Data Quality
Improving Business Decisions While Addressing a Key Solvency II Requirement
With Solvency II, many insurers look at data quality as primarily a regulatory issue, especially in light of the explicit link between data quality and capital requirements. However, investing in data management can also help enhance decision making, since the availability of more detailed and more accurate data can improve the organization’s ability to understand the company’s “health” and identify the levers used for managing essential activities and, ultimately, financial results.

Many insurers are now seeking ways to address Solvency II requirements related to data quality while obtaining real business value from their investments. The Solvency II directive is generic and offers little in the way of specific recommendations. The question, therefore, is how to transform the data required for Solvency II into a reliable source of information for decision making.
Data management can still be improved at most insurance companies

Uncertainty over data quality can have real costs for insurers. Such uncertainty can lead to over-coverage of risks, resulting in the additional consumption of capital.

In many cases, insurers have added new applications to legacy systems, creating complex, multi-layered and redundant IT architectures. This can lead to data duplication and less-than-optimal processes, raising concerns around data quality and making it difficult for the organization to get a broad view of data. Specific problems include:

- The use of semi-automated solutions can create the risk of erroneous processing as well as incomplete traceability from sources to results. This can also force users to capture the same data more than once within the systems.

- The lack of unique and shared definitions as well as weak quality controls in place on data flows and data sources — not only for internal data but also for external data provided by third-parties such as brokers or other business partners, including asset managers or reinsurers.

- A lack of common repositories to store master data, possibly resulting in difficulties in data matching when performing consistency controls (for example, between accounting and actuarial data).

Due to these and other problems, insurance companies are under considerable pressure to address the data quality issues resulting from their non-integrated features and processes.
Solvency II regulation is pushing hard to improve data quality and data governance

Data quality
The Solvency II regulation highlights the importance of data quality. Three major consultation papers (CP 33, 43 and 60), cross-referencing each other, provide directives on data quality, especially for technical provisions, model designs and computations.

According to these consultation papers, the data should be:

• **Accurate:** data must be sufficiently accurate to avoid material distortion of the model output;
• **Complete:** databases must provide comprehensive information for the undertaking; and
• **Appropriate:** data should not contain biases which make it unfit for its intended purpose.

Solvency II requirements on data, however, are not limited to data quality. The new regulations recognize the need for dedicated data governance to enable continuous improvements in ensuring data quality over time. Although patchwork fixes may provide temporary improvements, without effective data governance, data may degrade over time.

Data governance
Data governance is commonly understood as the policy, organization, processes and control procedures which collectively describe and enforce the appropriate data management rules.

If Solvency II is very clear on the risks pertaining to poor data management (capital add-ons to the Solvency Capital Requirement), it allows some interpretation as to the implementation of data quality assessment and monitoring.

Consideration should be given to approaching data governance systematically with the intention of developing a permanent structure. It may be beneficial, therefore, for particular attention to be given to roles and responsibilities related to data quality, since data quality may have to be aligned over time with the organization’s business needs and its processes and systems.

Beyond the regulation and compliance requirements, data can also fuel the organization’s monitoring and ultimately, its business decisions.

Improving data management helps unlock business value
Many insurance companies rely upon the most complete and accurate data possible to protect themselves against contingent losses and other uncertainties.

Despite the fact that insurers must deal with large quantities of data to identify risks and measure their exposure, they often do not make full use of the treasure trove of data at their disposal.

In addition to data used for performance management or risk and finance reporting, it can be beneficial if data also supports operations in a consistent manner across a wide range of activities, ranging from marketing to product development. Thus, improving data quality can be the first step in producing management reports addressing activities and decision making at all levels.
Getting started

Many insurance companies are accustomed to dealing with data quality issues, but the larger concept of data management can be more difficult to address, due to the amount of data and the number of processes to assess and monitor.

In the area of risk and finance, for example, insurers often are called upon to coordinate data initiatives related to projects such as local GAAP (Generally Accepted Accounting Principles), International Financial Reporting Standards (IFRS), and MCEV (Market Consistent Embedded Value) as well as Solvency II. Accenture has developed a four-step methodology to help insurers improve their data reliability:

1. Identifying the Solvency II necessary data as a starting point
2. Locating the data throughout the systems: tracing data flows, charting architecture and identifying gaps
3. Defining data quality standards through controls and key performance indicators (KPIs); and
4. Defining a data governance structure.

Step 1: Identifying the Solvency II necessary data as a starting point

Definition of the data is part of data quality management and it "comprises the identification of the needs in terms of data, a detailed description of the items that should be collected and the eventual relations between the different items." Consultation paper 43 – alinea 3.34.2

Our experience indicates that between ~200 distinct data fields (for P&C or Life insurance companies) up to ~450 distinct data fields (for specific lines of business, like credit insurance companies) are used in the Solvency II modeling and reporting processes.

Improving data quality involves identifying which data has to be monitored. The existence of a complete, updated, and shared data dictionary can strongly help in this matter.

It can be beneficial to demonstrate, as well, that data used for the three Solvency II pillars are properly identified and defined.

The first step in building the data dictionary is to analyze the data requirements, including a complete specification of each type of data (definition and usage). Consideration should be given to sharing the resulting documentation and making it readily available to both business and IT people.

It can also be beneficial for this data dictionary to be maintained over time through a dedicated set of governance principles outlining organization, processes, roles and responsibilities.

Step 2: Locating data throughout the systems: tracing data flows, charting architecture and identifying gaps

In Step 2, the insurer locates the data throughout its functional architecture, identifying source systems, their links (e.g., the types of interfaces) and dependencies, data feeding frequencies and existing controls on the data.

In identifying data flows, one goal may be to speed up the analysis by grouping the data into families. A given data family can be considered as a group of data belonging to the same functional topic and used by common systems. Liabilities, for example, can include the following information: client (name, address, age...), contract (contract number, contract duration...), product (denomination, guarantees, line of business...), premiums (amount, frequency...), claims (nature, date, amount of surrenders...).

Once data flows are identified and data located, it may then be possible to describe the existing controls between and within the systems that are established to ensure that the required data are monitored during their lifecycle.

Data location, data flows and data controls can provide a base to perform a high-level gap analysis between target requirements and as-is data architecture (at the data family level). The gap analysis, in turn, can help identify required improvements to data coverage, data flows simplification and data control coverage in the information system.
Example of a high level data mapping for an insurance company's Solvency II reporting requirement

<table>
<thead>
<tr>
<th>Insurance companies</th>
<th>2.1 Policies administration system and claims</th>
<th>2.2 Asset management systems</th>
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<tbody>
<tr>
<td>2.1.2 Life &amp; Non-life policies management systems</td>
<td>2.1.3 Claims management systems</td>
<td>2.1.4 Reinsurance systems</td>
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<td>2.3 Accounting and treasury systems</td>
<td>2.4 Actuarial systems</td>
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<td>2.5 Storage systems</td>
<td>2.6 Consultation and reporting systems</td>
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<td>2.7 ALM systems</td>
<td>2.8 Other systems</td>
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<thead>
<tr>
<th>Data usage</th>
<th>Solvency II reports</th>
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<tbody>
<tr>
<td>1</td>
<td>Balance sheet (local GAAP)</td>
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<tr>
<td>2</td>
<td>Balance sheet (IFRS)</td>
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<tr>
<td>3</td>
<td>Balance sheet (Solvency II)</td>
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<tr>
<td>4</td>
<td>Own funds and analysis of changes</td>
</tr>
<tr>
<td>5</td>
<td>SCR calculations</td>
</tr>
<tr>
<td>6</td>
<td>MCR calculations</td>
</tr>
<tr>
<td>7</td>
<td>Assets</td>
</tr>
<tr>
<td>8</td>
<td>Technical provisions</td>
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<td>9</td>
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<td>13</td>
<td>Technical provisions</td>
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<tr>
<td>14</td>
<td>Reinsurance</td>
</tr>
<tr>
<td>15</td>
<td>Underwriting risks</td>
</tr>
</tbody>
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Step 3: Defining data quality through controls and KPIs

The Solvency II Consultation Papers define data quality management as a continuous process designed to assess the accuracy, the completeness and the appropriateness of the data. This process consists of four major areas as represented in Figure 1.

The measurement of data quality through KPIs can represent a significant amount of recurring work. It can be beneficial for the KPIs to be pragmatically defined, first by articulating data quality business rules, then by designing measurable KPIs based on compliance with or violation of those rules, ending with the definition of how, where (within the information system) and when KPIs should be measured.

A first set of data quality business rules can be developed from existing data controls (with thresholds to be further defined); these can then be extended to the targeted scope from the previous data mapping, while conforming to the standard dimensions of data quality. Starting with the principles of accuracy, completeness and appropriateness can help the insurer reach its Solvency II requirements. Extending these to the principles of consistency (a lack of conflicting information coming from distinct data), duplication (a lack of duplication of the same data), integrity (a lack of missing or inconsistent link across different sets of related data), and timeliness (a timely availability of data) can further an organization’s efforts to secure quality data.

It should be noted that not all rules violations have the same importance and so, it may be that they should not be treated the same way. For instance, it may be beneficial for data quality metrics to consider the percentage of items violating a rule instead of observing individual item violations and these data quality metrics should be weighted according to their criticality. Defining acceptable ranges for KPIs may be necessary, as achieving a 100 percent score in data quality is in many cases unrealistic and may in fact be counterproductive. One goal may be to find the most appropriate balance between the expected benefit from improved data quality and the cost to achieve it.

Once the data quality measurement is defined, the next step is to set targets for the resulting KPIs. These targets may be shared with all stakeholders based on their roles and responsibilities.

It may be beneficial to measure business rules compliance or violation, and calculate KPIs from the raw data frequently. Since these activities are typically repetitive and workload intensive if performed manually, automating them by setting up new measures in existing applications or new tools to implement the measures may be beneficial.

Once the KPIs are specified, the set of data quality reports can also be defined. This can represent a key contribution to the overall data quality, and over time can facilitate the monitoring of data management processes at the operational level, and enable reporting on the quality of data at all levels of the organization.

A large set of tools and features, such as desktop reporting, enterprise-wide web based reports and scorecards — including drilldown, alerts and customization are available to support data quality reporting. Reports can be published via third-party dashboard tools and then integrated into management processes such as company performance management.

Defining a data quality capability through appropriate business rules, KPIs and reporting can be a big step towards enabling a clear "vision" of data at every level of an insurance company. Accomplishing this often requires a dedicated organization focused on putting in place action plans, and implementing and running data quality processes.

Figure 1. The Accenture process for data quality management
Step 4: Defining a data governance structure

It can be beneficial to plan and sponsor the implementation of data governance at specified levels of the company, with involvement from both business and IT resources.

Although titles (data stewards, data priests, data czars) may vary, distinct roles can be assigned to better cover the activities listed in Figure 2.

As for data governance, though it may be very company-specific, its main objectives are often the same: to foster an environment in which standard data management processes are aligned with business needs; to allow the identification of data quality issues close to where they arise; and to escalate them at the right level of the organization for decision and remediation.

The Solvency II directive and corresponding consultation papers refer to four key functions for the system of governance:

1. The Risk Management Function shall assist management in designing, implementing and monitoring the risk management system. The risk management system covers all the processes, governance, decision framework, controls and reporting over a minimum set of risks (underwriting & reserving, assets & liabilities management, asset management, liquidity and concentration, operational, reinsurance and other risk mitigation techniques). It shall also oversee the implementation, validation and actual utilization of the internal model.

2. The Internal Audit Function shall be totally independent and assess the overall relevance, efficiency and effectiveness of all the components within the system of governance.

3. The Actuarial Function is carried out by skilled resources in actuarial and financial mathematics. The function is in charge of coordinating the calculation of technical provisions (calculation oversight, methods, quality and sufficiency of data, back testing against experience), and expressing an opinion on the level of reserves, the overall underwriting policy and reinsurance arrangements.

4. The Compliance Function ensures that an effective and efficient internal control system is in place. This should ensure compliance with both current legal or administrative requirement and internal provisions (effectiveness and efficiency of operations in line with the objectives, availability and reliability of financial and non-financial information).

Figure 2. Example of a data governance model

<table>
<thead>
<tr>
<th>Business</th>
<th>IT</th>
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<tbody>
<tr>
<td><strong>Data Quality Officer</strong></td>
<td><strong>Data Owner</strong></td>
</tr>
<tr>
<td>Sponsor that supports the data governance initiative and communicates its vision</td>
<td>Responsible for policies, standards, and data quality rules implementation for data within their area</td>
</tr>
<tr>
<td><strong>Data Custodian</strong></td>
<td><strong>Data Architect</strong></td>
</tr>
<tr>
<td>Business referent with detailed knowledge of the data structure, content, and appropriate use of the business information</td>
<td>Translate business rules into data models. Subject matter expert for the overall data catalog</td>
</tr>
<tr>
<td><strong>Data Steward</strong></td>
<td></td>
</tr>
<tr>
<td>IT referent monitoring data processing applications to ensure that data quality is supported from technical side</td>
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More than a regulatory concern, data management is a key enabler for high performance.

A data quality assessment can provide an excellent opportunity for IT improvement and help decrease the cost of operations while increasing the level of service for business operations and for decision making.

Improving data quality management does not necessarily mean massive investments in IT and changes in the organization. Even small tuning-type adjustments to the existing architecture can bring quick and significant benefits.

In-depth transformation of functional architecture is sometimes required when IT architecture reflects long-term activity, resulting in stratified technologies, systems and interfaces.

The management of recurring costs and IT complexity are important decision factors in data quality assessment, rather than data quality management itself. But data quality management can be one of the key triggers of such an effort.

A data quality assessment as required by Solvency II sometimes reveals the need for better functional architecture, but setting up tools for measuring and reporting on data quality can help manage overall data quality. Such initiatives may also lead to the inclusion of new business process management (BPM) capabilities into the architecture in order to support the Solvency II reporting process, as well as overall data management.

Adding a documentation management system can facilitate the access and maintenance of key Solvency II data and processes documentation for all employees involved in such processes. Using an enterprise-wide information search engine can help employees locate the most appropriate information on data and/or processes, as well as the best way to manage them.

Improving data management is often more than a compliance issue. By helping turn data into reliable information, better data management can help support operational, tactical and strategic decisions that can make a real difference in insurers’ performance.
Sources


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