

Data and Information

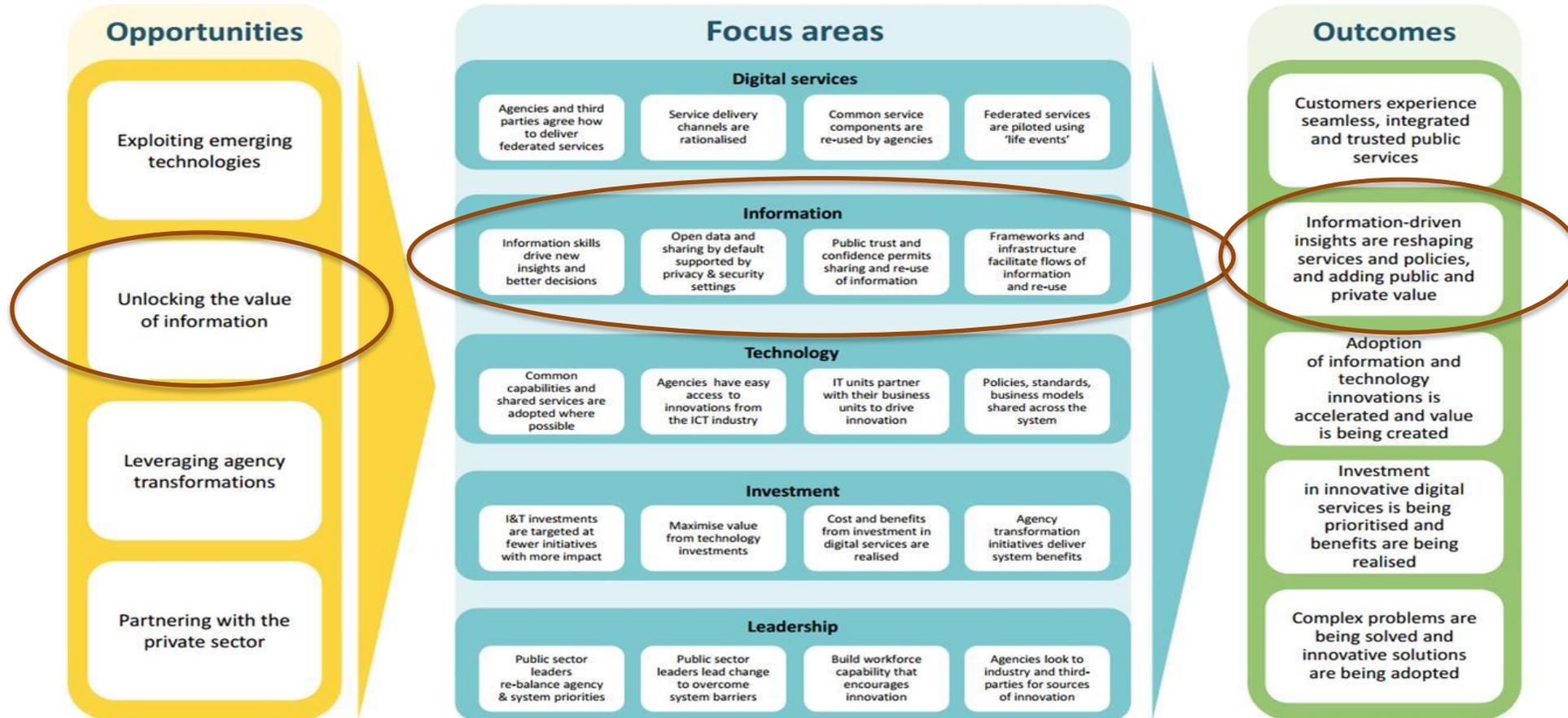
Work session for Non-Practitioners



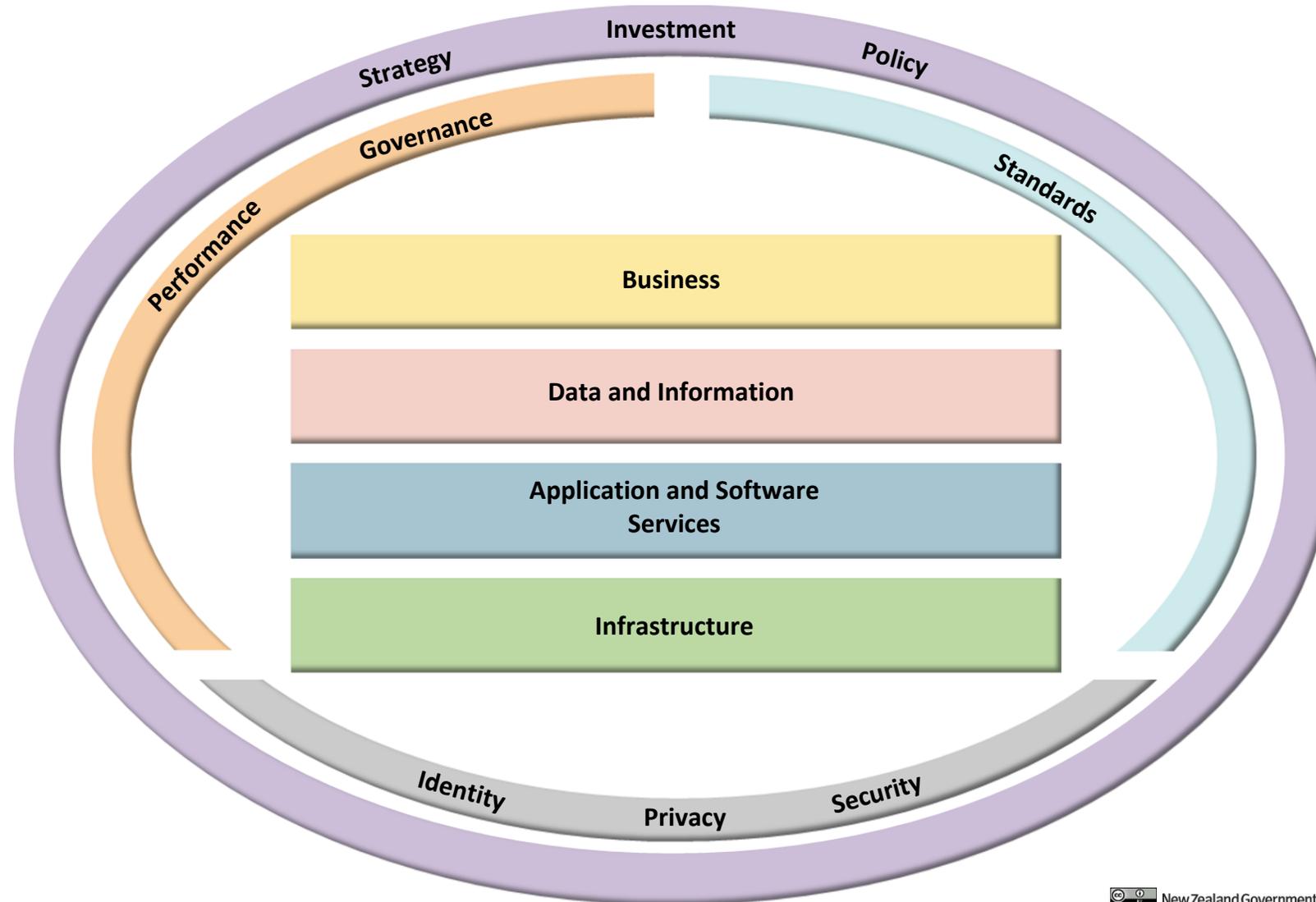
Regine Deleu
All-of-Government Enterprise Architect

NZ Government Digital Strategy

Information is managed as an asset.



Eight Dimensions of an Organisation



**Information
as an
Asset**

Is Information an Asset?

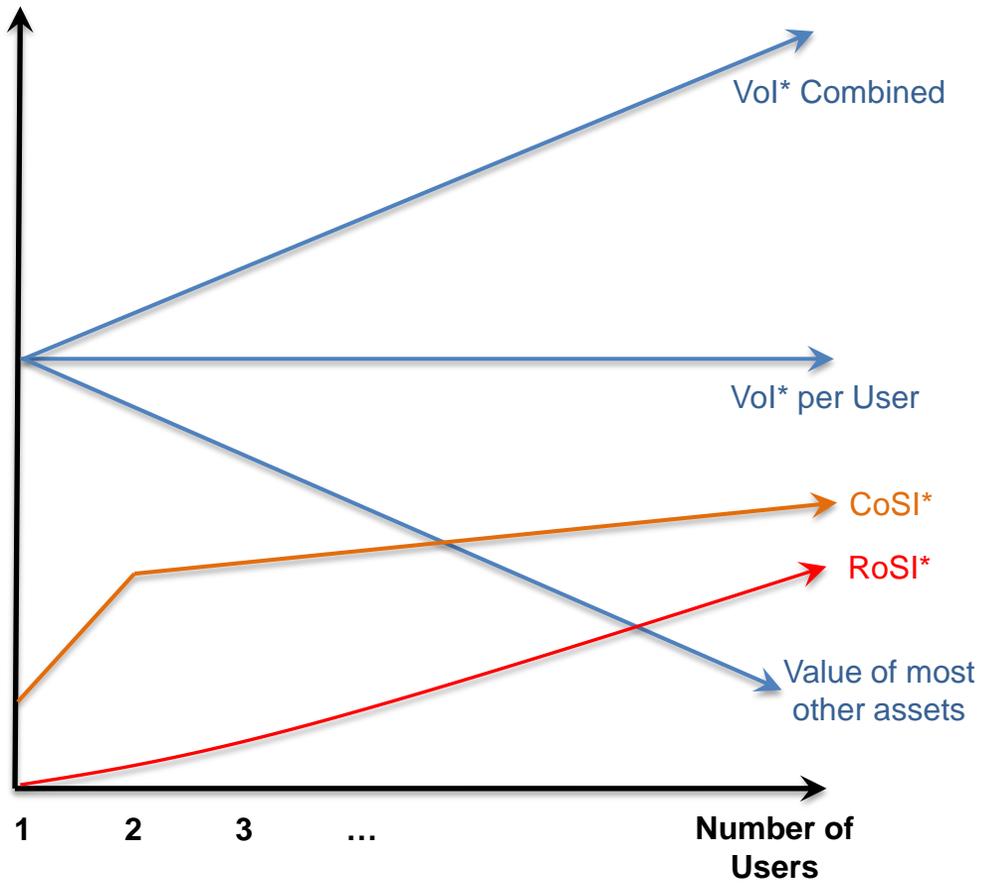
- An asset has a service potential or economic benefit
- An asset is controlled by the organisation
- An asset is the result of past transactions

Information is Shareable

RoSI* = Risk of Sharing Information

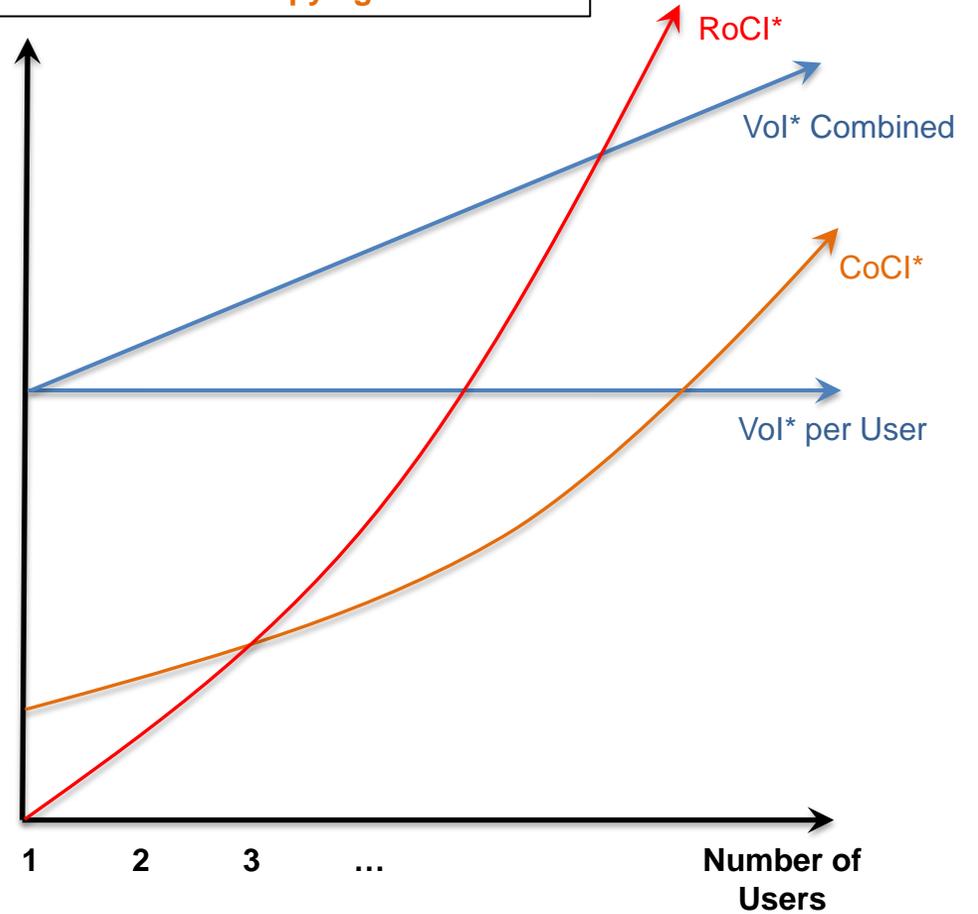
CoSI* = Cost of Sharing Information

Vol* = Value of Information

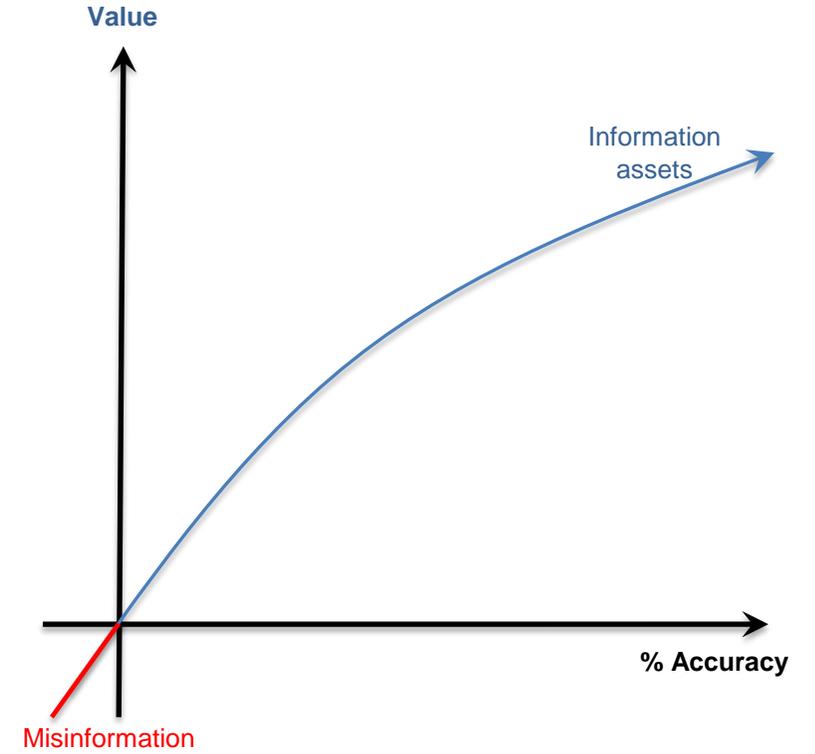
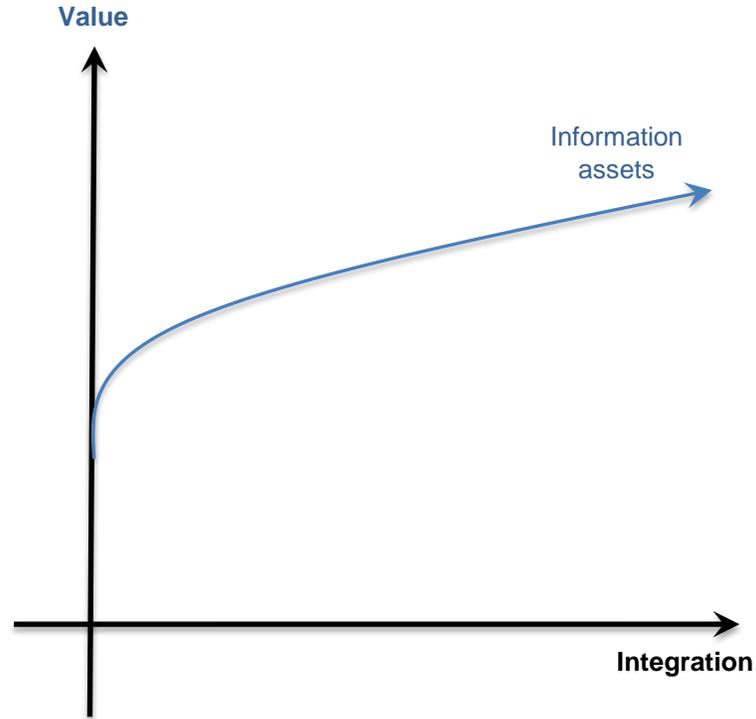
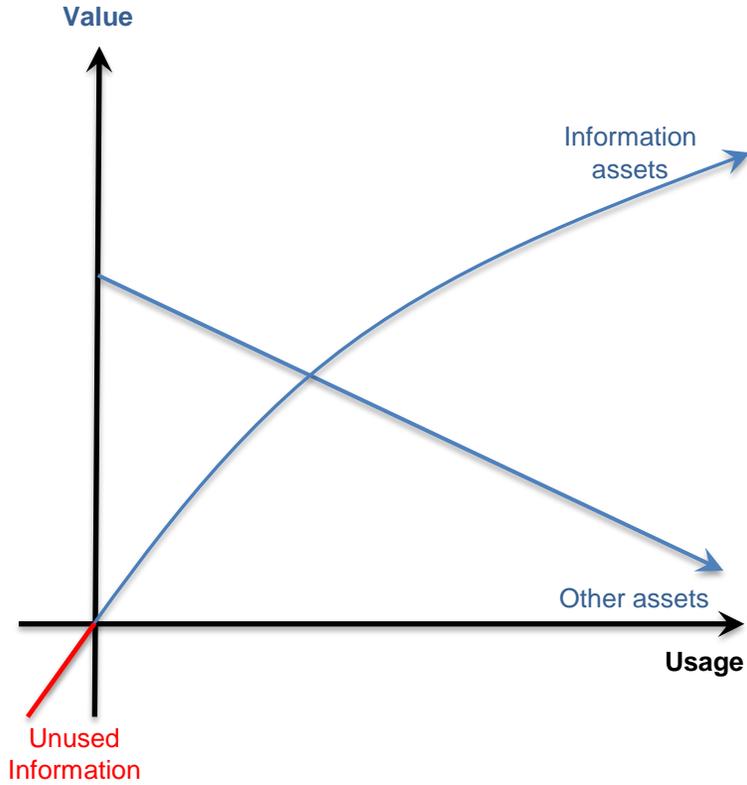


RoCI* = Risk of Copying Information

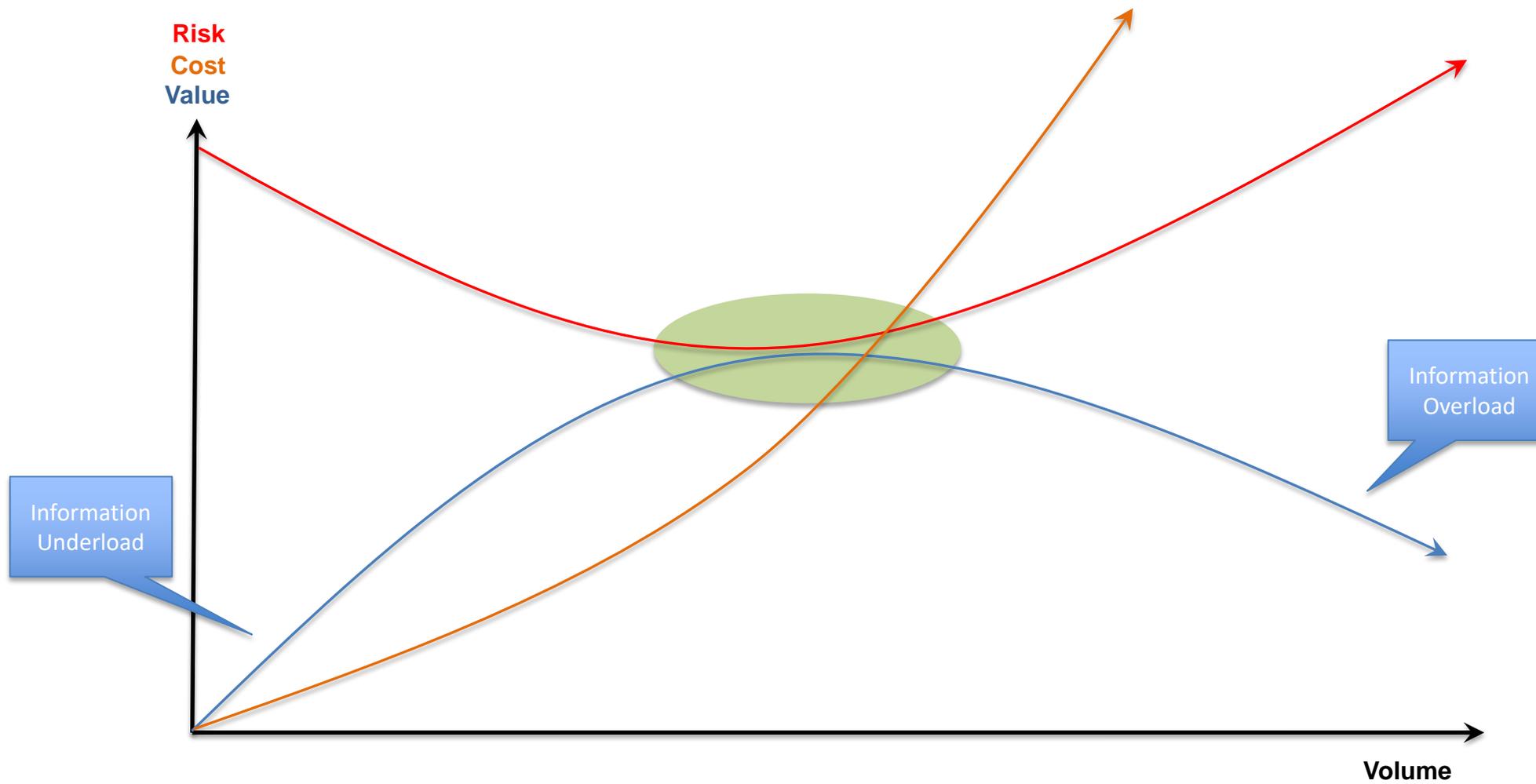
CoCI* = Cost of Copying Information



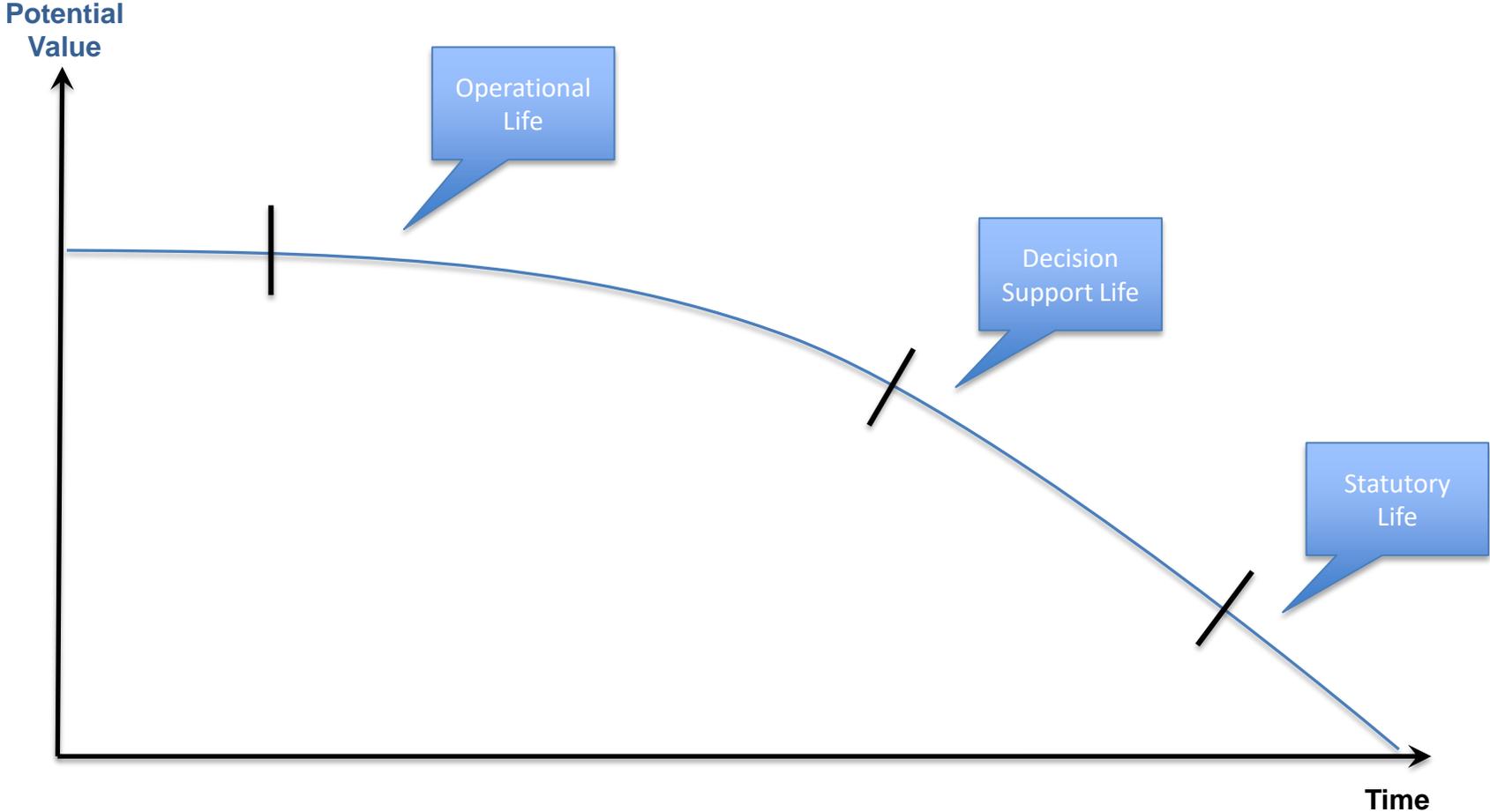
Value of Information



More is NOT necessarily Better



Information is Perishable but not Depletable



Principles for Quality

Principles for Quality

- **Accuracy**
 - *How closely does your data represent what really happened?*
 - *Accuracy is best tackled at source.*
- **Consistency**
 - *The form in which data is passed from one system to another must be as consistent as possible within and across agencies and their business partners to achieve the highest interoperability.*
- **Relevance**
 - *How well the information is designed to achieve specific outcomes.*
- **Completeness:**
 - *An indication of whether or not data meets the current and future business demand*
 - *Data is available in the data resource.*
 - *Incomplete information will weaken the agency's ability to use and apply it as widely and wisely as needed.*
- **Timeliness**
 - *The time expectation for the accessibility of data and information.*
- **Provenance**
 - *The sources of information involved in producing or delivering an artefact.*
- **Value**
 - *The amount a decision maker would be willing to pay for information prior to making a decision.*

Guiding Principles

- **Usefulness**
 - *The use of data is defined by its intended purpose*
- **Trust**
 - *Trust is essential because no manager will act upon data they don't trust.*

Data Governance

Data Governance - Goals

- Increasing consistency and confidence in decision making
- Improving data and information security
- Maximizing the benefit generation of information
- Designating accountability for data quality
- Minimizing or eliminating re-work
- Optimize staff effectiveness
- Establish process performance baselines to enable improvement efforts
- Managing business risks
- Optimising investments
- Enabling evidence-based policy development
- Consistency in reporting



Data Governance - Why we care?

A Policy DCE expresses frustration that the organisation has "no corporate memory" after finding that a piece of research work recently commissioned has been done before on at least three occasions over time and in different parts of the organisation.

A business case for a major project is relitigated multiple times and takes 2-3 years, largely because there is insufficient baseline operational data to develop a credible approach to benefit realisation. When the project finally proceeds, a large part of it is eventually abandoned because it becomes clear that the benefit estimation was indeed flawed.

A technical flaw causes a serious privacy breach, and the root cause is found to be that there is no clear and effective business accountability within the organisation for assuring the protection of the data in question.

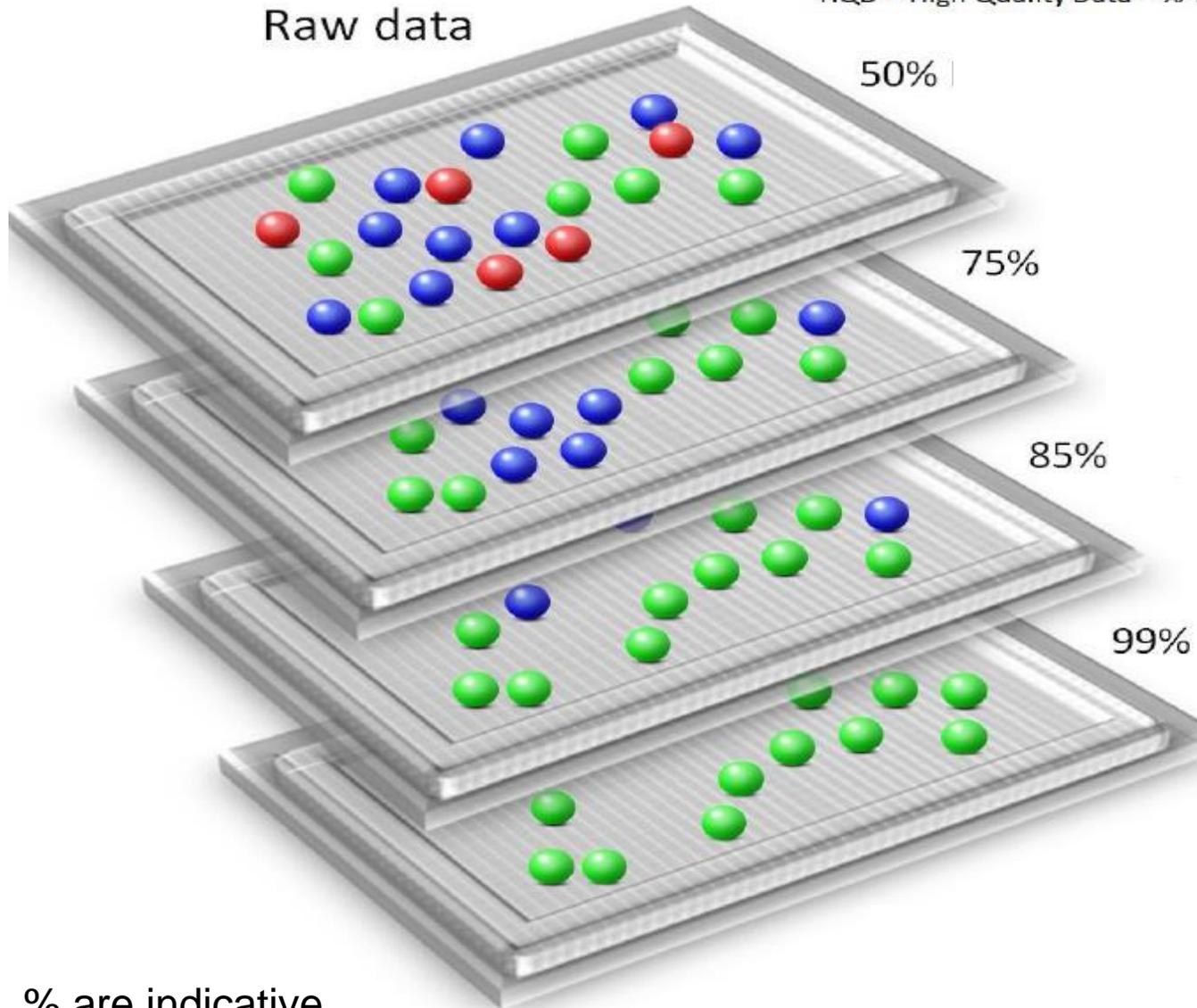
Two business units provide Ministers with significantly different values for the same KPI,
→ because the definition of one of the inputs is not consistent within the organisation, and
→ because different assumptions are made in "correcting" other inputs that are based on incomplete or low-quality operational data.
Attempts to "fix" these problems are fragmented and siloed within the business units, and the same discrepancy re-occurs within 2 years.

A major debt recovery campaign is instituted based on a mistaken estimate of debtor population and outstanding debt. In reality, the true value is only 50% of the estimate and the campaign is poorly targeted and not justifiable on this basis.

Note: the above scenarios do not refer to specific incidents, but are based loosely on anecdotes collected over years from a number of organisations

Data Governance – Trust & Confidence

HQD = High Quality Data = % Trust and confidence in the quality and correctness of the data



Stage 1: Common data definition & Master Data Management

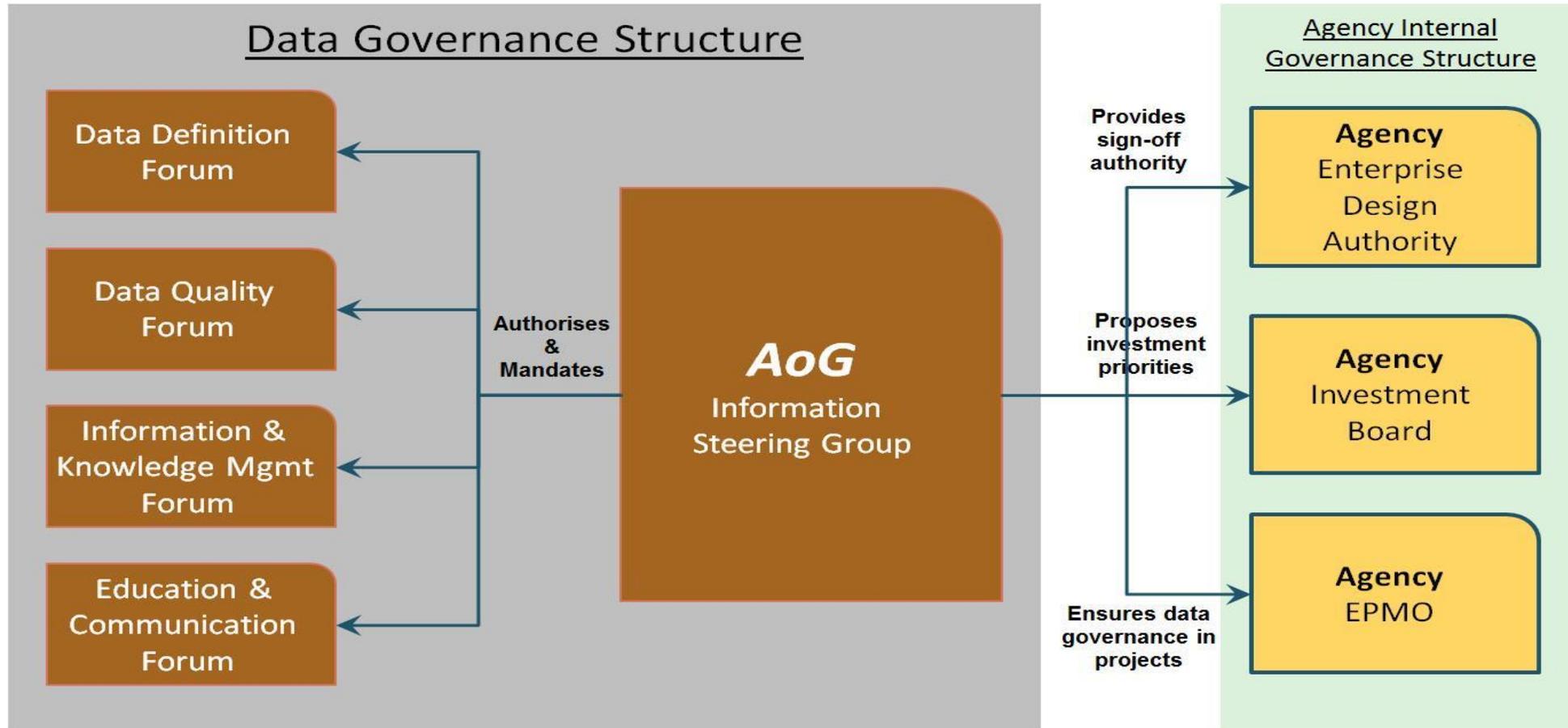
Stage 2: Data and Information Quality Management Framework

Stage 3: Data Reporting Framework, including statistics, and analytics

Stage 4: Information usable for decision making

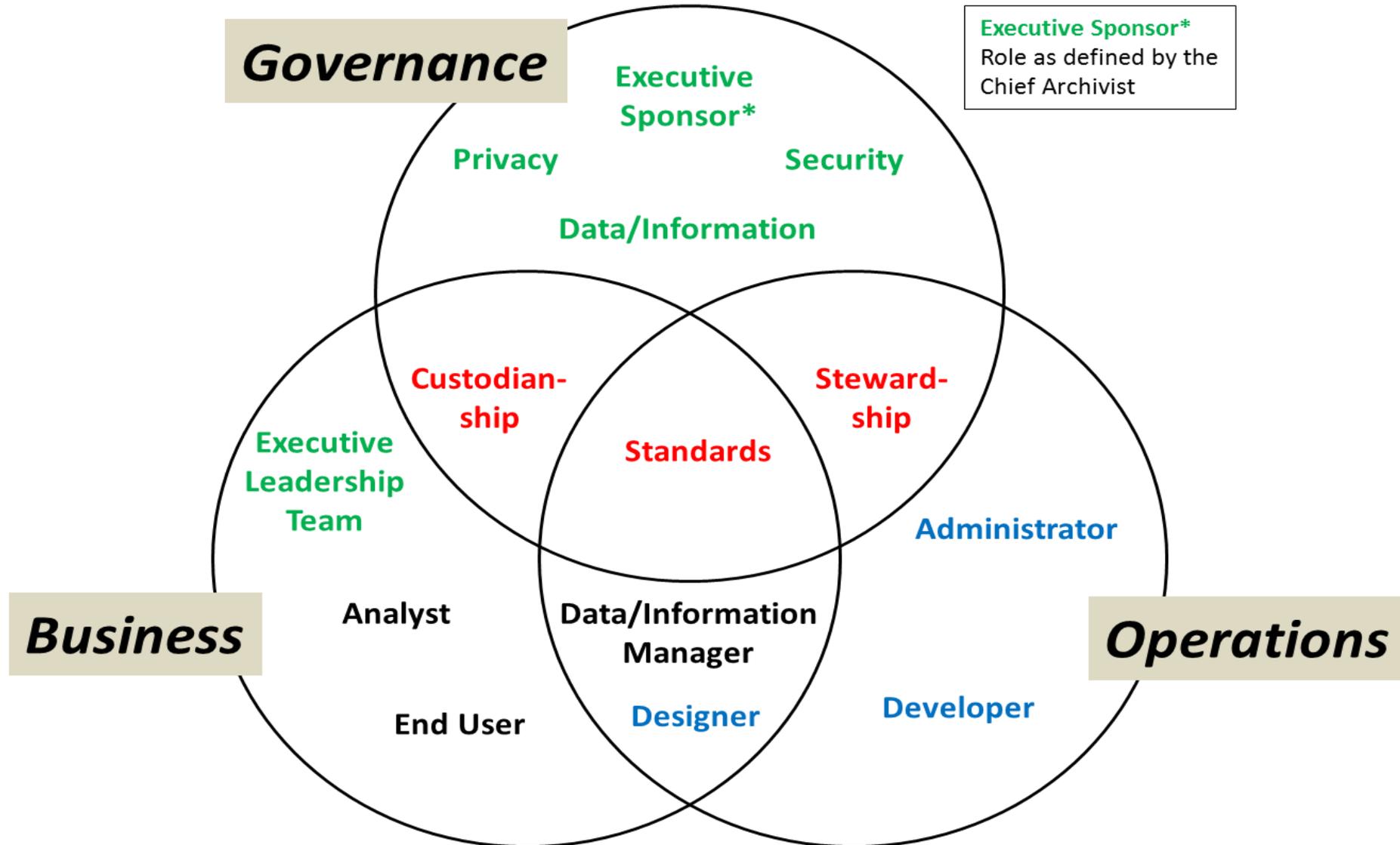
% are indicative

Data Governance - Structure

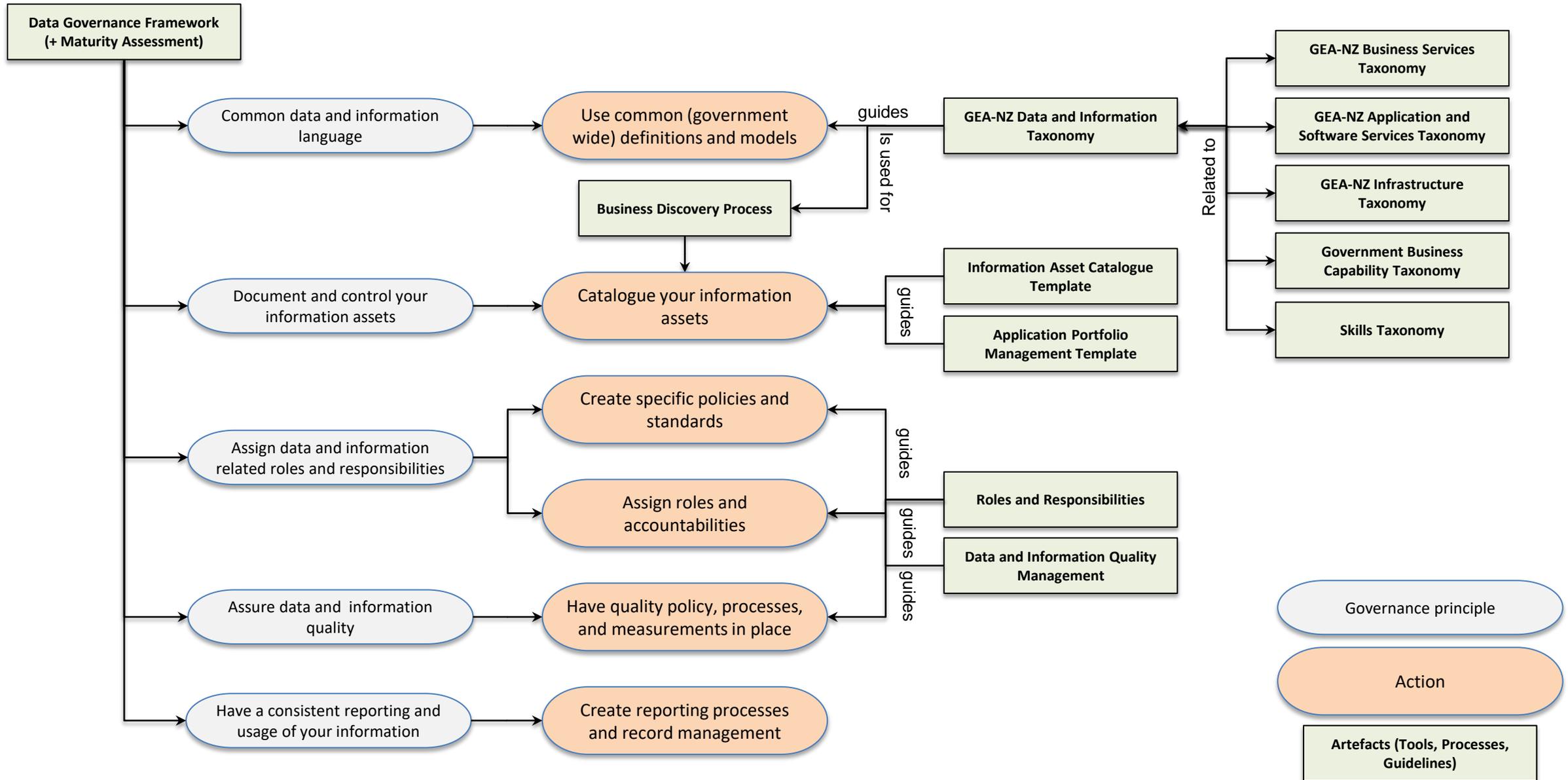


Roles and Responsibilities

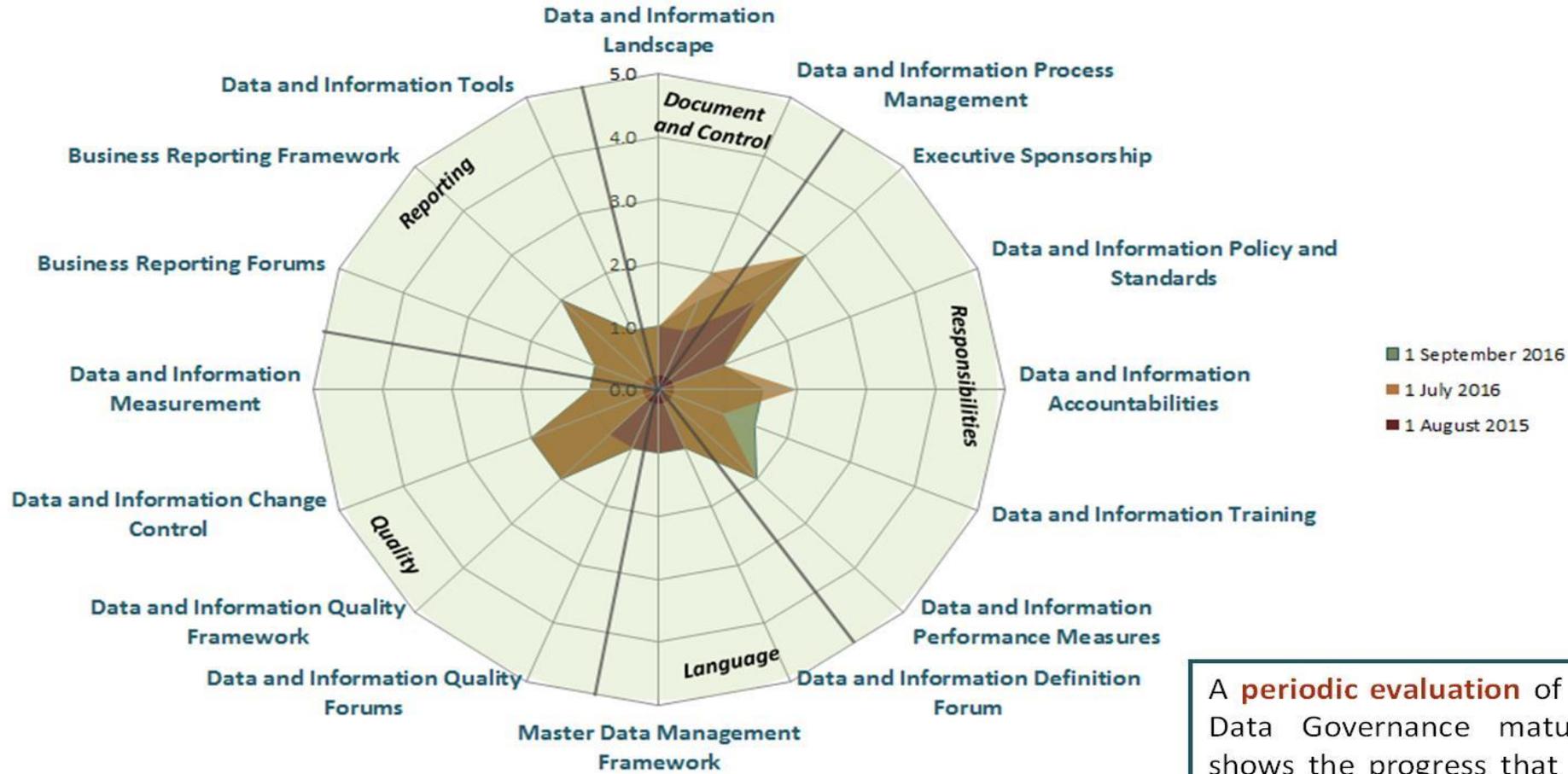
Government Chief Information Officer



Data Governance – Principles and Artefacts



Maturity Model – Periodic Evaluation



A **periodic evaluation** of the Data Governance maturity shows the progress that has been made and the focus points for the coming period.

**What needs to be in place
in an organisation**

Government Enterprise Architecture
of
New Zealand

Data and Information
Quality Management
Guidelines

New Zealand Government

Plan

To *Plan* is typically to create a list of steps with timing and resources, used to achieve an objective to do something. It is commonly understood as a temporal set of intended actions through which one expects to achieve a goal. Plans can be formal or informal.

Document / Record

To *Document / Record* is to write, photograph, or capture information in any form (structured or unstructured) that provides evidence or serves as an official record.

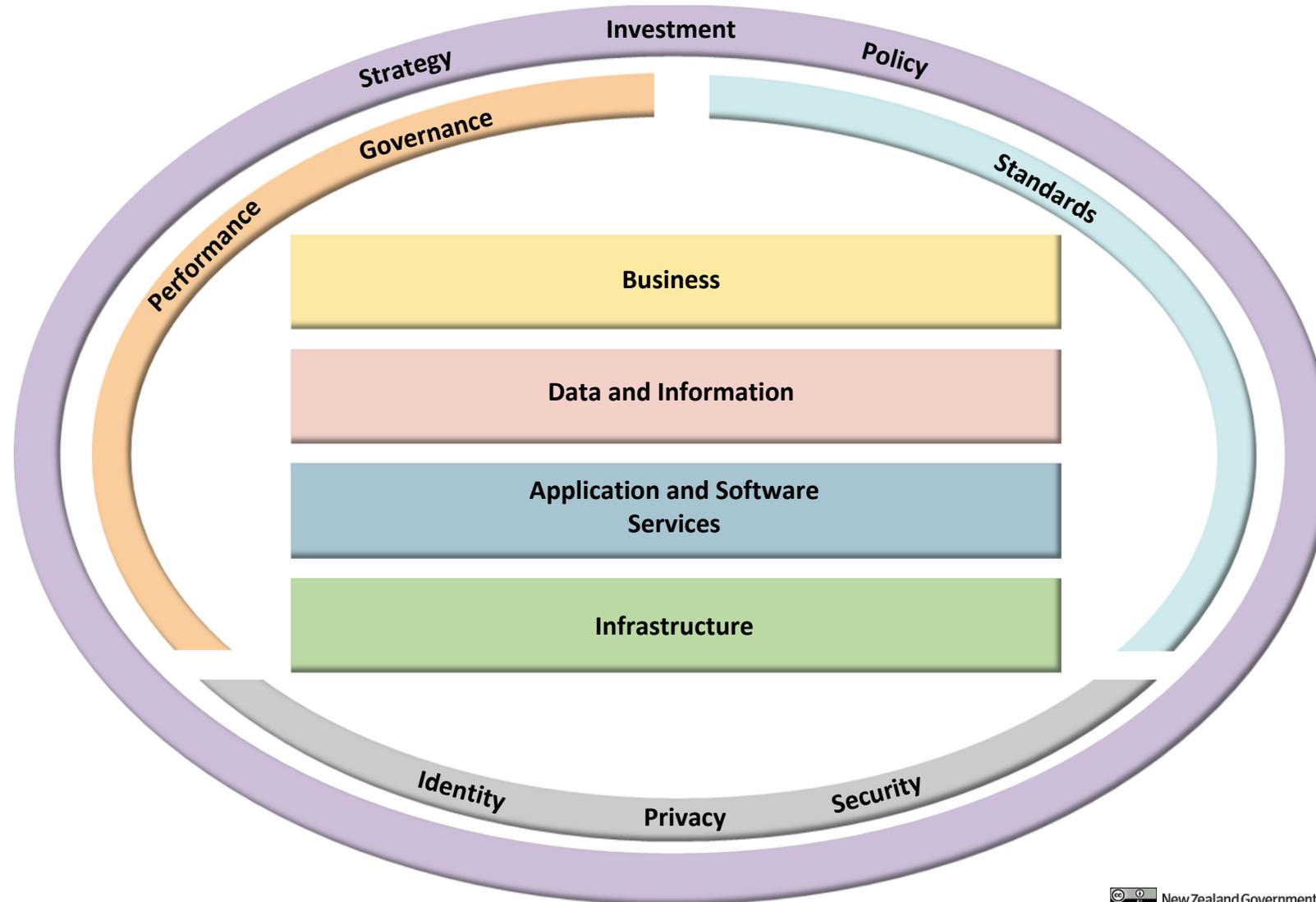
Execute

To *Execute* is to put a plan or course of actions into effect.

Control / Monitor / Evaluate

To *Control / Monitor / Evaluate* is to exercise restraining or directing influence over the execution of an action, to regularly check something or watch someone in order to find out what is happening, and to determine the significance, worth, or quality of the results.

Eight Dimensions of an Organisation



Business Dimension

Business	
Plan	<ul style="list-style-type: none">• Staff Roles & Skills• Product & Service Life-cycle• Revision & Change• Initial Data Entry & Setup• Ongoing Data Maintenance
Document / Record	<ul style="list-style-type: none">• Customer Criteria• Channel Strategy• Product & Service Documentation• Governance Organisational Structure• Delivery Methodology• Customer Feedback & Follow-up• Personal Objectives
Execute	<ul style="list-style-type: none">• Education & Awareness• Customer Feedback Resolution• Product & Service Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Internal & External Feedback Controls• Review of Personal Objectives• Product & Service Controls• Workflow Controls

Data and Information Dimension

Data and Information	
Plan	<ul style="list-style-type: none">• Data Stewards• Data & Information Quality Improvement Plan• Initial Data Entry & Setup• Ongoing Data Maintenance• Architecture & Design
Document / Record	<ul style="list-style-type: none">• Information Asset Catalogue• Data & Information Taxonomy• Data & Information Quality Management
Execute	<ul style="list-style-type: none">• Education & Awareness• Data Cleansing• Data Profiling• Data Validation
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Data & Information Quality Controls• Monitor Impact of Inadequate, Missing, or Wrong Data

Application and Software Service Dimension

Application and Software Service	
Plan	<ul style="list-style-type: none">• Application Ownership Model• Application Portfolio• User Interfaces• Unified Data Repository• Data & Information Interoperability• Architecture & Design
Document / Record	<ul style="list-style-type: none">• Application Asset Catalogue• Application & software Service Taxonomy• API Catalogue• Application Manuals, Guides, & Instructions
Execute	<ul style="list-style-type: none">• Education & Awareness• Application & software Service Change Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Application & software Service Validations• Application Service Level Controls• Compliance Audits

Infrastructure Dimension

Infrastructure	
Plan	<ul style="list-style-type: none">• Infrastructure Ownership Model• External Publication• Internal Publication• Unified Data Repository• Data & Information Interoperability
Document / Record	<ul style="list-style-type: none">• Infrastructure Asset Catalogue• Infrastructure Taxonomy• Operating Procedures
Execute	<ul style="list-style-type: none">• Education & Awareness• Infrastructure Change Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Infrastructure Issue Management• Infrastructure Service Levels Control• Compliance Audits

Governance and Performance Dimension

Governance and Performance	
Plan	<ul style="list-style-type: none">• Guiding Principles• Success Measures• Improvement Plans
Document / Record	<ul style="list-style-type: none">• Data & Information Governance Model• Success & Quality Measures• Performance Metrics• Assessment Procedures• Assessment Results• Improvement Plans• Audit Procedures
Execute	<ul style="list-style-type: none">• Education & Awareness• Performance Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Performance Controls• Service Level Controls• Data & Information Audits

Standard Dimension

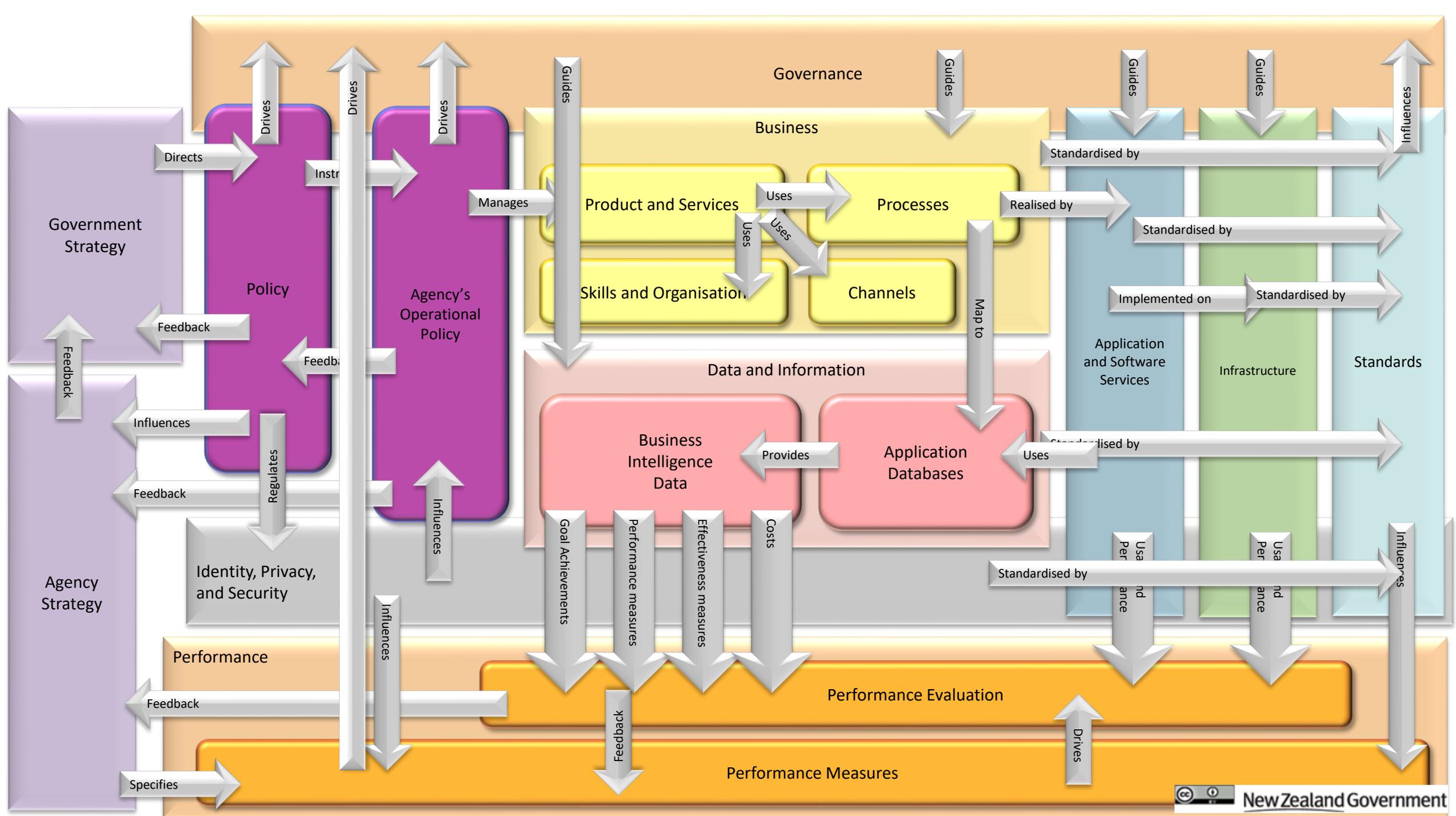
Standard	
Plan	<ul style="list-style-type: none">• Standard Management
Document / Record	<ul style="list-style-type: none">• National & International Standards
Execute	<ul style="list-style-type: none">• Education & Awareness• Standard Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Standard Validations• Compliance Audits

Identity, Privacy, and Security Dimension

Identity, Privacy, and Security	
Plan	<ul style="list-style-type: none">• Privacy & Security Management
Document / Record	<ul style="list-style-type: none">• Security & Privacy Policy, Regulations & Laws• Threat & Vulnerability Model• Risk Management Procedures
Execute	<ul style="list-style-type: none">• Education & Awareness• Privacy & Security Management• Risk Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Privacy & Security Validations• Compliance Audits

Strategy, Investment, and Policy Dimension

Strategy, Investment, and Policy	
Plan	<ul style="list-style-type: none">• Executive Sponsorship• Goals & Objectives• Plans & Roadmaps• Roles & Responsibilities• Terms of Reference
Document / Record	<ul style="list-style-type: none">• Goals & Objectives• Plans & Roadmaps• Roles & Responsibilities• Data & Information Quality Assurance• Data & Information Change Management
Execute	<ul style="list-style-type: none">• Education & Awareness• Data & Information Change Management
Control / Monitor / Evaluate	<ul style="list-style-type: none">• Organisational Capability Review



Business Discovery Process

Business Discovery Template

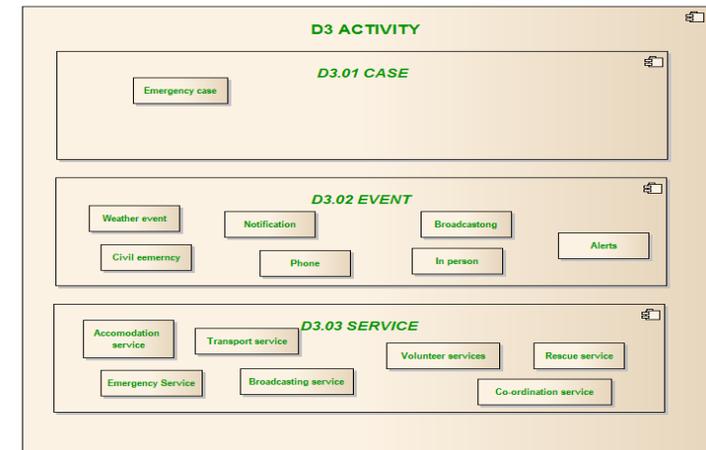
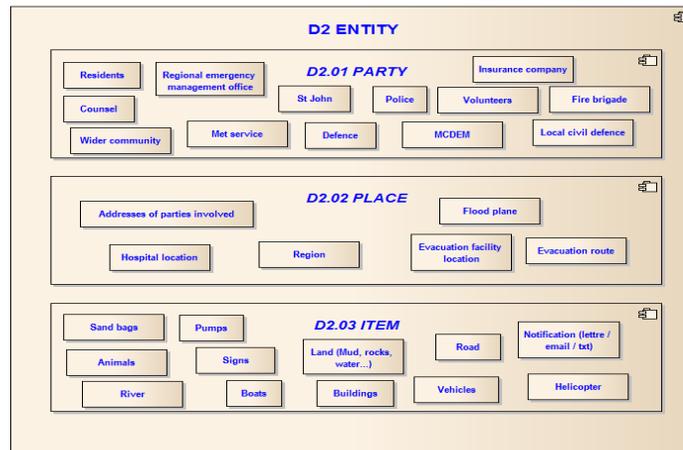
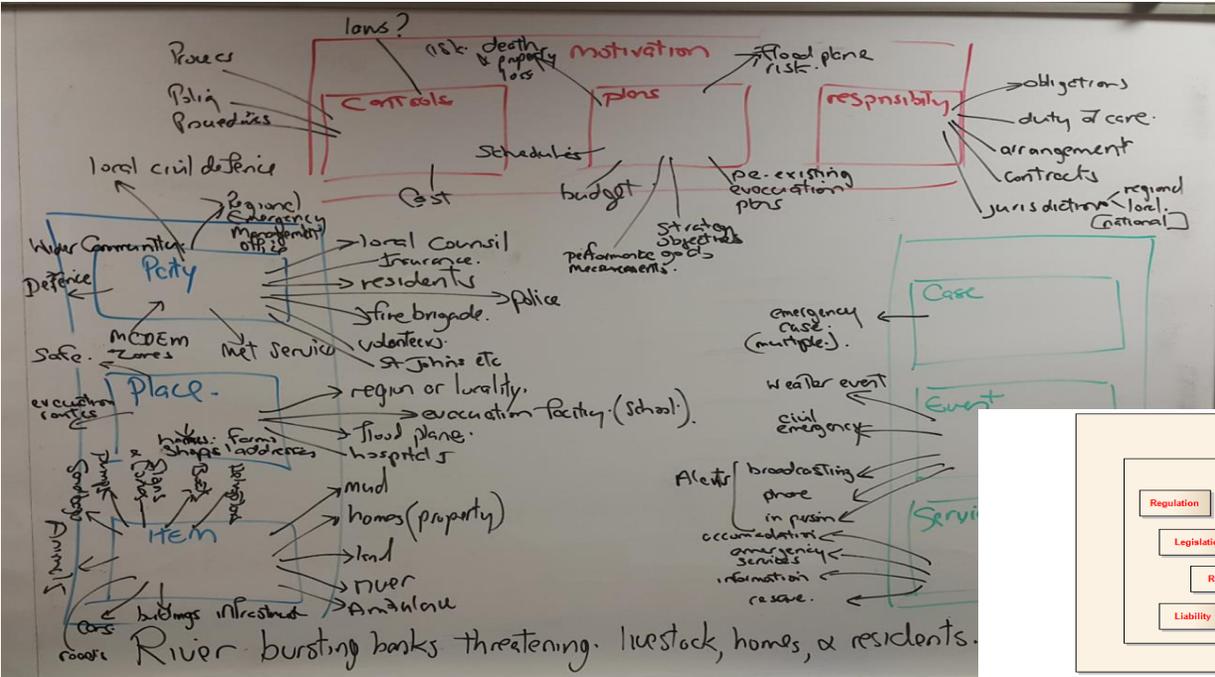
<p>Plans</p>	<p>Motivators Controls</p>	<p>Contracts</p>
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<p>Entities Parties</p>
<p>Places</p>
<p>Items</p>

<p>Activities Cases</p>
<p>Events</p>
<p>Services</p>

Scenario:

Business Discovery Example



Information Asset Catalogue

- **CORE ATTRIBUTES**
- **CUSTODIANSHIP AND LIFECYCLE**
- **DISPOSAL**
- **INFORMATION ASSET DESCRIPTION AND CONTEXT**
- **VALUE AND IMPACT**
- **PROVENANCE AND DATA QUALITY**
- **SECURITY AND PRIVACY CONSIDERATIONS**
- **USAGE SHARING AND REUSE**
- **TECHNICAL**
- **NOTES**

Information Asset Catalogue

CORE ATTRIBUTES

- Agency Unique Identifier
- Full and Brief Name
- Description and Size
- Agency Custodian
- Authoritative / Public Register
- Legislation
- Business Services

CUSTODIANSHIP AND LIFECYCLE

- Asset Custodian
- Asset Steward
- Statutory Custodian Title
- Frequency of updated
- Approval of updates
- Current or non-current Information Asset
- Date range of Information Asset
- Annual growth rate
- Associated historical Information Assets

DISPOSAL

- Disposal authority
- Disposal actions
- Retention period or disposal trigger
- Archival privacy and security considerations
- Disposal date

SECURITY AND PRIVACY CONSIDERATIONS

- Formal security-classification
- Personally Identifiable Information
- Privacy Act purpose and scope
- Any other restrictions

INFORMATION ASSET DESCRIPTION AND CONTEXT

- Summary of information stored
- Primary Function of Information Asset
- Primary Business Domain of Asset
- Primary Data and Information Domain/Subject of the Asset
- Containing Information Asset (if subset)
- Contained Information Assets (if superset)
- Consumer - Internal & External
- Geographic range of information asset
- Population range of information asset

VALUE AND IMPACT

- Value / significance of asset to Agency / Sector / NZ
- Impact of loss of Information Asset to Agency / Sector / NZ
- Value of asset - Economic & Social Outcomes
- Value of asset - Transparency & Democratic Outcomes
- Value of asset - Efficiency Outcomes

PROVENANCE AND DATA QUALITY

- Method of collection
- Data quality assurance mechanisms
- Data quality caveats
- Data quality statement
- Data quality expectations
- Applicable conformance to controlled vocabularies or standards

USAGE SHARING AND REUSE

- Data Sharing Arrangement/s
- Data Sharing Mechanisms
- Copyright
- Where Published
- Open Data
- Data model reference
- Data definition reference

TECHNICAL

- Source Type
- Source Business System(s)
- Source Storage Format
- Output Format(s)
- Applicable conformance to technical standards

Value Of Information

Information Valuation Methods

Foundational Measures

- Intrinsic Value of Information (IVI)
- Business Value of Information (BVI)
- Performance Value of Information (PVI)

Financial Measures

- Cost Value of Information (CVI)
- Market Value of Information (MVI)
- Economic Value of Information (EVI)

Criteria to Value Information

- Accessibility
- Flexibility
- Integration
- Reliability
- Timeliness / Speed
- Security
- Accuracy / Precision
- Applicability
- Completeness
- Convenience
- Conciseness
- Consistency
- Currency
- Format / Clarity
- Traceability

System Quality

$$\frac{\sum (\text{Score} * \text{Criteria IW})}{\sum (\text{Criteria IW})}$$

Information Quality

$$\frac{\sum (\text{Score} * \text{Criteria IW})}{\sum (\text{Criteria IW})}$$

- Information Satisfaction
 $\sum \text{Quality Score} / 2$
- Operability
- Attractiveness
- Learnability
- Fun
- Efficiency
- Maintainability
- Context Coverage
- Freedom from Risk
- Effectiveness

Usability / Usefulness / Utilisation
↓
for User

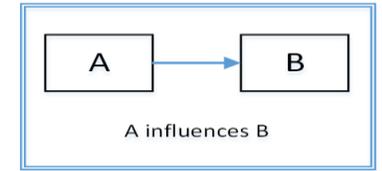
*(Score Info. Satisfaction +
 $(\sum (\text{Score} * \text{Criteria IW})$))*

$$\frac{\sum (\text{Additional Criteria IW})}{2}$$

Usability / Usefulness / Utilisation
↓
for Agency / Sector / Government / Country

$$\frac{\sum (\text{Score} * \text{Criteria IW})}{\sum (\text{Criteria IW})}$$

Information Value

$$\frac{(\text{Score U/U/U for User} + \text{Score U/U/U for A/S/G/C})}{2}$$


- A Very Important
- A Important
- A Somewhat Important
- A Not Important

Importance Weight (IW)

Score Information Asset, that needs to be Conform, between:
3 to 1 degree of conformity
0 - Does not conform

Very Important	3
Important	2
Somewhat Important	1
Not Important	Remove the criteria

Survey to Identify Criteria

Efficiency

- How many times per week do you use the information asset?
- How many minutes do you spend reviewing and using the information asset each time you receive it?
- How long does it take to completely review and understand the content of the information asset?

Quality

- How happy are you with the correctness of the information asset?
- How comprehensive is the information asset?
- How dependent are you on the information asset?

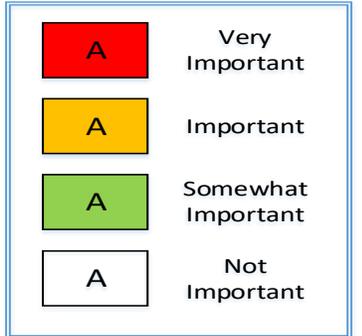
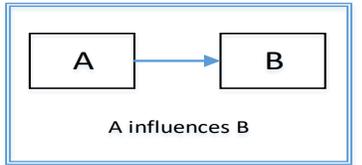
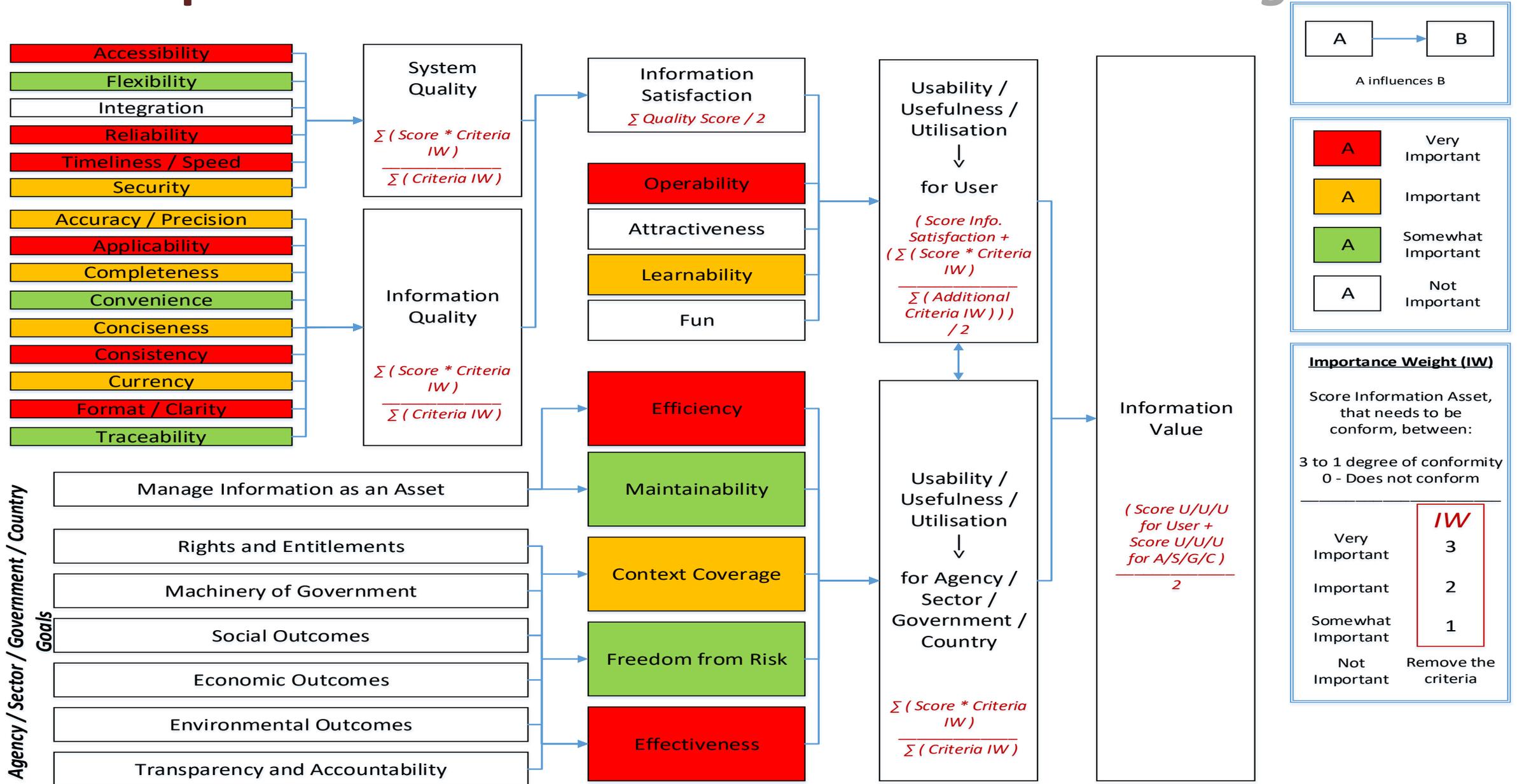
Decision Making

- What kind of decisions do you make based on the information asset?
- How sure are you in making the right decision based on the information asset?
- Would you be able to make the same decision WITHOUT having access to the information asset?
- How sure are you in making the right decision WITHOUT having access to the information asset?
- What is the alternative if you would not have access to the information asset?
- How much time do you save with this information asset?

Effectiveness

- Can risks to the organisation be avoided based on the information asset? If so, to what extent does it help?
- To which goals does the information asset contribute?

Example of Value Calculation for *Decision Making*



Importance Weight (IW)

Score Information Asset, that needs to be conform, between:
3 to 1 degree of conformity
0 - Does not conform

Very Important	IW 3
Important	2
Somewhat Important	1
Not Important	Remove the criteria

Q

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A