

ENHANCING ACTUARIAL INSIGHTS THROUGH DATA MODERNISATION

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AGENDA

Welcome, context & presentation objectives

How can we move from fragmented models to connected actuarial insight?

What does a modern data platform mean for actuarial teams?

How do we bridge the gap between actuarial and data disciplines?

- Our intention is **to guide you through four key areas:**



Current State and Vision

The way we work now: silos, manual effort, and reporting pain points and how we should address those



Unified Data Platforms

Unified environment that brings all our data, models, and people together



Practical Applications

Examples of use cases across non-life actuarial workflows



Bridging the Actuarial Gap

Empowering actuaries to collaborate, experiment, and innovate with modern tools

The aim of today's session is to give you an introduction to how Unified Data Platforms can enhance actuarial insight through better data, stronger governance, and smarter collaboration

MODELLING ECOSYSTEM AND PAIN POINTS

Addressing current state's data and process challenges is key to enabling faster, more controlled actuarial cycles

Legacy systems limit integration and scalability

- Limited integration capabilities
- Unable to handle granular data processing and real-time analytics



Fragmented systems

- Data silos
- Manual data processing



Challenges with data governance and ownership

- Poor data quality
- Lack of data contracts and ownership



Collaboration barriers with other teams

- Cultural and operational barriers
- Technology limitations



FUTURE PROOFING WITH MODERNIZATION

By addressing current challenges, modernisation enables faster insights, cost efficiency, and the flexibility to adapt to future business needs

Faster Insights

- Integration of sophisticated data visualisation tools allows stakeholders to comprehend complex actuarial data
- Real time access to data allowing for more proactive strategies rather than reactive responses

Laying the Groundwork for AI and ML

- Modern data management practices ensures data used for AI and ML is clean and relevant
- Built-in integration pathways to AI and ML platforms seamlessly
- Investment in human capital ensures team are upskilled for future challenges

Enhanced Collaboration

- Centralised data repositories enables teams to access a single source of truth
- Cross departmental access can ensure that teams and functions can collaborate more effectively

Enhanced Decision-Making

- Fast and easy access to data enhances the modelling and decision-making process



Operational Agility

- Routine tasks can be automated, freeing up human resources for more strategic activities
- Improves efficiency and reduces likelihood of errors

Cost Efficiency and Scalability

- Unified ecosystems reduce costs associated with multiple systems
- Cloud solutions provide flexibility to scale as business grows



Current State
and Vision



Unified Data
Platforms



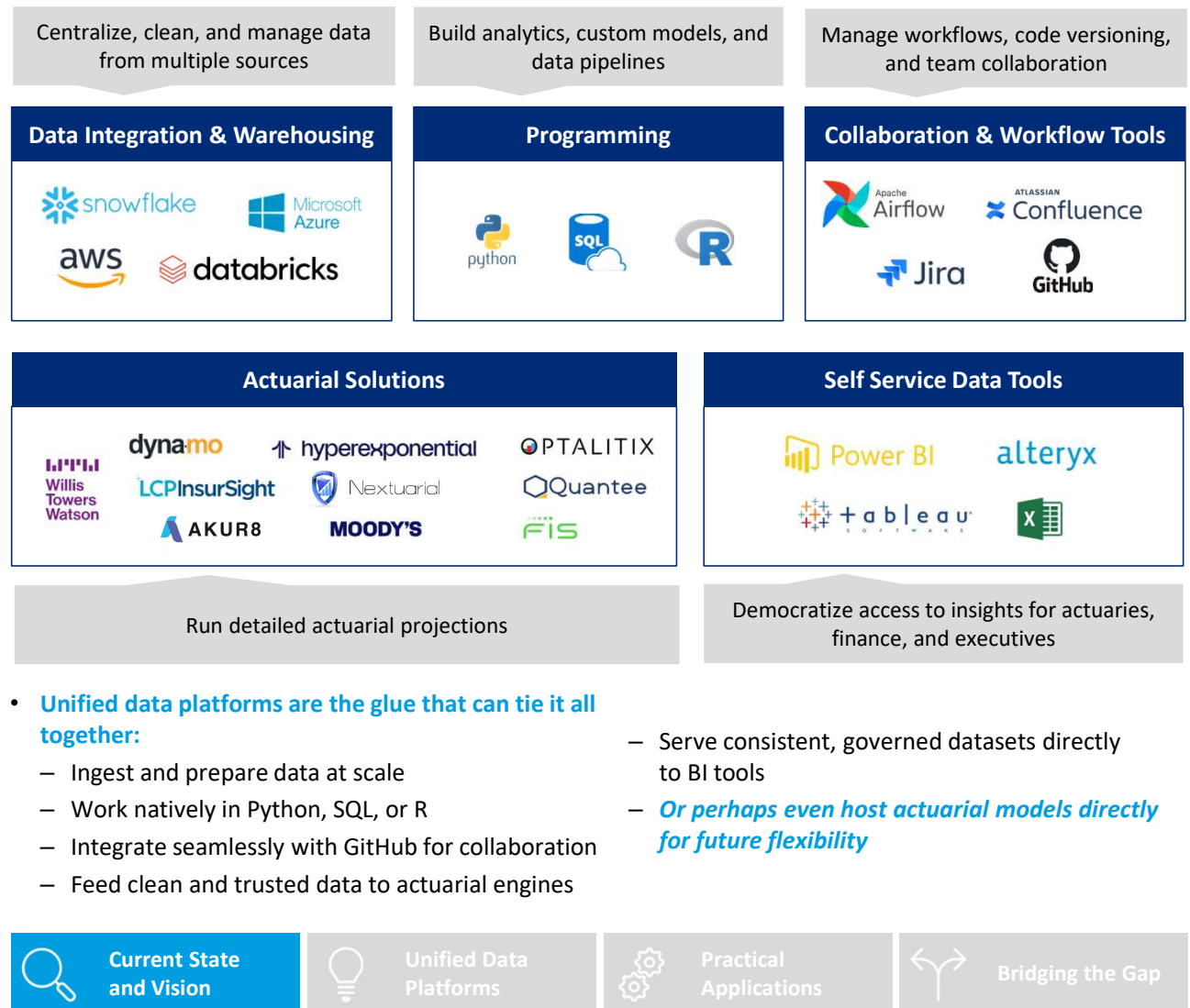
Practical
Applications



Bridging the Gap

MODERNIZING THE ACTUARIAL TECHNOLOGY STACK

Unified data platforms integrate with the tools modern actuarial teams already use – connecting data, modelling, collaboration, and reporting in one unified environment



INTRODUCING UNIFIED DATA PLATFORMS

1 What is it?

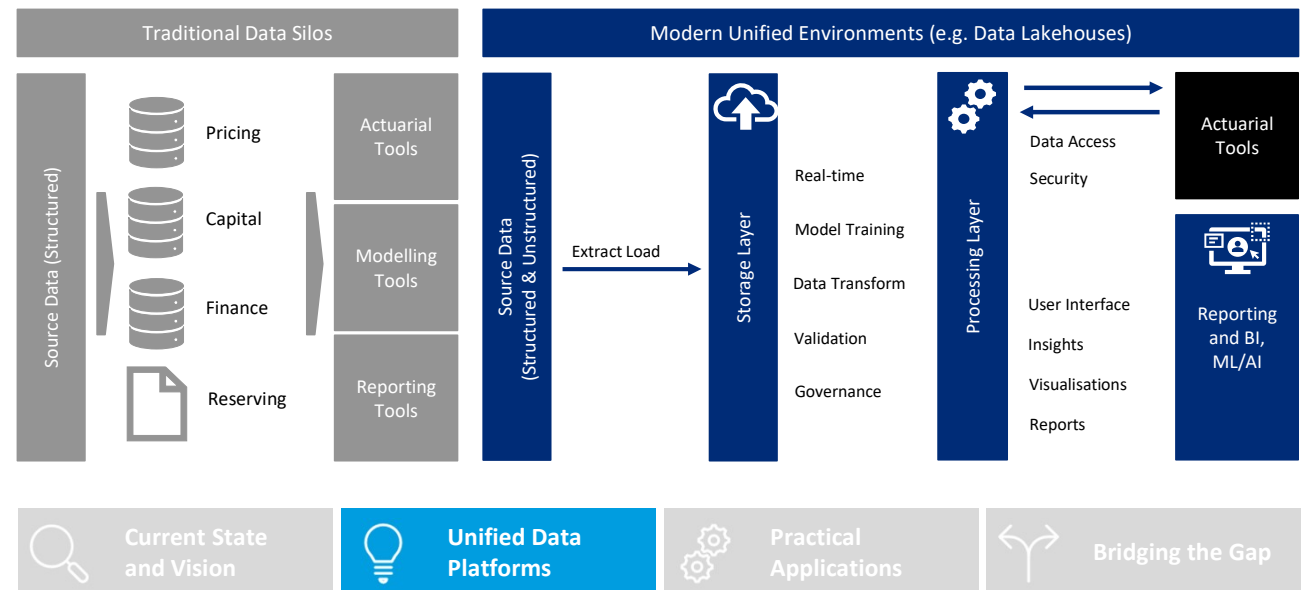
2 Data Governance

3 Medallion Architecture

4 Analytical Workspaces

5 Insurance: Use Cases

- Unified data platforms are **cloud-based platforms** that brings together data engineering, analytics, and machine learning in a secure environment
- The platforms are built on the **Lakehouse architecture**, meaning teams can **store all their data in one environment**, while still running fast, reliable analytics and reporting
- They act as a **central hub**, allowing actuaries, data engineers, and business users to collaborate on the same data without silos
- Teams can **ingest, process, validate, model, and analyze data** at scale using familiar languages like Python, SQL, and R
- For actuarial teams, these complement existing actuarial tools, **simplifying data preparation and governance** while offering the option to run models natively



INTRODUCING UNIFIED DATA PLATFORMS

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- **Effective data governance** means having the right structure, control, and transparency around how actuarial data is managed and used



Ownership

Every dataset has a clear owner and purpose



Traceability

Track data from source systems through transformations to financial actuarial outputs



Standards & Structure

Common data definitions, naming conventions, and organization



Access & Compliance

Role-based permissions and audit logs

- **Strong governance builds confidence** as every dataset is reliable, every result is explainable, every change is reproducible



Current State and Vision



Unified Data Platforms



Practical Applications



Bridging the Gap

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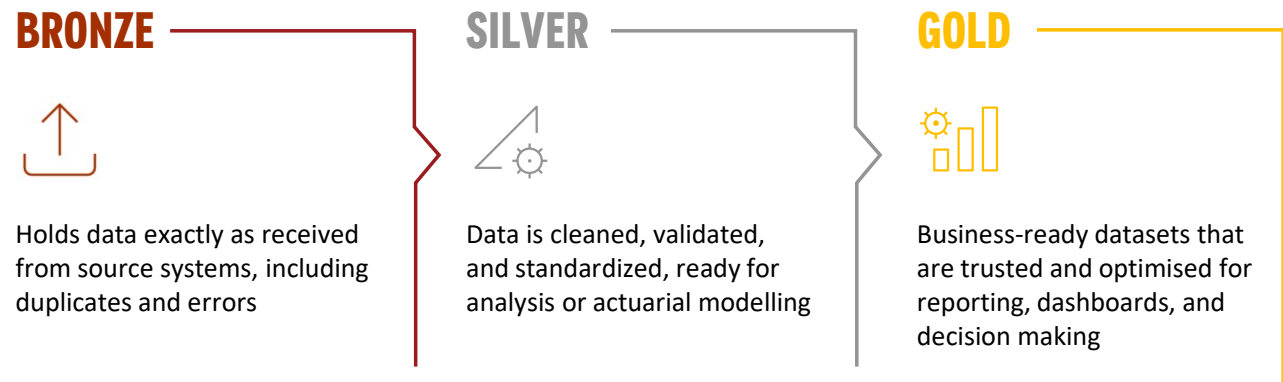
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- The **Medallion Architecture** describes data quality and processing stages, showing how clean and trusted the data is
- The **Medallion layers are implemented as schemas** inside the data hierarchy and the purpose is to organize data into three logical layers:



- This **layered approach** ensures there is always a **single source of truth**, while preserving **traceability** back to the original raw data
- It **prevents messy data** from contaminating final actuarial outputs and **allows for incremental improvements** without disrupting downstream reporting
- **Schema enforcement on write** strengthens this by **adding technical guardrails**, ensuring that only well-structured, valid data progresses through each stage.



Current State
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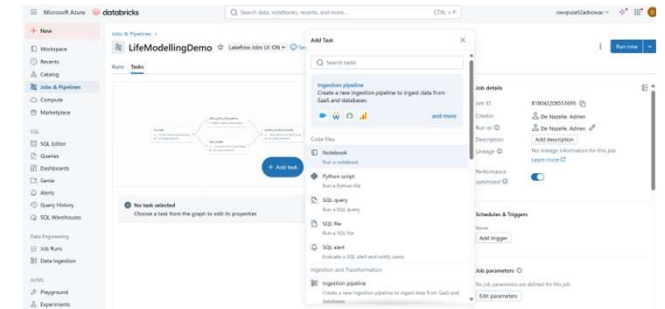
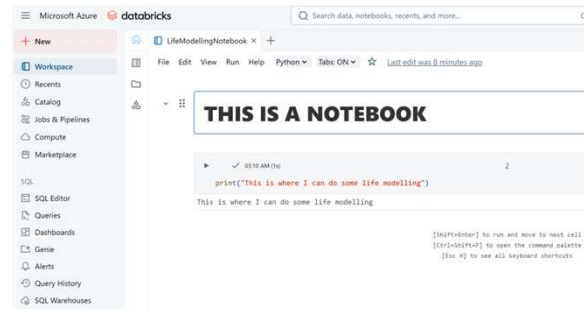
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- **Notebooks are interactive workspaces** where actuaries, data scientists, and engineers can write **Python, SQL, or R code** and see results instantly
- They allow **real-time collaboration**, similar to Google Docs or SharePoint, so teams can co-develop models or data pipelines
- Notebooks are **version-controlled via GitHub**, ensuring transparency and rollback if changes are needed
- **Jobs** take these notebooks and turn them into **automated, repeatable workflows** that can run on a schedule or be triggered by events
- This combination allows actuarial processes like **assumption updates or monthly reserve calculations to run consistently and automatically**, reducing manual effort and operational risk
- Best practice is to **use jobs for production processes**, while using notebooks for exploration, development, and testing



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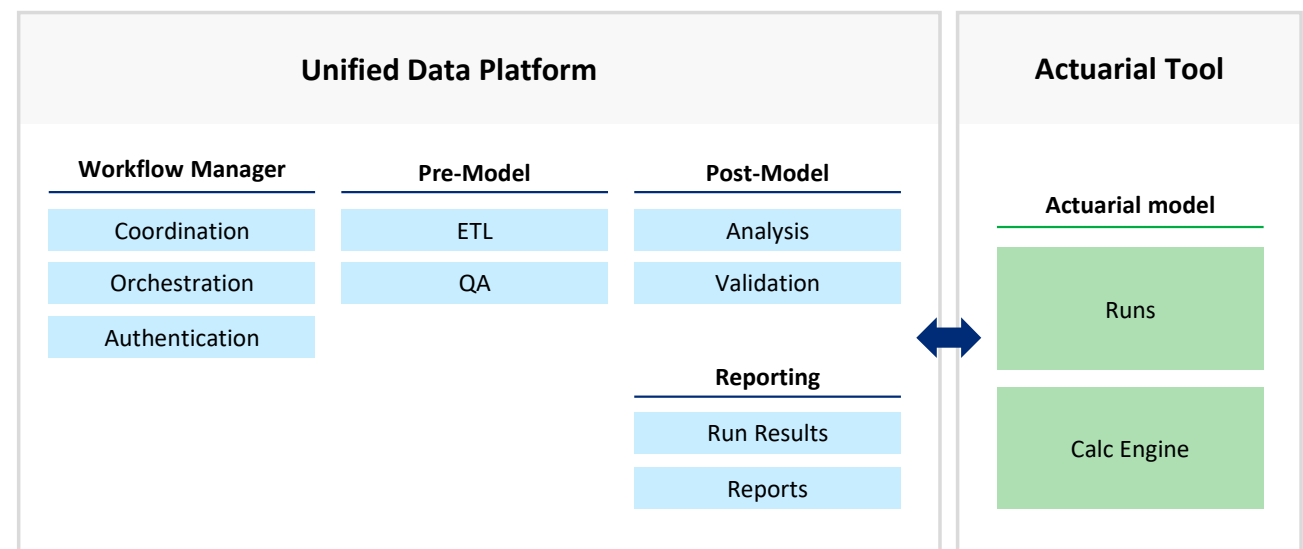
APPROACHES TO USING THE PLATFORM FOR MODELLING

Actuarial tools combined with a unified data platform delivers rapid benefits through better data, controls, and reporting

1 Integrate with Actuarial Software

2 Self-Build Solutions in Platform

- The **actuarial model** is executed in a **dedicated actuarial modelling solution**
- **Pre- and post-model activities**, plus **reporting** and **workflow management**, are implemented in **the unified data platform**
- **Managed services within unified data platforms** lower engineering barriers and accelerate delivery



Current State
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Bridging the Gap

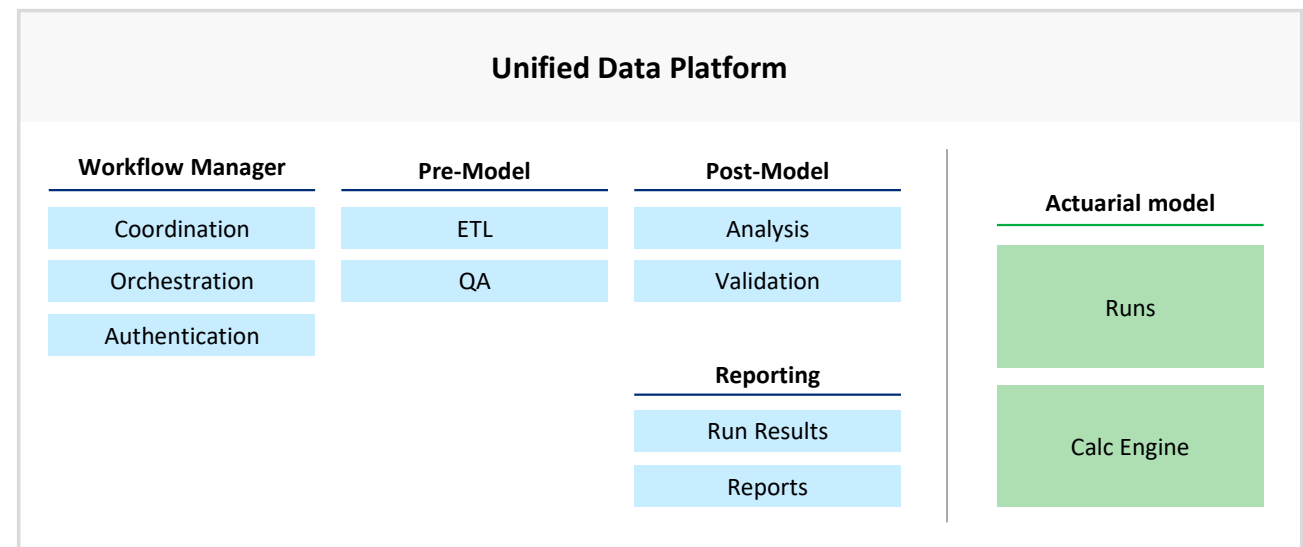
APPROACHES TO USING THE PLATFORM FOR MODELLING

Full platform approach offers long-term flexibility and scale but requires more time, skills, and validation to implement

1 Integrate with Actuarial Software

2 Self-Build Solutions in Platform

- The **actuarial model** is implemented **within the unified data platform** (for example, in **Python**).
- Offers **full flexibility** (open languages), **cloud-scale parallelism**, and **unified lineage**.
- Requires **new skills**, an **updated model validation approach**, and revised **operating procedures**.
- **Huge effort** for migration and implementation including the development of an efficient model architecture



Current State
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Bridging the Gap

BRIDGING THE GAP: TECHNOLOGY GETS US HALFWAY

Unified data platforms can solve some of the challenges currently related to developing in-house actuarial tools or integrating a vendor solution within a data ecosystem

Unified data platforms provide benefits for self-built actuarial solutions and processes:

Deploying a model or process in-house or embedding a vendor-solution within a data ecosystem often introduces challenges around governance, dependency management, and scaling. Unified data platforms can help eliminate some of these issues.

Unified data platforms solves some of the key concerns:



Governance

Centralized access controls,
audit logging, and model lineage



Hosting and scaling

Managed clusters, autoscaling,
and built-in reliability



Dependency management & reproducibility

Consistent environments,
versioning, and packaging

Remaining challenges to manage:



Model software architecture

Design decisions
(packaging, apis,
CI/CD) remain critical



Coding proficiency

Teams need coding
proficiency to develop
production-grade
models



Change management & testing

Deploying model
changes safely,
regression testing, UAT
sign-off



Current State
and Vision



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Bridging the Gap

BRIDGING THE GAP: ACTUARIES

Technology takes us halfway, but it's collaboration, curiosity, innovation, and shared ownership that will drive modernisation and change

Building stronger cross-department relationships

- Proactively working with IT, underwriting, claims, and data science to gain access to the data they need
- Joining agile squads and sitting in cross-functional meetings to pilot projects integrating data modernisation and AI

Developing hybrid skillsets

- Increasingly learning basic data engineering, SQL, and tools like Python or R
- Using self-service tools to help bypass delays and empower actuaries to automate their own data pipelines

Championing data governance improvements

- Advocating for better data ownership structures and pushing for company-wide standards (e.g. consistent definitions of claim severity or exposure)
- Getting involved in data strategy initiatives and how data should be shared across departments

Building actuarial-specific data marts

- Creating their own centralised repositories of the specific data they need, where enterprise-wide integration is not available
- May not solve the root silo problem, but can encourage collaboration and data sharing across actuarial functions



Current State
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Bridging the Gap

QUESTIONS & ANSWERS

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