

DIGITAL LEADERS 2018

A BCS REPORT ON THE CAPABILITY AND
RESOURCE NEEDS OF DIGITAL LEADERS

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Introduction

What do digital leaders need to do their job?

For the past seven years BCS has been surveying its members to get a sense for what digital leaders feel about their roles, resourcing needs and areas of concern for the forthcoming year. For 2018 this survey covers more issues than ever. It has been expanded to include more on skills, training and the ethical landscape.

Interestingly, while it is unsurprising that there are mentions of the oft-trumpeted concerns on the incoming GDPR legislation and effects of Brexit, most of the survey shows an attitude of wanting to get on with the job, whatever the circumstances surrounding it.

BCS deliberately allows scope for comment, so, in addition to the raw numbers, we can reflect the views of those working in digital environments every day. We can see their concerns but also their drive and creative thinking.

Sometimes we can sense comments that come from frustration, but likewise we see some fascinating ideas to address some of the issues we face, not only as an industry, but as a society enabled by this exciting industry.

The report begins with the numbers - then moves into the more qualitative, but perhaps more thought-provoking, views expressed.

Brian Runciman, Head of Content, BCS

Key findings

- The priorities for 2018 are business transformation and organisational change (50%), continuous innovation (46%), regulatory compliance (45%), and operational efficiencies (44%).
- When asked to single out their number one priority, 21% chose business transformation and organisational change.
- The technologies that organisations are prioritising for 2018 are cyber security (48%), cloud (40%), big data / insight (32%), SaaS, PaaS, IaaS, XaaS / as-a-service model / everything-as-a-service (31%), and IT governance (28%).
- When asked to identify their top technology priority, 17% chose cyber security.
- Only 14% of participants feel their organisation has enough resources to achieve success in 2018.

‘We see some fascinating ideas to address some of the issues we face, not only as an industry, but as a society’

‘Most of the survey shows an attitude of wanting to get on with the job’

Organisational priorities

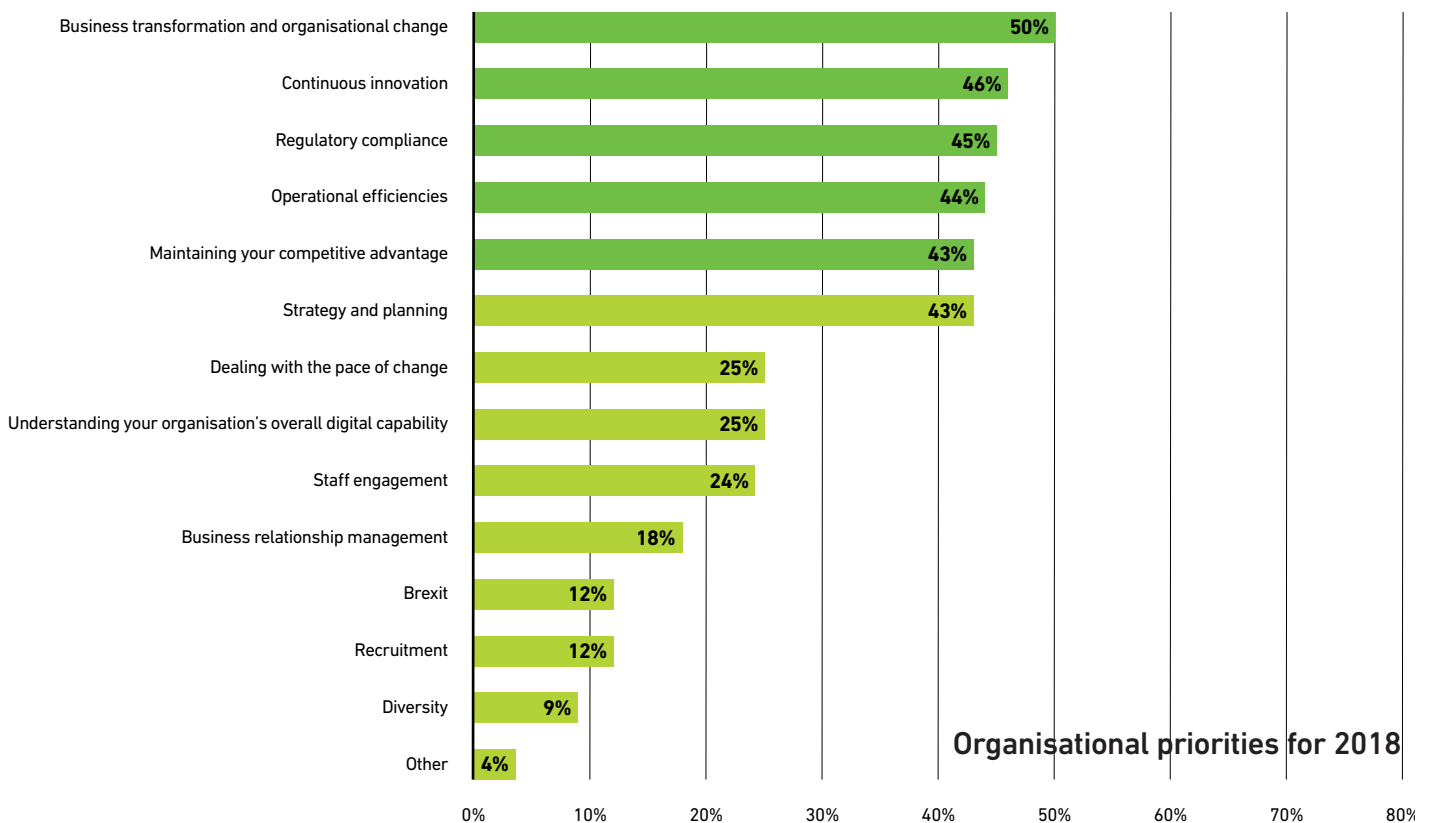
Participants here could choose up to five priority areas. The supporting comments here tended into two broad categories, the 'control' elements and the more dynamic entrepreneurial approaches.

Amongst the former the main concerns are:

- Surviving the downturn and GDPR
- Cost reduction/management
- Lower operating costs

Amongst the latter were some specific ideas, such as developing portal technologies for inter-agency working and developing a human-computer interaction strategy, through to more general business approaches and also renewed focus on product development and research and development.

Business transformation and organisational change was the top priority



Top priority

Of the five areas chosen, participants were asked to choose their top priority. There were a wide spread of top priorities, which is hardly surprising bearing in mind the breadth of organisations that took part in the survey (see research notes for more details).

Five that stood out, with double percentage figures, were:

- Business transformation and organisational

change - 21%

- Maintaining your competitive advantage - 17%
- Continuous innovation - 12%
- Regulatory compliance - 11%
- Operational efficiencies - 10%

The rest of the list comprised business relationship management; recruitment; strategy and planning; Brexit; understanding the organisation's overall digital capability; staff engagement; dealing with the pace of change; diversity.

Technology prioritisation

In this section respondents could also pick up to five options.

Some of the comments raised other noteworthy areas: forensic readiness and response; application rationalisation and smart city readiness – embedded technologies also were mentioned more than once.

Top technology priority

Of the five areas chosen, participants were asked to choose their top priority. Again, as would be expected with the wide range of organisation types surveyed, the answers here were very diverse.

However, three areas garnered a double-figure percentage:

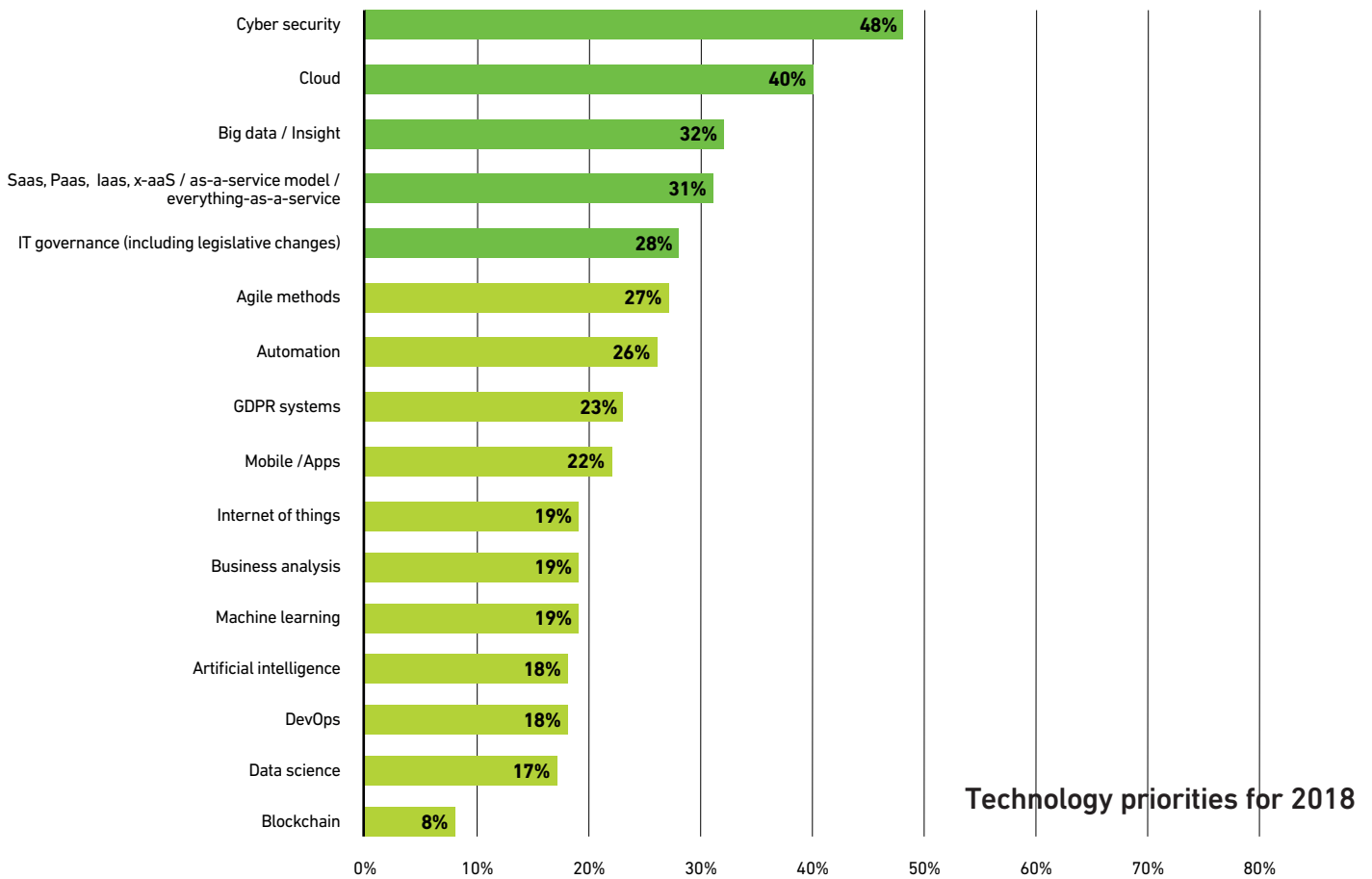
- Cyber security - 17%
- Cloud technologies - 11%
- SaaS/PaaS/IaaS – the 'as-a-service model' - 10%

Perhaps more illuminating, considering the way some of these subjects are covered in the media, are those areas that were less than popular at the top of the priority list, with big data and its attendant insights tying with agile methods as being top priority for only 6% of organisations.

Other areas that have perhaps been unrepresentatively hyped, such as AI and machine learning, also came in with low figures: four per cent and three per cent respectively. Data science and the internet of things likewise lagged at three per cent.



Other noteworthy areas included forensic readiness and response; application rationalisation and smart city readiness



Resource needs and the capability gap

Respondents were asked what additional resources they thought they needed to be a success in 2018, with only a paltry 14% of the view that they had enough resources to be truly successful this year.

From a BCS perspective the top answer was an encouraging one: 58% of organisations are looking for enhanced IT capability and skills in their existing workforce.

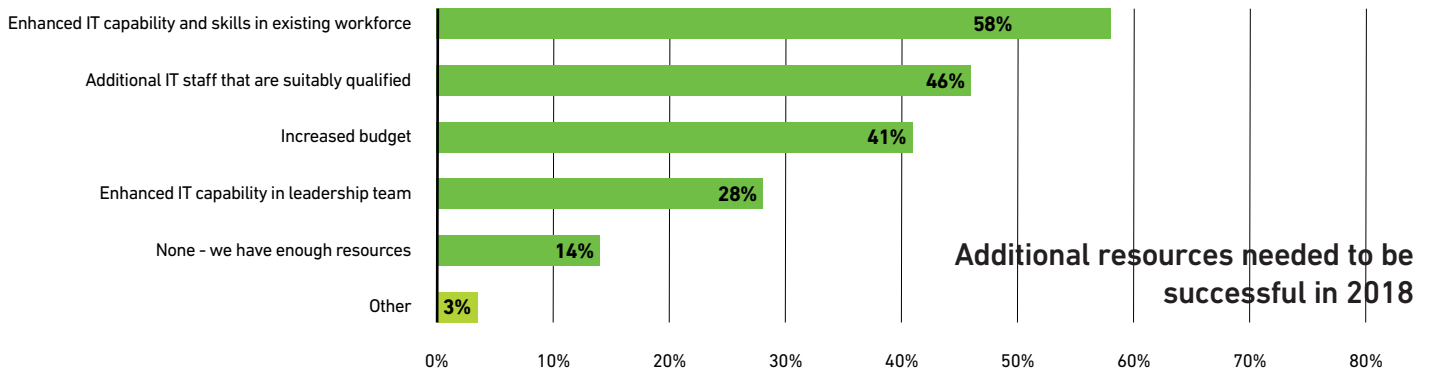
The additional comments also had an educational focus, with 'additional research staff, suitably qualified' mentioned by one commenter. Other suggestions ranged from the identification of top level buy-in ('improved executive awareness and sponsorship') to the rather more fatalist request for 'luck'.

The capability gaps

This section garnered by far the most 'free text – personal opinion style' responses. It is taken as self-evident that the UK suffers from an IT skills gap –

58%

are looking for enhanced IT capability and skills in their existing workforce



although other recent BCS research (Diversity in IT 2017) shows that some of this can be addressed with a more diverse workforce.

In broad terms the issues raised here fell into technical gaps, hybrid skills and general skills.

Technical skills gap

The IT industry, alongside society, is going through a period of profound change – and there is a large convergence of change happening in multiple dimensions. The IT disciplines that are converging are also in varying states of maturity. For example, hybrid cloud and analytics, AI and machine learning, and the ever-present and ever-evolving cyber threat landscape are creating a need for IT skills transformation.

But the problems attendant on each of these areas also demands experience not only to implement, but also, as one responder notes, to 'sort IT industry hype from deliverable outcomes with acceptable risk reward / ROI profiles.'

The specific gap areas mentioned included:

- Data scientists
- Hardware engineers
- Data engineers
- Cyber security specialists
- Big data analytics professionals
- Automation professionals
- Agile development staff
- Continuous delivery specialists
- Scientific computing experts
- Cloud professionals
- Linux sys admin professionals
- Those with legacy skills to support legacy systems (as noted by one commenter: 'we still have legacy systems that are critical to our business processes' and that surely is not a lone voice).
- Business analysis
- DevOps

Traditional skillsets are not well prepared for a more agile approach

The hybrid issues

Nearly 30 years ago BCS discussed the much-needed 'hybrid manager' – a technologist who could also speak to the business. Today, that role seems to be falling increasingly under the purview of the business analyst, but the issues around soft-skills and communication still came up regularly in this research.

The communication theme included calls for hybrid business and technical skills at an advanced and basic level. The same point was made in a number of different ways: 'architects who understand both digital and business'; 'the ability to speak to the business (especially be taken as an equal), and estimate properly'; the need for 'technically minded people with commercial acumen' and its attendant skill, 'explaining highly technical ideas to non-specialists.'

The use of agile methods and devops was still an area of concern. One commenter said that traditional skillsets are 'not well prepared for a more agile approach. Senior leaders are unaware of the operational practicalities of moving to agile.' Another called for proper consideration of end-user capabilities, saying, 'staff capability needs to extend from traditional ERP, waterfall, big project, one-size-fits-all environment to an agile, seize the moment, incremental benefits delivery type thinking and action.'

And, as this comment highlights, some of the problem seems to lie at a higher level: 'we see significant problems at executive levels on a regular basis. Unfortunately, most executives we see are remunerated on reducing costs and farming work off to India where quality is, at best, mediocre. What they don't seem to understand is that there are many other ways to gain/maintain competitive advantage e.g. innovation, customer service, making better products and so on. Sadly, those ways require executives to actually have skills they do not have. Cost-cutting is a lazy way out, which is not sustainable in the long term.'

General skills gap

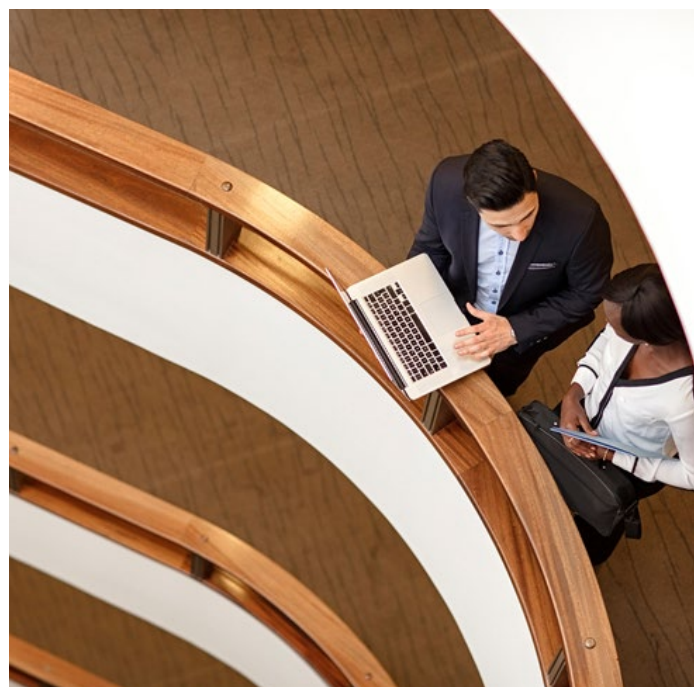
The skills-gap problem goes beyond the purely technical skills and the communication issues. Some other, more general issues raised were:

- Non-IT staff's use of web-based resources, such as virtual learning environments;
- Domain knowledge;
- Maintaining a sufficient level of knowledge of the IT industry in general and its related issues;
- Breaking down siloed working. One commenter remarked: 'We have the skills that we need, however they are currently siloed. We need better collaboration in our teams to make us properly resilient.'

Addressing the gaps

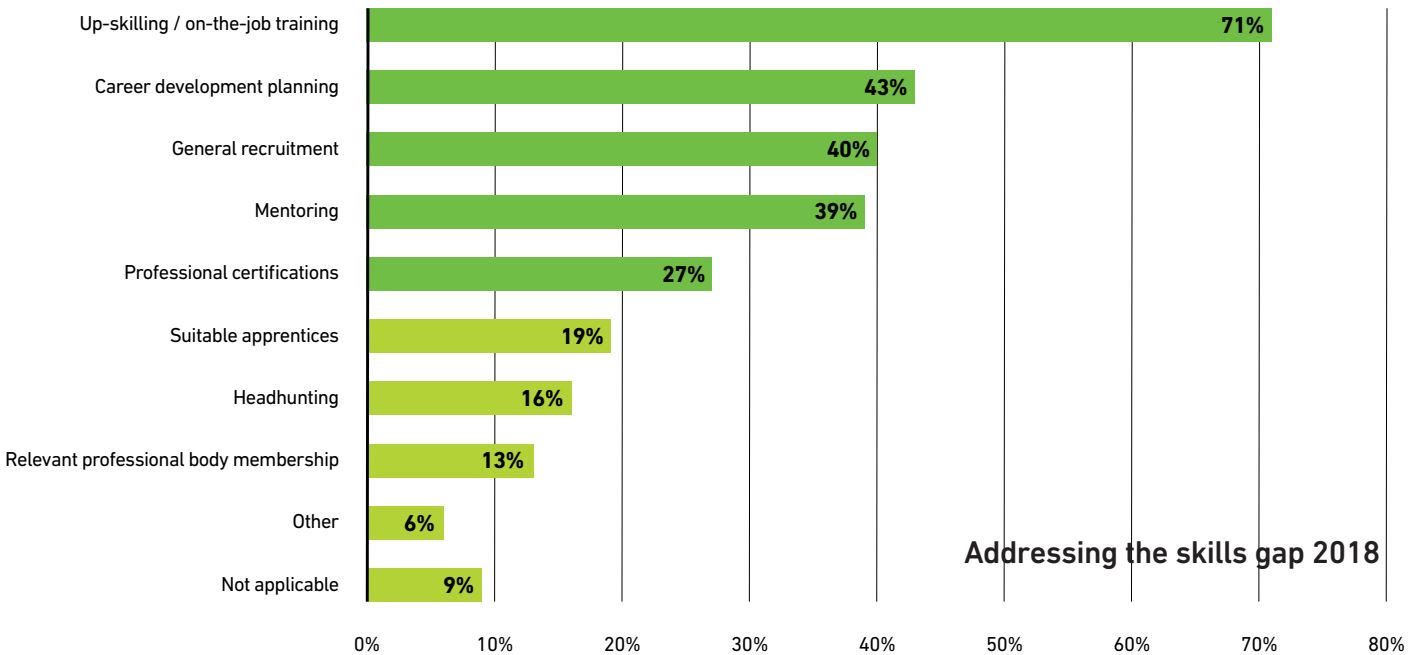
Some additional ideas mentioned here included use of

Issues around soft-skills and communication still came up regularly in this survey



consultancy services and other third-party collaborations such as working with universities; to the more prosaic 'buying in platforms and services to fill the gaps'.

But most see educational and training approaches as the key.



Sleepless nights

For the last five years, as BCS has done this research in its various iterations, the following question has garnered a wide-ranging and heartfelt response: 'When considering upcoming changes and trends in the IT industry, what's most likely to keep you awake at night?'

Again, the answers range from the technically or legislatively specific to those taking a more holistic view. Among the specifics: ransomware; compliance (especially GDPR); server-less services; phishing; malware; outsourcing, shadow IT; AI (and especially maintaining competitive advantage in this area, as some responders consider the UK to be lagging); blockchain; and digital transformation.

As ever, security figures large. One commenter says: 'In the city where I work there will be thousands of datacentres, ranging from small business single-server or similar through medium and large businesses of relatively sophisticated cross-functional requirements up to the city council supporting tens of thousands of client profiles. I will be able to count the number of cyber-security experts (as opposed to people with the title) in these organisations on my fingers. I think it unlikely that any of these organisations (including mine) will be able to fend off a serious attack and what passes for disaster

What passes for disaster recovery or business continuity is ineffective at the best of times

recovery or business continuity, which is ineffective at the best of times, will be useless. In short, we don't understand risk, basing our estimation of likelihood on experience rather than possibility.'

There were also a number of issues raised in the area of public policy:

- Net neutrality
- 'Ill-informed and woolly government thinking on aspects such as data security and encryption'
- 'Too much complacency regarding the ease with which hackers; private-, corporate- and state-sponsored; are able to access information over the internet'
- A worrying 'lack of commitment to innovation across UK plc'
- Ageism
- The alignment of IT with society
- Handling and protection of personal data and balancing the risks and opportunities arising from the use of sophisticated technologies for deriving sensitive information and knowledge through data mining and aggregation
- The inability to innovate in a sustainable manner
- The rate of automation of skills and the impact on the appeal of IT as a career.

On the last point the commenter said: 'I'm lucky enough that I will be retired before this really takes hold, but what about those looking forward to 40 years of work. They need to be certain that they have a job that will pay the mortgage and give them a pension they can live on.'

And even more holistic views were also expressed. On the angry side: 'the sheer bloody stupidity of this country isolating itself from the world'; but on the more creative side: 'I don't worry about change - it's what we do, and help others to achieve. Expanding appropriately and profitably is what keeps me awake.'

*...there is a
worrying lack of
commitment to
innovation across
UK PLC*

Technologists, ethics and society

For the first time in this survey BCS asked about what input technologists should have in developing the ethics and professionalism that will shape our future. BCS, of course, has a code of conduct and a specialist group looking at these areas. The range of views collected by this survey is a valuable insight into how the industry thinks of itself.

The majority of answers to this question indicate that most think technologists should have a role, especially, as one commenter put it, because IT 'will have the largest single impact on the workforce and society since the industrial revolution.'

On the 'yes' side of the argument, a selection of words and phrases that came up include: primary, completely, leading, hugely, major, key, heavily, paramount, and 'total involvement at all levels to develop and maintain an ethical IT profession'. Some mentioned BCS's role: 'An external body (such as the BCS) should be in charge of standards, oversight and certification and governance as well,' wrote one commenter.

One summarised this view as: 'Biologists should shape ecology legislation, cosmologists should shape space legislation, and technologists should shape IT legislation. In reality, politicians shape it all, which is why the outcome never makes any sense.'

Halfway-houses

Not all the respondents were so definite. One view that came up in a number of forms was that ethics is for others to think about, while technologists should just implement them and 'keep them in mind'. Some questioned whether technologists have a broad enough view of society as a whole to make useful input. In that context, one commenter said that technologists should have some input, but it should be 'restricted to those technologists who also have a full economic and business understanding.'

Some other pithy remarks:

- 'Ethics should be society-led...'
- 'Trust nobody!'
- 'Put integrity above technologies.'

Another angle on ethics is how technologists impart information to those who need it. In the public policy area, one commenter said: 'We should be informing policy makers to stop them making bad decisions. Some of the pronouncements about encryption show a woeful (possibly deliberate) level of ignorance about the subject. As someone who has worked in risk analysis and failure

'An external body, such as BCS, should be in charge of standards'

'In information security, ethics and integrity are our stock in trade. If we lose either we should be out of a job for life'

modes, the unintended consequences of some decisions are clear and horrific but are being swept under the carpet.'

Specific areas of concern

In their comments, some mentioned specific areas of concern, and relationships to other areas. For example, a person in the financial sector remarks: 'High ethical standards are the cornerstone of everything we do now in financial businesses. Transparency. Fairness. Diversity. All are now very important. Only the best will prosper.'

The behaviour of corporations also comes into the conversation for some: 'Given the behaviour of some of the larger technology companies toward other people's data and after breaches, we need to have a significant role in speaking out against their behaviour, censuring them and making sure the people we train do not do the same thing. In information security (my field), our ethics and integrity are our stock in trade. If we lose either we should be out of a job for life.'

Another related comment: 'This is tricky as current leaders in technology seem to have completely abdicated any notion of ethics or professionalism. I'm thinking in particular of companies like Facebook, Twitter, Google and even Apple. Even start-ups seem to be more concerned with monetising every aspect of our daily lives.'

There is, of course, a link between corporate behaviour, individual responsibility and professionalism. These concerns are perhaps well summed up with this comment: 'Technologists need to accept some responsibility for the outcomes of their algorithms.'

Another commenter feels technologists need to be more vocal: 'We should be prepared to say when a new technology is threatening the well-being (in whatever way) of those that may use it. We will seldom own the implementation decisions, as this is not usually a technologist's role, rather that of a politician or board, but we must make it very clear what the implications of implementation are, so 'users' understand what they are about to commit to. The BCS should aspire to emulate the medical and law councils and... comment authoritatively. Ethics are a very difficult area and I would strongly recommend getting some advice from academics who have done serious thinking. My employer has a need for very strong ethical principles and is constantly refreshing its thinking using both internal and external expertise.'

Some more areas mentioned as specifics:

- 'IT consultancy should be formalised to the levels of similar professions, (e.g. medicine, law and architecture). In other words, if you're not a fully accredited professional member of BCS you cannot call yourself an IT consultant.'
- 'We should 'focus on how personal data is being harvested and used'
- Robotics is an obvious area for developing a robust approach to ethics.



There are few people in the industry who carry the role of human-technology interface... we need a new role

Addressing ethics

While drawing attention to some of the negatives on the application of ethics that we see around us now, a number of the participants forwarded some ideas on what could be done to address them. These are a selection:

- 'All senior practitioners should be members of a profession body such as the BCS and support their professional body in supporting government decision making.'
- As 'there are few people in the industry who carry the role of human technology interface... we need a new role' to do the communicating.
- Technologists 'need to provide a better understanding of technology to government and law makers.'
- 'We need to develop a set of ethical principles around the use of customer data.'
- Ethics 'should be a core part of education.'
- We need 'improved qualifications and training, and to mentor current staff.'
- 'Clean earth manufacturing.'
- 'The bigger challenge is engagement in the political process. We need more scientists and engineers in the House of Commons (UK engineering strategy is led by an Oxford History graduate). We also need more science/engineering graduates as permanent secretaries - it is scandal that there is no career path from the scientific civil services to permanent secretary.'
- We need 'more hard science and less waffle and management BS.'
- Reflecting BCS's views on collaboration, technologists should be 'part of a multi-disciplinary group which would include philosophers, social scientists, technologists, academics and so on.'
- We must 'promote the value of mixed age in teams.'

Personal responsibility

For ethics, the individual stand can make a difference. One commenter cites the example of driverless car - we need to convince developers that just because something can be done that was previously impossible, does not make it a good thing. On autonomous vehicles he comments: 'This seems to be entirely driven by the art of the possible with scant regard to existing requirements for evidence of safety. When (not if) an autonomous vehicle kills someone, the arguments in court should be interesting.'

A final view also takes into account the personal dimension. One commenter said that he feels technologists should have little influence on ethics: 'it's always people who offend against ethics; the technology is neutral. On professionalism, technologists should strive (as always) to present their offerings with (i) enthusiasm and (ii) truthfulness on likely utility.'

'We need to convince developers that just because something can be done that was previously impossible does not make it a good thing'

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Research notes

This research was conducted online by BCS during the period 30 November 2017 to 8 January 2018. A total of 388 digital leaders took part in the survey.