DataToBiz

Transforming Insurance Data Integration with Azure Cloud Data Lake Solution

ABOUT CLIENT

- Our client is a prominent life insurance provider in India, with a vast customer base and a network of branches and offices across the country. They offer a wide range of life insurance products and operate across various departments, using different systems for sales, underwriting, claims processing, customer service, and policy servicing.

PROBLEM STATEMENT

The client faced several challenges due to fragmented data and outdated processes that impacted their operational efficiency and decision-making capabilities. Key issues included:

- **Data Silos and Inconsistent Data Models:** The client's data was scattered across multiple systems like Ingenium (Policy Administration System), Dynamics CRM, Claims Management System, and Sales Force Management, each with different data models and formats. This fragmentation made it difficult to integrate data, affecting critical functions like Customer Persistency Prediction, Claims Forecasting, and Sales Governance.

- **Manual Reporting and Delays in Data Access:** Over 600 reports were manually generated using Excel extracts, resulting in inefficiencies and slow access to actionable insights. Business areas like sales performance, claims data and persistency tracking relied on batch processes, which hindered the ability to track KPIs in real-time and slowed decision-making.

- **Data Quality Issues:** Fragmented data sources and inconsistent data entry practices led to inaccuracies in decision-making and reporting. This inconsistency impacted the reliability of AI/ML models for Persistency Prediction and Claims forecasting, leading to inaccurate insights.

- **Limited Real-Time Analytics:** The absence of a centralized real-time analytics platform meant that decision-making was slow, and up-to-date data was not readily accessible. Key areas like Sales Performance, Claims Status, and Policy Servicing lacked real-time visibility.

Scope Of Work

The project aimed to create a unified data platform to consolidate data, improve data quality, and enable real-time business insights. The main goals were:

- **Data Integration:** Consolidating data from Ingenium, Dynamics CRM, Claims Management, Sales Force Management, and HR/Finance Systems into a centralized data warehouse.

- **Real-Time Analytics:** Creating a centralized BI platform for reporting on KPIs like sales performance, persistency, claims forecasting, and customer service.

- **AI/ML Integration:** Implementing models to enhance decision-making in customer retention, claims forecasting, and sales optimization.

- **Data Governance:** Establishing a governance framework to ensure accurate, secure, and consistent data management.

Insurance

- Artificial Intelligence (AI),
- Azure Data Engineering,
- Business Intelligence (BI),
- Data Migration,
- Data Warehousing,
- Large Language Model (LLM),
- Natural Language Processing (NLP),
- Power BI

India

Multiple Departments

End to End Project Lifecycle Management

SOLUTION

We proposed a cloud-based data lake solution using Microsoft Azure and Azure Synapse Analytics for centralizing data, along with Azure Data Factory and Azure Fabric for seamless data orchestration and governance. The solution was implemented in five stages:

- **Data Strategy:**
  - We worked with the client to define a data strategy, aligning business goals with data requirements and setting a clear roadmap for the platform's architecture.

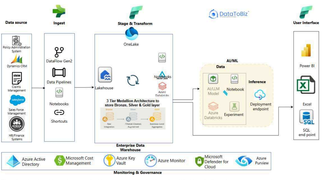
- **Data Warehouse Creation/Data Integration:**
  - Data Consolidation: A centralized data warehouse was created on Azure Synapse Analytics, integrating data from multiple sources like Ingenium, Dynamics CRM, Claims Management, and Sales Force Management.
  - Data Ingestion: Both real-time and batch data ingestion were implemented using Azure Data Factory to capture data efficiently, ensuring both immediate and scheduled updates.

- **Real-Time Centralized BI Reporting:**
  - Power BI Dashboards:Real-time dashboards were created using Power BI to provide leadership with insights into sales performance, claims forecasting, persistency, and customer service KPIs.
  - Real-Time Data Access: Data from Ingenium and Dynamics CRM was connected to Azure Synapse Analytics and Power BI, ensuring real-time reporting.

- **AI/ML Models:**
  - Model Migration: Predictive models for persistency prediction, claims forecasting and sales governance were migrated to Azure Machine Learning for real-time insights.
  - LLM Use Cases: Large Language Models (LLMs) were implemented to automate tasks like customer query resolution, claims documentation processing, and automated reporting, improving operational efficiency.

- **Data Governance:**
  - Data Governance Framework: A framework using Azure Purview for data lineage and Azure Active Directory (AAD) for role-based access control ensured secure data management.
  - Data Quality: Automated data validation rules in Azure Data Factory ensured high-quality data throughout the process.

TECHNICAL ARCHITECTURE



The technical implementation was carried out with the following approach:

Data Sources: Data from Ingenium, Microsoft Dynamics CRM, Claims Management System, and other internal systems were ingested into the Azure Data Lake and Azure Synapse Analytics.

CDC Scenarios: Change Data Capture (CDC) was used for real-time tracking of data changes in source systems, ensuring that the data warehouse was always up to date

Data Scale: The system was designed to handle the growing scale of data by utilizing the scalability of Azure Synapse Analytics and Power BI to ensure fast querying and reporting even as data volume increased.

Real-Time and Batch Data Ingestion: Critical data like sales, claims, and customer service were ingested in real-time, while other non-time-sensitive data like financial reporting was ingested in batch mode.

BUSINESS IMPACT

The implementation of the data lake and analytics platform resulted in significant improvements across the organization:

- **Unified Data Platform:** Data from multiple systems was integrated into a centralized data warehouse, providing a single version of the truth and ensuring consistency across departments.

- **Automated Reporting:** The automation of over 600 reports into real-time dashboards led to a 50% reduction in manual reporting time, enabling quicker access to insights and freeing up resources for more strategic tasks.

- **Real-Time Analytics:** Real-time data processing allowed business teams to access up-to-date dashboards, improving operational decision-making and enabling more agile responses to emerging trends.

- **Improved Decision-Making and Data Accuracy:** Real-time insights from Power BI and AI/ML models enabled faster, data-driven decisions. Automated data validation reduced errors by 30%, ensuring reliable reporting.

- **Increased Efficiency:** Streamlining reporting into dynamic dashboards reduced manual work, allowing employees to focus on analysis and improving productivity while enabling self-service analytics across departments.

- **High User Adoption:** The intuitive design of Power BI dashboards led to high adoption rates across departments, empowering business teams to perform self-service analytics and make informed decisions independently.

By implementing a comprehensive cloud-based data platform using Microsoft Azure, our client successfully centralized their data and transformed reporting and analytics. This solution addressed data silos, manual reporting, and limited real-time insights, improving decision-making and operational efficiency. The integration of AI/ML models and LLMs enhanced predictive capabilities, while data governance ensured data security and compliance.