

Effective Data Quality Management: The Path to Solvency II

INTRODUCTION

Solvency II, a regulatory mandate applicable to all insurance and reinsurance organizations operating in Europe, effective on January 1, 2013, stipulates the minimum capital requirements that insurers must have to cover their risk exposure and consistent risk management standards. Like Basel II (a similar regulation for financial services organizations effective since January 2008), Solvency II uses an economic risk based approach for calculating capital adequacy requirements. The primary goals of both Solvency II and Basel II are to protect policyholders/consumers by reducing the risk of consumer's loss and ensure the stability of the financial system by increasing the financial soundness of the participating organizations.

The Solvency II framework uses three pillars similar to Basel II. The first pillar deals with solvency capital requirements.

Insurer must calculate Technical Provisions (TP) by valuing technical liabilities and Solvency Capital Requirements (SCR) by calculating the capital requirements for the various types of risks such as underwriting risk, credit risk, market risk and operational risk. TP equates to the liability an insurer needs to pay to transfer its obligations to another entity. SCR reflects the risk profile of the organizations. The sum of TP and SCR is equal to the assets of the organization.

In order to calculate the TP and SCR per the Pillar I directives, organizations need to collect various types of information from multiple, often disparate information sources including external sources. The trustworthiness of the calculated capital requirements will largely depend on the quality of the underlying data. Acknowledging the importance and criticality of data quality, the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) has issued an advice on data quality standards for the data to be used by various models to calculate TP and SCR. In addition, the reliability of the internal models (as an alternative to standard formula to calculate regulatory capital requirements) depends on the quality of the data used for validating the model. As part of the internal model approval process, an insurer is required to provide evidence of input data quality and model output data quality.

Data at Rest	Data in Transition
<ul style="list-style-type: none"> • Missing or Duplicate Transactions • Missing Field Values • Out of Date Data 	<ul style="list-style-type: none"> • Delayed or Dropped Transactions • Incorrect/Out of Date Processing Logic • Unreasonable/Inconsistent Transactions

Pillar II directives involve demonstration of an adequate governance system including implementation of an effective enterprise risk management system. A large percentage of the operational risks stems from the data quality issues. For example, duplicate claims payment or SLA violations can largely be attributed to poor data governance issues.

In order to effectively mitigate these risks, insurance organizations need to use appropriate controls to detect and prevent data quality issues in operational systems.

Pillar III directives require periodic supervisory reporting and public disclosures. While reporting itself could be a daunting task, the reconciliation of financial data between the Solvency II and other statutory reports such as IFRS/GAAP will be a challenge. Without such reconciliation, there will be questions around the accuracy of the reported risks.

As insurance organizations prepare for implementing Solvency II directives, they need to put a stronger focus on data quality management. Poor data quality in risk data repositories increases the uncertainties in the data used for risk calculation

resulting in inaccurate risk capital calculation. In addition, poor data quality in transactional systems increases operational losses resulting in an increase in the operational risk which translates to higher capital requirements. While the scope of this article primarily addresses the Solvency II requirements applicable to insurance organizations operating in Europe, the data quality issues and mitigation principles outlined in this article are equally applicable to financial, insurance and non-financial corporations. S&P's decision to incorporate enterprise risk management, using frameworks similar to Basel II and Solvency II, as a factor in its credit rating methodology is reflective of the growing market need to understand an organization's risk exposures and its ability to address risk. In order to achieve a favorable rating, organizations should be able demonstrate sound practices in dealing with data quality risk which is typically categorized as an operational risk.

TYPES OF DATA QUALITY ISSUES

Data in most organizations has primarily two states and both states are susceptible to data quality issues.

- **Data at Rest:** Certain systems such as customer relationship management system, policy administration system, etc., serve as the source of input information for other systems. Data in these systems is referred to as

data at rest. These systems are called data provisioning systems.

- Data in Motion: Data is often exchanged between or processed by two or more systems. The data in this state is often referred to as data in motion.

Typical data quality issues observed in each of these states can be summarized below:

ROOT CAUSES OF DATA QUALITY ISSUES IN INSURANCE ORGANIZATIONS

While several factors can be attributed to the data quality issues, the following are the major causes of data errors experienced in most insurance organizations:

Data Quality issues with the Source System: Source systems data may be incomplete or inconsistent. For example, a customer record in the source system may have a missing identification code. Similarly, source system data related to policy may use an “abbreviation” of the policy names in their database. These types of data issues can primarily be attributed to manual data input, lack of data standards and poor quality of third party data used by source system. Data error in the source systems propagates in the downstream systems resulting in the higher detection and clean up cost. Incompleteness and inaccuracies in certain source system data will lead to quality issues in the target systems used for regulatory capital calculations.

External Data Provider: Insurance organizations routinely exchange critical information with third party vendors and partners (e.g. authorized repairers, loss adjusters). Without appropriate completeness and accuracy checks, the probabilities of data quality issues are high.

Multiple Systems: To support Solvency II directives, insurance organizations need to pull data from multiple source systems located in a diverse set of technology platforms. Without appropriate controls in place, there is no way to ensure the completeness and accuracy of the information that is being exchanged.

Complexity of Data Transfer Process: Data movement from source to target systems requires extraction of a variety of complex data structures (e.g. xml, EDI, database, proprietary structure etc.). In the absence of appropriate controls, the following types of errors may occur:

- Extraction logic excludes certain types of data that were not tested.
- Transformation logic may aggregate two different types of data (e.g. car policy and boat policy) into a single category (e.g. automobile policy). In some cases, transformation logic may exclude certain types of data resulting in incomplete records in the risk repository.
- Similar issues are also observed with the loading process.

Process Failures: Data transfer processes may fail due to system errors or transformation errors resulting in

incomplete data loading. System errors may include abends due to unavailability of source system/extract or the incorrect format of the source information. Transformation errors may result from incorrect formats.

Changes/Updates in the Reference Data: Outdated, incomplete or incorrect reference data will lead to errors in the risk repository information. For example, errors in the sales commission rate table may result in an erroneous calculation of the commission amount.

CURRENT APPROACHES AND CHALLENGES

Most insurance organizations recognize the importance of data quality and have some form of a data quality program in place. However, current approaches are often fragmented, ad-hoc, and costly due to organizational silos and varying departmental needs. In most cases, the primary focus of the current initiatives is on data at rest (e.g. name and addresses in customer relationship management system). The scope of these initiatives is often limited to periodic review and cleaning of critical data provisioning systems.

While the importance of clean data in provisioning systems is paramount, insurers must address the data quality issues when data is in motion (e.g. data is exchanged between systems, people and organizations) to support Solvency II directives. Current approaches to governing “data in motion” include:

- After the fact manual or semi-automated balancing, tracking and reconciliation to verify appropriateness, completeness and accuracy.
- Extensive research and remediation to identify, diagnose and correct issues identified during the previous steps.

More specifically, current approaches suffer from the following limitations related to supporting the Solvency II data quality requirements.

Detective versus Preventive: Existing data quality initiatives rely on detection versus prevention of data issues. The detective approach may result in costly calculation reruns, delays in internal model approval and often require extensive manual interventions.

Narrow Scope and Focus: Current data quality initiatives do not fully address the quality issues when data is in motion resulting in increased operational risk and erroneous data for use in regulatory capital requirement calculation

Lack of Monitoring and Visibility: Current approaches do not focus on measuring and monitoring data quality on an ongoing basis, thus resulting in a delayed response to data quality issues. In addition, these initiatives do not provide comprehensive visibility across processes resulting in increased cost of resolving data errors.

More importantly, the effectiveness of these initiatives degrades due to the presence of multiple systems,

complex data structure and increased adoption of real time distributed technology environment. The problem exacerbates when an insurer is required to provide evidence of data quality in the risk data used for regulatory capital calculation. Typically, risk data is collected from multiple transactional systems and stored in a risk repository which serves as the source for internal model and risk capital calculations. In this scenario, the requests for data quality evidence will be met by querying a myriad of log files, email chains and risk repository tables. This not only increases the cost but also, in some instances, may delay the certification of the risk capital calculation.

Current approaches provide short-term respites but are not sustainable in the long run. The increased labor cost for manual processes and high development cost of ad-hoc data quality detection and correction programs increase the ongoing operational costs.

REQUIRED CAPABILITIES FOR ENSURING DATA QUALITY FOR SOLVENCY II

In order to support the data quality management program prescribed in CEIOPS article 86f, insurance organizations must consider required minimum capabilities as depicted in the picture 1 and described below. In order to reduce cost and increase efficiency, organizations should aim at automating these capabilities to the extent possible.



Information Controls: Information controls are application independent automated routines/procedures that can validate data at rest and data in motion to detect and prevent errors and to identify anomalies. Ideally, Information Controls should have the following capabilities to validate data at rest and data in motion:

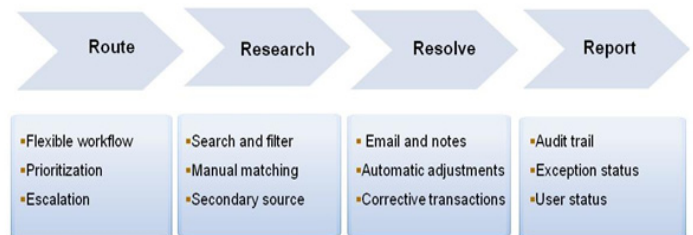
- **Verification:** Ability to verify the information content and format. Ability to verify the spatial and temporal reasonability of transactions.
- **Balancing:** Ability to balance information as it traverses through various systems.
- **Reconciliation:** Ability to reconcile information at an aggregated and transactional level.
- **Tracking:** Ability to track information to ensure adherence to SLA agreements and timeliness requirements.



Well designed information controls can validate information at an aggregate level as well as at a transaction level.

Exception Management: Exception management is an automated workflow that can support investigation and resolution of errors detected or prevented by information controls. Ideally, Exception Management should have the following capabilities to support resolution of errors within a certain time frame:

- **Routing:** Ability to route the error to appropriate resource for research and resolution.
- **Research:** Ability to research secondary sources and audit trail of the information flow.
- **Resolution:** Ability to correct the issue.
- **Reporting:** Ability to provide an audit trail report on exception resolution and status reports on exceptions and their resolution status.



Continuous Monitoring: Continuous monitoring enables organizations to achieve visibility and improve the data quality across processes. Ideally, Continuous monitoring should have the following capabilities to meet the visibility needs of business stakeholders for supporting Solvency II directives.

- **Process Monitoring:** Ability to measure and trend process information such as data volume, data quality indicator, etc.
- **Control Monitoring:** Ability to monitor the effectiveness of the information controls deployed to prevent data quality issues.
- **Exception Management:** Ability to monitor exception resolution progress.
- **Reporting:** Ability to create standardized and ad-hoc reports to support audit and business needs.



ESTABLISHING DATA QUALITY MANAGEMENT FRAMEWORK

Establishing a comprehensive and sustainable data quality management program could be daunting in the absence of a structured approach. Insurers may consider adopting the following four phase approach to achieve the data quality directives of Solvency II.

Analyze: In this phase, critical information flows relevant to Solvency II need to be identified. All data provisioning systems including external source systems along with their data lineage need to be identified and documented. Special attention must be given to establish a common understanding of the key data elements between the source system and target system. In this phase, source and target system owners should jointly establish data quality criteria and data quality measurement metrics for the key data elements.

Assess: In this phase, insurers must assess data quality risk for both data at rest and data in motion. Once the risks are evaluated and prioritized, insurers must determine an appropriate response based on a cost benefit analysis.

Control: Appropriate information controls and exception management processes must be defined and deployed to address the risks identified in the assessment phase. Insurer should consider use of automated controls to avoid sampling errors and to gain efficiency.

Monitor: Once appropriate controls are in place, business owners should monitor the data quality indicators established in the analysis phase and identify opportunities for improvements by analyzing the micro trends in the data quality indicators. Automated continuous monitoring solutions provide the most cost effective approach for monitoring.



CONCLUSION

Most insurers are currently focused on developing internal models and establishing the technology infrastructure to capture risk data from the multiple disparate source systems. In the absence of the appropriate controls to validate the data, the quality of risk data will increase the uncertainties around calculated capital requirements. In some instances, lack of the trust in the risk data will force insurers to use standardized formulas and default values resulting in higher capital requirements. Without a comprehensive approach to data quality, insurers will face increasing costs and delays in implementing Solvency II directives.

Insurance organizations can avoid such costs and delays by establishing a comprehensive data management program at a fraction of the cost. More importantly, the cost to establish such a program is easily offset by the gains made through the reduction of the operational losses. In order to address quality issues of data at rest and data in motion, insurers must acquire information control, exception management and continuous monitoring capabilities which are critical components of a sustainable data quality management program.



Learn how Infogix Controls can save you time and money.
Visit www.infogix.com or call 1.630.649.6800 (US & Canada)
44.1242.674.137 (UK and Europe).

Copyright ©2010 Infogix, Inc. All rights reserved. Company, product, brand, and mark names and logos herein are the property of their respective owners. 2009-01-12. For a list of Infogix trademarks, visit: www.infogix.com/legal