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Creating Business Value, Driven by Data Intelligence

CASE STUDY

Modernizing Actuarial Data Management

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Modernizing Actuarial Data Management

This case study explores the modernization of actuarial data storage and processing, focusing on transitioning from outdated systems to a unified, efficient, and data-driven architecture that enhances operational efficiency and regulatory compliance.

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Overview

This case study focuses on the modernization of actuarial data storage and processing systems, addressing the challenges posed by outdated architectures, manual processes, and fragmented data handling within many large organizations. By leveraging a combination of actuarial expertise and modern data architecture, including cloud solutions and advanced data governance practices, the aim is to streamline operations, improve data quality, and enable deeper analysis. The solution transitions organizations from legacy systems to a unified, data-driven architecture that enhances operational efficiency, ensures compliance with evolving regulatory frameworks like IFRS17, and delivers long-term benefits such as faster time to market, better data governance, and an automated, self-service business intelligence environment.

Problem Statement

Modernizing actuarial data storage and processing is essential to address inefficiencies, ensure compliance, and improve business agility. The current reliance on outdated systems and manual processes leads to poor data quality, slow turnaround times, and significant risk due to the loss of institutional knowledge. Furthermore, organizations are struggling with aligning their processes with modern data governance frameworks, which increases the risk of compliance failures and operational inefficiencies. The problem is exacerbated by the fact that actuarial teams, though highly skilled in risk analysis and modeling, are not always equipped to handle the complex data requirements needed for modern financial reporting and regulatory compliance (e.g., IFRS17). As a result, organizations are facing increased pressure to modernize their actuarial processes while dealing with aging systems, loss of key talent, and fragmented operations.

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Existing Environment Challenges

Many large enterprises in the insurance and financial sectors are operating with outdated Policy Administration Systems (PAS) and antiquated data processes. These systems were often designed decades ago, with data extracts and architectures built based on older frameworks. This creates significant dependency on a handful of key individuals who possess deep knowledge of these legacy systems. When these individuals retire or leave, the organization faces a talent retention problem, and the processes become harder to maintain.

Outdated Architecture: The architecture used by many organizations is outdated, resulting in significant inefficiencies in managing actuarial data. These systems were designed years ago, based on older technologies that are now incompatible with modern standards. As a result, data processes no longer align with current best practices, making them difficult to integrate with new tools or platforms. This misalignment leads to inefficiencies, higher operational costs, and challenges in adapting to new business or regulatory requirements. Moreover, the outdated architecture hinders scalability, limiting the organization's ability to grow or expand its actuarial data processes.

Aging Actuarial Models: Many actuarial models were developed to solve short-term problems or meet immediate needs, without consideration for future scalability or integration with modern systems. Over time, these models have become outdated, and they are now difficult to update or expand. The lack of a long-term strategy has left organizations with models that are not well-integrated with modern data frameworks or platforms, limiting their effectiveness in today's data-driven environment. Furthermore, these aging models often require manual interventions to function, further compounding inefficiencies and increasing the risk of errors.

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Existing Environment Challenges

Manual Processes: Many organizations rely on manual, workaround-heavy processes involving Excel and Access databases. These manual processes are labor-intensive, prone to errors, and lead to inefficiencies in generating data required for investigations and modeling.

Actuarial Team Skillsets: Actuaries are increasingly involved in adjusting models and datasets, but they often lack the technical skills needed to manage complex data processes. This gap between actuarial expertise and technical knowledge leads to bottlenecks and inefficient processes.

IFRS17 Challenges: The implementation of IFRS17 has placed significant strain on existing systems, requiring major changes in data processes. Many companies have struggled to adapt to the new requirements, leading to inefficiencies and challenges in data governance. Organizations that are unprepared for these changes face challenges in maintaining compliance and leading to inefficiencies.

Black Box Systems: Actuarial teams frequently rely on non-actuarial teams to handle complex data processing needs. This division often results in the creation of "black box" systems, where the underlying processes and logic are hidden or unclear to those who need the data. These systems are difficult to modify or adjust, especially when actuarial requirements change. This lack of transparency slows down actuarial investigations, making it hard for actuaries to model or analyze data efficiently, resulting to delayed business decisions or ability to respond quickly to market.

Duplicate Effort: In organizations with multiple business segments, teams often work in silos leading to to duplicate efforts in data extraction, processing, and analysis. These silos not only waste time and resources but also create inconsistencies in data, as different teams may use varying processes and standards. This exacerbates the problem, leading to operational inefficiencies and increased costs.

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Modernization Considerations

With the aim to modernize actuarial data processes and management, Data Symphony keeps into consideration several critical factors at all stages of the engagement to ensure a successful and sustainable transformation.

Data Quality: Ensuring high data quality is paramount. Poor data leads to poor results, particularly when it comes to actuarial models where precision is critical. Establishing a robust data governance framework is essential for ensuring that data is clean, accurate, and properly managed throughout its lifecycle.

Simplicity and Usability: The modernization process must focus on simplicity. It should streamline workflows and ensure that all stakeholders, from actuaries to data engineers to business analysts, can easily interact with the new system without requiring deep technical expertise.

Stakeholder Involvement: It is essential to involve all relevant stakeholders, including actuaries, project managers, accounting teams, and IT professionals. Each group must have a clear understanding of how the new processes will work and how they will contribute to the organization's success.

Adherence to DAMA DMBOK Standards: We follow DAMA DMBOK (Data Management Body of Knowledge) principles throughout the modernization process. This ensures that best practices in data management—such as data governance, quality, and lifecycle management—are strictly adhered to, promoting consistency and compliance across all data processes..

Future-Proofing: The new architecture must be scalable and flexible to accommodate future growth, including changing regulations, market conditions, and business needs. By leveraging modular design, organizations can ensure adaptability and rapid integration of new technologies while maintaining regulatory compliance.

Solution Approach

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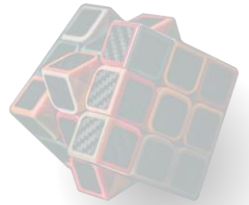
Data Symphony engaged to modernize outdated actuarial data systems which were hampered by manual processes and compliance challenges. The goal was to streamline operations, improve data governance, and ensure scalability. Through a structured and cost-effective approach, Data Symphony delivered a comprehensive solution that addressed these issues and provided lasting benefits.

- Developing a Structured Roadmap: The modernization journey began with Data Symphony creating a detailed high-level roadmap to guide the entire project from start to finish. This roadmap provided a clear, step-by-step approach that allowed all stakeholders to visualize the end-state of the project and comprehend the specific benefits and outcomes of the transition. The goal was to ensure alignment across teams and maintain focus on the project's long-term vision. Key milestones were defined at each phase of the roadmap.
    - Initial System Assessments: Evaluated legacy systems to identify inefficiencies and data issues. This assessment laid the groundwork for understanding the scope of the modernization.
    - Requirement Gathering: Defined regulatory and business requirements with actuarial, data, and IT teams.
    - New Architecture Design: Created a scalable, flexible architecture combining cloud and on-premise solutions. The design incorporated a blend of cloud-based and on-premise solutions, ensuring flexibility and cost-efficiency.
    - Phased Implementation: Ensured a smooth transition by breaking the project into manageable stages.
    - Stakeholder Engagement: Maintained alignment through continuous feedback from all relevant teams.



Solution Approach

Agile Project Management for Flexibility: To handle the complexity and evolving nature of the modernization process, Data Symphony employed Agile project management practices. Agile methodology allowed the project team to adapt quickly to changing requirements and provided continuous feedback loops. Iterative development ensured that the system remained aligned with business needs, reducing the risk of delays and ensuring the project stayed on track.

Combining Actuarial and Data Expertise: Data Symphony brought together a cross-functional team with actuarial and data architecture expertise. Actuaries were actively involved from the beginning, defining key requirements, analyzing existing datasets, and testing the final system to ensure it met the business's actuarial modeling and reporting goals. The data experts focused on optimizing data structures, streamlining processes, and ensuring the new architecture could scale with future demands.

Delivering Cost-Effective Solutions: A key focus of the modernization was ensuring cost-effectiveness without compromising quality. Data Symphony implemented solutions designed for long-term sustainability, reducing the risk of double-spending on short-term fixes. The emphasis was on minimizing operational costs while maximizing value through scalable and future-proof technologies that would not require constant re-investment enabling companies to stay ahead of the curve.

Establishing a Data Governance Framework: An essential component of the solution was the implementation of a robust data governance framework. This framework established clear roles, responsibilities, and processes for managing data across its entire lifecycle. By enforcing strong governance, Data Symphony ensured compliance with regulatory standards like IFRS17, while enhancing data security and quality control across the organization.

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Solution Approach

Implementing Unified Data Architecture: Data Symphony played a pivotal role in assisting the organization with the transition to a unified enterprise data architecture, effectively addressing the issue of data fragmentation that often hampers operational efficiency. This transformation streamlined the entire data management process, facilitating easier access to critical information and enabling teams to make informed decisions. The architecture supports both structured and unstructured data, providing a holistic view of business operations and enhancing analytical capabilities. Designed to be scalable, it accommodates the organization's growing data needs without extensive reconfiguration, simplifying data governance and maintaining integrity across the board. This robust framework not only improves operational efficiency but also positions the organization to adapt quickly to changing business requirements, making future integrations of new technologies or processes resource-efficient..

Enabling Self-Service Business Intelligence: To empower decision-makers with real-time insights, Data Symphony implemented self-service BI tools. These tools provided stakeholders with easy access to data without needing deep technical expertise. This not only improved transparency but also accelerated data-driven decision-making, enabling faster responses to market changes and internal reporting needs.

Hybrid Cloud and On-Premise Solutions: Data Symphony leveraged cloud-based platforms such as AWS, Azure, and Databricks, alongside existing on-premise systems to create a hybrid infrastructure that offered flexibility and scalability. This solution ensured that both cloud and on-premise systems worked seamlessly together, maximizing data availability and efficiency. This hybrid approach provided the organization with the best of both worlds: cost savings and the ability to scale resources based on demand.

Skills and Expertise

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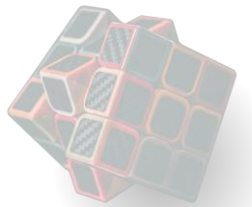
Data Symphony recommended deploying the following skills and resources for the modernization exercise:

- Data/Solutions Architects: To design and implement a robust, scalable data architecture.
- Actuarial Experts: To ensure the system aligned with actuarial modeling needs and delivered actionable insights for decision-making.
- Project Managers: To keep the project on track, manage timelines, and align stakeholder expectations.
- Technical Teams: Including data engineers, systems analysts, and developers to handle the technical build and system integration.
- Cloud and Network Engineers: To manage networking, firewalls, and infrastructure in both cloud and hybrid environments.
- Data Analysts: To collect, interpret, and analyze data to ensure the system meets business and analytical requirements
- Business Analysts: To ensure the new system met business requirements and integrated with accounting, financial reporting, and compliance needs.



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Outcomes

Improved Actuarial Processes

- Streamlined data workflows allowed actuaries to focus more on analysis and decision-making rather than manual data management tasks.
- Automated processes reduced the time spent on routine data preparation, increasing overall team efficiency.

Improved Data Governance

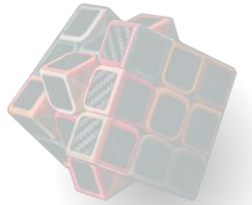
- A comprehensive data governance framework was established, ensuring clear roles, responsibilities, and processes for data management.
- The system provided active data lineage and column-level tracking, allowing organizations to monitor data quality and trace its journey throughout the system.
- Compliance with regulatory frameworks, such as IFRS17, was enhanced through well-structured data management and governance policies.

Deeper Levels of Analysis

- The modernized system enabled faster access to detailed data, supporting more granular and advanced actuarial analysis.
- Actuaries were empowered to model complex scenarios more accurately, improving the quality of forecasts and risk assessments.

Unified Data Architecture

- By transitioning to a unified enterprise data architecture, the organization eliminated fragmented systems and silos, resulting in a more cohesive and integrated data environment.
- This unified architecture made it easier to scale operations and adapt to future business and technology demands.



Outcomes

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Faster Time to Market

- The new system reduced the time needed to develop and launch new products, enabling quicker responses to market changes and customer needs.
- With automated data processes, the organization could more rapidly adjust actuarial models and financial products, significantly cutting lead times.

Self-Service Business Intelligence

- Self-service BI tools enabled users across departments to access real-time data insights without needing technical assistance, fostering a data-driven decision-making culture.
- Decision-makers could generate reports, analyze data, and make informed decisions faster, improving overall business agility.

Cloud and On-Premise Flexibility

- The hybrid system, leveraging AWS, Azure, and on-premise infrastructure, provided flexibility to scale resources based on demand, ensuring both cost efficiency and high performance.
- The integration between cloud and on-premise environments offered the organization agility in managing workloads while ensuring data security and compliance..

Operational Streamlining

- The new system reduced reliance on manual interventions, automating key workflows and enhancing operational efficiency.
- Through automated insights and real-time data processing, the organization could quickly identify and address inefficiencies, leading to more streamlined operations.

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