



Institute
and Faculty
of Actuaries

IFoA Life Conference

From spreadsheets to sparks: igniting
finance with Databricks

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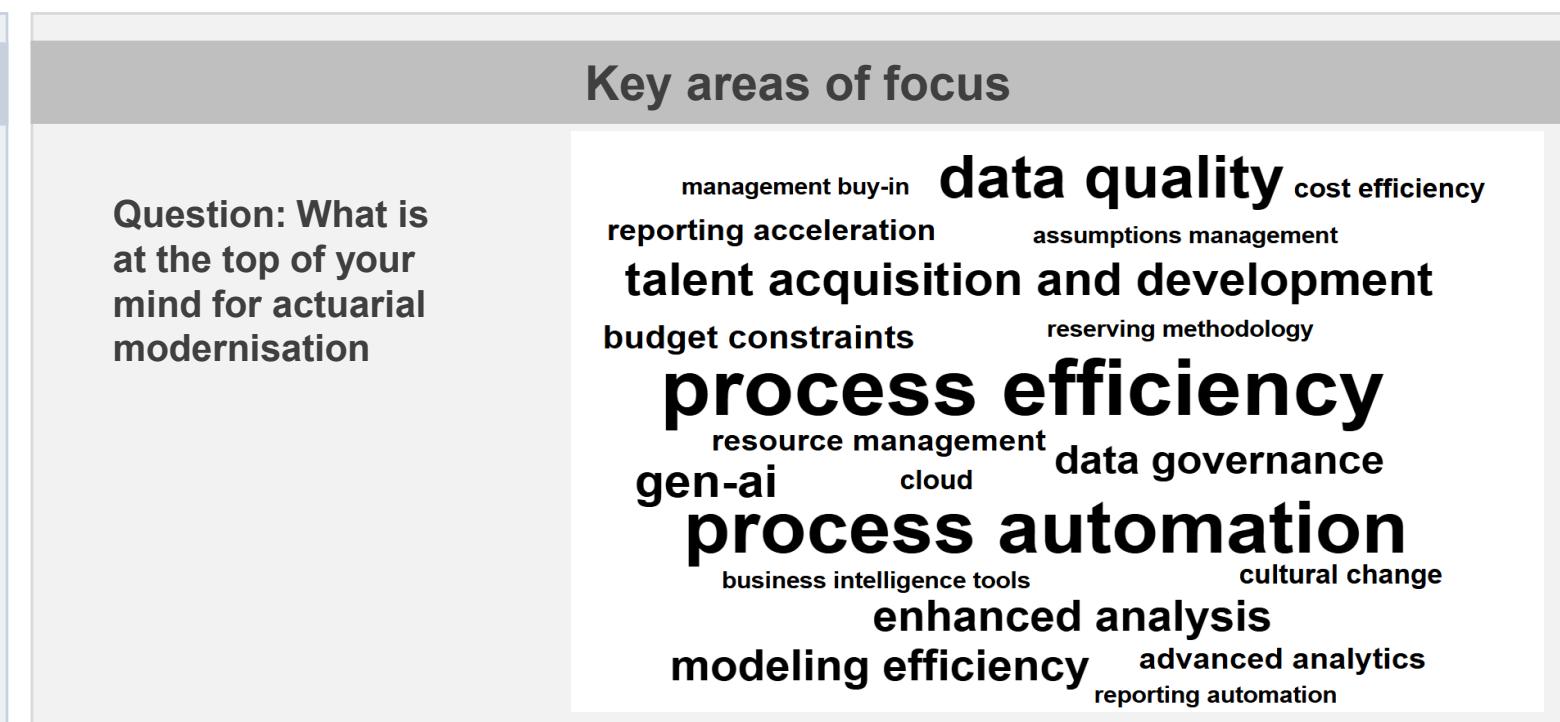
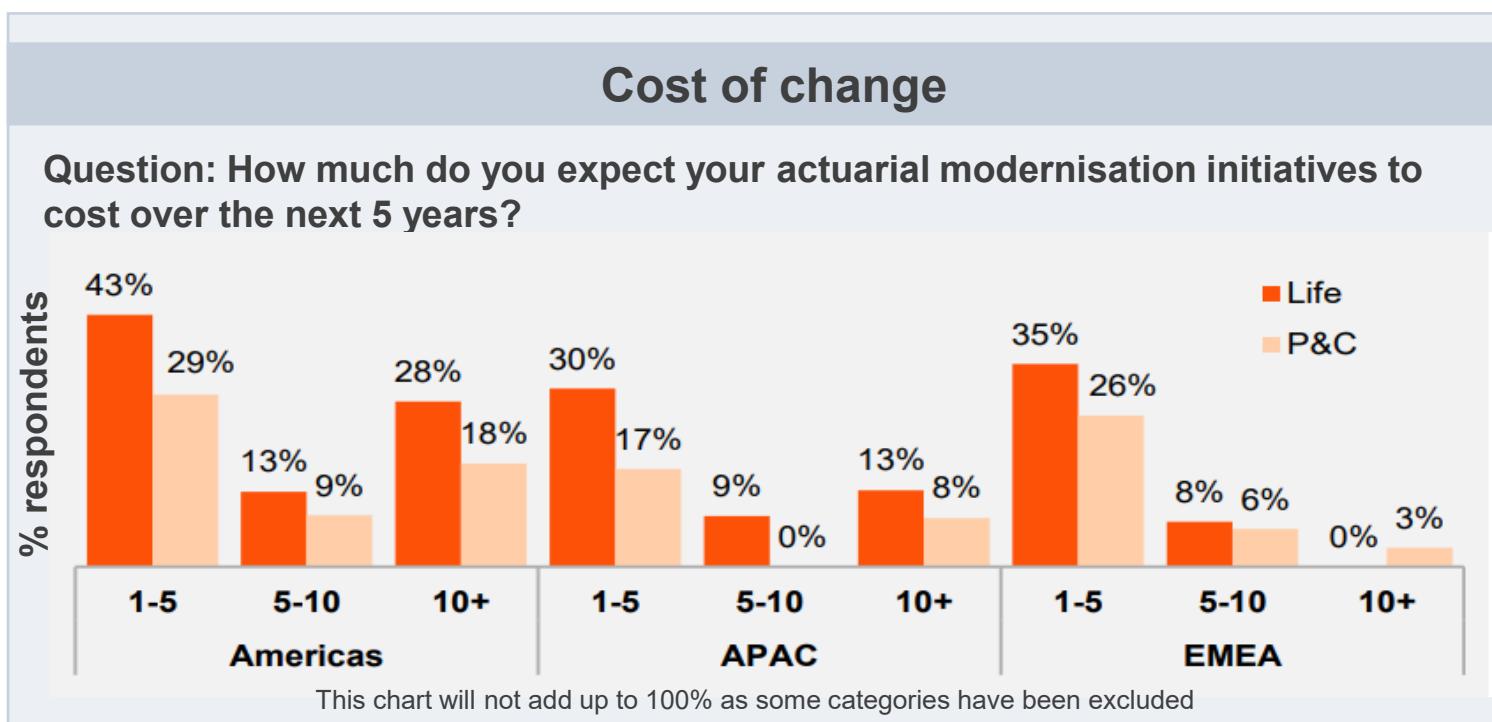
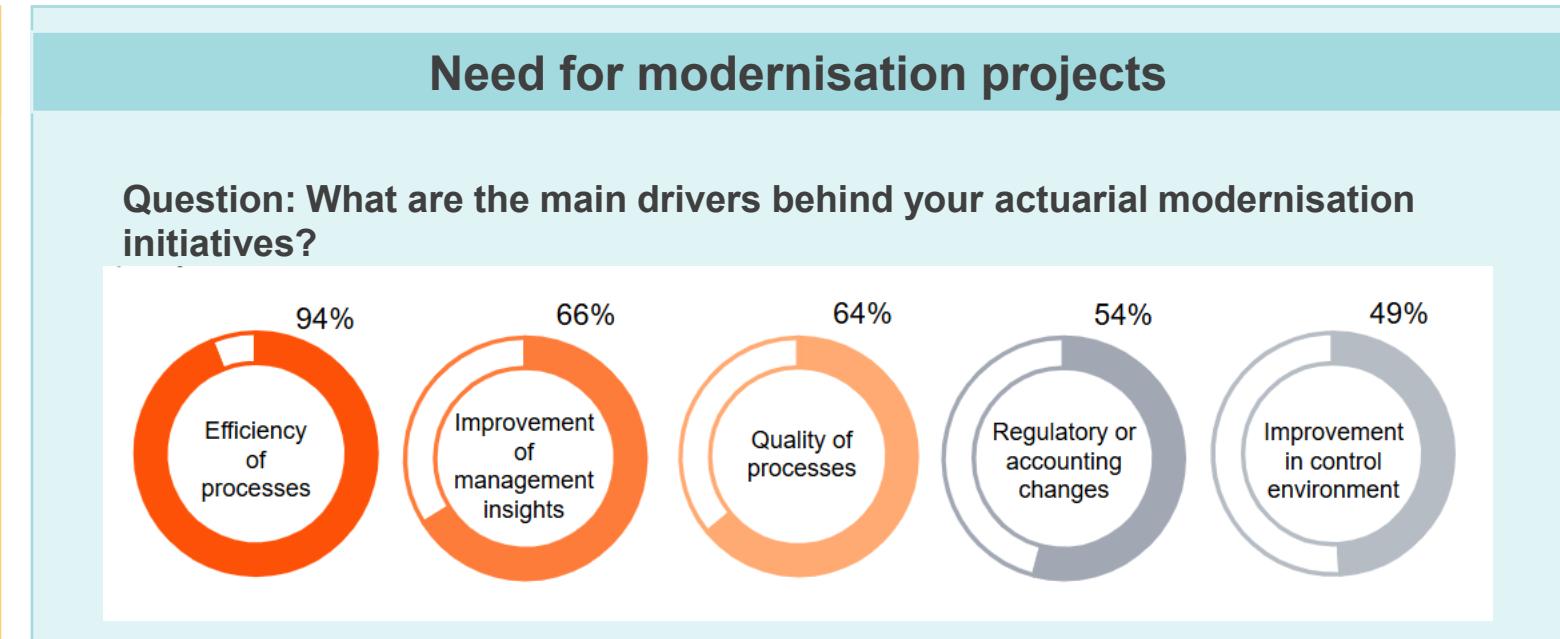
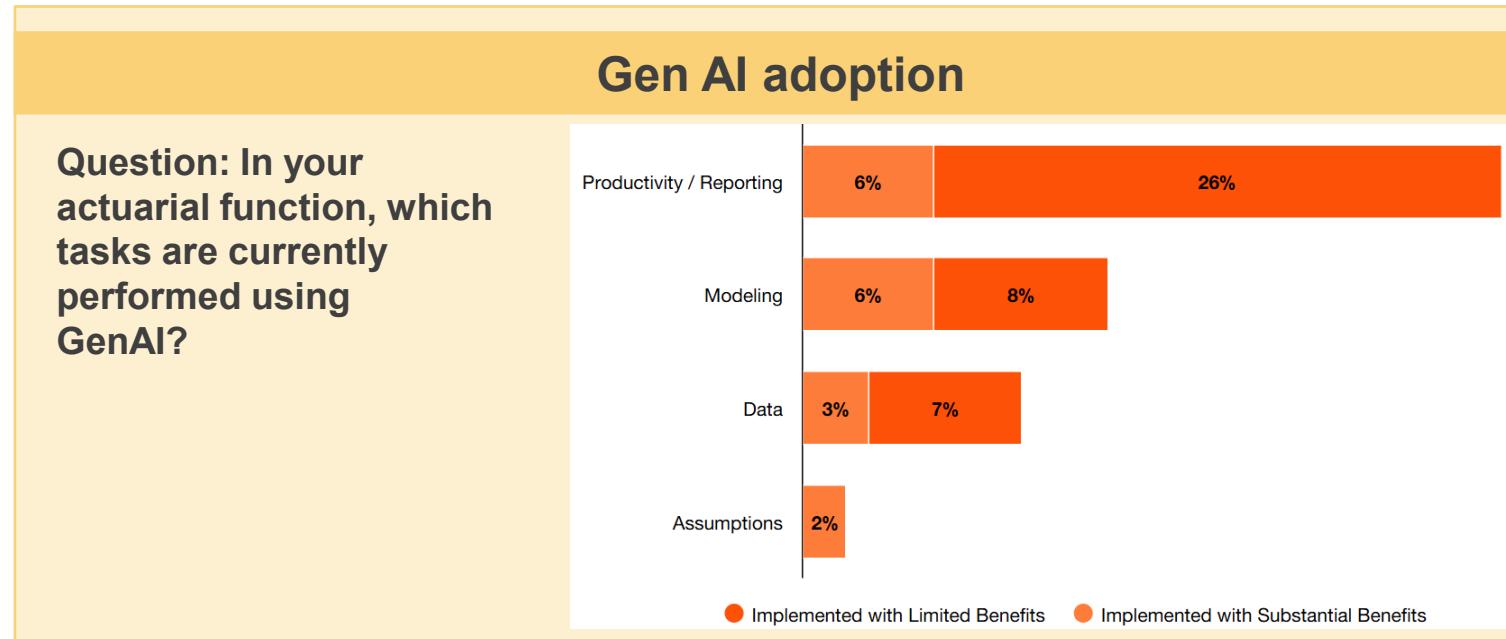
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IFoA Life Conference 2025

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Actuarial Modernisation – A Case for Investment?



1. Asia Pacific, 2. Europe, Middle East and Africa

Source: PwC global actuarial modernisation survey 2025

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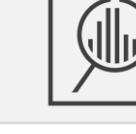
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Actuarial Modernisation – A Case for Investment?

Challenges			Benefits		
Over-reliance on excel  <ul style="list-style-type: none">• Error prone• Hard to scale	Key person risk  <ul style="list-style-type: none">• Concentration of expertise and single-point failure	Slow model run time  <ul style="list-style-type: none">• Longer processing and WDT	People  <ul style="list-style-type: none">• Actuaries can add higher value insights	Technology  <ul style="list-style-type: none">• Faster, scalable technology	Strategic change  <ul style="list-style-type: none">• Support strategic change and “What if?” thinking
Cost Pressures  <ul style="list-style-type: none">• Cost-driven trade-offs that drive inefficiency.		Capacity for change  <ul style="list-style-type: none">• Insufficient capacity for strategic change	Scalability & flexibility  <ul style="list-style-type: none">• Scalable analysis and capacity for growth or business change		Operational resilience <ul style="list-style-type: none">• Robust, repeatable pipelines reduce single points of failure.
Lack of auditability  <ul style="list-style-type: none">• Unclear workflow / pipeline traceability	Rise of data scientists  <ul style="list-style-type: none">• Skill gap within evolving market	Poor quality data  <ul style="list-style-type: none">• Inconsistent data and lengthy cleansing	Diversity  <ul style="list-style-type: none">• Mixed skillsets increases versatility in modelling approach	Deeper insights  <ul style="list-style-type: none">• Single source of truth and clearer insights.	Governance  <ul style="list-style-type: none">• Clear, traceable pipelines• Auditable, and resilient

Goals of the Modernisation Project

Finance Modernisation isn't just about faster numbers – it's about better understanding of long-term risk and value. To produce a set of goals for our project, we first understood the high value areas to address.

<i>High value areas to address</i>		<i>Key considerations</i>				
		Regulatory compliance	Improved analytics	Reduced WDT	Enterprise wide changes	Retention of staff
1	Proactive risk management, creating more resilience and better controls.					
2	Support strategic decision making with better insights, from periodic reporting to continuous insights					
3	Enhance the working day timetable: accelerate and reduce effort.					
4	Cost efficiency – free up more resource to work on project and change activity by reducing time needed to deliver QE results.					
5	Improve staff wellbeing: reducing overtime and increasing retention.					
6	Develop with scalability and flexibility in mind.					

Goals of the Modernisation Project

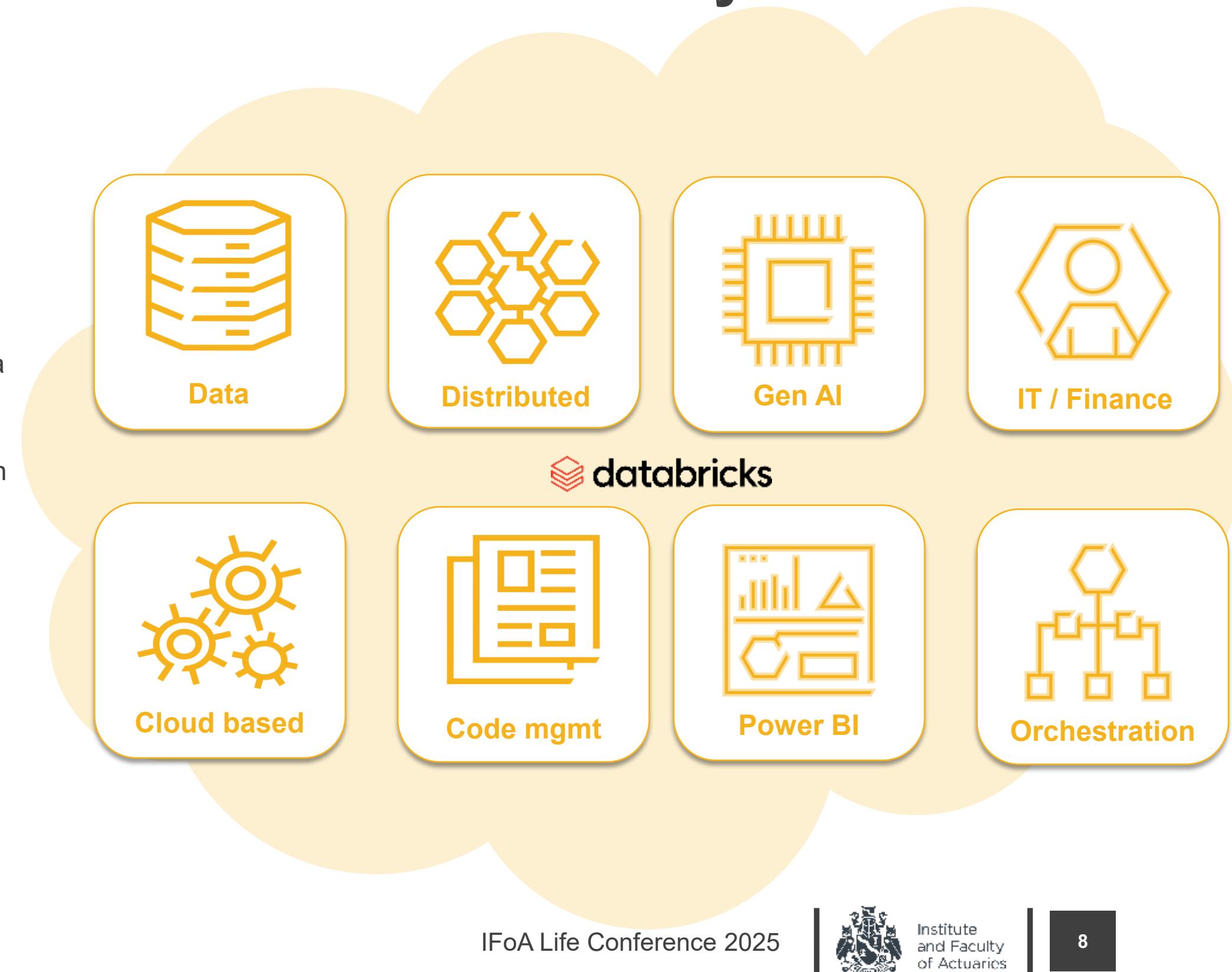
Aligning high value areas with strategic programmes to drive value creation and realise measurable goals.



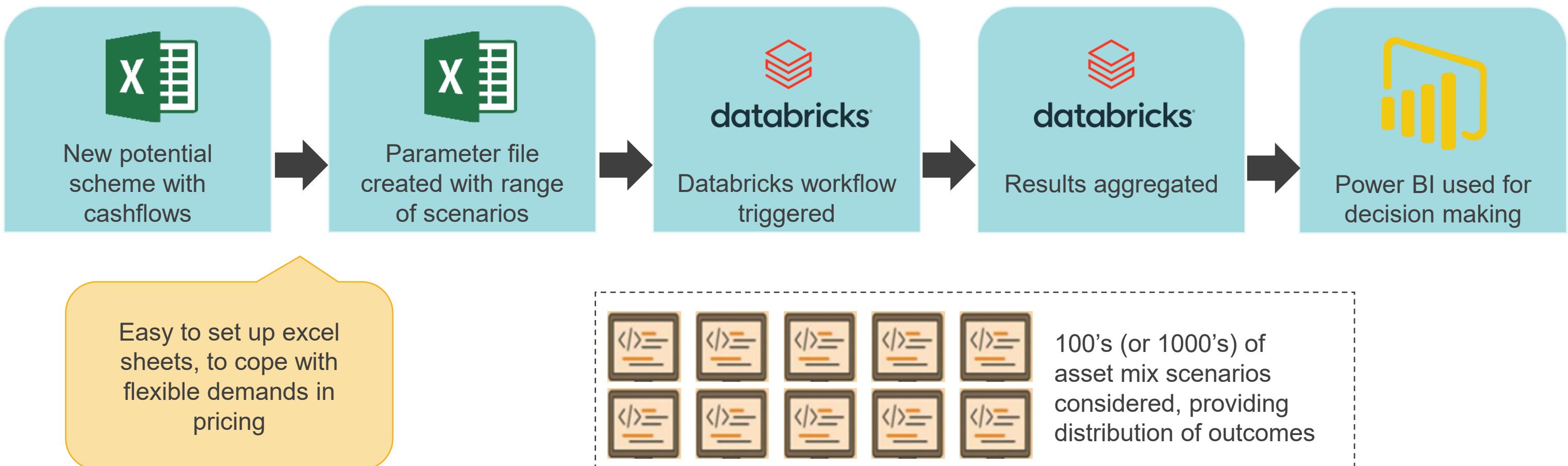
Enabling Modernisation with a Unified Data Analytics Platform

What is Databricks?

- A unified cloud-native analytics platform for data engineering, analytics and machine learning.
- Manages compute, notebooks, pipelines, and a central data catalogue.
- Uses Apache Spark DataFrames to handle large datasets in a simple, table-like format with distributed processing behind the scenes.
- Built for scalable/distributed processing and collaboration
- Acts as a shared workspace for data, code and models across teams.
- One platform that facilitates data, compute and collaboration.



Enabling Modernisation with a Unified Data Analytics Platform

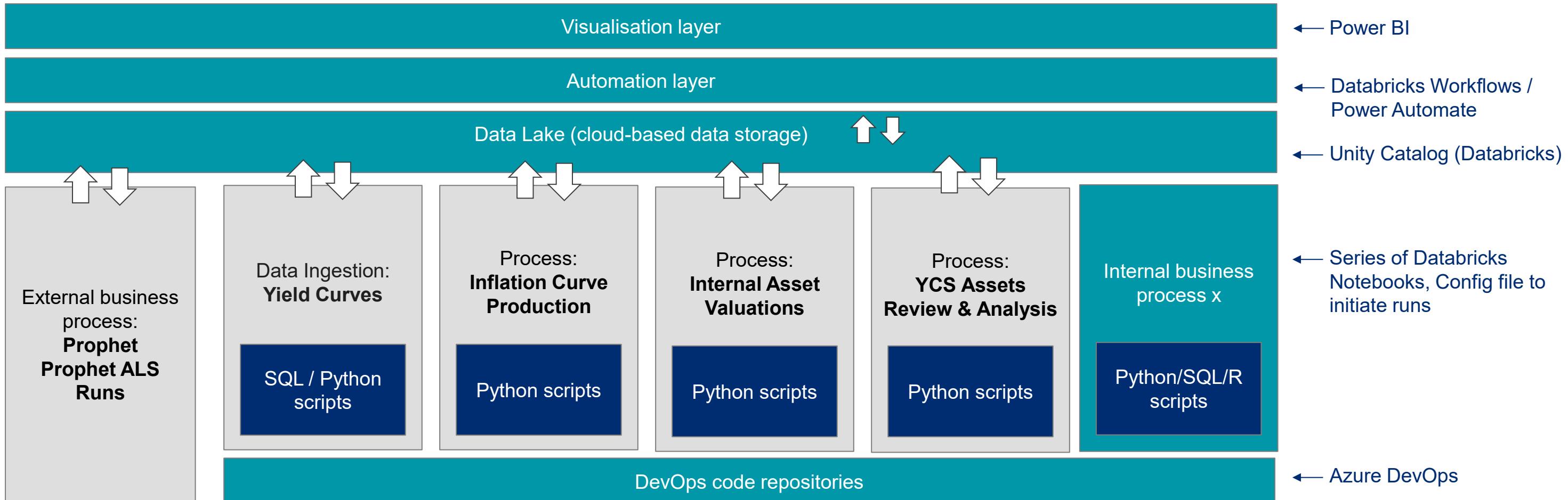


Enabling Modernisation with a Unified Data Analytics Platform

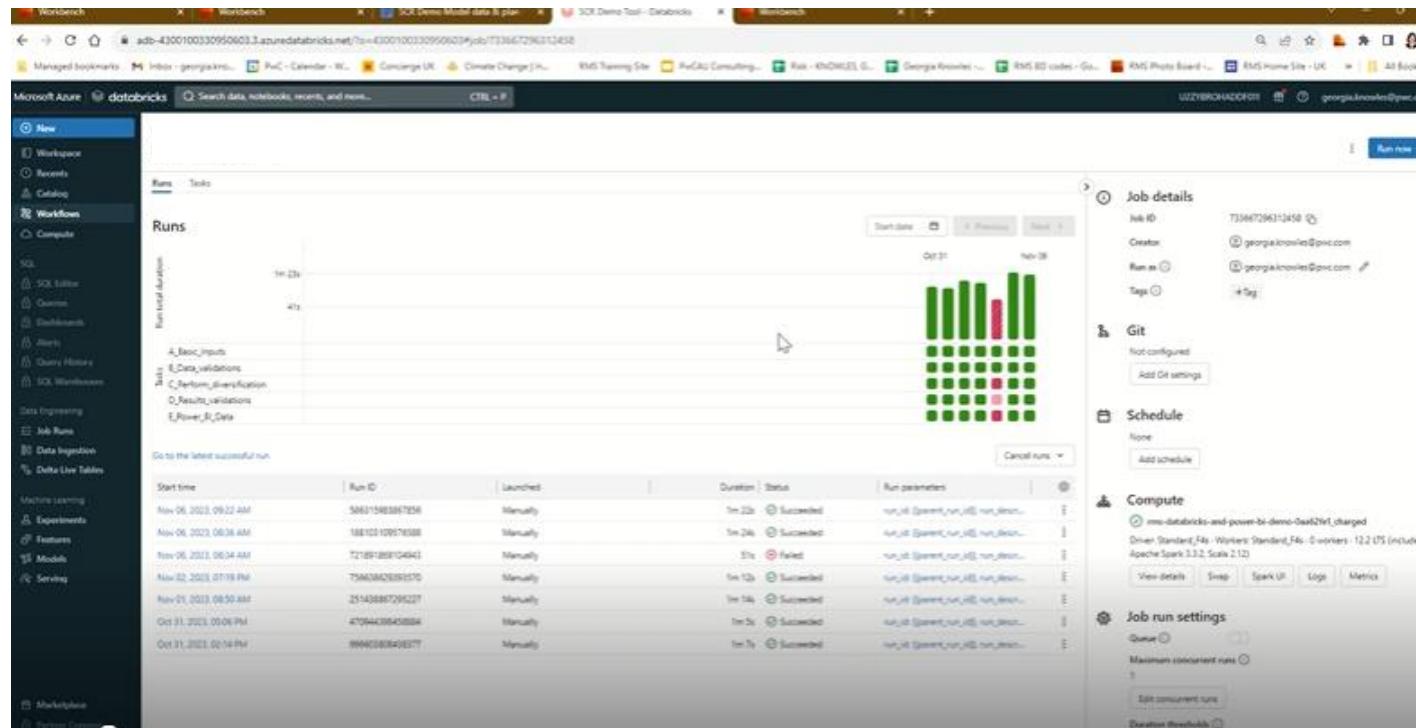


Yield curve service

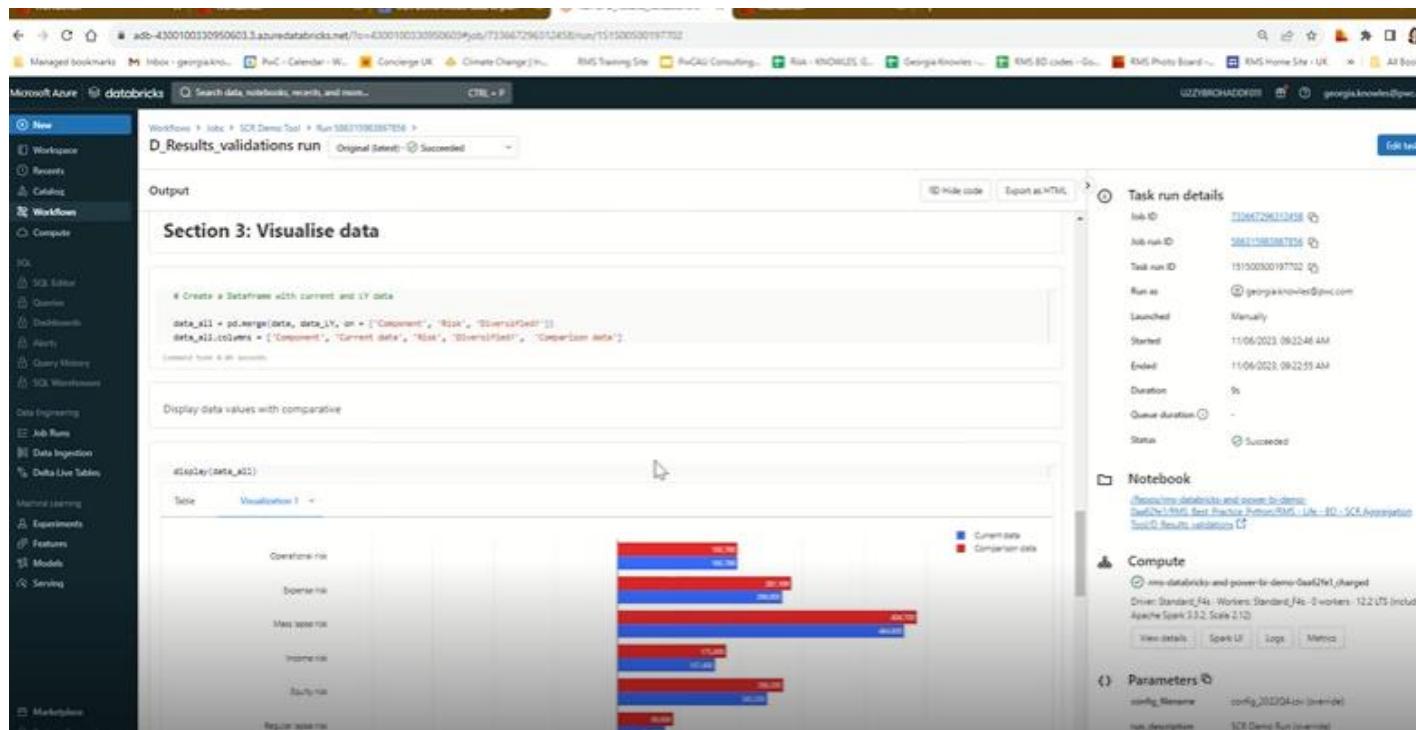
- New ecosystem for accelerating curve production
- Automated process that enhances WDT



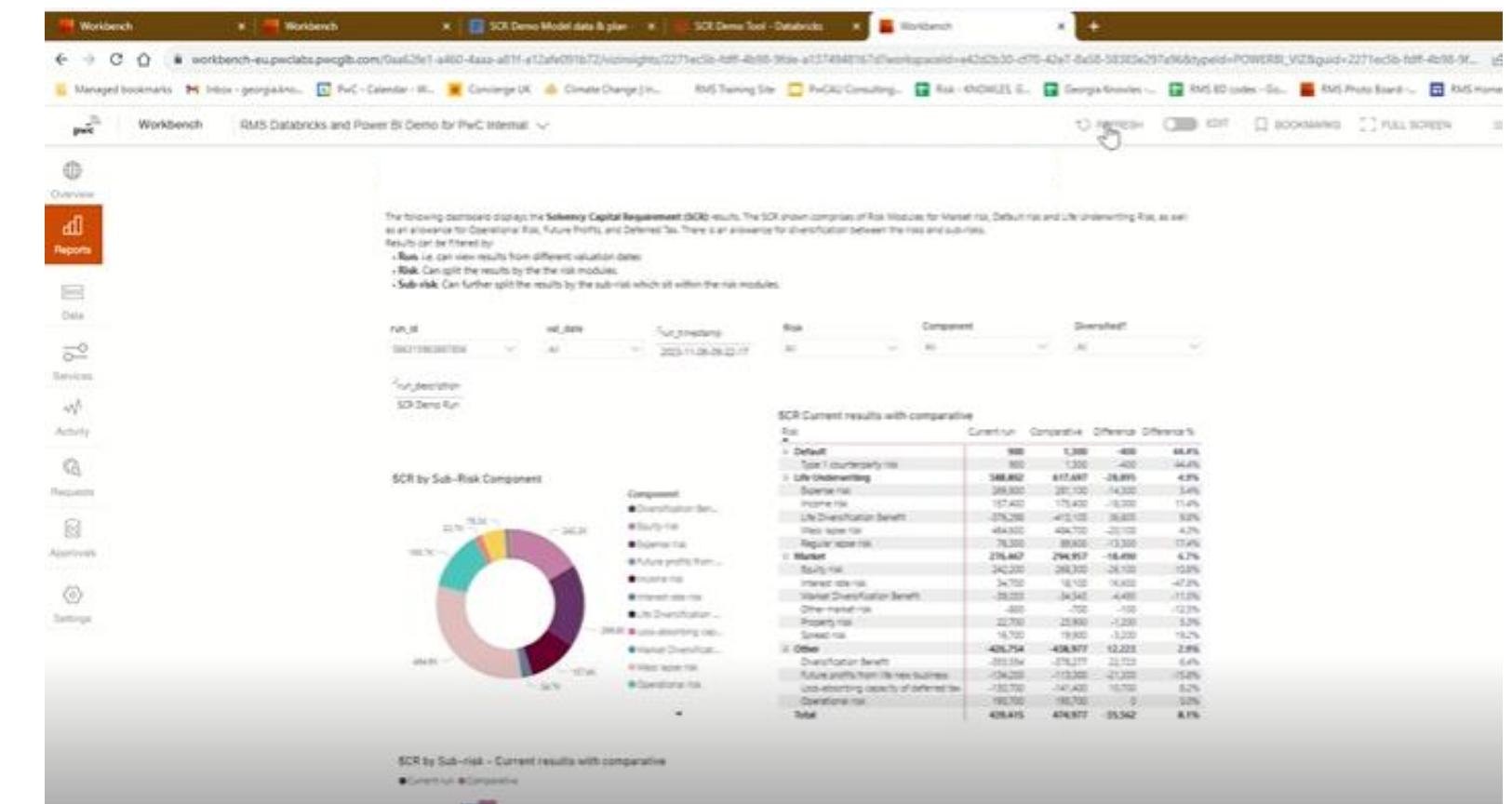
Enabling Modernisation with a Unified Data Analytics Platform



The screenshot shows the Databricks Workflows interface. On the left, a sidebar lists various Databricks services: Workspace, Catalog, Workflows, Compute, SQL, Databricks, Work, Query History, SQL Workbooks, Data Engineering, Job Runs, Data Ingestion, Delta Live Tables, Machine Learning, Experiments, Models, and Serving. The 'Workflows' section is selected. The main area displays a 'Runs' table with columns: Start time, Run ID, Launched, Duration, Status, and Run parameters. Below the table is a 'Job details' section with fields for Job ID, Creator, Run as, Tags, and a 'Git' section. The 'Schedule' section shows 'None' and a 'Job run settings' section with a 'Maximum concurrent runs' field set to 1.



The screenshot shows the Databricks Workflows interface. The 'Workflow' section is selected in the sidebar. A specific task run is selected, showing 'D_Results_validations run' with a status of 'Succeeded'. The 'Output' section contains a 'Section 3: Visualise data' section with a bar chart comparing 'Current data' (blue) and 'Comparison data' (red) across categories like 'Operational risk', 'Solvency risk', 'Market risk', 'Income risk', 'Interest rate risk', 'Loss-distributing cap.', 'Value Diversification', and 'Operational risk'. The 'Task run details' section provides a detailed breakdown of the task run, including job ID, job run ID, task run ID, run as, launched manually, started at 11/06/2023 09:22:46 AM, ended at 11/06/2023 09:22:55 AM, duration of 9s, and a status of 'Succeeded'. The 'Compute' section shows the job was run on a 'Standard_F4' cluster with 4 workers and 12.2 UDFs. The 'Parameters' section shows parameters for 'config_name' (config_20220414) and 'run_description' (SCR Demo Run (updated)).



The screenshot shows the LICAT Capital Reporting interface. The 'Reports' section is selected in the sidebar. The main area displays a dashboard for 'SCR Demo Model data & plan'. It includes a 'SCR by Sub-Risk Component' donut chart and a 'SCR Current results with comparative' table. The table shows current and comparative values for various risk components, with a difference percentage column. The 'SCR by Sub-risk - Current results with comparative' chart is also visible.

Component	Current run	Comparative	Difference	Difference %
Default	900	1,300	-400	-30.77%
Life Underwriting	388,892	817,487	-428,695	-52.43%
Solvency risk	288,300	281,100	-14,200	5.00%
Income risk	157,400	175,400	-18,000	-10.33%
Market	276,250	415,100	-138,850	-33.03%
Regulatory risk	78,300	89,800	-11,500	-12.75%
Interest rate risk	216,467	294,917	-78,450	-26.47%
Other	242,000	288,300	-46,300	-16.00%
Interest rate risk	34,100	16,100	-18,000	-53.53%
Market Diversification Benefit	28,000	34,340	-6,340	-18.61%
Other - interest rate risk	400	700	-300	-12.50%
Property risk	22,700	25,800	-3,100	12.00%
Interest rate risk	16,700	19,400	-2,700	-14.27%
Operational risk	426,754	436,877	-10,123	2.29%
Other	276,250	22,723	-253,527	-64.47%
Interest rate risk	28,000	173,300	-145,300	-51.86%
Market Diversification Benefit	15,700	14,700	1,000	7.01%
Property risk	22,700	18,700	4,000	17.82%
Interest rate risk	16,700	18,700	-2,000	-10.87%
Operational risk	180,700	180,700	0	0.00%
Total	426,754	436,877	-10,123	2.29%

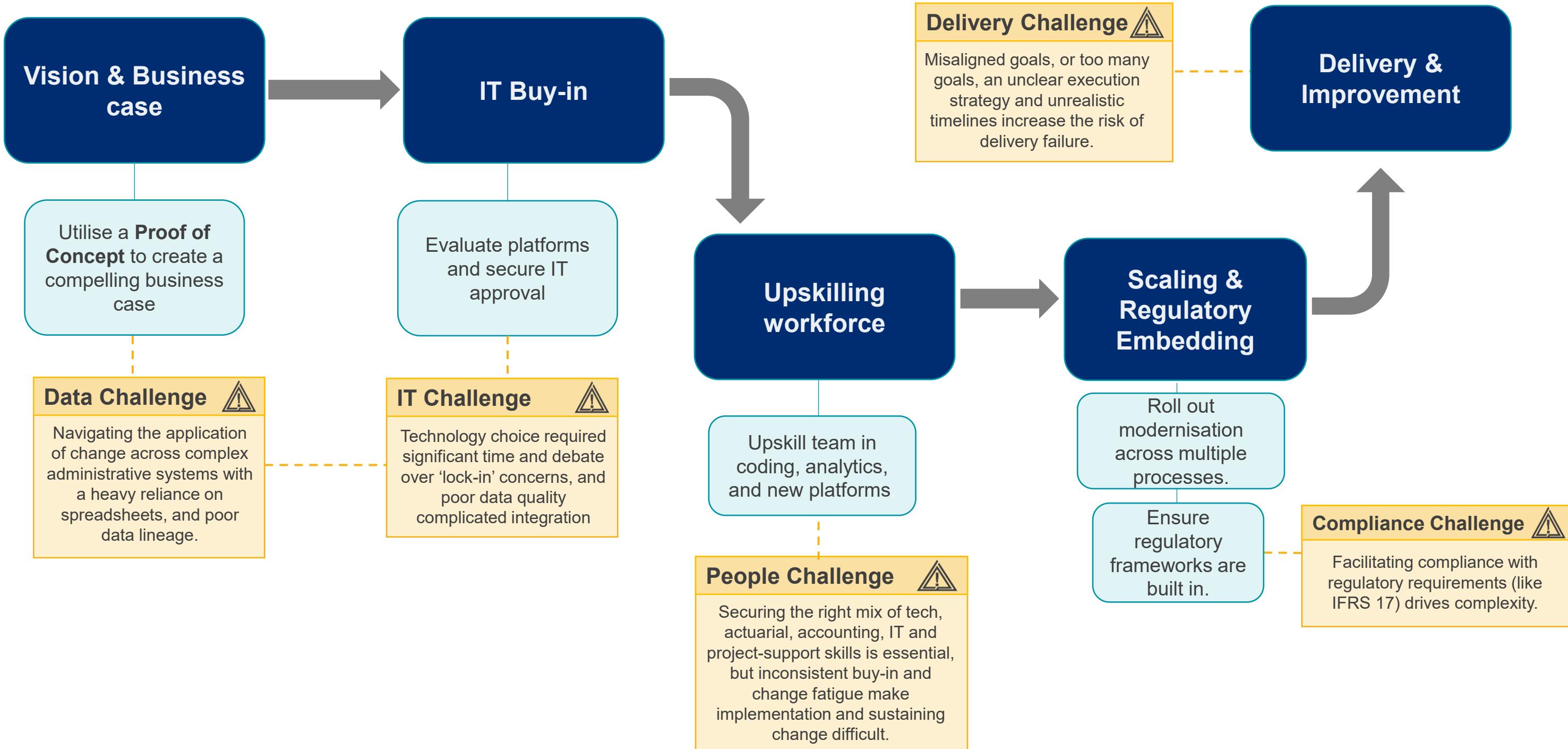
LICAT Capital Reporting

- Replaced RHS of models with automated workflow
- Reduced effort producing Group templates
- Stronger control environment



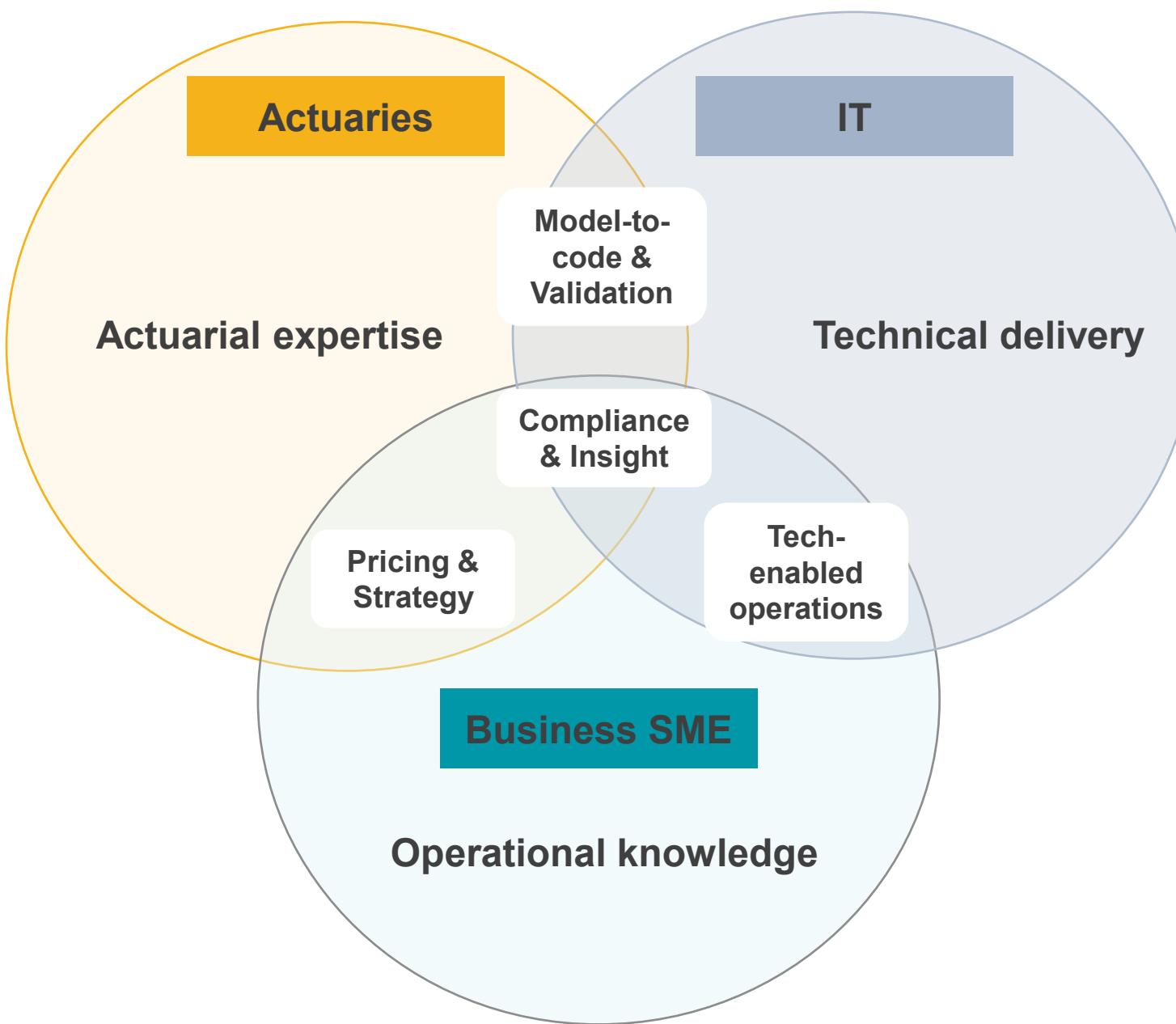
Where to Start

The path to actuarial modernisation follows these key steps...



What do Actuaries Bring?

It is impossible to solve the problem with just IT....



“Actuaries bring the insight and expertise so that modernisation delivers both compliance and insight.”

Actuaries bring domain specialisms:

- Deep understanding of the business
- Translate business needs into technical & process requirements
- Critical thinking & problem solving to unblock design issues
- Actuarial methods to feed into design process
- UAT and 2nd/3rd line checks
- Clear communication of actuarial requirements to IT, project teams and senior stakeholders

Actuaries of the Future



Questions?