# Mobile Technology

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# Telecoms networks 'maxed out'

The internet of things needs a new generation of digital infrastructure, writes *Daniel Thomas* 

he holy grail for the telecoms industry is a network that is all-powerful, always on and everywhere. This may sound fantastical to those using an unreliable mobile or home broadband connection, but it may be closer than many imagine.

"We think we are at a point where there is a huge disruption coming," says Marcus Weldon, chief technology officer at Nokia and president of Bell Labs. Telecoms networks have already seen increases in speeds, but experts say a bigger change is needed in order to connect billions of devices in homes, work places and public spaces.

The past few technology cycles have been driven by devices or web services, Mr Weldon says, but the next disruption will be about creating cloud-based networks from which we can instantly access data.

Streaming ultra high-definition television, internet banking, remote health-care and virtual reality will increasingly depend on near-perfect network quality. A connected car is useless without a connection, and that connection needs to be flawless to prevent accidents.

"Every device, every media, every person will be connected," says Mr Weldon. "Mundane tasks will be taken away by algorithms that can automate large chunks of everyday life. The network is cool again because it enables a new human existence."



Ericsson, the Swedish telecoms group, expects there to be 28bn connected devices by 2021 — of which only 9bn will be traditional mobile subscriptions. The rest will be "things", as applications for connected homes and cities become reality.

But new network architecture is needed. "All available tech is maxed out," Mr Weldon says. "We built a network for people but in future every person will have 100 connected things."

By 2020, Huawei estimates that network traffic will grow threefold and mobile traffic will increase eightfold. Fibre networks capable of carrying vast amounts of data across countries will need to be expanded. Telecoms groups are squeezing more out of the older copper cables using technologies such as G.Fast or vectoring, which can

achieve speeds of 500 megabits per second (Mbps). But many analysts see this as a stopgap.

Developing the technology behind 5G — the next generation of high speed mobile — is also crucial. The goal is not just faster speeds. "A response time is more important for a connected car, and battery life is more important for an agricultural application to measure moisture", says Rima Qureshi, chief strategy officer at Ericsson.

The cost of developing and deploying this infrastructure is a problem. Ryan Ding, president for products and solutions at Huawei, says that sharing infrastructure is one solution. In Singapore, for example, the government encouraged power companies and telecoms operators to share pipelines, which brought the cost of connecting a home to the fibre network down to \$100 per connection, less than one-eighth of the average cost in Europe.

Indeed, many governments — cognizant of the economic and social advantages of digital infrastructure — are working with companies to help develop next generation networks.

Broadband access has become a basic human right, says Mr Ding. "This will create a new type of inequality. Broadband access brings both commercial and social value, so every country should increase investment in broadband construction."

Tech experts, meanwhile are even more ambitious about changing the world. "Star Trek had it right," says Mr Weldon. "The replicator is the 3D printer. The Holodesk is a VR room. A tricorder is there in real time medical imaging. Communicators — the smartphone. This is about simplifying life, automating life, improving life."

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More than 1m malware programs targeted handsets last year

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### The relief of owning a 'dumb' phone

Travellers and the digitally weary seek simplicity from their handsets





### **Mobile Technology**

### Black rectangle Smartphone market at risk of commodification as design innovations hit plateau

Tens of thousands of technology experts will gather today at the Mobile World Congress trade show to see companies unveil their latest smartphones, tablets and wearable connected devices. But will they be excited by what they see?

There is a "growing view that design features of smartphones have reached a plateau", says Ben Wood, an analyst at CCS Insight. It is a problem for companies hoping to encourage customers to upgrade their devices.

This year, the most high-profile launch is likely to come from South Korea's Samsung, which is expected to reveal a flagship Galaxy smartphone, the S7. Analysts predict the device will contain several innovations and a more advanced processor. But in many respects it is expected to be much like



Phone fans: new models on display

the previous iteration — the S6 — with a similarly tapered "Edge" version. Sony, meanwhile, will show off its latest Xperia handset, likely to come with a better camera. LG, Huawei and HTC will also launch devices.

Mr Wood expects improvements in core features such as battery life. camera performance, screen technology, ruggedness and memory capacity. But there is unlikely to be any dramatic departure from previous ranges.

While Mr Woods says there are likely to be some "free-form" phone prototypes that move away from the traditional rectangle, these will not come from mainstream phonemakers. Virtual reality headsets may also provide some excitement, with both

HTC and Samsung pushing platforms.

However, commodification of the

Ad blocker monthly

smartphone may be the biggest story at the conference, with a large number of high-spec devices on show from Chinese brands such as Alcatel OneTouch, Lenovo, Xiaomi and others.

These companies are producing smartphones similar in design and technology to devices from Sony and Samsung, but often undercut their rivals on price. They are causing established companies to lose market share.

One of the most interesting launches will come from Xiaomi, which has promised to give details about the forthcoming Mi 5 smartphone at an event hosted by ex-Google executive Hugo Barra. Analysts expect that the phone will carry a relatively high price, showing that Xiaomi will compete as much on quality as cost. **Daniel Thomas** 

# Media sector worried as ad blocking goes mobile

### **Advertising** Software companies are accused of running an 'extortion racket', says Robert Cookson

n "unethical, immoral, mendacious coven of techie wannabes" - that is how Randall Rothenberg, president of the Interactive Advertising Bureau, describes ad-blocking companies.

In a speech to his members, which include Google and Yahoo, Mr Rothenberg last month described Adblock Plus, maker of the most popular software for blocking ads, as "an old-fashioned extortion racket, gussied [dressed] up in the flowery but false language of contemporary consumerism".

The barbed speech is the latest sign of anxiety in the media and marketing sectors over the rapid adoption by consumers of technologies to prevent advertising from appearing on web pages. More than 200m people worldwide use ad-blocking software, which is double the number two years ago, according to estimates by PageFair, the anti-blocking service, and Adobe, the software company.

For online publishers whose businesses rely on advertising revenues, the trend is worrying. Their fear has intensified in recent months as blocking technologies, once limited to desktop computers, have spread to mobile devices.

In September, Apple started allowing iPhone users to block ads in its Safari web browser. Apps such as Crystal and Purify soared to the top of Apple's App Store rankings by downloads, as consumers embraced the option to eliminate ads that slow page loading times, clutter websites, and drain data allow-

According to a survey by Global Web Index, a research company, 37 per cent of mobile users said they had blocked ads on their device in the last month.

Jason Mander, director of research and insight at Global Web Index, said: "The arrival of ad blocking on mobile has also been encouraging people to adopt this approach across all of their devices."The survey found that across all ages and genders, at least 70 per cent of respondents said they were either blocking ads already or were interested in doing so.

Mobile network operators have spied an opportunity in consumers' rejection of ads. Digicel, the Caribbean-focused network owned by Denis O'Brien, Ireland's richest man, started blocking ads on its network in Jamaica in September. Digicel is working with Shine, an Israeli start-up, whose software prevents companies including Google from delivering ads to mobile browsers and apps.

Mr O'Brien said that the move was "about giving customers the best experience". But he added that he wanted to

### US cost of ad blocking active users (Global) Million 200 US digital ad spend US ad block cost 80 150 60 100 40 2009 10 11 12 13 14 15 2013 14 15 16 Ad blocker users by device Q2 2015 (%) 100 2% Mobile 98% Desktop Source: PageFair

force companies such as Google, Yahoo and Facebook "to put their hands in their pockets" and pay Digicel to allow their ads to reach its customers.

Advertisers and media companies are angry that ad blocking groups want to take a cut of their business. Many have focused their ire on Eyeo, the company behind Adblock Plus, which accepts payment from companies including Google and Microsoft to allow some ads through its filters.

German media groups including ProSiebenSat.1 and RTL have sued Eyeo, alleging that it is guilty of anticompetitive behaviour. However they

37 per cent of mobile users said they had blocked ads on their device last month

have failed to win in court, and Eyeo says its activities are entirely lawful.

The ad blocking trend is "a wake-up call for better advertising", says Norm Johnston, chief strategy and digital officer at Mindshare, the WPP-owned media agency. "If you don't pay attention . . . then things will get worse."

But he says fears about ad blocking are exaggerated. "The vast majority of people want free content," he argues, and so will ultimately have to accept

Indeed, an increasing number of media companies, such as ITV and Channel 4, the UK broadcasters, refuse to load content on their websites when they detect that a visitor is using an ad blocker. If you want to watch their shows, you also need to watch their ads.

Forbes, the business news site, also recently began asking readers with ad blocking software to turn it off. The company found that 42 per cent of the 2.1m visitors who were asked to disable their ad blockers did so.

Ad blocking will also be limited by the fact that apps are largely immune. Apple and Google, which control the most widely-used mobile operating systems, allow ad blocking in mobile web browsers but do not let blockers interfere with advertising in apps.

While Digicel has shown that in-app advertising can be blocked at network level, telecoms industry experts say that it would be difficult for US and European mobile operators to follow suit. To protect "net neutrality" - the principle that no internet traffic should be favoured or blocked - regulators in many jurisdictions prevent internet service providers from interfering in the data traffic that passes through their networks.

## 'More than 1m malware codes target phones'

Cyber security

Mobile handsets containing banking, health and work data are attractive targets for hackers, writes *Jane Bird* 

Mobile malware took off in 2011. That is when hackers began serious attacks on mobile phones, says David Emm, principal security researcher, at Kaspersky Lab, a cyber security company.

"At that point, the data became worth stealing, and since then growth has been exponential," Mr Emm says. He estimates 1m new malicious codes were found on devices in 2015. "The actual number of attacks is much bigger than this because each program tends to be used many times."

Early attacks focused on causing handsets silently to call premium rate numbers. Then hackers diversified into phishing – creating spoof websites that trick people into revealing account numbers and login details.

Phishing still accounts for the overwhelming number of attacks on mobiles, says Mr Emm, although ransomware - locking data and demanding payment for its release - is also big, accounting for 17 per cent of the total across all platforms, according to Kaspersky's research.

Most phone attacks are on handsets that use the Android operating system because of its large market share and flexible, open technology. Apple's iPhones use proprietary technology which is more difficult to breach.

"Android is like having a room with lots of doors as opposed to a cave with a single entrance," Mr Emm says. But Apple is not immune.

In 2015, many app developers unwittingly downloaded a malicious version of Xcode - Apple's official tool for building apps - from a file-sharing website.Among scores of apps infected were WeChat, a messaging app popular in China, and CamCard, a popular business card reader in the US.

Although Apple vets the apps sold through its app store, the infected programs were not initially detected. They were made available and widely used.

Mobile phone security is challenging because devices are designed to connect in many different ways, says Ben Johnson, chief security strategist at Carbon Black, a security software company. "Whether it is a text message, email, web browsing, Bluetooth or near-field communication (NFC) connectivity, each method of communication is a potential attack route."

As human interaction is the main purpose of a mobile device, Mr Johnson adds, there are more chances to trick users. "People are much more likely to click on malicious images or videos sent to a mobile phone than to a PC, because it feels more familiar and natural."

Phones are also often set to connect automatically and display quick preview images, data or text. "This makes it possible to exploit a system without the recipient opening or 'clicking' anything," Mr Johnson says.

Defending against the most serious attacks is difficult, says Ian Evans, a vice-president and managing director at VMware Airwatch. "If the main source of the threat is a nation state agency, you're best to just throw your phone away."

However, simple steps can help against more common hackers. You should use a passcode or complex PIN on your device to protect it in case of loss or theft, says Mr Evans. "And it is best to avoid connecting to public WiFi networks. If the WiFi is not encrypted, somebody could intercept data including passwords. If you have to do so, make sure you always use a virtual private network to connect to sensitive resources."

Also, do not "jailbreak" your mobile devices, he says. This is a process whereby users remove operating system restrictions so that they can customise their phone and download apps not normally allowed. "Jailbreaking negates your warranty and exposes you to more potential malware," says Keiron Shepherd, senior security specialist at F5 Networks, a cyber security company.

Phones with hardware-based encryption tend to offer stronger protection than software encryption, says Mr Evans. "The encryption key is stored on a chip, which acts like a safe." But Android handsets continue to lack dependable hardware-based encryption, Mr Evans says.

Sometimes phones are compromised during production, as happened in 2014 when a factory-installed "Trojan horse" was found on the Star N9500 Android smartphone, made in China and sold by companies such as Amazon and eBay. It enabled hackers to operate the phone remotely and, being embedded at the factory, could not be removed.

The next battleground between

### The next battleground will be biometric data such as thumbprints, iris or voice

hackers and phone owners will be biometric data such as thumbprints, iris or voice profile. At present, hackers rarely use biometrics to circumnavigate security because there are many easier paths, says Mr Shepherd. "This is likely to change. The problem is that if your password is discovered you can quickly change it, whereas once biometric data are compromised, that's it."

### **1G**

**1980s** The first generation of the cellular network was an analogue system that supported voice services only. The technology drove early mobile adoption but was problematic, and



### **Motorola DynaTAC 8000X**

**Data transmission speed** 

0.001m bits per second Downloading an MP3

Sources: GSMA; University of Surrey; Strategy Analytics; FT research

### 2G

1990s Mobile networks emerged supporting far more users and better security. As well as voice, they began to support simple data and gave birth to the 'text message' as a means of sending a memo between handsets. Consumers were also able to roam on foreign networks



**Nokia 3310** 

0.1m to 0.3m bps

7 minutes

### 3G

2000s Growing use of internet and broadband led to mobile systems that were built to support high-speed data services. Phones with advanced operating systems became available which could support video calls. This resulted in a dramatic rise in the use of mobile data



Apple iPhone 3G

0.3m to 42m bps

10 seconds

### 4G

2010s The shift toward smartphones and other mobile devices forced operators to seek more efficient ways to use the spectrum as heavy usage of sites such as YouTube was stretching the network. The current generation of mobile data services is about 10 times faster than 3G network speeds



Samsung Galaxy S6

100m bps

3 seconds

### **5G**

2020s 5G will not be just about the mobile phone but about providing connectivity over the airwaves to billions of devices that in future will require access to the internet, ranging from driverless cars to smart cities. Enabling this 'internet of things' will require a mobile internet that is as broad as it is fast



Google driverless car

Up to 10,000m bps

Near instant

### Setting the standard

**Europe and Asia race to** develop 5G technology in hope of reaping rich patent payments

An intense rivalry is developing between Europe and Asia to be the first to develop the next generation of mobile technology, known as 5G. Being first would allow a region to set the standard and reap the economic benefits, chiefly the fees from patent licensing.

The next generation network is expected to build on, rather than replace, existing 4G services. It is likely to be able to deliver data speeds up to 10 gigabits per second (gbps) and near instant reaction times capable of supporting connected

cars and virtual reality applications.

The European Commission has stepped in to help companies such as Nokia and Ericsson stay in the forefront. Last month the regulator summoned telecoms groups to a meeting to help speed up and implement a strategy to deploy next generation mobile services.

Regional authorities have control over policies regarding spectrum allocation and the licensing needed to launch 5G services. Europe has already said that the 700MHz band — used for TV services — will be reallocated for 5G use, and it will work on securing highfrequency spectrum above 6 GHz by

2020. "Governments should make sure that an additional 500 to 1.000MHz should be made available," says Ryan Ding, president for products and solutions at Huawei Technologies. "Governments should also issue more licenses to leading telcos to improve the experience with existing networks."

However, some experts say Asian countries may already have a lead, not least because Korea has promised a

form of the technology in time for the 2018 Winter Olympics. Chinese companies such as Huawei and ZTE are also working to establish 5G standards.

Kester Mann, analyst at CCS Insight, says that the primary focus at Mobile World Congress, the annual telecoms sector conference, will be on Asian operators as the "race to launch the first pre-commercial networks intensifies".

"The PyeongChang 2018 Winter Olympic Games in South Korea and the Tokyo 2020 Olympic Games in Japan will be high-profile events for such

deployments. KT Telecom and NTT DoCoMo are likely to articulate their plans for the events and 5G technology at Mobile World Congress," he adds

European telecoms groups, meanwhile, have been more conservative about their own 5G plans — preferring instead to work with more advanced 4G formats for now. But, having recently completed the acquisition of Alcatel-Lucent, Nokia was "likely to set out its vision with a strong focus on 5G technology," Mr Mann says. **Daniel Thomas** 

Mobile Technology

Telecoms correspondent

Digital media correspondent

Technology correspondent

**Daniel Thomas** 

**Robert Cookson** 

### Smart cities Mobile phones offer ways to make urban transport

The phrase "connected cities" conjures images of sensor-laden highways, live maps of underground systems and a mission control centre filled with huge screens of data.

Ghent, however, is leaping into the future of "smart" infrastructure just by

The Belgian city is among the first in western Europe to sign up to the Waze Connected Citizens programme, which sees city transport authorities exchange traffic and incident data with the

traffic jams, which are then relayed to other drivers. The data are also shared with local governments to help with real-time traffic management, including

give Waze information about road

"If you were starting today with webservices know-how and data analytics," a traffic management centre could be built for a "fraction" of what they typically cost, says Di-Ann Eisnor, Waze's head of growth.

Waze is an example of how cities can take advantage of the sophisticated sensors that millions of residents already carry: smartphones.

thinking in a top-down way, putting a lot of new sensors into the city," says Carlo

### Global smart city pilots

Cities are experimenting with using sensors, smartphone and apps for everything from medical



Transport for I ondon and companies including IBM run

Barcelona

provides a

telemedicine

24-hour

The City Council

government are testing initiatives from smart

Nice

3,000 sensors

out over 160

have been rolled

**Amsterdam** 

Companies and

lighting to new ways to engage citizens. in civic debate. Plans include installing iBeacon technology across the city which will transmit tourist information to mobile phones and tablets nearby



supports a number of

Singapore

is testing a

scheme called

The government

Seoul

The local

sharing economy projects such as car rental company So Car and the Billiji website that allows neighbours to borrow rarely-used items from each

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people to unplug from the modern

There are also practical reasons why

some are turning their backs on smart-

phones. The short battery life of devices is a source of constant complaint and

many travellers are still attracted to the

reliability and long battery life of older

This market is still being served by

Microsoft, which now owns the Nokia brand. The US group last year launched

the Nokia 215, for example, a simple,

robust device that has a standby battery

life of 29 days. The Nokia 515 has a mas-

The phone has a simple layer of apps

and basic data connectivity, but the

main attraction is the \$30 price tag. As

Microsoft boasts: "Exceptional battery

life and impressive durability are stand-

ard features. When you own a Nokia,

Dumb phones have more specific

uses, however, for example being given

to children for calling home. They are

Likewise, there are simple phones for

the elderly, such as those made by Doro,

which prioritise large buttons and the

amplification of volume rather than

how quickly they can access the

Mr Jeronimo says that such products

you own a phone that's built to last."

simple, robust and cheap if lost.

sive 38 days standby time.

internet world.

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services to traffic planning

**New York** 

'Midtown in Motion', the Department for Transportation's traffic scheme, uses sensors and

cameras to gauge congestion. The DoT says the programme improved traffic speeds by 10 per cent in the first year

> the open data the city provides about tube, bus and train lines. As well as general public, Citymapper offers transit authorities data management tools that help handle feedback and incident alerts

service for more than 70,000 elderly

Source: FT research Photos: Dreamstime

and disabled people

Similarly, Strava, a cycling tracker app, sells anonymised data to cities from London to Orlando, Florida. It shows where people are riding to help plan

Even Uber, despite often locking horns with regulators, has begun to share driver data with officials in cities such as Boston, helping inform policy and congestion reduction plans. Similar data, including anonymised pick-up and drop-off locations and times, are also provided by taxi services.

western Nice to collect environmental

data such as air and sound pollution

Analysing such data from New York City in 2014, Mr Ratti and researchers from Cornell University found that the city's taxi fleet could be reduced by as much as 40 per cent if more residents opted to share cabs. Since that study, the Senseable City Lab has been working with Uber on optimising its

allows commuters to pre-book rides on

private bus routes using an app. The

scheme crowdsources suggestions for

schemes that dated from the 1970s and 80s," says Mr Ratti. "But because at the time we didn't have smartphones and real-time information, most of them

work more efficiently

using a couple of smartphone apps.

Google-owned navigation app. Waze's users can report accidents and

emergency response dispatch. In turn, the 55 cities in the scheme

closures and new traffic policies.

"There are some people who are

### Ratti, director of the Senseable City Lab at the Massachusetts Institute of Technology. Singapore is a leading example. "Or you can also look at a more bottom-up, distributed way where you can use what you already have, such as a cellphone," Mr Ratti adds.

Citymapper, an urban transport app that

raised \$40m in venture funding in

January, got its start in London using

In many cities, municipal authorities and mobile apps already collaborate.

providing transport advice to the

bike lanes and traffic calming measures.

Uber Pool ride-sharing service.

"There were plenty of ride-sharing failed."

**Tim Bradshaw** 

new bus routes

# Big pharma sees future for digital tools in

### Brain training Mobile devices could be used to treat neurological conditions, says *Andrew Ward*

healthcare

very year in the US, about \$13bn is spent on treatments for many of the estimated one in 10 children with attention deficit hyperactivity disorder.

This usually involves a prescription of stimulant drugs such as Adderall and Ritalin, which have stirred controversy over their risks and benefits. But what if these could be replaced, at least in some cases, by a non-pharmacological alter-

Akili Interactive Labs is a Bostonbased start-up developing mobile video games to treat ADHD and other neurological conditions including autism, depression, Alzheimer's disease and

traumatic brain injuries. The company's lead product, called Project: Evo, aims to train the brains of children with ADHD to prioritise between a competing blizzard of information and stimuli. Akili last month raised \$30.5m of equity investment to fund a large-scale clinical trial after

encouraging data from earlier studies. "We're seeing the emergence of an entirely new category of non-

Insurance

Mobile tracking, data

Pizza, films and music downloads are

just some of the rewards that Carrot, a

car insurer, offers to responsible drivers.

assess customers' driving for some time

but Carrot, along with a number of

rivals, is taking this a stage further by

using mobile phones rather than "black

boxes" in cars to compile data. It also

uses mobiles to deliver both immediate

feedback on the customer's driving and

Insurers are increasingly under pres-

sure to embrace new technologies, says

François Robinet, chairman of Axa Stra-

tegic Ventures, as the main components

of the industry – capital, dealing with

customers and data — are all candidates

- if warranted - the rewards.

Insurers have been using telematics to

pharmacological therapies . . . to target some of the most underserved patient populations and disrupt massive markets," says John Spinale of Jazz Venture Partners, which took part in the fund-

Big pharmaceuticals groups are taking the technology seriously. Shire, the dominant producer of ADHD drugs, has invested in Akili and Pfizer is working with the company on Alzheimer's

Software-based "digital therapies" of the kind pioneered by Akili are part of a growing range of mobile technologies aiming to test and in some cases even enhance mental health. The global market for cognitive assessment and training is already worth \$2.4bn, according to M & M, the research company, and is

expected to triple to \$7.5bn by 2020. The growth is being driven by an increasing burden of age-related conditions such as dementia and, says M & M, the "rise in brain fitness awareness". These trends have coincided with technological advances which are opening the way to more sophisticated and clinically-credible products.



Tablet therapy: video games to assess mental health are being tested - Getty

Take, for example, UK-based Cambridge Cognition, which has developed touchscreen tests and research tools for more than a dozen conditions from Alzheimer's and Parkinson's disease to epilepsy and schizophrenia.

Its "neuropsychological assessments" are based on work dating back to the 1980s by renowned Cambridge neuroscientists Barbara Sahakian and Trevor Robbins. But it is breakthroughs in mobile technology that have allowed them to be commercialised via tablet

computers. The company's Cantab Mobile tests have been used on more than 20,000 patients to measure cognitive functions such as memory, reaction time, attention span and decision making through simple games and puzzles.

Much of the demand has so far come from medical researchers. But the biggest long-term potential comes from its use as a diagnostic tool in healthcare. The product already has marketing authorisation in Europe as a medical device and the company is planning to seek approval from the US Food and Drug Administration.

Both Akili and Cambridge Cognition are positioning themselves as serious medical technology companies in contrast to consumer-focused "brain-training" apps, which have been growing in popularity but also drawing scrutiny

over questionable scientific claims. Lumos Labs this month agreed to pay the US Fair Trade Commission \$2m to settle false marketing allegations against its Lumosity brain-training game. The company had claimed its games helped users perform better at work and could even alleviate symptoms of Alzheimer's disease.

The FTC said: "Lumosity preyed on consumers' fears about age-related cognitive decline . . . [but] simply did not have the science to back up its ads".

The case highlights wider questions over the reliability of the proliferating range of fitness apps and wearable devices being used by people to help monitor and manage their health.

Akili and Cambridge Cognition aim to overcome these concerns by showing that mental as well as physical health can benefit from the convergence of mobile technology and medical science.

## Many still crave an old-fashioned 'dumb phone'

Hardware

There is a small but busy market for mobile handsets offering simple functions, writes Daniel Thomas

In January, British actor Eddie Redmayne made headlines around the world as he became the latest in a growing band of smartphone refuseniks.

"It was a reaction against being glued permanently to my iPhone during waking hours," he explained, turning instead to an old-fashioned "dumb phone" handset that could only make and take calls.

He is not alone. There is a small but busy market for phones that are simple and cheap at a time when smartphones are becoming ever more complex and expensive.

Feature phones – handsets with some basic functions such as playing music and accessing the internet - are gradually being replaced by low cost smartphones, according to Francisco Jeronimo, research director for European mobile devices at IDC, the research group. But there is still a significant demand for older-style phones.

Strategy Analytics, a research group, estimates that 44m basic phones were sold in 2015, accounting for 2 per cent of the global market.

Some phonemakers, such as Sony and LG, have already turned their back on the market. But others like Microsoft and Samsung are still producing devices every year aimed at the feature market.

Many smartphone users bemoan having to buy devices that are easily broken, require daily recharging and which will be superseded by a new, better version within a year. Even basic smartphones offer computing power that not many people need.

Some users buy phones with limited or no internet connections in a conscious attempt to decouple from the modern digital world. Light Phone founder Joe Hollier falls into this camp. The 25-year-old former skater has developed a credit card-sized phone without a data connection and no extra functions other than to make calls.

check emails or status updates is removed. Analysts say that there is a growing number of "second phoneys" who use an expen-

sive smartphone or "phablet" during the day, but turn to cheaper, pocket-sized devices when they go out in the evening. The Light Phone

are becoming a niche opportunity for companies. Doro has grown to become the third-largest feature phonemaker in western Europe after Microsoft and Samsung, he adds. Feature phones are also more popular in developing markets because of the combination of low prices and long

"Using a smartphone in some countries in Africa, for instance, is not an option for many users, as it would require to charge it on a daily basis," says Mr Jeronimo. "On the other hand using a smart-

phone means little for users who cannot connect to a 3G network, either because they are not available or because the connectivity is extremely expensive."

And, for those that find even basic phones are too much, there is a solution: the \$5 NoPhone Zero. It claims to be the least advanced phone ever created,

> has no buttons or components and is just a plastic rectangle. It is a joke, but one that says much about our modern anxiety about technology.

> > **Unplugged: Eddie Redmayne** was tired of being 'glued' to his iPhone

### concerned about the speed of technologanalysis and cyber security nally, often in company "labs" devoted are creating new business Tech initiatives under way in the to new products and services. But insurindustry vary. Legal & General is using ers are also looking externally. Some of models, writes *Oliver Ralph*

for disruption. A poll by PwC, the profes-

sional services firm, found that 69 per

cent of insurance chief executives are

Insurers offer safe drivers pizza and films

retina scanning in India to speed up the process of applying for life insurance products. The retina scan immediately brings up personal data that can be used to fill in online forms. Elsewhere, insurers are using information on Facebook and social media when assessing claims. In China, Zhong An (a joint venture between Alibaba, Tencent and Ping An) sells insurance covering individual

Insurers are also using their own data better to price new policies. Aviva has

69% of insurance CEOs concerned about speed of change

in technology

ecommerce transactions.

\$1<sub>bn</sub> committed by insurers to venture capital start-up funds

discovered that its pensions customers tend to be safer drivers, so it offers them motor insurance discounts. Many initiatives are developed inter-

them, including XL Catlin, Axa, Aviva, MassMutual and Allianz, have set up dedicated venture capital funds to invest in start-ups. Globally, insurers have committed more than \$1bn to such funds. This month, Axa Strategic Ventures helped to lead a \$55m funding round for Blockstream, which is developing blockchain, or shared ledger, technology.

For many, the real prize technology offers is the opportunity to reduce claims costs. Telematics in motor insurance is one example. If customers have incentives to drive more slowly, there should be fewer accidents. Similarly Discovery, a South African health insurer, offers incentives to customers who work out, tracking their activity via wearable devices. In the US, Beam has extended the principle to dental insurance with bluetooth-connected toothbrushes and an app that tells customers how well they are brushing. Technological change has also created

a new line of business - cyber insurance. According to Verizon's data breach investigations report, there were almost 80,000 security incidents affecting companies' data last year. High-profile attacks on businesses such as Target in the US and TalkTalk in the UK have created concern among executives and an opportunity for insurers.

In the US, where companies have an obligation to report data breaches to the authorities and customers, insurers often cover the costs but they are still nervous of cyber risks. "[They] are not quite sure of what their exposure might be to a cyber attack," says Andrew Coburn, of risk analysis specialist RMS.

Nevertheless, the market is expected to grow strongly. "Globally, gross written premium for cyber liability is about \$2.5-\$3bn," says Glyn Thoms, of brokers Willis Towers Watson. "But that could be \$25bn by 2025."

He describes a feeling of huge relief when the ability to

functions as a companion device to a smartphone but Mr Hollier hopes it will also encourage



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