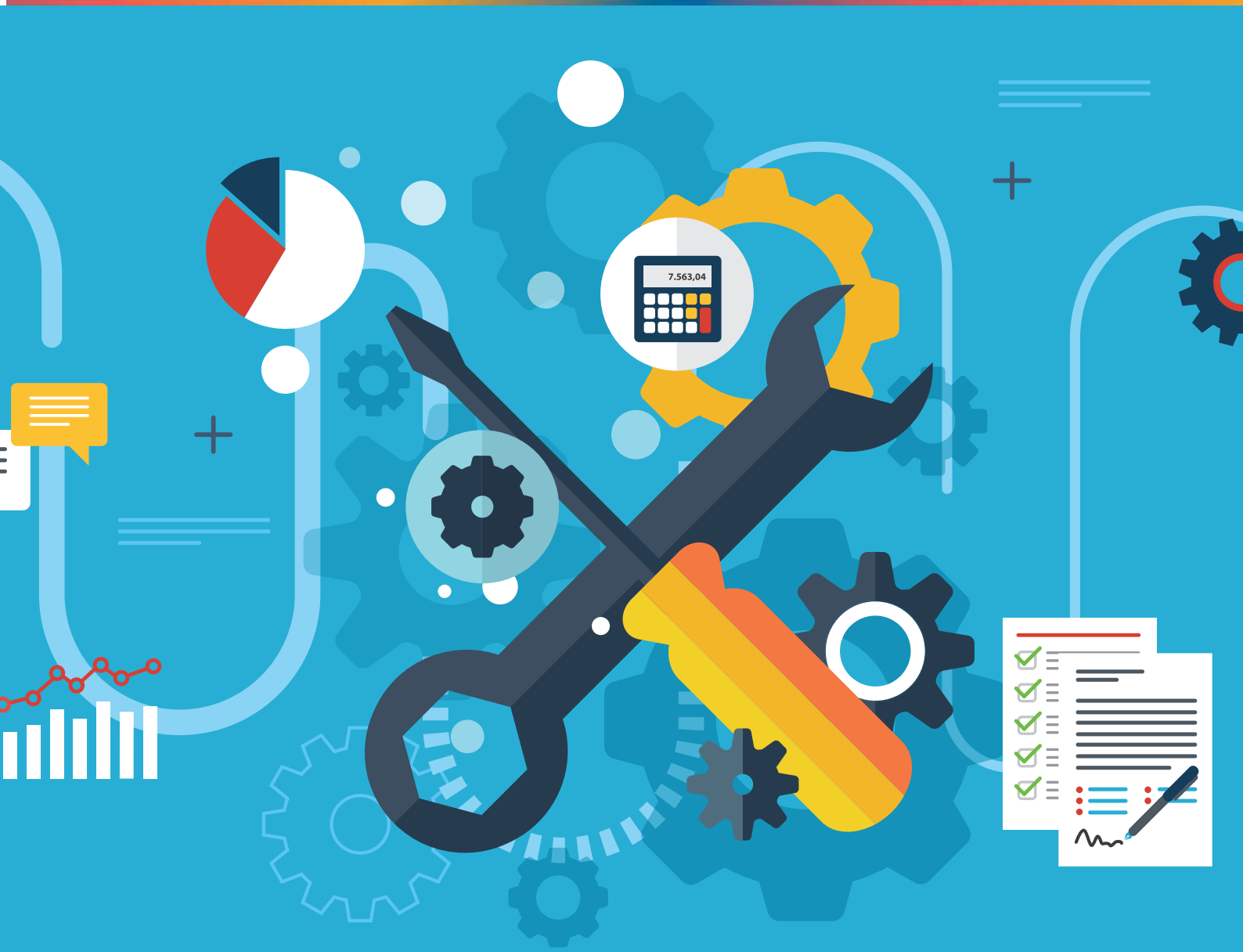
IFRS 17 – Benefits of High-Performance and Scalable Technology

IFRS 17 Essentials



InsuranceERM

IBM

IFRS 17 – Benefits of High-Performance and Scalable Technology

Implementing the IFRS 17 reporting standard means insurers will need to contend with multiple data sources, large data volumes and intensive calculations. Consequently, as IBM explains, insurance providers will require platforms built for performance, scalability and ease of data integration. Andrew Dansereau, PhD, FSA, CFA; Paolo Laureti, PhD; Stephen Wang, MEng, FRM explain

Introduction

Insurers throughout the globe are gearing up for the impending IFRS 17 effective date, assessing their readiness, determining the ongoing impact of the change in regime, planning IFRS 17 architectures and evaluating IFRS 17 vendors.

The imminent delay of the IFRS 17 effective date by one year to January 1, 2022 has afforded insurers a small buffer to further consider whether to take a "bare minimum compliance" approach or take an approach that will allow them to confidently manage the ongoing implications and to optimize their business strategy.

The IBM IFRS 17 solution is built on technology that will empower insurers to adopt an approach that delivers business benefits by affording a single application approach for high performance, ease of data integration, required IFRS 17 calculations and powerful what-if capabilities.

It is rooted in the belief that there is a firm distinction between reporting and analysis, with both being critical yet distinct and complementary topics; the former being essential for compliance while the latter allowing businesses to confidently explain, explore and optimize.

What Matters

Deriving business benefits from IFRS 17 requires special consideration of the capabilities of the underlying IFRS 17 Calculation Engine and related data infrastructure. For example, rigid data models with prescriptive data input formats typically lead to laborious, costly and brittle data integration efforts – not only for the initial implementation but on an ongoing basis as businesses and the vast volumes of underlying data evolve.

Insurers, much like other financial institution domain, need to contend with multiple data sources, large data volumes and processing intensive IFRS 17 calculations. Consequently, these firms require platforms built for performance, scalability, ease of data integration and flexibility.

Furthermore, to derive tangible business benefits, business users need the ability to intuitively conduct real-time analysis to see the impact on current and future IFRS 17 results based on user-defined changes to market and underwriting assumptions.

Deriving business benefits from IFRS 17 requires special consideration of the capabilities of the underlying IFRS 17 Calculation Engine and related data infrastructure.

The bottom line is that a robust technology matters as a key enabler of success.

In devising and implementing IFRS 17 systems, insurers can also take advantage of lessons learned from the implementation of Solvency II and other similar prudential regimes. While, of course, the underlying purposes and goals of Solvency II and IFRS 17 are different (i.e., solvency vs. financial reporting), both are based upon market-consistent valuation of assets and liabilities and both require that a risk adjustment (in Solvency II for non-hedgeable risk in IFRS 17 for non-financial risk) be incorporated on top of the best-estimate liability; both regimes require an analysis of change analysis albeit with different parameters.

Also, in practice, both IFRS 17 and Solvency II require the integration of outputs (e.g., cash flows) from disparate actuarial engines potentially located at multiple locations throughout the globe.

The bottom line is that various regulatory and accounting regimes are gravitating towards a common ground for intensive analysis with commonality in approaches, and firms can increasingly leverage their experiences and expertise across domains.

Finally, along the same line of reasoning in the previous paragraph, it is important to understand and to be able to draw upon the experiences of the capital market and banking industries in implementing "modern" (i.e., market-consistent and risk-based) capital requirements and financial reporting standards.

Market turbulence over the past two decades, and most prominently the 2008 crisis, were primary catalysts for new prudential regimes and financial accounting standards (including Solvency II and IFRS 17). The stated goals of the new regimes include the harmonization of capital markets, banking and insurance regulation and financial accounting standards, while promoting disclosure and transparency to internal and external stakeholders.

Therefore, in addition to applying the lessons of Solvency II, insurers can also benefit from the lessons learned and from the technology applied in other domains such as the Fundamental Review of the Trading Book (FRTB) market risk capital requirements, Standardized Approach for Counterparty Credit Risk (SA-CCR) and IFRS 9 Financial Instruments accounting standard.

The bottom line is that methodology, approaches, and technology used for other purposes such as risk management, FRTB, IFRS 9 and other regimes are valuable now in the context of IFRS 17.

The IBM IFRS 17 Solution – Underlying Technology

The IBM IFRS 17 solution is built-upon an in-memory technology platform that aggregates and manages vast volumes of data across multiple source systems in real-time, enabling insurers to perform detailed and sophisticated analysis and scenarios to extract insights beyond the minimum IFRS 17 requirements by grouping data across any dimension and/or changing the way calculations are performed.

The technology's key features and differentiators:

- **Scalability and Real-time Performance** which enables calculations, aggregations and allocations across billions of data points in seconds using commodity hardware. For IFRS 17, this means that insurers can (i) load data at the most granular contract level, (ii) conduct validation routines on the fly versus relying on more painstaking and typically slower data movement processes (e.g., ETL), (iii) run IFRS 17 models (i.e., general modeling methodology, premium allocation approach and variable fee approach), (iv) produce required disclosure reports and journal entries, (v) create business oriented-reports across multiple reporting periods. All at the high pace of business and the need for stakeholders to get answers in limited reporting time frames.
- **Data Integration Flexibility** supports the loading of data from multiple source systems: databases, flat files, data feeds, actuarial systems, trading systems, claims administration and accounting systems. Of course, data can also be integrated from data staging areas or data lakes. The IBM IFRS 17 solution utilises Java-based data adapters to connect to data where it lives, dramatically reducing the overhead of traditional data management, implementation time, effort and costs.
- **Collaborative Sandboxing**, enabling users to instantly create and share sandboxes to manipulate any data element or formula to perform what-if analysis across any dimension. For IFRS 17, sandboxing is used not only to determine required IFRS 17 sensitivity analysis but more importantly to conduct business driven what-if analysis related to changing conditions (e.g., interest rates and exchange rates), business mix and growth assumptions as well as merger, acquisition and divestiture analysis).

Market turbulence over the past two decades, and most prominently the 2008 crisis, were primary catalysts for new prudential regimes and financial accounting standards.

- **Extensibility** to allow clients to perform custom calculations by writing Java classes that integrate via pre-defined hooks. The extensibility means that clients can incorporate additional data elements and modify/extend metrics and outputs by writing Java code to extend the solution; the solution also includes a business user-oriented scripting language, A-script. In many ways, the use of common Java allows business and technology teams within insurers to adapt the solution to their specific needs with less dependency on proprietary source code development from vendors.

In the financial industry the technology underlying the IFRS 17 solution has been successfully applied to IFRS 9 (Financial Instruments) standard, the Fundamental Review of the Trading Book (FRTB) market risk capital requirements, Market Risk in general, Credit Risk, Liquidity Risk, and the Standardized Approach for Counterparty Credit Risk (SA-CCR).

The IBM IFRS 17 Solution

IBM IFRS 17 Solution: Data Integration – flexibility and granularity

Our discussions with insurers and consultants indicate that a major challenge is the vast volume of required data, the multiple dimensions across which they need to be aggregated (business hierarchy, portfolios, groups, cohorts, etc.), its management and its use in reporting and analysis. There are several key decision points when it comes to data and its interaction with the IFRS 17 calculation engine:

i. The IBM IFRS 17 solution does not prescribe a rigid data model and connects directly to insurer's data sources via flexible Java-based data adapters. This means that the implementation effort does not need to include the time-consuming, costly and critical-path delay associated with mapping to data to (yet another) vendor input format. Likewise, it means incorporating a new data source or a replacement data source requires only to modify/add a data adapter.

ii. The IBM IFRS 17 solution supports loading data at the most granular level (e.g., contract/policy level) and consequently can conduct calculations and filter based on any aggregation, which is made possible by the technology's in-memory processing and scalability. Frequently, IFRS 17 engines, due to memory or processing limitation, require the pre-aggregation of data and thus the end-user loses the ability to conduct vital business analysis within the system.

iii. The IBM IFRS 17 solution supports the creation and application of validation rules by users to validate data and to flag input or output values that may need additional investigation (e.g., cash flows extending beyond 100 years, negative claim payments).

iv. Additionally, IBM has experience integrating and processing of insurer data from disparate actuarial systems from Solvency II implementations in Europe. The experience drove home the

While IBM recognises the critical importance of meeting the prescribed requirements of IFRS 17, we believe that it is equally important for insurers to harvest tangible business benefits from their IFRS 17 investments

critical nature of data integration and the need for flexible approaches.

IBM IFRS 17 Solution: Calculation Engine – the power of performance and extensibility

As mentioned above, the IBM IFRS 17 solution's underlying technology supports the loading of large amounts of data and then conducts required IFRS 17 calculations related to the IFRS 17 methodologies (i.e., building block approach, premium allocation approach and the variable fee approach) in real-time. Key characteristics of the IFRS 17 engine include:

i. **Extensibility**. The IFRS 17 calculation engine is built upon the technology's core platform using Java code that takes advantage of the strengths of the core's infrastructure. The development cycle is short and can incorporate potential extensions related to possible changes/modifications/interpretations of the requirements as well as country specific or company specific requirements. Likewise, clients can write Java code and connect it via pre-defined hooks to extend the solution for client-specific calculations.

i. **Performance**. The IFRS 17 Calculation Engine delivers high performance due to the underlying technology which distributes calculation requests over commodity hardware. Also, the technology includes a dependency graph which speeds performance by only conducting calculations once. For instance, suppose a user wishes to calculate A which depends on B and C and suppose that the system has already calculated B as part of a previous calculation. In the calculation of A, the cached value of B is used, which speeds the calculation.

   As a reference and proof-point for the technology's performance, consider the following two client use cases:

   - *Performance Use Case 1:* North American Bank with 200,000 financial instruments, 500 scenarios, 100 nodes in the hierarchy. For a calculation with 14 billion profit and loss calculations, the calculation time was 1.5 seconds for 1-day aggregation and 4.0 seconds for 4 days aggregation at the top of the house.
   - *Performance Use Case 2*: Asian Bank with 400,000 financial instruments, 22,500 scenarios, 100 hierarchy nodes, and 2 business days that requires 18 billion profit and loss values. The calculation time for the FRTB Capital Charge Report is 5.6 seconds.

IBM IFRS 17 Solution: Required Disclosure Reports, Business Reports, Journal Entries and Accounting Hub Integrations

In addition to conducting the required IFRS 17 calculation, the IBM IFRS 17 solution produces required disclosure reports (e.g., Paragraph 100 and Paragraph 101 reconciliations, analysis of insurance revenue, effect of new contracts initially recognized during the period, etc.). Additionally, the solution comes with business-oriented reports (e.g., tabular, bar graphs, waterfall charts, pie charts) providing insights into the data and results).

Users can interactively build customised reports and share reports with other users. Report variables can be exported from the solution's user interface and can also be retrieved programmatically via an API (application program interface).

The IBM IFRS 17 solution integrates with the insurer's accounting sub-ledger by creating journal entry reports and exporting results as well as posting accounting results based upon the insurer's chart of accounts.

IBM IFRS 17 Solution: Initial Recognition, What-if Analysis and Projections – unlocking business benefits

While IBM recognises the critical importance of meeting the prescribed requirements of IFRS 17, we believe that it is equally important for insurers to harvest tangible business benefits from their IFRS 17 investments.

The primary mechanism that the IBM IFRS 17 solution utilises to allow users to conduct business analysis and to manage the business in light of financial reporting implications is the underlying technology's "collaborative sandboxing" capabilities. Essentially, within the solution's interface, a user can create a sandbox which tracks all incremental data and analytics changes driven by that user, without copying the bulk of the data so as to optimize memory consumption.

Within the sandbox, the user can change one or more data element and one or more calculation and assess the impact on the change on any financial reporting output or table. Users can share their sandbox with other users and also, if the user has the proper permission, publish their sandbox to the system.

Examples, by no means exhaustive, of the applications of sandboxing include:

i. **Initial Recognition Grouping.** Within the User Interface, users can create business rules which, on initial recognition, classify contracts as onerous, profitable or risky. The rules can be based on calculated metrics (e.g., profitability as percentage of the fulfillment cash flows) and characteristic of the contract (where allowed by the standard). Rules do not need to be universal (i.e., there could be different rules, if appropriate, per portfolio).

ii. **Sensitivities.** Sandboxing can be used for the calculations related to the required IFRS 17 sensitivities (e.g., interest rates, underwriting assumptions). More importantly, business users can also use sandboxing to conduct any what-if analysis. For example, looking at the effects (a) of the steepening of the discount curves in all or select currencies, (b) increasing/decreasing claims or expenses in specified regions, (c) changes in exchange rates, (d) changing amortization method(s), or any combination of (a), (b), (c). and (d).

iii. **Changes in business mix.** Users can also easily assess the impact of potential management decisions around the business mix (e.g., acquisitions, divestitures) by removing portfolios, product lines or reporting entities, on financial results. Also, if the insurer is conducting due diligence on an acquisition, it can include the inputs representing the acquisition's business and assess the impact of the potential acquisition on financial results. [Our Solvency II clients conduct similar analysis from a risk perspective.]

Insurers face important decisions with respect to their IFRS 17 projects, as the impacts will transcend across their entire organisations

iv. **New Product Analysis and Business Steering.** As part of the product development and pricing process, the standalone and diversified effect of adding one or more products (with varying pricing assumptions) can be analyzed via what-if analysis. Additionally, the effects of business steering (i.e., increasing investment into one or more products) can be analyzed; using drill through capabilities, the effect on profitability by any aggregation (e.g., distribution channel) can be investigated.

v. **Financial Statement Projections.** Senior management and other stakeholders frequently want to know what future financial results will look like given specified assumptions regarding the future. The IBM IFRS 17 solution empowers firm to give insight into future financial results by providing the capability to project future accounting results. Projecting financial statements is made possible due to the underlying technology's in-memory processing and scalability.

Insurers face important decisions with respect to their IFRS 17 projects, as the impacts will transcend across their entire organisations – on the business side, from the way product, pricing and distribution strategies are constructed, and on the technology side from the deepest data management practices, through analytical processes, to the delivery of periodic accounting results to the street.

Given this deep and pervasive nature of the impacts of IFRS 17, firms need to seriously consider their project strategy – a minimal compliance approach can certainly deliver results on the initial reporting periods, but is likely to be a major source of challenges (if not become an organizational liability) going forward as critical parts of the analytical process will definitely change (e.g., data models and quality, business mix, market conditions) and both internal and external stakeholders will definitely ask for more intensive analysis, explanations and insights.

Most who have experienced the recent crises will attest to the value of a technology foundation that can confidently deliver granular data and analysis, with the right level of flexibility and performance to quickly answer any number and types of questions that arise literally at the eleventh hour from senior management or the Board of Directors, prior to results being published to external analysts.

As discussed in this article, IBM strives to deliver those types of capabilities with a high performance, granular, and flexible solution that can confidently meet the most intricate and urgent business analyses. ■

This article was first published on www.insuranceerm.com. InsuranceERM is the leading source of news and analysis on the issues that affect the risk and finance departments of the world's leading insurance companies. To take a free one month trial please visit www.insuranceERM.com