



XCEEDANCE

# Applications of Data Science in Actuarial, Underwriting and Claims

CAS 2022 Spring Meeting

# Presenter BIOS



## **Matthew Duke, ACAS, ARe, MAAA, MBA**

### **SVP & Chief Actuary, Head of Global Actuarial & Analytics Services**

Duke leads global actuarial services at Xceedance. He brings 15 years of leadership in actuarial and analytics with expertise in strategy execution, facilitating organizational change, and solving business challenges with analytical insights that directly impact profitability.

Prior to joining Xceedance, Duke worked at Blackboard Insurance as head of pricing and growth analytics, where he developed actuarial pricing infrastructure, led state filing initiatives, redefined the role of an actuary, and recruited top talent. In addition to interim head of risk at Blackboard, Duke held various leadership positions at Freedom Mortgage, Guy Carpenter, and Arch Insurance Group. He started his career at Travelers, as a participant in the company's Actuarial Leadership Development Program.



## **MICHAEL PARCELLI, MS, CPCU, ARM, CRIS, PMP, and Lean Six Sigma green belt**

### **SVP, Head of Global Solutioning and Business Process Consulting**

Michael is responsible for building innovative solutions and business process consulting engagements for Xceedance clients. As a seasoned insurance expert with 35 years of experience, he applies a technology-centric consulting approach to business problems, driving profitable growth and operational excellence for insurance organizations. His underwriting knowledge and in-depth technical understanding of automation enable Michael to provide holistic and future-ready solutions across the insurance lifecycle.

Prior to joining Xceedance, Michael was vice president of insurance underwriting at Genpact and a senior property/casualty E&O underwriter at Zurich North America and CNA Insurance. His contributions spanned various functions of the insurance value chain, including underwriting, claims, and technology. Michael has delivered digital transformation and process excellence for clients worldwide and has proven expertise in insurance product innovation and technology enablement

# Our Actuarial & Analytics Offerings

## Enablement

### Staff Enablement

- > Part Time Resources
- > Full Time Resources

### Technology Enablement

- > Cloud based
  - Partner solutions
  - In-house solutions
- > Single sign on
- > One data upload unlocks multiple solutions

## Advisory & Consulting

### Pricing & Growth Analytics

- > Business Planning
- > Product Launch
- > Product Maintenance
- > Price Monitoring
- > Profitability Studies
- > Rate Adequacy

### Reserving & Claims Analytics

- > Quarterly Reserving
- > Annual Reporting (SAO, AOS, AR)
- > Loss Adjustment Expense Studies
- > Claims Studies

### Data Science

- > Growth Analytics
- > Predictive Model Driven Pricing
- > Claims Analytics
- > Business Intelligence Tools & Dashboard Integration

### Admitted Market Management

- > State Filings
- > Regulatory Compliance
- > ISO Circular Monitoring
- > Bureau Monitoring
- > Statistical Reporting

Learn more at [www.xceedance.com/actuarial](http://www.xceedance.com/actuarial)

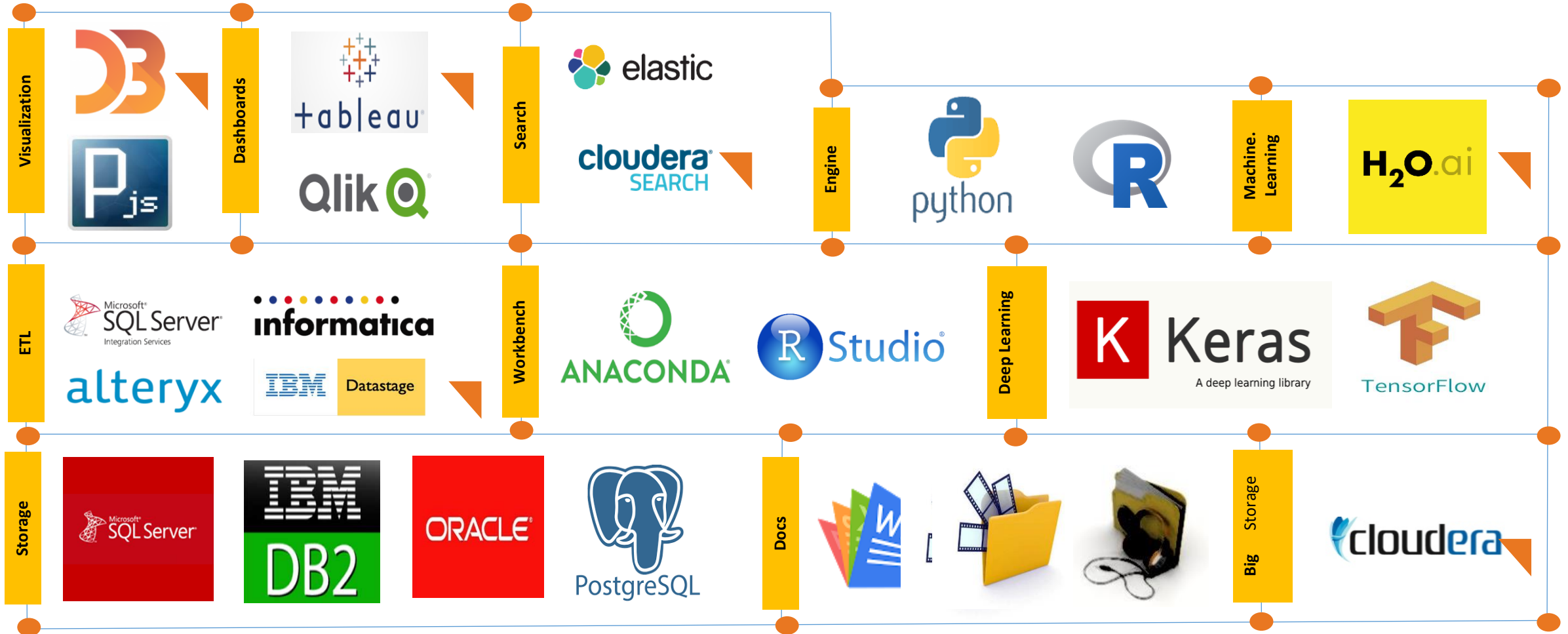
# Data Science Technologies

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## Covering the following technologies

- ❖ Artificial Intelligence (AI)
- ❖ Machine Language (ML)
- ❖ Deep Learning (DL)
- ❖ Robotic Process Automation (RPA)
- ❖ Decision Support Systems (DSS)
- ❖ Natural Language Understanding/Processing (NLU/NLP)
- ❖ Chatbots
- ❖ Voicebots

# Sample Of Tools Used



# Actuarial Applications



## ❖ **Ratemaking**

- Loss Costs**
- Relativities**

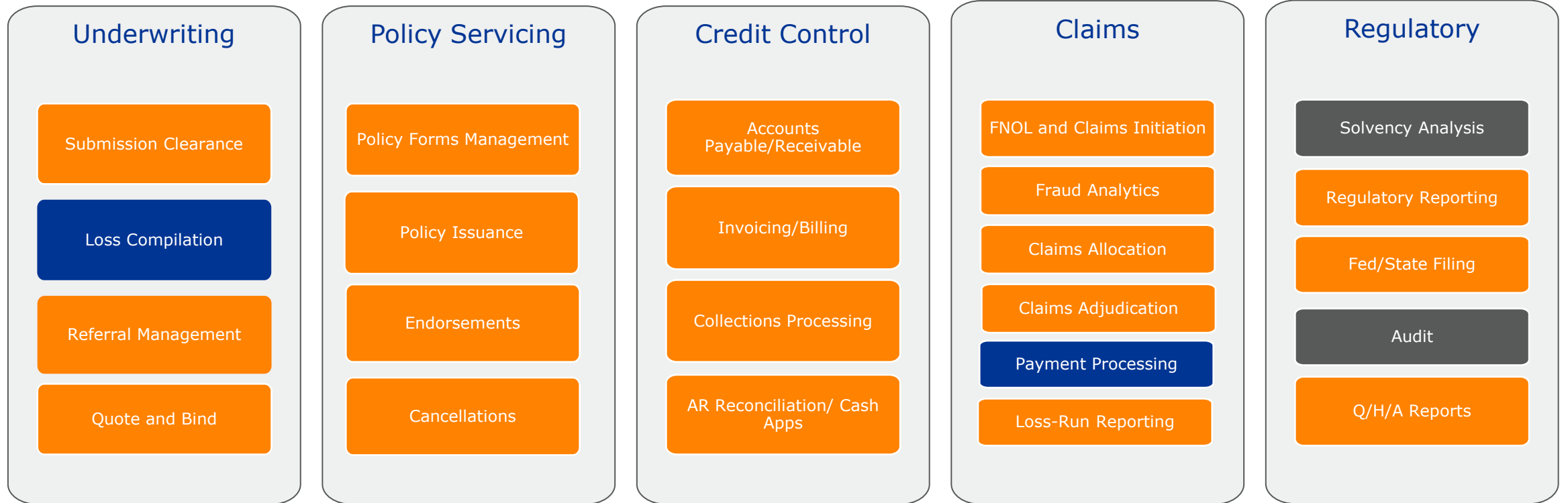
## ❖ **Portfolio Management**

- Loss prediction**
- Propensity analysis**

## ❖ **Reserving**

- Loss (Case + IBNR) prediction**
- IBNR Allocation**

# Personal Lines Insurance Process Heat Map



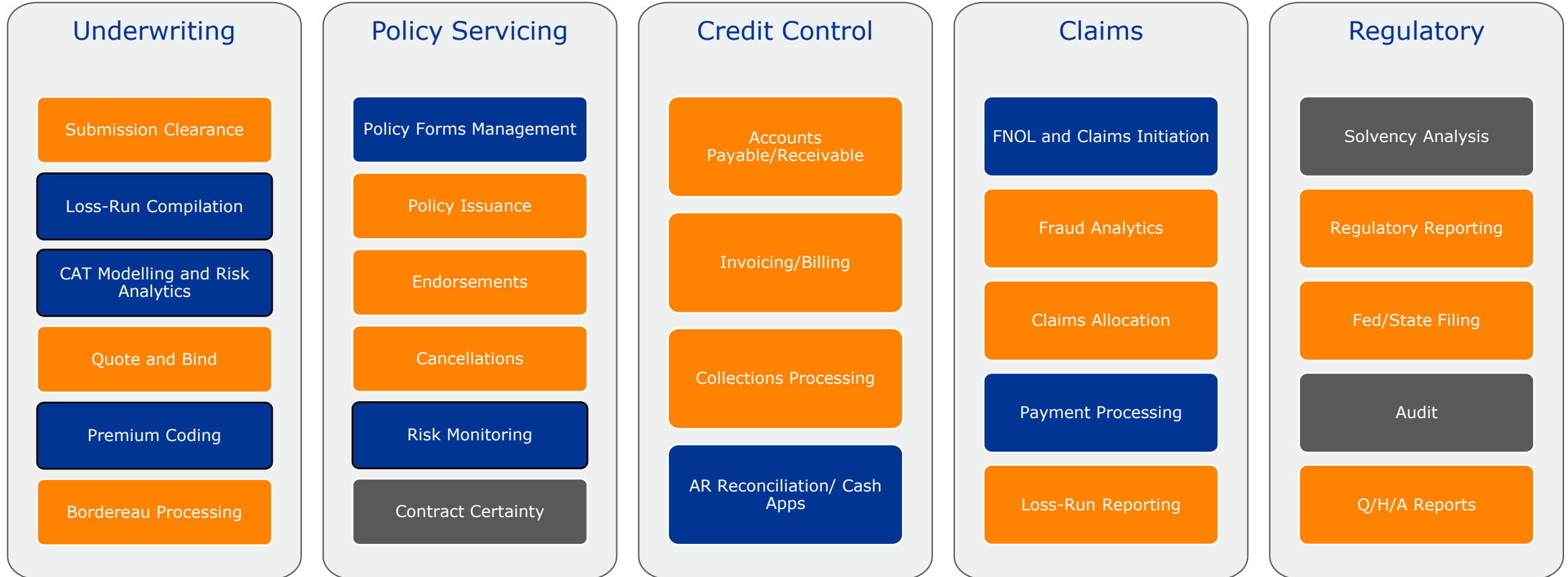
## Common Processes



## ROI Potential



# Commercial Lines Insurance Process Heat Map



## Common Processes



## ROI Potential





# Underwriting & Claims

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## Underwriting

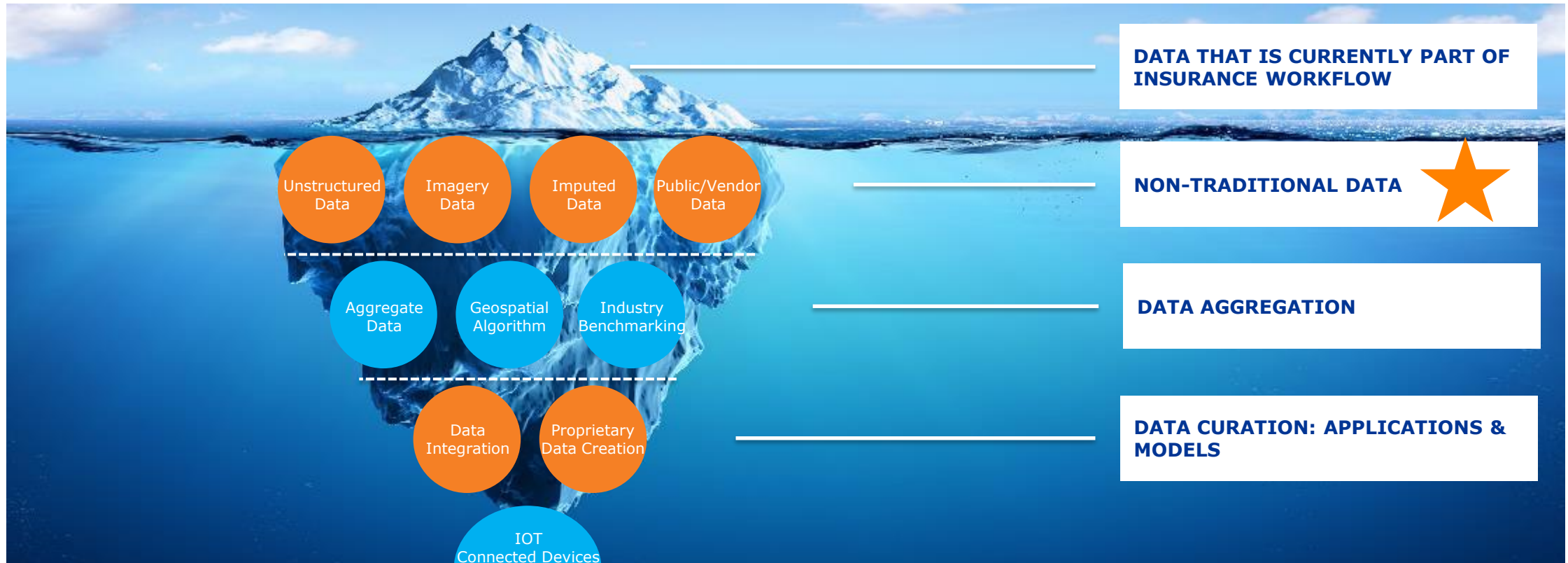
- ❖ Loss Run Ingestion & Data Extraction
- ❖ Customer interactions – policyholder and distribution
- ❖ Submission & Clearance Automation
- ❖ Policy Issuance Automation
- ❖ First term loss prediction

## Claims

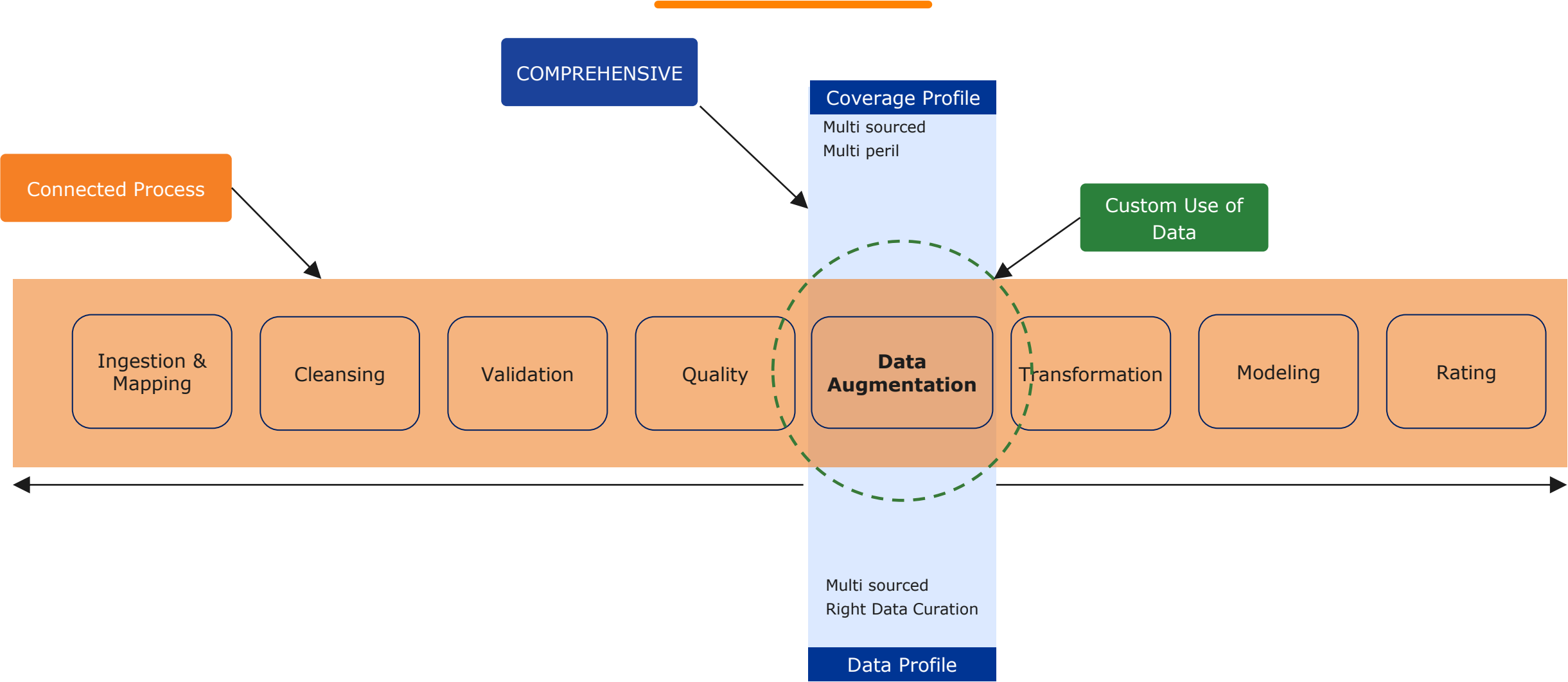
- ❖ First Notice of Loss (FNOL)
- ❖ Policyholder claims interactions
- ❖ Site Inspection Selection
- ❖ Adjudication
- ❖ Settlement
- ❖ Claim Closure

# Data Available to the Insurance Industry

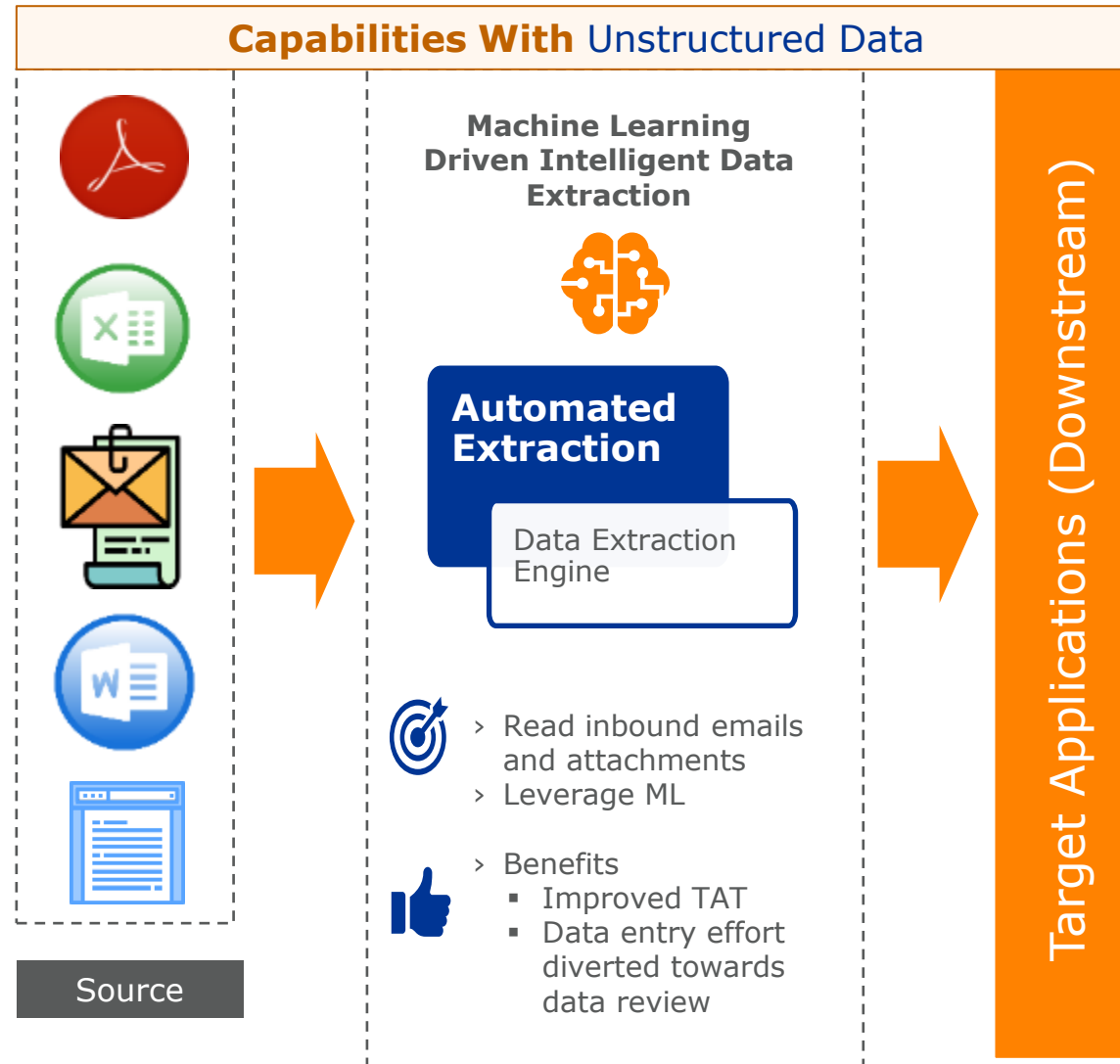
Type	Coverage Type						Risk Profile Data	Data Type				Data Creation	Data Aggregation	Data Curation
	Product Development	Underwriting	Exposure Management	Risk Assessment	Claims Management	Submission, Form, Billing		Unstructured Data	Existing Data Imputation	3rd Party Source	Satellite Imagery			
Insurance Data, Apps, Services	✓	✓	✓	✓	✓	✓	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



# Optimal Rating Framework With Augmented Data (Simplified)



# Example of Unstructured Data



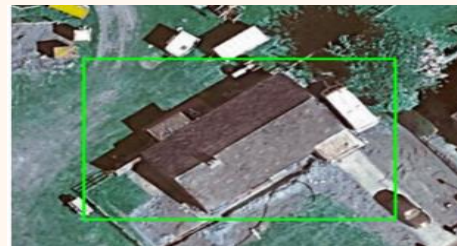
# Example of Imagery Data

## Capabilities With Image Data



- Extracted footprint
- Geocoded Lat/Long
- Computed Centroid

Total Area = 27,365 Sq Meter



Roof Geometry = Gable

Roof Covering = Asphalt Singles

Roof Pitch = High (> 30 degree)

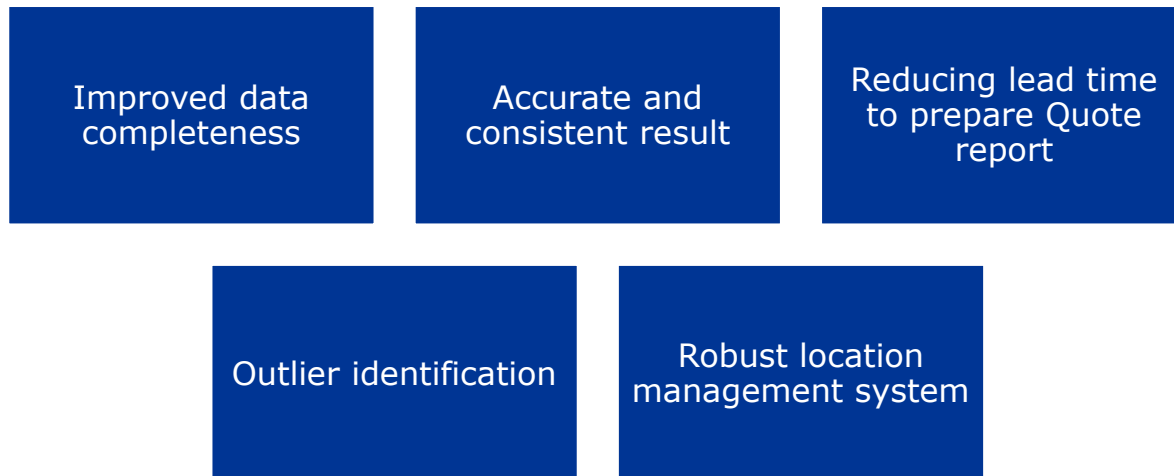
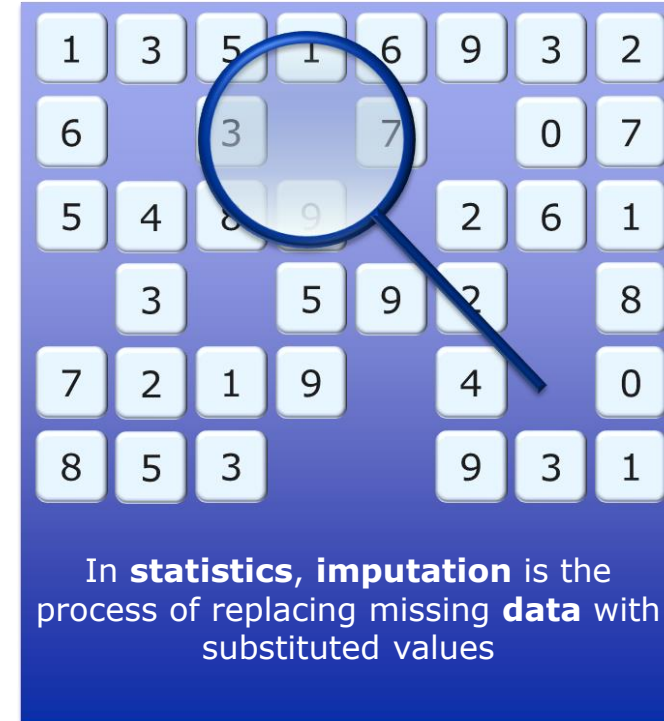


Glass Percentage = 30-50%

No of stories = 7

# Example of Imputed Data

- > To leverage past data to fill missing value for exact same property
- > To infer missing value considering similar locations in the portfolio
- > Approach distinguished with
  - A direct intelligent location search
  - A predictive model for similar locations



# Example of Public/Vendor Available Data

Data Types	Coverage					
	Product Development	Underwriting	Exposure Management	Risk Assessment	Claims Management	Submission, Form, Billing
Risk Profiling - FEMA Flood Zones - Distance to Coast - Storm Surge Risk - Hail Risk - Tornado Risk - Wildfire Risk - Earthquake Risk - Terrorism Potential - Crime Score - Political Violence	Y	Y	Y	Y		
Property Characteristics: COPE		Y	Y	Y		
Property Characteristics: Secondary Modifiers		Y	Y	Y		
Property Characteristics: Value Disaggregation		Y	Y	Y		
Property Characteristics: Valuation		Y	Y	Y		
Property Characteristics: Loss History	Y	Y	Y	Y	Y	
Property Characteristics: Diagnostics from Connected Devices	Y	Y	Y	Y	Y	
Property Characteristics: Financial history	Y	Y	Y	Y		Y
Loss History: Non-property / casualty	Y	Y	Y			Y
Customer Profile: Histroty, Rating, Etc.	Y					
Customer Profile: Sociel, Behavioural	Y	Y	Y			Y
Risk Data Accumulation, HotSpot, Cluster		Y	Y	Y		
Dynamic Event Rating Nat Cat, Terrorism, Cyber	Y	Y	Y	Y	Y	Y

# Xceedance Case Studies

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# Leading Insurer Accelerates Submission and Clearance

## THE CHALLENGE



Dependency on individual to apply complex rules

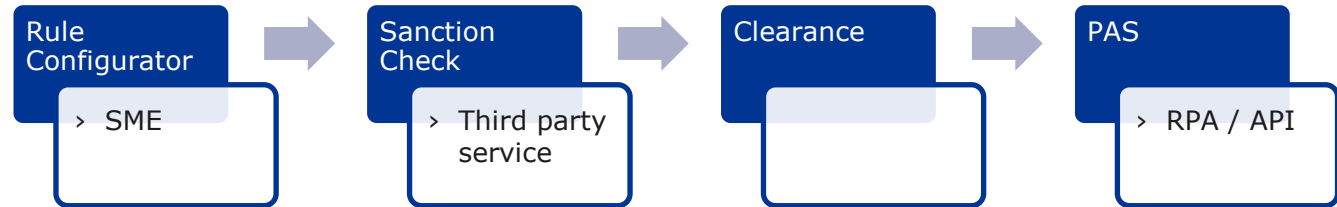


Dependencies on developers to change rules



High turnaround time due to effort-intensive workflows

## OUR SOLUTION



Region: North America | LOB : Casualty and property

## Technology Focus



## PROVEN RESULTS



100% Accuracy achieved



200% Improvement volume handling



20% Increase in submission to quote ratio



80% Reduction in turnaround time

# Specialty Insurer Optimizes Policy Issuances

## THE CHALLENGE



Operational Inefficiency



Lack of insights leading to risk of errors and omission



Longer turnaround time affecting CSAT score

## OUR SOLUTION

- > Used RPA to extract data from Binder, scrub it against PAS values and email discrepancy report to the Underwriter
- > RPA Bot also updates the PAS for selected values with the rest flowing into a manual queue

### Region / LOB

- > North America
- > Executive and Professionals

## Technology Focus



## PROVEN RESULTS



5.3 FTE Capacity



5.3 FTE Capacity



50% Handling Time

# Large Insurance Company Implements Automated Bordereaux Functions

## THE CHALLENGE



Effort intensive workflows



Risk of inaccuracy and omissions



Longer turnaround time due to manual intervention

## OUR SOLUTION

- > Automated validation to report mismatches with reservation system
- > Automated solution to categorize entries based on transaction type and premium details
- > Automatic feeding of the data to book the entries into the reservation system

### Region / LOB

- > North America
- > Medical Stop Loss

## Technology Focus



## PROVEN RESULTS



50% Improvement in turnaround time



60% Increase in productivity



100% Accuracy achieved



# Thank You

Strategic Consulting  
Technology Implementation  
Managed Services

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