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CHANGING THE TRADE  
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**PHISY BUSINESS**  
LEARNING TRICKS  
FROM HACKERS TO  
IMPROVE SECURITY



## Accounts evolution

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abacus to counting on  
technology, where next  
for the profession?



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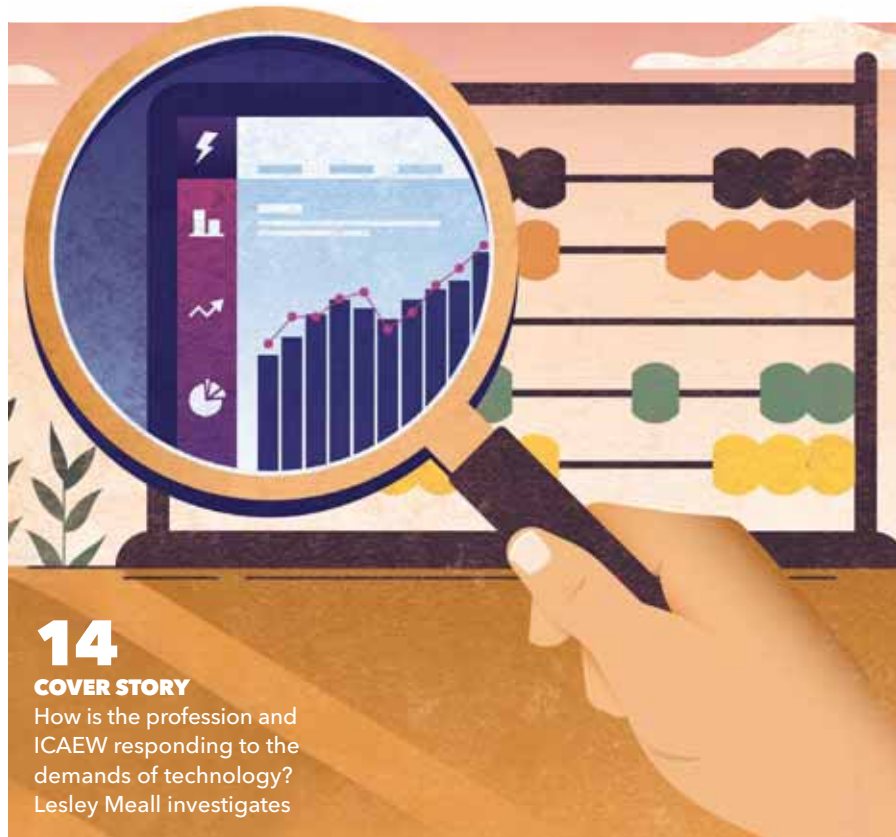
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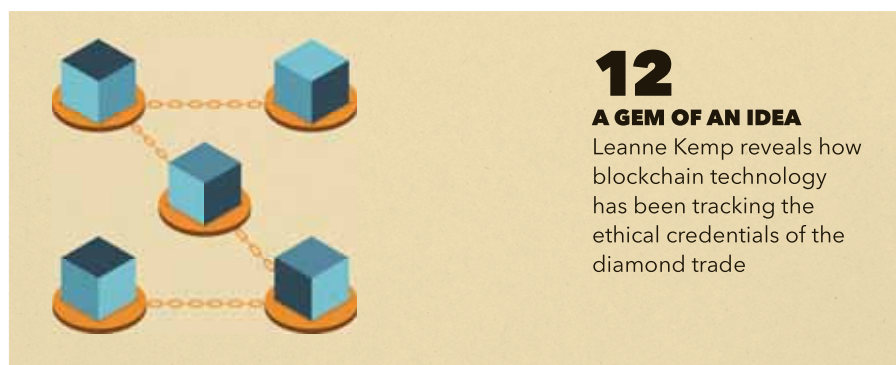
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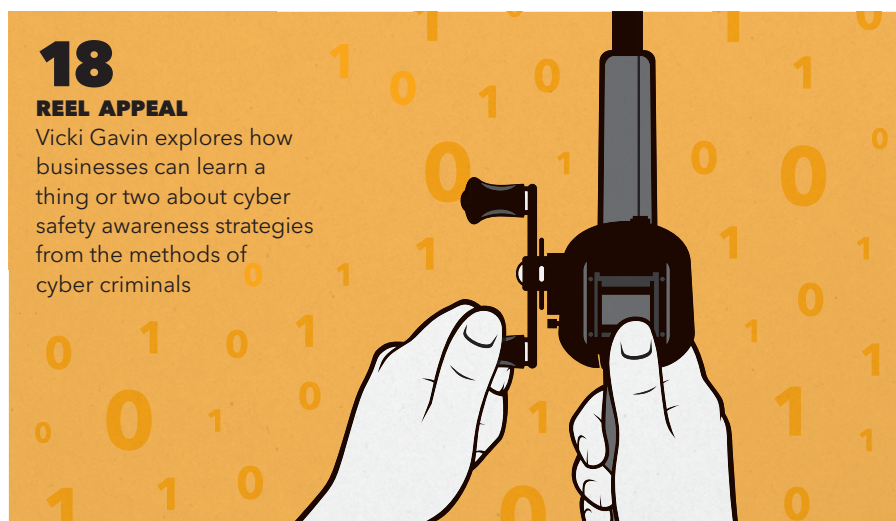
## September/October 2017 Issue 211

**14****COVER STORY**

How is the profession and ICAEW responding to the demands of technology? Lesley Meall investigates

**12****A GEM OF AN IDEA**

Leanne Kemp reveals how blockchain technology has been tracking the ethical credentials of the diamond trade

**18****REEL APPEAL**

Vicki Gavin explores how businesses can learn a thing or two about cyber safety awareness strategies from the methods of cyber criminals

**11****THE RIGHT WAY**

Lawfully processing personal data is not just about consent, explains Alan Calder

**04 Editor's letter**

How seemingly unrelated aspects of technology can still have a common theme

**05 News and events**

The latest news from the faculty, plus important dates for your diary

**08 Byte size**

Rise of AI software; bid to enshrine GDPR in UK law; DfT action on drone users; and China hits cryptocurrencies

**10 Automatic assistance**

Jessica Pillow discusses how the admin workload in a practice can be eased with a judicious use of automation

**17 Tagged to perfection**

The Financial Reporting Council details how to ensure electronically-filed accounts are iXBRL compliant

**20 Excel tips**

Simon Hurst has the answers to your data presentation problems with his exploration of the Power BI Desktop

**22 Leo on security**

With more companies mining the data from your devices, Leo Waldock wonders who is the owner of tech

# Shape of the future



In our summer artificial intelligence special, the Rice University academic Moshe Vardi explained how there could be a potential negative impact on the world as a result of increased automation, in particular among those engaged in low skilled employment. We also looked at the debates taking place between AI specialists about how long it will be before the brave new world sweeps in.

This issue, we are able to take the discussions forward, elaborating on how ICAEW is taking a more positive view of the future, at least for the accounting profession. The cover theme, the future of accountancy and technology, explores how accountants are poised to take advantage of the opportunities that may arise as a result of workaday tasks becoming automated, collated, and analysed at speed by computers - leaving them open and ready to taking on more challenging management and strategic tasks. With a future of opportunity squarely in mind, we detail how the ACA qualification is itself changing by increments; the content of new and updated exam papers reflects how those coming through the ranks will need to have an understanding of technology to take the profession forward while the world around us evolves. See page 14.

It can be tricky to stay one step ahead of the game in technology, and one area in which this is a never-ending concern is cyber security. Security specialist Vicki Gavin writes for us this issue of beating hackers at their own game by taking a few lessons from the phishing playbook (page 18).

Another impressive example of technology offering solutions with world-changing potential is blockchain-based Everledger, which has used the idea of the distributed ledger and smart contracts to help transform global diamond trade: read about how CEO Leanne Kemp got the concept off the ground on page 12.

While these features at first appear to be about completely different topics, they do share a common thread: they each show ways in which tech has transformed or is transforming how we think about business. It follows that the accountancy world of the future is probably going to look completely unlike the world we have grown used to. Learning how to adapt will be key to survival.

**Richard Anning**  
Head of faculty

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# NEWS & EVENTS



## CHATTO ICAEW'S AI

Hello. I am an artificial intelligent assistant. I can answer questions about the impact of artificial intelligence on the accountancy profession based on the findings of Kirstin Gillon's report.

Ask me a question about AI, its impact on the profession or anything about ICAEW or how I work.

## BOT 'JOINS' THE IT FACULTY STAFF



In June the faculty published its report on artificial intelligence (AI) and the future of accountancy. The report, written by faculty technical manager Kirstin Gillon (pictured), recognises the strengths that machine learning and AI have already been bringing to the profession, allowing better and cheaper data to support decision-making, generating new insights from that data and freeing up accountants' time so they can be more involved in strategic matters, decision-making and leadership.

ICAEW aims to focus on building understanding of the practical use of AI across business and accounting activities and encourage debate about the long-term opportunities and challenges.

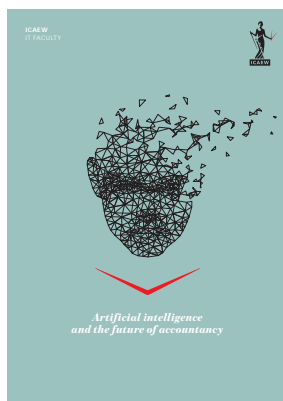
Alongside the report, staff in ICAEW's Digital Development Group have spent time creating ICAEW's first AI assistant, using IBM Watson technology, which is now live on our website, sitting alongside the paper and answering questions about it.

You can try it out and have a virtual conversation with it. The bot is currently in 'beta'. It has been trained to discuss the report and respond to general AI questions.

Even if it doesn't get an answer completely right, since we are supervising the conversations to train it for future queries, your interactions with it will improve through machine learning.

We welcome any feedback you may have - the more people that visit the page and test it, the better. To test the bot, and feed into its learning, visit [tinyurl.com/CH-AI-Bot](https://tinyurl.com/CH-AI-Bot)

You can read the report in full at [tinyurl.com/CH-AI-Report](https://tinyurl.com/CH-AI-Report)



## MAKING TAX DIGITAL CONTINUES

While the government suspended discussions of Making Tax Digital (MTD) during the summer parliamentary recess, ICAEW and HMRC have continued talks, particularly in relation to how MTD will affect large and complex businesses.

Mandatory MTD quarterly reporting from April 2019 will now be restricted to VAT returns for registered businesses, while the rest of the implementation timetable has slowed rather than been abandoned. Businesses below the VAT threshold of £85,000 may voluntarily adopt the system, which includes keeping digital records, prior to any greater rollout of digital tax in 2020.

Meanwhile, the VAT pilot will start by the end of the year, initially with a small-scale private test and a wider live pilot in the spring. Further legislative measures are expected in Finance Bill (No 2) due this autumn. HMRC has also been working with software suppliers to develop systems that can handle MTD.

ICAEW, while supportive of the move towards MTD in principle, is pleased that mandatory MTD for smaller businesses has been delayed, giving more time for people to plan and avoid any administrative burdens. ICAEW will continue to monitor developments closely and issue guidance for practitioners in due course.

For the latest news and position on MTD visit the hub at [icaew.com/mtd](https://icaew.com/mtd)

## LEVERAGE YOUR SKILLS WITH CORPORATE FINANCE

If financial modelling and Excel are a major part of your skills, then the chances are that you are responsible for preparing information related to finance raising or the funding of your organisation. In which case, why not join ICAEW's highly regarded Corporate Finance Faculty for the special introductory fee of just £25? On joining the Corporate Finance Faculty you will connect with more than 7,000 members and 80 member organisations. The faculty's membership is drawn from major professional service groups, specialist advisory firms, companies, banks, private equity, venture capital, law firms, brokers, consultants, policymakers and academic experts. More than 40% of the faculty's membership is from beyond ICAEW. With expert best-practice guidelines, popular networking events and influential magazine *Corporate Financier*, faculty members enjoy a host of content which is essential for all corporate finance professionals. You can join the Corporate Finance Faculty at [tinyurl.com/CH-JoinCF](http://tinyurl.com/CH-JoinCF)

## TECH ESSENTIALS: THE 10 STEPS TO CYBER SECURITY



With nearly half of all UK businesses having suffered at least one cyber attack in the past year, the need to take cyber

security seriously has never been so pressing.

To help IT Faculty members, we have updated and re-issued *10 Steps to Cyber Security for Smaller Firms* - the fourth in our series of added-value Tech Essentials supplements - providing practical advice that could make all the difference for small practitioners looking to stay one step ahead of cybercrime.

## IT FACULTY PROFESSIONAL DEVELOPMENT

### EVENTS

#### Technological advances - twilight of the finance function?

**21 November 2017**

New technologies are affecting finance functions globally. In this event, we will separate hype from reality and provide advice on where finance professionals should focus their attention to make the most of technological advances.

### WEBINARS

#### Cyber protection of the supply chain - learn from our experience at the MOD

**12 October 2017**

This webinar will explain how the Defence Cyber Protection Partnership (DCPP) is a joint MoD and industry initiative put in place to improve the protection of the defence supply chain from cyber threats.

#### 10 steps to cyber security for the smaller firm

**17 October 2017**

Small organisations struggle to understand how to approach cyber security. Mark Taylor will discuss 10 steps to good cyber hygiene. The webinar will also provide you with the opportunity to ask questions about cyber security.

#### Financial modelling using Excel - the hows and whys

**19 October 2017**

Liam Bastick will highlight the dos and don'ts of setting up a financial model. The webinar will include: layout, format vs style, the importance of units, key issues with number formatting, hyperlinking, and creating a workable template.

#### Charts and graphs in Excel

**7 December 2017**

Excel trainer John Tennent reviews his latest blog series on charts and graphs. John will explain tips on every aspect of producing charts, and will look at: when and how to use charts, producing complex chart combinations, analysing chart data, and how to present data visually to maximum effect. The webinar will show you exactly where each option lies and how to use it in practice.

Webinars are free to IT Faculty members. To book, visit [icaew.com/itfacevents](http://icaew.com/itfacevents)

### WEBINAR ARCHIVES

Don't forget that our Excel webinar recordings can be viewed again. For a full listing visit [icaew.com/excelwebinars](http://icaew.com/excelwebinars)

### EXCEL ONLINE TRAINING

Have you ever had any formal Microsoft Excel training? Or have you picked it up by trial and error? Excel and Advanced Excel online training courses are part of your IT Faculty membership. You can formally assess your level of spreadsheet expertise and improve your skillset using personalised online training. This training is available for beginner, intermediate or advanced users through two comprehensive online training courses. Find out more and start your training today. [icaew.com/excel](http://icaew.com/excel)



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## ARTIFICIAL INTELLIGENCE IN ALL SOFTWARE BY 2020

Analyst Gartner says that artificial intelligence (AI) will be in almost every new software product by 2020, and will be a top five investment priority for more than 30% of CIOs at that time.

Gartner defines AI as systems that change behaviours without being explicitly programmed, based on data collected, usage analysed and other observations. It says today's AI and machine learning technologies are about helping, rather than replacing, humans.

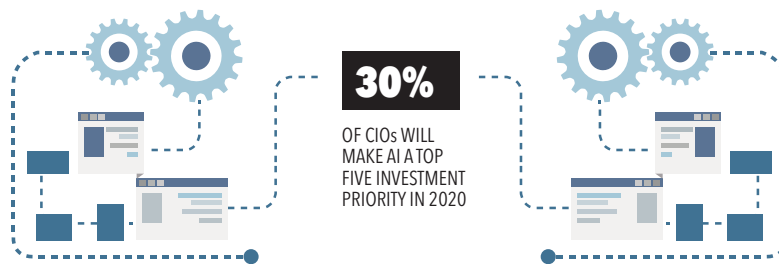
Gartner identifies three key issues for vendors and technology providers to address. One, vendors are using the term AI too indiscriminately, which makes it

difficult for chief information officers to make the right purchasing decisions. Gartner calls for better differentiation of products.

Two, while deep learning and other complex AI implementations are getting a lot of exposure, there are simpler and better proven approaches that vendors could use to great advantage.

Three, organisations lack the skills they need to evaluate, build and deploy AI solutions, and prefer to buy packaged solutions than build their own.

The general conclusion is that vendors need to focus on solutions to business problems rather than building cutting-edge technologies.



## GOVERNMENT SIGNALS INTENTION TO TAKE BACK DATA PROTECTION LAWS

While the UK is set to adopt the EU's new General Data Protection Regulation (GDPR) on 25 May next year, the government has indicated that it will enshrine data protection with fresh UK legislation upon Brexit.

In August, the Department for Digital, Culture, Media & Sport issued a statement of intent, promising a new Data Protection Bill in the near future.

Echoing GDPR (compliance with which will still be required to share data with EU countries), the government says it will make it simpler to withdraw consent for the use of personal data; allow people to ask for their personal data held by companies to be erased; enable parents and guardians to give consent for their

child's data to be used; require explicit consent to be necessary for processing sensitive personal data; expand the definition of personal data to include IP addresses, internet cookies and DNA; update and strengthen data protection law to reflect the changing nature and scope of the digital economy; make it easier and free for individuals to require an organisation to disclose the personal data it holds on them; and make it easier for customers to move data between service providers.

New criminal offences will be created to deter intentional or reckless activity, resulting in someone being identified from anonymised data.

The Information Commissioner's Office will be able to fine companies up to £17m or 4% of global turnover for data breaches.



## GET READY FOR USB 3.2

For those still struggling with the upgrade from USB 3.0 (Type A) connectors to the new USB-C connectors, news of another, faster, USB standard might cause something of a sigh of resignation.

The good news is that the new USB 3.2 standard will use the same USB-C connectors that are becoming popular on phones and laptops while adding a massive injection of data speed. USB 3.1 generation 1 cables that are currently certified to operate at five gigabits per second (gbps) will step up to 10gbps, while USB 3.1 generation 2 cables will step from 10gbps to 20gbps.

Getting that kind of throughput will depend on the capability of devices at each end of the cables. But backwards compatibility will ensure that data flows between devices at the maximum allowable speed.

A single USB-C cable has multiple internal wires, more than one of which can be used for data transfer at the same time, hence the faster speed and also allowing Thunderbolt and DisplayPort connectivity.

The specification for USB 3.2 is set to be finalised in September, with supporting devices to follow.



By **Sandra Vogel**  
Freelance IT writer  
sandra@vogel.com



## A NEW WAY TO PAY: THE RISE AND RISE OF CONTACTLESS PAYMENTS

We are now able to pay for goods contactlessly via a multitude of devices – payment cards, smartphones, smartwatches and tablets to name a few. But now the newest way to pay could be with your car keys.

In the first week of September the first car keys to have a contactless Barclaycard chip embedded in them were launched by DS Automobiles.

Though contactless technology has been around a lot longer – think Oyster cards etc – contactless payment cards were first introduced in 2007. Ten years on and the number of contactless cards in issue in the UK hit 111 million in June 2017. And contactless reportedly now accounts for 34% of all card transactions in the UK.

Barclaycard’s research indicates that almost six in 10 people now use contactless

payments, with 71% claiming to pay this way more often than they did 12 months ago. It is also forecast that spending this way will increase by more than 300% over the next four years.

The quick and easy payment method even accounted for over 39% of all Visa face-to-face payments in Europe in April this year, up from 11% in 2015.

However, half of retailers are yet to support the technology, with John Lewis being one of those that is lagging behind. This is more than just an annoyance for customers shopping in their stores, as Barclaycard’s research shows that businesses that accept contactless report the number of such sales rising by an average of 30% a day.

Contactless payments, it seems, now make good business sense.



The rise in contactless payments, predicted by Barclaycard researchers, that will take place over the next four years

## REGISTRATION AND SAFETY TESTS FOR DRONE OWNERS



The Department for Transport (DfT) is working on systems for drones to be registered and for drone users to undertake safety awareness tests. The new rules will apply to owners of drones weighing 250g or more. Details of how the registration process will work have not yet been agreed.

There are also plans to expand the use of geofencing to protect certain buildings and sensitive areas. Geofencing works by building GPS coordinates into drones, effectively creating spaces that they can’t enter (see page 22). It could be used to protect places like airports or prisons.

The DfT has published a report on the safe use of drones. Get it at [tinyurl.com/CH-DroneBen](http://tinyurl.com/CH-DroneBen)

## CHINA BANS INITIAL COIN OFFERINGS

At the beginning of September the People’s Bank of China (PBoC) outlawed initial coin offerings (ICOs), declaring them illegal funding.

ICOs have become very popular recently, with \$1.5bn raised using this method in 2017 alone. But the PBoC says they have “seriously disrupted the economic and financial order”.

The PBoC said that virtual currencies that are “not issued by the monetary authorities... do not have legal status equivalent to money, and can not and should not be circulated as a currency in the market use.” It added: “Any so-called tokens financing trading platform shall not engage in the exchange of legal currency and tokens.”

But the enormity of the matter lies in the wording of the PBoC edict, which suggests that the trading and usage of all cryptocurrencies, including bitcoin, could now be illegal in China.

eToro’s operations director, Adam Efrima, said the ruling is a huge deal: “It’s bigger than most people think. Cryptocurrency related exchanging and trading activities are officially forbidden. If you interpret the law literally then you cannot engage in any crypto exchange.”

## FROM GOOD TO GREAT

The UK needs to transform its current ‘good’ standard of digital infrastructure into a ‘great’ standard if it is to thrive in a post Brexit world, says technology sector association techUK. This transformation can be achieved through investment and collaboration between industry, local and central government and regulation. *From Good to Great: Digital Connectivity for a World Class Economy*, techUK’s report, outlines five key focus areas:

- sustainable investment that ensures coherent policies and tackles obstacles to digital connectivity;
- greater collaboration with good management of commercially sensitive issues to build trust, and active leadership where public sector agencies have a central role;
- supportive regulation that encourages innovation and the early adoption of digital products and services;
- spectrum leadership to ensure spectrum is made available and is flexible enough to meet innovation needs; and
- international recognition to ensure UK companies can viably participate in strategic European and international technology services development and influence standards development.

You can download *From Good to Great: Digital Connectivity for a World Class Economy* for free at [tinyurl.com/CH-techUK](http://tinyurl.com/CH-techUK)



JESSICA PILLOW

At Accountex this year, I gave a talk on automation, called *Quicker but do robots mean Daleks*, with Simon Goodyear. Simon is our main developer, a Salesforce MVP and a fellow director at our practice management software company, mTrio. He has great understanding of how automation will impact technology in the next few years. We considered whether some tasks need to remain completely personal or could be just personalised.

**AUTOMATING THE MUNDANE**

Routine tasks are the obvious starting point for personalised machine automation as they are lower skilled, repetitive and time consuming. In my small accountancy practice, a huge amount of time is spent on client communication emails: requesting information, chasing clients for action, document approval and payment reminders. Under Making Tax Digital, with quarterly workflows instead of annual, the level of this communication is only going to increase.

In the online retail sector, customers now expect personalised automation to be used to deliver good customer service, as demonstrated by Amazon and Ocado. Automatic communication is no longer seen as offensive because it is personalised, accurate and pertinent. Can we transfer this level of customer acceptance of personalised automation into the accountancy sector, where traditionally clients have received a more personal, human level of communication?

Most accountants already use a low level of automation in practice without recognising it as such, for example an out of office email. Generally clients are not offended by its non-personalised content, providing it's not received too frequently and it offers a way to resolve their inquiry.

At the simplest level, we could acknowledge the receipt of client

**MAKING AUTOMATION THE NORM**

Automatic emails can lighten the admin load and develop your customer service delivery

emails and outline our service level agreement for replies; or acknowledge that records have been successfully received and the likely turnaround time for the resulting work. This is all positive client communication, keeping them up to date and preventing missed information.

**THE NEXT STEP**

At the next level, we could use email generated by triggers set up in our practice systems to prompt clients for a reply. This would enable us to deliver a more responsive level of customer service in a cost effective manner, while also speeding up our work processes.

Follow-up emails, known as auto-chasers, can be sent out if:

- a response isn't received from a client to an email request for information within a set time frame - follow-ups can be set up through practice management software;
- a document is sent out for approval and isn't signed promptly - could be sent through e-signature software such as Signable or DocuSign;
- accounts or tax returns move through stages in the workflow or when documents have been successfully submitted to the authorities, so the client remains fully informed on the progress of their work;
- clients need reminding how much tax they need to pay in five days' time, along with payment details so they don't forget and get charged interest; and
- an invoice remains unpaid after a set amount of time - could be pursued via apps such as Chaser.

However, as we start to include more information in our automatic emails, our internal systems must be robust. There would be nothing worse than sending out a tax payment reminder email to a client, using the wrong client name or the wrong tax amount. In an industry dealing with highly sensitive information, maintaining client acceptance of automation relies heavily on accuracy and trust. As Bill Gates said: "Automation applied to an inefficient operation will magnify the inefficiency."

Some companies are now going a step further and introducing bots to communicate with customers through direct messaging. But that's a step too far for me just now. ●

**Jessica Pillow, managing director, Pillow May chartered accountants**



ALAN CALDER

Under the General Data Protection Regulation (GDPR), every organisation that processes personal information needs to ensure it does so lawfully, fairly and transparently. Documenting your processes is essential. If you cannot demonstrate a lawful basis for processing before you start, any processing you carry out will necessarily be unlawful and you will be subject to the higher level of fines (up to €20m or 4% of annual global turnover – whichever is greater).

#### LAWFUL PROCESSING

Article 6 of the Regulation (Lawfulness of processing) states that processing is lawful only if and to the extent that one of the following conditions applies.

1. The data subject has given consent to the processing of his or her personal data for one or more specific purposes.
2. Processing is necessary for the performance of a contract to which the data subject is party or in order to take steps at the request of the data subject prior to entering into a contract.
3. Processing is necessary for compliance with a legal obligation to which the controller is subject.
4. Processing is necessary in order to protect the vital interests of the data subject or of another natural person.
5. Processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller.
6. Processing is necessary for the purposes of the legitimate interests pursued by the controller or by a third party, except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject which require protection of personal data, in particular where the data subject

## A NEW AGE OF CONSENT

What is the lawful basis for processing personal data and retaining it under the GDPR?

is a child (this basis doesn't apply to processing carried out by public authorities in the performance of their tasks).

Consent, unsurprisingly, tends to get most attention. However, it's arguably the weakest basis because it can be withdrawn, so it's worth considering whether another lawful basis applies or can apply. For example, when you process staff data for payroll purposes, point 2 will apply as they will have signed a contract of employment – you will not need to obtain their consent.

Determining your lawful basis for processing personal data ought to be obvious given the processing you carry out, but a data protection impact

assessment could prove helpful. It's also worth remembering that your decision will have an effect on data subjects' rights and your obligations as a data processor, especially if you rely on consent.

#### TICK THE BOXES

The GDPR is more specific than the Data Protection Act 1998 (DPA) when it comes to consent, especially in terms of how it should be given. Article 7 of the Regulation sets out the conditions for consent, but more detail is provided in Recital 32, which stipulates that "consent should be given by a clear affirmative act" and that "silence, pre-ticked boxes or inactivity should not therefore constitute consent".

If you have relied on consent under the DPA, you cannot assume it is still lawful under the GDPR. You will need to ensure it meets the regulation's requirements and if it does not, you will need to change your consent mechanisms and obtain fresh consent – or find an alternative lawful basis for processing.

It's essential that you keep records of consent, as stipulated by Article 7. This is particularly important because, under the GDPR, data subjects have the right to withdraw their consent at any time – and it must be as easy to do so as it was to provide it in the first place. You will then be obliged to erase their data "without undue delay" – not a simple proposition, especially if it has been shared or made public – so it is essential to ensure that you have appropriate processes in place.

If you haven't started your GDPR compliance project, the clock is ticking. You have until 25 May 2018 to bring your personal data processing into line with the new law.

Visit the IT Faculty's hub at [icaew.com/gdpr](http://icaew.com/gdpr) for more information. ●

**Alan Calder, CEO, IT Governance**



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# SYMPHONY OF DATA

**Leanne Kemp** explains to Nina Bryant how Everledger's implementation of blockchain in the diamond industry is lighting the way for other sectors



Until recently the cryptocurrency known as Bitcoin stole most of the thunder when it came to mainstream media coverage of blockchain technology. But finally, thanks to the efforts of several committed entrepreneurs, the impressive tech that underpins blockchain - a form of distributed ledger - is getting the recognition it has been waiting for. As a result, the transformative results for accounting, finance, business - even society as a whole - could be staggering.

Everledger's CEO Leanne Kemp long ago spied an opening for blockchain technology to prove its worth in the diamond industry. And, as a businesswoman with 25 years' experience of running start-ups, Kemp was able to get it off the ground. She describes her company as "providing a transaction layer of trust to help with the reputation of

objects and serving that through a digital vault, enabling an ethical trade platform".

## PRECIOUS RECORDS

Following a UN resolution in 2000, the diamond trade has implemented a global verification protocol since 2003, known as the Kimberley Process, to record the provenance of rough and polished stones and avoid conflict diamonds coming into circulation. Although the process has proved successful (encouraging trade only with members of the certification scheme), most documentation to date has been paper-based. That's where blockchain now comes in, as Everledger has the ability to "work with stakeholders on taking their paper-based processes and bringing them into digital origination".

Kemp continues: "We ensure that the people who have the certificates have the right to have them, creating a rights

management process associated with digital provenance of certification." There is time spent on establishing the DNA of the item, "ensuring that what's on your certificate matches your object". Finally, checks show whether transactions are appropriate, before details of the sale/transfer of ownership can be seen simultaneously by all involved parties. Since starting in 2015, Everledger has processed 1.6 million diamonds.

A tantalising feature of blockchain technology (particularly around its future potential in regulation) is its inherent immutability, with all records in the chain being simultaneously available and impossible to change or delete, only able to be added to (see box, right). For Kemp this immutability is one among many plus points about Everledger, which builds a forensic picture of objects based on scans and datapoints associated with the asset

class in question - not only diamonds, but also fine art, watches, wine and even species: "It's about a symphony of data, putting together expert opinions and machines. We integrate data and weave that into a business network," she says.

Kemp came to build that business network on the back of being selected to join the Barclays Accelerator as part of its Techstars programme - offering successful applicants access to the Barclays network and the wider fintech community. During the 13-week programme Everledger became incorporated. Kemp stayed on as entrepreneur in residence the following year, developing in the process an important relationship with Barclays. "Our strategic alignment with Barclays is quite significant, given that it is one of our oldest standing banks but with deep roots in Africa, where the greatest volume of the world's diamonds are mined," Kemp says.

#### KNOW YOUR CUSTOMER

Everledger's strong proposition also led it to work with IBM: "We work with IBM very closely on the Hyperledger (see IBM's Hyperledger Project at [tinyurl.com/CH-IBM-Hyper](http://tinyurl.com/CH-IBM-Hyper)) and open source fabrics, ensuring that we're deploying blockchain in a highly secured woven stack - we're in IBM's high security business network." Achieving this kind of heavyweight strategic alignment allows businesses built around blockchain to help develop regulated industries such as banking and insurance. The example of Everledger's achievements in the self-regulated world of diamond trade has only heightened the attention paid to blockchain's capabilities.

## "It's about a symphony of data, putting together expert opinions and machines. We integrate data and weave that into a business network"

To build on the "know your customer" principle, blockchains can be used to assist banks and insurers in the reduction of risk around object verification and placing trust in the entities and people they are dealing with. Kemp observes that this is changing all the time: "Mobile phones as we know them today are super connected to the internet, and cars are moving into an autonomous mode, so the risk associated with those objects is changing, and ownership of those objects is changing. Fractional ownership is becoming important to millennials and so too is the circular economy." This in turn could have an effect on future legislation and regulation, especially around the evolution of smart contracts that can see these codified inside a blockchain.

#### TICKETAPE OF TRUTH

Kemp highlights the importance of establishing the right kind of legal frameworks to enable blockchains to be successful. For diamonds in Everledger, a public and private network hybrid works well. "It's very difficult for any of the ethereum or bitcoin consensus protocols

to know and understand or have any sensibility around what's inside a transaction or to confirm that that diamond is legitimate," she says. "They can provide a time-marking stamp on the chain of custody of that transaction at that time. Hence we've always considered that the hybrid model allows a network federated consensus on what the transactions are and who is party to the transactions, but also ensures there is a tickertape of truth that is publicly available."

Such fundamental change being heralded across business will surely necessitate an evolution in education. Kemp believes this is already happening: "We're certainly seeing some online courses coming through in blockchain and we're also undertaking quite large initiatives with International Organization for Standardization standards. The open source community has embraced the entire technology stack and we're starting to see that now beyond just seminars and conferences.

"We're starting to see divisions within companies being formed, educating and starting to cross skills for staff members on distributed ledgers, blockchain and ledgers and cryptocurrencies. The legal profession is looking at how we can gain dual skilled lawyers, in coding law as well as in contract law."

#### COMING SOON...

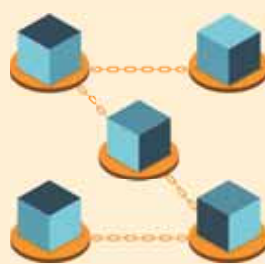
Meanwhile, Kemp has been developing the concept of the digital vault for retail - and it's an aim that looks set to be realised. Everledger has connections in the global retail sector; it has investment from Japanese platform Rakuten, and demonstrated its potential to eBay, in whose office Everledger was based in 2016. Kemp says there is a thirst for high-profile online retailers to ensure there are no counterfeit goods on their sites - a sure market for a blockchain verification process. "We've been actively working in this space. Something will come to market next year," Kemp reveals. She sees this as part of the next generation - "web 3.0 and 4.0. We'll move from the worldwide web to the worldwide ledger. I think that's positive for everyone." ●

#### WHAT IS BLOCKCHAIN?

A blockchain - a type of distributed ledger - collects blocks (groups of new transactions) and links them into an immutable chain which can be seen by everyone who has access, but altered by none. As David Lyford-Smith explains: "You can't edit or remove information from the shared database. If personal data is on there that you don't want in the public space, you can't remove it."

As well as being used to track provenance in high value objects like those outlined by Everledger's Leanne Kemp (see main article), an exciting development is the execution of smart contracts, where specified conditions can be codified and stored. Land transfer transactions are also ripe for recording in blockchain ledgers, and nations with a history of land disputes have been reaching out to work with the technology.

See the faculty's output on blockchain at [icaew.com/blockchain](http://icaew.com/blockchain) and the IT Faculty's Tech Essentials series supplement *The essential guide to blockchain*, which was mailed with the July/August edition of *Chartech*.



**Leanne Kemp,**  
founder and  
CEO, Everledger  
([everledger.io](http://everledger.io))

# COUNTING ON TECHNOLOGY

Lesley Meall looks at how career development in accounting – and the ACA qualification itself – is changing to reflect how our world has been altered by tech





There was a time when the abacus was advanced. Over millennia, we have used fingers, toes, knots on ropes, tally sticks, clay tokens and numerous other devices to help us to count, record commercial transactions and administer tax. Our own digits may still come in handy when we are searching for the nth character in a password, but the usefulness of these other aids and technologies has gradually peaked and then fallen away as they are superseded by superior new alternatives.

The accountancy profession has historically been pretty good at spotting winners - witness the flexibility, longevity and resilience of the spreadsheet. Now, the onslaught of change, disruption and innovation around digital technologies can make it difficult to keep up with what's possible, let alone back winners (or eschew losers). So ICAEW is supporting members by consulting widely with employers, academics and other stakeholders around key technology trends and topics (see box below) for the profession.

"There has been an explosion in technology and it is constantly changing," says David Lyford-Smith, technical manager, IT and the profession, IT Faculty. It simply isn't possible to know all

## "Accountants need to be open-minded about technology and aware of trends in business, such as the gig economy and new internet based services and business models"

about every development. "Accountants need to be flexible and adaptable," he suggests. "They need to be open-minded about technology and aware of trends in business, such as the gig economy and new internet based services and business models and the associated opportunities and challenges."

Some technologies and trends loom larger than others and this is reflected in the ongoing development of the ACA syllabus. Alison Stiles, ACA development and special projects manager, says: "The 2017 syllabus builds on previous coverage of technology by including cyber security and data analytics within the Corporate Reporting and Strategic Business Management advanced level modules. The 2018 syllabus broadens this out across more modules and expands the breadth of coverage around key technology topics."

Year on year, more on technology and its impact is being incorporated throughout the ACA syllabus, from certificate to advanced level and embedded in each module. As two modules in particular are strongly associated with technology they are being renamed in the 2018 syllabus. The professional level module Business Strategy will become Business Strategy and Technology and the certificate level module Business and Finance will

### KEY TECHNOLOGY TRENDS FOR ACCOUNTANTS

Technology content in the ACA is focused on the six key areas of technology outlined below, so chartered accountants may want to focus some of their technology oriented CPD on them.

#### Big data and analytics

As the volume and variety of structured and unstructured data increase, so does their role in business decision-making and the use of data analytics.

Practitioners are using analytics to reduce manual testing and increase audit efficiency; accountants in the finance function are using analytics to reinforce their strategic and business partnering roles.

#### Cloud computing

Use of cloud accounting software has been a growing trend in business and practice for many years, helping firms and their clients to access and share

information. This positions accountants to make the most of the cloud-based resources such as servers, storage, processing and other services, which are becoming increasingly commonplace.

#### The Internet of Things

As ever more buildings, devices and everyday objects are internet-enabled and embedded with software, sensors and trackers, the Internet of Things grows - as does the volume and variety of data these "connected" and "smart" devices collect and exchange.

Accountants need to be aware of the multitude of new services and business models that will result.

#### Cyber security

Cyber security breaches are a fact of life for organisations, across the public and the private sector. The potential damage to reputation and the bottom line are pushing the management of cyber security risk up the priority lists of boards and other stakeholders.

Accountants can help those they work with (and for) to be prepared.

#### Distributed ledger technologies

The bitcoin cryptocurrency has grabbed headlines but the underlying distributed ledger technology, blockchain, could revolutionise how transactions are made and stored. It allows a network of participants to securely share transactions and information without the need for a central controlling party. Accountants could take a lead in its implementation and use.

#### Digitalisation of tax

The digitalisation of tax administration and preparation has been ongoing for years. Interaction is increasingly being digitalised between the taxpayer and the tax authority, with the latter moving towards pre-populated returns. Tax service providers are starting to apply data analytics and smart systems to tax preparation. With tax, technology can be a burden and a boon.

## A VIEW FROM PRACTICE

Ask accountants what they see as big technology issues and the responses run the gamut. "Analytical skills, knowledge of technology in business and understanding sector dynamics are already as important as technical accounting knowledge," says a financial controller. "As more accounting transactions and processes are automated there will be fewer roles for accountants," adds a practitioner. A third accountant sees scope for more to be done at the cutting edge, around blockchain and the regulatory issues it raises. Others cite the speed and scope of change; a desire for more guidance on matters such as accounting treatments; the cost of investing in new technology and training; and understanding the impact of technology on existing, new and emerging business practices and models.

How to make the profession attractive to those growing up with digital technologies is also perplexing to many. "The days are gone when you joined a firm at 21 and worked 16-hour days for years because you wanted to be a partner. Millennials aspire to project-based work, have more short-term views on career paths and dislike hierarchy," says Sancho Simmonds of Smith & Williamson.

All accountants will need to adopt and adapt to new technologies. Howard Gross, founder of Gross Klein, urges the profession to be brave: "Accountants led in the past and we should be leading again." Scale and scope are barriers for individuals and firms. "We have always advised and used technology to benefit clients and business, but there is only so much time you can spend learning about emerging technology," he says.

The importance of softer skills is increasing. When group finance development director Trisha Haughey automated and standardised finance processes across Rentokil Initial, the biggest change for management was people. She says: "To take people on this sort of journey you have to change how people think. You have to influence your way through." There will be more need for this as the pace of technology change accelerates.

## "Do you treat bitcoin as a currency or a voucher? Can you hedge it? I don't know. I don't even know what I need to know"

become Business, Technology and Finance. "The focus in the syllabus is very much in the context of spotting commercial opportunities and threats associated with key technology areas and how chartered accountants can advise on them," says Stiles.

With cyber security, for example, it's not about learning how to write code to prevent a cyber attack, it is about recognising that businesses and other types of organisation may be vulnerable to an attack, what can be done to prevent this and how to deal with it if a cyber attack does happen.

Within some modules, more detailed content has been added to the 2018 syllabus. At certificate level, for example, the Principles of Taxation module explores why governments may advocate the digitalisation of tax and considers the implications of this; the module on Management Information covers how data analytics can support budgeting and forecasting and provide organisations with lots more information on their customers, markets and so on.

A basic understanding of what key technology areas make possible and an

awareness of the associated opportunities and threats are as important to those with ACA or FCA after their name as they are to those who aspire to have those letters after their name. Digital technologies are rapidly and fundamentally changing the way we all live and work; chartered accountants in all sectors and areas of specialisation are affected; continuing professional development (CPD) needs to reflect this.

"The scale and speed of technology change means that members are doing more technology related CPD," says Lyford-Smith. An abundance of useful material is available from the faculties, including a series of Audit & Assurance Faculty publications on data analytics ([tinyurl.com/CH-AuditTech](http://tinyurl.com/CH-AuditTech)); articles and reports on financial modelling and forecasting from the Business & Management faculty ([tinyurl.com/CH-FinModel](http://tinyurl.com/CH-FinModel)); and IT Faculty resources on analytics, blockchain, cloud, cyber security, data science, the digitalisation of tax and more.

However, even CPD cannot yet help accountants to address some emerging issues created by the scale and speed of change. Witness the questions one practitioner has about distributed ledgers and cryptocurrency: "What do financial reporting standards say about bitcoin? Do you treat it as a currency or a voucher? Can you hedge it? I don't know. I don't even know what I need to know."

It's almost enough to make you pine for an abacus. ●



# BETTER DIGITAL REPORTING

The Financial Reporting Council takes us through how to ensure your company only files high-quality iXBRL tagging



Companies are now starting to file accounts that use new UK GAAP (FRS 101, FRS 102 or FRS 105), for accounting periods beginning on or after 1 January 2016. It has been a requirement that company tax returns filed online are “tagged” using inline eXtensible Business Reporting Language (iXBRL) since 2011. Accounts filed electronically at Companies House can also use iXBRL.

HMRC can take advantage of iXBRL with more effective analysis software, cutting out unnecessary queries and helping to deliver better risk assessment. Companies House also achieves improvements in speed and efficiency.

The IT Faculty is heavily involved with the development and take up of iXBRL. You can find more guidance at [tinyurl.com/CH-iXBRL](http://tinyurl.com/CH-iXBRL)

The Financial Reporting Council (FRC) updated the iXBRL taxonomies in December 2015, so if you are filing 2016 accounts and/or tax returns you should make sure you use this version.

The taxonomies have been designed to enable full tagging of entries in accounts and tax computations. This means that you need to ensure all entries have been tagged; only if there is no suitable tag should items in the accounts or computation not be tagged.

## PROGRESS SO FAR

HMRC and Companies House have identified issues both in terms of accuracy and completeness of tagging in accounts submitted so far. The main message is that a significant number of companies are still tagging their accounts using older versions of the taxonomy. Ultimately it is the company’s responsibility to ensure correct tagging, but if you are preparing accounts or tax computations for your clients, you should ensure that your software is fully up to date and allows use of the December 2015 taxonomies.

Merely aiming to ensure that tagged accounts and tax computations pass through the HMRC gateway is not enough. High-quality tagging of accounts and computations should (as a minimum): fulfil HMRC’s requirement to ensure full tagging; ensure that unusual disclosures are tagged consistently across time periods; and be prepared in such a way that any matters of judgement are exercised in an environment with good internal controls.

Tagged information filed at Companies House is freely available. As more users access this information they will increasingly demand high quality tagging. A company’s reputation could be damaged if it files poor quality, inaccurate or incomplete tagged data.

## WHAT IS iXBRL?

iXBRL allows business information to be processed automatically by computer software, cutting out the cost and effort of manual re-entry and comparison. It works by adding computer-readable “tags” to financial reports, choosing the appropriate electronic labels from a hierarchical, structured dictionary of financial reporting terms called a taxonomy.

Computers can recognise the information in an iXBRL document, select it, analyse it, store it, exchange it with other computers and present it automatically in a variety of ways. It greatly increases the speed of handling financial data, reduces the chance of error and permits automatic checking of information. The data can also be presented in human readable form.

## SETTING AN EXAMPLE

As a regulator, the FRC wants to take the lead in promoting high quality digital reporting and show how this can be done in parallel with a high quality readable format. To this end, it has published its own 2016 financial statements in fully tagged iXBRL format (you can find them at [tinyurl.com/FRC-AR-1516](http://tinyurl.com/FRC-AR-1516)). These financial statements also illustrate how iXBRL handles the full content of published financial statements, including, for example, photographs.

## THE LAB

As part of the FRC’s drive to encourage best practice, its Financial Reporting Lab is examining the future of digital reporting and how companies and investors can make the most of new technology and opportunities that flow from this.

It has engaged with companies, investors and other stakeholders to find out what they want from a digitally enabled reporting system and published a framework of 12 characteristics to be considered in any future updates.

The Lab has been busy investigating further possible developments this summer. To keep fully abreast of their work, see [frc.org.uk/lab](http://frc.org.uk/lab) ●



# PHISHING CONTEST

Cyber criminals often seem to do a better job of communicating with a company's staff than the company itself. **Vicki Gavin** offers her tips to compete with and defeat the phishers



Investment in cyber security technologies continues to increase and yet, the scale, scope and number of cyber attacks also continues to increase. How can this be? Shouldn't increased technical capability reduce the number of successful cyber attacks? The technology vendors would have us believe this is the case. Unfortunately technology alone is not enough.

Studies have shown that 90% of successful cyber attacks rely on human error or, more accurately, tricking a person in some way. The cyber criminals are succeeding because they are successfully targeting our people. If we want to reduce the success rate of cyber attacks we must reduce the likelihood of human errors and employ appropriate strategies to minimise the impact when these errors occur.

Let's look at likelihood first. The cyber criminals' social engineering and phishing

campaigns are succeeding while our user awareness training and education is failing. What are criminals doing that we are not?

We can identify some typical characteristics of phishing emails. They always offer the recipient some kind of reward and are focused on a single objective - click that link. To achieve their goal, phishers vary their approach, trying multiple times with varying sales pitches. They also often require the recipient to make several clicks to get to the prize.

In comparison to clever, interactive and rewarding phishing emails, our corporate cyber training is not nearly as appealing. Most annual e-learning can best be described as required, wholesome, familiar and repetitive. Furthermore, rather than an incentive, there is usually a penalty for failing to complete the training.

Corporate e-learning covers all aspects of our security policy, from setting passwords

to locking up laptops while travelling, and yet we're surprised that people can't take it all in.

Staff members are required to complete the same online e-learning year after year and, as Einstein said, doing the same thing over again and expecting a different outcome is the definition of insanity. The material is rarely engaging, we are usually asked to read case study after case study and answer obvious questions, and the whole experience is so tedious as to ensure that learners will have trouble taking in and remembering this important information.

It is obvious which of these approaches is more likely to succeed. So how can we make awareness learning at least as exciting as a phishing email?

To resolve this conundrum, a little learning science is in order and a five-step plan I call "DOVE-C":

# 01

## DESIRABLE

Make every training event desirable. People learn because they want to, not because they have to. Make sure there is something in your training for the learner and make sure they know what it is. Don't make them guess, state it right up front. Making it mandatory will not make it desirable.

# 02

## ONE FOCUS

Focus on one thing per learning event. People can only learn one thing at a time. A campaign which sets out to teach more than one thing has a high likelihood of failure. It is better to provide information in small doses throughout the year rather than a single big bang approach.

# 03

## VARY THE METHOD

Everyone has different learning styles and preferences. If you always use the same method to relay your message you are likely to appeal to only a small percentage of the learners. As you design learning campaigns, try to appeal to all five senses. Behavioural scientists tell us it takes a person three weeks to form a new habit. Therefore, your training must continue for at least three weeks and, if it's not continuous, even longer in order to change people's behaviours.

# 04

## ENGAGE THE LEARNER

Activity helps build engagement. Make sure your events involve the learner in their own learning.

# 05

## COMPEL

Your education and awareness materials need to be compelling. There needs to be a bit of drama or theatre to grab the learners' imagination and draw them into your event.

By incorporating the five tenets of DOVE-C into my training activities I am able to ensure maximum buy-in and

learning from the participants and maximum benefit to the organisation.

To raise awareness of phishing, I ran a five-week "phishing contest". The objective was to ensure everyone knew how to identify phishing emails and what to do if they received one. The name provided a bit of whimsy/drama. I began the contest with an email outlining the rules for the contest and how to identify phishing emails. Then for five weeks I had people send the security team the phishing emails they received, thus teaching the new behaviours I wanted to develop. For each phishing email I received I gave the sender a raffle ticket for a "security blanket" - a bit more whimsy and the prize made participation more desirable.

We have run other phishing awareness campaigns since to reinforce the learning. Our phishing awareness has been highly successful: during a recent phishing attack only 3% of staff opened the phishing email and only one person (0.1%) was tricked into clicking on the link.

Most recently we gave out "Misfortune Cookies" to everyone who works here, including the board. Each fortune cookie was filled with a short security reminder. The goal of the event was to remind everyone to be vigilant about cybercrime. It had the added benefit of getting staff talking about cyber security among themselves as they compared misfortunes.

We have also run a storywriting contest, a poster campaign, created a "special internal edition" of *The Economist*, run crisis exercises, sent emails, run lunch and learn sessions,

## VICKI GAVIN

Vicki graduated from Lakehead University, Canada, with a BSc in physics. She has worked in IT for more than 30 years, and at the Economist Group for eight, where she is compliance director, head of business continuity, information security and data privacy. Vicki also has a postgraduate diploma in adult education. She was cyber security woman of the year 2015, and 2016 Marathon Woman in the Security Serious Unsung Heroes Awards. Vicki was a panellist in the IT Faculty's Women in Tech roundtable, and profiled in *Chartech* in Nov/Dec 2016.



brought in guest speakers and provided written FAQs and tip sheets. We are always on the lookout for fun and informative ways to engage with our user community.

In summary, to engage your staff as successfully as a hacker you need to take a page out of their playbook and make your education and awareness as desirable, rewarding, focused, engaging and compelling as a phishing email while keeping in mind people learn because they want to, variety is the spice of life and it takes at least three weeks to learn a new habit. ●

## HOW TO START A CYBER TRAINING PROGRAMME

If you have the expertise in house but aren't confident of imparting that knowledge in a training setting, consider earning a Diploma in Teaching in the Lifelong Learning Sector (DTLLS). This certification is offered by many colleges including City and Guilds. A quicker option is the College of Public Speaking two-day "Training the trainer" course leading to Institute of Leadership and Management and NCFE accreditation.

Alternatively, a search of the internet for "end user cyber training" will return hundreds of different third parties who provide training. Here is a link ([axelos.com/resilia/what-is-resilia](http://axelos.com/resilia/what-is-resilia)) to one of the best I've seen.

Finally, there are any number of books on the subject. A search on Amazon for "experiential learning" will return many resources on training others and *Cyber Security Awareness for Accountants and CPAs* provides an overview of the risks and controls.

Be sure to evaluate any training against DOVE-C, whether you buy it in or deliver it yourselves. Is their product desirable to the learner? Does it focus on one concept at a time? Does it use a variety of different instructional techniques? Is it engaging, is the learner actively involved in their learning? And finally, is it compelling, is it dramatic, whimsical and fun?

# POWER BI DESKTOP - PART ONE

Power BI Desktop offers new ways to visualise and present data. In part one of his guide, **Simon Hurst** uses Facebook posts to demonstrate some of its capabilities

From the 2010 version, a series of add-ins significantly extended Excel's data analysis and visualisation capabilities. Power Pivot, Power View, Power Map and Power Query became the Power BI suite, enabling Excel to deliver what Microsoft called "self-service business intelligence". However, despite nominally grouping these add-ins into a suite, some were integrated into Excel as standard, while others remained as add-ins, some only available in certain editions of Microsoft Office and Excel.

Microsoft Power BI brought all the BI features together into a dedicated application that is available for free as Power BI Desktop, and also available in a paid-for, Power BI Premium, edition. We will use a practical example to show what Power BI is capable of and how it relates to the BI features in Excel.

Although Power BI shares many capabilities with Excel, there are some significant differences, particularly when it comes to visualising and presenting the data. To demonstrate this, we will use some of the visualisation types in Power BI that are not available as a built-in part of Excel.

We will also work with data that is less structured than the familiar tables of rows and columns.

For those used to the three-year Microsoft Office update cycle, Power BI Desktop is much more dynamic with significant changes and enhancements being introduced monthly. Accordingly, by the time you read this, some of the features and techniques that we cover may well have changed. In the event of any particularly significant changes, we will aim to include details on the IT Counts blog ([ion.icaew.com/itcounts/](http://ion.icaew.com/itcounts/)).

Power BI Desktop can be downloaded from [powerbi.microsoft.com/en-us/](http://powerbi.microsoft.com/en-us/)

## FACEBOOK AS DATA

In our example, we will compare the posts on two Facebook pages, using the words in those posts as our data. In this first

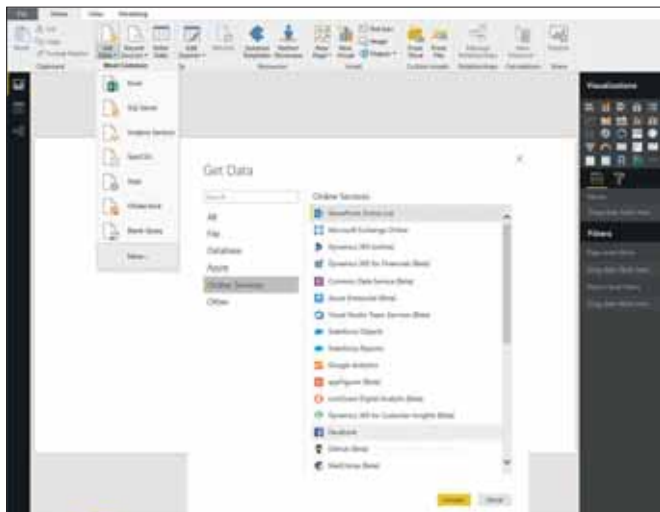


Figure 1

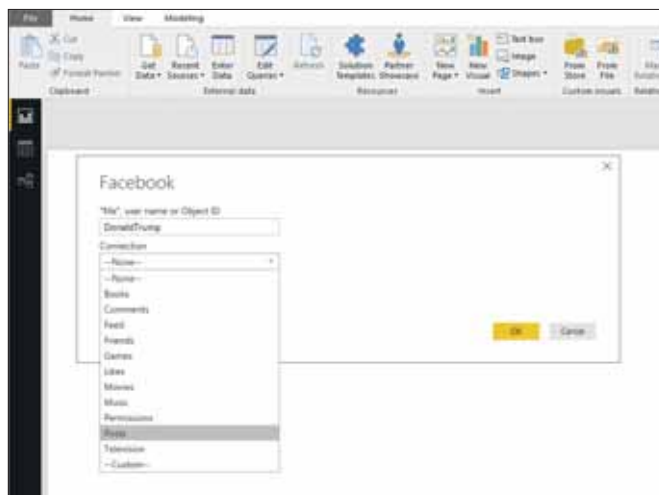


Figure 2

part, we will concentrate on getting at our data and transforming it into something we can use with the Power BI visualisations.

The Get Data stage of Power BI Desktop is equivalent to the Power Query add-in for Excel 2010 and 2013, and the Get & Transform tools in Excel 2016.

If you would like to find out more about Power Query/Get & Transform itself, the Excel Community has many posts on the different aspects of Power Query including a recent five-part exploration of creating a fully automated set of management accounts from multiple trial balances held in Excel worksheets: [tinyurl.com/C-PowerQuery](http://tinyurl.com/C-PowerQuery).

In direct contrast to a straightforward list of balances in an Excel worksheet, here we are looking at words in Facebook posts. We start in the same way, by using Get Data dropdown, More..., Online Services, Facebook (see Figure 1).

After a warning that the connectors used to obtain data from third-party services such as Facebook are likely to vary over time, we enter the details of the Facebook page that we want to access and choose the items within it. If you are not already logged in to your Facebook account you will need to log in. We are going to compare the Facebook pages of Donald Trump and Hillary Clinton. We'll start off with Donald Trump, and choose to work with the Posts (see Figure 2).

If you are not accessing your own Facebook page, which you can do by entering "Me", you will see another warning. This time telling you that the "limit" parameter cannot exceed 100. We will click on the Edit button to return to the previous screen and change "DonaldTrump" back to "Me".

This time, because we are working with our own Facebook page we should see a preview of our own posts. We click on the Edit button. In order to get at the Facebook details we want to use, we need to edit the Source statement that has been created. We need to replace Me with DonaldTrump and add the limit parameter, set to a maximum of 100:



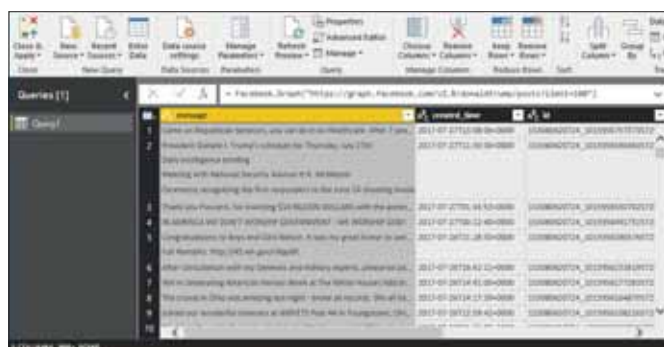


Figure 3

= Facebook.Graph ("https://graph.facebook.com/v2.8/donaldtrump/posts?limit=100")

You should now see the most recent 100 posts (currently it appears that the limit parameter may not be applying this limit particularly rigorously) - see Figure 3.

Because we are going to compare two different sets of posts, we add a column to identify each source. We could allow for the use of multiple sources by holding the Facebook name in a separate table and creating a statement that inserts each entry in turn into our Source step, but in the interests of simplicity, we will just create separate links to each Facebook page and then append them.

Accordingly, we will use the Add Column ribbon tab, Custom Column command to enter "Trump" as text in each row of our column and name our new column "Source" - see Figure 4.

Our Facebook data includes the text in each post in the message column and the date and time of the post in the created\_time field. We will just need the date part of this field for our visualisation so we can use the Home ribbon tab, Transform



Figure 4

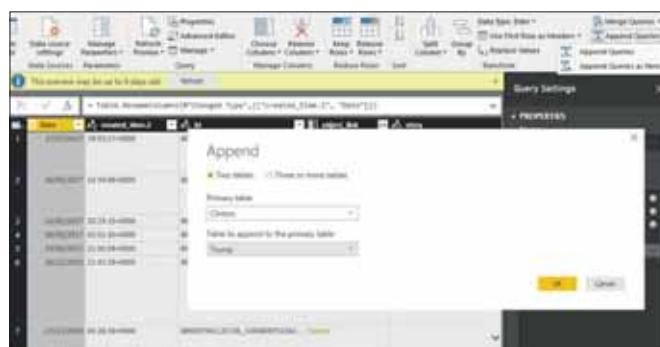


Figure 5

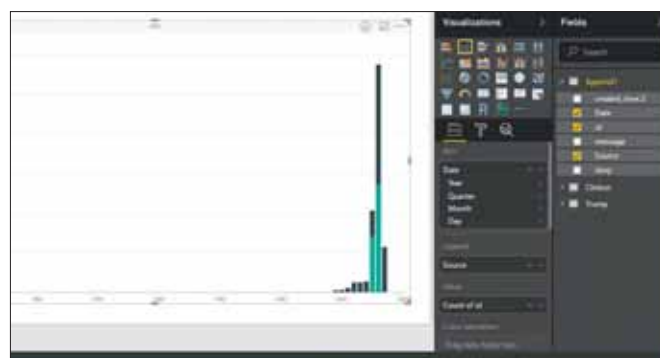


Figure 6

group, Split Column command to split the column using "T" as the separator. This leaves our date in one column, which we can rename as Date. We will also rename our entire query as Trump to make it easier to identify.

We have now created our first Facebook query. We can right-click on it and choose Duplicate. We will compare Trump's post to those of Hillary Clinton so we edit our duplicate query to use HillaryClinton in the source statement rather than DonaldTrump, and Clinton rather than Trump in our custom column. We also rename our query as Clinton.

We combine our queries using Home ribbon tab, Combine group, Append Queries, Append Queries as New - see Figure 5.

We now have a single query that we can Close & Apply to use in Power BI. We have added a Stacked Column chart with our Date field as the axis, the Source as the legend and a count of the id field as the Value - see Figure 6.

**NEXT TIME**

In part 2, we will go on to examine the visualisation capabilities of Power BI desktop including Word Clouds, Slicers and animations. ●

**OTHER EXCEL RESOURCES**

The Excel Community site includes many articles on Excel and other office software. There is also a forum where you can ask, and answer, questions on a wide range of Excel issues. The forum can be found at [ion.icaew.com/excelcommunity](http://ion.icaew.com/excelcommunity)

The IT Counts site includes articles of general interest including office

software and hardware, IT security, management reporting and cloud computing, and it can be found at [ion.icaew.com/itcounts](http://ion.icaew.com/itcounts)

Both IT Counts and the Excel Community are available for free to IT Faculty members as part of their subscription. You can also access faculty Excel material at [icaew.com/excel](http://icaew.com/excel)

Simon's book, *Essential Excel for Accountants (and others)*, is available as a PDF at [tkb.co.uk/towiee.htm](http://tkb.co.uk/towiee.htm)

Simon has included many useful Excel tips in the 'Lunchtime Learning' section on his website. These can be found at [tkb.co.uk/lunchlearn.htm](http://tkb.co.uk/lunchlearn.htm)



LEO WALDOCK

Piece by piece, I am losing control over my hardware. My internet service provider updates the firmware of my modem/router when it fancies without explanation. It is similar with Windows 10, which updates my computers monthly with the choice of doing it now or very soon. I live in fear of travelling abroad without first disabling mobile data on my Android phone as the endless torrent of app updates would cost me a small fortune over 4G rather than wifi.

There are good reasons why end-users want to retain control of their devices - primarily because that is the nature of ownership - but it is clear manufacturers feel differently. As more devices become connected to the Internet of Things (IoT), you can be certain that manufacturers will seize every opportunity to mine our data and treat it as their commodity. On the positive side, the manufacturers also get the chance to maintain the devices by fixing bugs as they come to light and provide new services, such as mapping technology for your satnav or drone.

#### THE DRONE DILEMMA

But this rapidly runs into problems. Let's take a look at drones and in particular manufacturer DJI, which is based in Shenzhen, China, and has a massively successful range of drones that act as flying camera platforms.

Drones have to abide by a number of rules - such as speed limits, height restrictions and remaining within line-of-sight of the operator - and they are also bound by limits on where they can fly. DJI uses a No Fly Zone (NFZ) feature that prevents you flying your Phantom 4 Pro over Heathrow, military bases and, I am sure, Buckingham Palace and Parliament. The logic is undeniable, however, this is only a command held in software, so naturally hackers feel the need to remove the NFZ restriction. If you

## ILLUSION OF CONTROL

What will be left for us to do when smart devices take over the decision-making?

**There are good reasons why end-users want to retain control of their devices - primarily because that is the nature of ownership - but it is clear manufacturers feel differently**

don't want to do the job yourself, you can buy a software pack without difficulty.

There is clearly a strong case for drone developers to use hardware and firmware that cannot be hacked or adjusted to make absolutely sure the drones can only fly where they are allowed by rules and regulations. That may be fine in Western Europe, but what if your plan is to use a hacked drone to video the riots that have erupted in Venezuela this year, rather than flying contraband into a UK prison? That seems morally defensible, even if it likely breaks the laws of that particular land.

#### QUESTION OF SECURITY

And what about institutions, such as the US army, that uses drones? It turns out it has used DJI drones, presumably to provide 4K video of places that interest the Pentagon. It is hard to imagine the Department of Defense HQ is happy to stream such videos to other nations, along with diagnostic information that gives the time, speed and position of the drone. The snag here is that if armies are capable of reworking drone firmware, it follows that hackers will be able to do the same. Either a drone is secure or not. There is no middle ground.

The obvious conclusion is that we can have little faith in any IoT device that comes from an unreliable source. In the case of military use, that may mean finding suppliers of small battery powered drones that armies can trust.

Bearing in mind the promise of autonomous vehicles in the future (where developers are aiming for cars with no manual controls to take you to your chosen destination) you may want to think about all this when you get into that self-driving car - and place your life in the digital hands of the control system. ●

Leo Waldock, freelance IT writer



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