The Data Revolution

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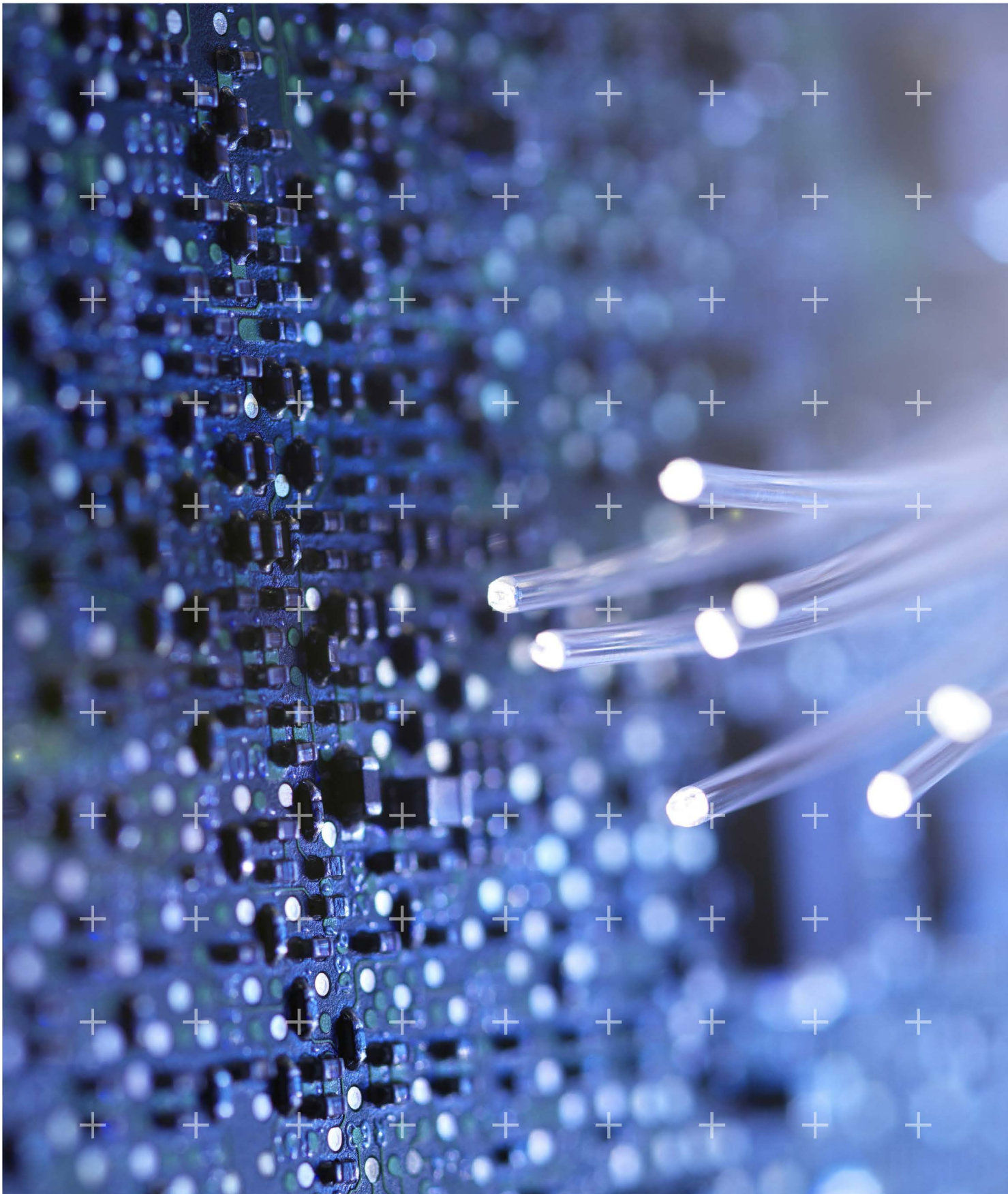

Abstract

The purpose of this report is to draw attention to the radical change in the role of data in relation to the accountancy profession. It touches upon issues of data management, data governance and data lifecycle, and describes key current and future trends for a broad range of data-related activities.

Demand for new data-related skills is already high and is likely to increase even further. Acknowledging the revolutionary nature of changes related to data and understanding the concepts and challenges that working with data presents are likely to be among the key requirements for finance professionals in the near future.

About ACCA

ACCA (Association of Chartered Certified Accountants) is the global body for professional accountants. We aim to offer business-relevant, first-choice qualifications to people of application, ability and ambition around the world who seek a rewarding career in accountancy, finance and management.

Founded in 1904, ACCA has consistently held unique core values: opportunity, diversity, innovation, integrity and accountability. We believe that accountants bring value to economies in all stages of development. We aim to develop capacity in the profession and encourage the adoption of consistent global standards. Our values are aligned to the needs of employers in all sectors and we ensure that, through our qualifications, we prepare accountants for business. We work to open up the profession to people of all backgrounds and remove artificial barriers to entry, ensuring that our qualifications and their delivery meet the diverse needs of trainee professionals and their employers.

We support our 170,000 members and 436,000 students in 180 countries, helping them to develop successful careers in accounting and business with the skills needed by employers. We work through a network of 92 offices and centres and more than 8,500 Approved Employers worldwide, who provide high standards of employee learning and development.

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About IMA

IMA® (Institute of Management Accountants), the association of accountants and financial professionals in business, is one of the largest and most respected associations focused exclusively on advancing the management accounting profession. Globally, IMA supports the profession through research, the CMA® (Certified Management Accountant) credential, continuing education, networking and advocacy of the highest ethical business practices. IMA has a global network of more than 75,000 members in 140 countries and 300 professional and student chapters. Headquartered in Montvale, N.J., USA, IMA provides localized services through its four global regions: The Americas, Asia Pacific, Europe, and Middle East/Africa.

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Table of contents

Acknowledgements 2

Foreword 7

Executive summary 8

1. Introduction 10

2. Data management, data governance and data lifecycle 12

3. Data Revolution – current and future trends 18

4. Data management and the future of accountancy – what is required and what does it mean for you? 22

5. Conclusion 26

6. References 28

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Anne Kimari is chief operating officer, with a concurrent role of chief finance officer, at the African Academy of Sciences, a pan-African organisation with affiliation with NEPAD and the African Union, championing science, technology and innovation. She has been a member of the ACCA SME Global Forum, as she has personal interest in promoting SMEs' performance and big data management.

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Dilesh Magdani is the Director of Finance Operations at Specsavers. He is an experienced senior professional and an award-winning leader. He has worked in multinational blue chip, private and VC-backed organisations and has experience across a variety of industries, including retail, utilities, manufacturing, distribution, food and beverage.

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Foreword

Calling data ‘the new oil’ of the digital economy may have become a cliché, but it still makes sense.

Imtiaz Ibne Sattar,
ACCA Accountancy
Futures Academy
Global Forum Member

The catchy phrase has been in use since the mid-2000s and is arguably not the best of metaphors, but its key message is still valid. Oil facilitated the Industrial Revolution in the 19th century, and, in a similar way, data has become an essential resource of the digital economy in the 21st century, bringing tremendous benefits to businesses and to society at large. Like oil, data is seldom used in its raw form: it needs to undergo a number of transformations in order to generate value. If not stored and treated with due care and diligence, data too can cause massive problems, as data leaks can be highly toxic and very expensive to contain.

This report by ACCA and IMA suggests that, in order to fully anticipate the future impact of data and its role, the finance profession needs to look beyond the ‘new oil’ metaphor; instead, it should support the business in adopting a data-centric approach to modern information technology. What this means, in short, is that data should be seen not only as a useful commodity (which it undoubtedly is) but also as a factor that is critically important for business strategy, as it directly affects issues such as costs, efficiency and quality of service.

In the near future, data governance and managing data through its full lifecycle should no longer be considered among those boring tasks confined to the depths of the back office. New data-orientated business functions and roles will eventually emerge, and this should present accountants with a very good opportunity, as they are well placed to fulfil some of these functions and roles. For instance, such issues as calculating the true value of data and the monetary impact of data management decisions, as well as monitoring regulatory compliance of various data-related processes, would be well within the remit of finance professionals.

Executive summary

The role of data in the modern world is changing in a most dramatic way. The changes, their speed and scale, as well as their impact on almost every aspect of daily life, are so significant that the term 'Data Revolution' is being used ever more frequently, and rightly so.

As was the case with the first two industrial revolutions, the Data Revolution has been facilitated by technology, most importantly by rapid advancement of various computer-related technologies and by the development of internet and mobile data networks. Naturally, modern business has been very quick to take advantage of the new opportunities, demanding electronic forms of data and data-driven processes. As a result, working with electronic data is now firmly established as one of the key functions of modern business; this applies to companies of all sizes, in all sectors of economy all over the world.

Accountants and finance professionals have always been right at the heart of data-related work. Now, as the Data Revolution causes huge shifts in the data landscape, the very nature of the finance profession is being significantly affected, and new data-related skills are being sought. This signifies an urgent need to re-examine current and future trends of digital data and data processing, as well as their imminent impact on the future of accounting.

What is required first of all is a change in perception of the relationship between data and information technology (IT). Data can no longer be seen as a by-product of IT systems, much as oil cannot be viewed as something that is secondary to wells and pipelines. IT and its support of the business have to be viewed from a data-centric perspective.

The data-centric approach to technology will inevitably put more emphasis on data management and data governance. Data governance is a subject that is yet to gain traction; when it does, finance professionals will play a role in helping to support projects that lead businesses towards data maturity in their use and handling of data. The specific implementation of the data lifecycle will vary significantly between any given businesses, depending on the nature of the data, its quantity and the way it is used, but finance professionals should make an appropriate contribution at every stage of the lifecycle.

It is very important to be aware of key current and future trends related to the Data Revolution. One such trend is the sharp increase in the volume and complexity of data, facilitated by the relentless growth of digital technologies of people's daily lives and by emerging new technologies related to the IoT (Internet of Things). It should be noted that, while so-called 'Big Data' tends to draw a lot of attention, it is by no means the only area where the Data Revolution battles are being fought; the 'small data' users are also very much affected and can no longer go about their data business as they did in the past.

Mobility and agility of data is also among the key trends. New mobile technologies and advanced communications provide means of data mobility and facilitate 'always on' work practices; consequently, decision making at all levels is increasingly being determined by data's availability (and accessibility) whenever required.

Rapid development of Cloud computing is also one of the key trends that needs to be monitored. The Cloud offers many advantages, such as low up-front costs, rapid implementation, resilience, scalability and location independence, but there are often hidden costs, management overheads and legal problems to consider, and accountants should have a lot to contribute to decision making in these areas. Closely linked with the Data Revolution is the issue of data security and associated enforcement risks. Data has become a truly valuable asset: making use of data and extracting profit from it offers great opportunities for generating revenue, but for this reason also attracts the attention of criminals and may therefore present a massive liability from a legal point of view, particularly as regulations become more onerous. For instance, one area of increasing importance is regulatory compliance in matters such as data retention and data disposal.

By the very nature of their professional training and their work, accountants and finance professionals are well equipped to survive the data 'avalanche', but to do this they need to keep data issues clearly in view. As the data-centric approach to technology gains momentum, there is a growing demand for people, sometimes referred to as 'data stewards', who can articulate and support the value of data. Accountants and finance professionals have a very good opportunity to take on such responsibilities. There is a further argument to support this. New hybrid roles are gradually emerging that will determine the future of the accountancy profession: they are roles at the intersection of finance, technology and information, such as the chief financial technology officer (CFTO) or chief financial information officer (CFIO).

While these new roles and business functions are emerging, collaboration between finance and IT professionals remains very important. Companies and executives need to be flexible, clever and innovative in order to facilitate collaboration and find solutions that work in their specific circumstances.

As valued advisers to businesses, accountants must maintain awareness of a broad range of technologies and trends and acquire new skills as necessary; this is no longer a 'nice to have', but rather a 'must-have' for the profession.

Ultimately, data is a truly valuable asset, and finance professionals must help the business extract value and treat data and data-related infrastructure and business processes with the attention that these matters fully deserve.

1. Introduction

Dawn of the 'Data Revolution'

Producing, collecting and making use of data are not new concepts: they have been managed throughout history by governments, businesses, scientists and individuals. Financial data has always been of utmost importance, and consequently accountants and finance professionals have always been right at the heart of data-related work.

Even so, the role of data in the modern world has changed recently and most dramatically. There is no shortage of terms used to draw attention to this process; notable among them being 'Data Revolution'. For instance, the United Nations (UN) recently used the term when it announced the creation of its Data Revolution Advisory Group (UN 2014). Yet is it perhaps overly dramatic? Is it truly a revolution, or more of a rapid evolution?

The answer to this question lies in the scale of the changes that are happening at present and in the effect that these changes are having and will continue to have, on almost every aspect of daily life. A recent report confidently states that the amount of data being generated is doubling every two years and is expected to grow to 40 trillion gigabytes (more than 5,200 gigabytes for every man, woman and child) in 2020 (Accenture 2014). The effects of the advent of all this data and its availability are equally significant. Among other things, increased data availability allows companies to be more flexible in responding to business demands, to gain knowledge of their own efficiency and achieve greater insight into their customer base and customer demands. The latter can be illustrated by a quote from Lord MacLaurin, when Tesco's chairman, describing his astonishment at the findings of the data analysis of customers' use of Clubcard (Tesco's customer loyalty card) by saying: 'What scares me about this is that you know more about my customers after three months than I know after 30 years' (Brown 2010).

Like industrial revolutions of the past, the Data Revolution is likely to signify a major turning point in human history. There are several contributing factors that have been facilitating its advance and are now shaping its course.

+ Rapid advances in computer hardware and related technologies, including processing power, storage capacity and speed of communication within computer systems, create a robust platform for new ways in which data processing tasks are being performed.

+ The development of the internet and the subsequent success of various internet-related technologies mean that inter-connectivity of computer-based devices has reached a point that would once have seemed incredible. Many different devices and systems can now be connected to each other all across the planet, completely changing the way in which data can be collected and distributed.

+ Computer scientists constantly produce new algorithms and both software and hardware-based technologies that provide new and exciting ways of working with data. These have so far included advanced data indexing, data analysis, and data visualisation, among others.

+ In addition, there is the reduction of costs associated with collecting and storing data (although this should not be taken for granted and has to be closely monitored).

None of the factors described above currently show any signs of slowing down; if anything, there is an increasing appetite for new types of data and new ways of using it. As for the finance profession, its very nature is already being significantly affected by the changing data landscape. For accountants, new data-related skills are being sought, while the value of some other skills is being slowly eroded. This means that all those finance professionals who think that the term 'Data Revolution' is overly dramatic and of no concern to them need to think again.

All data, big and small

So-called 'Big Data' tends to receive the most attention in many data-related articles and conversations, and gets otherwise mentioned so often that one could be forgiven for thinking that no other type of data matters any more. In fact, that is far from true.

'Big Data' refers to data sets so large and/or so complex that they cannot be effectively handled by traditional data-processing technologies such as spreadsheets and database management software. Uniquely complex technological solutions, both software and hardware, have been created instead, and they certainly deserve a lot of attention. For those who will need to work with Big Data, there is promise of remarkable new opportunities.

Does this mean that talk of the Data Revolution only applies to 'Big Data' players, and that the 'small data' users can go about their data business as they have always done? The answer to this question is a categorical '**No**'. In data issues, it is not only size that matters. Other factors include the increasing importance of data management and data governance due to tightening regulations, data mobility, cybercrime and related data security concerns, and new data storage possibilities, such as Cloud-based solutions. The nature of these changes is revolutionary and they are transforming the data landscape of a modern business world.

> 'SMEs often do not have a comprehensive data strategy. CFOs can get through initial stages of the data lifecycle; but then, once the data has been used, it is down to individuals' own skills to decide what to do.'
>
> Anne Kimari, FCCA, CPA, Chief Operating Officer at the African Academy of Sciences

From data to information, from knowledge to insight

People who closely work with data often make a point of differentiating between the terms 'data' and 'information'. The point is a valid one and draws on a commonly used 'DIKI Pyramid' model (see Figure 1.1).

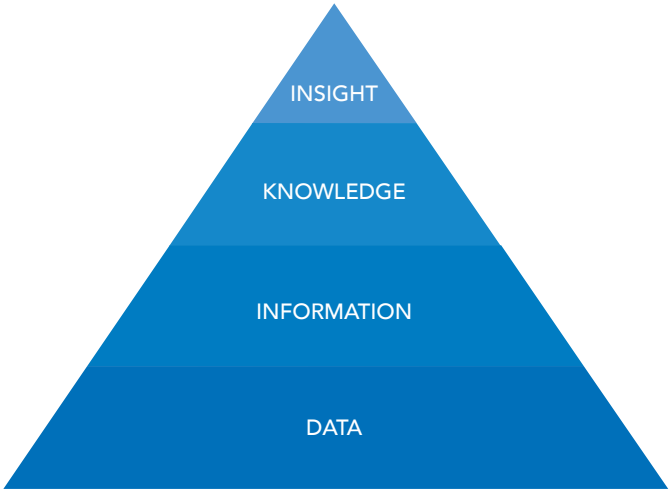


Figure 1.1: The DIKI Pyramid model

Let us take a closer look at the pyramid. Data is commonly understood to be a collection of individual items, such as text and numbers. Within a company, it is typically something that sits close to an IT function and is managed by IT professionals, who are traditionally concerned with its physical storage and security. Data becomes information after individual data items have been processed and subjected to analysis to identify their meaning, semantic structure and context, as well as the relationships between data items. Further up the pyramid, knowledge is the domain of those within the business who can structure and interpret information, and this ultimately leads to insight and the ability to make relevant appropriate business decisions.

This report will follow the common trend of using the term 'data' in the broadest possible sense, so that it refers to both 'data' and 'information', as described above.

2. Data management, data governance and data lifecycle

Data management and data governance, often seen as unpopular and unsuccessful concepts within businesses, are among the key issues that are being pushed to the fore by the Data Revolution.

What is data management and why is it important?

Data management is a concept that often means different things to different people. This is clearly a problem at a time when data in its various forms is gradually becoming a vitally important component in the daily life of every business, regardless of its size, geographical location and the industry within which it operates. A wide consensus is needed to define what 'data management' actually means.

A good place to start is the collection of resources provided by the Data Management Association (DAMA), a non-profit vendor-independent association whose main function is to develop and provide vendor-independent advice on best practices for data management. DAMA's Guide to the Data Management Body of Knowledge (also known as the DAMA-DMBOK Guide) is a definitive introduction to data management. It broadly defines data management as 'development, execution and supervision of plans, policies, programmes and practices that control, protect, deliver and enhance the value of data and information assets' (DAMA International 2009).

This report does not intend to go much further into details of the DAMA research but it is definitely worth mentioning the 'DAMA-DMBOK2 Guide Knowledge Area Wheel' (see Figure 2.1) – a graphical representation of the proposed data management framework (DAMA International 2014) which defines 11 key functions (or rather, knowledge areas) of data management. This representation is quite broad: it does not show that some areas are optional or unnecessary for some companies; for instance, Reference & Master Data or Metadata would not always feature. Another point that is not clear from The Knowledge Area Wheel is interdependencies between different areas. Still, it does serve as a useful starting point, because, even though implementation of the data management process can be significantly different across businesses, its nature is mostly the same.

Listed below are several reasons why data management is important.

+ The unfolding Data Revolution makes data an ever more valuable commodity, so effective use of data becomes crucial to successful implementation of business strategy and gaining a 'cutting edge'; data management is a key factor in achieving this kind of effectiveness.

+ Robust data architecture and properly designed data models are likely to bring improvements in data quality and availability, which in turn can increase productivity and reduce operational costs; equally, poor data quality is likely to affect decision making, resulting in lost opportunities and strategic mistakes.

+ Poorly implemented data storage and the consequent risk of losing data can result in huge financial losses.

+ Data security breaches can be extremely painful for a business, resulting in huge litigation costs, negative publicity and reputational losses.

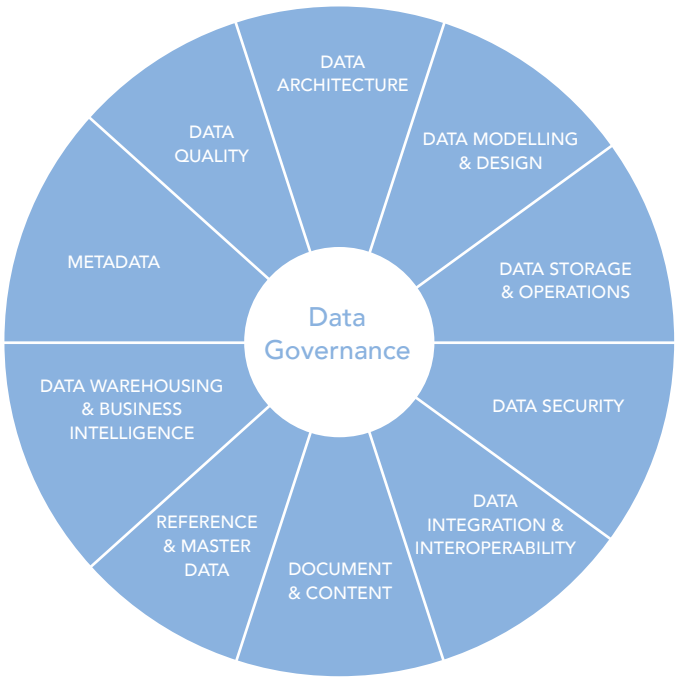


Figure 2.1: DAMA-DMBOK2 Guide Knowledge Area Wheel

What is data governance and why is it important?

Data governance is one of the key concepts of data management, as defined by DAMA: it is at the heart of the Data Management Knowledge Area Wheel shown here.

Data governance is not a new concept, but it has not exactly been popular. Smaller businesses often think that it is not an issue that need concern them; insufficient understanding of the problem area and lack of available resources are often to blame. On the other hand, large corporations might have the resources and the necessary knowledge, but they often struggle with implementation challenges. According to Vivek Katyal, who leads Deloitte & Touche LLP's Operations Risk & Data Management practice, 'setting up a data governance program is easy, but getting it operational, to the point that it can ensure the quality of the data being used, is the hard part' (Deloitte 2014). Linking data quality to improved business performance, and thus gaining support from key stakeholders, seems to be among the key problems that data governance teams have to face.

A widely known and well-respected professional association that provides extensive research in this field is called The Data Governance Institute (The DGI), and its main function is to be a source of in-depth, vendor-neutral data governance best practices and guidance.

The DGI provides a compact and concise definition of data governance: 'Data Governance is the exercise of decision-making and authority for data-related matters' (The DGI 2015a).

This is a good place to start, but there are plenty of other definitions in circulation; this is because people's understanding of data governance, and of what it means for them and their business, varies in much the same way as it does for data management (as described previously). For instance, focus areas of data governance can include (The DGI 2015b):

+ policy, standards, strategy
+ data quality
+ privacy/compliance/security
+ architecture/integration
+ data warehouses and business intelligence (BI)
+ management support.

This report does not intend to go much further into the details of the DGI research, but the DGI's universal principles of data governance are too important to miss and are listed below.

1. Integrity
Data governance participants will practice integrity in their dealings with each other; they will be truthful and forthcoming when discussing drivers, constraints, options, and impacts for data-related decisions.

2. Transparency
Data governance and stewardship processes will exhibit transparency; it should be clear to all participants and auditors how and when data-related decisions and controls were introduced into processes.

3. Auditability
Data-related decisions, processes, and controls subject to data governance will be auditable; they will be accompanied by documentation to support compliance-based and operational auditing requirements.

4. Accountability
Data governance will define accountabilities for cross-functional data-related decisions, processes, and controls.

5. Stewardship
Data governance will define accountabilities for stewardship activities that are the responsibilities of individual contributors, as well as accountabilities for groups of data stewards.

6. Checks and balances
Data governance will define accountabilities in a manner that introduces checks and balances between business and technology teams as well as between those who create/collect information, those who manage it, those who use it, and those who introduce standards and compliance requirements.

7. Standardization
Data governance will introduce and support standardization of enterprise data.

8. Change management
Data governance will support proactive and reactive change management activities for reference data values and the structure/use of master data and metadata.

Data management and data governance: What is the difference?
Data management and data governance are two concepts that are closely related to one another, so a question often arises: what is the difference between them? One answer is that 'data governance is what ensures that data management happens properly, i.e. in a way that is aligned with the original goals and terms of reference for the initiative under way' (Tattersall 2013).

In other words, data governance is important because it facilitates and safeguards key areas of data management, as described above.

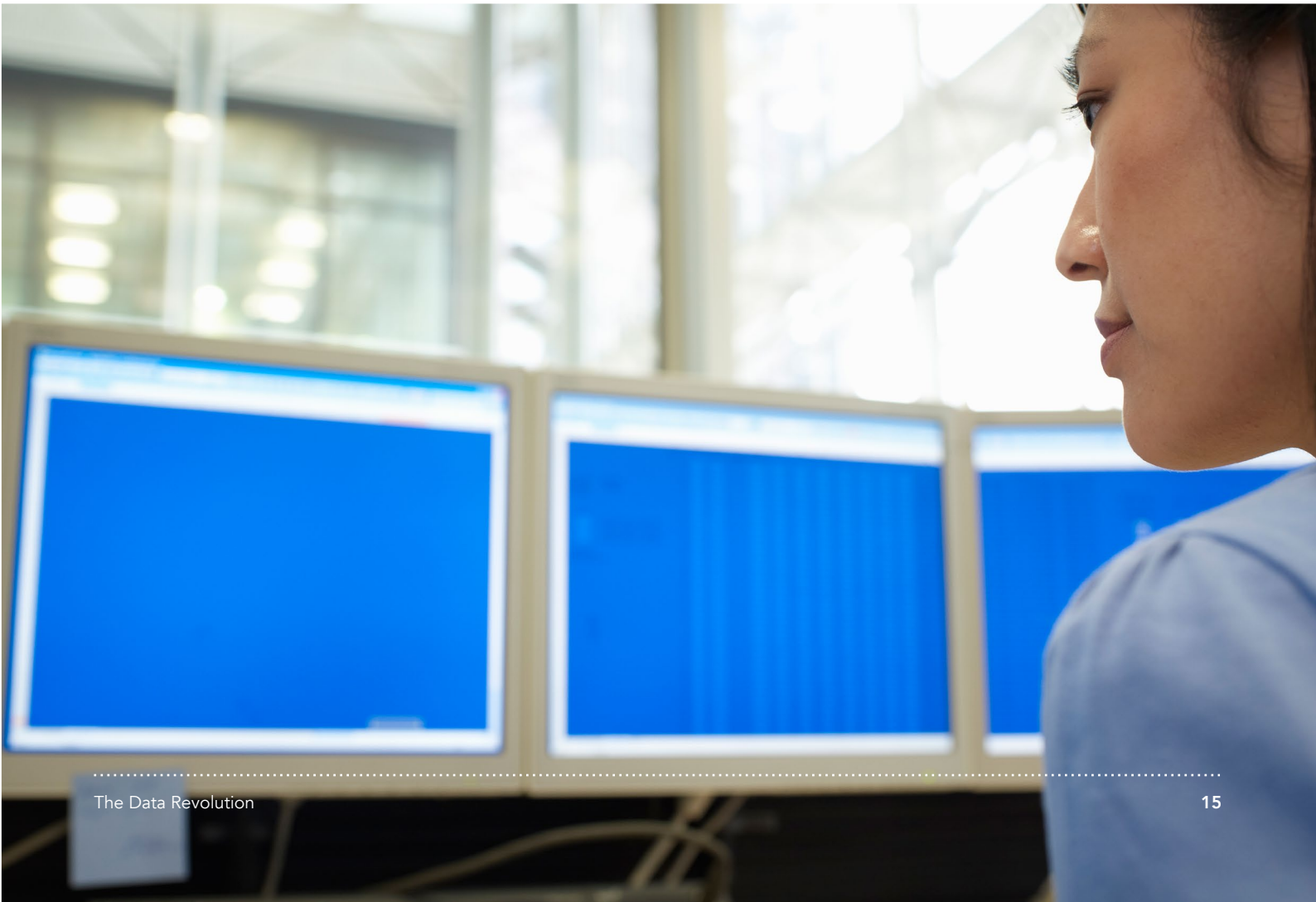
Data lifecycle model

Figure 2.2 shows a data lifecycle model. It is important to note that this model is generic; the way in which models like this are implemented in reality will vary quite significantly depending on many factors, including the nature of the data, its quantity, and the way it is used.

Areas of the data lifecycle that typically should be of particular interest to accountants and finance professionals are shaded in blue; note, however, that for those who will get involved in implementation of data governance, all areas should eventually become equally relevant.

Historically, responsibility for the data at various stages of the lifecycle was entrusted to IT and/or Operations departments and, when data tasks became more complex, business analysts and/or data architects would have to get involved. More recently, however, there has been a growing demand for more direct involvement in data-related activities from users across the business. Note, for instance, the 'Analysis and Discovery' area, where the 'Discovery' part highlights a rapidly developing trend for giving end users direct access to large complex data sets via new powerful business intelligence and visualisation tools. Such tools also allow dynamic user-driven reporting, and this will be of particular interest to accountants, in particular with the expected uptake of integrated reporting. Traditional pre-defined reports and data extracts, listed in the model as part of the 'Processing and Distribution' stage of the data lifecycle, will no doubt retain their importance.

'Storage and Security' and 'Archiving and Disposal' stages are highlighted in the model because of the increasing importance of regulatory compliance in matters such as data retention and data disposal. Accountants have to play an increasing role in these areas, especially because data-related legislation is still far from being firmly established in any given country, besides which, huge discrepancies in the implementation of such legislation and its enforcement exist all across the world.



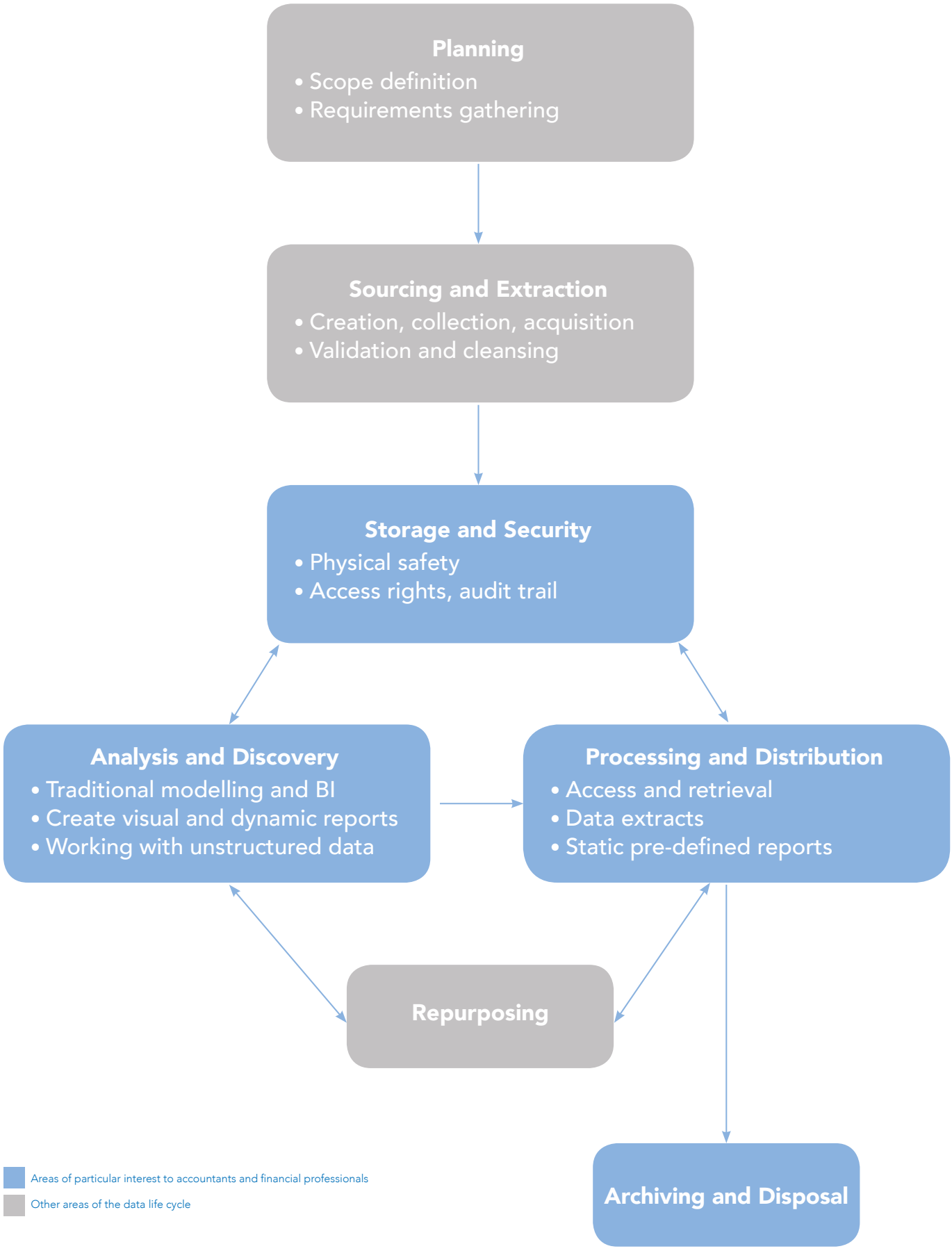


Figure 2.2: Data lifecycle model

3. Data Revolution – current and future trends

The term 'Data Revolution' is not an exaggeration when one considers the drastic shifts in the digital landscape caused by the data avalanche that hardly anyone can escape. Managing data and the data lifecycle has become one of the key functions of modern business. It is important to stress that this applies to businesses of all sizes, in all sectors of the economy and located all over the world.

In his recent article for the Harvard Business Review, Dr Thomas C. Redman (aka 'the Data Doc'), one of the leading specialists in the field of data quality, used the words 'data revolutionaries' to describe those advancing a 'data agenda' (Redman 2015). Nonetheless, regardless of whether one is fortunate enough to become a data revolutionary or not, the effect of the revolution on the outlook for accountants or finance professionals is clear. Both as professionals and as individuals, they have no choice but to embrace new realities, master new terminology and skills, and understand current and future trends related to the modern data landscape.

Increasing volumes and complexity of data

Volumes of data generated globally are increasing exponentially because of the relentless growth of digital technologies of people's daily lives: books, news, music, photos and movies; purchases made both online and offline; all manner of conversations – email, social media, VOIP calls; insurance policies, health and employment records, tax returns… the list goes on and on.

The IoT (Internet of Things) is also becoming a huge contributing factor in the creation of new data. According to Gartner, the IoT will grow to 26 billion devices installed by 2020, and global economic value-added through sales into diverse end markets is forecast to be US$1.9 trillion (Gartner 2013).

This inevitably means that a vast amount of data will be generated every day. As more and more data is created, battles for business advantage are increasingly won or lost on the digital battlefield. The increasing volumes of data are not the only concern because the nature of the data is changing too. The rigidly structured database management systems of the past are giving way to systems that can cope well with vast amounts of unstructured data – or rather, data of varied structure and complexity – commonly known as 'Big Data'.

A point worth reiterating here is that, regardless of whether the data is 'Big' or 'small', the challenge of keeping data in order, so that everyone across the business understands what data they have and how to access it, is of the utmost importance.

> 'You may be able to acquire and store the data quite cheaply, but this does not mean that you can ignore the task of structuring it properly. Understanding data content and quality is a crucial step to analysis and delivering value; but you can now be more efficient, collecting all data, but only working on the potentially important elements for the analytics in hand.'
>
> Kevin Long, FCA, Business Development Director at Teradata

Mobility and agility of data

Increasing volumes of data, as well as the bigger role that data plays, are being matched by the demand for it to be available anywhere and at any time. Decision making at all levels, for individuals, small/medium enterprises (SMEs) and large corporates alike, is being determined by the availability (and accessibility) of data, as and when required. New mobile technologies – gadgets of all kinds, as well as advanced mobile communications – provide means of data mobility and facilitate 'always on' work practices.

Another side of this process is data agility: the ability of data to stay 'fit for purpose', while moving through various systems and transformations. Rather like human physical agility, data agility certainly does not exist spontaneously and cannot maintain itself; it requires forethought, planning, constant monitoring of performance and re-evaluation of progress.

> 'You are expected to be available all day and all night. So if you look at the lines between work and social/personal life they get increasingly blurred. You end up with one set of equipment – it's all this one big convenience.'
>
> Rob Mutchell, ACCA, Chief Financial Officer at BP Ventures and Head of Finance at BP Alternative Energy

The ultimate measure for data agility is its quality. The old principle of 'rubbish in – rubbish out' underestimates the danger of inaccurate data; the real danger is not in generating tons of digital rubbish: it lies in making wrong decisions that could cause huge financial and reputational losses. 'Data lakes' is a popular term among data professionals, and keeping data lakes from turning into 'data swamps' is a complicated task.

Keeping one's head in the Cloud

Cloud-based services have now been firmly established as an important part of the digital landscape, and they will undoubtedly continue to evolve.

The Cloud offers resilience, agility, scalability, low up-front costs, rapid implementation, location independence and several other important benefits. The true measure of the Cloud's success is the variety of options that consumers get. There are SaaS (Software-as-a-Service), PaaS (Platform-as-a-Service) and IaaS (Infrastructure-as-a-Service) models to choose from. There are different deployment models, such as public, private and hybrid Clouds. There is also a wide choice of supporting architecture and security implementations, with cost implications to match. All this allows a business of any size, from an SME to a government department or large corporation, to choose the exact service, or combination of services, that suits its needs best.

Accountants and other finance professionals seem to be well aware of the advance of Cloud computing. In an ACCA study conducted in 2014, 80% of respondents indicated that in the long term (over 10 years) they believed that adoption of Cloud computing by their businesses would be likely or highly likely.

While pricing models offered by Cloud providers can be appealing, especially during the so-called 'honeymoon period', there are hidden costs, management overhead and legal side-effects to consider. Accountants will need to contribute to decisions related to the calculation of the TCO (total cost of ownership) of Cloud-based solutions.

Data storage – security concerns and associated enforcement risks

Closely linked with the Data Revolution is the issue of cybersecurity in general and data security in particular.

Individuals, businesses and governments alike are acknowledging cybersecurity as one of the key areas of concern, both for the present and future. Data is now central to many businesses and forms an integral part of the digital landscape, so data security will continue to be very important. Unfortunately, there are many types of data-related cybercrimes, with targets ranging from personal data to intellectual property to state secrets.

A further area of concern related to data security is the activity of dark criminal forces that are sometimes lurking, waiting to take advantage of the Cloud's well-publicised advantages. Doubts about the Cloud are facilitated by newly emerging stories of high-profile hacking and subsequent data leaks, including leaks from very well-known and highly reputable providers. Cybersecurity research by ZDNet put Cloud services at number 14 in their list of expected cyber-threats for 2015 (ZDNet 2015). And in their 'Six Enterprise IT Predictions for 2015', Varonis Systems, a leading data security company, highlighted managing and protecting client data as an area on which Cloud-orientated companies will definitely need to concentrate (Varonis 2014).

Another important issue is the secure and timely disposal of data. This area is getting its share of attention from regulators, and for a good reason.

+ Sometimes companies are reluctant to part with old data and want to keep it, just in case an opportunity rises when it will become useful again.

+ Proper secure disposal of digital data is not as easy as shredding paper forms; it is more difficult to set up and it costs more; therefore companies are inclined to stock up old data, so that they can dispose of it in bulk.

Making use of available data offers great opportunities for generating revenue. Nonetheless, it may also present a massive liability from a legal point of view, as development of data protection regulation around the world begins to make a significant impact on the way in which global businesses are required to approach the collection and management of personal information. For instance, the 'right to be forgotten and to erasure', as defined in the current EU Draft Data Protection Regulation, can arm data-savvy consumers, worried about ways in which their personal data is stored and shared by companies, with a very powerful weapon.

> 'With regulators like the US SEC looking more closely at internal controls around cyber risk, as well as adequacy of disclosures by companies when there is a breach, companies will move towards a data governance strategy perhaps a little more quickly.'
>
> **Brad Monterio,** Global Board Member on the Board of Directors at the IMA

The proposed new EU data protection regulation is predictably attracting a lot of attention, as it will trigger a fundamental change in the relevant legal frameworks. Other countries across the world are trying to follow suit; the gradual emergence of data protection law continues in countries that previously did not have such laws in place, and this includes a large number of countries in Asia, Latin America and the Middle East. For instance, according to the Brazilian Internet Act, which came into force in June 2014, in order to collect, store, transfer or otherwise process any personal data of an internet user, express consent of this user is required. Problematically, the Brazilian Internet Act does not contain a formal legal definition of personal data.

Another example is those data laws that deal with cross-border data transfer. In this particular area, Brazilian law does not yet have any formal restrictions; in comparison, the Protection of Personal Information Act of South Africa of November 2013 (the PPI Act) forbids transfer of personal information to a third party in a foreign jurisdiction, unless certain conditions are met (explicit consent of the person in question is deemed sufficient).

Also very significant are the increasingly strict legal requirements and enforcements in South Korea, Singapore and Hong Kong. For instance, under the Personal Information Protection Act of South Korea (PIPA), effective from September 2011 and further updated in August 2014, a data subject has the right to inspect their personal data held by a data controller; a data controller must grant a data subject access to their data within 10 days of receipt of a request for such inspection.

Overall, working with data carries considerable operational risks. There are ways of mitigating the risks, such as anonymising the data whenever possible, or acquiring cyber liability insurance. Companies should evaluate whether the potential economic gains from lawfully using data in new ways outweigh the potential for breaches of trust that may result in reputational harm and financial losses (Rathburn and Dunlap 2014).

4. Data management and the future of accountancy – what is required and what does it mean for you?

By the very nature of their professional training and their work, accountants and finance professionals are well equipped to survive the expected deluge of data but, in order to do this, they need to keep data management issues firmly in mind.

So what are key data-related opportunities, challenges and imperatives that will affect the future of the profession?

A data-centric approach to technology and data governance

For the Data Revolution to succeed, a significant shift is required in understanding the role of data and the responsibilities of those who look after it. Peter Aiken, a former president of DAMA International, argues that there is an urgent need to re-examine IT and its support of the business from a data-centric perspective – where data is perceived as a valuable commodity in its own right, rather than something that just happens to be contained in the bowels of IT systems (Aiken and Billings 2014).

In his online presentation, Aiken highlights the problem of what typically occurs when there is no clear understanding of who is responsible for managing data assets (P. Aiken 2014). In his words:

> 'Business thinks: IT is taking care of it (it is called Information Technology after all); IT thinks: if you can sign on to the system – their job is complete.'

One example of such discrepancy is an issue of data security. While IT professionals should have the knowledge and the means to find ways of securing data and preventing breaches, properly managing the overall operational risk, such as risk arising from regulatory non-compliance, naturally falls within the remit of data governance.

A recent study highlighted just how important this shift towards a data-centric view of technology really is for leveraging data resources properly. To a question about the main reasons for the failure of data management initiatives, over two-thirds of respondents replied by choosing 'organisation not ready for required changes' (Datablueprint 2014). Unfortunately, this highlights a rather common problem of poor data governance implementation; the worst-case scenario is when there is no data governance at all.

The data-centric approach to technology will inevitably put more emphasis on data governance, and accountants and finance professionals have a role to play here: they can help support projects that lead businesses towards data maturity. Typically, they should be very familiar with the key principles of data governance (as defined by the DGI, listed on page 14), because similar principles apply to working with financial data. This gives them an excellent opportunity for the near future; as data governance initiatives become more prominent, they can naturally begin to participate actively. One of the immediate key challenges that they will no doubt have to face will be the need to justify the cost of such initiatives – something that they are uniquely placed to do.

> 'In order to withstand a 'digital tsunami', a fundamental change in our perception of digital data is required. We have to see data not as a manufactured product but as part of an intellectual framework that allows us to define and measure the characteristics of systems and organizations.'
>
> George Staw, Enterprise Data Architect at Wincor Nixdorf

Emergence of new data-orientated roles

The data-centric approach needs people who can articulate and support the value of data – they are sometimes referred to as 'data stewards'. Two things are required for this:

+ appropriate roles within companies, for which ownership of the data management function is clearly defined and which have sufficient operational weight.
+ people with sufficient skills to fill such roles.

The ACCA-IMA report 'Big data: Its Power and Perils' suggests that new hybrid roles will determine the future of the accountancy profession; roles such as the chief financial technology officer (CFTO) or chief financial information officer (CFIO) would lie at the intersection of finance, technology and information (ACCA-IMA 2013). This view was strongly supported by interviewees and participants in the research underlying the ACCA-IMA report.

Having a dedicated data-orientated executive might be a luxury that not every business can afford. Nonetheless, regardless of whether the role of the 'data steward' exists in the C-suite, in a back office, or is entrusted to a freelancer – it is imperative that someone fulfils this function.

'Data stewards' are not yet being properly trained. There are data-orientated courses that some colleges and universities offer as part of their curriculum, and even some Data Science degrees – but there do not seem to be many. Therefore, it is likely that in the near future this function will have to be performed by someone who can gain the necessary new skills on their own and who is not afraid to cross boundaries.

> 'IT, finance and business all have their own paradigms, so collaboration between them is not always easy. Companies need to be flexible and clever in defining the data-related roles.'
>
> Ian Betts, FCCA, Data Manager, Upstream, Projects and Technology at Shell

This is where accountants and finance professionals have a very good chance of making a difference, because:

+ they should have the required depth of industry knowledge and a good understanding of the overarching strategy and end-to-end operation of the business.
+ the very nature of their work means that they are good at collecting, processing and benchmarking data, and at data analysis.
+ the ability to manage risks and to keep an eye on the bottom line is also important in data management – and this is something accountants and finance professionals do well.

It would be wrong to assume that any accountant will be able to morph into a 'data super-hero' who can single-handedly manage data issues on top of doing everything else they are expected to do. What is likely to be required instead is cross-functional collaboration, ability to build bridges, determination and clear understanding of the additional business value that all this will bring. With this in mind, accountants and other finance professionals should have an excellent opportunity for taking on new roles, allowing them to participate in data governance, as the latter becomes more prominent.

New trends within traditional functions of accounting

While discussing exciting new opportunities and challenges that accountants and finance professionals have to face owing to the unique demands of the Data Revolution age, we must not forget more traditional data-related functions that will be affected by new trends as the professional landscape changes.

For instance, compliance, one of the more traditional functions of accounting, includes issues of data retention: monitoring of how, where and for how long various data items can be held. The increase in digital processing of data means that laws and regulations for data handling are changing, and accountants and finance professionals need to be fully aware of this.

Another issue worth mentioning here is integrated reporting, which is gradually being introduced. With the move from separate sustainability and corporate social responsibility reports towards integrated reporting, the nature of the underlying data will change: a more holistic view will be required. Finance professionals are well placed to execute the required control over underlying data quality.

The concepts of 'data privacy' and 'data security' are also undergoing massive changes, with newly developed data privacy regulations becoming complex and sometimes conflicting. This increases the need for accountants and finance professionals to get actively involved in data governance work.

> 'We are increasingly being asked to advise on the regulatory compliance issues (such as the application of the Data Protection Legislation and legal risk) on outsourcing data processing and Cloud storage within the same country and within several countries. To properly advise a client it is essential to understand the terminology and the way in which the IT works and the data flows through that IT structure.'
>
> Faris Dean, FCCA, Head of Business Services at Bowden Jones Solicitor

Escalation of cybercrime and concerns over the safety and security of digital data have increased interest in cyber liability insurance, and one of the related products gradually appearing on the market is digital data insurance – yet another aspect for compliance-orientated finance professionals to consider.

As valued advisers to the businesses with which and for which they work, accountants must maintain awareness of a broad range of technologies and trends. This certainly applies to modern data-related technologies; for instance, improved data analysis and data visual tools mean that users of business intelligence should be less dependent than in the past on the IT department's help for extracting and manipulating data from multiple systems and turning this into reports.

Last, but certainly not least, is the need to keep an eye on the bottom line. For instance, there has been a common perception that the price of digital data storage will steadily decrease. The amount of storage that can be purchased for a given amount of money was once expected to double every two years – this is known as 'Kryder's Law' (Walter 2005). Nonetheless, this widely popular view (not a scientific 'law' but merely a clever observation) does not appear to be holding up (The Register 2014). Consequently, any vision of a future where Cloud storage is infinite and free is proving to be wrong. Accountants should play a key role in monitoring such trends, in order to make sure that data-related activities result in a profit, rather than a loss.

Conclusion

Regardless of whether one is a 'data revolutionary', or thinks that buzzwords such as Data Revolution are overly dramatic and too far-fetched, changes in the digital landscape are too significant to ignore. The form the Data Revolution takes for each business will vary, but it will, at some stage, affect everyone, regardless of whether it was invited and whether it is welcome or not.

Accountants and finance professionals cannot afford to bury their heads in the sand, hoping that the storm will pass. It is not possible to avoid the massive changes that are coming and trying to ignore them would leave one exposed and vulnerable. Eventually, one would have to deal with the new digital environment and it might require considerable effort, and at some stage become altogether impossible, to catch up.

Acquiring new skills

Adapting to the changes and making the most of the opportunities that the Data Revolution presents is not going to be easy. Acquiring new skills has become imperative, and everyone seems to agree with that; the big question is – how does one go about actually doing it?

In his book 'The Art of War', Sun Tzu, a 6th-century BC Chinese general and military strategist, forcefully stated:

'If you know the enemy and know yourself, you need not fear the result of a hundred battles... If you know neither the enemy nor yourself, you will succumb in every battle.' (Jackson 2014)

Applying this principle to the battles of the Data Revolution, one needs to start with surveying the 'data battlefield', to understand the new concepts, terminology and tools that are already available. Admittedly, this might not be easy for someone new to this area; new terms, abbreviations and buzzwords are abundant and can become very confusing. Still, for those with good analytical skills (among the core skills of every accountant and finance professional) this should be achievable.

Help is available; often it is a matter of putting the right questions to the right people, and where necessary asking for a second, third or fourth opinion, and then using common sense and good judgement to find an answer that is useful.

What is very important here is understanding that this is not a one-off exercise, but has to be done on a regular basis, so that one stays abreast of new developments. For those working with governments and large corporations, regular training is usually provided; for SMEs it will need to be sought out and arranged. Some free training, encouraged and sponsored by governments and various professional bodies, is appearing – one has to look for what is available.

Accountants and finance professionals must acknowledge that technology skills are no longer a 'nice to have', but rather a 'must-have', and be more proactive in acquiring and maintaining a skillset fit for the challenges that lie ahead.

Collaboration between finance and technology professionals

There is a question in the air as to whether IT and finance professions may eventually converge. Whether or not this will happen is open to debate, and the answer will probably vary, depending on the size of companies and the nature of their business.

Data-orientated work undoubtedly has a significant technical element, shown as grey-shaded boxes on the Data lifecycle model (please refer to Figure 2.2). Ambitious young students studying accounting and finance now often take additional IT-related courses, such as data management or software development; this is something that has to be strongly encouraged. Nonetheless, it would be foolish to expect every working accountant to take a degree in Information Technology to add to their existing qualifications.

Collaboration across the business must now be established, so that finance and technology professionals can work together. This may not be easy in practice, so companies and executives need to be flexible and innovative to facilitate collaboration and find solutions that work in their specific circumstances. In some cases, the answer may come in the form of a data governance steering committee or a dedicated taskforce; others might need to start by getting people from across the business in a room together for a meaningful conversation. However facilitated, successful collaboration is key.

> ‘When it comes to embracing technical innovation, finance professionals often tend to err on the side of caution. And yet, the very nature of the profession is changing before our very eyes. Taking part in the Data Revolution is an excellent opportunity for accountants to make a real difference.’
>
> Fergus Wong, FCCA, Tax Director, National Tax Policy Services, at PricewaterhouseCoopers

No ‘silver bullet’ solution

When someone offers a ‘silver bullet’ technology solution to a complex data-related problem, check it and then check it again. Simple inexpensive solutions to complex problems are not impossible but they are very rare, regardless of how hard software and hardware vendors try to persuade their potential customers otherwise.

Sales and marketing efforts by vendors will always play an important role in determining how IT products are perceived. With an overwhelming drive towards getting punters interested in the ‘latest and greatest’ gadgets and apps, a sales mantra that seems to be very efficient and therefore very popular is: ‘It is all very simple. Just press the button, and the clever thing will do the rest.’

In reality, it is hardly ever simple. One of the reasons for everything in IT being much more complicated than we would like is that, as an industry, it is still relatively young and has to operate in what are largely unchartered waters. Vendors desperately want their products to appear simple to appeal to clients, but IT is far from simple. The gap between the beautiful simplicity promised by a sales person and the highly complex, gritty reality of post-implementation can cost a business a lot of money, which is exactly what accountants and other finance professionals have to guard the business against.

Extracting value is key

As the world becomes increasingly digital, the volume and complexity of data gets truly staggering. The arrival of ‘Big Data’, facilitated by increasing data mobility and rapid development of the IoT scene, is forcing changes of approach to data.

The necessary data-centric view of technology means that data can no longer be seen as a by-product of IT systems, much as oil cannot be viewed as something that is secondary to wells and pipelines. Conversations about data have to be held at the most senior levels, regardless of whether a company is large or small.

Data governance is clearly a subject that has yet to gain traction. Forward-looking companies already have teams of people working on data governance strategy – and often struggle with implementation challenges. Others, especially SMEs, are yet to follow suit. It is key to consider that there is no single stage in the modern data lifecycle where a contribution from finance professionals would be inappropriate.

By the very nature of their profession, accountants are always trying to drive value. If the role of data within the digital economy is going to be as profound as now assumed, the finance function must be fully aware of its potential to add value and must closely monitor the return on any related investment. The data infrastructure has to be profitable, and will undoubtedly be so – provided that data assets are treated with the attention and care they deserve.

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