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5 Decisions

Impacting Data-on-Cloud Strategy of Insurance Enterprises

A Larsen & Toubro Group Company

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Insurance companies are under tremendous stress since the pandemic. In such trying times, they have been forced to explore new ways to cut operational costs while ensuring profitable growth by expanding into new markets and innovating products. The key to this new normal is data and analytics, which drives decision-making in the insurance value chain. In the last couple of years, multiple cloud-based technology platforms have emerged with advanced analytical capabilities that are more accessible and affordable. Insurers need to redefine their data strategy to take advantage of a multi-cloud technology ecosystem with advanced analytical capabilities.

Making a **technology decision**

The good news is that there are plenty of options to choose from. The bad news is that fast-paced digital disruption and transformation is making it impossible for firms to make long-term decisions. The insurers of today need increased agility, access to disruptive technologies, improved operational efficiencies, and reducing IT infrastructure cost.

Understanding **key requirements**

Here are the key requirements for adopting cloud-built data and analytics technologies:

Expanding data sources and frequency

An enterprise is never short of data. On one hand, you have the internal data (customers, products, quotes, policies, claims), and on the other hand, there is unstructured data (scanned submission forms, damage assessment photos, claims note). On an average, the insurance company leverages 45+ third-party sources for risk evaluation and underwriting. Many companies offer usage-based products and risk management services by integrating with streaming IoT devices.

As the data sources, size, and real-time consumption expands exponentially, traditional data warehouses will result in higher operating costs for enterprises. Using cloud-built data warehouses, you can separate purchases for 'compute' and 'storage', and dynamically scale resources as required, thereby making it a cost-effective solution.

Instant elasticity of infrastructure

Insurance companies need to respond to cyclic events such as enrollment, book transfers, catastrophe losses, claims litigations, monthly/ quarterly closings, forecasting/ reserving, etc. It is not cost-effective to plan for peak infrastructure needs. The cloud environment provides instant elasticity to grow or reduce infrastructure capacity as required, thereby saving substantial costs.

Performance needs

Many insurance processes are either data or compute-intensive, especially feature engineering and predictive model development tasks. On top of that, traditional data preparation and ETL processes take hours to run. Most cloud platforms provide dedicated compute clusters for each workload, thereby drastically improving the performance of these processes.

Access to advanced analytics and AI capabilities

Data scientists typically spend the majority of their time gathering and prepping up the data instead of building and training their models. They need better tools and capabilities to accelerate the model development. Also, many organizations are actively trying to democratize the data and model development for citizen data scientists. Cloud-based data scientist platforms provide these integrated capabilities to accelerate the business value realization.

Security and compliance

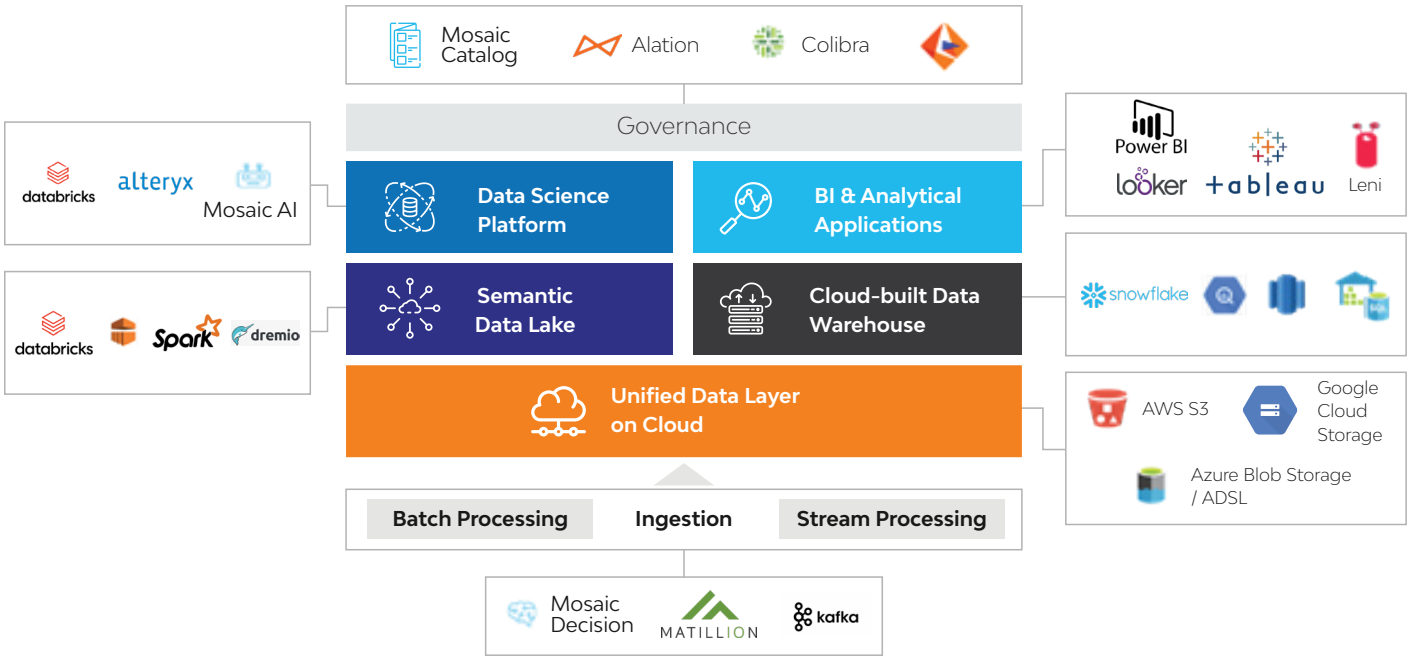
Cloud-built warehouses provide better security capabilities at much lower costs as compared to typical non-traditional setup. Also, most are compliant with regulatory needs such as HIPAA, PCI DSS, SOC 2, etc.

Strategizing your **cloud adoption**

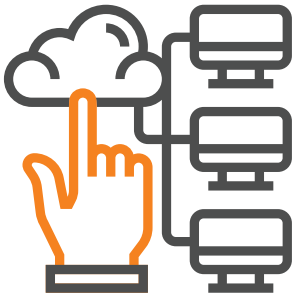
Now that we have established the need for cloud-built data warehouse and analytics platforms, let's discuss how we can define the strategy for cloud adoption, including the target state architecture and technology selection.

Architecture building blocks

The following diagram represents critical architectural building blocks and popular technology options for 'Data on Cloud' for the insurers.



For choosing the right technology options, there are many architectural decisions to be made.



Decision 1

Platform Selection – **Cloud provider lock-in Vs lock-out**

The capabilities, performances, and cost efficiencies of public cloud providers are evolving at a rapid pace. That's why it is prudent not to get locked in to one public cloud provider and be flexible to pivot and take advantage of new capabilities in the future. However, it also means that you may not be able to take optimal advantage of a cloud provider's current capabilities, and there will be higher front-loaded integration costs and additional architecture complexity. This effect is known as a cloud provider lock-out effect.

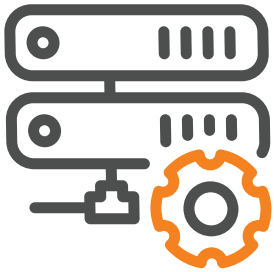
It is required to evaluate options for each architecture building block and make a decision by weighing 'cloud provider lock-in' versus 'cloud provider lock-out' risks. For example, you may choose a public cloud solution for data integration and staging, and a cloud provider agnostic solution for data lake (like Spark-based platforms) or data warehouse (like Snowflake).

Decision 2

Target Data model – **Keep it same or Modernize**

When the data warehouse is moved from on-premise to cloud, it is often cost-effective to keep the data model same to avoid the impact on existing business intelligence reporting and other data consuming apps. However, it is also a good opportunity to redo or refine your data model if it is not serving your needs efficiently.

As insurance companies are actively innovating products, expanding geographically, and taking advantage of third-party data sources for different lines of businesses, the data integration complexity has increased multi-fold. They also need a flexible data model to accommodate a new set of business rules at a faster pace. A good data model solution is 'Data Vault' architecture, which is a hybrid approach encompassing the best of breed between 3rd normal form (3NF) and star schema. The data value architecture separates business keys (such as Hubs), associations (like Links), and descriptive attributed (like Satellites), thereby improving flexibility to align with the changing business environment. The design requires many relationships, complex joins, and bridging tables, so the read performance is often compromised. The data marts on top of 'Data Vault DWH' are often required to improve reporting performance and reduce semantic complexity for the power business users.



Decision 3

ETL or ELT

There are two approaches for data integration –

- **ETL**
- **ELT**

ETL – Extract, Transform and Load approach is utilized mostly in traditional architectures. As the ETL engine needs to transform a large amount of data, it usually hosts a complex logic and is expensive to run and maintain.

ELT – Extract, Load and Transform by utilizing the computing power of the target data environment. This approach is more cost effective for the cloud-built data warehouses as it is possible to scale and process in parallel without any impact on performance. Some cloud native data integration tools such as Matillion allow to push down SQL to cloud data warehouses, thereby effectively using their computing power.

Decision 4

AI / ML Capabilities – **For Expert Data Scientist or Citizen Data Scientist**

To select the right 'data science platform', you need to evaluate your organization's AI/ ML maturity and understand who will be using this platform. Expert data scientists prefer to code in Python or R using notebooks. They expect features such as notebook support, efficient data pipeline and support for MLOps. Citizen data scientists need a drag-and-drop UI to create visual pipelines and models.

The following are the key features that data science platform should provide –
DataOps – Capability of discovering, retrieving, consolidating, cleaning, and preparing data
MLOps - Drift detection, ongoing adjustments, and model governance
Explainable AI – Set of tools to interpret AI model output, ground truth labeling, continuous evaluation, and what-if capabilities
Auto ML – Suite of ready machine learning models and graphical user interface to accelerate the model building and operationalization process
Collaboration – Data cataloging and ability to collaborate with other data scientists around data assets

Many large organizations have put together their data science platform by leveraging open-source frameworks, whereas many prefer to leverage a commercially available vendor toolset. Many vendors provide platforms targeted at expert data scientists, whereas some vendors focus on 'no-code' (or low-code) approach for citizen data scientists. There are also vendors who try to balance the needs of both stakeholders. It is vital to do a thorough evaluation of your current and future needs before selecting the right vendor for a data science platform. **https://www.gartner.com/en/documents/3980855.**

LTI's Mosaic AI Platform provides "Build your own Capabilities" to construct your data science platform customized for the needs of your organizations.

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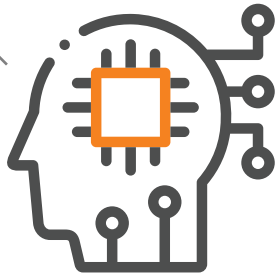

Decision 5

Visualization with **Self-service and AI Augmentation**

As defined by Gartner, Augmented analytics is the use of enabling technologies such as machine learning and AI to assist data preparation, insight generation and explanation to augment how people explore and analyze data in analytics and BI platforms. By integrating the visualization layer with natural language processing and augmented analytics such as diagnostic, predictive, and prescriptive algorithms, we can empower business users to interact with data more effectively.

LTI's Leni platform is an example of augmented analytics for self-service and deep-dive analysis.

Key takeaways

Given the challenging business conditions, insurers need to accelerate business value realization by leveraging their data and analytics capabilities. The cloud-built data ecosystem is a perfect option to be agile and cost-effective at the same time. As the technologies are evolving at a rapid speed, the insurers need to evaluate their needs cautiously and architect a flexible solution that can be implemented incrementally and provide an ability to pivot in response to future market developments.

About Author

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Amit leads LTI's Insurance Customer Success team and Enterprise Architecture Practice for North America. He has more than 20 years of experience working with insurance companies across the globe. He has a blend of technology and insurance domain expertise, and has helped leading carriers, brokers, and reinsurance firms in defining their Enterprise Architecture and IT Strategy roadmap.

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