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Actuarial point of view: Data quality management

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Data Quality Management

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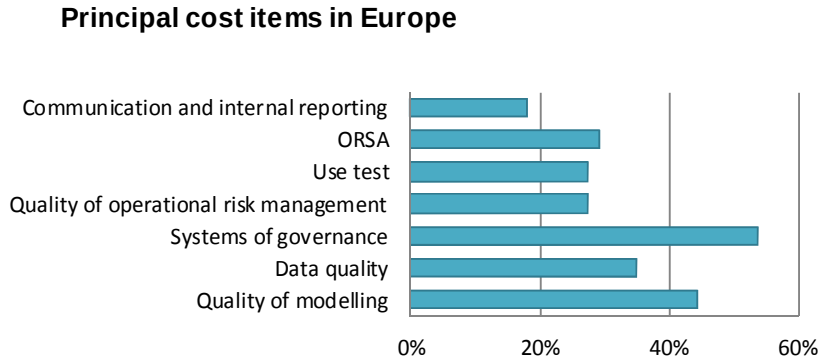
Data Quality Management

Introduction

Importance of data quality in Solvency II

Data quality is one of the central themes of Solvency II

- Solvency II has major implications for insurance companies in terms of both risk management and internal control
- Data represent a key budget item under the reform



Source: PwC Solvency Survey

- Basel II feedback: the systematic underestimation of data-related compliance issues has led to the maintaining of stop-gap solutions (short cuts, proxies, etc.) that prove more costly in the long run.

Data quality benefits

1. Cost

- Identify opportunities for cost-take out in knowledge workers
- Reduce head count and time lines for delivery
- Avoid regulatory fines
- Manage data better to reduce hardware costs
- Reduce data redundancy

2. Risk, compliance, and security

- React to regulatory pressure for greater transparency and reporting
- Meet increased personal accountability for executives to endorse all aspects of the business
- Manage online fraud and data security
- Avoid data disasters

3. Value enablement

- Deliver on strategic business objectives
- Be able to answer the most important business questions
- Business and technology enablement via governed enterprise data assets
- Prioritize activities based upon value
- Stakeholder/customer satisfaction

4. Operational excellence

- Reduce errors that lead to cost, risk, and value reduction
- Provide an approach to stop data quality issues from occurring in the first place
- How much data quality issues cost the business – often master data

5. Business and IT alignment

- Reduce cross team duplication
- Decrease implementation time
- Reduce technology complexity
- Optimize existing technology investments
- Streamline operational support/services

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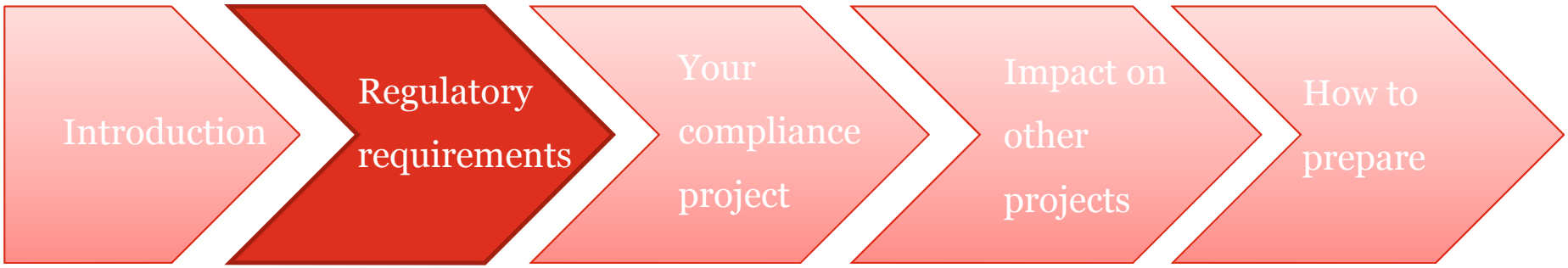
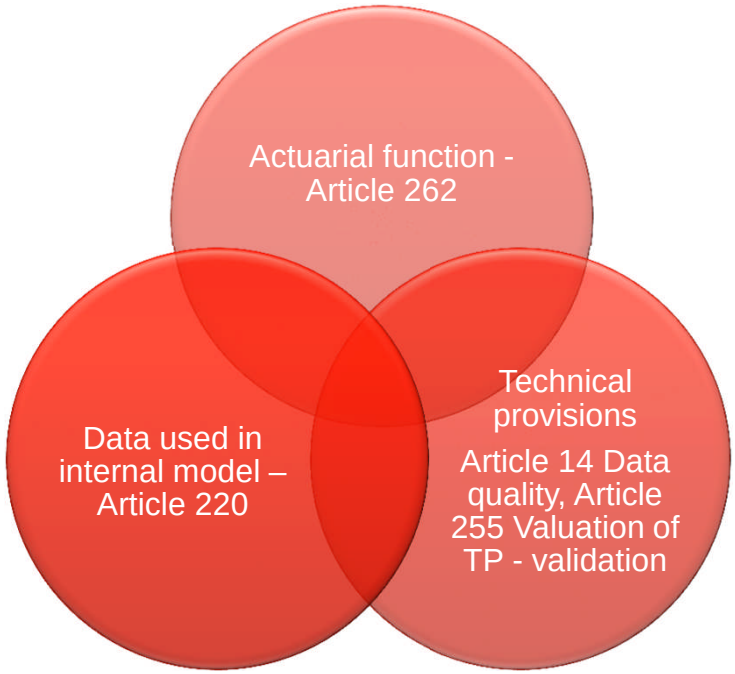


Regulatory requirements
Data quality related to actuaries

"The actuarial function shall…

…draw conclusions on the appropriateness, accuracy and completeness of the data and assumptions used as well as on the methodologies applied in their (best estimate) calculation." (Article 262)

"Data needs to be collected, processed and applied in a transparent and structured manner based on:
(i) the definition and assessment of the quality of data;
(ii) assumptions made in the collection, processing and application of data;
(iii) the process for carrying out data updates." (Article 14, 3e)



"…an estimation error in the calculation of the technical provisions shall be considered material where it could influence the decision-making or the judgement of the users of the calculation result, including the supervisory authorities." (Article 14, 3)

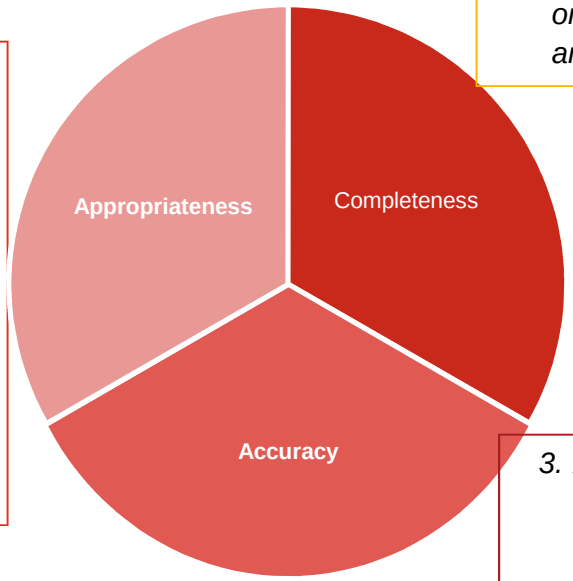
Regulatory requirements

Data quality imperatives: 3 key themes

Data do not contain biases which make them unfit for purpose

1. *How far back should historical data go for mass risks like motor liability and for major risks?*
2. *Do we have consistently detailed information on group portfolios across distribution networks and the corporate size range ?*

6. *Do we have an homogeneous level of details for individual data within group portfolios?*
7. *Which age limits should be applied for monitoring data produced by the system?*
8. *Relevance of birth date 01/01/1900?*
9. *Degree of accuracy of age calculation: within 1 month, 6 months, or year-based?*



Databases provide comprehensive, comparable information on all portfolios

Reference to the degree of confidence that the organisation places in the data

3. *Are the financial returns used by the internal model to calculate best estimates consistent across the company for given accounting base ?*
4. *Do expense levels stipulated in the underwriting policy match commission levels as per accounting records?*
5. *Are options and contractually guaranteed cover effectively taken into account, together with their impact on solvency monitoring and measurement?*

Dimensions of data quality improvement

Data quality can be measured across quantitative and qualitative dimensions.

Measurable dimensions for data quality		**Intangible dimensions**	
Dimension	Description	Dimension	Description
Accuracy	Does the data accurately represent reality or a verifiable source?	*Relevance*	Every piece of information stored is important in order to get a true business representation.
Integrity	Do broken links exist between data that should be related?	*Usability*	The stored information is usable by the organization with ease.
Consistency	Is there a single representation of data?	*Usefulness*	The stored information is applicable for the organization.
Completeness	Is any key information missing?	*Believability*	The level to which the data is regarded as true and credible.
Uniqueness	Is the data value unique, i.e. no duplicate values or records?	*Unambiguous*	Each piece of data has a unique meaning, and can be easily comprehended.
Accessibility	Is the data easily accessible, understandable, and used consistently?	*Objectivity*	Data is objective, unbiased and impartial i.e., it does not depend on the judgment, interpretation, or evaluation of people.
Precision	Is data stored with the precision required by the business?		
Timeliness	Is the information update frequency adequate to meet the business requirements?		

Data quality involves more than just addressing historical data quality issues through data profiling and re-engineering. It involves preventing these issues from occurring in the first place. This is where data governance plays a major role.

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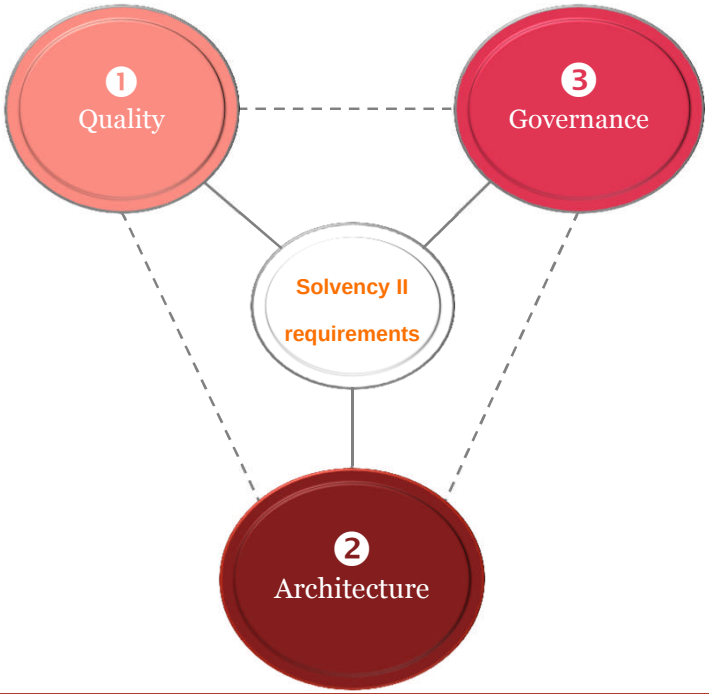
Data Quality Management

Your compliance project

Operational implementation

DESIGN

Implementation

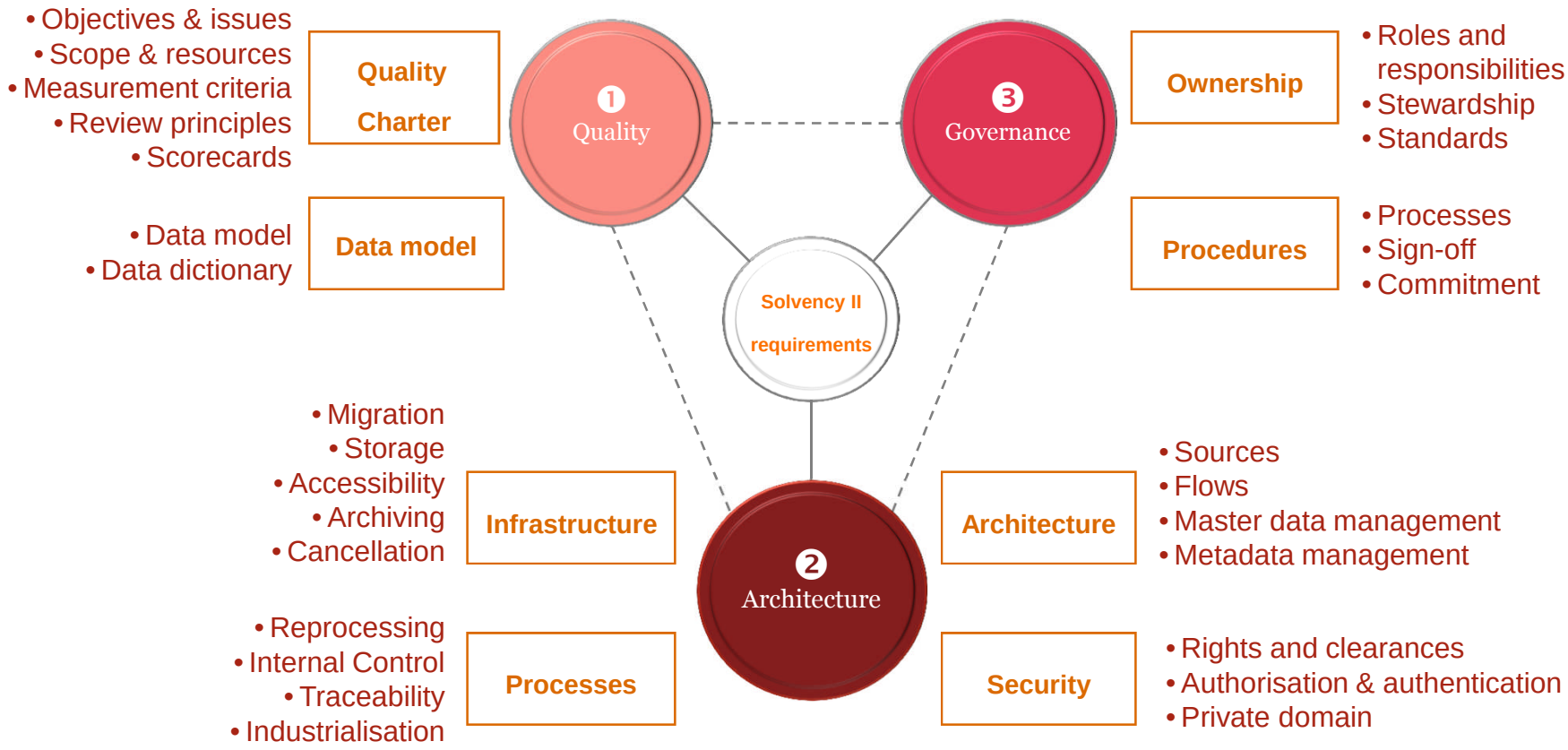


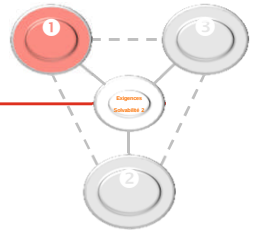
Specification of required standards of quality and performance

Automation
Tools parameterization – System Integration – Acceptance tests
Industrialisation

Your compliance project

Interaction between the three focuses and their content





Your compliance project

1 - Intrinsic (natural, essential) data quality

How to translate the three criteria be in measurable indicators of intrinsic data quality?

How can the policy for data quality be structured around the various indictors?

The approach to intrinsic data quality must permit the definition of the three following components:

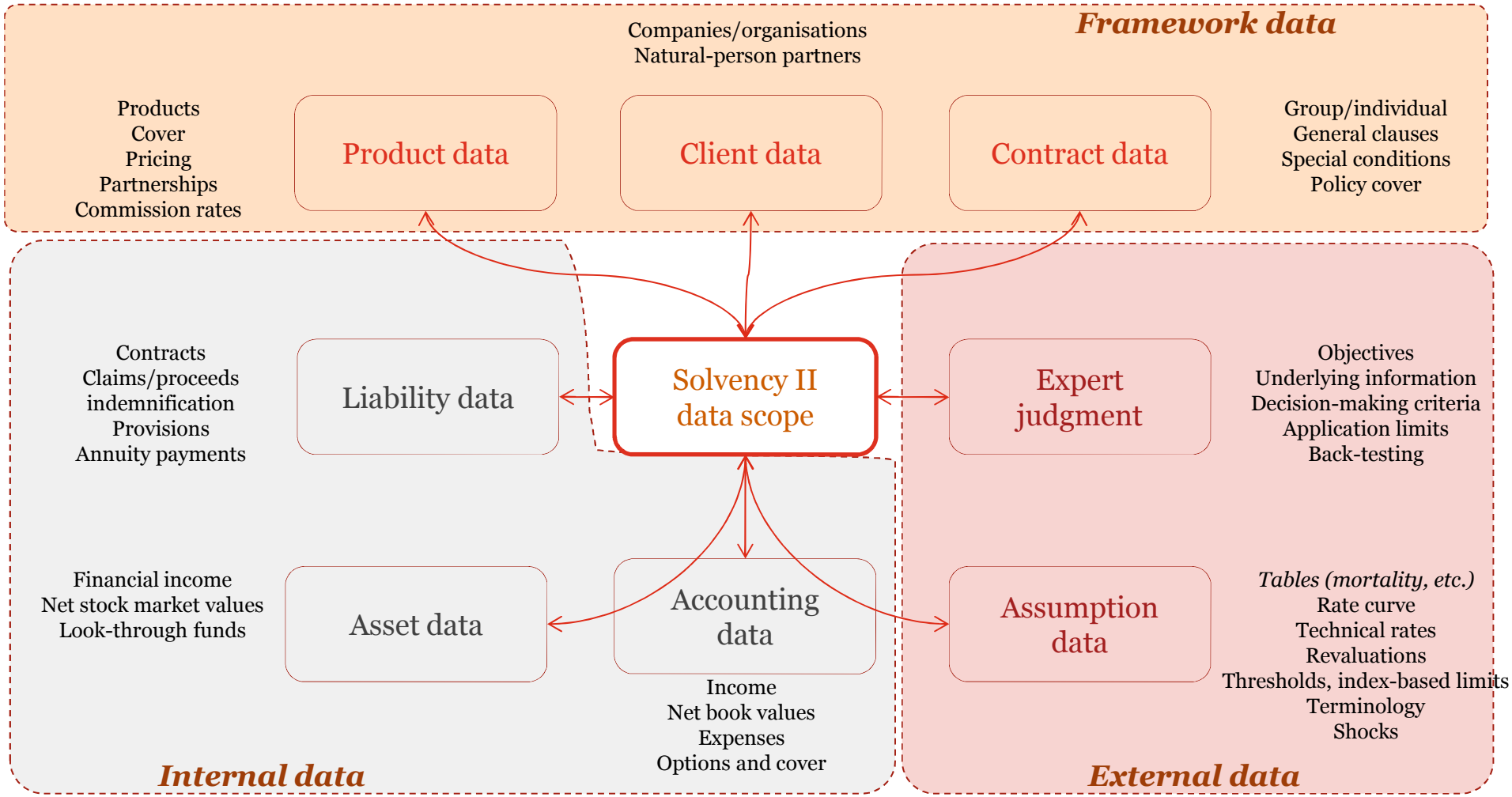
- **Scope** of data:
  - internal, external, framework
  - accounting, financial, life/non-life liabilities, assets, etc.
  - Expert judgment

- Quality **measurement indicators:**
  - How can the three criteria of completeness, accuracy and appropriateness be reflected in measurable indicators?
  - Which indicators should be used for which reference frame?

- Management **policy** for data quality:
  - Which processes should be specifically designed for the calculation of indicators?
  - Which reviews should be performed and how frequently?
  - How far back should historical data go?
  - How should supporting evidence be archived?

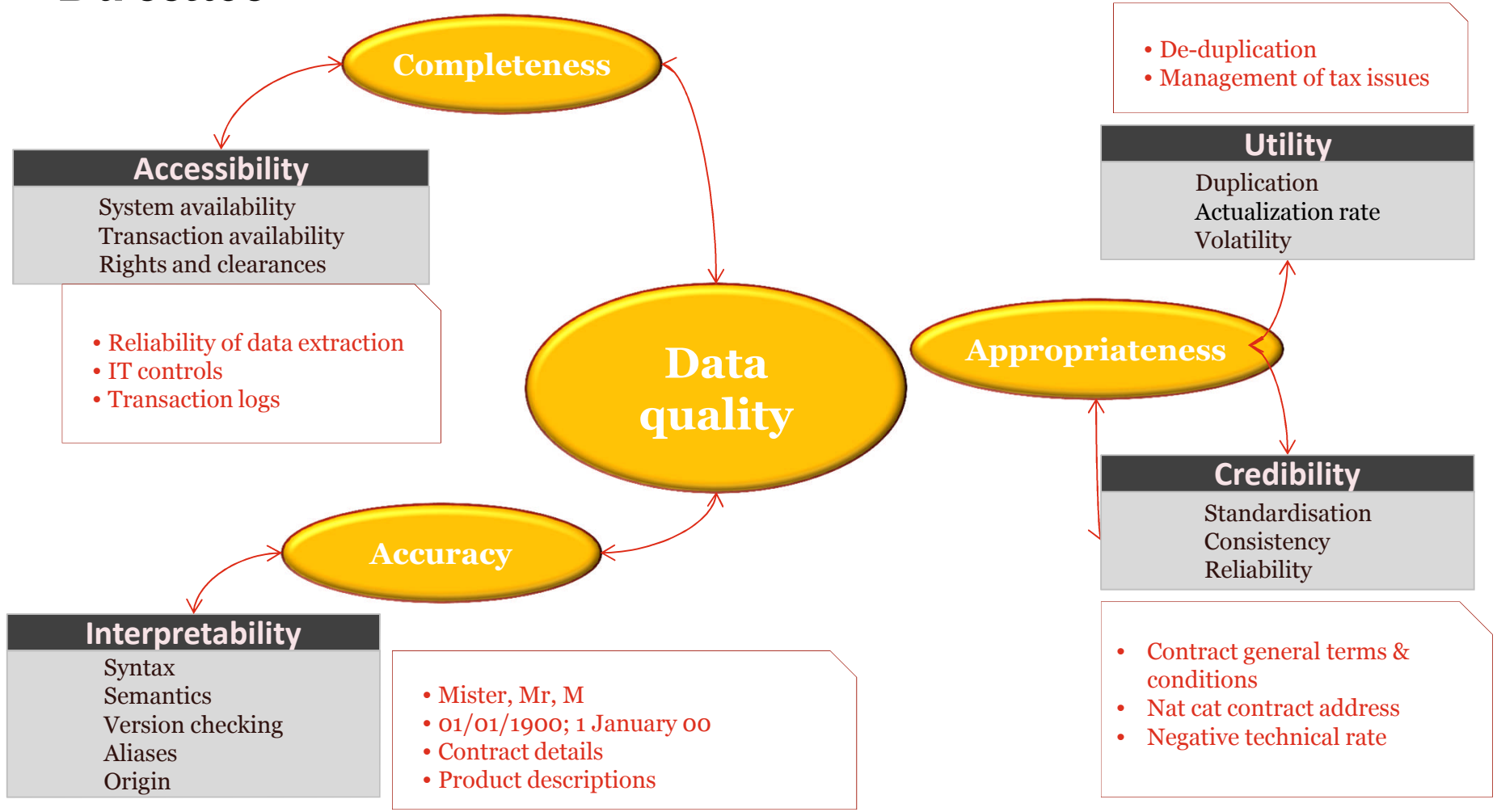
Your compliance project

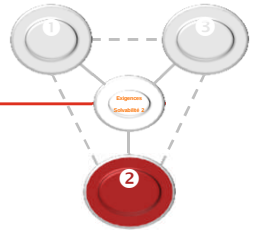
Data scope



Your compliance project

Criteria for measuring data quality under the Directive





Your compliance project

2 – Data architecture

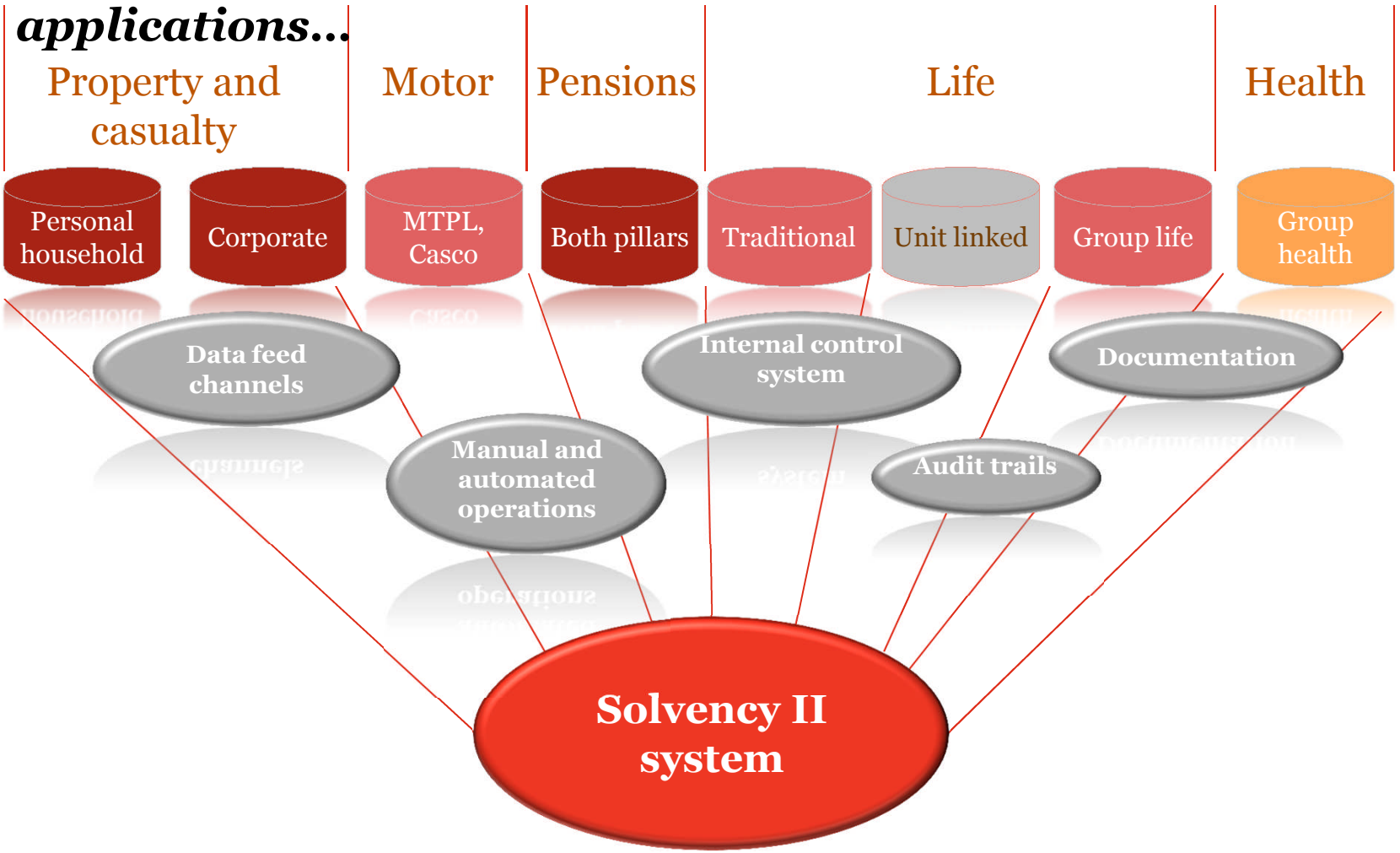
The burden of proof requirement creates a need for very detailed system documentation.

The control environment must be integrated into system design.

- Data architecture
  - Identification of data feed channels
  - Record of data management operations
  - Mapping of processes and flows
  - Implementation of controls over all data management processes
  - Traceability
- The required level of automation will depend on the volume of data to be handled, the frequency of regulatory calculations, and the extent and level of detail of Quality reviews
- The extent of automation will influence the level of industrialisation and, therefore, the selection of tools to be integrated into the Solvency II system
- All aspects of the system must be transparent and accessible to the regulator

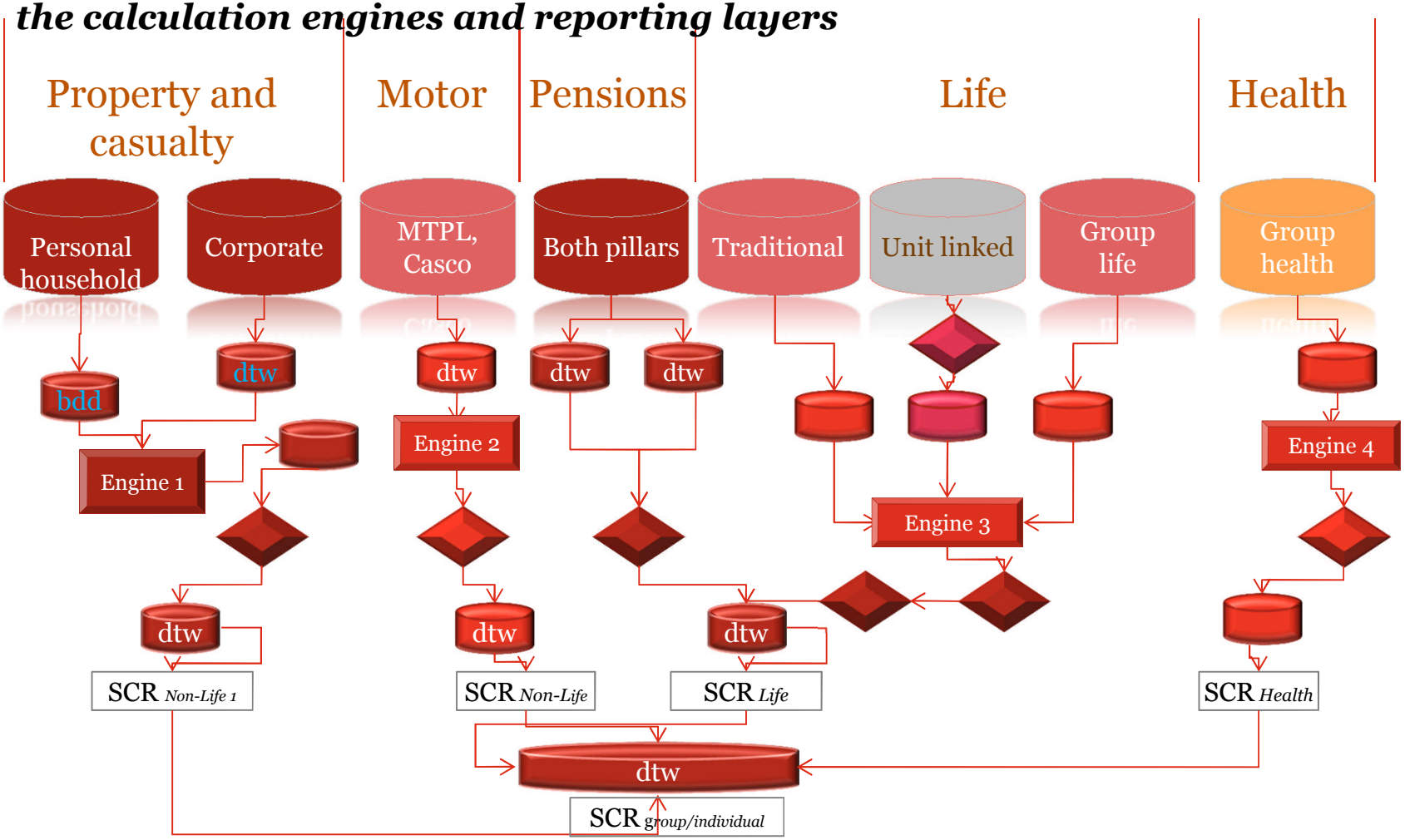
Your compliance project

Roll out the approach as per business lines and applications…



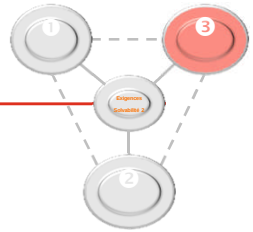
Your compliance project

… and each data channel from one business application down to the calculation engines and reporting layers



Your compliance project

Our experience shows that needs are wide-ranging and that integration is the appropriate solution.



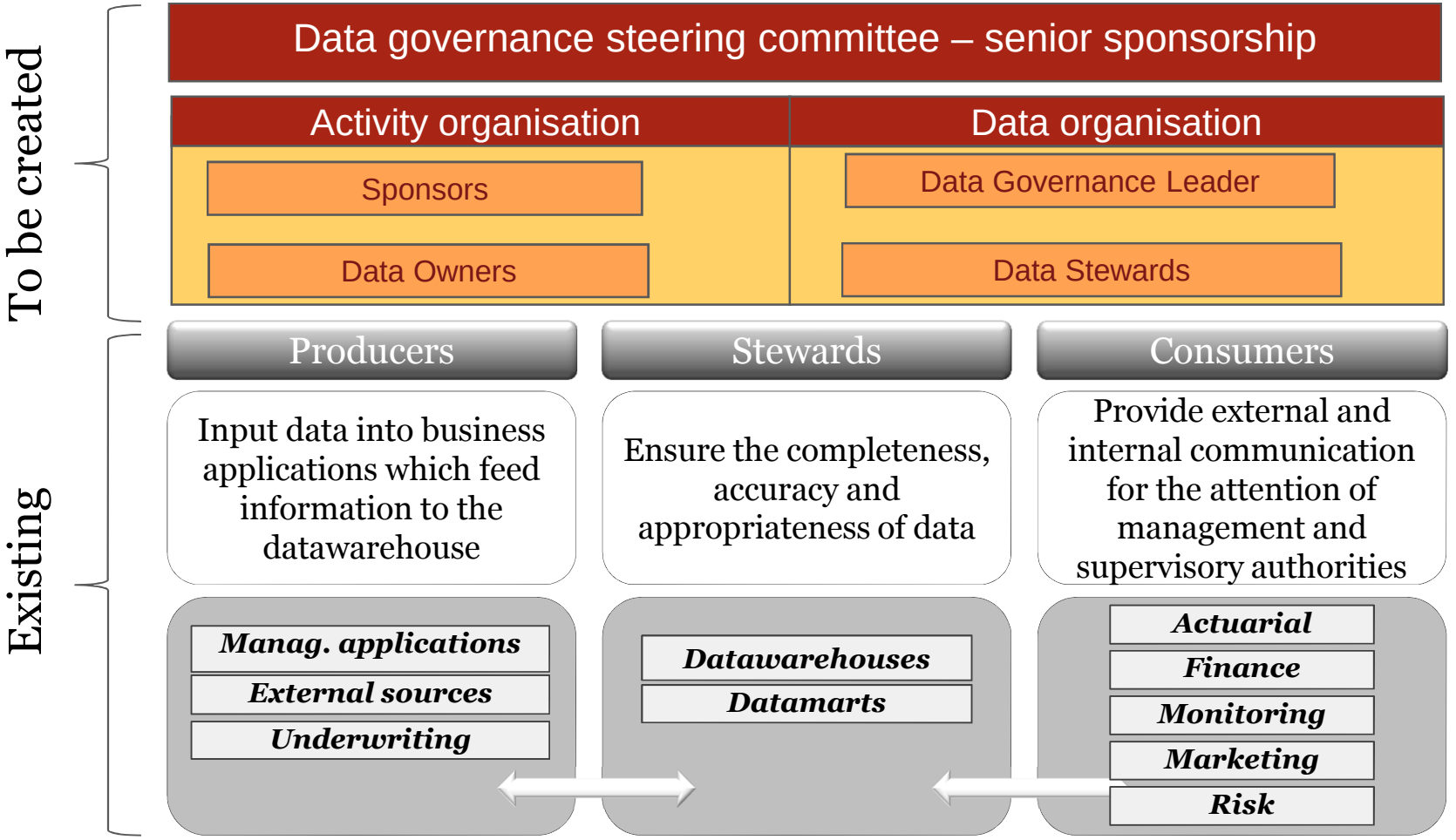
Your compliance project

3 - Governance

The organisation and resources required must be put in place to ensure demonstrable control over the risk data processing chain

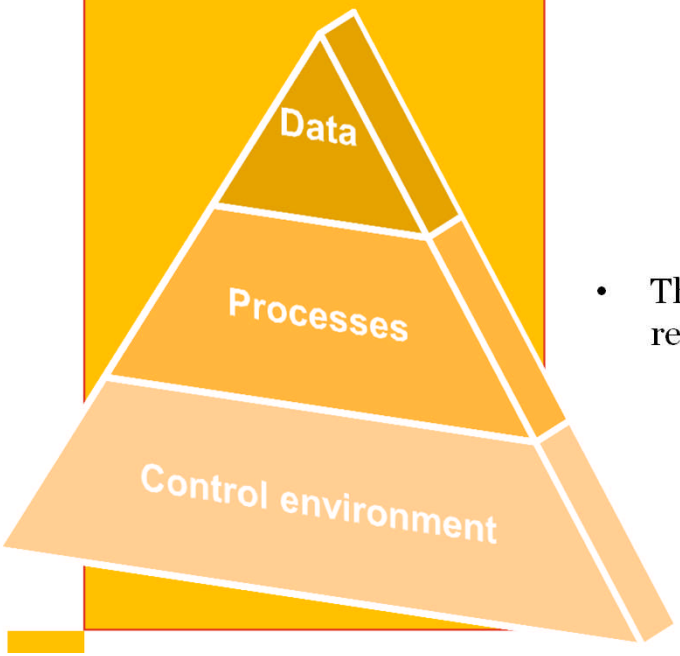
- Governance in respect of data quality encompasses the following areas:
  - **Roles and responsibilities**
    - Who decides?
    - Roles and responsibilities
    - Committee system
  - **Resources**
    - Data quality policy
    - Procedures guide: timing, sign-off
    - Delegation levels, procedures for detecting threshold breaches, remedial action plans and related monitoring
  - **Links with other corporate bodies:**
    - Permanent control
    - Internal control
  - **Integration into the existing organisation**
    - Technical & Financial departments
    - Risk Management and IT departments

Your compliance project
Embedding data governance within your organisation



Your compliance project
The control environment for data

A reliable internal control framework to ensure data integrity



- Given the requirements concerning data, **an effective internal control system is a pre-requisite**
- This means a **permanent framework** which strengthens the undertaking's operational environment through control measures that permit effective risk management and prevent deficiencies.
- The control system should provide **reasonable assurance** that:
  - All strategies, policies and procedures defined are effectively and efficiently implemented within the organisation.
  - Regulatory requirements are complied with.
  - **Financial and non-financial data** are reliable, i.e. of satisfactory quality and complete.
- The reliability of the control environment must be ensured in respect of :
  - **Business** processes (e.g. verification of reserve adequacy)
  - **IT** processes (e.g. data access checks)

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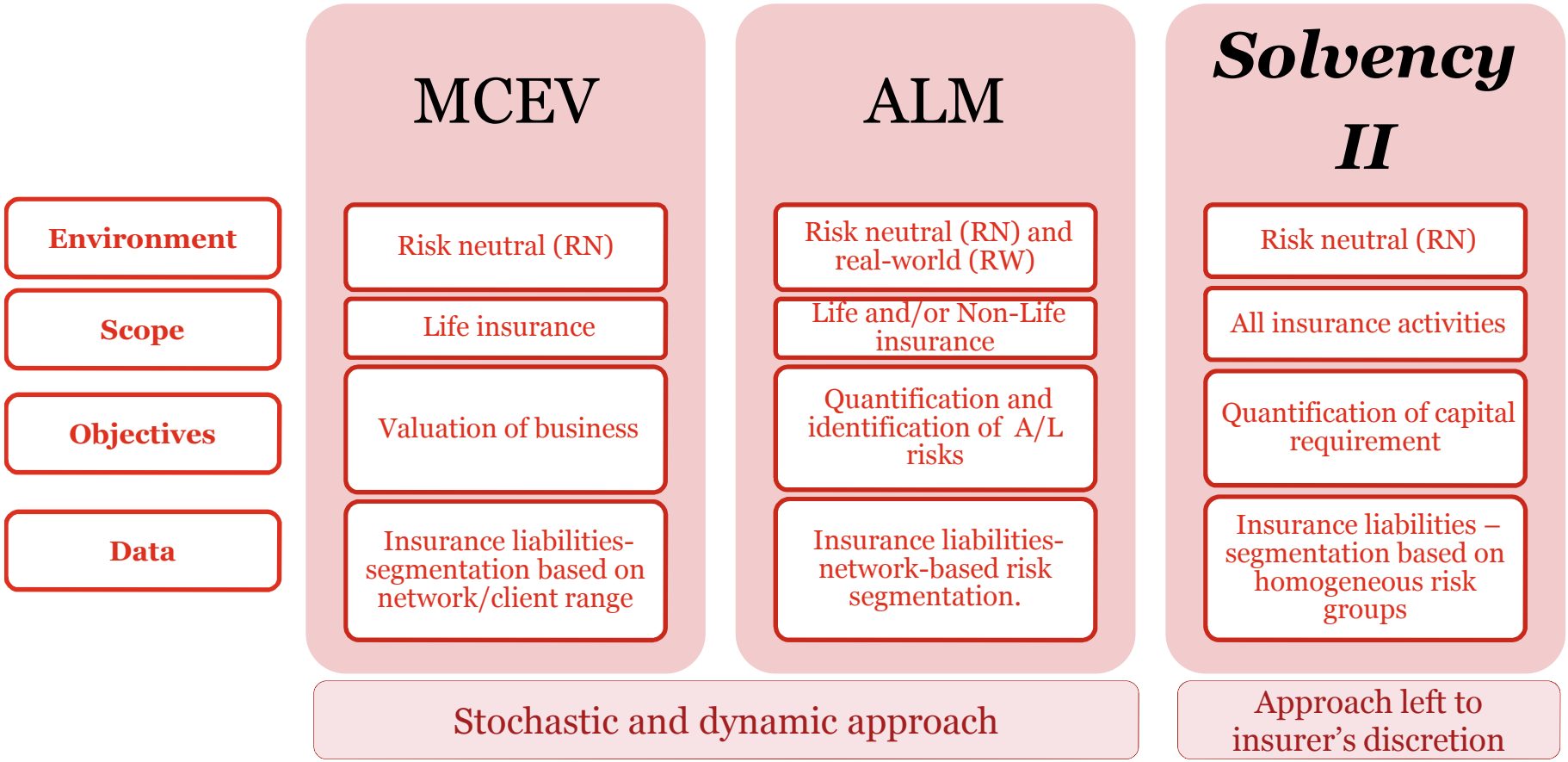
Impact on on other projects

Solvency II and the MCEV and ALM frameworks



Impact on other projects

Solvency II and IFRS 4 Phase 2: anticipating the impact

The proposals contained in the exposure draft will affect all entities which issue contracts that meet the definition of an insurance contract

- ***Reminder of differences regarding data scope:***

	IFRS 4 Phase 2	Solvency II
Contract data	Pooling based on underwriting period and/or expected duration	Pooling based on homogeneous risk groups
Assumption	Discretionary discount rate	Prescribed discount rate

- ***What to do***
  - In an internal model context, allow for data generation and feed processes which facilitate impact studies on data aggregation methods
  - Emphasise model data feed automation.

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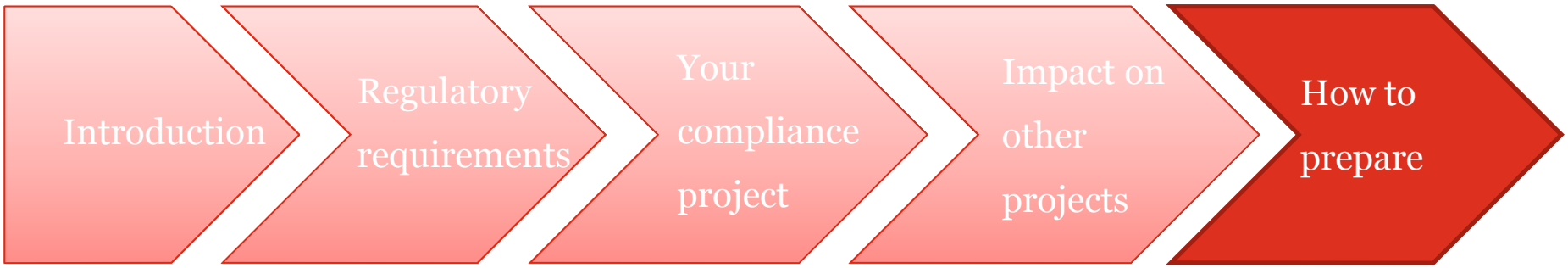

How to prepare

Possible approach

Map, analyse and take remedial action

Start with priorities derived from Gap Analysis, where appropriate, and prepare the following deliverables, at least:

Data dictionary	•Identification of all data concerned
Mapping of source systems	•Record sources (management applications, core systems, data warehouses, databases relevant for key data)
Process and flow mapping	•Model all feed channels •Record and document all existing controls
Risk and control matrix	•Mapping of risk •Definition of risk/control/process matrices
Data quality policy	•Data governance (roles and responsibilities, procedures), data quality, data security,…

Thank you for attention