Session 5A: Conversions: Best Practices and Lessons Learned for Conversions in Insurance Companies

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Session Description:

• Actuaries have been involved with conversions throughout the course of their careers. The types of conversions have ranged from administrative system conversions, valuation system conversions, modelling system conversions, general ledger conversions, illustrations system conversions, and more. Using an Interactive Forum (encouraging discussion from the audience), the presenters will discuss best practices, pitfalls, and lessons learned for conversions that affect actuarial valuations and financial reporting.
Session Goals

• Describe what has worked well for other actuaries
• Understand how to prevent problems that can be controlled
Insurer Technology Stack

Illustration/Sales System
New Business/Underwriting System
Administration System
Claims System
Disbursement System
General Ledger System
Additional Extracts
Actuarial Technology Stack

Inventory and Activity Extract(s)
Actuarial Asset / Liability System
Actuarial Income System
Actuarial Risk/Hedging System
Evolution of Actuarial Modeling

• Although pricing calculations, planning/forecasting, and formulaic valuations had been done for years, actuarial modeling of cash flows did not go mainstream until asset adequacy analysis using cash flow testing was mandated by regulators in the 1980s.

• Internal and external stakeholders have been adding to the modeling workload ever since: C-3 Phase I & II, AG43, PBR, various GAAP requirements, economic capital, embedded values, duration calculations, what-if analyses, etc.

• Most have remained as one-off desktop models, even as complexity increases and results have a more direct and visible role in company financials, never realizing the consistency and sustainability associated with enterprise processes.
  • Easy to spawn and hard to kill (even during M&As), their number has multiplied over the years (much like spreadsheets).
  • Increased risk due to ever more frequently changing assumptions and inputs, while subject to increased internal and external scrutiny.
The Actuarial Role in Various Conversions Methods

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Best Practices

• Open and Frequent Communications
• Clear, Well-Defined Expectations
• Realistic Timelines
• Team Work
• Formal Peer Review
• Validation Tools
Conversion Methods

• **Direct Changeover** – Launched at a point in time
  Also called the Big Bang conversion method

• **Parallel Conversion** – Run the unconverted
  production version and the converted system in
  parallel

  Interface systems can be used for validation
  (accounting feeds, valuation feeds, valuation reports
  and seriatim data) – feeds into production need to
  be suppressed on one of the two
Conversion Methods (continued)

• **Gradual or Phased Conversion** – Conversion that is broken into stages or phases
  
  Best choice for larger conversions

  Dependencies need to be identified

• **Modular Conversion** – Involves building self-contained, operational subsystems to convert gradually
  
  Each subsystem can be tested before using

  Users become familiar with each subsystem as it becomes operational
Conversion Methods (continued)

- **Distributed Conversion** — Uses one of the previous methods at one site

Conversion at test site followed by other conversions at other sites

Advantages: Problems can be resolved quicker and they do not affect entire operation

Disadvantages: Each site may have its own modifications needed
Traditional Conversion Approaches

- **Design**
- **Develop**
- **Test**

- Depends on Concept
- Depends on Design
- Depends on Development
Agile Model for Conversion

- Design
- Test
- Design
- Reiterate
Actuarial Roles in Conversions

• **Design Team** – Subject Matter Expert
  
  Definition of Formulas for Administrative System

• **Development Team** – Actuaries involved with formula definition, table definition or validation (database structures)
Actuarial Roles in Conversions (continued)

• **Testing Team** – Actuaries may develop test conditions with expected results

  Actuaries may develop testing tools – illustration or valuation modeling software and validation tools may be adopted

  Actuaries may be assigned policy validation or policy page verifications

  For valuation or modeling system conversions, actuaries will have key roles with peer review roles
Audit Trails and Validation

- Complexity depends on the size of the conversion
- Audit tools require planning in advance of the conversion
- Basic fields are Face Amount, Policy Count, Coverage Count, Cash Values
- Before and After Comparisons should be easy to follow
Session 5A: Conversions: Best Practices and Lessons Learned for Conversions in Insurance Companies

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Simple Admin System Conversion: Setup

• Conversion Project Ownership: Insurer’s Information Technology (IT) department
• Project Goal: Shut down a Group Universal Life (UL) Admin System
• Conversion Set: All contracts on the Group UL Admin System
• Target: Nearly identical Admin System
• Actuarial Ask: Can Actuarial help us confirm the conversion at the policy and rider level for Go/No Go decision on conversion weekend
Simple Admin System Conversion: Setup

• Context: Two Actuarial Inventory Extracts to One Vendor UL CRVM Reserve System and One Actuarial Database

• Additional Goals: Actuarial wants to be sure their processes are not impacted by the conversion and they get the same Reserve System and Database results from the new single inventory extract as from the two extracts

• Staging: 2 conversion test runs (less than full and full)
Simple Admin System Conversion: Actuarial Plan

- Comparisons done at the policy level for coverage amounts, account values, stat reserve and text reserve in summary and detail
- Actuarial Database comparisons in Paradox
- Process refined in two test runs over multiple days to be executed in 4 hours on conversion weekend
- Give ‘Go’ opinion on Saturday.
Simple Admin System Conversion: Whose Conversion is this Anyway?

• **Answer: Information Technology**
  - Launch, upgrade or **shutdown** systems
  - Context: Any Non-Actuarial Systems
  - Best Practices
    - Have a Project Charter document and keep it up to date
    - A dedicated project manager
    - Actuarial may be defined full-time, part-time and **assigned task** team members
    - Actuarial should consider its own goals for the conversion and champion them
    - What other actuarial tools or processes should be improved at the same time.
    - Be a good partner and share the expertise actuaries possess
Simple Admin System Conversion: Whose Conversion is this Anyway?

• **Answer: Information Technology**
  - Pitfalls
    - None this time
  - Lessons Learned
    - Practice conversion, with verification steps, were the key to a quick confident analysis on the Conversion Weekend
    - Simple conversions, like system to like system, can have simple validation
    - Reflect on what is not being validate. What did we miss?
Simple Admin System Conversion: What did we miss?

• Don’t just trust the Administration System, check it
  • 7702 and 7702A compliance at and after conversion
  • Interest Crediting after conversion
  • ?

• As Insurance and Annuity Product Engineers, actuaries may understand the insurance contract like no one else
Illustration System Conversion: Setup

• Conversion Project Ownership: Illustration Actuary
• Project Goal: Develop Rate Sheets, At-Issue Illustrations and Inforce Illustration compliant with the Life Insurance Sales Illustration Model and Consistent with the Universal Life Admin System
• Conversion Set: Inforce Illustration must work for all existing UL contracts
• Target: New Illustration Rate Sheets, Stand alone At-Issue Illustration System and Home Office Inforce Illustration System
• Actuarial Ask: Manage, design, build, test and implement tools consistent with the UL Admin System calculations and issue documents
Illustration System Conversion: Setup

• Context: Payroll Deduction Group UL Third Party Administrator for nine insurer clients
• Additional Goals: All insurer clients must approve the solution
• Staging:
  • Design and approval of Solution
  • Build and test UL calculation engine to Specs and Admin System
  • Test Output
Illustration System Conversion: Actuarial Plan

• Actuarial built spreadsheets to validate projected UL policy values consistent with the Admin System with 20 pages of calculation documentation

• Actuarial led multi-discipline team that designed the new Graphical User Interface (GUI) Inforce Illustration tool

• IT programmers built the new systems based on the issue illustration calculation document and inforce illustration design
Illustration System Conversion: Actuarial Plan

• Using validation spreadsheets
  • Actuarial validated ratesheets for all 9 Insurer Client
  • Actuarial validate a designed sampling of At Issue Illustration for every insurer client both on screen and in print
  • Actuarial validate a designed sampling of Inforce Illustration for every insurer client both on screen and in print
  • The multi-discipline team tested the inforce illustration interface and output
Illustration System Conversion: Whose Conversion is this Anyway?

• Answer: Actuarial
  • Within constraints, you define strategy, pace and success
  • Context: Actuarial Systems, Illustration, etc...

• Best Practices
  • Have a Project Charter document and keep it up to date
  • A dedicated project manager
  • Define full-time, part-time and assigned task team members
  • Project longer than 3 months (IMO) need some intermediate steps where progress can be demonstrated (demoed)
    • Don’t tell me about progress, show me progress
  • Determine what other tools or processes should be improved at the same time.
Illustration System Conversion: Whose Conversion is this Anyway?

• Answer: Actuarial
  • Pitfalls
    • Not enough focus on demonstratable progress
  • Lessons Learned
    • Make the solution’s printed output flexible enough to handle insurer client specific output variation
    • Do the hard work of modifying the project charter to keep it a living document, not a historic artifact
    • Be ready for some long days of testing
    • Keep looking for ways to make your testing/validating more efficient
Illustration System Conversion: What did we miss?

• Defining the next set of enhancements (nice to haves) that did not get done.
Full Admin System Conversion: Setup

• Conversion Project Ownership: Insurer’s Information Technology (IT) department

• Project Goal: Shut down two Product Definition File (PDF) driven Admin Systems

• Conversion Set: All active contracts and contracts active 18 month before that

• Target: Another PDF driven Admin System where some new products have already been implemented and issued

• Actuarial Ask: Can Actuarial historic product expertise help build out the historic products in the new system? Can Actuarial confirm the conversion at the policy and rider level for Go/No Go decision on conversion weekend?
Full Admin System Conversion: Setup

• Context: Nearly all the insurers Insurance and Annuity blocks were on these two systems. New product were being implemented on the new Admin System with actuarial support

• Additional Goals: Actuarial wants to be sure their processes are not impacted by the conversion and they get the same Reserve System and Financial Reporting results. The also want to be sure the policies on the Admin System are administered in the same way as on the previous Admin Systems. The also want to see deficiencies of the old Admin Systems are corrected in the new system

• Staging: The conversion was split into two phases over three years. Each phase had a PDF build follow by a growing conversion block. Each phase includes a production parallel to confirm identical processing (except expected differences
Full Admin System Conversion: Actuarial Plan

• Participate in implementation and testing of new products on the new Admin System
• Build validation tools for difficult calculation (mostly UL and 7702/7702A)
• Make actuarial product experts available to help define Product Definition File for the next Admin System
• Assist in analysis of policy level differences between the two systems.
• Run reserving and other actuarial processes with extracts from the new Admin System
Full Admin System Conversion: Whose Conversion is this Anyway?

• Answer: Information Technology
  • Launch, upgrade or **shutdown** systems
  • Context: Any Non-Actuarial Systems
  • Best Practices
    • Have a Project Charter document and keep it up to date
    • A dedicated project manager
    • Actuarial may be defined **full-time, part-time** and assigned task team members
    • Consider new product testing to be a major validation of the new Admin System
    • Had a senior actuary working full-time on the project leadership team for the benefit of both actuarial and the project
Full Admin System Conversion: Whose Conversion is this Anyway?

• **Answer:** Information Technology
  
  • Pitfalls
    • None this time
  
  • Lessons Learned
    • Conservative project timeline allowed success
    • Company expertise in the old Admin Systems PDF was successfully combined with Admin System vendor know led to success
    • Intellectual Property issues can mostly be avoided by not allowing new vendor personnel look at old Admin System vendor documentation.
The new world of Administration Systems

• Older Admin Systems use Product Definition Files (PDF) to define the policy processing. PDFs allow menu driven selection of Insurance or Annuity Plan processing. Most products would be successfully converted if the PDF conversion (old to new) was done correctly

• Newer Admin System use Configuration and Rules to define processing. This is much more flexible, but more testing must be done to be sure the process or calculation is right

• Actuarial may be asked to create spreadsheet examples of important calculations to demonstrate calculations to be configured in the new Admin System.

• The same spreadsheets can be used to validate calculations
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More on Actuarial Modeling Systems Conversions

• Guiding Principles
• Enterprise Actuarial Modeling & End-To-End Processing
• Considerations
  • Preparations
  • Model Rationalization and Fit for Purpose
  • Roles and Responsibilities
  • Model Production Procedures
  • Governance and Communication
Illustrative Guiding Principles

1. **Use Default Functionality**
   - Minimize customization
   - Use only standard vendor-supplied functionality, if possible
   - Eliminate all end-user applications, where possible

2. **Engage Internal Audit**
   - During implementation planning
   - Understand their expectations
   - Provide for base-touching throughout implementation

3. **Take Advantage of New Capabilities**
   - Do not simply map current processes and methodologies to the new system
   - Leverage new capabilities that the vendor solution can provide
   - Do not confine implementation to current valuation team responsibilities

Establish guiding principles at the outset of the project
Illustrative Guiding Principles (continued)

4. Assumption Transparency
- Be able to easily and clearly see what assumptions are being used to drive reported amounts across all valuation
- Provide a straightforward process for comparing assumptions between systems

5. Complete End-to-End Process
- Be mindful of the complete valuation process
- Do not focus only on the calculation engine, but consider the front-end data processes and the calculation-to-ledger consolidation processes as well

6. Migration Documentation
- Must properly track and fully document all phases of implementation and testing
- Documentation includes changes made, impacts resulting, and support / rationale for each change along with error/refinement treatment

Establish guiding principles at the outset of the project
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<th>Illustrative Guiding Principles (continued)</th>
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<th>7. Accounting Policies</th>
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<td>• Migration should not result in deviation from established accounting policies</td>
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<th>8. Non-Implementation Work</th>
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<td>• Implementation must not adversely interfere with the proper execution of the current duties of the valuation/modeling teams</td>
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<th>9. Risk Mitigation</th>
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<td>• Identify risks to successful and timely implementation early</td>
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<td>• Communicate risks clearly to the Steering Committee</td>
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Establish guiding principles at the outset of the project
Enterprise Actuarial Modeling

Enterprise actuarial modeling done in a centrally managed enterprise environment in compliance with enterprise IT infrastructure and architecture standards

Benefits:

- Better data management with quick, automatic access to quality data and consistent assumptions and modeling efficiency techniques
- Enhanced security using permission-based dev, test, production environments
- Production quality controls
- Scalable distributed processing for improved performance
- Improved automation capabilities
- Integration with business intelligence services for reporting
- Automatic backups and redundancy for robust 24/7 availability
- Defined roles and responsibilities
- Official change control and validation procedures
# Desktop vs. Enterprise Actuarial Modeling

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<tr>
<th>Desktop</th>
<th>Enterprise</th>
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<td>• Focused on individual actuarial tasks/calculation</td>
<td>• Broad processes</td>
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<td>• Ad-hoc, short term,</td>
<td>• Governed and repeatable</td>
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<td>• Siloed infrastructure with redundant data and models</td>
<td>• Centralized infrastructure, shared data and reused models</td>
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<tr>
<td>• Local security and individual user rights</td>
<td>• Centralized security, roles, and audit trails for multiple users</td>
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<td>• Models for creativity and individual preference</td>
<td>• Automated models for timely and efficient results</td>
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<tr>
<td>• Focused on a single model application</td>
<td>• Results are consistent, repeatable, and reproducible, with shorter reporting timescales</td>
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<td>• Actuarial independence from IT</td>
<td>• Reduced risk</td>
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<td>• Minimal governance and controls</td>
<td>• Grid scalable, reduced run time</td>
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<td>• Actuarial leverage of IT</td>
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Actuarial End-To-End Processing (illustrative)

**Liab System 1**
- Extract/ETL
- Data Cleanup
- History/Inforce Files

**Liab System 2**

**Liab System n**

**Asset System 1**
- Extract/ETL
- Data Cleanup
- Inforce Files

**Asset System 2**

**Asset System n**

**Experience Studies**

**Valuation**
- Tasks
  - Stat/PBR
  - Tax
  - GAAP/LDTI
- Inforce/Specs
  - Inforce files
  - Product specs
  - Run specs
- Assumptions
  - Liabs
  - Assets
  - Scenarios

**Modeling**
- Tasks
  - CFT, RBC
  - ALM, EC
  - EV, Ad Hoc
- Inforce/Specs
  - Inforce files
  - Product specs
  - Run specs
- Assumptions
  - Liabs
  - Assets
  - Scenarios

**Product Pricing & Inforce NGEs**
- Tasks
  - Pricing
  - Cred Rates
  - Illustrations
- Inforce/Specs
  - Inforce files
  - Product specs
  - Run specs
- Assumptions
  - Liabs
  - Assets
  - Scenarios

**Data Output Files**
- Pre-Defined Reports
- Results Analysis

**Customized Reports**
Preparations

• Executive sponsorship and a culture ready for modeling standards
• Model inventory and risk assessment
• Assess core actuarial cash flow projections across modeling platforms, rationalizing their use
• Assess roles, centralizing modeling work where possible
• Design and construct a modeling structure that works with enterprise infrastructure and IT architecture standards
• Design and set up the following functionally separate components on the new enterprise modeling structure, leveraging existing capabilities if possible, and satisfying each modeling application:
  • Data extracts, assumptions, product specs, and other input items
  • Core cash flow projections (use modular, object orientated programming)
  • Canned/custom reports and other output items
  • Controls, automation, and execution processes
• Perform baseline model testing/validation (initially and periodically)
• Review controls for production and model changes
Model Rationalization and Fit for Purpose

Is the model good enough to do the job it was designed for?
- “All models are wrong, some are useful”
- “A model that is perfect in every respect is as useful as a map with a scale of one”

• Although model rationalization often results in fewer models/platforms, the goal of “one corporate model” is often hard to achieve in practice
  • Models exist across multiple business units/geographies with varied products and jurisdictional regulatory requirements
  • Need for nimble, ad-hoc modeling in sandbox environment
  • “Closed” vs. “Open” systems
  • Different requirements for time horizons, granularity, etc., can be hard to fit in one model
  • May want multiple models for validations, reconciliations, and/or redundancy
  • Multiple models increases the importance of assumption governance
Roles and Responsibilities

- Best practice involves separation of duties
  - Who does what where

- Is there a dedicated model team?
  - Who makes key modelling decisions? Who reviews and signs off?
  - Is there a chief modeling officer? A model steward?
  - Who can request model runs and model changes?
  - Who runs the model and makes the changes? IT? Anyone?
  - What are individual access rights?

- What responsibilities exist outside the model team?
  - What is the relationship with enterprise IT? Are there Service level agreements?
  - What is the relationship with the software vendor?
  - What is the level of integration with assumption governance?

Sample Roles
- Model steward
- Model architect
- Data steward
- Extract programmer
- Program developer
- Tester
- Actuarial "coder"
- User of model output
- Subject matter expert
- Enterprise IT
- Software vendor
Model Production Procedures

Considerations when setting up processes for updating and running the production model

• Processes should have default settings be easily repeatable each reporting cycle
• Formats for input data
• Naming conventions
• File locations/structure
• Modeling efficiency techniques, e.g. compression and representative scenarios
• Automation routines/scripting
• Priorities for managing the production queue, e.g. grid scheduling
• Validation procedures
• Controls and documentation
Governance and Communication have increased in importance as models increase in complexity

• Like all governance, model governance is a measured approach for controlled decision making and organized activity, primarily aimed at reducing risk.

• A model governance document establishes the rules, roles, and controls related to models.

• In the end, successful governance comes down to execution and enforcement.

• Communication of model results must be reliably timely and effective for senior management to confidently report on results and use them for decision making.

• Be prepared to explain financial results at various levels of granularity, and why results have changed over time.
  • Step-by-step attribution analyses can help provide insight into the drivers of change.
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