



# Advancing data governance

## Creating improved data quality frameworks

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## Introduction

In examining data quality, it is very easy to become ‘hyper-focussed’ on data quality. It seems that data is clearly an important business resource. In becoming ‘hyper-focussed’ on data quality, remember that you are pursuing data quality for a utilitarian purpose. Data quality must be important to the business and its senior team, including the business owners. Data must be fit for purpose and help the business.

In approaching the problem of data quality, be aware of the dangers of attempting to improve the quality of all your data all at once. For all but the most special of organisations this ‘big bang’ approach is doomed to fail. The business must want data quality, and the approach to your data quality must be aligned with your business strategy. It is not costless to improve data quality, and in fact it is quite the reverse. Data quality is not an end in itself.

Good data governance ensures that your framework for data quality is aligned with your business needs.

This paper provides an approach and a toolset to advance the state of data governance in your business to improve the data quality frameworks that are in place in the business. These tools will include methods to help:

- Ensure sustained ownership of data quality to cultivate cohesive ideas and processes
- Negotiate policies and legislation that affect data use and dissemination
- Adopt governance groups to draw out business benefits from data
- Create and documenting data quality processes to create accountability and clarity

This paper explores the meaning of data governance, its impact upon the business, and how to develop a strategic program of works that builds data governance for the business. The aim is to develop an improved data quality framework that works. A data quality framework that works is one that aligns data quality practices with the business’ strategic need for data quality.

The emphasis is on governance as a set of rules for governing data quality processes, and our strategy is the way we direct day to day activities to ensure alignment with the business.

## Data governance for business

### Definitions

In the context of this paper, the following definitions apply:

- **Data Quality:** measures the data's fitness for the intended use in operations, decision making & planning
- **Governance:** is a set of accountabilities, processes, and auditable and measurable controls that ensure the business is on track to achieve its objectives
- **Data Governance:** is therefore a set of accountabilities, processes, and auditable and measurable controls to ensure the business is on track to achieve its data quality objectives
- **Data Quality Frameworks:** These frameworks provide structure to data quality activities and allow assessment of data quality

Data quality is principally about fitness for purpose. This is a broad definition, but it goes to the heart of the matter. If the data is fit for the purpose for which it is intended, then data quality is generally sufficient. However, businesses frequently use data for decision-making that it absolutely does not support.

For example, a client once had developed several information systems to manage its business functions. This client was an agency focussed upon the management of personal relationships with the government, and frequently aggregated the data from the different information systems to inform the development of government policy responses to social issues. Unfortunately, the different systems used different attributes to describe the people in care – in one system, there were three ethnicities (Indigenous, Torres Strait Islander, and 'other'), while another system had twelve ethnicity codes. This approach made sense for each individual system, and the data was fit for the purpose initially envisaged. Problems arose, however, when the data was used to support decisions it was not originally intended for.

Similarly, this client was responsible for maintaining a spreadsheet of people who were considered a 'threat to the community'. Unfortunately, this information was derived from the three information systems, and was manually maintained. At the time of our review the master spreadsheet had not been revised for six months – data that loses accuracy, timeliness and relevance.

Another agency was spending in excess of one billion dollars on infrastructure, but could not provide a record of the negotiations and decisions made by its field agents. The system allowed the final outcomes of negotiations to be recorded, but had no real method for recording the decisions made. The information was contained inside many spreadsheets and could easily be overwritten.

There are several core components to the concepts of data governance.

Firstly, ‘governance’ is not about the specific actions to be taken, it is about who is accountable for those actions, what processes are followed, and how these actions are measured.

Secondly, the aim is to meet the business’s data quality objectives. If those objectives are not set out, or are at odds with the aims of the data quality framework, then data governance is poor.

### The reasons why

In order to advance data governance, it is absolutely essential that the business strategy is understood. There are very good business reasons for improving data quality frameworks through good data governance, which can be analysed in terms of ‘compliance’ frameworks (required by a standard or law) and ‘incentive’ frameworks (whereby it can be seen that IT governance provides a positive return to the business, even when it is not required).

#### Compliance frameworks

- Control Objectives for IT (COBIT)
- Sarbanes-Oxley (SOx)
- ASX Principles (risk, value)
- National Privacy Principles
- AS8015-2005

#### Good IT governance is good for bottom line

- MIT research shows that companies with better than average IT governance earn at least a 20 percent higher return on assets than organizations with weaker governance (Weill/Ross 2004)

Control Objectives for IT (COBIT) and Sarbanes-Oxley are both audit standards. Neither has a direct ‘black and white’ legislative effect in Australia, although they are both influential for Australian businesses.

COBIT is managed and developed by the Information Technology Governance Institute. The Information Systems and Audit Control Association originally developed COBIT in order to assess the controls over information technology and the information managed by it. COBIT is an audit standard for IT governance, and a very small part of that standard is devoted to data management and data quality. Financial auditors use COBIT when assessing the controls over information technology as part of a financial audit. These control objectives become important for complex audits, and where the auditor feels unable to consider information technology to be a ‘black box’ that can safely be ignored.

For a financial auditor, if the controls over the accounting system are inadequate and unreliable, then there is little prospect that the auditor can place reliance upon the information produced from that accounting system.

The COBIT standard may be applied to larger organisations that require complex audits. However, there is no legislative requirement that this be followed, and its application is generally left to the professional judgment of the auditor.

Sarbanes-Oxley is, again, a standard that is not generally relevant for most Australian companies, as it is US-based legislation. However, it should be noted that US legislation generally attempts to be as inclusive as it possibly can, and wholly-owned subsidiaries of US firms operating in Australia are required to achieve SOx compliance if the parent company is subject to Sarbanes-Oxley.

S404 of the Sarbanes-Oxley Act requires a management assessment of internal controls. In practice, the auditor must be certain of the provenance of financial data, and so controls over feeder systems through to the financial information systems are relevant. Generally, auditors have tended to be conservative in their application of S404 – so although not all systems need be tested every year, auditors err on the side of caution in these instances.

Of interest is speculation that Australian companies may be captured by the operation of S404 if those companies produce information that passes information to the financial information systems of a US company. Sarbanes-Oxley affects Australian companies with significant business-to-business relationships with US companies (e.g. joint ventures).

In Australia, the Stock Exchange has rules for listed companies, although these are not particularly onerous in this context. Principle 2 requires that the board of the business is structured to add value, whilst Principle 7 requires that the board recognise and manage risk.

The average board in Australia has a preponderance of lawyers, accountants, and possibly ex-politicians as members. The focus on data quality is generally not there in the structure of the board, which implies that data quality is not seen as a board issue.

As for the management of risk, it is true that poor data quality can result in poor business decisions, but generally data quality seems to be the last thing on the minds of board members and the senior executive team. Until, that is, poor data quality results in a bad business decision or a crisis.

There needs to be a story to motivate the senior team about data quality. My stories would include the time a school sent academic reports to the estranged father of a child. The father was the subject of a domestic violence order and was not to know where the student attended the school. Or the time the accounting firm kept inviting the managing director of a very major client to seminars and presentations, despite the fact he had died six months previously. Or Queensland Police Service, where if the information provided to their people on the streets by 000 is wrong, people die. There is also the story of the managing director of a listed company with \$16 million turnover. He received an audit letter that was 32 pages in length, mostly due to poor information security and data quality, and yet refused to upgrade the accounting system from MYOB.

The National Privacy Principles also apply, and there is of course an Australian standard on IT Governance (AS8015-2005) and AS4360 is the Australian standard on Risk Management. Amongst other requirements, there is also the act to counter spam and the counter-terrorism

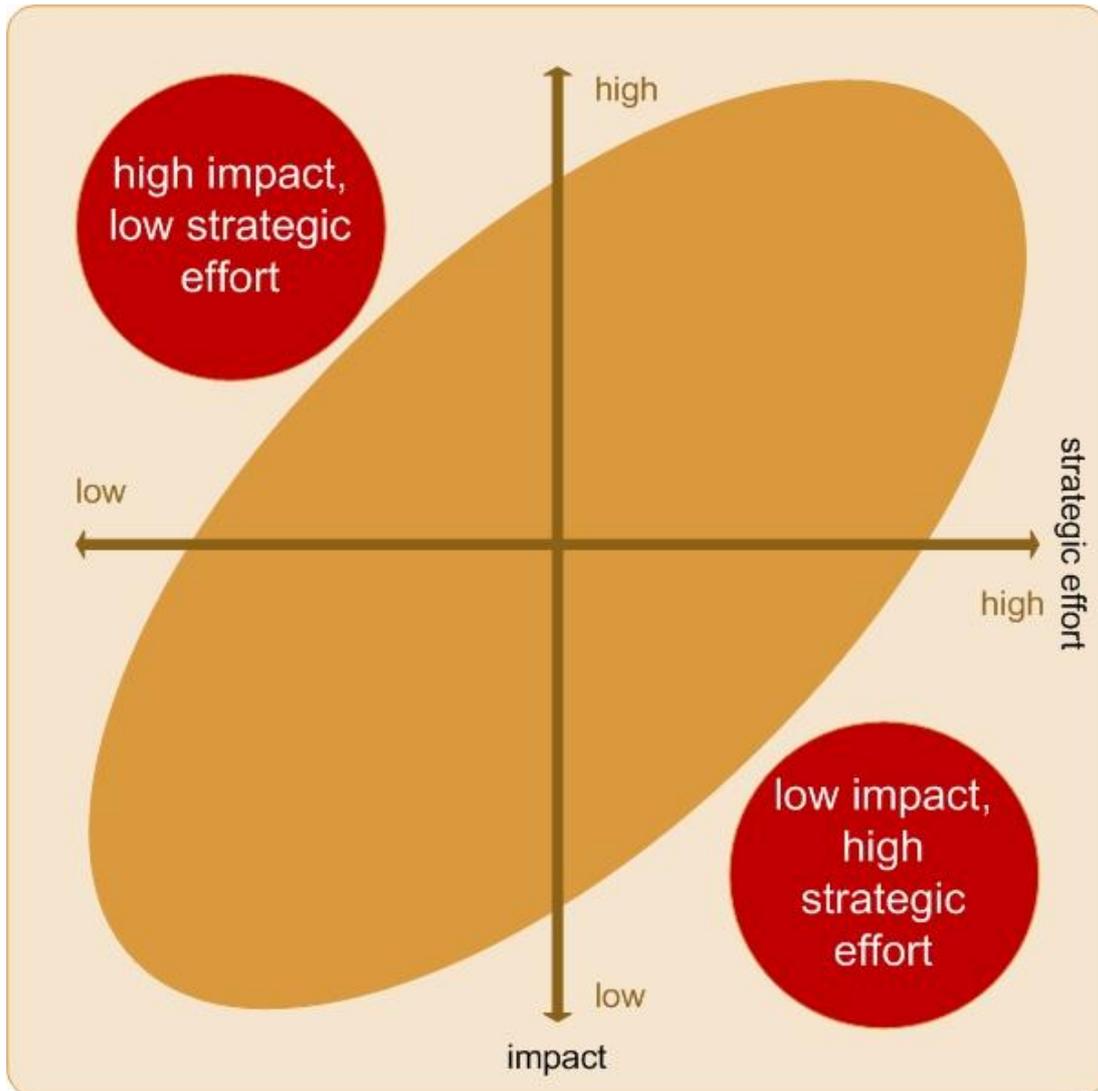
act, the credit card companies impose their own restrictions, and if you are an accountant there is the new money-laundering act, all of which provide for harsh penalties for breaches by directors.

However, there is generally no hard-and-fast requirement for data quality in Australia, and so you need to build the business case for data quality judiciously. There is the assertion by Weill & Ross (2004) that good IT governance practices provide a higher return on assets for businesses than businesses without good IT governance practices. Generally, though, you will need to build the case for the improvement of data quality on the basis of your business.

Unfortunately, the Sarbanes-Oxley experience shows that penalties (both civil and criminal) seem to be a primary motivator in getting a focus on data quality in businesses.

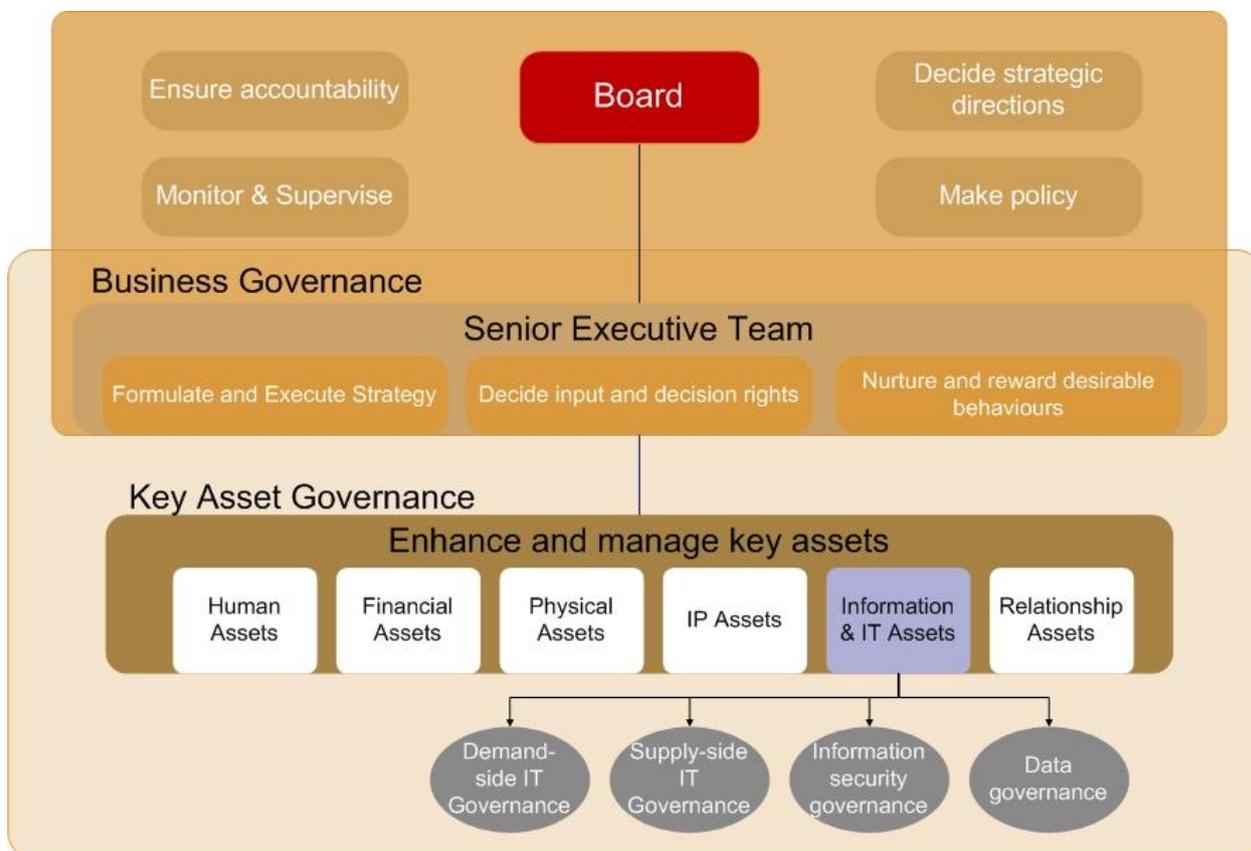
### Do what the business needs

The diagram below shows the relationship between the effort you put into managing data quality and the expected impact on the business. The red circles indicate an unsustainable mismatch of the effort put into data quality and the impact upon the business.



The need to build the business case for data quality means that the alignment of data quality practices with the needs of the business is paramount. There is very little point in pursuing data quality as an end in itself if it has little benefit for the business. Focus is needed to get the most business impact from your strategic effort.

## Corporate governance and data



Your average board is comprised of accountants, lawyers, and sometimes an ex-politician or two. Given the focus of directors’ duties on compliance with financial standards, and the general background of boards, it is probably no surprise that businesses are very good at managing financial assets and physical assets, and quite poor at most of the other key assets of the business.

To advance data quality, we need to bring this issue to appropriate prominence. It starts with the board, which will need to ensure accountability, monitor and supervise the actions of the senior executive team, decide strategic actions, and make policy. If, at this time, the board sees no role for data quality within the business, then that needs to be changed if data governance is to be advanced. The senior executive team needs to set out the business strategy – which must include the objectives for data quality – and decide who has input into the approach.

Data quality needs to be on the board’s agenda – it does not need to *be* the board’s agenda, but it does need to be on it. This means that we adopt governance groups and governance processes to ensure data quality stays top-of-mind.

### Governance groups

Decision Archetype	IT Principles	IT Architecture	IT Infrastructure Strategies	Business Application Needs	IT Investment
Business Monarchy					
IT Monarchy					
Feudal					
Federal					
Duopoly					
Anarchy					
Don't Know					

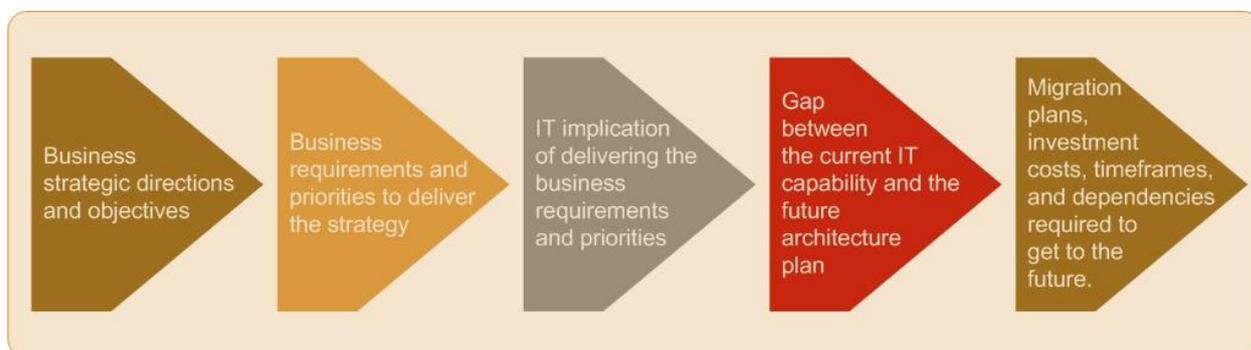
When approaching governance groups, they need to be compatible with your business and the way it approaches the questions of IT management. A steering committee is unlikely to work well if the rest of the IT approach is decided in an anarchistic environment.

However, key governance groups and processes include:

- Applications board
- Information Steering Committee
- Board Risk and Audit Committee
- Governance Calendar
- Balanced Scorecard

Key is that there needs to be a way to manage data quality, and it needs to be monitored by the people that matter.

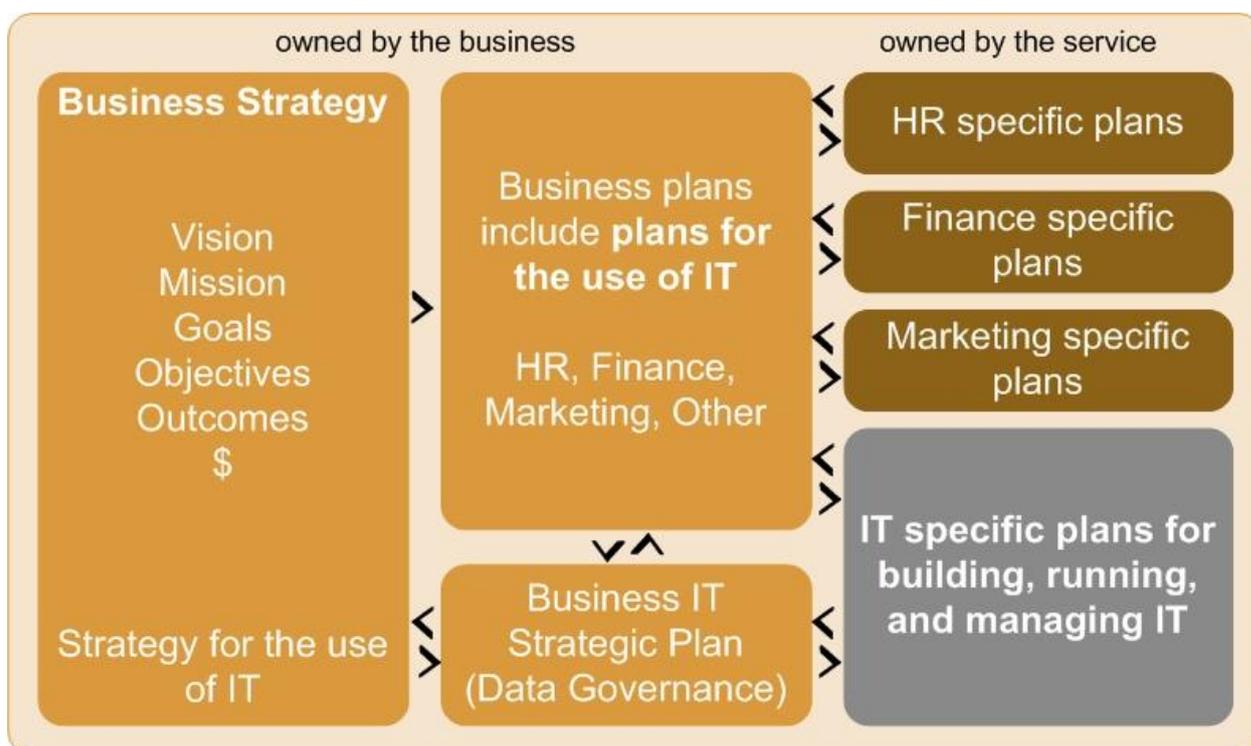
### Integrating IT plans into business strategy



This process is a rational one, and essentially requires that the gap is identified between the current approach and business requirements, and then the gap is closed. Unfortunately there are common flaws that exist in the approach by business:

- Where there is no direction by the business, IT fills the gap as it sees fit.
- The approach is completely out of alignment with the business
- Personal or political agendas cloud the approach
- There is no way of closing the loop with feedback so that the current ‘flavour of the month’ continues to be monitored.

### A business decision



Data quality is a business issue. A forum and a process are needed to synthesise a whole-of-business approach. The responsibilities of the Chief Information Officer include the development of business-driven IT strategy and the monitoring of ICT service delivery. This includes the development of the data governance approach and the strategy for data quality.

The CIO does have a role to input into business strategy in terms of identifying business opportunities. As a supporting business function, though, in practical terms the CIO must engage with the business functions of HR, Finance, and Marketing once they have developed their specific plans, and then identify the Business IT Strategic Plan. This will include the data quality strategy, which defines the required goals, initiatives and program of work for delivery of the strategy.

This is critical to achieving data quality in the context of ensuring alignment with the business, although frequently this does not appear to be undertaken in business.

## Data Governance Strategy

### Improving data quality

Improving data quality is about the development of good business habits and a culture of good data, rather than a 'big bang' approach. It is naive to think that data quality can be improved in a 'Great Leap Forward' on all fronts and all at once. Critically, data quality is only tangentially related to the use of software tools.

To be sustainable, data quality must meet the cost/benefit test, and be important to the business. A data governance strategy grows organisational capability by implementing a data quality 'floor' for all data and focussing the most resources upon the most critical data.

This creates less business risk, higher quality, and lower costs than a 'big bang' approach. The data quality strategy needs to be owned by the business, not 'IT'; this has implications for the approach to the development of governance groups.

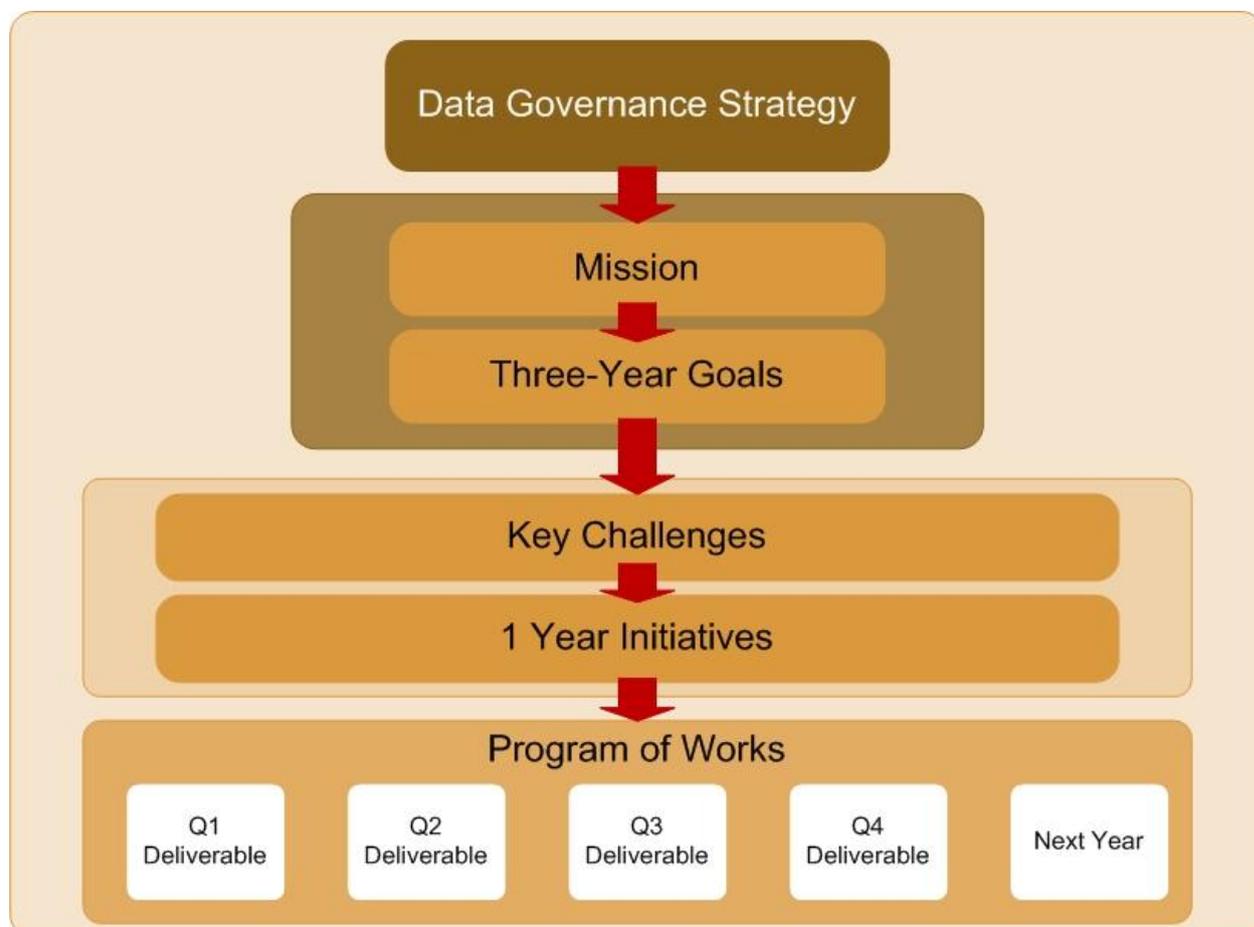
In developing the strategy, set core standards for all data to create a basic level of data quality, and then focus business resources on the development of data quality practices for absolutely critical data first. These could be termed critical data types.

It is recommended that you be realistic in your approach, and do not develop over-engineered solutions for the entire organisation's data at first. A steady and sure approach is usually best - slow-burn strategies that deliver beat fast-burning failures every time.

It is recommended that you build a strategic rhythm of monthly & quarterly reviews. This approach de-emphasises the development of a strategy that sits on the shelf, and instead focuses on regular touch points of the strategy throughout the timeframe of the strategy.

Quarterly deliverables should be set in the program of works for ease of monitoring, and these should be reported to and reviewed by the Steering Committee, and noted by the Board committee through the Balanced Scorecard and Governance Calendar. At all times, an active strategy is a practical strategy

## Strategy for delivering data governance



Under this approach, our Business IT Strategic Plan will set out the mission, the three-year goals and, after identifying the key challenges to achieving those goals, identify a set of initiatives that will be successful. Unless there are significant resources available, a slow-burn strategy will be most appropriate.

It is important that this strategy recognise the business' limitations. The achievement of even a single deliverable will be a major step forward in improving the data quality framework. Recognise that the resources available are limited – if they are. If the resources cannot be made available, then work with what you have.

This approach emphasises the process of developing the strategy, rather than the strategy. So, rather than spending many hours at developing a strategy that sits on the top shelf, this approach requires a constant monitoring (daily, weekly, and monthly reviews) and the development of quarterly deliverables with the strategy development team. Be conservative in your deliverables, and be wary of creating an undeliverable wish-list.

This is an active strategy approach.

## The program of works

### Maturity through growth

Management of the process of Manage data that satisfies the business requirement for IT of optimising the use of information and ensuring that information is available as required is:

Rank	Level	Description
0	Non-existent	Data are not recognised as corporate resources and assets. There is no assigned data ownership or individual accountability for data management. Data quality and security are poor or non-existent.
1	Ad hoc	<p>The organisation recognises a need for effective data management. There is an ad hoc approach for specifying security requirements for data management, but no formal communications procedures are in place. No specific training on data management takes place.</p> <p>Responsibility for data management is not clear. Backup/restoration procedures and disposal arrangements are in place.</p>
2	Repeatable but intuitive	The awareness of the need for effective data management exists throughout the organisation. Data ownership at a high level begins to occur. Security requirements for data management are documented by key individuals. Some monitoring within IT is performed on data management key activities (e.g., backup, restoration, and disposal). Responsibilities for data management are informally assigned for key IT staff members.
3	Defined process	The need for data management within IT and across the organisation is understood and accepted. Responsibility for data management is established. Data ownership is assigned to the responsible party who controls integrity and security. Data management procedures are formalised within IT, and some tools for backup/restoration and disposal of equipment are used. Some monitoring over data management is in place. Basic performance metrics are defined. Training for data management staff members is emerging.
4	Managed and measurable	The need for data management is understood, and required actions are accepted within the organisation. Responsibility for

		data ownership and management are clearly defined, assigned and communicated within the organisation. Procedures are formalised and widely known, and knowledge is shared. Usage of current tools is emerging. Goal and performance indicators are agreed to with customers and monitored through a well-defined process. Formal training for data management staff members is in place.
5	Optimised	<p>The need for data management and the understanding of all required actions is understood and accepted within the organisation.</p> <p>Future needs and requirements are explored in a proactive manner. The responsibilities for data ownership and data management are clearly established, widely known across the organisation and updated on a timely basis. Procedures are formalised and widely known, and knowledge sharing is standard practice. Sophisticated tools are used with maximum automation of data management. Goal and performance indicators are agreed to with customers, linked to business objectives and consistently monitored using a well-defined process. Opportunities for improvement are constantly explored. Training for data management staff members is instituted.</p>

Data quality management can only work when the organisation is ready for it. A great leap forward won't work for data management. The activities set out in the program of work, and the key performance indicators adopted as metrics to measure data quality must be tailored for your readiness.

### Objectives of data quality

Process	Description
DS11.1	Business Requirements for Data Management
DS11.2	Storage and Retention Arrangements
DS11.3	Media Library Management System
DS11.4	Disposal
DS11.5	Backup and Restoration
DS11.6	Security Requirements for Data Management

These control objectives are the ones set out by COBIT, and although they are not a complete set of available objectives, this should be reflected in the data quality strategy.

- DS11.1 Business Requirements for Data Management - Verify that all data expected for processing are received and processed completely, accurately and in a timely manner, and all output is delivered in accordance with business requirements. Support restart and reprocessing needs.
- DS11.2 Storage and Retention Arrangements - Define and implement procedures for effective and efficient data storage, retention and archiving to meet business objectives, the organisation’s security policy and regulatory requirements.
- DS11.3 Media Library Management System - Define and implement procedures to maintain an inventory of stored and archived media to ensure their usability and integrity.
- DS11.4 Disposal - Define and implement procedures to ensure that business requirements for protection of sensitive data and software are met when data and hardware are disposed or transferred.
- DS11.5 Backup and Restoration - Define and implement procedures for backup and restoration of systems, applications, data and documentation in line with business requirements and the continuity plan.
- DS11.6 Security Requirements for Data Management - Define and implement policies and procedures to identify and apply security requirements applicable to the receipt, processing, storage and output of data to meet business objectives, the organisation’s security policy and regulatory requirements.

### Improving the data quality framework

Ref	Description	*	0	1	2	3	4	5
DS11.1	Business Requirements for Data Management			○	↔	×		
DS11.2	Storage and Retention Arrangements		○	↔	×			
DS11.3	Media Library Management System		○	↔	×			
DS11.4	Disposal			○	↔	×		
DS11.5	Backup and Restoration		○	↔	×			
DS11.6	Security Requirements for Data Management		○	↔	↔	×		

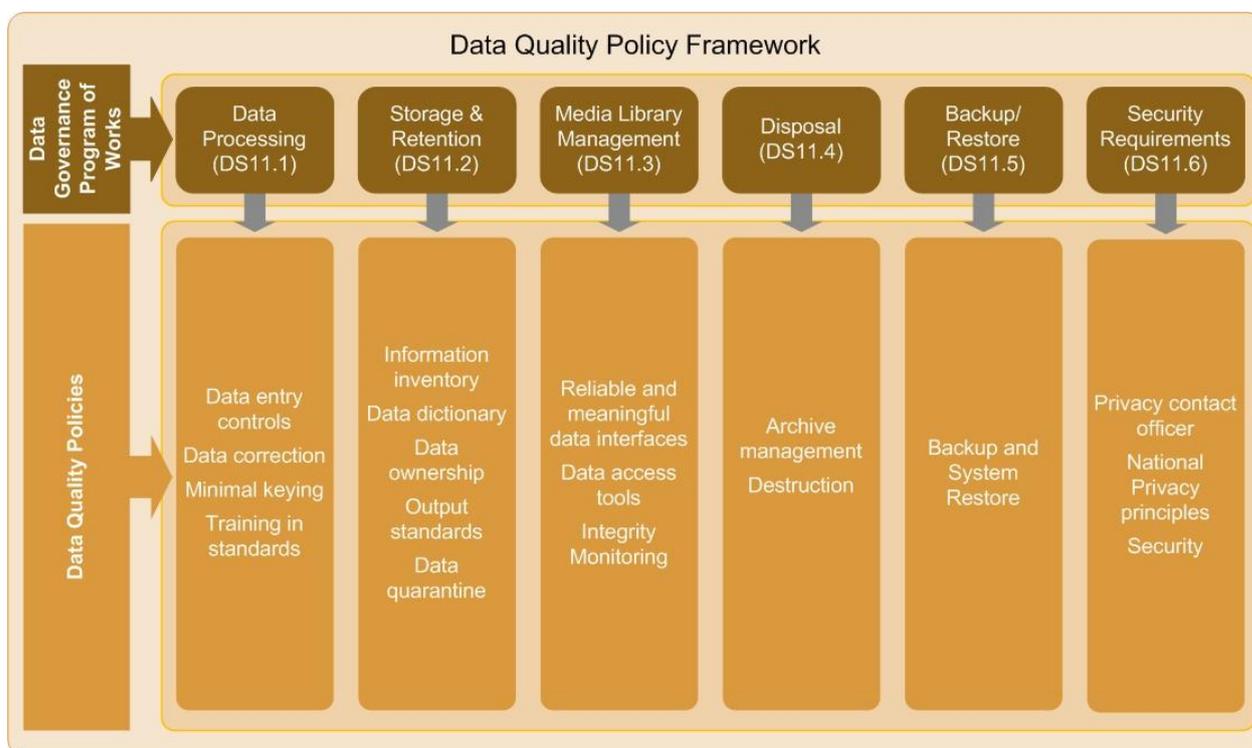
Having assessed your control objectives, the strategy will outline the need to improve the data quality framework through assessment of the gap between the required level and the necessary steps to improve these measures over time.

As part of this, ongoing feedback and data quality metrics will be important for providing feedback for your data governance groups. Key Performance Indicators may include:

- Percent of data input errors
- Percent of updates reprocessed
- Percent of automated data integrity checks incorporated into the applications
- Percent of errors prevented at the point of entry
- Number of automated data integrity checks run independently of the applications
- Time interval between error occurrence, detection and correction
- Reduced data output problems
- Reduced time for recovery of archived data

The KPI may be a simple ratio, a minimum or a maximum value, or a weighted average. These KPIs will be provided as part of the balanced scorecard to the board and its committee, and in more detail to the business steering committee.

## Data quality policy framework



This diagram sets out some of the practical things we can do to achieve data quality. These items would be added to the program of works, and delivered over time to critical data types. It is critical that you consider this strategy in the context of two streams:

1. Non-critical data types
2. Critical data types

Activities need to be broken down to ensure a minimally acceptable standard of data quality for non-critical data, and focus resources on the development of practices that affect critical data types.

Practical things that can be done to achieve data quality include:

- **Data entry controls:** Data entry requirements are clearly stated, enforced and supported by automated techniques at all levels, including database and file interfaces
- **Data ownership:** The responsibilities for data ownership and integrity requirements are clearly stated and accepted throughout the organisation
- **Training in standards:** Data accuracy and standards are clearly communicated and incorporated into the training and personnel development processes
- **Data correction:** Data entry standards and correction are enforced at the point of entry
- **Output standards:** Data input, processing and output integrity standards are formalised and enforced
- **Data quarantine:** Data are held in suspense until corrected

- Integrity Monitoring: Effective detection methods are used to enforce data accuracy and integrity standards
- Reliable and meaningful data interfaces: Effective translation of data across platforms is implemented without loss of integrity or reliability to meet changing business demands
- Minimal keying: There is a decreased reliance on manual data input and re-keying processes
- Data access tools: Efficient and flexible solutions promote effective use of data
- Archive management: Data are archived and protected and are readily available when needed for recovery
- Data dictionary: A data dictionary provides a framework of data types, their semantic meaning, and works to improve the business's understanding of its own information.
- Information inventory: An information inventory provides a visual reference to identified data and information types within the organisation.

## Conclusion

Major points to recall:

- Data quality is not an end in itself
- Involvement and ownership by the business is vital
- Pursuing data quality by technology alone is doomed to fail
- Start focussed and small on critical data types
- Develop an active strategy and strong data quality habits.

## More information

- [www.cpaaustralia.com.au](http://www.cpaaustralia.com.au)
- [www.isaca.org](http://www.isaca.org)
- [www.itgi.org](http://www.itgi.org)
- [www.appliedinsight.com.au](http://www.appliedinsight.com.au)

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