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Harnessing Databricks & AI for Actuarial Workflows



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AI and modern data platforms are reshaping actuarial work

Session overview: using Databricks and AI in actuarial work

Why this matters now



- Policy, claims, and exposure data are consolidating onto modern platforms
- Actuaries gain direct access to larger, more granular data without hand-offs
- Routine transformation and reconciliation work can be automated reliably
- AI assistance shortens the path from raw data to an explainable insight

What we will cover



- Data transformation: preparing and analyzing data in one governed environment
- Reporting and visualization: building dashboards actuaries can maintain themselves
- AI-enabled analysis with Genie: asking questions of your data in plain language
- Live demonstration of Databricks capabilities

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Where actuaries can put Databricks to work



Decrement and experience studies

Review mortality, lapse, and morbidity assumptions across full seriatim data, leveraging Python for advanced calculations and A/E analysis.



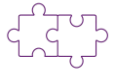
Projections and modeling in Python

Run cash flow and reserve projections as distributed Python jobs, scaling stochastic scenarios and sensitivities well beyond spreadsheet limits.



Valuation and reporting pipelines

Automate model input preparation, reconciliations, and roll-forward reporting with versioned, auditable data and repeatable runs.



AI-assisted insight with Genie

Ask plain-language questions of experience and valuation results, surface emerging trends, and build dashboards for business partners.

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What you will take away



Recognize practical opportunities

Identify where Databricks and AI fit into existing actuarial processes, from data preparation through experience analysis and reporting.



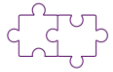
Work faster with complex data

See how large, granular datasets can be queried, transformed, and analyzed in minutes rather than through lengthy manual cycles.



Interact with data using AI

Use Genie to ask questions in natural language, generate visualizations, and explore results without writing code first.



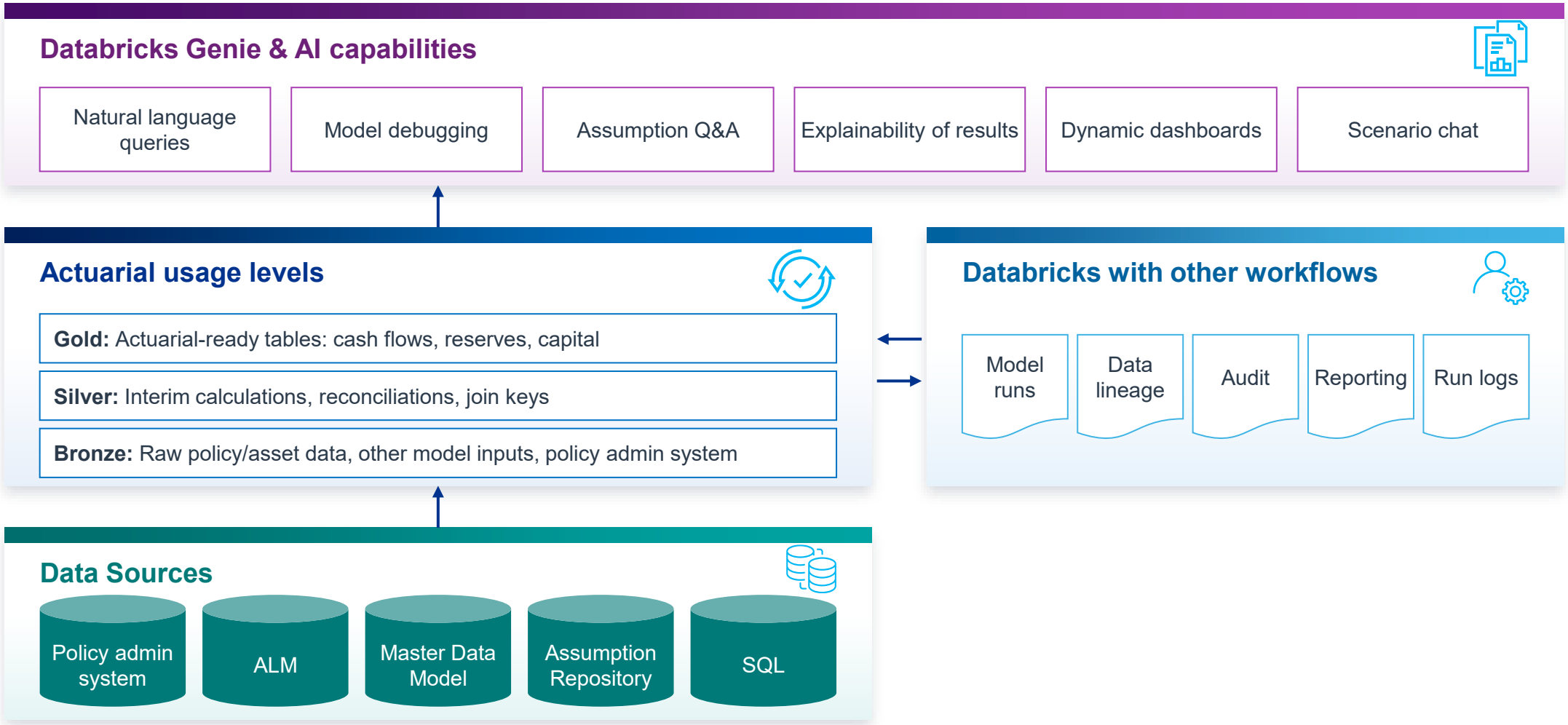
Complement, not replace

Understand how these capabilities sit alongside established actuarial models, tools, and governance and controls expectations.

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Databricks architecture for actuarial valuation models



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Genie use cases for actuarial models

Model Diagnostics

“Explain the difference between Q2 and Q3 runs for Term Life model”

Assumption Q&A

“What’s the latest mortality improvement assumption used?”

Scenario Analysis

“Simulate +100 bps shock to discount rate and recompute cohort-level reserves”

Governance Inquiry

“Who last modified the mortality table?”

BI and Dashboard Query

“Show CFT results by product and scenario”

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Expense Analysis Use Case

Leveraging Databricks for expense analysis

Objective: Act as a strategic partner to the business

Finance and actuarial teams want to uncover the why behind the numbers, identify real cost-saving opportunities, and spot anomalies before they become major problems. But too often, they are so buried in the manual, reactive cycle of reporting that there's simply no time left for deeper analysis.

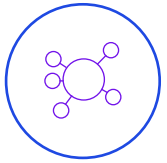
The future of actuarial is data-driven, insightful, and proactive



Aggregating and reviewing data. We created a synthetic financial dataset to analyze expense drivers at a high level across different business lines and regions. Here, Product and Region are our key business segments, and the Scenario column contains both 'Actual' and 'Budget' values.



Conducting high-level analysis and uncovering hidden patterns. We look to identify anomalies and outliers in the data. If a certain product or region is showing expenses significantly over budget, we want to know if this is a one-time shock or part of a pattern. This is where we can introduce a more advanced technique called k-means clustering – a machine learning technique that automatically groups similar data points together.



Delivering actionable insight. We created multiple dashboard views to interact with the data and identify expense drivers. We can view results of our clustering analysis to see segmented expenses and see if any natural, distinct groups emerge. We can view results on key financial metrics like Operating Expenses, Total Claims, and Net Income. These dashboards can be exported for management review. This provides leaders with crucial information about business performance to make strategic decisions.

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