDPR) is a step change in privacy regulation for most markets. Companies are facing challenges in providing users with both the transparency and control over their personal data that GDPR envisages. PDAs that control multiple devices and services for a user have the potential to collect and aggregate a large amount of data about those users and households. As such, GDPR compliance for PDAs is far from straightforward, and any compliance approach needs to address how data is shared with the manufacturer's and third parties' own broader service offerings.

The GDPR, which takes effect on 25 May 2018, addresses the issue of processing biometric data and organisations need to be aware of their responsibilities under it when collecting and storing biometric data.

Concerns about using personal digital assistants or other connected devices

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
Maintaining privacy/protecting my personal information	34%	35%	40%	35%	33%	32%	38%	32%	29%
Security breaches/data hacking	33%	35%	30%	33%	31%	35%	34%	31%	36%
Trusting the PDA to make the right decisions	30%	30%	27%	28%	37%	24%	32%	32%	31%
Sharing too much personal data	25%	24%	23%	26%	26%	26%	27%	22%	25%
Receiving unwanted advertising/marketing	22%	22%	20%	17%	24%	21%	22%	22%	24%

1st reason 2nd reason 3rd reason

Again, consumers will have to decide how much they value the convenience of a control hub in their homes against privacy issues. A PDA that controls the heating, the vacuuming, fridge replenishment, music and TV consumption, for example, has the potential to aggregate a huge variety of data about an individual household. This could be used to build a very detailed profile of the inhabitants. Consumers are becoming increasingly aware of the wide commercial uses to which their big data can and is being put.

"Trust is the primary barrier that is preventing widespread adoption and usage of PDAs in Europe."

Flemming Moos

Partner, Germany
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Gaining trust from consumers in adequately protecting their personal data when using PDAs is not an easy task: the results of the study show that consumers do not worry so much about specific potentially intrusive data handling practices such as direct marketing measures or sharing data with third parties, which could have been addressed easily by the manufacturers. An explanation for this might be that consumers feel their interests are effectively protected by existing laws. Concerns rather relate to more general issues that are less easy to get a grip on.

This is because data processing activities caused by the use of PDAs are extensive and complex so that it is a challenge to provide sufficient transparency to consumers. Privacy policies intended to explain complex data processing systems are normally either too general or too long. Therefore, manufacturers should explore additional ways to gain consumers' trust. Two approaches seem to be particularly promising: (1) the adoption of systematic data protection by design approach, factoring in effective privacy controls from the outset; and (2) making use of data protection certification schemes. Both concepts are also at the core of the GDPR and should be on the road map of every PDA manufacturer.

Chapter four

Mobile payments and security

Death of cash?

Predictions of the death of cash as the primary means of payment have been made for a number of years. According to the British Retail Consortium, card payments replaced cash as the number one payment method in the UK in 2016, representing over 50% of all transactions – one of the biggest drivers being the increase in use of contactless payments.

Retail Week and Osborne Clarke Connected Consumer research in 2015 and 2016 correctly predicted rapid growth in the popularity of contactless payments in the UK. But does this mean the death of cash is imminent in the UK? It is Sweden that is expected to become the world's first cashless society by 2030, according to a study by Stockholm's KTH Royal Institute of Technology.

However, the situation may not be quite as straightforward as it seems. This latest Connected Consumer research shows concern growing across all markets over mobile payments. Fraud (81%) and security breaches (80%) remain Europe's biggest worries and more consumers worried about them in 2017 than in 2016.

Consumers in Europe are also increasingly concerned about sharing too much personal data. This is unsurprising given, again, the number of high-profile data breaches in 2017, one example being the hacking of taxi app Uber in November 2017, in which 57 million passenger records were stolen.

Trust in the technology, as seen with PDAs, is also an issue here with concern over the technology not working increasing significantly, as well as fears over running out of battery.

Concern about the following problems if mobile payments completely replaced cash as a method of payment in future (% very/quite concerned)

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden*	UK
Fraud	81% (+12)	84% (+15)	86% (+12)	85% (+9)	79% (+20)	73% (+3)	87% (+17)	71%	81% (+8)
Security breaches	80% (+7)	84% (+8)	86% (+8)	86% (+9)	78% (+8)	73% (+3)	85% (+8)	63%	83% (+6)
Sharing too much personal data	76% (+25)	77% (+26)	82% (+26)	84% (+24)	**74% (+32)**	**66% (+13)**	82% (+30)	60%	**79% (+22)**
Losing your mobile device	67% (+11)	70% (+16)	77% (+13)	67% (+13)	68% (+23)	57% (-1)	71% (+5)	61%	70% (+6)
Technology not working	66% (+26)	71% (+29)	**74% (+34)**	**75% (+31)**	48% (+14)	**61% (+13)**	**75% (+45)**	57%	69% (+18)
Running out of battery on your mobile device	48% (+14)	**46% (+32)**	60% (+24)	52% (+16)	43% (+11)	36% (-1)	47% (+11)	42%	57% (+6)

(Figures in brackets show percentage point difference compared to 2016 result)
*2016 result unavailable

Biggest country percentage increase

Is the future biometric?

Fingerprints are the most popular form of personal ID in Europe (60%), followed closely by the more traditional device security method, passwords (57%). One in three (34%) are comfortable using iris/eye scanning to unlock their device while slightly fewer are comfortable using facial (25%) or voice (21%) recognition. This masks regional variations: those in Germany are less comfortable using personal identification than we see in other markets. However, with the launch of devices such as Apple's iPhone X, where such technologies are standard, it is likely that this will lead to an increase in consumer acceptance and growth in this area.

As consumers become more comfortable with biometric device security methods, there is exciting potential for biometric identity technology. The GDPR addresses biometric data in detail and organisations need to be aware of their responsibilities in collecting and storing biometric data.

Clare Burman

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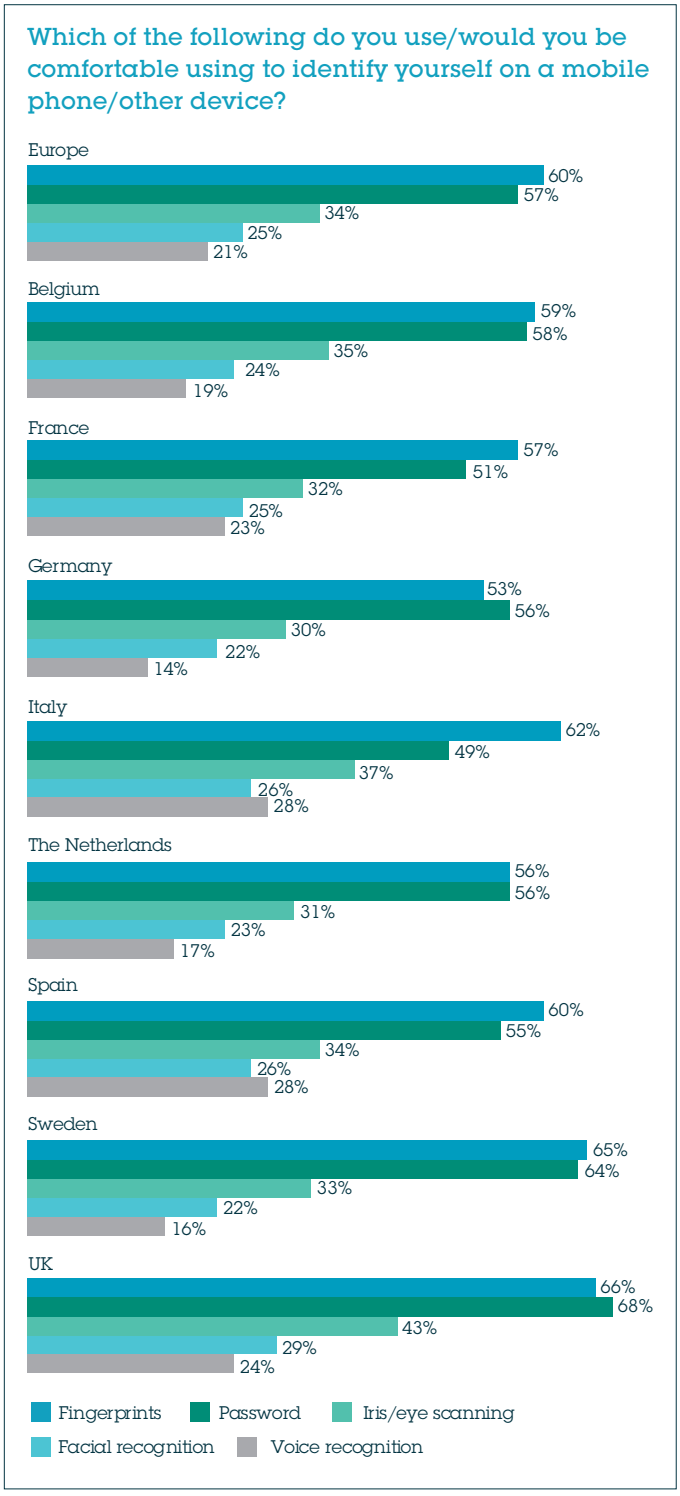
The implementation of strong customer authentication, as required by the Second Payment Services Directive (PSD2), should go some way to addressing consumers' concerns about payment security. Each account holder will need to show two out of the three elements of possession (e.g. holding a payment card), knowledge (e.g. a password or PIN) and being (e.g. passing a biometric test, such as iris recognition or fingerprint scan) in order to verify that he or she is the person accessing the account and making payments.

The aim of these more thorough and more frequent security checks is to make it harder for fraudsters and hackers to take funds from accounts that are linked to a mobile or electronic device.



Chapter five

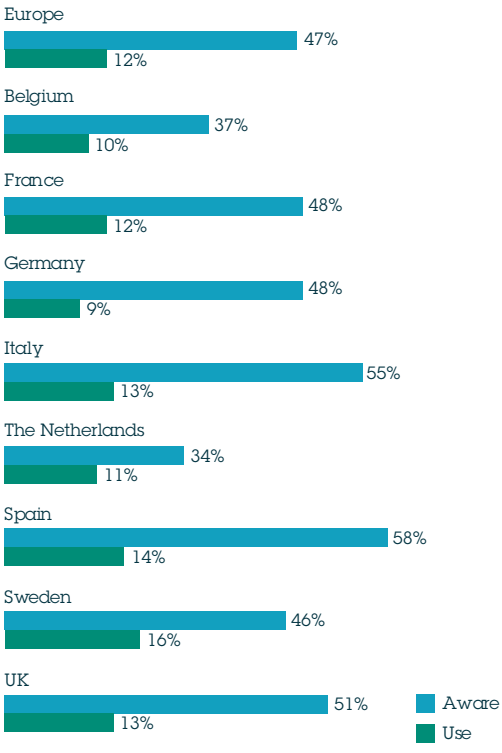
Augmented reality

How will augmented reality become embedded in our lives?

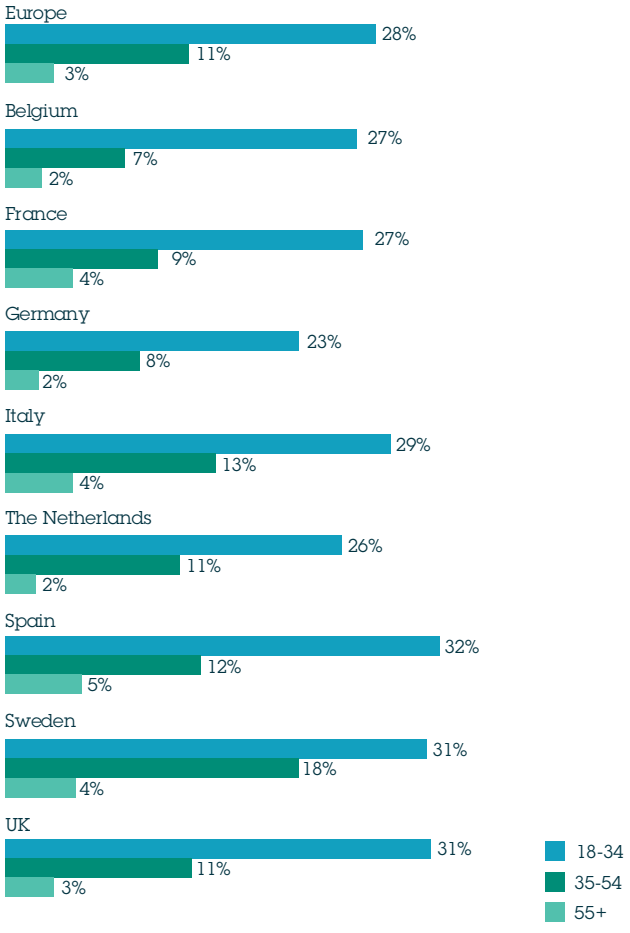
Augmented reality (AR) has yet to gain significant traction among consumers. However, with the technology being a more prominent part of Apple's iOS 11 launch in September 2017 with AR Kits, in addition to competition from Google's ARCore and Facebook's Camera Effects, could AR be set for take-off in 2018?

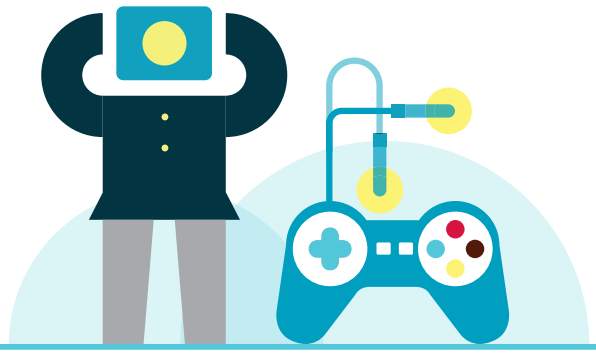
Around one half of European consumers have heard of AR and one in ten use it. Almost six in ten in Spain and Italy have heard of AR, though this does not translate to any wider usage. Awareness of AR is highest among 18 to 34 year olds (65%), while only one half of those aged 35 to 54 and one third of those aged 55 and over are aware. The use of AR is also mainly driven by 18 to 34 year olds, with 28% of Europeans in that age group having used the technology for any purpose. Clearly, the technology appeals to younger consumers. The reason for this is possibly in its application to date.

Awareness and use of augmented reality

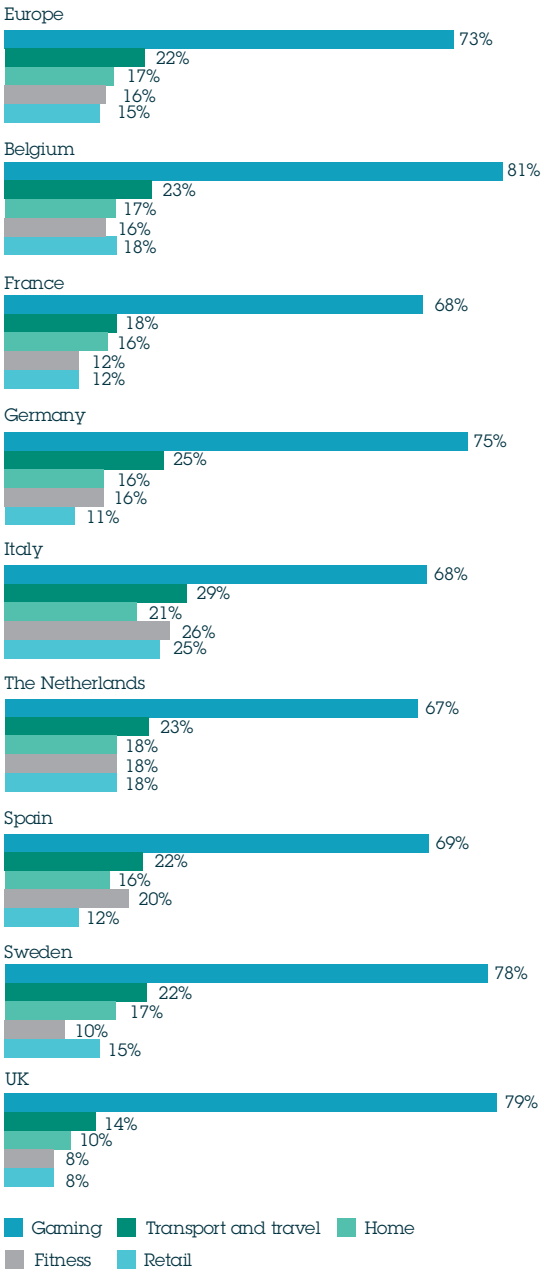


Use of augmented reality for any purpose





How augmented reality is used



The main use of AR goes a long way to explaining the age profile among consumers in all markets – gaming. Propelled by games such as Pokemon Go, which surged to international prominence in 2016 and currently has over five million daily active users, gaming is the activity undertaken by the vast majority of consumers using AR.

How else is AR used?

Of those who use AR, outside gaming, under one quarter in Europe use AR for transport and travel, home, fitness or retail. Again, of those who use AR, Belgium and the UK have the highest proportion of 18 to 34 year olds using AR for gaming (89% and 86%). Usage of AR for transport and travel is highest among 35 to 54 year olds in Italy (35%), Germany (30%) and Belgium (30%). Home and retail are also used by the highest proportion in Belgium (27% and 28%) among 35 to 54 year olds.

There is potential for increasing the adoption of AR beyond gaming and increasing consumer awareness around applications of the technology is the next step in widening usage.

Andrea Rizzi

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Immersive technologies are not only revolutionising the way we enjoy content but also how we experience reality. AR adds a new layer on how we perceive and interact with our surroundings and the potential is endless – from cultural to marketing apps, from educational to gaming.

From a legal perspective, intellectual property and privacy and data protection are of extreme interest. Adding a digital layer to reality involves both filming real objects, adding something, often user generated, and sharing within a community or more widely, with relevant consequences for copyright and trademarks. On the other side, AR might capture and process images and data of people who may be unaware of being captured by the camera, which again poses privacy issues.

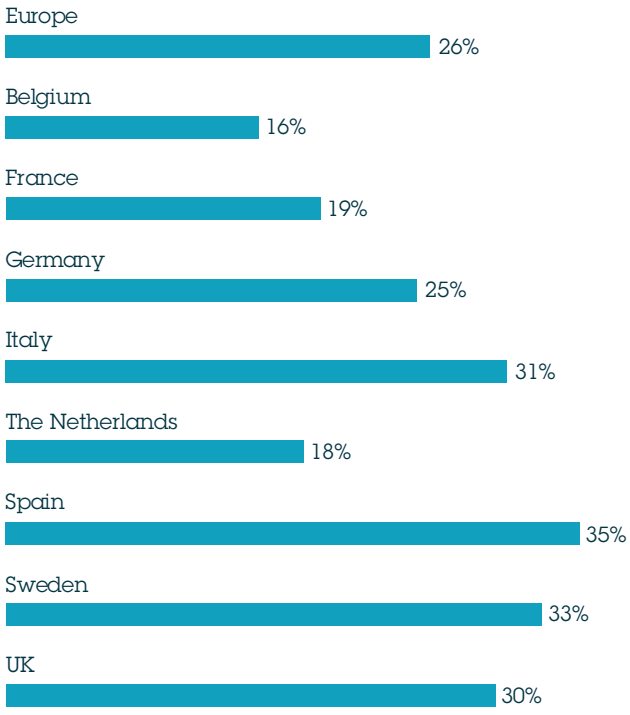
Chapter six

Consumer rights and trust

Do consumers know their rights?

There is a continuing focus across the EU to enhance consumers' rights, particularly going forward in the context of digital services and online purchases. However, only 26% of consumers across Europe have ever used a specific knowledge of their current rights in order to complain/get compensation from an organisation when something has gone wrong, rather than just complaining generally. Of these, though, there are some interesting variations across the territories surveyed. Consumers in Italy (31%), Spain (35%), Sweden (33%) and the UK (30%) are significantly more likely to complain on this basis than in other markets, such as Belgium (16%).

Have used specific knowledge of their consumer rights in order to complain/get compensation from an organisation rather than complaining generally



And of those in Italy, Spain and Sweden, it is millennials who are the most likely to do so, perhaps indicating a greater awareness of what those rights are among that age group.

As technology becomes more interconnected, knowing where to direct any complaint also becomes more difficult. For connected devices, for example, if a device that a PDA (e.g. Amazon's Alexa) is communicating with no longer operates properly, consumers had mixed expectations as to whether they could direct their complaint to the manufacturer of the PDA (26%) or the connected device (32%), or to their respective retailers. This confusion is not surprising considering the complicated interplay of the products and technologies. It also means that for businesses operating in this connected chain, having established and consistent lines of customer support and responsibility is key when dealing with any complaint. Confusion will only add to the uncertainty, and potentially lose consumer trust if not dealt with correctly.

Tom Harding
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Consumer rights have come to the foreground in recent years, from both a consumer and regulator's perspective, and will continue to do so through ongoing reforms brought about by the Digital Single Market.

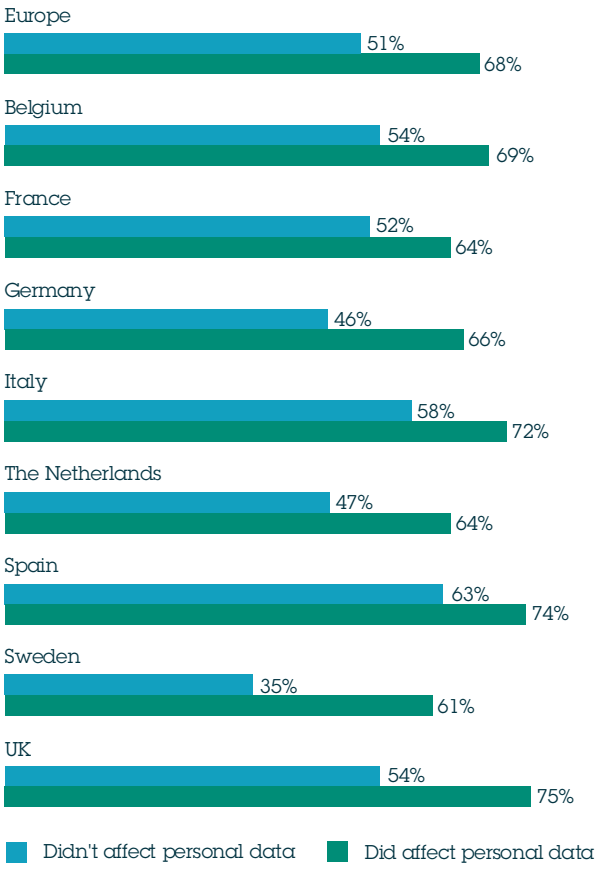
The key for businesses is being able to deal with reliance on, and enforcement of, these rights appropriately, knowing that they are under ever-increasing scrutiny to do so. Although that can potentially be challenging in the context of a connected environment, businesses should always look to go above and beyond if they want to retain consumer trust.

Careful use and handling of data, of course, equally underpins that trust. We have seen many cases where that trust has been undermined by a serious data breach.

Consumer trust and data

Consumers are more likely to stop buying products from a company that suffered a data breach that affected their own personal data (68%), rather than the personal data of others (51%). Although this may not come as a surprise, the key fact remains that any type of data breach will nonetheless still have a significant impact across a company's entire consumer base. It is essential that businesses know how they are going to manage any breach and deal with the consequences.

Would stop buying products from a company if news broke of a data breach and it did/didn't affect their personal data.



Looking ahead

The pace of change in the way in which we communicate, manage our work and personal lives and in the enabling technology is breathtaking. Last year's science fiction is this year's reality. And yet it's been said that we are really only at the foothills of the next industrial revolution. For example, 3D printing has now become an everyday occurrence. Apart from changing the supply chain forever, 3D printing will continue to revolutionise the medical profession by providing prosthetic limbs and implants. The possibilities are seemingly endless.

Equally, artificial intelligence will continue to dominate developments both at home and at work (and all points in between). We must be only a short step from having affordable robots supporting us at home with everyday chores. This raises moral and socio-economic concerns about the role of artificial intelligence and the extent to which it needs to be managed. As AI and driverless cars disrupt the workplace, thought needs to be given to the future of the workforce. The future looks very exciting (if a little scary). There will undoubtedly be new challenges to be addressed, but the opportunities being presented are myriad.

Jon Fell

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This is the third annual Osborne Clarke survey of connected consumers in Europe. Over those three years, these reports have provided essential insights into the mindsets of Europe's digital consumers. At the heart of each report is something of a paradox: a clear appetite for and take up of new technologies and services across the EU, but also concerns and issues raised by those technologies and services. As you would expect, we are interested in interpreting these themes for our clients who are either in the digital sector or are applying digital methods to their models in order to flourish in the 21st century.

Our experience tells us that this new world will continue to throw up novel and complex legal challenges as well as opportunities. We are making sure that Osborne Clarke is ready to meet these challenges. Let us help you flourish too.

League table

Who ranks where?

Tier 1

1 Italy 58 points

2 Spain 58 points

Italy is ranked no 1 because it has more first place positions than Spain.

Tier 2

3 Sweden 37 points

4 UK 33 points

5 The Netherlands 32 points

6 France 32 points

The Netherlands ranks no 5 because it has more first place positions than France.

Tier 3

7 Germany 25 points

8 Belgium 21 points

*To calculate the position, points were awarded 1-8, where 1 is the least connected (i.e. lowest percentage of consumers) and 8 is the most connected (i.e. highest percentage of consumers).

	Europe	Belgium	France	Germany	Italy	The Netherlands	Spain	Sweden	UK
Use health app	46%	33% (2)	32% (1)	36% (3)	66% (8)	45% (5)	64% (7)	49% (6)	45% (5)
Prefer a virtual health consultation	26%	15% (1)	20% (3)	19% (2)	41% (7)	26% (6)	43% (8)	23% (5)	21% (4)
Heard of 3D printing	91%	92% (6)	91% (4)	88% (2)	93% (8)	93% (8)	92% (6)	85% (1)	91% (4)
Would 3D print at home	74%	70% (4)	76% (6)	75% (5)	88% (8)	65% (1)	81% (7)	69% (3)	68% (2)
Use a PDA	18%	15% (3)	18% (6)	15% (3)	29% (8)	18% (6)	24% (7)	16% (4)	14% (1)
Heard of AR	47%	37% (2)	48% (5)	48% (5)	55% (7)	34% (1)	58% (8)	46% (3)	51% (6)
Used AR	12%	10% (2)	12% (4)	9% (1)	13% (6)	11% (3)	14% (7)	16% (8)	13% (6)
Used knowledge of consumer rights	26%	16% (1)	19% (3)	25% (4)	31% (6)	18% (2)	35% (8)	33% (7)	30% (5)

Position/total points*

Appendix

About the respondents

YouGov conducted this Connected Consumer research on behalf of Osborne Clarke between 30 October and 15 November 2017. In the following eight countries a nationally representative sample of 2,000 per country were asked the same questions. The respondents were split as follows:

Belgium

Gender

Male: 49%
Female: 51%

Age

18-24: 10%
25-34: 16%
35-44: 17%
45-54: 18%
55+: 39%

Region

Antwerp: 18.5%
Brussels: 10.0%
Eastern Flanders: 12.4%
Hainaut: 11.6%
Limbourg: 7.5%
Liège: 9.7%
Luxembourg: 2.1%
Namur: 4.4%
Flemish Brabant: 9.1%
Walloon Brabant: 4.2%
Western Flanders: 10.5%

France

Gender

Male: 48.0%
Female: 52.0%

Age

18-24: 10.9%
25-34: 15.7%
35-44: 17.1%
45-54: 17.5%
55+: 38.8%

Region

Alsace: 2.3%
Aquitane: 5.4%
Auvergne: 2.0%
Basse-Normandie: 2.5%
Bourgogne: 2.4%
Bretagne: 5.3%
Centre-Val de Loire: 4.2%
Champagne-Ardennes: 2.0%
Corse: 0.2%
Franche-Comté: 1.5%
Île-de-France: 17.6%
Languedoc-Roussillon: 5.1%
Limousin: 1.0%
Lorraine: 4.3%
Midi-Pyrénées: 4.6%
Nord-Pas-de-Calais: 7.9%
Haute-Normandie: 2.5%
Pays-de-la-Loire: 6.1%
Poitou-Charentes: 2.4%
Provence-Alpes-Côte d'Azur: 8.9%
Rhône-Alpes: 8.9%

Germany

Gender

Male: 48.5%
Female: 51.5%

Age

18-24: 9.2%
25-34: 14.9%
35-44: 15.0%
45-54: 20.1%
55+: 37.4%

Region

Baden-Württemberg: 13.0%
Bayern: 15.5%
Berlin: 4.4%
Brandenburg: 3.1%
Bremen: 0.8%
Hamburg: 2.2%
Hessen: 8.9%
Mecklenburg-Vorpommern: 1.9%
Niedersachsen: 9.5%
Nordrhein-Westfalen: 21.6%
Rheinland-Pfalz: 4.9%
Saarland: 1.2%
Sachsen: 5.2%
Sachsen-Anhalt: 2.9%
Schleswig-Holstein: 3.5%
Thüringen: 2.8%

Italy

Gender

Male: 47.6%
Female: 52.4%

Age

18-24: 8.3%
25-34: 13.6%
35-44: 17.9%
45-54: 19.3%
55+: 40.9%

Region

Abruzzo: 3.9%
Autonoma Friuli-Venezia Giulia: 3.0%
Autonoma Trentino-Alto Adige: 1.0%
Basilicanta: 1.2%
Calabria: 4.2%
Campania: 14.7%
del Veneto: 9.0%
Emilia-Romagna: 6.0%
Lazio: 10.4%
Liguria: 3.3%
Lombardia:16.5%
Marche: 2.6%
Molise: 0.6%
Piemonte: 7.3%
Puglia: 9.5%
Toscana: 5.8%
Umbria: 1.3%

The Netherlands

Gender
Male: 49.0%
Female: 51.0%

Age
18-24: 10.6%
25-34: 15.5%
35-44: 15.5%
45-54: 18.9%
55+: 39.5%

Region
Drenthe: 3.1%
Flevoland: 4.1%
Friesland: 3.5%
Gelderland: 10.3%
Groningen: 3.7%
Limburg: 8.4%
Noord-Brabant: 13.0%
Noord-Holland: 16.6%
Overijssel: 6.9%
Utrecht: 6.8%
Zeeland: 2.5%
Zuid-Holland: 21.1%

Spain

Gender
Male: 48.8%
Female: 51.2%

Age
18-24: 8.3%
25-34: 15.2%
35-44: 21.2%
45-54: 19.0%
55+: 36.3%

Region
Andalucía: 21.0%
Aragón: 3.7%
Asturias: 2.8%
Cantabria: 1.4%
Castilla y León: 4.2%
Castilla-La Mancha: 3.7%
Cataluña: 15.6%
Comunidad de Madrid: 13.7%
Comunidad Valenciana: 10.8%
Extremadura: 2.1%
Galicia: 5.9%
Islas Baleares: 1.1%
Islas Canarias: 4.0%
la Región de Murcia: 3.0%
La Rioja: 0.8%
Melilla: 0.1%
Navarra: 1.4%
País Vasco (Euskadi): 4.7%

Sweden

Gender
Male: 50.5%
Female: 49.5%

Age
18-24: 11.5%
25-34: 15.7%
35-44: 15.7%
45-54: 17.3%
55+: 39.8%

Region
Stockholms stad och län: 22.4%
Uppsala län: 3.7%
Södermanlands län: 2.6%
Östergötlands län: 6.0%
Jönköpings län: 2.6%
Kronobergs län: 1.5%
Kalmar län: 2.5%
Gotlands län: 1.0%
Blekinge län: 2.1%
Skåne län: 13.6%
Hallands län: 2.7%
Västra Götalands län: 17.0%
Värmlands län: 2.5%
Örebro län: 3.0%
Västmanlands län: 2.4%
Dalarnas län: 3.0%
Gävleborgs län: 3.2%
Västernorrlands län: 2.8%
Jämtlands län: 1.6%
Västerbottens län: 2.5%
Norrbottens län: 2.3%

UK

Gender
Male: 50.5%
Female: 49.5%

Age
18-24: 11.5%
25-34: 15.7%
35-44: 15.7%
45-54: 17.3%
55+: 39.8%

Region
North East: 3.7%
North West: 11.6%
Yorkshire and the Humber: 8.1%
East Midlands: 7.3%
West Midlands: 8.7%
East of England : 8.5%
London: 13.0%
South East: 13.4%
South West: 9.7%
Wales: 4.8%
Scotland: 8.5%
Northern Ireland: 2.8%

N.B. – Throughout the report, all figures are rounded to the nearest whole number. The figures in the appendix are not.

Throughout the report comparisons are made to 2016 Connected Consumer research that was conducted by *Retail Week* on behalf of Osborne Clarke.

Glossary

What is a connected consumer?

Connected consumers use their connected devices to interact with each other and the environment in consuming products and services.

What is meant by Europe and European?

In this report, Europe and European are, generally speaking, terms confined to the eight countries that are the focus of this report: Belgium, France, Germany, Italy, Spain, Sweden, The Netherlands and the UK.

What is meant by millennial age group?

In this report, references made to millennials or the millennial age group are to those aged between 18 and 34 years.

What is a virtual health consultation?

A virtual health consultation uses a smart database and data collected about you through a health app to make a health diagnosis without human intervention.

What is a health app?

Health apps collect data and information on your health, which can then be used to make a diagnosis.

What is 3D printing?

3D printing is a technology where a three-dimensional object is built from a computer-aided design model and then printed by successively adding material layer by layer.

What is a personal digital assistant?

A personal digital assistant (PDA) is a device that uses the sound of your voice to carry out tasks.

What is augmented reality?

Augmented reality is a view of a physical, real-world environment whose elements are 'augmented' by computer-generated or extracted real-world sensory input such as sound, video, graphics or GPS data.

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