



DATA, ANALYTICS AND AI TRENDS AND APPLICATIONS IN INSURANCE

Singapore Actuarial Conference 2023

27 September 2023

Max Ang

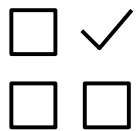
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DATA, ANALYTICS AND AI TRENDS AND APPLICATIONS IN INSURANCE

1

Overview of Trends Observed



2

Data, Analytics and AI Trends and Applications in Insurance



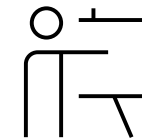
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Areas to Consider in the Development of Data Initiatives

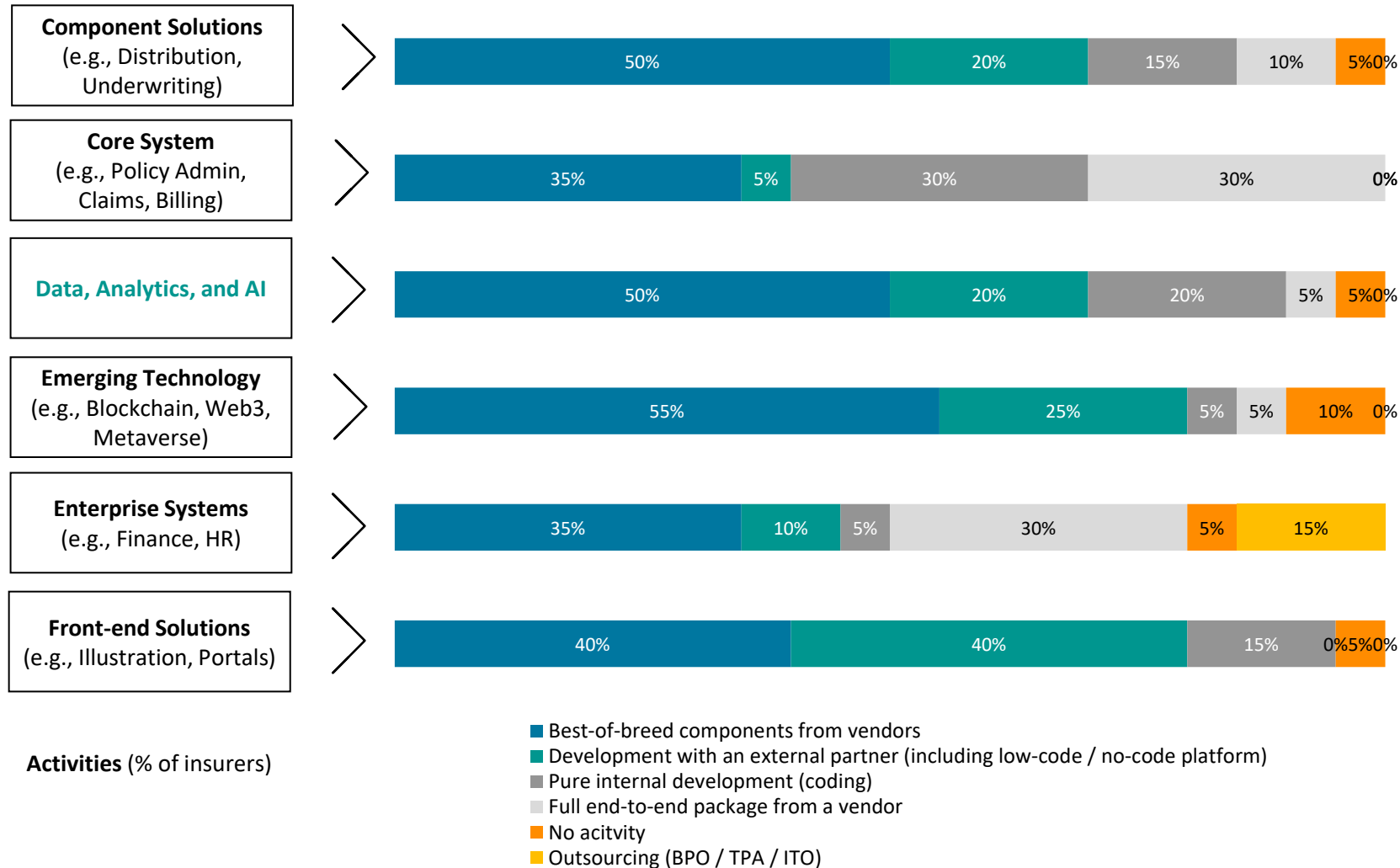


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Engaging with Us



WE EXPECT APAC INSURERS TO LOOK TO VENDORS TO OFFER BEST-OF-BREED COMPONENTS FOR MODULAR ACTIVITIES, DATA, ENTERPRISE, AND NEW PRODUCTS









- APAC insurers invest in vendors who can provide solutions for individual activities on the insurance value chain, which is a common trend in the region
- Some insurers have an internal core that is proprietary and do not seek vendors but look to innovation in other aspects. Another group looks to core systems vendors who can provide the end-to-end workflow, with consideration for modern architecture like API-based services, or to vendors with reputable selected components
- **Data initiatives tend to be modular functions and supplement insurers' workflow improvement or product development. However, they may lack necessary knowledge. Hence, vendors—typically insurtechs with modeling capabilities—will provide the service using data from the insurer**

ALONG THE INSURANCE VALUE CHAIN, UNDERWRITING AND ACTUARY ARE BENEFITING FROM DATA INITIATIVES



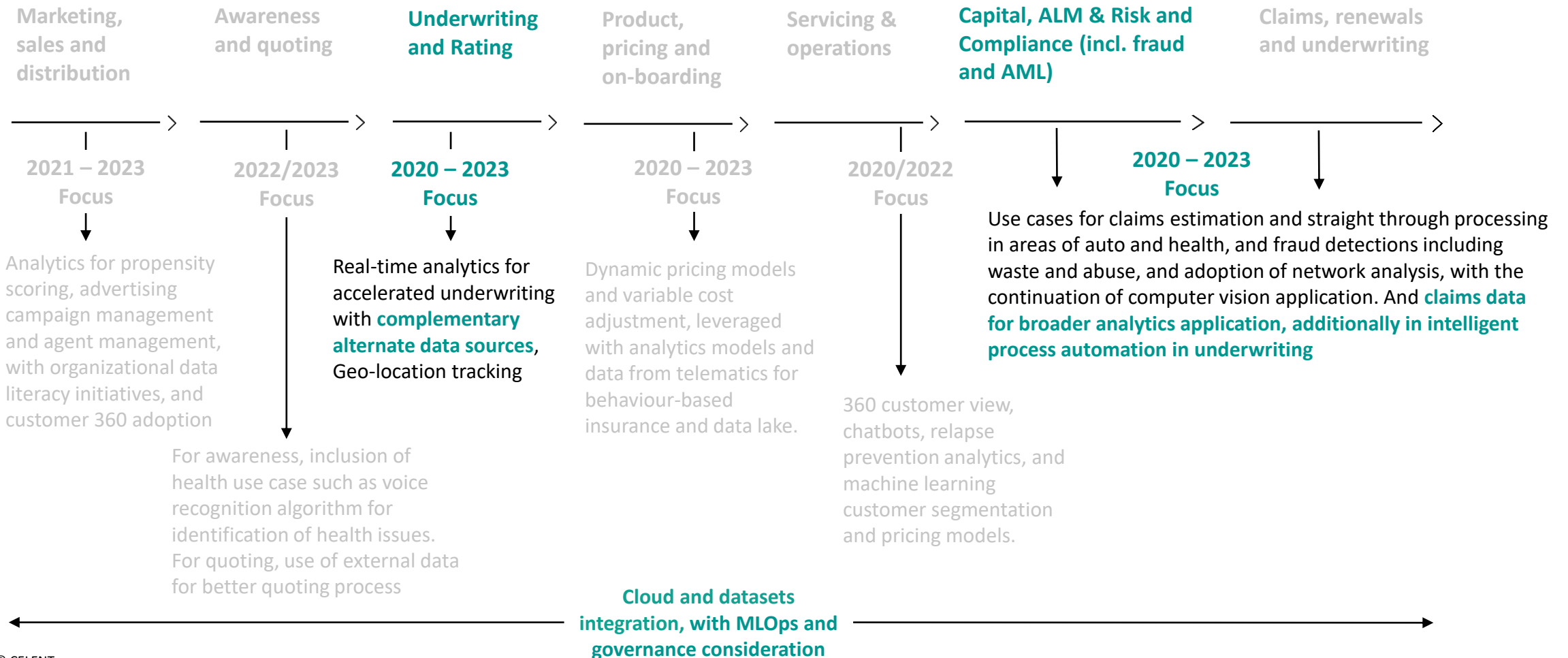
Data Management and Applied Analytics/Machine Learning

					
360 Single Customer View	Customer Journey/Persona Mapping	Risk Assessment and Exposure	Omni-Channel Digital Insurance Ecosystem	Premium Investments for Profits	Self-Transactions
<ul style="list-style-type: none"> • Agent prospects discovery through social network and customer analysis • Digital marketing content tracking and analysis • Blockchain secure distribution of customer information 	<ul style="list-style-type: none"> • Analytics recommender engine and personalization • Persona development • Integration with mobile application • Internet of Things sensor tracking 	<ul style="list-style-type: none"> • Documents digitization and automation • Risk model auto-testing and calibration • Risk propensity scoring • Regulation reporting and reinsurance 	<ul style="list-style-type: none"> • Recommendation across product lines • Inclusion of healthcare, banking/ investment/micro-insurance, and related industries 	<ul style="list-style-type: none"> • Machine learning on insurance historical data, loss reserves (future claims) estimation and realization 	<ul style="list-style-type: none"> • Self-service transactions • Pocket agents for advice, products, and claims • On-demand, instant, and electronic services

Source: Celent report, [Integrated Insurance Ecosystem: The Next Generation Insurer](#)

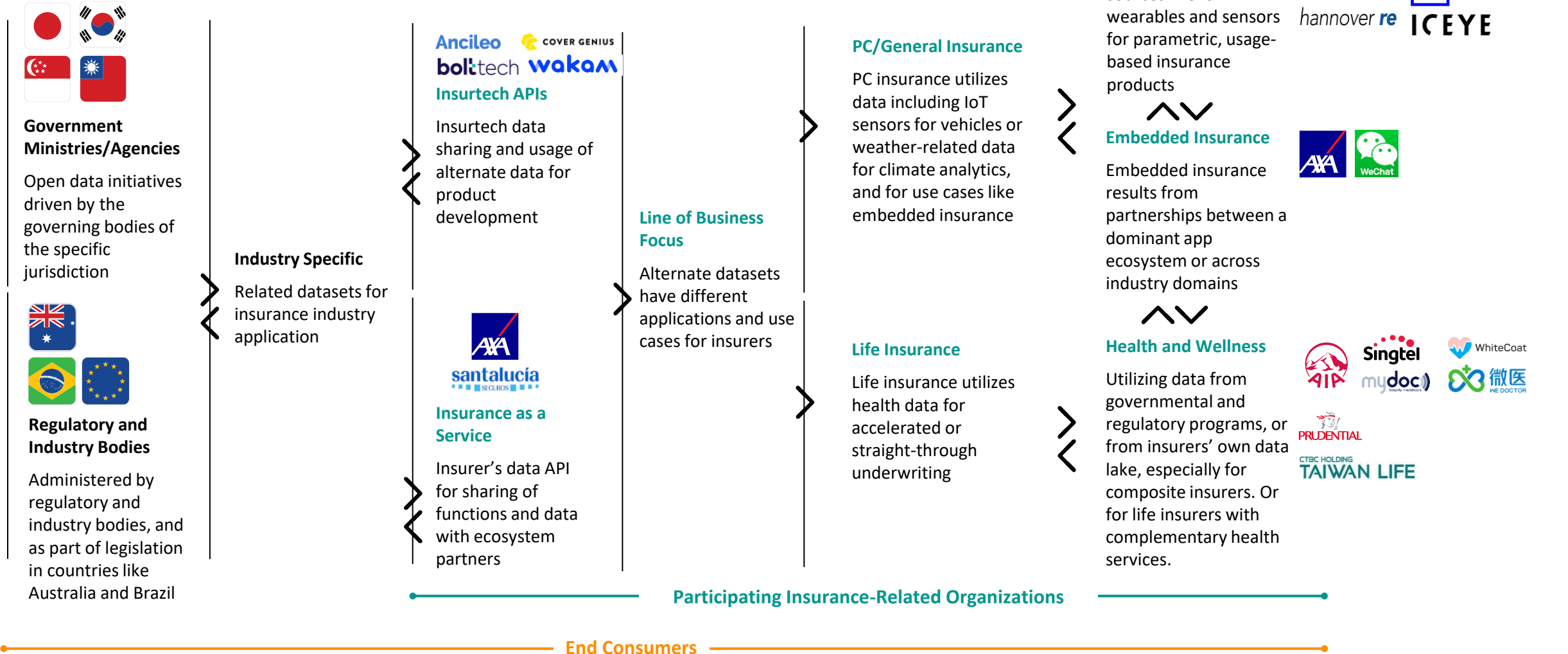
IN HIGHLIGHTING DATA, ANALYTICS, AND AI NOMINATIONS OVER THE PAST 4 YEARS ACROSS THE INSURANCE VALUE CHAIN, **ACCELERATED UNDERWRITING HAS BEEN A GROWING USE CASE**

Data Management and Applied Analytics / Machine Learning Focus Area and Foundation, with Data Business Strategy as a Core Principle in 2023



EXAMPLE: FLOW OF OPEN DATA AMONG PARTICIPANTS OUTSIDE AND WITHIN THE INSURANCE ECOSYSTEM

An example of participants' relations and access to open data and usage



01

**DATA, ANALYTICS AND AI TRENDS AND APPLICATIONS IN
INSURANCE**

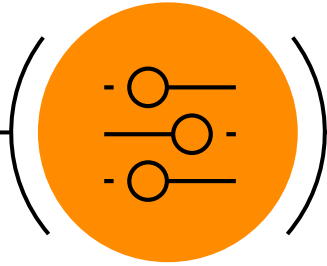
DATA, ANALYTICS, AND AI ARE USED TO DRIVE MULTIPLE GOALS



01

Optimizing customer engagement and delivery

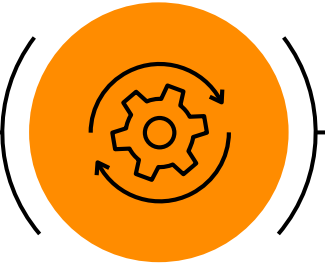
Using behavioral data to provide pricing lift, more finely tuned underwriting scores, and much shorter cycles to estimate auto repairs (lowering claim losses).



02

Embracing disruptive imperatives

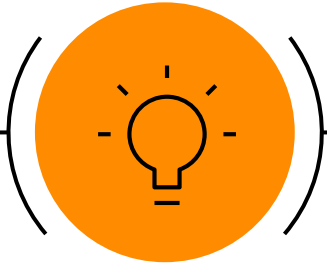
If an insurer does not utilize new analytics tools on new data, it is likely to incur adverse selection.



03

Taking an ecosystem approach to growth

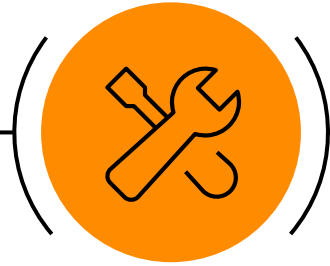
New sources of data, such as public records, social media, and aerial imaging, are inputs to advanced analytics analysis, yielding pricing and underwriting insights.



04

Driving product innovation and differentiation

It's hard to create truly innovative products. But location and website/app tracking (with permission) can be used to create highly personalized customer offerings.



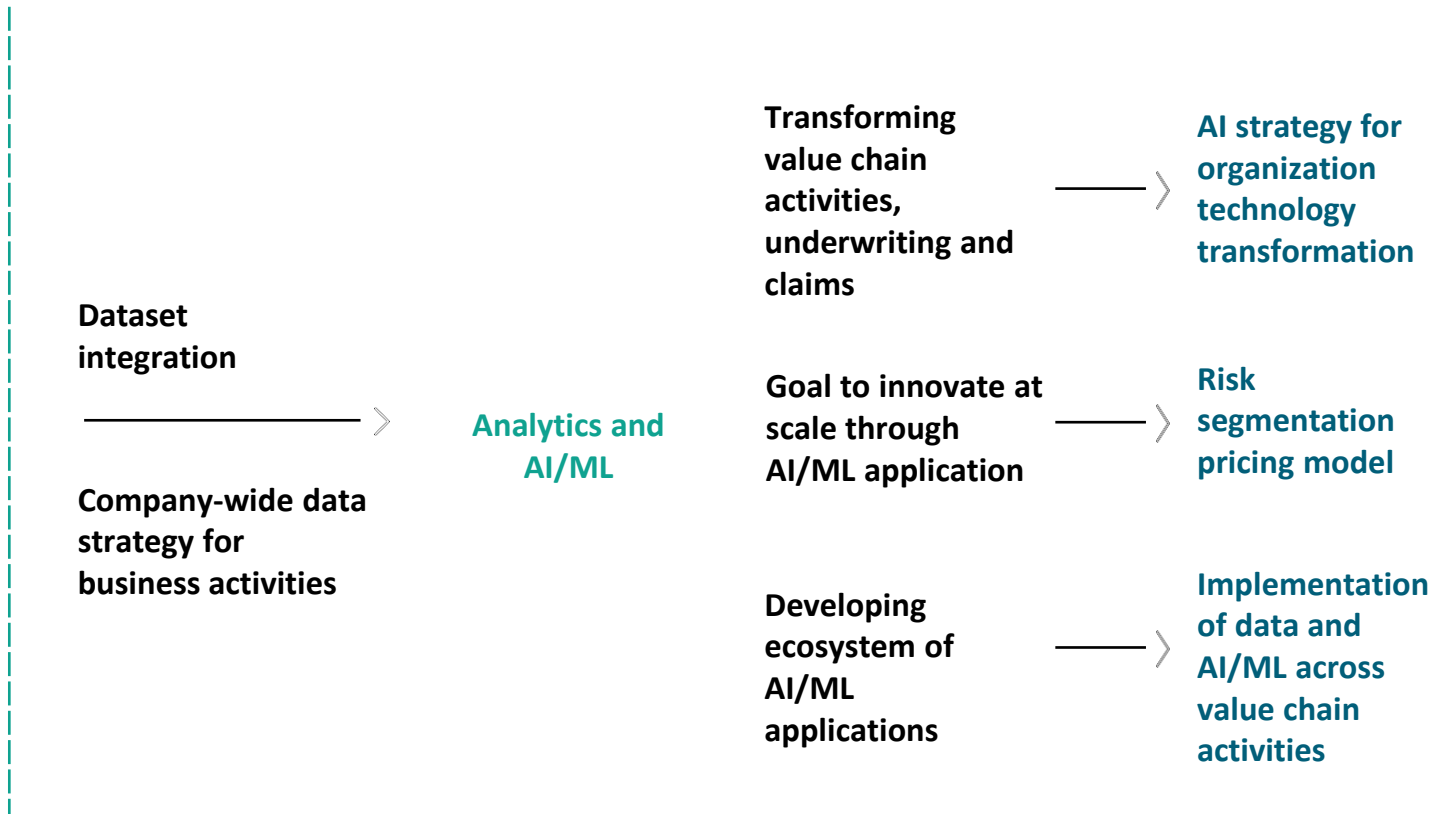
05

Diversifying technology transformation toolkit

Vast new amounts of data from connected cars, home, worksites, and people; demand new storage (e.g., data lakes) and analytics methods (e.g., neural networks) to create differentiating insights.

FOCUS ON DATA STRATEGY FOR THE INSURANCE VALUE CHAIN ACTIVITIES

- This year, we recognized initiatives that have shown emphasis in developing use case for the insurance value chain activities, and a provision for a company-wide data strategy and business units' inclusion.
- Analytics and ML/AI innovations have continued to take the role on improving organizational productivity and to enhance customer experience
- Three main use cases we discovered are for developing data ecosystems, customer experience transformation, and enabling business activities like underwriting



AIA: AI-ENABLED CLAIMS AND UNDERWRITING TRANSFORMATION

Asia, South Korea



OVERVIEW

- Committed to a transformation program based on three themes of technology, digital, and analytics (TDA), AIA's AI strategy is at the heart of future-proofing their technology transformation, moving from “usable and scalable” platforms to “intelligent” platforms.
- This enables AIA to enhance decision-making, upgrade their platforms, and transform their business processes. AIA demonstrate increased automation and the use of AI to achieve more personalized and consistent service, with higher customer engagement and retention.
- AIA demonstrated good strategy execution and integration of data, analytics, and AI with the business.



CELENT PERSPECTIVE

- Two outstanding TDA's initiatives are an AI-powered medical/computational intelligence (CI) insurance pre-underwriting, and AI-enabled Accident & Health (A&H) claims straight through processing.
- The former broadened the pool of profitable prospects for the underwriting of two medical products and **the latter substantially increase the portion of A&H claims submitted through straight-through processing.**
- AIA has demonstrated good usage of data sources and sound modeling processes to enable value chain activities for underwriting and claims across the region. This has provided improvement in the customer journey and risk assessment, as well as offering a better claims experience.

Source: Celent report, 2023 MI Winner for Data, Analytics, and AI, [AIA: AI-Enabled Underwriting and Claims Transformation](#)

CATHAY LIFE: CATHAY EYE RISK SEGMENTATION PRICING MODEL



國泰人壽

Cathay Life Insurance

Taiwan



OVERVIEW

- Cathay Life developed a risk segmentation pricing model for a new term life product, which enables comprehensive health risk ratings for policyholders and sets the foundation for future data innovation across their insurance value chain.
- Cathay Eye utilizes data, analytics, and AI technology to realize commercial value in insurance product development, which can be divided into the three aspects: data mining, data infrastructure and ModelOps, and data ecosystem and governance.



CELENT PERSPECTIVE

- From business data strategy to value chain innovation, Cathay Life has realized the commercial value of AI models and brought together a collaboration of experts across different fields in Cathay Life to implement digital innovation utilizing AI.
- Cathay Life has demonstrated a good data management process before optimizing the end-to-end insurance value chain. This leads to collaboration across the business units and helps foster a culture of technological development and innovation.

Source: Celent report, 2023 MI Winner for Data, Analytics, and AI, [Cathay Life: Cathay Eye, Risk Segmentation Pricing Model](#)

MAX LIFE INSURANCE LTD: EMBEDDING INTELLIGENCE ACROSS LIFE INSURANCE VALUE CHAIN



India



OVERVIEW

- Max Life Insurance has developed an end-to-end ecosystem for an intelligent life insurance value chain which hosts a comprehensive suite of AI/ML-based predictive models, cognitive intelligence (computer vision, speech, NLP) and real time business insights and decision systems.
- Max Life has embedded intelligence across 70% of their core business processes and integrated AI at every phase of customer journey.



CELENT PERSPECTIVE

- Max Life has demonstrated a good case of applying data solutions for activities across the insurance value chain. The creation of a data lake for disparate systems and third-party data integration has led to a unified data source, enabling a range of value chain activities like underwriting and servicing and operations through AI/ML.
- For instance, there was good articulation of customer voice conversations analytics, and the utilization of spectrogram and considerations for language differences.

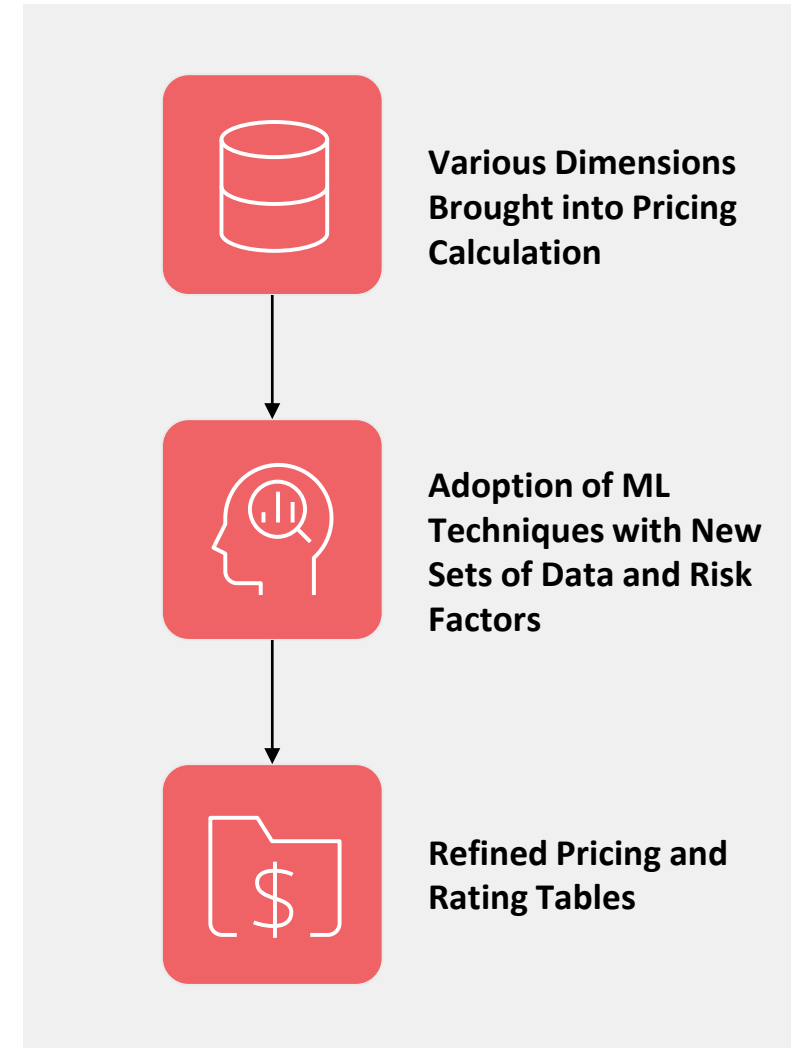
Source: Celent report, 2023 MI Winner for Data, Analytics, and AI, [Max Life: Data and AI Driven Life Insurer](#)

BULSTRAD ML-BASED PRICING AND RATING ENGINES

Bulgaria



- Bulstrad's case study provides a good indicator that pricing optimization with data analytics is a priority for insurers. There was an expansive usage of data; from customer behavior, claims, and market environment factors integrated for use in the models.
- ML can generate tangible benefits and have a major impact on the fundamental business of an insurer: its underwriting profit, with claim propensity models providing useful input to scoring system to refine underwriting rules.
- Bulstrad's application of ML to pricing has complemented actuarial effort and enable the easier application of applied mathematics. This results in the utilization of predictive analytics, through multivariate rating algorithms, to optimize rate tables for the actuary function.



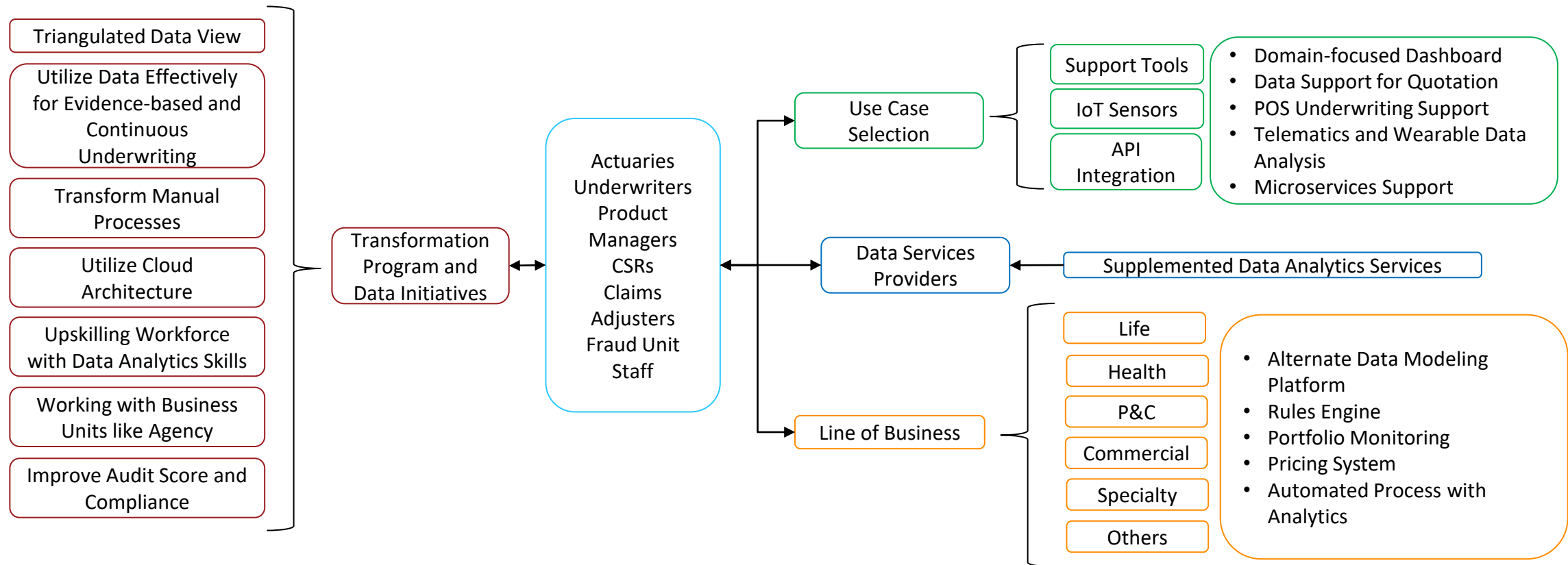
Source: Celent report, 2022 MI Winner for Data, Analytics, and AI, [Bulstrad: ML-Based Pricing and Rating Engines](#)

02

**AREAS TO CONSIDER IN THE DEVELOPMENT OF DATA
INITIATIVES**

HOW ACTUARIES AND UNDERWRITERS CAN WORK WITH VENDORS

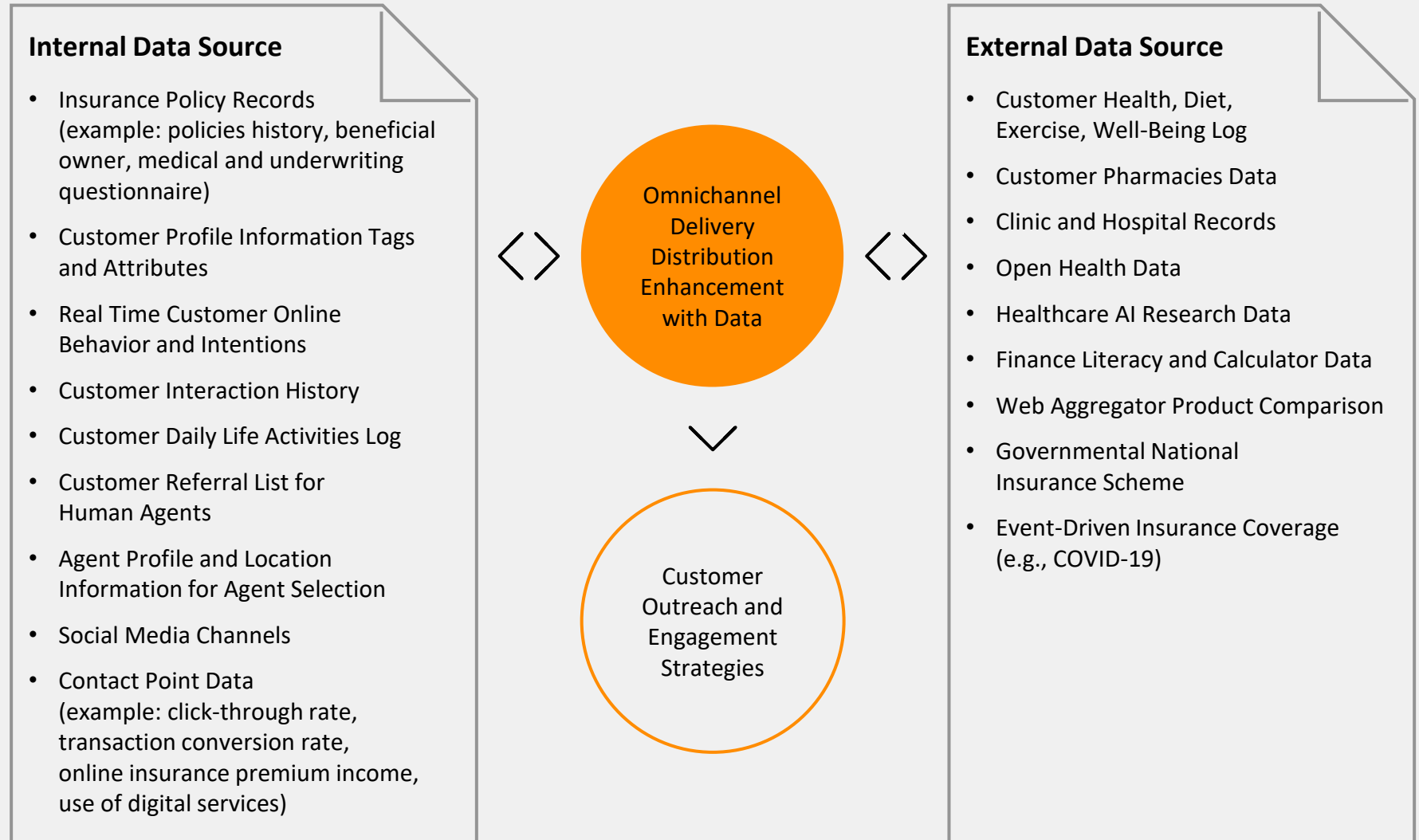
- From our observations, there are several aspirations and concerns that underwriters and actuaries face.
- Solutions can be largely categorized according to the vendor's main business and the catered niche, such as support tools, or via insurance lines of business. Although not an exhaustive coverage, these observations show the potential use case that can be supplemented with vendor solutions.
- Ultimately, the roles of the underwriter and the actuary can be enhanced with technology and greater adoption of data. There is also recognition of cross-business unit collaboration and platforms that bring together the value chain activities in a seamless information exchange.



Source: Celent report, **Business and Data Strategy: Underwriting and Actuary Case Studies**

COMMON DATA FIELDS OBSERVED FROM VARIOUS LIFE AND HEALTH DATA INITIATIVES— A DISTRIBUTION EXAMPLE

The integration of third-party data or alternative data can improve how we distribute, underwrite, claim, and perform risk analysis for insurance coverage.



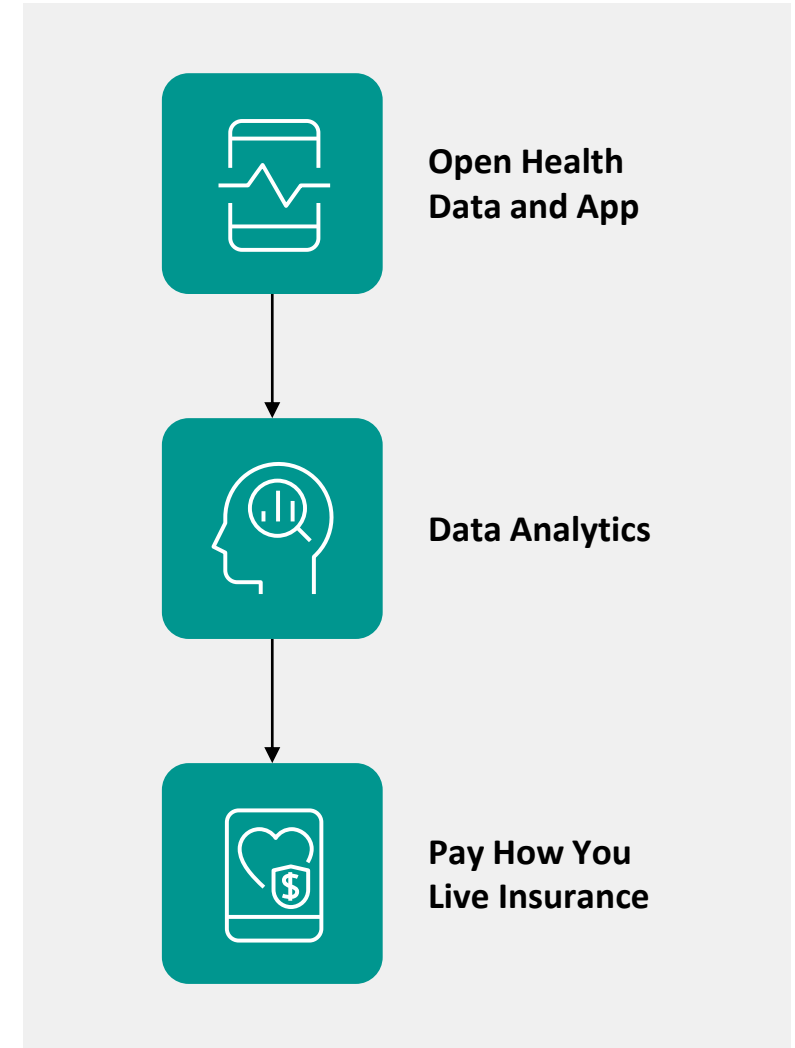
Source: Celent report, [From Data to Product to Customer Engagement: Delivering Good Distribution and Customer Experience with Alternative Data](#)

TAIWAN LIFE USE OF ALTERNATIVE DATA THROUGH GOVERNMENT OPEN HEALTH DATA INITIATIVE

Taiwan



- A symbiotic partnership between Taiwan Life and Lydia AI
- Taiwan Life selected Lydia AI to bolster internal capabilities and expedite time to market with models pretrained on global data
- For this initiative, Lydia AI tapped on the Taiwan's government open health data initiative and Taiwan's Mobile Health Bank app to derive better outcome for health insurance
- Taiwan Life combine these new open data sources with Lydia AI's health AI models to assess risk and improve customer experience, to enable the Pay How You Live insurance and optimize cost of care



Source: Celent report, 2022 MI Winner for Data, Analytics, and AI, [Taiwan Life: External Open Health Data for Digital Accelerated Underwriting](#)

GRAPH APPLICATIONS IN FINANCIAL SERVICES

- Graphs can help to organise an overflowing amount of information in financial institutions, bridging siloed data together. Graphs semantically integrate diverse data and connect at scale, regardless of data formats and models.
- Possible applications can be for document classification, know-your-customers (KYC) information, compliance and regulatory reporting, investment research, fraud analysis, insurance underwriting and claims processing, and chatbot recommendations. Knowledge graphs allow an expansive organisation of data.
- To elaborate on some possibilities:
 1. **Customer analysis**, risk dimensions, and relevant regulations can be mapped in a single graph and used for identification of at-risk customers of a financial institution.
 2. **Data lineage and metadata management** are especially important in financial institutions, for use cases in regulatory reporting and management of systems or new data sources.
 3. **Graphs can provide better pattern recognition in real time, through graph traversing.** Insurance fraud detection can be enhanced with graphs, with visualisation of an entity, and potential clusters of fake claims, augmenting existing ML pipelines with graph feature engineering.



Source: Celent report, [Introduction to Graph Data Design: Alternative Database and Tools](#)

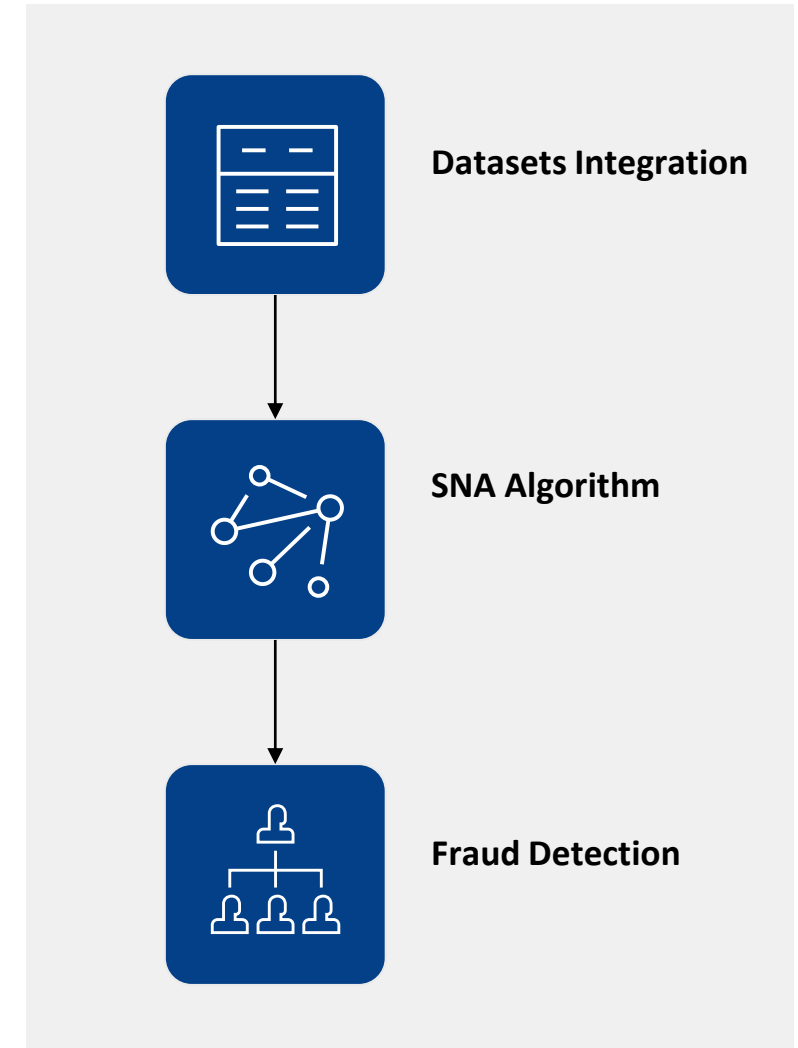
ORGANIZED FRAUD DETECTION VIA SOCIAL NETWORK ANALYSIS (SNA)

Turkey

ANADOLU SIGORTA

Kaybetmek yok.

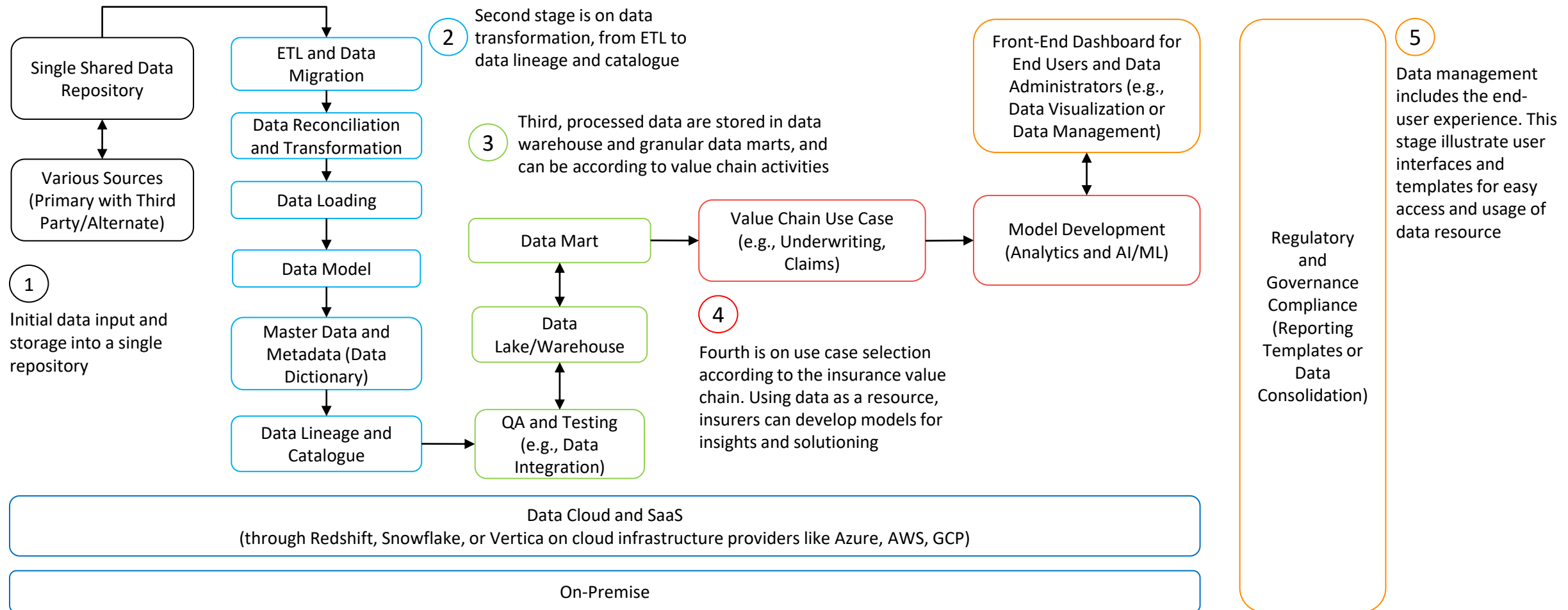
- Anadolu Sigorta is a Turkey-based insurance provider and offers health, liability, marine, engineering, motor, and fire and home insurance packages, among others.
- To overcome manual workload and traditional methods for fraud detection, Anadolu Sigorta showcase a winning application of graph theory through SNA.
- They investigate social structure by using graph models to map real-world entities through nodes (people or things) and the links (relationships or edges) that connect them.
- This automated fraud detection is a step away from the traditional fraud detection techniques of rule-based systems and machine learning or data analytics fraud-prediction techniques and show an interesting combination of datasets for model development.



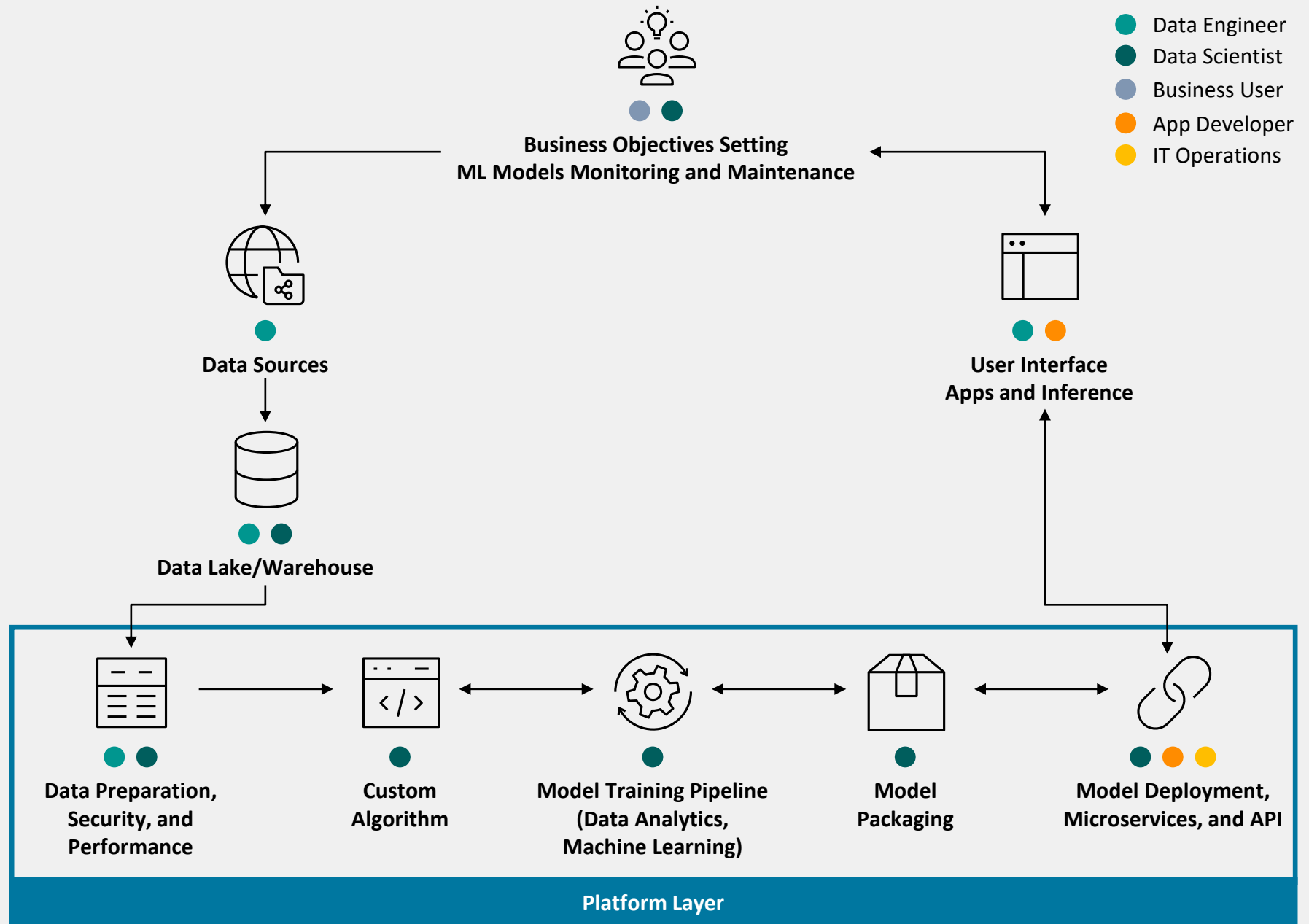
Source: Celent report, 2021 MI Winner for Data, Analytics, and AI, [Anadolu Sigorta: Organized Fraud Detection via Social Network Analysis](#)

BASED ON OUR OVERVIEW OF THE DATA MANAGEMENT PROCESS AND VENDORS' SPACE, WE HAVE IDENTIFIED THE FOLLOWING MODULES ON OFFER TODAY

Visualized Process Flow and User Interface



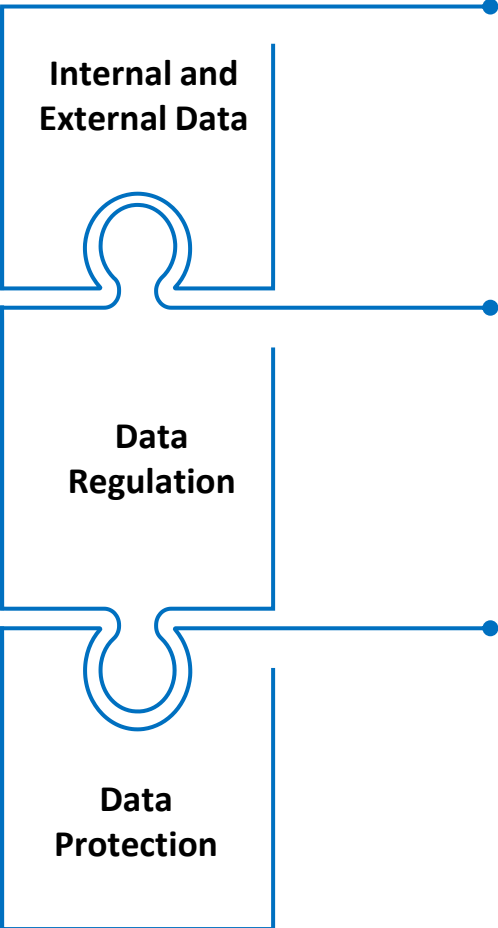
SCALABLE ARCHITECTURE FOR DATA MODELS: MLOPS PROCESS AND PLATFORM TO BRIDGE THE GULF BETWEEN ML INNOVATION AND PRODUCTION: AN ITERATIVE PROCESS



Source: Celent report, [Data, MLOps, and IoT for the Next-Generation Insurance Industry](#)

DATA MANAGEMENT AND REGULATION CONSIDERATIONS

Factors to Consider



More and Wider Variety of Data

The proliferation of data has brought about new challenges. Data can be collected from different sources (e.g., IoT data) and can be used for future purposes.

Data Regulation Challenge

Due to the regulated nature of the insurance industry, data must comply with regulations, and this causes interpretation challenges too.

Having Data Safeguards

Sensitive data that is collected from any system, such as healthcare records or personal data, must be considered carefully as some of these data fields are forbidden for use in the models and must be anonymized if use.

Best Practices

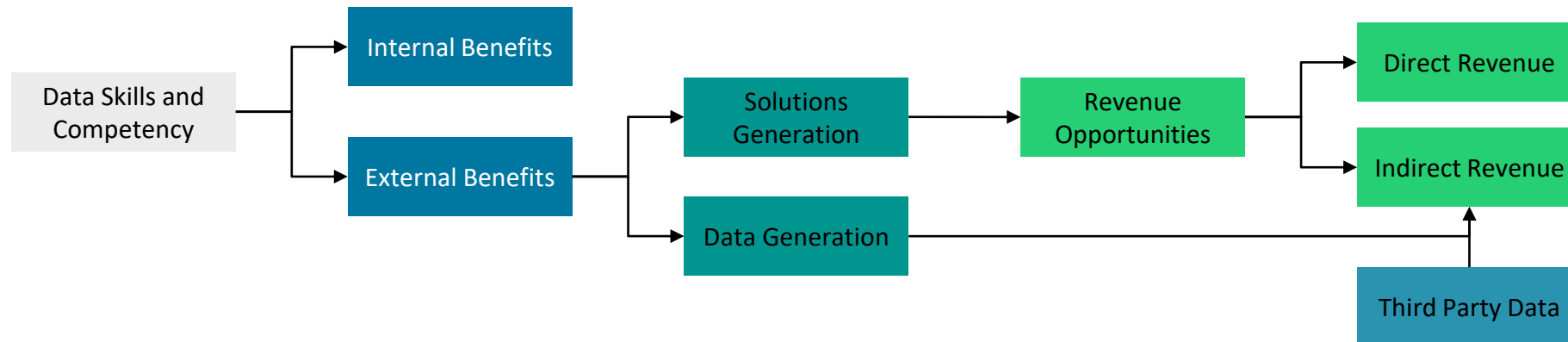
Keep data for future use but do not collect data you cannot use. If there are strict regulations on certain data usage, collecting that data might not be useful in the end.

Follow regulations and adjust the sensitive variables in the dataset to continue protecting the consumer. Have a trade-off between data that is allowed for use and data that is not.

Have request procedures to determine the right quantity and quality of data to be used, **with transparency of data lineage and data anonymization in place.**

DATA LITERACY AND REVENUE GENERATION FRAMEWORK: FROM DATA LITERACY AND SKILLSET TO VALUE CREATION

- **Internal benefits** include an increase in data competence in the organization, which is beneficial for providing digital skillset for employees and for understanding the kinds of data to use for different situations.
- **External benefits** include the development of solutions that can generate revenue, and the data collected can be valued and shared with or sold to interested parties. With data skills, we can develop and improve data models using procured data internally or using external data sources to supplement current analysis.
- **Direct revenue** relates to data solutions developed by the data science teams based on an actual business requirement or challenge faced by customers. This include image recognition for claims, which helps expediate auto claims processes for customers or dynamic pricing based on sensor data
- **Indirect revenue** could come from procuring data, such as sensor data from IoT companies, to improve on existing insurance underwriting assessment, which in turn leads to better assessment and ratio analysis benefits for customers and insurers.



Source: Celent report, **The Data Force: Cultivating a Data-Ready Organization**

TECHNOLOGY ENABLERS SHOULD REMAIN AT THE CENTER OF INSURERS' PLANS IF THEY WANT TO ADDRESS NEW RISKS, CUSTOMERS, ADVOCATES, AND MARKET CHALLENGES

What if an insurer builds a comprehensive, integrated ecosystem?

- **Risk and fraud** models
- Predictive and value-based **analytics**
- **Automation** via AI application and chat bots
- Social network graph analysis
- IoT, **sensors**, and drones
- **APIs**
- **Multidimensional data** mining and storage



Cloud and edge computing

- Incumbent Insurers
- Neo Insurers
- Insurtech Startups and Vendors

Enhanced customer experience


- Onboarding experience
- **Customer experience** design
- **On-demand services**
- Digital relationship and agent management
- Digital operating model
- Reward/loyalty programs

Empowered industry domains

- Insurance
- Health care and medical services
- Banking
- Wealth management

Source: Celent report, [Integrated Insurance Ecosystem: The Next Generation Insurer](#)

THANK YOU



**for your
attention**

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