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Mobile Consumer 2015: The UK cut Game of phones

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Foreword

With every year the smartphone becomes yet more ubiquitous and pervasive: 76 per cent of adults in the UK now have one, up six percentage points from last year. 32 million smartphones – one for every other person in the country – are forecast to ship this year. Collectively UK consumers glance at their smartphones over a billion times every day.

But the most fascinating aspect of the adoption of the smartphone is the extent to which it has become not just our primary access to digital, but an ever more comprehensive and capable remote control for life.

As we head home on a typical British autumnal day on a bus stuck in rush hour traffic and with rain streaking the windows, we can use our smartphones to look up the forecast for the weekend (grim) and contrast this with the outlook for a Mediterranean city (great). An algorithm could serve us an ad on our phones offering last minute flights to that destination for that weekend, payment for which we could authorise with a fingerprint.

As our current wardrobe may predominantly consist of wet-weather gear, we could browse for shorts and T-shirts from our favourite retailer, then select to have this delivered to a click-and-collect locker the following day, using a code sent to the smartphone.

To celebrate the trip we could agree to go for a meal with our partner using instant messaging (IM), and reserve a table via an app.

We could get directions to the eatery via our smartphone, or abandon the bus and use an app to locate and summon a taxi. The same device could display an estimated time of arrival, rate a driver, make a payment and receive a receipt.

At the restaurant, our phone can show the menu, order the food, post a photo of each course to a social network, and at the end of the meal, pay the bill.

And at no time, from bus to bill, would we have had to utter a word.

We hope you enjoy this year's Deloitte mobile consumer survey, UK edition, whose 4,000 respondents are part of a 30 country review of mobile usage spanning 49,000 respondents.

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Britain, distracted

The modern, touchscreen-based smartphone is a mere eight years old and is more embedded in our lives than ever.

For tens of millions of UK consumers, it has become the most personal, most coveted of companions, rarely leaving our side. It has become essential: it accompanies and participates in many of our daily rituals; it is the conduit for and the catalogue of our conversations.¹ Collectively, UK consumers look at their smartphones over a billion times a day.²

Every couple of years, as our smartphones become sluggish and increasingly lack the energy to make it through the day, we trade up for a younger, sleeker, more powerful model, which we convince ourselves we got for free. In the UK, more than 32 million smartphones are purchased every year; a further six million are handed down.³

Most UK consumers use their smartphones at every opportunity. Two-thirds of smartphone owners use their devices while on public transport; 60 per cent while at work and almost half while meeting a friend (see Figure 1). For younger age groups, usage intensity is higher still: 80 per cent of 18-24 year-olds use their devices on public transport; a fifth when crossing the road.

The smartphone is our companion on special occasions. Almost a third of us (and 43 per cent of 18-24 year-olds) use our phones while eating in a restaurant. At the theatre, as the curtain descends for the interval, smartphones light up as we check on distant friends – prior to chatting to adjacent ones. At sports days and prize-giving ceremonies, some parents choose to observe their children via the miniscule prism of a smartphone screen, trading a full-screen view for digitised posterity. Holidays of a lifetime are captured and communicated by smartphones in real-time in words, photos and, increasingly, videos.

Figure 1. Usage of smartphones while doing other activities

Question. How often, if at all, do you use your smartphone while doing the following?



Note: Respondents for whom a particular activity does not apply have been excluded from this analysis (e.g. respondents who do not work have not been asked if they use their phone in a business meeting). Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

One in ten smartphone owners reaches for his or her device immediately upon waking (and not just to turn the alarm off), and within 15 minutes, 55 per cent have done so (see Figure 2). Almost half of 18-24 year-olds, but only 16 per cent of 65-75 year-olds, check their smartphones within five minutes of waking. Upon waking, we reach for our devices to see who has communicated with us, looking principally for texts, emails and social network updates. The ritual is repeated at bedtime: more than a quarter check their smartphone within five minutes before turning off the light (see Figure 2).

Figure 2. Interval between waking up and looking at smartphones and between preparing to sleep and looking at smartphones

Question. Typically how long is the interval between waking up and looking at your phone for the first time (not including turning off your phone's alarm clock)?







Note: Respondents who answered "Don't know" have been excluded from this analysis Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015 UK consumers look at their smartphones 400 billion times a year with the most frequent glancing undertaken by younger age groups (see Figure 3). While the cost of a handset worth £700 owned for two years is approximately £1 a day, for the sixth of smartphone owners who look at their devices 50 times or more a day, the cost per glance is a mere two pence. And that is before allowing for trade-in value.





Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015 Historically, people often reach for their phones reactively, for example when alerted to an incoming message or call. But increasingly, they are checking their phones unprompted, to see whether any messages or updates have arrived since the last glance, or to seek out information. Thirty per cent do this "very often" or "almost always", with almost half of 18-24 year-olds doing this (see Figure 4).

Figure 4. Unprompted checking of smartphones

Question. Thinking about a typical day, how often, if at all, do you tend to check your smartphone without being prompted by a notification?



Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

More UK consumers are subject to distraction by a smartphone as penetration continues to rise. As of May 2015, 76 per cent of UK adults had one, a six percentage point increase on the prior year and 14 percentage points higher than two years ago.

However, rising ownership of smartphones has not caused the abandonment of other devices (see Figure 5). Laptops, for example, have maintained a penetration rate close to 80 per cent. Tablet penetration has continued to increase, reaching 60 per cent this year. This accumulation of devices should not surprise: each is optimised for a different task and each is its own bundle of compromises. There are good reasons why we would, for example, keep our laptops (for their keyboard, power and screen) or buy more tablets (for their larger screen and lower price).



Figure 5. Laptop, smartphone and tablet ownership among UK adults, 2012-15 Question. Which, if any, of the following devices do you own or have ready access to?

Weighted base (2012/2013/2014/2015): All respondents (2,060/4,020/4,000/4,000) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2012, May 2013, May 2014, May-Jun 2015 While penetration rates may either be maintained or rise, the usage profile of each device is changing. The utility of smartphones is deepening as it consolidates its role as the portable – and increasingly central – portal to a widening range of aspects of our lives, from ordering takeaways to capturing memories, from communicating with our colleagues to making bank transfers to keeping abreast of world news.

In recent years, the smartphone has assumed the mantle of the general purpose digital tool that the PC had a decade back. While a PC may have been shared by a household, the smartphone is personal; the laptop can be carried, but cannot be slipped into a pocket or purse. Over time, the smartphone's usage may become more general, while the PC's may become increasingly specialised.

A decade ago, the PC was the default to every digital interaction and played a central role in delivering the online revolution. Computers relieved us, for example, of the need to meet or call a travel agent to book a flight. They allowed us to check-in for a flight and choose a seat. But now the smartphone can do most of this, and can do it better. It is the boarding pass. It nudges us to head for the gate.

PCs have long been used to book a restaurant. But now a smartphone can easily do this, and also direct us, turn by turn, to the location. At the restaurant, the smartphone can become the menu, and the till too, saving us the time to request, check and pay the bill.⁴

The smartphone revolution is not yet ten years old, and its work is certainly not done. Imminent device and connectivity innovations should tempt us into becoming yet more reliant on, wedded to and distracted by our smartphones.

Data speeds should continue to increase, thanks to greater 4G network roll-out, upgrades to the more rapid LTE-Advanced and faster WiFi networks. New services, such as Voice over LTE (VoLTE), and emerging apps, such as Periscope, will enrich our communication options. Smartphone photography should get better, too, bolstered by better lenses and software. Falling prices for solid state memory will encourage us to store more of our digital baggage, in the forms of conversations, photos and videos.⁵ Advances in glass technology should make screens more responsive and more resilient. There is plenty to look forward to – and there is ample further distraction.

Bottom line

The cellular network is core to the appeal of the smartphone. The more the network develops, in terms of reach, reliability and speed, the more useful devices can become. For example, as shown in Figure 6, those on faster networks (4G) are more likely to use their phones while on public transport. Higher speeds enable a smartphone to be used more diversely and make existing applications more enjoyable. Fast networks make mobile commerce pages a pleasure to flick through, rather than a stream of 'waiting for network' notices, and can enable photos to upload to a social network in an instant. Uninterrupted and fast internet connectivity will continue to be a core differentiator for network operators.

Current 4G network performance is now double that of 3G and over 250 times faster than GSM networks' top speed of 58 Kbit/s.⁶ This increment in performance may appear excessive; arguably users should be content with 3G. But consumer response suggests otherwise: in the year to May 2015, the proportion of 4G customers leapt from eight to 25 per cent.

Suppliers should always remember that the smartphone is at core a communications tool. Mainstream consumers are likely to use higher speed to communicate more, and more richly. Two years ago, when just three per cent of respondents had 4G, the most common used application was watching video. Last year, when eight per cent had 4G, this fell to seventh, and this year, with a quarter of respondents having 4G, it fell further, to eighth. Two of the three more frequently used applications this year were communication tools: email and social networks.



Figure 6. Impact of faster networks on usage of smartphones while on public transport, by 4G ownership Question. How often, if at all, do you use your smartphone while doing the following (using public transport)?

Note: Respondents who do not use public transport have been excluded from this analysis Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015



Smartphones, reincarnated

Every fortnight 1,230,000 new smartphones are sold in the UK. By the end of 2015, 32 million will have shipped.⁷

The smartphone is the most successful consumer electronics device ever. While televisions and radios may have higher reach in the UK, with over 90 per cent of people in the UK having access to either, the smartphone sells in much greater volumes. Globally, it outsells all tablets, PCs, televisions and video games consoles combined, from the perspective of either value or unit.⁸

Its market performance is due to two main factors: its life cycle is the shortest of any device, and it is typically owned by individuals rather than shared.⁹ A family of four may share a television; a smartphone typically has one owner.

With the smartphone market being so valuable – £250 billion revenues forecast for 2015 globally – it enjoys the most innovation and iteration of all consumer electronics devices, not just in terms of technical specifications (processor speed, connectivity rate, memory size), but also in terms of materials used (glass, metals, premium plastics) and components (lens, accelerometers, gyroscopes).¹⁰ The pace of improvement in smartphones drives the urge to upgrade. The resulting sales volumes encourage innovation, and so the cycle continues.

But what is the fate of the abandoned units? A decade back, when we were still in a voice-centric, candy-bar or clam-shaped era of mobile telephony, many old phones were simply consigned to drawers.¹¹

In 2007, when the first iPhone device launched, the average trade-in value of phones was ± 20 .¹² ¹³ By 2013, at which point 62 per cent of UK adults had a smartphone, the average had reached ± 108 .¹⁴ Currently, the latest premium smartphone have a trade-in value of close to ± 400 .¹⁵ The rising residual value of some smartphone models has increased the likelihood of a second life for these devices. Deloitte estimates in the year to May 2015 about 40 per cent of second-hand smartphones, or almost 13 million units, were either traded-in or handed down, and would therefore continue in use with a new owner (see Figure 7).

Figure 7. Second life of smartphones

Question. What did you do with your previous mobile phone when you last upgraded?



Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

> The volume of devices traded-in or sold has increased steadily over recent years. In 2013, about 5.4 million phones were recycled.¹⁶ Last year the volume rose to 6.7 million.¹⁷ This year, if there is a similar level of growth, about seven million phones, mostly smartphones, would be traded-in with an aggregate value of about £900 million.

There are multiple drivers for handing smartphones down. Some teens may prefer a second-hand premium model to a brand-new budget device. Some parents, whose new smartphone is on the same operating system as the one they are donating, may welcome features such as the ability to track their kids' location, or to share content. Savvy children may urge their parents to upgrade their handset in the hope that they would in turn benefit from an upgraded hand-medown. As for older generations, in our survey about 11 per cent of 65-75 year-olds had "used phones from a family member or friend", the highest proportion among all age groups surveyed (see Figure 8).¹⁸ This demographic may currently be less demanding of their smartphones so a hand-me-down phone may be sufficient.





Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015 Deloitte expects the volume of sales and trade-ins to continue rising, as the range of options for both continues to expand. There are currently more than 50 registered phone recycling companies.¹⁹ Increasingly trade-ins are being offered at the point of sale, removing the need for the individual to handle a sale separate to the purchase of the new smartphone. Similarly, phone recycling companies may offer incentives to upgrade to a new phone via preferred partners.²⁰

Bottom line

The second life of smartphones is likely to become an increasingly important dynamic in the mobile sector.

For consumers, a second-hand phone will be an opportunity to own a high-end device that they could not otherwise afford. While smartphone vendors will not receive any revenue from the device sale, they will get potential customers for new smartphones when it comes to the next replacement cycle. Even if these consumers might never be able to afford a brand new high-end device, they may still embrace, and potentially pay for, the services and apps offered.

Smartphone vendors may start marketing the potential future trade-in value of their models, similar to practises in the car industry. In recent years, variation in depreciation rates by smartphone model has been significant: some lost over 80 per cent of their value in 2013.²¹ Some vendors may want to encourage customers to replace their phone annually, rather than biennially. New entrants to the market may have to offer guaranteed trade-in values.

Network operators could offer superior trade-in rates and simple trade-in procedures to lure users from other networks, or to encourage contract extensions. Operators could increase their offer of refurbished premium phones. Customers on tight budgets with a refurbished premium device may generate more network traffic and opt for a large monthly data bundle, than those with a brand new mid-range or budget device. Companies specialising in acquiring second-hand phones are likely to have to compete ever harder to acquire second-hand phones. Most phones sold to specialist vendors will end up abroad, in Sub-Saharan Africa, Latin America or Asia. Vendors will need to understand how varying economic environments may affect demand. In some countries, people may opt for a high-specification unbranded phone instead of prior generation premium handset.

Manufacturers and operating system (OS) developers should remain aware of possibly extending lifetimes of hardware. OS updates may render older but still in-use phones unusable.

Companies purchasing smartphones for their staff should evaluate how long they should own their phones to optimise the total cost of ownership. It could be that replacing (and trading in phones) after two years is more financially attractive than keeping them for three, for example.



Voice, revitalised

The original premise of the smartphone was that it would enable voice and data communications via one device.

The Nokia Communicator, launched in 1996, was the first smartphone designed and marketed as a multi-function phone that could handle emails, documents and spreadsheets, as well as make calls. And, for the first 15 years, this is how smartphones were mostly used.

In the last decade the data capabilities of smartphones have steadily ratcheted up; in the form of bigger screens, faster connectivity, more powerful processors, superior camera or improved graphics capabilities. Voice capability, by contrast, has improved only marginally.

The rise of the 'data-exclusives'

In recent years there have been two contrasting trends with voice. The first is that mobile voice volumes have increased, by four per cent between 2012 and 2014.²² This has likely been due to rising take-up of unlimited voice packages, an increase in voice minute allowances, ongoing substitution of fixed to mobile calling as well as an increase in the UK population.

Between 2012 and 2015, most smartphone owners' usage patterns have become more data-centric, with time spent on non-voice activity almost trebling to 90 minutes per day.²³

Just three years ago almost all smartphone owners made at least one call per week. Three years on 25 per cent of smartphone users have become data-exclusive, in a given week. What may have been happening is a polarisation in the usage of voice on mobile: some users are increasing their voice call volumes; at the other end of the scale a growing proportion are not using voice at all.

Figure 9 shows how voice usage has steadily become less prevalent since 2012, while over the same period most forms of data communication, such as IM (instant messaging), social networks and even the now 'old school' email, have become more widespread. Even the text message, a relatively simple form of data communication, remains widely used, although in declining volumes. If this decline were to maintain the same pace, almost half of smartphone owners would not be making traditional voice calls weekly by mid-2018.

Figure 9. Weekly use of standard voice calls

Question. In the last seven days, in which of the following ways did you use your smartphone to communicate with others (Standard voice calls)?



Weighted base (2012/2013/2014/2015): Respondents who own or have access to a smartphone (1,005/2,382/2,802/3,039)

Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2012, May-Jun 2013, May 2014, May-Jun 2015

A key catalyst for the fall in the proportion of people making voice calls using their smartphones has been the proliferation in options to communicate without speaking. Phone conversations with friends and family, for example, have been supplanted to an extent by social networks, which offer multiple enhancements to a standard conversation, from the ability to broadcast to friends and family, to append photos, videos and hyperlinks. Social networks, IM, email and other forms of messaging also offer control over when to respond; voice conversation obliges a real-time response.

It is not just private conversations that are being usurped. An app can replace the calls we would have formerly made to order a take-away, request a taxi, book an appointment or make a bank transfer.

The demographic with the largest proportion of data-exclusives are 18-24 yearolds. Currently 29 per cent of 18-24 year old smartphone owners do not make phone calls on a weekly basis, compared to the average for adults of 25 per cent. In future this proportion may rise further as teens and pre-teens are being weaned on messaging. Children may be given a touch-screen MP3 player or a WiFi tablet, which can readily be used for messaging, apps and other types of data functionality, but will not have a cellular modem, thus no native voice capability. As children progress to their first smartphone, they may not be provided with a voice and data package so as to control costs, and so this device may be used exclusively over WiFi, constraining usage to data applications. By the time a teen has the funds to pay for a regular package that includes voice calls, he or she could be so accustomed to messaging that they forego voice calls.

So, is it game over for voice?

Voice, but not as we knew it

We expect usage of standard voice calls in the form of circuit-based calls to diminish steadily in popularity over time. But spoken conversations are very unlikely to disappear from smartphones, rather they will migrate to apps and also new forms of operator-managed voice services.

Currently the majority of (and historically all) voice calls made from mobile phones have been carried over a dedicated part of a mobile network, with quality levels managed by operators. The emergence of data capability enabled an alternative approach to making a call. Rather than conveying a call via the dedicated voice portion of the network, it could now be converted into data packets and transmitted over the data network (WiFi or cellular). Using this approach, known as Voice over IP (VoIP), the voice call would be just another service using the data network.

In the last year, there has been a surge in VoIP usage, particularly among younger age groups. In this year's survey, 14 per cent of smartphone users used VoIP services. This compares to five per cent in 2014, and three per cent in 2012.²⁴ The main types of VoIP services are apps from Over-the-top (OTT) providers and mobile operators. VoIP calls have the advantage of being zero marginal cost for consumers if made over a WiFi network or on an unlimited cellular data package (operators tend to decrement minutes from the voice allowance). The downside is that the quality can be variable, as data calls are handled using a 'best efforts' approach. The voice call might get dropped if someone on the same WiFi network starts downloading a large video file. A traditional mobile voice call is carried by a dedicated part of the network and is monitored to reduce the likelihood of the call being dropped.

Over time we expect that a growing proportion of calls will be carried over the existing VoIP apps and also via two emerging voice services, called Voice over WiFi (VoWiFi) and Voice over LTE (VoLTE).

VoWiFi, also known as WiFi calling is equivalent to VoIP apps with two major differences. One is that calls are placed from the phone's 'native' dialler – the same user interface that is used to make a regular mobile call, but the call is carried over the WiFi network. This means that users do not need to open an app to place a call. The second is that the operator is able to manage elements of the call, and as a result the call quality may be superior to a VoIP call, which is treated by the network as any data application.

VoLTE is a voice service that has been invented specifically for LTE (4G) networks. It incorporates quality of service management, better voice call quality, better audio fidelity, faster call connection, fewer dropped calls, the ability to switch from a voice call to a video call, data connection while being on a call.

We expect VoLTE users in the UK to become advocates rapidly. Users will upgrade voice calls to video whenever images rather than words provide a faster, or richer description. The appeal of video streaming apps such as Periscope demonstrates the allure of explaining just by showing. Talking and being online will help in little but important ways, for example guiding someone to their destination while looking at a map. Higher quality voice calls can best be appreciated by going back to standard voice quality.

VoLTE services are expected to be launched over the next 12 months in the UK.²⁵ The service will be available to the minority of people in the UK who have compatible handsets *and* are in 4G range *and* have a 4G contract. And of course you would need to be calling someone who meets the same requirements. While the proportion of VoLTE calls will remain small over the next year, we expect it to grow steadily over time.

We also expect VoLTE calls to co-exist with VoIP and standard voice calls, but each will have different trajectories: historically, consumers have tended to amass a growing array of communication tools and dropped few. IM has not catalysed the disappearance of email or text messaging. The rise of ephemeral IM apps, with Snapchat being the best known, has not led to the demise of sites that record every comment.

Over the next 12 months consumers should start to experience voice, revitalised.²⁶

Bottom line

Voice calls are likely to have a declining share of the increasing time we spend on our smartphones. However voice remains important, and services such as OTT VoIP apps make smartphone calls possible in locations where cellular networks do not reach. Furthermore, cheap or free international calls, and free roaming calls are now possible.

While this is beneficial for consumers, OTT VoIP may impact operators' bottom line in the long term. However, VoLTE could offset a potential decline in revenue, even if consumers do not end up paying more for VoLTE services. Cost savings from being able to carry more calls, from managing a rationalised network and potentially a single billing system (if VoLTE calls are to be treated as data usage) should be considered by operators. At the same time, VoLTE may become a differentiator. However, in the short term, resources will need to be invested in making call handover smoother.²⁷

That said, operators should choose carefully when to launch VoLTE. If an operator were too launch too early in any regard, for example with too little of the market covered by 4G, users may quickly give up trying to use the new functionality. Deploying VoLTE is a tremendous technological feat, and operators should be proud of what their network teams achieve. However, the engineering complexity of launch service should be hidden from consumers. Operators will need to delineate clearly between the multiple similar (but different) voice services now available, and for example, explain in clear terms how VoLTE's quality of service differentiates it from OTT VoIP, which can, in the right conditions, offer similar audio quality.

Operators should determine how best to charge for VoLTE. Should it be charged at a premium to standard voice, should usage just be deducted from a data allowance, or should it decrement the existing voice calls allowance? Should VoLTE be charged for by operators that have waived voice roaming fees? How should VoWiFi calls that are managed by the carrier be charged for? Should VoLTE calls that start as voice but get switched to video over 4G incur a premium?²⁸

For VoLTE to be truly successful, both handset manufacturers and network operators should make their APIs (Application Program Interface) available to third-party application developers. VoLTE's carrier-grade reliability could be particularly beneficial for applications in industries where low latency and high reliability, such as telemedicine or connected cars, are required.

All companies that currently reach their customers partially via mobile should consider how VoLTE could enable them to enhance their service. For example, can VoLTE enable technical support to become a multimedia service, with the phone's camera enabling remote visual inspection of a new boiler? Can remote medical diagnoses be handled by integrated voice and data functionality?



Things, unconnected

Most Britons today are connected. However, the vast majority of their things are not, yet.

More than 80 per cent of adults have some form of broadband connection.²⁹ Only two categories of connected device – televisions and games consoles are owned by more than ten per cent of the UK population. Penetration levels of smart thermostats, lighting systems, home appliances, surveillance systems, watches, fitness bands and connected cars are all four per cent or lower.

The Internet of Things (IoT) describes a vision where every object – from spin dryers to dog collars to traffic lights – is connected, enabling, potentially, an explosion of value creation similar to that experienced by our internet-enabled selves.³⁰

IoT may appear a recent phenomenon, but it has actually been a work in progress for decades. The first 'intelligent' vending machine, which communicated stock levels enabling smarter restocking of its soft drinks, went live 33 years ago.³¹ The first fitness tracking smartwatches went on sale 24 years ago.³² Connected car systems, enabling navigation and emergency services assistance, first launched 19 years ago.³³ The first connected fridge went on sale 14 years ago.³⁴ Conferences heralding the year of IoT have been held perennially for dozens of years.

As with most technologies, predicting their occurrence is the easy part; the challenge is determining when. Arguably that 'when' should be soon. In recent years the momentum behind IoT has surged, with significant progression in IoT's fundamental enablers, such as connectivity, addressing conventions and user interfaces.

The faster and easier devices can be connected to the internet, the swifter adoption can be. Twenty years ago, when the first IoT consumer solutions were conceived, internet connectivity was typically wired and delivered via a telephone call. Today, in addition to cellular mobile speeds which are 1,000 times faster than those possible with GSM, there is extensive short-range wireless network coverage from WiFi and Bluetooth. Over three billion products with Bluetooth are shipped every year.³⁵

Both WiFi and Bluetooth have iterated constantly, improving in terms of speed, cost and power consumption. The latest WiFi standard, 802.11ac, offers speeds of 1.3 Gbit/s, sufficient to deliver very high resolution video, and three times faster than the prior standard, 802.11n.³⁶ The latest Bluetooth standard, 4.2, offers transfer speeds 2.5 times greater than with previous versions.³⁷

A further major advance of recent years is the launch of a new naming protocol for internet connected devices. If IoT is to attain its potential, that is to connect tens of billions of objects around the world, each of these items has to have a unique 'name'. Every laptop, smartphone or tablet, for example, is assigned a unique name, known as an Internet Protocol (IP) address. The first publicly used naming convention (known as IP version 4) allowed for 4.3 billion addresses. This was plenty in an era in which the ambition was to put a personal computer into every home in the developed world, but subscale in a possible future in which all the world's 12 billion light bulbs are connected to the web. The emerging convention (known as IP version 6) with a total pool of 2¹²⁸ addresses, offers 46 octillion (effectively limitless) IP addresses for every person.³⁸

A further enabler of IoT has been the availability of a ubiquitous, high resolution, easily updatable user interface that can control connected devices – the smartphone app. The high (76 per cent) penetration of smartphones means that we already own the remote control for all these connected things. Furthermore, what should really boost the potential for IoT is the fact that there are now legions of developers that have growing experience and capability in designing simple, attractive user interfaces that can fit within the restricted confines of a smartphone screen.

Suppliers have responded enthusiastically to the IoT opportunity. Major trade shows showcase thousands of IoT products.

However mainstream consumers in the UK have so far only tentatively adopted connected devices, as can be seen in Figure 10.

The four main categories of IoT devices available today are:

- connected home entertainment: games consoles (29 per cent), smart TVs (24 per cent), wireless speakers (nine per cent) and video streaming devices (eight per cent)
- connected home devices: smart surveillance systems (three per cent) and connected thermostats, lighting and appliances (all with two per cent adoption each)
- connected individual devices: fitness bands (four per cent) and smartwatches (two per cent)
- connected cars (two per cent).

Figure 10. IoT devices adoption among UK adults

Question. Which, if any, of the following devices do you own or have ready access to?



Weighted base: All respondents (4,000) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

Connected home entertainment

This category has enjoyed the highest adoption so far. Games consoles and connected televisions are the most popular, with 29 and 24 per cent penetration among UK adults respectively. The 29 per cent with a connected games console likely reflects the current active base of consoles in the UK, as all current and prior generation consoles have built-in internet access. Online games play has become a fundamental feature of many titles and connectivity enables further additional content, software updates and patches to be downloaded.

The proportion of connected TVs reflects the popularity of on-demand television, but may not reflect the totality of demand. Some connected sets may not be purchased primarily for that feature: connectivity is increasingly being provided by default. In 2014, smart TV sets, priced from £150 outsold standard sets for the first time.³⁹ Older televisions can be connected via a games console or video streaming device (owned by eight per cent of UK consumers). Similarly, some TVs with in-built internet access may just be used to receive broadcast signal.

The third most popular connected entertainment device is the wireless speaker, costing from £20, and owned by nine per cent of respondents.⁴⁰ Wireless is replacing the speaker cable and the docking system, and has become the default way of playing music in a room from smartphones, MP3 players and laptops, which are steadily displacing CD players.⁴¹

Connected home

The most popular connected home device – albeit by just one percentage point – is the connected surveillance system. We would expect this category to grow steadily over time, as the current home security market increasingly incorporates connectivity. Connected burglar alarms have existed for many years, relying on what may seem a fairly rudimentary process of placing a call to the home to check that everything is fine. Alternatively a wide array of sensors, such as cameras, microphones, motion detectors, temperature, gas gauges and even 'nanny' cams could all be monitored remotely either by the homeowner or else by a third party. Among connected home devices, one of the best known is the smart thermostat, currently adopted by two per cent of UK adults (see Figure 10). This offers the ability to monitor and control heating levels from anywhere, be it the bedroom, or the other side of the world, ideally leading to lower energy bills. Apps connected to smart thermostats could make people more aware of their energy consumption: a user could place a 'geo-fence' on their home, and whenever they left their home's perimeter their smartphone could prompt them to turn off their heating.

Alternatively many households could simply set a timer on their thermostat (as has happened for decades) and attain a roughly similar outcome.⁴²

Smart lighting may well be purchased as standard in a decade, but currently only two per cent of our respondents had smart lighting in their home. Smart lighting enables each bulb, based on LED technology, to have its own IP address. This makes the bulb's luminosity and colour controllable via an app. The bulb's brightness and colour can automatically be adjusted based on events. For example, a goal could be honoured by a light display of the scoring team's colours. Each member of the family could create its lighting profile. When the homeowners are away overnight, lights can be remotely turned on and off to give the semblance of occupation.

The future of smart lighting should be bright but the current reality is that it is expensive and cumbersome. Smart lights can be ten times as expensive as halogen lights, as they use LED technology, whose price is declining, but still expensive. To control a smart bulb from an app, in most cases, requires a separate device (also called a bridge) that connects the light bulbs to the WiFi router. As of mid-2015, connected LED bulbs cost from £25. A starter pack with three bulbs and a connector bridge costs £149.⁴³

The connected appliance has long been a core IoT objective: the idea being that an appliance could self-diagnose a fault and communicate this to an engineer, who would then arrive with the correct part. But demand so far has been lacklustre, as reflected in the penetration rate.⁴⁴ The range of connected appliances is limited and they are relatively expensive. Smart washing machines cost between £650 and £1,100 compared to the selling price for a standard washing machine in Europe of £280.⁴⁵ No smart fridges appear to be on sale in the UK, but there is one model of connected kettle and one coffee machine that cost £99 and £179 respectively.⁴⁶ Connected air conditioning systems start at about £600.⁴⁷ A number of consumer electronics manufacturers have announced new connected appliances that should be available this year.⁴⁸

Connected individual or wearables

A few years ago fitness bands were expected to become mainstream and tap into our innate competitiveness, and become a core tool of the 'quantified-self' movement.⁴⁹ Adoption of fitness bands, which can cost as a little as £12, is higher among younger age groups, which we would presume to be the fitter age groups.⁵⁰ Therefore the fit may be using fitness bands to measure how fit they are; the unfit may be avoiding or abandoning their devices so as to not quantify their inactivity. Globally fitness band sales are expected to reach about 15 million.⁵¹

At the time of our survey, adoption of smartwatches was low, despite the many different models available in the market, and a retail price starting at under £100. We expect the launch of the Apple Watch wearable device to broaden adoption of smartwatches.⁵²

Connected car

The connected car was one of the first categories of 'connected' device to launch commercially. A connected car enables data to be sent to and from the car. One common way of connecting a car is using a smartphone as an internet hotspot to connect a compatible in-car display.⁵³ WiFi hotspots can also be used instead of smartphones. Another way of connecting a car is using an embedded cellular-enabled module. This option may also feature usage tracking (which can enable usage-based insurance tracking also called black box insurance), remote diagnosis, roadside assistance and stolen vehicle tracking. A dedicated data tariff may be required for such service.

However, so far, only two per cent of respondents indicated they have access to a connected car. This may be expected considering the long life cycle of cars, and the reluctance to retrofit older cars with this technology.

The demand for connected cars could increase significantly over the next few years if embedded connectivity becomes the default for cars, much in the same way that features such as air bags and anti-lock brakes have become standard. A surge in demand has already been experienced in the US with one operator adding a million connected-car customers in one quarter, representing almost half of their net customer addition.⁵⁴ Factors such as improved connectivity on roads and more flexible data plans are likely to contribute to the adoption.

The outlook for the Internet of Things

Near-term demand for IoT devices appears minimal relative to established product categories. A quarter of respondents plan to purchase a smartphone in the next 12 months, and one in five are likely to buy a tablet. The proportion of UK adults even considering purchasing an IoT device is considerably lower (see Figure 11). However, if these purchase considerations turn into transactions, penetration rates for many categories of IoT device would leap relative to current levels. For example, currently two per cent of respondents have a smart thermostat, while purchase consideration is running at three times that level. Consideration may not lead to purchase, and for some categories, such as smart appliances, this may be down to a lack of products to buy.



Figure 11. Purchase consideration for IoT devices

Question. Which, if any, of the following would you consider purchasing in the next 12 months?

Weighted base: All respondents (4,000) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

Bottom line

The current consumer adoption and outlook for many IoT devices may look a little foreboding. However, consumer demand can surge rapidly as has been shown by demand for devices such as wireless speakers or connected cars in the US.

IoT device adoption speed is linked to how much consumer behaviour needs to change. For example, media entertainment devices give access to content via the internet, content otherwise available via TV and radio stations or DVDs. With just a slight adjustment in behaviour – content is still being watched, music is still being listened to, but the source is different – home entertainment devices are likely to be adopted en masse. However, most connected home and individual devices may require a dramatic change in behaviour. To appeal to the mass-market consumer, they will need to have obvious benefits or serve a specific need not addressed by any other device.
Some of the connected devices of today may need to go through significant changes in look and functionality before their appeal is increased. For example, health or fitness tracking devices could be embedded into our clothing or even inserted into our bodies.⁵⁵ The connected individual could evolve from fitness tracking (which tends only to appeal to the fit) to health (which should appeal to all of us). While connected devices embedded within our bodies which transmit real-time information to our doctors could transform healthcare radically, the privacy and security implications of our heartbeats being streamed to the web may remain an insurmountable barrier for years to come.

Consumers could end up using connected devices not by choice, but when existing suppliers provide them by default. For example, utilities could collect information on demand and asset performance via smart meters, and use these data to control consumption during periods of peak demand. If customers agreed, air conditioning systems could be powered down remotely, or washing machine cycles suspended, during heatwaves for example, to conserve energy for essential services, such as traffic lights and lifts. Car manufacturers may push built-in connectivity to deliver over-the-air updates: a cheaper alternative to recalls.⁵⁶ In future we may be consuming vegetables whose potassium levels have been lowered thanks to IoT techniques; we have long eaten meat courtesy of electronically tagged cattle.⁵⁷

While most consumers (56 per cent according to our survey) who are interested in IoT devices are willing to share usage data, they may still have concerns as to what data is being collected and how it is used.⁵⁸ Companies should make sure they explain how and why their customer data is being used.

Connected cars perhaps offer the greatest potential for operators as they rely on cellular connectivity to work. Connected cars can offer data plans for cars, wholesale contracts for car manufacturers to enable them to gather information and send updates, and prepay packages for access to rental cars.



Photos, inflicted

The oldest known portrait, etched out of a mammoth's tusk, dates back 26,000 years.⁵⁹ The oldest picture was painted 40,000 years ago.⁶⁰

For millennia the cost of creating a realistic portrait had restricted the market to royalty and nobility. The arrival of photography changed this, unleashing a demand for portraiture that has proliferated as rapidly as technological progress has permitted. The first photograph of a human was taken in 1838. The following year Robert Cornelius took the first self-portrait using a camera. To achieve this he had to stay motionless for an entire minute while the negative was capturing his image.⁶¹

In the time that Robert Cornelius posed for his selfie, a smartphone can capture 14,400 images, at 240 frames per second and at zero marginal cost. The smartphone and the networks they connect to have democratised the creation, finessing and distribution of portraits.⁶²

Currently, more than one in ten of us take photos of ourselves, other people or things every day. Among UK adults with a smartphone, all but five per cent have used their devices to take a photo, two-thirds upload or share their creations via social networks and IM (instant messaging) and 39 per cent upload them to file storage sites (see Figure 12). About half use their smartphone to take a photo at least once a week.

A megabyte (MB) photo looks pin sharp on a large smartphone screen. Users have plenty of space to accumulate their snaps. If one took and kept a one MB photo every hour for a year, this would occupy a mere 9 gigabytes (GB). A 64 GB smartphone can hold 64,000 high quality photos. A 32 GB memory card currently costs less than £10.⁶³ The price of the solid state storage used in smartphones falls every year.



Question. How frequently, if at all, do you do each of the following on your smartphone? (Take photos, upload/share photos on social networks or IM apps, upload photos to a file storage site)



Note: Responses for "weekly" exclude respondents who take photos "daily" Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

Of all types of digital camera in the market, the smartphone is the weakest optically. But for most people it is the optimal camera, as it is able to capture, correct and send a photo in the blink of an eye, all within a compact, lightweight and readily portable unit. Digital compact and SLR (Single Lens Reflex) cameras may have significantly better optical quality, but they are bulkier and may offer less overall utility as they lack in-built cellular and WiFi connectivity. We are likely to be carrying our smartphones when a moment worth capturing occurs.⁶⁴

The pleasure from portraits derives both from capturing a moment and from the positive and immediate feedback from friends who received the image. Smartphones enable holidaymakers to engage in a daily, real-time dialogue (or monologue) with people back home; a generation ago, holiday photos could only be shared post-vacation and once the rolls of film had been developed. Smartphone innovations increase the likelihood that the photos we take will be worth sharing. The better the photo quality, the more we take and share, with a resultant impact on network traffic.

For example, a technique called high dynamic range (HDR) enables a better-lit final photo, which is a composite of the best-lit parts of multiple shots of the same subject taken in very rapid succession.⁶⁵ HDR is analogous to the film-photography technique of 'dodging and burning' in which over-exposed elements of a photograph would be given less exposure to light, and vice versa. In a dark room, this technique takes minutes; a premium smartphone does this in a moment.

Gyroscopes and other sensors in a phone compensate for the blurring caused by camera shake. Software can adjust the image in low light conditions, enabling the subject of the portrait to be seen. The latest smartphones calibrate flash intensity using lasers to judge distance. This reduces the chances of a person's face being whitened out by an excess flash. Lasers can also be used to focus the lens faster.

Photos can be adjusted further via software that enables a range of parameters to be changed, such as brightness, colour saturation and orientation. The mood of the image can be changed with filters or by making the image monochrome. Thousands of apps, most of which are free to download, enable myriad further tweaks.

The better the photo quality, the more we take and share, with a resultant impact on network traffic. Faster network speeds encourage us to share our snaps liberally, and the UK public has taken up the offer, albeit to differing degrees, according to gender and age. Whereas half of all UK smartphone owners use their device to take a photo at least weekly, that proportion is 66 per cent among 18-34 year-olds and just 27 per cent among 65-75 year-olds. 55 per cent of female adults take photos with their smartphones on a weekly basis, compared to 45 per cent of adult males. The most prolific snappers are 18-34 year old women, three-quarters of whom take photos on their smartphones weekly. Women are also more likely to share photos on a weekly basis: a third of female adults to do so compared to a quarter of men. The speed and quality with which we can take portraits and other photos are changing the way in which we communicate; we can substitute photos and videos for spoken or written words. The message "having a lovely time on holiday" via a postcard or a phone call is being replaced by photos captured and sent from a phone. The 2013 fashion of posting a photo of a tanned pair of legs – colloquially known as 'hot dog' legs – was a popular way of conveying that you were on holiday and that the sunshine had been abundant.⁶⁶ The ability to communicate in this way is driving usage of mobile data while abroad, and accentuating a differentiator for operators that offer low-cost of no cost roaming.

'Hot dog' legs are just one facet of photographic self-portraits collectively known as selfies,⁶⁷ demand for which has been unleashed by the smartphone, but which was initially served by the automated photo-booth.⁶⁸ The first booth, installed in New York in 1925, had 280,000 customers in its first six months.⁶⁹

The smartphone appears to be satisfying a formally unfulfilled desire to catalogue, control and communicate self-image. A third of a billion images have already been posted to just one social network, Instagram, with the hashtag #selfie.⁷⁰ The UK public takes an estimated 1.2 billion selfies every year.⁷¹ A new born in 2015 may be the subject of thousands of photos before his or her first birthday.

Each of these photos can drive network traffic, when uploaded, viewed, or forwarded.

We communicate with photos of other subjects, such as food. A generation back people may have talked about a good meal out. A decade back they might have blogged via their PC when back home. Today, smartphones and restaurant WiFi permit diners to share an image of every course. For some this detracts from the enjoyment; for others instant feedback in the form of 'likes' is an essential ingredient.

In Deloitte's view, popular enthusiasm for smartphone photography – and what this engenders – will continue to influence the direction of innovation. A current focus is on enabling better selfies through higher resolution, wider-angle frontfacing lenses. A subsequent development is likely to be forward-facing, distancesensitive, natural light flashes that create better-lit selfies in low-light conditions. For manufacturers this feature may be a key differentiator; for operators better quality selfies will likely encourage sharing, thus driving network traffic. As smartphones and the networks they connect to improve, the photographic format is likely to change. Current smartphones create ultra-wide panoramic photos by digitally stitching multiple still photos together. The next step will likely be a 360-degree photo, capturing every angle simultaneously.⁷²

Deloitte's view is that video should become increasingly popular. Sports day triumphs will no longer just be conveyed merely as a shot of the finishing line victory, but also as a video of the entire race, with critical moments captured in slow motion. A parent unable to attend their child's recital at assembly in person could watch a live-stream of the event. Athletes using apps such as Periscope and Meerkat, could broadcast their athletic prowess on track, tarmac or waves to anyone anywhere who wishes to watch.

The smartphone has enabled portraits and other images to proliferate by democratising photography like never before. And as one navigates past tourist hot spots congested by thickets of selfie-stick wielding travellers one may feel as if people are already capturing and communicating to excess. But imminent technological advances should make it ever easier to capture, correct and communicate. History suggests that these advances will be adopted, eagerly. The future may be more documented – in every dimension – than ever before.

Some may argue that the democratisation of portraiture is a negative for society. Some may feel photos are being inflicted rather than shared. The ease with which we can take photos may foment obsessiveness with our appearance. But arguably we could condemn anything that enables us to change our appearance, be this lipstick or the colour black.

Some may sneer at diners who mark the arrival of every course with a round of photos; or this could be regarded as a contemporary form of peacocking, analogous to the decades-old practice of fine-dining top trumps.

The tens of billions of photos the UK public has collectively amassed on their smartphones could be regarded as a negative. But each collection is also a repository of thousands of joyous occasions. Glancing at photos can prompt happy memories bringing sparkle to an otherwise dull day.

Bottom line

The desire for photos drives innovation, encourages smartphone upgrades and increases network usage.

Smartphone vendors have long differentiated their models on photographic capability. They should however focus on innovations that are perceptible and appreciated by users, and not be lured into a specification race that only pleases the device's creators. A few years back, some vendors competed on megapixel count. With most photos viewed on small screens by both creators and recipients, incremental resolution soon became imperceptible to all but the best-trained eyes: ultra-high resolution requires vastness to appreciate. Engineers' ingenuity was thus arguably squandered.

Customers are likely to respond to technology that flatters their ability. Smartphones benefit from exponentially improving processor and connectivity speed – a progression known as Moore's Law. There is no equivalent law for talent, but technology can (and should) be deployed to lessen user error when taking photos. Software that automatically compensates for photographic mistakes (such as shooting into direct sunlight) can make the owner feel more talented.

Smartphone vendors should also consider how to tap into our innate vanity by using technology to enhance the subject. A phone's software can deliver an instant, digital make over by automatically smoothing wrinkles, lessening bags under the eyes, deleting spots and adding a sun-kissed glow. The smartphone is an upgrade to the Evil Queen's magic mirror, as it need not speak the truth.

Software can also differentiate by automating cataloguing. When one has amassed tens of thousands of photos on a phone, finding a specific portrait becomes tedious. Facial recognition can be deployed to identify individuals automatically, without having to create metadata for each image. Network operators can harness our sharing of photos to drive network traffic, and to encourage upgrades to larger data packages. Exclusive supply of the smartphone models with the best cameras and software could attract customers from other networks, or help renew a contract. The biggest near-term opportunity for network operators is likely to be the progression from images to video, but carriers should make users aware of how much more data sending video requires relative to photos, or users may exhaust their monthly allowances too quickly.

Retailers should consider how best to tap into the growing communication via images. Catalogues, which have traditionally been shot months before distribution, can be deconstructed into smartphone screen-sized photos accompanied by a 'buy' button. A photo of a celebrity wearing a brand's outfit can be relayed immediately to fans – there is no need to wait for this to appear in a newspaper, magazine or a website.



Retail, reinvented

Smartphones are increasingly integral to our retail experiences.

The progression is inexorable: 13 per cent of UK adults have now made a mobile payment in-store, 40 per cent have made a mobile commerce purchase with their phone and 59 per cent have browsed retailers' sites on their phone. Retail is being steadily reinvented, with the smartphone becoming increasingly core to multiple aspects of retail from merchandising to payments.

Today, neither wallet nor purse is doomed, but both are likely to become increasingly marginal, particularly among younger age groups, because of the smartphone. Within a year, the base of retailers in UK cities accepting mobile payments via apps or in-store readers should be sufficiently broad such that early adopters may be able to leave home without their wallets.⁷³ For the mainstream consumer, it will be many years before credit cards are dispensed of entirely, and cash's anonymity may well mean it remains in circulation for generations.

Mobile payments: Niche to norm

The journey to where we are today has been long and arduous; the road ahead will likely be just as difficult (and rewarding). It is over 15 years since the first major joint venture was set up to enable mobile payments.⁷⁴ It is over ten years since the first e-commerce sites launched their mobile equivalents.

In the last year, there has been a marked increase in the number of UK adults who have tried out mobile payments. In May 2014, about three per cent of UK adults had used their phone to make a payment in-store. A year later, (just prior to the launch of Apple Pay mobile payments solution in the UK on 14 July 2015) the proportion had surged to 13 per cent.⁷⁵ But just one per cent were using their phones to make payments on a regular basis (see Figure 13). We expect that in a year's time the proportion of phone owners who pay using their phone in-store to increase further, and the proportion of those who do so regularly to rise sharply.



Figure 13. Frequency of making mobile in-store payments among UK adults Question. How frequently do you use your phone to make in-store payments?

Note: Respondents who answered 'Don't know' have been excluded from this analysis Weighted base: Respondents who own or have access to a standard phone/smartphone (3,682) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

The progression to in-store payments via mobile has been gruelling, and will likely continue to be, as blending retail systems and financial systems is a complex task. But the industry and consumers will likely persevere in making this happen.

Enabling in-store mobile payments requires retailers to have NFC (contactless) card readers and the latest software uploaded. It requires their staff to be familiar not just with the availability of the service, but also which phone models are compatible and which cards are supported. In addition, staff should be able to assist first-time users. While customers may know where to place their plastic cards to make a contactless payment, they may not have yet worked out how to place their smartphone on a credit card reader.

In-store mobile payments usage should surge among consumers who frequent stores which offer this payment method and whose friends are already using their devices to pay seamlessly. UK consumers living in cities have become accustomed to using contactless, and this has become the default payment method in fast food locations in central London. Once you have got used to the concept of paying for something without signing or entering a PIN, replacing a credit card with a smartphone is a smaller step to take.

Among the uninitiated security is likely to remain a concern (see Figure 14). Among UK adults that have not yet used their phone to pay in-store, the most common reason given – cited by 42 per cent – was "I don't think they are secure enough". Yet making a payment with a phone can be the most secure way to pay at present as the fingerprint provides accurate authentication, and cannot be copied through observation as a PIN can be.⁷⁶ Furthermore, the phone transmits a one-off token to authorise the payment, meaning that the payment card number cannot be compromised.



Figure 14. Reasons for not making in-store payments via mobile phones Question. What are the main reasons why you don't use your phone to make payments in-store?

Weighted base: Respondents who never made a mobile in-store payment (3,176) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015 The second most common reason for not using mobile payments is "I don't see the benefits from using this". However, we expect that over the coming months the benefits will become more evident. For example, with contactless card payments there is a current limit of £30 per transaction.⁷⁷ With smartphones the limit is governed by the card's limit, which for credit cards could be thousands of pounds. Once payment and loyalty systems become combined, enabling customers to discard physical cards, the benefits are likely to become increasingly apparent.

The third reason, cited by a fifth of those who have not yet made a payment in-store via mobile, was that they lacked the necessary feature or app on the phone. In some cases, lethargy or lack of bandwidth may have thwarted the download of an app. Some respondents may have believed that they need to have an NFC-equipped phone to pay via their phone, but the reality is that any smartphone can download an app which enables payments via two-dimensional barcodes (also known as QR codes).⁷⁸

Mobile commerce: Smartphones enable the spontaneity economy

Recent news on mobile and payments has focused on in-store transactions. But the bigger activity, and arguably the bigger opportunity, is mobile commerce. Of the 59 per cent of all UK adults who have used their phone to browse shopping websites or apps, over half (36 per cent of the Deloitte survey sample) do this at least once a week. Of the 40 per cent who have used their phones to purchase, only a quarter of this group (11 per cent of the total) do this weekly. This is entirely understandable. While opening an app or browsing through a mobile-optimised website requires little dexterity, accurately entering the full data set required (address and credit card number) to make a first-time purchase is cumbersome and time consuming.

We expect the volume of transactions via a phone to increase significantly as the payment process gets compacted into a single click or fingerprint impression.⁷⁹ We also expect that greater ease of payments will lead to more browsing on a mobile phone and that payment will be made on the same device. At the same time some individuals may wait till they have access to a larger device before entering their details.

Retail's continuing mobile reinvention

Over the next few years, the capability of smartphones will continue to iterate in ways which support yet deeper integration of mobile into the retail experience.

We believe there are at least ten smartphone-enabled⁸⁰ retail rituals that are mainstream practices today or likely to become popular in the medium term future:

- Upon waking, checking special offers from retailers sent via email or social networks. Currently more than a half of smartphone owners have looked at their phones within 15 minutes of waking. A quarter look at email, and a sixth look at social networks.
- 2. Using a phone to pay for a coffee, using NFC or 2D barcodes. As of May 2015, just one per cent used their smartphones to make a payment daily. We expect this proportion to have risen considerably by the time of our next survey in 2016.
- 3. Browsing websites on the way to work. Two-thirds use their smartphone while using public transport.⁸¹
- 4. Reserving a product online. 45 per cent use their smartphone to reserve a product and collect it in store.
- 5. Buying lunch. About one in five would use their smartphones to pay for fast food and about one in six to pay for restaurant bills.
- 6. Looking up information on products while shopping. Over half use their smartphones while out shopping.⁸²
- 7. Browsing #wiwt (what I wore today) sites while on a conference call. Currently about one in seven admit to using their smartphone during business meetings.
- 8. Transacting while on the bus on the way home. 14 per cent purchase a product online via their smartphones weekly.
- 9. Providing proof of purchase when picking up goods ordered via click and collect. Almost five in ten have used their smartphone to validate a purchase and about nine per cent do so weekly.
- 10. Searching for information prompted by something seen while watching television. At present, over half are using their smartphones at the same time as watching TV, with one in four doing so "almost always" or "very often".

Bottom line

Retailers should steadily iterate their mobile-centric offer, but should also be aware that mobile will likely remain one of several retail experiences provided, rather than the sole interface. The mobile offer should be part of an integrated, consistent retail experience that spans all channels, digital and physical, that a consumer may wish to use.

Context will determine how each customer, at each point in time, wishes to interact with retailers. Mobile is ideal while on a congested train, but the same fervent user of a retail app may also be a fan of the in-store experience, as and when time and place permit. The survey results show that very few (14 per cent) of those adults who use their smartphone for online shopping prefer to shop on a smartphone rather than another device such as laptop or tablet; but occasionally it may be the only option available.

The check-out process is a core part of the retail experience. It may be the only time that the customer speaks with a member of staff. The slickness of the process, including the range of payment options available, is likely to be a key influence on perception. Enabling customers to pay by phone will be a positive if the consumer taking this option feels good for doing so. Any store offering payment via phone should ensure that staff are aware of all the options available, and can guide users to complete the transaction.

In-store payments may go through initial teething problems. To encourage usage, retailers could offer additional incentives, such as integrating payment with loyalty point collection and redemption.⁸³ For handset vendors, payment is likely to become an increasingly important differentiator and driver of loyalty. Smartphones are becoming an individual's most extensive repository of personal data, all of which can be used to authenticate the identity of the user. Biometric data such as fingerprint impressions are already stored on millions of phones in the UK.⁸⁴ Additional identifiers such as voice patterns and gait (using accelerometers)⁸⁵ could also be incorporated along with geographic data, such as locations visited and buildings entered (using WiFi hotspot data).⁸⁶

Better mobile commerce sites are likely to drive network traffic, and can drive consumer upgrades to faster networks. The survey results show that respondents with a 4G connection are more likely to browse shopping websites or apps (60 per cent do so weekly) than those without one (37 per cent do so weekly).

Smartphone-enabled payment processes should always be iterated. If contactless smartphone payments are to gain mainstream adoption, the process needs to be just as fast as paying with a card. Currently the additional time required for the fingerprint to be read is sufficient to slow down the payment process, and for high volume locations, such as fast food or transport, that additional second may embarrass the consumer, and possibly vex the retailer. One solution to this would be to submit and validate the fingerprint a few seconds prior to the phone being placed near the reader.

With all the prerequisites of in-store payments coming together, retailers have the opportunity to overhaul the shopping experience completely. A 'zero-interaction' retail experience, which could allow consumers to walk into a store, scan a barcode, pick up the product they want, pay with their phone and walk out again, without ever having to speak to a retail assistant or go anywhere near a payment counter, will be possible. This may prove practical for consumers as it could considerably reduce their shopping time. Retailers could benefit from a reduction in operational cost and supply chain automation.



Video, minimised

Television is the most successful media service. The smartphone is the most successful consumer electronics device. So the attraction of combining the two to create mobile television may appear obvious; indeed there have been multiple attempts over the past decades. Many have launched to fanfare; most have subsequently disappeared with barely a ripple.

Every failure can be blamed on a range of factors: inadequate screen quality, the appropriateness of the content or the speed of underlying networks.

But, in the last few years, the majority of these factors have been addressed. Smartphone screen resolution has long since passed the point at which individual pixels were identifiable at normal viewing distance. Screen size has jumped in the last couple of years such that five-inch screens are now standard and no longer considered out-sized. Cellular and fixed networks can readily provide the data rates sufficient to stream high-definition content to even the largest of smartphone screens. And where networks do not reach, or are too slow, most major video-on-demand services enable content to be pre-loaded to devices. Some of the most used mobile sites, particularly social networks and news, offer an increasing range of video content.

And smartphone penetration continues to climb. In the last three years it has risen by 24 percentage points to 76 per cent. By end-2016, it is likely to have surpassed 80 per cent of adults.

So, are we now at the point, finally, at which video can finally make the leap from the big screen to the small screen? Is the era of family viewing of big-ticket, scheduled televised shows watched on 50-inch flat screens finally coming to an end?

While television remains the dominant media service, its resilience has come under increasing scrutiny in recent years. In the first decade of the millennium, television was the traditional medium that remained resolutely impervious to the rise of the PC, broadband and the internet. Viewing remained at about four hours per day, year-in, year-out. But in recent years, hours watched has declined, steadily. According to BARB, hours of live television in the UK fell by six per cent (12 minutes) to 194 minutes in 2014, following a five per cent (11 minute) decline in 2013.⁸⁷ During these two years the number of adults with smartphones increased by about 15 percentage points. Is this coincidence or correlation?

Multiple factors have likely contributed to the decline in viewing time, from gaps in measurement (leading to under-counting of TV consumption) or rising employment (reducing hours available to watch programmes). But the rising penetration and usage of smartphones is likely to have been a factor. They have nibbled away for example at the relevance of televised news bulletins, which formerly broke news stories ahead of newspapers, but which now repeat what online news services had announced hours earlier. Social networks offer personalised soap operas, as opposed to broadcast ones. And smartphones offer increasingly attractive, portable alternatives to watching television programmes, such as playing games. The visual sophistication of games created for mobile phones ratchets up each year: compare the first *Angry Birds* with the high production values in *Monument Valley* or *Leo's Fortune*.

Is traditional television doomed to slow, inexorable decline?

Deloitte's view is that smartphones and television currently largely coexist: they address largely different needs, and are therefore used in different ways. At present, the primary function of the smartphone is communication, while the television's main role is entertainment, mostly based on high-production value content. We use a widening array of communications tools on our smartphones. As well as voice calls and text messaging, which are used weekly by nine in ten adults with a smartphone, we use email (60 per cent), social networks (51 per cent) and IM (instant messaging) (46 per cent) to exchange information with others. Aside from voice calls, we are, on the whole, using each communication medium more each year, for example the use of IM was up 15 percentage points from 2014. When we reach for our phones first thing in the morning, it is most commonly to check for text messages, emails and social networks. We do not, in general, reach for our phones to watch video upon waking.

We are content to watch several hours of video on a television in the evening; on smartphones the shorter the duration the better. The only video format to enjoy significant usage by smartphone owners is the short-form clip (typically a few minutes long). About two in five smartphone owners (37 per cent) watch video clips (see Figure 15). As for other video formats, about one in seven (14 per cent) smartphone owners watch news videos. This compares to the 42 per cent of those who read news on their smartphones.

One in ten watch catch-up TV, and one in six watch live TV or movies. The longer the video, the less palatable the smartphone screen is for its consumption, most likely due to the discomfort of watching content formatted for a fifty-inch screen on a five-inch one.

Figure 15. Video usage on smartphones

Question. For which, if any, of the following do you typically use your smartphone for?



Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015

Usage of video on smartphones declines considerably when out and about and most likely reliant on cellular networks or public WiFi hotspots whose quality is variable by design. Watching short videos declines 24 percentage points to 13 per cent usage. Only five per cent watch video news, a mere three per cent watch catch-up TV and just two per cent watch live TV or films.

Access to 4G networks has little impact on video consumption when out and about. 4G users respond to faster network speeds by using more communication services (email, social networks and IM). Some of them watch more video, but in our 2015 survey, it was only the eighth most used application.⁸⁸

One type of video which has seen some popularity with consumers is auto-play video, a feature often found on social networks, where video plays automatically upon appearing in a user's feed or stream. More than a quarter of smartphone owners watch auto-play videos at least weekly. It is unclear however if these videos would have been watched if the user had had to press 'play'.

Videos consumption is data intensive and each second is equivalent to up to 30 photos.⁸⁹ Auto-play has been blamed for causing consumers to exceed their monthly data allowances.⁹⁰ It has had a marked impact on network traffic: during 2014's 'Ice bucket challenge',⁹¹ some mobile operators noted a 60 per cent year-on-year increase in Facebook traffic.⁹²

While smartphones may not compete with television for watching traditional long-form video, arguably they could crowd-out time and attention that would otherwise have been spent in front of a TV set. After all, over a third of adults claim to look at their phones more than 25 times a day, and about a sixth look 50 or more times a day. Even the most avid TV viewers would not have two dozen viewing sessions a day. Almost a quarter of respondents say that use their smartphone "almost always" and "very often" while watching TV or a film (see Figure 16). This behaviour is even more pronounced among younger consumers with more than a third of smartphone users aged between 18-24 year old exhibiting this behaviour.



Figure 16. Usage of smartphones while watching TV/a film

Question. How often, if at all, do you use your smartphone while doing the following? (While watching TV/films)

Note: Respondents who do not watch TV/films have been excluded from this analysis Weighted base: Respondents who own or have access to a smartphone (3,039) Source: UK edition, Deloitte Global Mobile Consumer Survey, May-Jun 2015 However, we expect smartphone usage to be predominated by brief glances checking for updates, whereas television viewing is characterised by lengthy consumption. We think mobile addresses different needs to television.

Smartphones are our connection to our personal and professional networks, and are used throughout the day, but briefly. For tens of millions, television is an evening activity, used to relax and disconnect, often in the company of others (and smartphones).

Bottom line

We do not think content creators are likely to depart television for mobile. Some core television genres, including entertainment, drama and sports, are formatted for large television screens and can be significantly harder to watch on a small screen. For example in sports, it may be hard to spot the ball. One option would be to format content for a small screen. This works readily and can be automated for text and even with still images, but is much harder to attain with video. We think it is unlikely that smartphone screens will get much bigger so to accommodate these genres, as they would lose their portability: only a tiny minority of larger screened tablets are used out of doors.

However some genres, particularly news and weather, mesh very well with the smartphone format. Smartphones are well suited to break news alerts; weather apps can provide updated, local weather information on demand. Indeed upon waking, once we have checked for messages, we next turn to news and weather.

In recent years, there has been a focus on developing second screen apps to accompany television viewing. Our current view is that only a minority of television viewers 'second screen', for example by playing along with contestants on a quiz show. We do not expect, based on the modest take-up so far, this behaviour to change significantly in the medium term. The less these apps are used, the less investment that is likely to go into their creation. So far, smartphone usage does not appear to have had an impact on TV industry revenue. Revenues from both subscriptions and advertising have been increasing year-on-year. In fact, TV industry revenue in the UK hit a record high £13.2 billion in 2014, with both subscription and advertising at their highest levels in history.⁹³ At the same time, we do not expect that in the near future, TV advertising revenues will be directed to mobile. Mobile advertising is increasing, but not at the expense of TV.⁹⁴

As the smartphone screen now diverts our attention while sitting on the sofa watching TV, advertisers must rise to the challenge. They may no longer be able to rely on the 30 second ad to effectively convey their brand message. So they must find ways of adapting to this new, distracted consumer behaviour to create the 'cut-through' they once enjoyed. Finding ways to straddle both the mobile and the traditional TV platform will be crucial to the success of advertisers in the future.

About the research

The UK data cut is part of Deloitte's Global Mobile Consumer Survey, a multi-country study of mobile phone users around the world. The 2015 study comprises of 49,000 respondents across 30 countries and six continents.

Data cited in this report are based on a nationally representative sample of 4,000 UK consumers aged 18-75. The sample follows a country specific quota on age, gender, region, working and socio-economic status. Fieldwork took place during May to June 2015 and was carried out online by Ipsos MORI, an independent research firm, based on a question set provided by Deloitte.

This brief report provides a snapshot of some of the insights that the survey has revealed. Additional analyses such as: 4G adoption and usage, smartphone purchasing channel, reasons for joining/leaving mobile operators, attitudes towards triple/quad play, usage of tablets, and usage of communication services such as IM, SMS and social networks are available upon request.

Results for other countries are also available upon request.

For further information about this research, please contact: mobileconsumer@deloitte.co.uk

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Endnotes

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