DATA GOVERNANCE
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DATA GOVERNANCE
Governing data for sustainable business

Edited by Alison Holt
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Alison Holt is an internationally acclaimed expert in the governance of data and information technology, and sustainability. Alison brings over 30 years of experience of working in the IT industry in the USA, Europe, Australia, New Zealand and, most recently, Papua New Guinea. Delivering excellence across the private and public sector, she specialises in organisational governance, procurement, strategic planning and expediting organisational change programmes through the use of business realisation technologies. Alison is a fellow of both BCS The Chartered Institute for IT and the Institute of IT Professionals, New Zealand, and she was one of the first certified IT professionals in New Zealand. She holds a number of professional memberships, including the NZ Institute of Directors. Alison’s first book for the British Computer Society, Governance of IT was published in 2013.

Benoit Aubert is a professor at HEC Montréal (Canada) and a fellow of the CIRANO (Center for Interuniversity Research and Analysis on Organizations). His research focuses primarily on governance of information technology (IT), risk management, outsourcing and innovation. He has published extensively on these topics and worked closely with industry to ensure research and practice informed each other. Benoit Aubert’s past roles include: director of the Rowe School of Business at Dalhousie University (Canada); head of the School of Information Management and professor at Victoria University of Wellington (New Zealand), where he was the chair of the Spearheading Digital Futures strategic initiative for the university; president and chief executive officer of the CIRANO; and director of research at HEC Montréal.

Geoff Clarke is the chair and expert member of several IT and governance standards committees, and is employed by Microsoft. He works with national standards bodies, government departments and industry experts to ensure that Microsoft and its customers can achieve their strategic goals through the innovative and responsible use of IT. Geoff represents Australia on several international standards committees and contributes to standards on topics such as governance, cloud computing, IT security and artificial intelligence (AI). The common thread through these committees is his focus on providing guidance to organisations on developing data and technology strategies within a robust governance framework. Geoff holds a Bachelor of Commerce degree from the University of Queensland and is a graduate of the Australian Institute of Company Directors. He lives on the Sunshine Coast in Queensland.
Frédéric Gelissen was born in 1970 in Liège (Belgium). When he was 12, he bought the famous Commodore 64, with which he took his first steps into software coding and surfing networks that were not called internet yet. Fred started his professional career in 1995 in a pharmaceutical company. In 2001 he took on the responsibilities of quality and security expert and had his first contact with IT service management (ITSM). This was the spark that started the fire of a strong taste for management and governance. In 2007 he joined a French IT consulting company, where he took the lead of the ITSM, Project and Quality Management team. Then, in 2015 he created PROCSIMA, one of the most successful information security service companies in Belgium. Fred has organised several events for the Belgian ITSMF chapter. It was during one of these that he met the surprising lady, Alison Holt.

Abdelaziz Khadraoui is a scientific collaborator at the University of Geneva. Dr Khadraoui’s research relates to the engineering of IT-based services with a specific focus on the engineering of egovernment services and information systems. He is a member of several international conference committees. He is also author or co-author of several contributions and publications in the field of egovernment services and institutional information systems engineering.

Rohan Light works in data governance, strategy and risk. His current projects include practical applications of data trusts, digital regulation (self and other) and issues of probabilistic estimation. His recent body of data work includes openness and transparency, responsible information use and re-identification risk. He is currently focused on de-risking the connections between the Deming–agile family of operational methodologies and common data use/decision-making trips and pratfalls. This is to enable better quality data input to an organisation’s machine-learning environment. Based in Te Whanganui-a-Tara Wellington in Aotearoa, New Zealand, he is used to working through complex data governance issues and leveraging the benefits of building open data principles deep into data infrastructure.

Nathalie de Marcellis-Warin is a full professor in the Department of Mathematics and Industrial Engineering at Polytechnique Montréal. She is president and chief executive officer of the CIRANO Research Center. She is also a visiting scientist at Harvard T. Chan School of Public Health and a collaborating member of the Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT). Holder of a PhD in management science (in risks and insurance management) from École Normale Supérieure de Cachan (France), her research interests focus on risk management and decision making in different risks and uncertainty contexts as well as public policies.

Alisdair McKenzie’s career as an IT professional spanned some 50 years in the public and private sectors. He began as an analyst/programmer (COBOL) in 1970 at the NZ Defence EDP Centre and continued on to system requirements development and specification. When he retired from the RNZAF after 20 years as a logistics officer he was engaged as an IT project leader at a motor vehicle assembler. In 1989 he segued into IT auditing, first as a contractor on a major banking system pre-implementation review and then in salaried IT audit roles in public and private enterprises, where he often introduced computer assisted audit techniques. Since the millennium he has practised as an independent consultant on audit and assurance roles, and most recently focused on information security risk management and enterprise cybersecurity governance and management. He is put on guard by the advice of another pale stale male: ‘οὐδὲν ἔρπει θνατῶν βιότῳ πάμπολύ γ’ ἐκτός ἄτας’ (Nothing vast enters life without a curse) (Sophocles, Antigone, 613–614).
Li Ming was one of the project editors of the second part of the international data governance standard ISO/IEC TR 38505-2:2018 Information technology – Governance of IT – Governance of data – Part 2: Implications of ISO/IEC 38505-1 for data management. His experience from the China Electronic Standardisation Institute and his perspective of technology solutions beyond the world of data management was invaluable as the standard was developed. He currently holds the prestigious role of chair of the IEEE Computer Society Blockchain and Distributed Ledger Standards Committee, the IEEE P2418.2 Standard Data Format for Blockchain Systems and of the IEEE SA P2841 Framework and Process for Deep Learning Evaluation Group. He is also a member of the IEEE Standards Association Review committee, the IEEE SA Asia-Pac Regional Advisory Group and a number of organisations including DAMA and ISACA.

Rose (Rong) Pan, BSI APAC is a chief data governance expert, and member of DAMA, IAPP and BCI. She graduated from Tsinghua University, majoring in computer science, and she continued studying for enterprise strategy and digital transformation at the University of Hong Kong. She is a professional in information security and data governance and co-editor of the ISO 38505 series standard development. In early 2015 she published the book *Big Data Governance and Service*, which first defined a framework of Big Data governance in China. Thus she became a thought leader of data governance. She now leads the team to help Chinese companies attain international privacy compliance to support overseas business, and she also advises the Chinese government on open data, data classification and data sharing.

Beenish Saeed was awarded a Bachelors of Law with Honours from the University of Sussex in 2015 where she was a Chancellor’s International Scholar and concentrated on intellectual property, business and Internet laws and regulations. Her passion for Information Technology (IT) literacy stems from the day she received a personal computer at the age of five – her most special present to date. She possesses international legal experience in intellectual property, telecommunications and payment systems. As a Tax and Legal Consultant at Deloitte, Beenish headed up the Pakistani and English student delegations to Harvard University and was awarded for outstanding diplomacy on international development issues in the USA, UK and Belgium. Apart from IT and policy work, Beenish has served in the Royal Navy as an honorary officer cadet. Queen’s University awarded a Master of Management, Innovation and Entrepreneurship to Beenish in 2017.

David Sutton’s career spans more than 50 years and includes radio transmission, international telephone switching, computing, voice and data networking, information security and critical information infrastructure protection. At Telefónica UK, he was responsible for ensuring the continuity and restoration of the core cellular networks, and represented the company in the electronic communications industry’s national resilience forum. In December 2005 he gave evidence to the Greater London Authority enquiry into the mobile telecoms impact of the London bombings. Since retiring from Telefónica UK, he has undertaken a number of critical information infrastructure projects for the European Network and Information Security Agency (ENISA). David has been a member of the BCS Professional Certification Information Security Panel since 2005, and is a co-author of *Information Security Management Principles*, author of *Information Risk Management: A Practitioner’s Guide*; and author of *Cyber Security: A Practitioner’s Guide*, all published by BCS, The Chartered Institute for IT.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIoT</td>
<td>AI applied to the Internet of Things</td>
</tr>
<tr>
<td>BCP</td>
<td>business continuity plan</td>
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<tr>
<td>BI</td>
<td>business intelligence</td>
</tr>
<tr>
<td>BPMN</td>
<td>Business Process Model and Notation</td>
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<tr>
<td>CDO</td>
<td>chief data officer</td>
</tr>
<tr>
<td>CEO</td>
<td>chief executive officer</td>
</tr>
<tr>
<td>CFO</td>
<td>chief financial officer</td>
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<tr>
<td>CIO</td>
<td>chief information officer</td>
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<tr>
<td>DPIA</td>
<td>Data Protection Impact Assessment</td>
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<td>DRP</td>
<td>disaster recovery plan</td>
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<tr>
<td>EDM</td>
<td>evaluate, direct, monitor (model)</td>
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<td>GDPR</td>
<td>General Data Protection Regulation</td>
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<tr>
<td>HR</td>
<td>human resources</td>
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<tr>
<td>ICT</td>
<td>information and communication technology</td>
</tr>
<tr>
<td>IoT</td>
<td>Internet of Things</td>
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<td>IT</td>
<td>information technology</td>
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<td>ITIL</td>
<td>IT Infrastructure Library®</td>
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<td>itSMF</td>
<td>IT Service Management Forum</td>
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<tr>
<td>KPI</td>
<td>key performance indicator</td>
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<tr>
<td>OBASHI®</td>
<td>Ownership, Business Process, Application, System, Hardware, Infrastructure</td>
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<tr>
<td>PDCA</td>
<td>plan, do, check, act</td>
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<tr>
<td>PDF</td>
<td>portable document format</td>
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<td>PIA</td>
<td>privacy impact assessment</td>
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<tr>
<td>PII</td>
<td>personally identifiable information</td>
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<td>SLA</td>
<td>service level agreement</td>
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<td>TOGAF</td>
<td>The Open Group Architecture Framework</td>
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<td>UML</td>
<td>Unified Modeling Language</td>
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## ORGANISATIONAL ABBREVIATIONS

<table>
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>Auto-ISAC</td>
<td>Automotive Information Sharing and Analysis Center</td>
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<tr>
<td>BCI</td>
<td>Business Continuity Institute</td>
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<tr>
<td>BSI</td>
<td>British Standards Institution</td>
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<tr>
<td>DCMS</td>
<td>Department for Digital, Culture, Media &amp; Sport (UK)</td>
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<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
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<tr>
<td>FDA</td>
<td>Food and Drug Administration (US)</td>
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<td>FTC</td>
<td>Federal Trade Commission (US)</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>NIST</td>
<td>National Institute of Standards and Technology (US)</td>
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<td>OWASP</td>
<td>Open Web Application Security Project</td>
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<td>StatsNZ</td>
<td>Statistics New Zealand</td>
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At the time of publication of this book, the world is battling through a global pandemic that has caused havoc and devastation for individuals, families and businesses, and seen entire nations struggle to keep their economies afloat and their health services functioning.

The effects of COVID-19 are raw and painful, and it is too soon to run a ‘lessons learnt’ exercise to see who made the best use of their data during the pandemic, or to analyse whether any nation’s test and trace application performed reliably well, in a way that provided better health outcomes for their population.

What can be said is this: whatever your personal, family, business or national situation, there will always be a ‘something’ that disturbs your plans – whether that ‘something’ is a pandemic, an earthquake, a tsunami, a fire, a flood, a gas leak, an extended power outage, a sudden change of government – the list is endless. This book will assist you and your organisation with tools and ideas that will make you more resilient to sudden change. Data is the fuel that powers your business, and if you can harness that power through good governance, you are free to pivot and move quickly and painlessly when your next ‘something’ event hits.

The aim of this book is to help you on your journey of digital awareness or digital transformation, from wherever your journey starts and whether or not you know your final destination. The book is based around the ISO 38505 series of governance of data standards that have been written for organisations who are contemplating the development and implementation of a data strategy with the aim of delivering new services or products for their customers. Data strategy and digital strategy are becoming increasingly intertwined. Successful delivery of a new data-fuelled app, for example, will require consideration to the hosting infrastructure and organisation’s digital strategy. The data strategy should answer the questions: Where are we going? What are we trying to achieve? How does this data strategy fit with the vision, mission and strategy of the organisation? The digital strategy should answer the overarching question: How are we planning to achieve this?

Whether you are just curious at what all the fuss is about data-driven services, or you are wondering how bothered you should be about pairing your intelligent bed or your car to your phone using Bluetooth, through to discovering that you have been given the task of planning and executing a data strategy for your organisation, there is something here for you.
INTRODUCING THE TERMINOLOGY USED IN THIS BOOK

There are multiple definitions available for the following highlighted terms, but for the purposes of this book, terms will be used as explained in the following paragraphs.

**Data governance** or the **governance of data** are terms that we’ll use in the book for the governance activities carried out by a board of directors or trustees, a cabinet committee, or any other top-level group charged with setting policy rules for how their organisations use data for decision making, reference and analysis. We will refer to this group of people as a **governing body**. This governing body is responsible for the development of a **data strategy** to determine how data is used within their organisation to deliver the overarching organisational strategy. Data governance activities can include the actions taken by managers to observe and respect the policy rules set by the governing body, but it should be noted that the data governance duties of the governing body cannot be delegated without a loss of accountability.

Although technically the term **data** refers to the streams of 1s and 0s that, when decoded, convey **information** in the form of words, letters and numbers, we often find ourselves using the term data to refer to the information contained within an electronic filing cabinet, a **database**.

**Big Data** is a term that has fallen into misuse, with organisations claiming they use Big Data when they often just mean lots of data. If you are dealing with such large volumes of data that you cannot handle them through normal means, then you probably are working with Big Data. That is to say, if you are collecting and storing large and/or expanding volumes of data from one or multiple sources that cannot be processed using your existing traditional data processing application software, then you are using Big Data.

While we are dealing with the more confusing of the terms, we will introduce **digital**. In common use, the terms ‘data’ and ‘digital’ are muddled, but we will try to stick to **data systems** for a content-related context and **digital systems** for a hardware or infrastructure-related context. Data sits on digital systems, which follow the design principles laid out in a **digital strategy**. **Data products** and **data services** are easier to define, with a data service being the intangible version of a data product.

Managing data falls in the realm of the **data manager**, although overall responsibility for all things data may lie with a **chief data officer** (CDO). The data manager has a close relationship with the data he or she manages, and a responsibility to make sure that the **data quality** and other characteristics of the data are fit for purpose with the organisational use of data. **Data management** tasks include putting in place the tools, frameworks, storage facilities, policies, practices, systems and so on to ensure that data is accessible and available in line with organisational requirements, as defined and stipulated by the **data owners**. **Data stewards** sound as though they might also be data managers, but their role is more focused on championing the correct use of data and protecting against unauthorised use. Ironically, the data stewards in an organisation generally spend more of their time with the people (data users) than the data itself.
INTRODUCING THE AUTHORS

As the editor of this book, it has been my great pleasure to invite my international colleagues, who are governance of data subject matter experts, to each write a guest chapter. Most of the authors have had direct experience of developing national and international standards, and they have all had exciting careers. Some of these careers are shorter than others – the youngest author is in her 30s and the oldest is in his 70s.

The book contains contributions from colleagues based in Australia, Belgium, Canada, China, New Zealand, Papua New Guinea and the United Kingdom. The resulting book provides a richness of experience from different areas of the world and different generational perspectives.

As a group of authors, we have decided collectively to donate all royalties from this book to charity.

INTRODUCING THE STANDARDS REFERRED TO IN THIS BOOK

Most of the authors associated with this book have been involved in some capacity in the development of International Organization for Standardization (ISO) standards, so it shouldn’t come as any surprise that the theory behind the book sits across the following prominent standards:

- ISO/DIS 37000: Guidance for the Governance of Organisations (in development at the time of writing)
- ISO/IEC 38500:2015 Information technology – Governance of IT for the organisation

The titles of international standards can be a bit overwhelming, so we will generally refer to them by their numbers.

37000

The scope of the developing 37000 standard is the governance of organisations, and the current draft (at time of publication) provides 11 principles of good governance for setting up a comprehensive governance framework in line with external legislative and regulatory requirements. The aim of 37000 is to assist with the development of a governance framework that will enable an organisation to reflect its purpose and mission to external stakeholders and society in general, and to drive organisational accountability and effectiveness.
38500

The governance of IT standard 38500 pre-dates the governance of organisations standards, and it includes a list of six governance principles and guidance for the development of a governance framework for IT.

38505 – Parts 1 and 2

These governance of data standards sit within the IT governance framework described in 38500. They form the basis of this book and will be described in greater detail in Chapter 3.

NAVIGATING THE BOOK

Acknowledging the wide diversity of audience for the book and the very different styles of our guest authors, we have developed a ‘tube map’ representation of chapters with suggested pathways for different readers. Feel free to hop in and out of the book as best suits your needs.

Key chapters for key roles

Although most people reading this book will find most chapters relevant, we thought it would be helpful to know which chapters would be particularly useful for a specific role. Table 0.1 is a quick look-up table for busy people reading this book between meetings.

Table 0.1 Key chapters

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PLANNING YOUR JOURNEY

Though most of the book will be practical to all, the ‘tube map’ in Figure 0.1 provides a route through chapters of particular interest for the following roles.

**Route A for the data curious**

Typically, you don’t consider yourself really interested in technology or IT systems, but you are aware that things are changing around you. You are enjoying the convenience of some data-enabled services – such as being able to book and track a taxi or a pizza from your phone or being able to rent out your spare bedroom on an ad hoc basis. Maybe, though, you have heard some horror stories of telephone companies inadvertently releasing bank details and you are wondering who you should be sharing your information with? Or perhaps you are having to give the same information again and again to different parts of the same organisation, and you’re wondering why?

This book will raise some questions to ask of data service providers, and some things to look for in a trusted service.

**Route B for the policy writers**

As a policy writer you have been tasked with writing policy around data, maybe specifically addressing privacy legislation such as the General Data Protection Regulation (GDPR). (The implementation of the GDPR in 2016 raised awareness for organisations across the world to develop data policy that would determine how they would handle personal data. Although the GDPR is part of European Union law, it has had global influence in the development of national data protection and privacy law.)

This book will provide support in writing data policy that addresses the compliance needs of your organisation.
**Route C for the managers**

Managers have a vital role in the area of the governance of data, to advise and support a board that is planning digital transformation, in understanding what is possible immediately and also what could be possible in the future.

This book will provide support in implementing a data strategy.

**Route D for the CDO**

As CDO, you have responsibility for all things data at a senior executive level. It is likely that you came up through a data/technology career path, but it is unlikely that you still have direct hands-on access to data in your CDO role.

This book will assist with setting practice direction.

**Route E for governing body members (directors, etc.)**

Members of a governing body have the role of setting digital strategy and also responsibility for the use of data throughout their organisation.

This book will assist with developing a digital strategy and guidance for setting appropriate policy to ensure that the strategy is carried out.

And now, with all the introductions out of the way, let’s get on with the book.
I asked Siri™ ‘What is data?’ and Siri’s response was, ‘Interesting question.’ Yes, Siri, it is an interesting question.

This first part of the book will provide some background into data and why it holds such an important role in our lives. We’ll look at the benefits of collecting and sharing data and why governing data is an essential task for all organisations.

WHAT IS DATA?

We tend to think of data in electronic form, but humans were collecting data thousands of years before computers. Although this book will focus on the governance of data in electronic form, we will start off by looking at the history of the collection of data. The governance practices applied to the collection of data in physical form (from clay tiles through knotted ropes to paper) will shed light on our approach to the governance of data held in electronic form. Although our media for storage has changed, the issues faced by our forebears will be very familiar.

History also reveals the significant advantage that can be gained from holding the right data of the right quality at the right time, where ‘right’ is a statement of fit for purpose. Whether you are looking for an advantage over your competitors, or finding a cure for a disease or looking to find patterns in physical phenomena or events, then the ‘right’ data is your friend. Putting in place a governance framework will ensure that this ‘right’ data is in the right place at the right time.

DATA GOVERNANCE OR DATA MANAGEMENT?

We often confuse the terms data governance and data management. This isn’t surprising, given that some major countries in the world do not have a term for data governance and it sort of ‘translates’ as data management. The governance of data, or data governance, covers the evaluation of what needs to be done, providing direction to make it happen and monitoring to check that the desired outcomes have been delivered. Data governance can be extended to include: the application and operationalisation of the governance of data; and the setting of policy to ensure that the desired outcomes will be met through management outputs, the establishment of controls, and controlling mechanisms to ensure that the governance requirements are met.

Data management is the administration of data and includes, among other activities, the setting up of databases, the transfer of data and the archiving of data.
For thousands of years humans have collected, stored, reported on, made decisions with, distributed and disposed of data. Amazingly, some of these data sets are still accessible today. They reveal information about ancient civilisations that would otherwise remain a mystery. Their original purpose, however, was not to provide a journal entry or historical record, but to inform the decision makers of the day.

**CENSUS DATA**

The Babylonians were collecting census data over 4000 years ago to work out how much food was needed to feed the population. Their census records took the form of clay tiles, and several of these tiles are held in the British Museum. Around 1500 years later, the Egyptians and the Chinese started to collect census data. The Egyptians used their data to plan the workforce needed for the building of pyramids and for the assignment of land after the annual flooding of the Nile. The Chinese census of 2 AD collected data from a staggering 57.67 million people from 12.36 million households. Meanwhile, over in Europe, the Romans were collecting census data every five years to estimate taxes due, through a sort of early rating system. The Roman method of census collection was unusually disruptive, especially for heavily pregnant mothers married to out-of-towners. It involved every man and his family returning to his place of birth to be counted.

Skipping another thousand years, we come to the production of the Domesday Book in England, a detailed survey of land holding, wealth and population across the country to enable determination of tax, rents and military service obligations of the populace, from the lowly peasants through to the barons. Five hundred years later, we find the Incas collecting census data by knotting ropes made from alpaca or llama hair.

Finally, from the 1800s we have a number of countries around the world collecting census data on a regular basis to inform not just the taxable liability of their citizens, but to assist with the building of houses, schools and hospitals, and eventually to inform programmes for the eradication of disease.

**Governance lessons from census data**

Census data is generally well governed and provides some interesting insights into the successful governance of data, and the need for influential and determined data custodians. UK census data cannot be released for 100 years, and the Census Registrars General through the ages have had to fight off requests for access. In the early 1900s,
a request from the sanitation authorities for access to personal information in the 1891 census was denied, citing personally identifiable information (PII) reasons and the undertaking of confidentiality at the point of data collection. I suspect the requesters would have argued that many lives could have been saved, or at least improved, through the release of the data. More recently, there were online petitions in the UK for the release of the 1921 census data to assist family historians trace their ancestors. The Census Act of 1920 made the release of this information before 2021 not just ill-advised, but illegal.

Retention of data has been a trying subject for the Census Registrars General, who have several times struggled for the preservation of records, and for adequate fire-proof and water-proof storage facilities. There have also been arguments over the appropriateness of some of the data collected, and issues with the time taken to process and analyse census data. The 1911 Census of England and Wales collected information on the fertility of women in marriage, to help understand issues with the falling birth rate amidst the need for a growing workforce to support industrial expansion, but it was 1923 before a final report could be published on the data. The time delay in receiving this information must have been a great source of frustration for the initiator of the report. Timeliness is an important factor that needs to be taken into account when considering data quality.

The automation of processing and collection of census data has been a slow process, starting with the use of punched cards in the US 1890 Census to speed up the analysis of census responses. Back in 1890, processing using punched cards was calculated to be 10 times faster than the previous manual process. Since then, electronic analysis of census data has blossomed, but putting confidence in the electronic collection of census data has been a matter of debate for many years. In preparation for the 2018 New Zealand Census of Population and Dwellings, Statistics New Zealand (StatsNZ) modernised the process for data collection; according to their website:

We designed the 2018 Census forms primarily for online completion. Our aim was for 70 percent of respondents to complete their census online. The online forms were designed to work on a range of devices, from personal computers to smartphones, and were easier to complete. The version for smartphones was a first for the census, intended to encourage young people (aged 15–24 years) to take part. The 2018 Census forms were available online and in paper, in English and te reo Māori.

(Stats.govt.nz 2019)

Of course, collecting data electronically brings a completely new set of requirements for a data governance framework for the census. These types of framework will be the focus of this book.

Census data has always been collected by people who care passionately about data and understand the importance of collecting data in a consistent way. My StatsNZ friends and colleagues involved in the census in New Zealand have taken on the role of guardians protecting a precious asset – and rightly so. Census development and data collection is the gold standard among population surveys. Being supported by legislation helps to focus the respondents on completing the questions, and picking one night in every three or five years to hold the census gives the survey a sense of awe and mystery, akin with election night and Christmas Eve. There are few other sectors and areas where the importance of collecting consistent, quality data and the value of that data is understood so well, but health is one of these.
HEALTH DATA

Without data, how can we determine the difference between an isolated incident and an epidemic? How do we know how effective vaccination, chemotherapy, specific surgical procedures and so on are unless we measure outcomes accurately across a statistically significant sample of the population? If we can’t determine what causes the spread of infection, how can we fight an epidemic? And, once we’ve worked out how infection is spread, how do we contact the people who we think could be vulnerable?

There have been a number of examples in the last few years where data scientists have worked alongside health professionals to protect populations. COVID-19 aside, the Ebola outbreak in 2014 is an example of this – a disease that initially had no antidote, no vaccination to provide protection. It was essential to quickly understand how the disease was spread, and to identify potential carriers and who they had been in contact with. Data was the key in unlocking the facts that would give health professionals and government officials an understanding of how the outbreak could be stemmed. One of the Ebola stories that stuck in my mind was the health care worker who had been caring for an infected patient and who then took a commercial flight across the US. The following day she developed a fever that resulted in her being moved into isolation, tested for and then treated for Ebola. Working out who was on the plane with her, and therefore potentially at risk, was straightforward. Working out how she got infected, and who else she had been in contact with along the way, was trickier. The incident resulted in a need to rethink the governance of data relating to disease.

Let’s look at vaccination data: the Gates Foundation has done the most amazing job of vaccinating against polio, with the aim of eradicating the disease. They work by collecting data and carrying out analysis. How can we know what is really killing children in the poorest areas of the world unless we can collect, analyse and interpret data? In New Zealand we are seeing the re-emergence of diseases that had been ’eradicated’. How can we address the root cause of this issue without reliable data to inform us?

Data ‘demonstrating’ a link between autism and vaccination has put mothers off having their babies vaccinated. We’ve had recent measles and whooping cough epidemics. How ironic that babies should be suffering in first world countries, having been withdrawn from vaccination programmes, while third world babies are happily surviving through recently established vaccination programmes.

Similarly, data ‘demonstrating’ that a tsunami defence system would protect a length of the Japanese coastline led to deaths in the major earthquake of March 2011. People in the affluent areas, who thought they were fully protected by the tsunami defence system, had insufficient time to run for safety when the defence system was overwhelmed. The people of the poorer coastal towns that didn’t have a defence system in place ran for the hills as soon as they knew that the tsunami was coming, and survived.

Governance lessons from health data

Health data has traditionally been well governed, in the sense that, since health records were first collected, all stakeholders have understood the value of having data made accessible to them, the privacy risk of sharing data and the constraints set by legislation, local health boards and policy.
THEMES: DATA GOVERNANCE

TRADITIONAL DATA-HEAVY INDUSTRIES

Certain industries are (and always have been) heavily dependent on data, and the survival of individual companies and the reputation of individual government agencies within those industries have fully depended on their ability to safely collect and store data. Examples are police forces, airlines, schools, warehouses, prisons, supermarkets and companies and government agencies involved in defence and military applications. These organisations traditionally collected information on paper and spreadsheets, but now I can check into a flight online and order my weekly supermarket shop without leaving the house; and the New Zealand police force, for example, carry iPads and iPhones on the street and work with real time information.

Back in the 1990s I ran a project with a private school in the UK to demonstrate the use of databases to Year 5 and Year 6 (10- and 11-year-old) students. As part of the project we visited a supermarket and looked at the bar codes, stock control and logistics. The supermarket data was highly accurate, and the shop knew how many items had been sold that week and what needed to be restocked. Both overstocking and understocking caused issues. The system controlling the stock was reasonably straightforward and was most likely hosted in the supermarket chain’s IT centre, for internal staff access only. It didn’t take into account the multiple channels of data that would be combined to predict demand today, and it wouldn’t have been able to support services such as online shopping or specials based on loyalty card usage.

In May 2016 a group of us presented at an international governance of data conference in Suzhou, China. We spoke to a member of the Chinese Securities Regulatory Commission afterwards and learnt of the huge volumes (measured in petabytes) of transactional data that he dealt with on a daily basis, and we began to understand his requirement for a governance framework that would protect his high-speed and high-accuracy data transfers.

Many traditional industries, such as food stores and financial markets, started off with paper and pens and verbal or written governance processes for what could be transferred where and when. These industries now trade almost entirely electronically, collecting large volumes of data from and sharing large volumes of data with multiple sources. There is a need for governance frameworks to ensure that the same level of rigour that was associated with traditional business methods is now applied to maximise the value and protect the data at the heart of each modern business.

Governance lessons from traditional data-heavy industries

Some of our data-heavy industries have been the slowest to take the opportunity of driving new value from their data through Big Data techniques. We cannot assume that because our organisation handles large volumes of data that it has embraced the benefits of new technology, cheaper processing and storage. Collecting and processing large volumes of data without the application of governance principles can open up risks, including an exposure to non-compliance to legislation. The concept of Big Data
demonstrates the potential for providing access to petabytes of data to search for patterns or solutions. For medical researchers looking for the cause of an infrequent medical occurrence, or financial analysts looking for global spending trends, the access to Big Data is often a key to solving problems that have been outstanding for decades. Making assumptions from poor-quality data (where quality is measured as a requirement to provide reliable results) would lead to disastrous consequences. Successful Big Data users have put in place the necessary governance measures to ensure that they are working from data that is fit for purpose, and not unnecessarily collecting data that is not relevant.

When data storage dropped significantly in price, it was common for organisations, spurred on by the concept of Big Data, to collect all the data they could because they could. There was little thought to the consequences of collecting data of mixed quality to inform decision making or the consequence of unnecessarily collecting PII. As the area of Big Data has matured and found its niche market, most organisations have settled into collecting the data they need – and only the data they need.

MODERN DAY DATA-ENABLED BUSINESSES

The modern day data-enabled business has an even greater need for a clear governance framework. Many business start-ups are treading new ground and do not have the benefit of the traditional practices for governance.

Let’s suppose that I am starting up a business that prints three dimensional (3D) widgets and delivers them by drone, or I am launching a fleet of driverless taxis. Where do I start to put in place a governance of data framework that will enhance the value of my business while reducing the risks for all the stakeholders involved and ensuring that the business is run within legislative constraints?

At the time of going to press, Netflix is testing measures to prevent account holders sharing their account password beyond physical household members. Good data governance can protect the revenue from data services and products.

Governance lessons from modern day data-enabled businesses

We have seen a number of start-up data-empowered businesses get up and running very quickly, delivering value to their users and customers in innovative ways, but in some cases these businesses have not considered the risk and constraints associated with the delivery of their new service or product. For example, a common mistake is to inadvertently provide a data set that, when combined with a second easily available data set, can reveal information that disadvantages the target users and customers. An example of this was a property data application that provided useful land information on houses for sale, and value to estate agents, house sellers and house purchasers. However, a second organisation combined the property data with freely available police data, and was able to show the crime levels at each address.

1 https://www.wired.com/story/netflix-password-sharing-crackdown/
DATA GOVERNANCE

SUMMARY

While the technology sector leaps from one buzzword to another, presenting the latest emerging trend, it is easy to forget that humans have been collecting information and processing data since the beginning of time. Our foundation for data governance is shaped by the civilisations that have come before us. There are valuable lessons to learn by reflecting on previous uses of data through the ages, and by looking at the varying approaches to data collection from different sectors. Specifically, the leaders of the most successful civilisations were quick to work out what data to collect and how that data could be shared by working through the incentives and disincentives of collecting and sharing the data available to them.
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DATA GOVERNANCE
Governing data for sustainable business
Edited by Alison Holt

Data is fundamentally changing the nature of organisations and the mechanisms for delivering products and services. It is an invaluable asset, but it also needs to be well governed – how you handle data can make or break your career or your business.

This book is a practical guide to developing resilient, fit-for-purpose strategy and policy for data governance for your organisation.

In line with the ISO 38505 series of governance of data standards, this book explains how to assess the value, risks and constraints associated with collecting and storing data, using data to drive decision making, reporting on data, distributing data and disposing of data in your organisation – enabling you to produce your own reliable and robust data governance framework.

- Understand the importance of data governance and the impact of poor governance of data, on an individual and organisational level
- Examine the theory behind data governance, with reference and insight into the ISO 38505 governance of data standards
- Explore the points of the data accountability map – collect, store, decide, report, distribute, dispose – and how each of these should be considered and pragmatically addressed in your data governance framework
- Contextualise your learning with real-world examples and case studies used throughout the book

ABOUT THE EDITOR
An internationally acclaimed expert in corporate governance of data, IT and sustainability management, Alison Holt is Director and Founder of Longitude 174 Limited. Alison chairs the New Zealand mirror groups for the development of international IT governance and IT service management standards, and is the author of the BCS book, Governance of IT. Alison has recently been working as e-Judiciary Adviser to the Chief Justice of Papua New Guinea.

You might also be interested in:

Finally, an in-depth global data governance guide that delivers expert best practices to a diversity of stakeholders for modelling strategy, regulatory frameworks and business sustainability.

Caryn Lusinchi, Founder & CEO, Bias in AI

A must read for any digitally and socially responsible leader who navigates the intended and unintended outcomes of their data, technology, people, and ethics, on their business, customers, and wider society.

Patricia Shaw, CEO, Beyond Reach Consulting Limited

Working over several decades with data, it was refreshing to read this book on data governance, which clearly explains evolving ISO standards, while recognizing that data are now very connected and valuable assets.

Peter A Campbell, Independent Business and Information Management Consultant; Founding Member & Director, BeLux chapter of DAMA

Information Technology, Business

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