

The digital accountant: Digital skills in a transformed world

Think Ahead

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The digital accountant: Digital skills in a transformed world

About this report

This report considers the implications of the digital quotient, one of the seven quotients defined by ACCA in 2016, in the context of digitalisation of organisations. A lot has been written about digital transformation and how that is important for future organisational growth. In that context, how much should accountancy and finance professionals know? What skills do they have and what skills do they need to develop?

The insights in this report are based upon interviews and roundtables conducted with ACCA members and other interested parties. The report also draws upon the results of a survey of 4,264 accountancy and finance professionals, including ACCA members, affiliates and students, conducted in November 2019.



Foreword



The digital agenda is transforming our lives in many ways. The ways in which we both interact and conduct business are radically different from those in the environment of ten, and perhaps even five, years ago.

The ability to navigate these transitions is fundamental to continuing to be successful as accountancy and finance professionals. To ensure that professional accountants are effective, they need to broaden their knowledge base from the application focus that they may traditionally have had, to the understanding of how technology and data create value for organisations. ACCA members have a clear opportunity to play a significant role in achieving that success.

This is a transformative journey: one where the pace of change means that professional accountants need to invest continually in their own development across a broad range of technology areas. This report explores the breadth and depth of these areas. It gives insight into how the combination of traditional accountancy and finance skills, and an ethical approach, together with digital knowledge and business acumen, puts accountancy and finance professionals in the right place to fulfil the potential this opportunity provides.

ACCA's Certificate in Digital Innovation for Finance provides one opportunity for members to develop these broader technology skills. The curriculum aligns closely to the drivers discussed in this report and provides a sound basis from which to continue to develop your skills. The focus on emerging technologies, future disruptors and digital transformation supports our digital quotient.

One thing is certain, digitalisation of our workplaces will continue apace. Either we are part of that journey or we run the risk of being left behind. We need to make sure that, as individuals and as professionals, we seize the opportunity.

Helen Brand, chief executive, ACCA

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Digital is a way of life. Almost everything, if not everything, that we do involves some form of interaction with technology. Similarly, we leave a data footprint. While this technology is not new, the pace of change that we are encountering is unprecedented.

The investment in digital transformation by organisations is substantial. Digital transformation is one of the most frequently heard business phrases of the moment. Organisations are changing their business models to become more customer and data centric. Those who are not grasping this face disruption or marginalisation.

In 2016, ACCA devised a series of quotients that members and students said represented their opinion about the skills and capabilities that the accountancy and finance professional needs to stay relevant in the coming years. Among these was the **digital quotient**.

Against the backdrop of fundamental organisational and technological change, this report explores the understanding and relevance of this quotient. Through a survey of over 4,000 accountancy and finance professionals, the quotient was evaluated against a range of indicative digital tools and concepts. We supplemented this with roundtables and interviews.

The results indicate that, as a profession, we are comfortable with older digital technologies, such as the spreadsheet and enterprise resource planning (ERP) applications. When considering emerging technologies, such as blockchain and the use of coding, though, we are often somewhat lacking in understanding and ambition. Fundamental to all this, however, is being able to speak the language of technology and appreciate how it now drives the business model. If we focus our digital acumen solely on applications and tools, we ignore the fundamental business dynamic.

Our unique technical and ethical perspective that is developed through our qualification and on-going development, applied to a deep understanding of the business model that we learn from on-the-job experiences, positions us as professionals in a fastmoving world where commercial advantage is gained in moments not years, and we use our inherent business skills to raise questions and ensure that the organisation is doing the right thing.

Successful professionals appreciate the digital landscape, are familiar with existing and emerging technologies and how these deliver strategic advantage. We stay informed in our role. We take time to invest in ourselves and to learn the digital narrative. Taking three minutes a day to invest in our continuous learning and focusing some of this on the digital landscape and language is clearly beneficial to us.

The digital world provides us with an opportunity to engage more with the transformed business model. Opening this skill set provides us with a robust role for the accountancy and finance professional in the future. Grasp the opportunity – build the knowledge.

Introduction

The conversation around digital technologies is one with which we are all probably familiar. We all live with and ourselves form a part of digital transformation. As accountancy and finance professionals we have a significant opportunity to use our existing skills, and develop our digital skills, to make us relevant to the world of work now and in the future. In the digitalised tomorrow it will be vital that we have an appreciation of its need.



We cannot afford to ossify our digital skills at those appropriate at a single point in time. The evolution of the profession and the evolution of technology are clearly interwoven. Organisations are making a significant investment in digital technologies, be this in how they deliver their services or how the use of data drives customer responsiveness in different ways. Section 1, 'The digital challenge', considers how this transformation drives the business model. This provides the context for the digital skills that we need to be effective, whether we participate in this from the perspective of those who provide assurance on organisations or of those who participate in the delivery of this transformation. From whichever side you participate, there is no ignoring this impact.

Section 2, 'Defining our digital skills', looks at ACCA's thoughts about the digital skills that we need and how we define the relationship between the digital skills and the other quotients that define our roles as accountants and finance professionals. Our opportunity is to broaden our knowledge of this technology base beyond what constitutes our comfort zone. The opportunity lies in the broader business context. The transformed business model, considered in section 3, 'The digital future – now', provides significant opportunities for the accountancy and finance professional that arise from this transformation and how we need to respond be developing digital skills. In each of the five career zones that ACCA has defined, there is a strong underpinning of these evolving digital skills.

We cannot afford to ossify our digital skills at those appropriate at a single point in time. The evolution of the profession and the evolution of technology are clearly interwoven. Section 4, 'Embracing digital – becoming a digital citizen', considers how clarity of understanding of the business and the on-going acquisition of the relevant digital skills are essential parts of our lifelong learning. These are aspects that we cannot afford to ignore, but mastering provides us with significant opportunities for developing our careers along whichever path we choose to take.

1. The digital challenge

'Whatever role you carry out in the finance function you can make a difference in this technological world. Boundaries are falling away, and opportunities are abundant. The limiting factors are mainly in the mindset of those who are unwilling to be open and embrace the transformation from industrious manual accounting to digital accounting.

'The mindset and behaviours of many accountants are shaped and conditioned by academic studies, established business practices, workplace colleagues and legacy systems. It is about time we learned to continually question these paradigms.

'The current wave of technological change isn't just limited to rewriting the way we use systems, it is addressing the very core of how we approach what we do, how we provide value in a holistic way and the way we transform our function over the next decade will lay the foundation of what difference we make to the world, not just the economic value but also the community value.

'The transformation we are undergoing will, if we participate in an active not passive way, create an environment which optimises our productivity by augmenting what we do with machine power, with the ultimate result that we have more time to ask questions, think conceptually and improve the science of accounting.'

Sam Ellis, Chair, ACCA Technology Global Forum

As accountants and finance professionals at the heart of organisations, if we do not understand how technology and the digital journey is evolving our workplace, we place ourselves at risk.

1.1 WHY THE DIGITAL JOURNEY MATTERS?

Everything, or nearly everything, that we do in both our working lives and our private lives, is supported in some way by a digital activity. The extent of that digital activity is increasing and the balance between the human and the machine is continuing to evolve. As individuals we increasingly demand more from this digital world. We take advantage of the opportunities that it affords us, and we embrace change almost without noticing. We only need to consider the ways in which we use 'smart' communications in modern society in comparison with the ways in which we interacted 10 or 20 years ago to realise how much that silent revolution is a part of us, whether we choose to participate or try to ignore it. As accountancy and finance professionals, we are as much an integral part of this revolution as any other member of society.

Two ACCA members interviewed gave their personal perspectives on the importance of digital skills to the accountancy and finance professional.

Rashika Fernando, director of enterprise project management in ScotiaBank, commented about the digital quotient,

'It is a container of a number of skill sets and driven by a number of trends. I think as an accounting profession we are a little behind.'

For Paul Wing, a former chair of the ACCA Canada panel and International Assembly member, explained that for him, as a retired Information Technology executive in financial services with 40 years' experience, the digital quotient matters because:

'As finance professionals it is important that we understand the role of the technology within the business, also that we understand enough of the technology to see how it benefits the business. But then we need to be able to apply the fundamental accounting principles, the fundamentals of the system of internal control, the how to control and audit it. How do you manage the business system and supporting infrastructure technology? How do you know when the system's got a problem and react in a timely way and, importantly ensure it doesn't happen again?' Organisations are spending significant amounts on embracing this digital revolution. In 2019, Forbes estimated that 70% of organisations either have a digital strategy in place or are working on one; 60% of companies that have undergone digital transformation have created new business models and companies that gross over US\$1bn a year earn an additional US\$700m over three years from that investment (Morgan 2019).

To place that in context, Rick Clarke, writing in *Disruption*, comments 'digital transformation requires unprecedented change in the way organisations around the world are structured – targeted at aligning business and technology imperatives. Where technology used to act as a functional component in an organisation's business model, we're now seeing business models based entirely around technology' (Clarke 2020).

The digital journey matters, therefore, because it is an essential part of business success and growth. It is the very way that we are increasingly doing business. As accountants and finance professionals at the heart of organisations, if we do not understand how technology and the digital journey is evolving our workplace, we place ourselves at risk. As McKinsey comment, 'The pace of change will never be this slow again' (McKinsey 2020).

1.2 IMPACT OF DIGITAL ON THE WORKPLACE

Human beings have always had a fear of the impact of machines on our working lives. The Luddites in the 19th century were concerned about the use of machinery in the textile industry. This group has lent its name to the so-called 'Luddite fallacy' that technological change will give rise to lower employment levels. As Alex Tabarrok comments 'If the Luddite fallacy were true, we would all be out of work because productivity has been increasing for two centuries' (Tabarrok 2003).

In their book *Race against the Machine*, McAffee and Brynjolfsson (2011) commented that 'the key to winning the race is not to compete against machines but to compete with machines'. In this vein we need to embrace technology and digitalisation and recognise the opportunities that it provides. The combination of these five forces means that the workplace itself is transforming and consequently the role that accountancy and finance professionals play in organisations is changing. For the finance profession this impact can be defined as being the result of five forces: the five Vs of change (Figure 1.1).

- Velocity the speed at which business is moving and organisations need to change is dramatically increasing.
- Volume the increased volume of transactions and the consequent impact on the data flow from the connected devices that we now use to undertake business is becoming ever more significant.
- Value the demand to derive insight, analysis and prediction from the data flow; to understand and model the business better and to use data to provide greater, faster and more relevant support to decision making.
- Variety how technology is driving us to use a variety of systems, a variety of data sources and a variety of project management models (eg agile, Kanban). We are being required to

adapt to this variety of systems and processes, and to work out ways of optimising these in our workplaces.

• Veracity – the reliability, quality, truth and prejudice of the data on which we are basing many business decisions; the application of our ethical lens.

The combination of these five forces means that the workplace itself is transforming and consequently the role that accountancy and finance professionals play in organisations is changing. This increases the level of expectation that those either working in-business, or in-practice will give an opinion that demonstrates a detailed understanding of the business, now that the data and tools available make greater insight more readily attainable.

Effective digital transformation is a combination of three distinct areas (Figure 1.2). While technology is rather obviously a significant part of this, it can only have the role of an enabler. It needs

FIGURE 1.1: Five Vs of change



FIGURE 1.2: Components of digital transformation



Advantage comes from the ability to react and provide insight to our customers – to manage the ever-increasing volume of information that we have available to us and be first to respond to or, better still, to lead the market. to be based upon a robust data model for the organisation. It facilitates the access to products and services that we, as consumers, want. How we use, or consume, these is a factor of the demographic sector that the organisation is targeting: how technologically literate it is and how the changes in birth rates and age profiles within it accelerate, or otherwise, the level of acceptance. The third dimension is organisations' intensifying focus on their purpose and on adding social value to society. As consumers, we evaluate organisations increasingly from this perspective.

Accountancy and finance professionals need to embrace the impact of these three elements of digital transformation on their work and on how they measure organisational performance and effectiveness.

ACCA's report Future Ready: Accountancy Careers in the 2020s (ACCA 2020a) highlights five future career zones, each of which has an underpinning of digital skill and capability (this is further discussed in section 4.4).

1.3 CHANGING BUSINESS MODELS

The reality is that digital enablement and the customer engagement model, which we all expect are here to stay, are fundamental parts of our way of life and the way in which we now do business.¹ As consumers we have embedded the digital delivery of service or information into our behaviours. We have changed how we view competing organisations and are more loyal to value than we are to tradition. Organisations are developing a digital culture, one that embraces the benefits of technology and data.

The impact of this evolution is that the business models of organisations are changing in response. The traditional siloed approach of independent processes is no longer valid. Successful business models are increasingly integrated across the organisation and formed around the customer journeys that the business addresses and are designed to match the requirements of the customer base. These include many aspects of the traditional process model, such as 'order to cash' and 'record to report', in integrated ways that we have not practised before. It is fundamental to organisational success that these models operate effectively and appreciating how technology facilitates this is essential. As finance professionals, we need to understand how technology enables these processes, how data flows across them and how business performance can be measured and modelled as a result.

As addressed in ACCA and PwC's report Finance: A Journey to the Future? (ACCA/ PwC 2019), with the advent of cloud-based systems at the heart of organisations there is no longer a competitive advantage in the optimisation of business processes to suit a particular organisation, we need to adapt those processes to fit the cloud-based model (see also section 3.3 in this report). Advantage comes from the ability to react and provide insight to our customers - to manage the ever-increasing volume of information that we have available to us and be first to respond to or, better still. to lead the market. This also influences how performance of organisations is measured. There is a need to think more broadly about performance measurement and how the use of data and analytics tools facilitates this.

An audit partner interviewed as part of this research addressed this from the practice perspective, commenting:

'I think, from my particular industry, it's all about efficiency. If we want to deliver efficient product, if we want to drive quality in opinion, you don't have a choice, but to... keep up on certain types of technological advances... [enabling you] to cut down on the timeline costs associated with delivering to the client.'

Digital is a reality of the future-focused business model.

¹ ACCA and Alibaba Cloud explored the theme of digital transformation and the implications for the leader of the finance function in a report, Digital Leadership: Leading Finance Digital Transformation (ACCA / Alibaba Cloud 2019).

of respondents consider digital skills to be

digital skills to be relevant or very relevant to the accountancy and finance profession

1.4 DIGITAL SKILLS ARE ESSENTIAL

It is important to recognise that digital skills are a fundamental part of the workplace and that as finance and accountancy professionals we need to embrace the sustained need for these. Simply acknowledging the evolution that is taking place is an important step, while ignoring it is a potential risk.

Are digital skills relevant to the accountancy and finance profession? In the survey that formed part of this research, 89% of the respondents considered them to be relevant or very relevant (as shown in Figure 1.3). Figure 1.4 provides an analysis by country of the respondents who thought that digital skills were either relevant or extremely relevant; while Figure 1.5 shows a similar comparison by age category. While there are some variations by country, there was a degree of consistency by age.

The lower percentage of relevance of digital skills in Hong Kong SAR can be correlated with the relative perception of the evolution of the finance function that was discussed in *Finance: A Journey to the Future?* (ACCA/PwC 2019). In that report, the responses were also

FIGURE 1.3: How relevant do you consider digital skills to be for accountants and finance professionals in your industry?







63%

of respondents claimed that they had enough digital skills to perform their role conservative, when compared with those obtained in other geographical areas, about the impact of digitalisation and the role of the finance function.

Assumptions are often made that there is significant variation in digital literacy across generations. To explore this, in several cases the survey responses have been broken down by age categories. While it is perceived that so-called 'digital natives' (those born or brought up during the age of digital technology and so are familiar with computers and the internet from an early age) are more conversant with technology, it was important to explore whether this is representative of the surveyed population.

Nauman Mian, chief financial officer at Bayt.com Inc, expresses a note of caution when interpreting the results across different generations. He comments that: 'Digital for somebody like me would be..., for example, LinkedIn. Whereas if you ask an 18-year-old, they will say Snapchat or Instagram. We are measuring ourselves against what we feel is digital. We're not even exposed to the same digital world that the 18 to 34-year-olds have been exposed to. I'm measuring myself with what I consider as my borderline, but then is borderline actually just LinkedIn?'

Each generation will have its own benchmarks, its own reference point in the digital environment. While each generation can learn from the others, it is the combination of experiences that provides the valuable picture.

In the survey, 63% of the respondents claimed that they had enough digital skills to perform their role (Figure 1.6), although 17% noted that they did not know whether they did.

FIGURE 1.5: How relevant do you consider digital skills to be for accountants and finance professionals in your industry? Analysis by age category of those scoring 4 or 5



FIGURE 1.6: In the role that you perform, do you consider that you have the right level of digital skills?



The start of a tail-off in the level of confidence in the 55+ category suggests that the typical reaction of those who have been longer in the workforce is that their skills are becoming less relevant. Figure 1.7 provides a by-country comparison of those who claimed that they had the right level of digital skills. In most countries over half the respondents considered that they did although, once more, there were variations. In some countries, digital skills and digital transformation have attracted political attention and government investment, which have accelerated the adoption of digital practices. This may, in turn, lead to a lower level of confidence that, at a personal level, digital skills are adequate.

Figure 1.8 provides an age comparison of the same response. The start of a tail-off in the level of confidence in the 55+ category suggests that the typical reaction of those who have been longer in the workforce is that their skills are becoming less relevant. Nonetheless, as the period of life in which we remain economically active extends (the so-called 'four or five generations in the workplace' phenomenon), so this group will need to invest continuously in their digital skills, as much as any other age group. Again, the cause of the lower score may be one of perception, that younger individuals have more digital experience and are perceived as more comfortable with technology. The reality, however, is that newer entrants to the workplace may lack confidence in the technology found specifically in the work context.









68%

of respondents indicated that they use their digital skills all the time as they are important to their work An alternative interpretation of the Singapore and Malaysia survey results is that the level of digital advancement has progressed. The report Finance: A Journey to the Future? (ACCA/PwC 2019) contrasts the use of digital technologies in finance with the expectations of individuals about whether the finance function spends enough time on generating forward insights (see Figure 2.4 in that report). For Singapore and Malaysia, for example, 31% in both countries commented that this was being achieved now, as opposed to 14% in both the UK and Republic of Ireland. This places in context how far respondents see the potential as having been realised. When asked how often they used their digital skills, 68% indicated that they used them all the time as they were an important component of their work (Figure 1.9).

Figure 1.10 provides an age comparison of those who indicated that they use digital skills all the time.

As accountants and finance professionals, we recognise the importance of digital skills in the work that we do. What we determine as constituting those 'digital skills' was explored later in the survey. Stephen Dowling, founder and CEO of ETM, a project management



FIGURE 1.10: How often are you required to use digital skills in your role? Comparison by age



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Our challenge is whether we can relate that to the evolving business model in the transformed organisation and understand precisely what constitutes those skills. transformation consultancy in Australia, noted that:

'Technology will come and go, and in the world we live in now, this will happen at a faster rate. What should always remain is the people, and provided we keep our customers happy, the business! The 'Digital Accountant' needs to be able to constantly adapt, evolve and extract value from whatever technology best suits the need of the business at the time. The skill and capability to continually unlearn old ways and relearn new/better ways of doing things, is I believe a core foundational element for the future. This will ensure they continue to add maximum value and stay relevant whatever the underlying technology happens to be'.

Were digital skills important to the work that the respondents performed? Of those who responded to the survey and identified themselves as working in external audit or similar roles, 92% thought that it was either important or extremely important that they understood the use of data and the digital landscape of their clients. Similarly, nearly 92% of those in-business had a similar view of the importance of understanding the impact on their own organisation.

In conclusion, as a profession, we clearly see that digital skills are a relevant part of the role of the accountancy and finance professional. Our challenge is whether we can relate that to the evolving business model in the transformed organisation and understand precisely what constitutes those skills.



2. Defining our digital skills



'The need for the accountant to understand the digital impact on businesses, is far higher today than it was 20 years ago.' Charles Marful, director, Talent (Assurance Practice), EY, Canada Strong technical and ethical skills remain at the core of what the accountancy and finance professional does, but these are supported by additional skills that are essential.

2.1 THE DIGITAL QUOTIENT

In 2016 ACCA conducted a significant piece of research into the skills that accountancy and finance professionals need to develop and maintain to remain relevant. The report *Professional Skills – the Future: Drivers of Change and Future Skills* (ACCA 2016) introduced the concept of the professional quotients to define these necessary skill groups. The resulting seven quotients were identified as shown in Figure 2.1.

Strong technical and ethical skills remain at the core of what the accountancy and finance professional does, but these are supported by additional skills that are essential. Among these are the skills that make up the digital quotient. The definition² offered for the digital quotient is:

'The awareness and application of existing and emerging technologies, capabilities, practices and strategies'.

The survey conducted as part of this research evaluated what the respondents considered to be the constituent elements of this quotient and the perception of how the importance of the digital quotient would change compared with that of the other quotients in the medium term: defined as the next three to five years.

The responses (see Figure 2.2) show that the respondents had no clear preference of one quotient against another when positioned against the digital quotient. Over the medium term, defined as the next three to five years, they see no change in the balance of relevance of the respective quotients (as denoted by the greater percentage response around the



The integration of the digital quotient into the overall skill set of the accountancy and finance professional is to place it in the context of the business purpose and how business goals are achieved. '3' and '4' scores). In part, they might anticipate a decline in relevance of the digital quotient.

Placing the digital quotient in context is important. To be a successful accountancy and finance professional, the survey respondents reconfirmed that a balance of the quotients is required, and while much of the conversation is around digitalisation of the workplace, it is the context in which digital skills are used that remains paramount. Using the emotional quotient to execute the work indicated by detailed analyses or to communicate the information derived from detailed analyses, for example, is an important aspect of the role.

Stuart Pedley-Smith, head of learning and Chief Learning Officer at Kaplan, places this in context:

'The appreciation of the digital quotient, the digital skills, is in the broader context. The digital quotient is something that is applied through the lens of the other quotients. To place the digital culture in context is important.' Mikhail Ratinsky, Chief Accountant of Sberbank in Russia reiterated this point. He commented that:

'The digital skills for the new generation... [are among] the most important skills, however, the most important [are] empathy and soft skills because the new digital skills are based on interaction not only with the machine, but firstly on the interaction between people.'

The integration of the digital quotient into the overall skill set of the accountancy and finance professional is to place it in the context of the business purpose and how business goals are achieved. Digital facility is an underpinning skill: its application depends as much on the culture of the organisation as on the mechanics of the technologies that are used. The ethical perspective that accountancy and finance professionals bring to digital transformation is also important. ACCA considered the impact of digitalisation on ethical and trust considerations in its report Ethics and Trust in a Digital Age (ACCA 2017).



FIGURE 2.2: Looking ahead (in three to five years), how important does the digital quotient appear compared with the other ACCA professional quotients?

As with the assessment of the adequacy of their digital skills the more mature respondents showed that they believed the digital quotient is less relevant to them. Figure 2.3 provides an analysis by age of those who evaluated the respective quotient as either a '4' or a '5'. As with the assessment of the adequacy of their digital skills (Figure 1.8) the more mature respondents showed that they believed the digital quotient is less relevant to them. While more experienced people may focus more on activities that require less direct contact with operational systems, the importance of the firm's digital strategy in achieving business success may well indicate that they need to continue to invest in their digital abilities. Figure 2.4 contrasts the responses of those who identified themselves as having 'C-suite' roles (chief financial officer and chief executive officer) against the total population of respondents.

FIGURE 2.3: Looking ahead (in three to five years), how important does the digital quotient appear compared with the other ACCA quotients? Comparison of net 'more important' responses by age



FIGURE 2.4: Looking ahead (in three to five years), how important does the digital quotient appear compared with the other ACCA quotients? Comparison of net 'more important' respondents who identified C-suite roles to total population



The level of relevance of each of the potential components was evaluated, as part of the survey, to consider how we interpret the potential breadth of the quotient.

2.2 EVALUATING THE DIGITAL QUOTIENT

The digital quotient can be interpreted as comprising a range of different, and differing degrees of, skills. The level of relevance of each of the potential components was evaluated, as part of the survey, to consider how we interpret the potential breadth of the quotient. The analysis was based on the four components of the quotient that were identified in the definition (Figure 2.5).

To facilitate the analysis, several potential components of each of the four areas were identified and the respondents were asked to evaluate each according to the level of expertise that it was thought to require. In each component, the examples chosen were intended to be representative of the range of topics that might be included and not to represent an exhaustive list of all the relevant areas; nor were any intended to be mutually exclusive. (A glossary of these and other terms is provided at the end of the report).

Figure 2.6 shows the overall level of significance of each of the four components of the digital quotient.

In the following, more detailed, analyses of each of the components, only those who had rated the component at '3' or above were asked to respond. The percentages of those scoring '3' or above are summarised in Table 2.1. This demonstrates that we see no potential variation in the overall relevance of each of these components, yet when we consider the more detailed examples (which follow in this section) variations increase.

The survey respondents were asked to evaluate several areas in each of the components of the digital quotient. To facilitate this, the scale in Table 2.2 was used.

FIGURE 2.5: Four components of the digital quotient



FIGURE 2.6: Of the four components in the ACCA definition of the digital quotient, how significant do you consider them to be for the accountant and finance professional to be successful in the future?



The results indicate a reasonable level of comfort with the more 'traditional' technologies such as ERP applications and spreadsheets, but less comfort with the more emergent technologies such as artificial intelligence (AI) and machine learning (ML).

Existing and emerging technologies

In this component, the relevance of several technologies that are fundamental to the finance professional was evaluated (Figure 2.7). The examples drawn included those that the finance professional may use in their day-to-day work, such as spreadsheet applications and enterprise resource planning applications (ERP), as well as technologies that may seem more peripheral, such as robotics and blockchain, but that are clearly emerging trends (see section 3.3). An analysis of the responses from those under 40 showed a similar pattern to that from the total survey population. The results indicate a reasonable level of comfort with the more 'traditional' technologies such as ERP applications and spreadsheets, but less comfort with the more emergent technologies (so-called EmTech) such as artificial intelligence (AI) and machine learning (ML).³

The finance professional has long been comfortable with the use of spreadsheeting tools. Their flexibility has enabled us to develop sophisticated models and simulations. Yet, as with many tools, there are better options becoming available and the failure to embrace these may mean that we are not able to obtain

TABLE 2.1: Of the four components in the ACCA definition of the digital quotient, how significant do you consider them to be for the accountant and finance professional to be successful in the future? Those rating the quotient at '3' or above in Figure 2.6

	% OF RESPONDENTS CONSIDERING THE COMPONENT TO BE AT LEAST SIGNIFICANT
Emerging and existing technologies	97.87%
Digital capabilities	98.14%
Digital practices	97.70%
Strategies	97.27%

TABLE 2.2: Definition of awareness levels used by survey respondents

AWARENESS LEVEL	DEFINITION FOR PURPOSE OF SURVEY
Basic awareness	You have a general understanding but do not have the ability to perform this particular skill
Basic ability	You are able to carry out basic tasks
Expert ability	You are able to carry out more sophisticated tasks



FIGURE 2.7: What level of awareness do accountancy and finance professionals need of the following forms of existing and emerging technologies?

3 The impact of machine learning is considered in ACCA's report Machine Learning: More Science than Fiction (ACCA 2018).

Data governance and project management are key skills required by accountancy and finance professionals; especially when applying these from an ethical position. the level of insight that the organisation requires of us. eCapital identified five reasons, for example, why the traditional reliance on spreadsheeting tools may no longer be appropriate for financial data analysis (Frederick 2019).

Yet it is these newer technologies that facilitate the finance professional in becoming more forward thinking and analytical in their insights. Embracing the evolution in tools that support data management and data analysis is essential.

Audit and assurance professionals are increasingly being asked to consider how financial statements and projections are being prepared on the basis of assumptions supported by these technologies. The need to increase awareness of these, given their business applications, is becoming more important.

The range of these emerging technologies will continue to expand. The arrival of 5G communications and the capabilities of the Internet of Things are determining the next step in the journey of digital transformation (see section 3.3). These technologies provide, for example, the opportunity to collect increasing amounts of data from devices in real time, in turn providing the opportunity for greater use of data analytics.

Discussion of expertise in technologies leads to a consideration of the mechanisms for managing their deployment. In the transformed digital world, the agile approach ('try, test, learn, amend') has superseded the traditional system-development lifecycle. The necessity of bringing solutions quickly to market requires capabilities in their management and delivery. Increasingly, these are drawn from multidisciplinary teams in which finance professionals play a significant role.

Digital capabilities

In relation to this component of the digital environment, the specific skills needed to embrace and deploy relevant technologies were considered (Figure 2.8).

For the purpose of the survey, examples of the techniques used to manage and govern the application of the existing and emerging technologies were considered. These included the skills in managing the transformation, such as project and programme management (the latter being the integrated management of a series of projects that is a fundamental part of the transformation journey), as well as governance aspects of data and technology themselves.

While not as positive a response as for existing and emerging technologies, there is a clear preference for a certain level of ability for the management of technology. Data governance and project management are key skills required by accountancy and finance professionals; especially when applying these from an ethical position.

As we look to gather data from multiple sources – internal or external, structured or unstructured – the ability to govern the integrity of the data is key. The finance professional already has skills in this area



FIGURE 2.8: What level of awareness do accountants and finance professionals need of the following elements of digital capability?

While the overall level of expertise was only marginally lower than for the first two components, when the respondents considered their opinions of the more detailed techniques, they gave these a generally lower evaluation. and to extend them, perhaps working with others, is important. For one data specialist interviewed for the report, the accountancy and finance professionals are natural partners in data governance. He sees the finance professional as a natural partner as we are essentially concerned with the completeness, existence and accuracy of the data.

The use of technology as a business enabler means that information technology (IT) governance is increasingly relevant to how we model the organisation and develop and appraise investment cases. Increasingly, applications can be added to the overall architecture of the organisation without recourse to significant development lifecycles. Understanding the impact of these agile approaches on the data flows is important, lest we corrupt the data sources.

The contrast between project and programme management is notable. While 50% of respondents expected to need an expert ability in project management, only 34% considered that the same level of expertise was needed in programme management. Programme management techniques are increasingly important in the transformation space as the connectivity between shorter-term, more agilely driven, projects and the overall organisational goals increases.

Having considered the processes through which transformations are managed, there is a role for the finance professional in the governance of data and technology.

Digital practice

In this component, the techniques for managing the digital environment that are relevant to the accountancy and finance professional were considered (Figure 2.9). The survey respondents were asked to evaluate a selection of techniques that can be used in their work. While the overall level of expertise was only marginally lower than for the first two components, when the respondents considered their opinions of the more detailed techniques, they gave these a generally lower evaluation. The practices selected reflected those that were potentially used in business digital transformation or the evolving finance function.

In this component the use of data, including operational data that may include both structured and unstructured components, required the accountancy and finance professional to have important skills. These support us in providing greater degrees of insight and better forecasts. This contrasts with the expertise for generating realtime visualisations, which is often cited as a skill needed to provide analytics and forecasting.

Coding is often seen as a key skill for accountancy and finance professionals, be this Structured Query Language (SQL) or Python, yet only 13% of our respondents thought that an expert ability was required (12% indicated that it was not required at all) and 49% thought that either a basic level or an expert level was required. In comparison, for the 331



FIGURE 2.9: What level of awareness do accountancy and finance professionals need of the following elements of digital practice?

The ethos of any successful organisation needs to be one of integrated technology enablement. respondents in the survey population who identified themselves as 35 or under, only 10% thought that an expert level was required and 42% considered that either a basic level or an expert level was appropriate. The responses do not reflect the opinion that coding skills are essential for the roles of tomorrow, as identified by Sean Hargrave, who commented: 'This modern language is so central to business life that the common mantra [among] technology experts is that today's children will need to learn to code "or get coded". It is not just hyperbole' (Hargrave 2018).

Wendell Ramoutar, a PwC partner based in Trinidad and Tobago, comments:

'You don't have to be a programmer but you have to be someone who is fully on board with the digital revolution and finding digital solutions to the way organisations conduct their work.'

Given the nature of the risk, it is perhaps surprising that the level of ability in cybersecurity skills scored slightly lower than might be anticipated. (The importance of cyber risk to the organisation as a whole and the role of the finance function in particular is considered in *Cyber and the CFO* (ACCA et al. 2019)). This highlights that digital practice includes a range of skills that facilitate not only the use of technology but also the management of business risk. Above all, however, the use of digital assets must be aligned to the strategic objectives of the organisation. The accountant, be they in business or in practice, needs to understand how technology and digital transformation enable execution of strategy to achieve value.

Strategy

In this component, the relevance of digital strategy to the accountancy and finance professional was considered (Figure 2.10). At the core of any business transformation is the organisation's strategy. The examples used to evaluate this component sought to explore how, as finance professionals, we saw the strategic advantage of technology for the organisations in which we work.

Digital transformation is being experienced across organisations and it is, perhaps, surprising that it was not thought that the accountancy and finance professional should have more expertise in the broader technology strategy, as opposed to the finance systems strategy alone. The level of integration in a transformed organisation between one process and another means that it is no longer beneficial to consider a separate finance system strategy. The ethos of any sucessful organisation needs to be one of integrated technology enablement (as discussed in section 3.3).



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At the heart of the strategy is the culture of the organisation and how it responds to transformation. At the heart of the strategy is the culture of the organisation and how it responds to transformation. One CFO interviewed considered that culture is increasingly important. He notes how critical an effective culture in organisations has been and that those that have not had an effective culture have invariably struggled. He explains that:

'A company needs to change its culture to address the digital agenda. If it ... [does] not do so it will find that it will be overtaken by those organisations [that] have achieved this.'

Overall comparison

In Table 2.3 the percentages of those in different age groups claiming to have expert ability in specific areas are compared. The spreadsheet as a key accounting and finance tool clearly dominates, with 81% claiming expertise, while the percentage of those with expertise in tools that visualise the results is only approximately 62% of this, at 50% of all respondents. An inference may be drawn that, as a profession, we need to be more comfortable with those technologies and tools that enable organisations to maintain competitive advantage against its competitors in the transformed business environment.

TABLE 2.3: Comparison	of expert ability respo	nses between categories,	including age analysis

1				
CATEGORY	EXPERT ABILITY % ALL RESPONDENTS	EXPERT ABILITY % 18 TO 35	EXPERT ABILITY % 35 TO 54	COMPONENT OF DIGITAL QUOTIENT
Spreadsheeting	81%	80%	83%	Existing and emerging technology
ERP	72%	70%	76%	Existing and emerging technology
Finance systems strategy	69%	70%	74%	Digital strategy
Analytics applications	64%	63%	64%	Existing and emerging technology
Use of operational data	59%	56%	65%	Digital practice
Data management	58%	58%	50%	Digital practice
Project management	50%	51%	51%	Digital capability
Data enquiries	50%	49%	53%	Digital practice
Data visualisation tools	50%	49%	52%	Existing and emerging technology
Data governance	49%	44%	50%	Digital capability
Data strategy	41%	42%	43%	Digital strategy
Target operating model and processes	37%	36%	41%	Digital strategy
Real-time visualisations	37%	36%	38%	Digital practice
Programme management	34%	34%	32%	Digital capability
Digital transformation	34%	33%	35%	Digital strategy
Cybersecurity	31%	33%	33%	Digital practice
Digital culture	31%	30%	33%	Digital strategy
Data labelling	30%	34%	30%	Digital capability
IT governance	28%	28%	31%	Digital capability
IT strategy	23%	23%	25%	Digital strategy
Artificial intelligence / machine learning	20%	19%	21%	Existing and emerging technology
Blockchain	20%	21%	19%	Existing and emerging technology
Coding	13%	15%	13%	Digital practice
Robotics	11%	11%	12%	Existing and emerging technology
he remaining respondents were aged 5	5 or over.			

3. The digital future – now

'Digital technology has rapidly become the facilitator of the business model, a mechanism for reaching conclusions quicker – not a substitute or short cut for understanding the business fundamentals and business risks.'

Liz Blackburn, RBS, UK and ACCA Council member

Digital evolution will continue, and technology will evolve into areas that we have not yet anticipated. As finance professionals we must be aware not only of the technologies themselves but also of their impact on the business model.

3.1 DIGITAL IS A WAY OF LIFE

Digital is a way of life for consumers and for businesses. Digital evolution will continue, and technology will evolve into areas that we have not yet anticipated. As finance professionals we must be aware not only of the technologies themselves but also of their impact on the business model. Those in-practice, need to appreciate the audit risks, for example, that may arise from the use of technology. Those in business need to understand how the business model is affected and the impact this has on the data that is collected. It will tell us different things about the way in which businesses succeed.

We increasingly use technology and digital facilities to deliver an organisation's services. It is not just how we facilitate transactional processing but also how we use technology, such as cognitive technology, to drive predictions or to drive opinions. This is a space in which the profession can and should operate. Embracing this and being aware of the technological implications is essential.

3.2 DIGITAL IN THE BUSINESS CONTEXT

Survey respondents were asked to consider how important it is to understand the digital context of either their client (if they identified themselves as working in-practice) or their organisation (if they identified themselves as working inbusiness). Nearly 60% of those in practice and 52% of those in business thought that it was extremely important (Figure 3.1).

Rashika Fernando illustrated the digital transformation in a practical context, as exemplified by his own organisation.

'The banking industry is moving through a phase where we are moving from a traditional bricks and mortar bank to a digital bank. So, our cost structure has shifted tremendously from infrastructure and fixed cost base to a more digitalservicing cost structure where even in one year the digital volumes have increased, in terms of banking transactions, by almost 85%. We are repositioning our products and service offerings into the digital space.'

Nigel Adams, managing partner of AdValorem, chartered certified accountants in the UK, noted that, for the small and medium-sized accountancy practice, the advent of cloud-based applications and the consequent availability of data has given the opportunity to expand the range of advice they can give and occupy part of the space vacated by the banks as a result of the trends that Rashika alludes to.

FIGURE 3.1: How important is it to have a working knowledge of the impact of the organisation's digital strategy?



While the impact of each of these on the accounting and finance functions will vary, the pace of change is fast and will remain so.

3.3 THE EVOLVING NATURE OF DIGITAL IN THE FINANCE WORKPLACE

The evolution of technology as it is used in the workplace continues. Gartner highlight 10 key trends for 2020 that they believe will affect the workplace (Panetta 2019). These include:

- hyperautomation including robotic process automation⁴ and iBPMS
- multiexperience
- democratisation
- human augmentation
- transparency and traceability
- 'empowered edge'
- distributed cloud
- autonomous things
- practical blockchain
- Al security.

FIGURE 3.2: Combining technologies in the workplace of tomorrow

(Explanations of these terms can be found in the glossary).

While the impact of each of these on the accounting and finance functions will vary, the pace of change is fast and will remain so. The impact of these may be measured against tasks and not roles, the nature of the change yet to come may be as significant as the evolution that has already happened. Being digitally and technologically aware is essential in this transforming world.

Figure 3.2 demonstrates how the skills that the accountancy and finance professional is developing, as exemplified by those used by those questioned in the survey, become relevant to the workplace of tomorrow, one in which we collaboratively work using increasingly integrated data in a more agile manner. There is an increasing rate of convergence of the technologies. Learning the language of this technology is important. While it is not essential for finance professionals to be data scientists or technology evangelists, for example, they need speak the language of data and technology and converse in a manner that facilitates their full participation in the future operating model.

ACCA	DIGITAL QUOTIENT	ENABLING TECHNOLOGIES		INTEGRATED WORKPLACE	
Exisitng and emerging technologies	ERP Spreadsheets Analysis Visualisation software AI / ML Blockchain	Virtual assistants Speech recognition Chat bots Natural language processing Hyperautomation			
Capabilities	Project management Programme management Data governance IT governance Data labelling	Cloud platforms Digital core Data democratisation 3D printing In memory computing	-	System of systems	
Processes	Data management Operational data Real-time reporting Coding and queries Cyber security	Visualisations Real time insight Finance forecasting Virtual and augmented reality / human augmentation	_	Smart cities Smart workplaces Mobile connected workforce	
Strategies	Business strategy Finance strategy IT strategy Operating model Digital culture	Distributed cloud Customer-centric business model Data collection at point of activity			

4 The impact of robotic process automation and intelligent automation is considered in the report Embracing Robotic Automation during the Evolution of Finance (ACCA et al. 2018).

Successful organisations that embrace this journey will bring together crossfunctional teams with agile mindsets capable of responding to business trends by reflecting on the real-time data that is available to team members. Successful organisations that embrace this journey will bring together crossfunctional teams with agile mindsets capable of responding to business trends by reflecting on the real-time data that is available to team members. This multidisciplinary environment will require common approaches and a common language among teams able to grasp problems and provide solutions by using the data available to them. This model builds strongly on many finance capabilities, yet speaking a common language is at the heart of it.

The extent to which such a model is adopted will depend upon industry and appetite. If you consider, for example, that your organisational business model will evolve from a 'build' to a 'maintain' model then the use of the internet of things and 'smart' cities and workplaces will be your future. This requires an evolved thinking of the transformed business model and the use of data and technology (Figure 3.3).

Practical finance integration – the digital core

One of the keys for the finance function in this transformation is the use of data and technology in a way that is based upon the concept of a digital core. This transformation was explored in *Finance*: A Journey to the Future? (ACCA / PwC 2019) and is represented in Figure 3.4. Traditionally an organisation's ERP solution would have encompassed a wide range of business processes. With the advent of cloud-based applications that address one component of the business model, such as human capital, or sales and customers, the role of the hub is becoming the central repository of information: a repository that is queried using analytical and other tools to present management information, analytics and visualisations, often in near real time. A far slimmer ERP solution.

While this may seem a utopia even to some large organisations, the use of private cloud applications provides a 'half-way house' for some organisations. In practice, while the use of the cloud gives vendors the facility to update their products constantly in line with cloud principles, the need to minimise specific variations to optimise their profits is a challenge. At the centre of this remains the importance of data and the ability to understand its flow and how the business is modelled in relation to the data.



Technology provides a more integrated environment where data can be shared between applications and the data repositories that facilitate them can in turn be interrogated to facilitate analyses and insights. It is important to realise that within this model there is an increasing convergence of financial and non-financial or operational data, as well as the incorporation of unstructured data. This is defined in a robust, organisation wide, data model. Having an appreciation of this aspect of the digital landscape is essential for the digitally enabled finance professional of the future. Organisational performance management is increasingly being driven by a wider range of metrics than just pure financial data.

While this model may at first sight appear to be applicable only to larger finance functions, the application of the principle to small and medium-sized enterprises (SMEs) is equally achievable. This is considered in ACCA's report *The Passionate Practitioner* (ACCA 2019).

As finance professionals, we need to stay abreast of these evolutions. The traditional view of the accounting system as just the place of record no longer holds. Technology provides a more integrated environment where data can be shared between applications and the data repositories that facilitate them can in turn be interrogated to facilitate analyses and insights. Using digital skills to understand the application environment (including existing and emerging technologies), appreciating how the information is managed (capabilities), facilitating the integrity of the information flow (practices) and levering commercial and strategic advantage (strategy) are all part of applying the digital quotient.

Importance of data

In the digitally transformed world, data is key. The ability to use data to understand the business environment in real time, to add value to customers, is key. Those organisations that survive and thrive will be those that have addressed the disruptive forces, understood how the changes affect their business model and addressed their customers' changing behaviours. ACCA and Alibaba Cloud explore the evolution of the organisation, including the role of Network Liquid organisations in their report Digital Leadership: Leading Finance Digital Transformation (ACCA and Alibaba Cloud 2019).

In this data-centric world, the core value of accountants in ensuring completeness, existence and accuracy of data come to the fore. These are skill sets that we



52%

of respondents working 'in-practice' consider digital skills to be extremely relevant naturally apply; yet they are also the core skills the data scientist uses in providing structure and organisation to data sets. The symbiotic relationship of these two roles is important and one that as accountancy and finance professionals we need to master.

3.4 IMPACT OF DIGITAL SKILLS ON THOSE 'IN-PRACTICE'

For the accountant working in audit practice, digital skills present two main areas of challenge. Firstly, their skills as digital practitioners, as audit and attestation processes are increasingly being automated (this is discussed in ACCA and CA ANZ's report Audit and Technology (ACCA / CA ANZ 2019)). Secondly, they need to understand how technology is used by their clients as part of understanding their business and its environment and the implications of transformed business models, revised financial performance frameworks and internal control frameworks.

As governments increasingly digitalise the collection of data, including tax records, accountants in practices need to become more data literate, especially in the small-to-medium-sized sector, to support their clients.

Perhaps one of the most significant impacts is the transformation of organisations' use of technology, which has challenges for those who provide opinions based upon the financial statements that result. A fundamental part of any organisation's internal control framework is the monitoring activities that it has in place to evaluate the integrity of the transactional flows. Increasingly, however, organisations are embedding technologies deep into these processes. Examples such as continuous monitoring techniques that may be enhanced by AI-enabled detection tools are but one step on this journey. In Audit and Technology (ACCA and CA ANZ 2019), we show that start-up businesses now tend to have business models based on advanced technologies (as discussed above) and therefore complex audit challenges could come from smaller businesses as well as larger ones.⁵

Indeed, a trend in organisational planning and forecasting is to challenge the traditional planning and budgeting processes and use different performance indicators to measure the achievement of strategic goals (this topic is discussed in ACCA and PwC (2019)).

Of those respondents to the survey who categorised themselves as working in-practice, 52% considered that digital skills were extremely relevant to them (Figure 3.5). This can be by using automated tools in the audit approach, or through understanding the implications for the internal control environment.

Of the respondents in this category, 60% thought that it was extremely important to understand how their clients used technology.



FIGURE 3.5: Do you consider digital skills to be fundamental to the role of the auditor / external advisor in future?

Note: this question was responded to only by those who identified themselves as working 'in-practice'.

The underpinning of these tools by AI techniques requires those 'in-practice' to appreciate the combination of audit objectives, ethical considerations of bias and how the data is managed by the organisation. An increasing use of specialists to understand the technology and data that audit clients use was cited by several of those who were interviewed. Yet the classic issue of relating the financial statement opinion to the work of these specialists is one that has been encountered since the initial days of computerisation of accounting records. Digital technology is now the way many organisations deliver value to customers. To achieve this level of understanding presents challenges.

The importance of a wide range of skills, including digital skills, in the context of the role of the financial statement auditor and their understanding of the internal control framework are considered in the Brydon review (Brydon 2019). In this report, Sir Donald Brydon considers, among other things, how the use of technology supports the financial statement audit, including the considerations around the acquisition and use of both structured and unstructured data by auditors. The marketplace in the software available to medium- and smaller-sized audit firms continues to grow, as does the use of their own tools by the Big Four. The underpinning of these tools by AI techniques requires

those 'in-practice' to appreciate the combination of audit objectives, ethical considerations of bias⁶ and how the data is managed by the organisation. This creates a 'sweet spot' of knowledge across the three domains (Figure 3.6).

In our survey, we asked those who identified themselves as working 'inpractice' to consider how important it will be to understand the technology landscape of their clients (Figure 3.7). The importance of this context was clearly appreciated, with 60% of the respondents indicating that it will be extremely important.

3.5 UNDERSTANDING THE DIGITAL STRATEGY

The importance of digital transformation to future operating models and business success means that we need to embrace this strategy. In our survey, we asked those respondents who identified themselves as working 'in-business' whether they considered it important to have a working knowledge of their organisation's digital strategy. As demonstrated in Figure 3.8, a significant majority (91%) ranked it as '4' or '5' on a scale of '1 – 5'.



The issue of bias in a digital age is considered in ACCA 2018

6

60% of respondents working

'in-practice' consider understanding the technology landscape of their clients to be extremely important





Note: this question was responded to only by those who identified themselves as working 'in-practice'.





Note: this question was only responded to by those who identified themselves as working 'in-business'.



FIGURE 3.9: How important will it be for accountants in business to understand the data and digital landscape of their organisation in the future?

4. Embracing digital – becoming a digital citizen

'Having relevant digital skills is an essential part of being an accountancy and finance professional now and into the future. Taking time to understand the digital landscape is no longer a choice, but a necessity.'

> Brendan Sheehan, White Squires, Australia and ACCA Council member
Heather Smith of ANISE Consulting noted that:

'The development of digital skill was part of lifelong learning activity, as there was a need to keep developing one's awareness. This does not stop at obtaining the ACCA qualification: people need to keep learning.'

Alastair Barlow, founder and chief dreamer at flinder, commented that for him:

'The key was a set of efficient processes and that digitalisation reflected the need to optimise these: to have robust data flows with a clear understanding of data sources, the controls over those sources, and how the data needed to flow to address the client's requirements. While operationally cloud-based computing systems supported this, the fundamental aspect is the process flow. You need to understand the context of the problem that you are seeking to solve and how the data that you have is relevant to that.'

4.1 THE CONTINUOUS LEARNING CHALLENGE

The digital landscape continues to evolve and the adoption of new technologies in the workplace will mean that it always will. Maintaining the right level of competence to be effective in one's role is essential for accountancy and finance professionals. The views on the left were offered by our interviewees.

The respondents to the survey identified the areas in which they believed they needed to develop their skills (Figure 4.1). Figure 4.2 shows the same responses divided between the different age groups.

FIGURE 4.1: In what areas do you think you may need to develop your digital skills to perform your role in the next three to five years? Please select all that apply



FIGURE 4.2: In what areas do you think you may need to develop your digital skills to perform your role in the next three to five years? Please select all that apply



Apart from a perceived lack of time, a lack of resources and of continuous learning opportunities were cited as the most significant challenges in maintaining digital skills. It is perhaps unsurprising that data analytics was a fundamental development area across the range of potential areas of interest. A geographic analysis of data analytics and spreadsheeting responses (Figure 4.3) shows a high level of interest in both, with a clear preference for data analytics skills.

The respondents to the survey reflected upon the challenges that they have in developing their awareness and proficiency in the digital quotient (Figure 4.4). Respondents were able to select all those limitations that applied to them. Apart from a perceived lack of time, a lack of resources and of continuous learning opportunities were cited as the most significant challenges in maintaining digital skills.

When asked whether they took a proactive or a reactive approach to developing their digital skills, just over half claimed that they took a mainly proactive approach (Figure 4.5).

FIGURE 4.3: In what areas do you think you may need to develop your digital skills to perform your role in the next three to five years? Geographic analysis of responses indicating data analytics and spreadsheeting as areas of focus





FIGURE 4.4: What challenges do you face in developing your digital skills?

If organisations are to continue to thrive by using fully the available, relevant, technologies, then those who manage or lead need to appreciate the time that must be invested to reach the required level of proficiency. Some commentators see the 'lack of time' response in survey questions of this nature to be a proxy for a lack of value or appreciation. If organisations are to continue to thrive by using fully the available, relevant, technologies, then those who manage or lead need to appreciate the time that must be invested to reach the required level of proficiency.

Figure 4.6 shows a further analysis of the challenges faced but those who selected a 'lack of time' as one of the issues that they faced. While the results are broadly like those in Figure 4.4, the survey suggests that there is no one clear reason why developing these skills is a challenge for many.

The lack of continuous learning opportunities and a network of peers from whom they believe that they could learn were also significant areas of challenge for the respondents. The digital area is often seen as confusing for many and the breadth that may need to be covered may well be daunting. It is important, however, to seize the opportunities available and capitalise upon them.

FIGURE 4.5: Do you consider that you are mainly proactive or reactive in developing your digital skills?



FIGURE 4.6: What challenges do you face in developing your digital skills? – Those identified by the population who identified 'lack of time' as their main barrier



Having a clear business understanding of how technology and data are used is possibly the key to developing our digital quotient.

4.2 THE CHALLENGE OF UNDERSTANDING THE BUSINESS

Whatever role the finance professional undertakes, technology plays a significant role in it. It is important to be comfortable with the use and application of tools relevant to our work. Shirley Lamarre, Professor of Accounting at Centennial College, commented:

'While you do need to know about data analytics, you don't need to do the actual work. However, knowing what questions to ask of the data would help you make better decisions and add value to the organisation.'

As businesses increasingly leverage technology as a source of commercial advantage, it is essential to recognise the importance of doing it the right way and the impact on the financial and operational processes. Rashika Fernando noted that for him what matters is a combination of the mechanics of technology, the business processes and the technological tools. He explains this as:

'Driving knowledge from finance's knowledge base. You need to know SQL, you need to know how to join tables and how certain data is structured. Most accountancy courses teach statistics but as we go to AI and machine learning we need to understand the statistical analysis of data and mathematical modelling. You must understand how data is structured and captured into tables and how relational databases work.' Dale Wright, senior audit manager at Ontario Treasury Board Secretariat, expanded on this theme by commenting:

'So the answer to the question, 'how can they be successful?' [is] pretty much understanding the digital footprint of the organisation and see[ing] technology... as an enabling mechanism rather than anything else; to bring it together including, for example, big data and artificial intelligence. As an enabling leader of the organisation we need to maximise, to be more efficient. How can we do continuous monitoring? And where do we spend or allocate our resources across the portfolio of the digital footprint of the organisation to ensure that we're getting the best and that we're giving [the organisation] value for money?'

Another interviewee saw this as needing to have confidence in three areas:

- the completeness, existence and accuracy of the data that the organisation uses
- the tools that can be used to analyse that data, and
- the business model of the organisation, to enable the accountant to place the analysis in the context of its strategy.

Having a clear business understanding of how technology and data are used is possibly the key to developing our digital quotient. The successful finance professionals will blend their digital skills into a content (Figure 4.7) that represents a combination of their accounting technical and ethical skills, their digital skills and their business skills.





The ability to create an effective operating model that is based on the core capabilities of the organisation will define those that succeed in future. If one is to position the accountant in the context of digital transformation, it is the combination of their digital and business skills with their background in accounting technical and ethical skills, that provides the finance professional with a clear advantage (Figure 4.8). Within the digital quotient we have expressed this as the relevance of the digital strategy component combined with the achievement of the overall objective through capabilities for using existing and emerging technologies.

An article for *Harvard Business Review* by Deloitte makes the point that in the transformed world, 'leaders should think about their operating models as their unique set of capabilities aligned to the enterprise's strategy, with skilled leadership teams, tailored metrics, unique investment profiles, and tight coordination across the value chain' (Deloitte 2020). The ability to create an effective operating model that is based on the core capabilities of the organisation will define those that succeed in future. As accountants and finance professionals. we need to ensure that we understand the organisation's capabilities and how we can use our skills well to measure how effectively these are used in executing that strategy. These capabilities are categorised as supporting either the demand side or the supply side of the organisation. Each side has challenges in the transformed business environment and requires cross-functional and agile teams to meet these challenges. The success of the business model is something that we need to understand clearly and work to achieve. From our ethical perspective we may need to temper the race for commercial advantage with a consideration of whether the organisation is doing the right thing.



FIGURE 4.8: Digital skills in context: why understanding the business is important

It is vital to have an enquiring mind about new technologies and embrace the opportunities offered to you, including learning from others in your workplace.

4.3 SEIZING THE DEVELOPMENTAL OPPORTUNITIES

The digital quotient is a hybrid of skill (how to do something) and fact-based knowledge (appreciating how commercial advantage can be gained, for example). There is no one developmental path that will satisfy both objectives.

It is vital to have an enquiring mind about new technologies and embrace the opportunities offered to you, including learning from others in your workplace. One potential path is to identify a select number of organisations that you trust, or whose opinions you value, and to monitor the insights that they develop. This enables the development of an appreciation of the trends and enables you to focus on those areas that matter to you.

It is not necessary to be a digital expert in all areas, but rather to appreciate how digital technology will change your current and future roles and ensure that you are prepared for these changes.

One finance lead interviewed as part of the research expressed concern at the finance professional's typical level of business process knowledge and suggested that, as a profession, we have allowed it to decline (Figure 4.9). There had been two peaks in the level of understanding of the business process, the first occurred when the first generation of ERP applications were implemented from the late 1980s; the second was when the Sarbanes-Oxley Act of 2002 focused attention on internal control and processes. While the control documentation has been maintained, the inherent understanding of the processes and data flows has been lost. For finance professionals, digital transformation provides an opportunity to recapture the 'lost ground' and to maximise our knowledge of process and data to better serve our organisations.

For Alexander Apollonov, the CFO of Russian medical laboratory Gemotest, understanding the operating model is one of the ways that senior finance professionals can use to deliver value to their companies. He comments that financial professionals of 10 to 20 years ago had two main tasks, to prepare reports for different authorities and to optimise taxation. Now, he suggests, thanks to improved technologies, most of these tasks are performed automatically, with the result that the related skills are not as important as they were. Instead, it is more important to understand the information flows and to manage and analyse that information.



The reality is that the workforce is ageing. Fertility rates are falling and for some developed economies the fastestgrowing segment of the workforce may well be the over-55s.

4.4 THE IMPORTANCE OF THE STORYTELLING NARRATIVE

Having the knowledge to understand the business model, the context in which technology is used, and the data flows across the organisation, together with the skill to analyse and explain these to others, enables the accountancy and finance professional to provide greater value to their organisations. Alexander Apollonov commented that:

'We are living in a time when there will be a new type of professional, a digital accountant who understands how to process data as an IT professional and then analyse it as a finance professional so that they can give a solution to the general manager to improve the business.'

Each of the five zones of the future careers of accountancy and finance professionals outlined in ACCA's report *Future Ready: Accountancy Careers in the 2020s* (ACCA 2020a) has elements of this digital understanding and storytelling narrative embedded within in it (Figure 4.10). This demonstrates the purpose of the profession in the context of this transformation. Part of the adaptation will be possible through using our digital skills.

4.5 THE GENERATIONAL DIVIDE?

The reality is that the workforce is ageing. Fertility rates are falling and for some developed economies the fastest-growing segment of the workforce may well be the over-55s. This is an age group that may be thought to have been left behind by technology, yet business success may well rely on the reskilling and re-careering of these individuals.

Whenever technology is discussed, several assumptions about generational divides seem to be made. One is that members of younger generations are always technologically literate while those of more mature years find challenges understanding the digital world.

Although there is inevitably some truth in such assumptions, they also belie a greater challenge. As one interviewee commented, the challenge can be that while the younger generations are used

FIGURE 4.10: The five 'zones' of future career opportunity in accountancy

The assurance advocate

The assurance advocate brings new levels of trust and integrity to organisational operations. They may focus on enterprise risk, helping drive transparency and understanding of emerging issues affecting business performance, or be at the forefront of shaping future forward-looking audit practices as the capabilities of digital tools and technologies expand. They could be driving best practices in emerging control frameworks or helping organisations meet ever-growing regulatory demands or managing complex tax issues. They may even be auditing algorithms in the future. They are essential to the strong stewardship of sustainable organisations for the future.

The data navigator

The data navigator is a true business partner. They see extraordinary opportunities from the expansion of data and use emerging tech and analytical tools to drive insights that deliver business outcomes and sound financial management of the organisation. They champion ever-growing multi-rich data sets and use smart data to generate brilliant forward-looking analysis to support decision making. This could be exploring new geographic market opportunities or building the case for investment. They understand that the currency of good information is at the heart of building sustainable future organisations.

The business transformer

The business transformer is the architect of organisational change. They could be driving major business change initiatives or transforming finance operations. They may be leading innovative smaller accountancy firms that transform client businesses. They could be exploring growing careers in external advisory services driven by technological innovation and economic growth. Or they may be leading smaller enterprises as digital platforms open the door to new commercial opportunities. They are critical to creating change, driving the strategies of organisations, and supporting sustainable organisations for the future.

The digital playmaker

The digital playmaker is a technology evangelist. They see remarkable possibilities for emerging digital tools in transforming the organisations in which they work. They are champions of technology adoption and data governance within the organisation. They look to connect across teams and functions to leverage the power of technology. They may focus on digital implementation programmes or have specialised expertise in particular finance and business technologies. They understand that digital transformation in today's global economy is the lifeblood of future sustainable organisations.

The sustainability trailblazer

The sustainability trailblazer is at the heart of performance management in the organisation. They play a key role in establishing frameworks that capture, evaluate and report on the activities that truly drive value and in ways that are much more transparent and meaningful to the outside world. They will transform management accounting fit for a multi-capital world and see emerging opportunities with better external disclosures to ever-growing stakeholder groups. They understand that aligning the pursuit of profit with the pursuit of purpose is integral to building sustainable future businesses.

As a profession we need to ensure that we make the relevant learning opportunities available to enable the required performance levels to be reached. to the presentation of data, they lack the analytical skills to contextualise and make sense of the information presented to them. The digital revolution has removed the established training grounds. The interviewee commented that:

'My concern is that because things are rapidly changing, and because younger generations have so much coming at them, I find that it's becoming a skill that is sort of harder and harder to develop, because it's hard for them to...give...attention to what they're looking at, because the mind is already on the next thing'.

As a profession we need to ensure that we make the relevant learning opportunities available to enable the required performance levels to be reached.

The potential challenge for the more mature individuals is that they may be perceived as being less adaptable than younger people. So, age becomes a point of focus. Do older workers have the same ability to develop the necessary skills as the younger generation? Older workers may compare themselves with a younger generation who are more comfortable with consumer technology. As the technological evolution continues, it will remain important for everyone to maintain and develop new skills throughout their careers. This is not to say that some transformations are not led by those technologically savvy members of the older generation. It will not be feasible for each generation to leave it to succeeding generations to master the latest software.

4.6 DEVELOPING YOUR DIGITAL QUOTIENT

As finance and accountancy professionals we need to invest, on a continuous basis, in our digital skills if we are to fulfil the opportunities that we have. As digital transformation continues apace, we cannot afford to be left behind.

Nonetheless, the development of the digital quotient must be seen within the context of the other quotients. Figure 4.11 summarises how we may develop the various elements of our digital skills in this context.

As accountants, we have a strong technical background through the qualification, which we always bring to the fore in our work. Our digital and business skills supplement this but it is the combination of all three, the confluence of the Venn diagram (Figure 4.11), that gives us our unique proposition for adding value to organisations and their stakeholders. Those who seek to develop robust careers need to occupy that optimal point.

Our business skills are honed, generally, by our experiences in the workplace. As our careers develop, we gain a greater understanding of organisational business models. While our qualification provides a context, it is the operational application of data and analysis, for example, that facilitates the refining of business skills. Therefore, equating digital skills to pure mastery of applications would limit our ability to embrace the transformation of the business model and the evolution of data models and 'customer centricity'.



FIGURE 4.11: Development of the digital quotient in context

Mastering our digital skills in a changing world is a continuous process. Mastering our digital skills in a changing world is a continuous process. At the same time, we do need to be cautious about the promises of technology. One interviewee working in practice commented that one aspect of the challenge for him was exemplified by his experiences of blockchain. Many of the organisation's leaders had attended conferences three to four years ago where this technology was trailed as delivering a fundamental shift in the accountancy profession, among others. After the conference, they demanded to be told how this transformation would occur. Yet, to this day, the number of public blockchains is few, while there are examples of private blockchains developing in industries where guaranteeing provenance between trusted parties is an issue. Many have now lost interest in the subject. At the advent of any technology its importance may be exaggerated, and this is followed by an appreciation of its limitations and a consolidation of practice (Figure 4.12). One can describe this as the transition from over-enthusiasm to reality. When we are developing our digital skills in what we may perceive to be important emerging technologies, we may need to ensure that we develop an initial level of awareness in the enthusiasm phase but be mindful of the need to wait to invest heavily until the reality phase. A failure to recognise this leaves the accountancy and finance professional exposed to the risk of being over-committed to emerging technologies that may turn out to be less useful than expected.

As a professional

The successful accountancy and finance professional continues to develop their digital quotient in two distinct areas:

- determining the relevance of the digital landscape to their workplace and understanding how business strategy is executed through technology- the digital context
- applying specific skills related to the technologies that the organisation uses – the digital applications.

Emerging technologies can be considered to represent a third category.

These two areas together represent a combination of knowledge and skill, but each requires different potential personal development strategies.

The first relies on developing a detailed understanding of the business model and how technologies can be used. Business models are something that we learn by experience, through the insights provided by others. Each organisation's business model is unique. The mechanics of driving value are deeply embedded in the product or service offered.

The second involves using the technology as part of the day-to-day work. This may be in an active mode, for example, as a hands-on user, or by inference through working with the outputs from the application.



Leading firmly with a strong digital culture in the organisation is essential. Rewarding progress is nonnegotiable, no matter what age, context or performance level. The imperatives, therefore, are to:

- ensure that you keep up to date with the relevant technological developments
- appreciate that technology will continue to change, and that advantage is gained towards the leading edge once stabilisation has been achieved rather than the end of the game; and
- understand that the successful deployment of technology relies upon the business context in which it is used.

Achieving these objectives relies on being constantly aware and informed, and choosing the data sources and continuing professional development (CPD) events that present relevant information at the right level. Too many conferences present the latest developments but confuse by not being business relevant. 'Little and often' is the key to staying informed.

As a manager or leader

'Digital skills are becoming nearuniversal requirements for employment. Yet they are rapidly changing – and employers must respond quickly, training workers for future skills as well as for the skills needed today.'

Burning Platform / UK government (2019)

Encouraging individuals to learn is fundamental. Appreciating the benefit to the individual and the organisation of the time invested is essential – the 'lack of time' can no longer be an excuse. A diversity of learning opportunities needs to be incorporated within individuals' development plans. As Josh Bersin, in his predictions of human resource (HR) and workplace trends in 2020, comments, 'leaders now realise that "being digital" is a people problem, not a technology problem' (Bersin 2020). He continues, 'Continuous reskilling will continue, but we have to move beyond merely providing learning content to capability academies and learning in the flow of work.'

As a manager or leader, you need to consider how you develop or acquire these skills. If you accept that the professionals who offer the greatest value to your organisation are at the intersection of the three knowledge and skill groups shown in Figure 4.11, then you need to consider whether it is more efficient to develop their business knowledge or their digital skill. You also need to appreciate that the digital knowledge and skills they need will continue to evolve and, as an effective manager, you must ensure that you prepare your team members for the world of tomorrow, not just the reality of today.

The successful transformed organisation also embeds a culture of innovation and curiosity. This is as important across the profession as the ability to understand the digital context in whatever role you perform. Some elements of such a culture include:

- more collaborative working across functions and geographies
- rewards for generating new ideas
- rewards for applying an agile mindset, being ready to test and adapt, and
- creating autonomy for making business decisions.

Leading firmly with a strong digital culture in the organisation is essential. Rewarding progress is non-negotiable, no matter what age, context or performance level.

Conclusion

'If the accountancy profession becomes highly digitally literate, then the accountant will drive the technology-enabled business agenda forwards. If they don't, then the Chief Information Officers (CIO) will. Digital affects all areas of a business and in many ways including analytics, process efficiencies and customer engagement. The CFO who is a key player in the strategic planning process shouldn't be absent in this area. If the CFO is absent in leading this, the CIO or someone else will rise to fill the void. It is really important to focus on the digital literacy of people who are in the profession.'

> Charles Marful, director, Talent (Assurance Practice), EY, Canada

We need to embrace these changes to ensure that we have the skills necessary to use these tools and embrace new business models. To learn about the new and to unlearn those areas that are no longer relevant to us. Digitalisation is changing the nature of business. The speed of evolution is increasing. For organisations now it is not a question of whether they digitalise but how fast they embrace the opportunities and remain relevant to their customers.

As accountancy and finance professionals, in order to remain relevant, we need to embrace that digital shift, recognising that the digital world is constantly moving forwards. The traditional digital tools with which we have long been associated, such as spreadsheet applications, are being eclipsed by new technologies that draw on various data sources, visually represent that data and use ML to forecast trends. Our digital world is expanding in parallel to that of the organisations that we work for and with, irrespective of whether we are in-practice or in-business.

We need to embrace these changes to ensure that we have the skills necessary to use these tools and embrace new business models. To learn about the new and to unlearn those areas that are no longer relevant to us. Doing that is a journey of continuous learning: one that we cannot afford to ignore.



On our developmental journey we need to:

- understand that whatever our generation, digitalisation is something in which we need to take part
- appreciate that embracing the digital future requires a mindset not just a set of applications; organisations' digital futures are built around agile cultures
- reflect that collaborative working between teams is at the heart of transformation and requires skills and knowledge beyond the traditional boundaries
- appreciate the changes in the business models of our businesses and clients
- manage the impact on ourselves and others of continuous change
- develop skills that use our knowledge of applications but also appreciate how the business deploys technology for commercial advantage
- recognise our inherent skills for handling data with integrity to create value
- apply our ethical perspective to the transformed organisation
- take a considered view of the emerging technologies, mindful that practical applications often lag behind those that create the most initial enthusiasm but may well have a longer-lasting impact
- stand back from time to time and step out of the digital space: 'detox' and reflect.

Appendix 1

Definition of ACCA professional quotients

The following table provides the definitions of the ACCA professional quotients as identified in the 2016 report Professional Accountants – the Future: Drivers of Change and Future Skills (ACCA 2016).

	Technical and ethical competencies (TEQ)	The skills and abilities to perform activities to a defined standard, while maintaining the highest standards of integrity, independence and scepticism.
	Experience quotient (XQ)	The ability and skills to understand customer expectations, to meet desired outcomes and to create value.
	Vision quotient (VQ)	The ability to predict future trends accurately by extrapolating existing trends and facts and filling the gaps by thinking innovatively.
\bigcirc	Emotional intelligence (EQ)	The ability to identify your own emotions and those of others, harness and apply them to tasks, and regulate and manage them.
	Intelligence quotient (IQ)	The ability to acquire and use knowledge: thinking, reasoning, solving problems and the ability to understand and analyse situations that are complex and ambiguous.
	Creative quotient (CQ)	The ability to use existing knowledge in a new situation, to make connections, explore potential outcomes and generate new ideas.
	Digital quotient (DQ)	The awareness and application of existing and emerging digital technologies, capabilities, practices, strategies and culture.

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Glossary

5G	5G is the fifth-generation wireless technology for digital cellular networks that began wide deployment in 2019. According to ITU (International Telecommunications Union) guidelines, 5G network speeds should have a peak data rate of 20 Gb/s for the downlink and 10 Gb/s for the uplink.
Al security	The ability of AI to perform as required and to be explainable to humans to manage and prevent cyber threats by applying additional techniques.
Artificial Intelligence (AI)	The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.
Autonomous Things	Machines that work autonomously without human guidance or direct intervention.
Blockchain	A list of records that are linked by cryptography to prevent the modification of the data.
Coding	Creating a computing programming code, using a language.
Data enquiries	Tasks that collect information from agents, whether end-users or software components, to be used later in the process.
Data governance	The overall management of the availability, usability, integrity and security of data used in an enterprise.
Data management	An administrative process that includes acquiring, validating, storing, protecting, and processing required data to ensure the accessibility, reliability, and timeliness of the data for its users.
Data visualisation	The representation of information in the form of a chart, diagram, picture and so forth.
Democratisation (of data)	The ability of data to be made available to average end users without assistance.
Digital culture	The nature of the organisation that is shaped by the emergence and use of digital technologies.
Digital transformation	Customer-centric business transformation that often cuts across traditional business models and involves the implementation of digital technologies
Digitalisation	The use of digital technologies to change a business model and support organisation growth.
Digitisation	Converting information from an analogue to a digital format.
Distributed cloud	The use of cloud computing to interconnect data and applications from multiple geographic locations.
Empowered edge	Computing power that is distributed to the edge of the network, ie to the end user and end user device, rather than being centralised.
EmTech	Abbreviation of 'emerging technologies'. Generally seen as defined by the Massachusetts Institute of Technology (MIT) in its annual conference of the same name.

Human augmentation	Technologies that enhance human productivity and capability, such as sensory devices.
Hyperautomation	Application of technologies such as AI and ML to automate and augment human processes.
iBPMS	An integrated set of technologies that coordinates people, machines and things (as in the 'Internet of Things') and supports traditional business process management requirements.
Intelligent process automation	The combination of robotic process automation tools with ML and AI.
Internet of Things	The interconnection via the internet of computing devices embedded in everyday objects, enabling them to send and receive data.
IT governance	An element of corporate governance, aimed at improving the overall management of IT, and driving improved value from its investment in information and technology.
Machine learning	An application of AI that gives systems the ability to learn automatically and improve performance by experience without being explicitly programmed.
Multiexperience	An application development platform that enables software to be rapidly deployed across a range of devices.
Network liquid organisation	A shadow organisation that embeds disruptive characteristics, which enables the organisation to optimise decision-making efficiency and response speed, while activating individual values, and ultimately reaching the synchronisation with the change of the external environment.
Private cloud	A model of cloud computing whereby IT services are provisioned over private IT infrastructure for the dedicated use of a single organisation. A private cloud is usually managed via internal resources.
Programme management	The coordinated management of projects and change management activities to achieve beneficial change.
Project management	The practice of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time.
Robotic process automation	Software that automate interactions with the user interface, and often doing so by repeating a set of demonstration actions performed by a user.
SQL	Standardised query language for requesting information from a database. Originally known as SEQUEL (Structured English Query Language).
Target operating model	The desired state of the operating model of an organisation.
Transparency and traceability	A range of attitudes, actions and supporting technologies and practices designed to address regulatory requirements, preserve an ethical approach to use of AI and other advanced technologies, and repair the growing lack of trust in these areas.

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