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Tracing a 3rd Party Liability Claim
Applying Analytics to Improve Claims Risk Management

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Casualty Loss Reserving Seminar
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Agenda

1. Setting Context

2. Model Design Considerations

3. Business Implementation

4. Discussion

Session Overview

What data and tools exist for actuaries to help predict the costliest claims upon FNOL

The "80/20" rule is commonly applied to third party liability claims: namely, that 80 percent of the cost comes from 20 percent of the claims. What if you could consistently predict whether a claim would fall in that costliest 20 percent so you could handle it in a way that mitigates the risk?

The session will provide a view on using analytics and predictive modeling to enhance the claims handling process for 3rd party liability claims. First, the session will discuss the design considerations for a 3rd party liability claims modeling solution. Second, there will be a review of how the model results can be effectively implemented into the day-to-day claims handling process to drive organizational value.

CAS Anti-Trust Slide

- The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings.

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- It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.
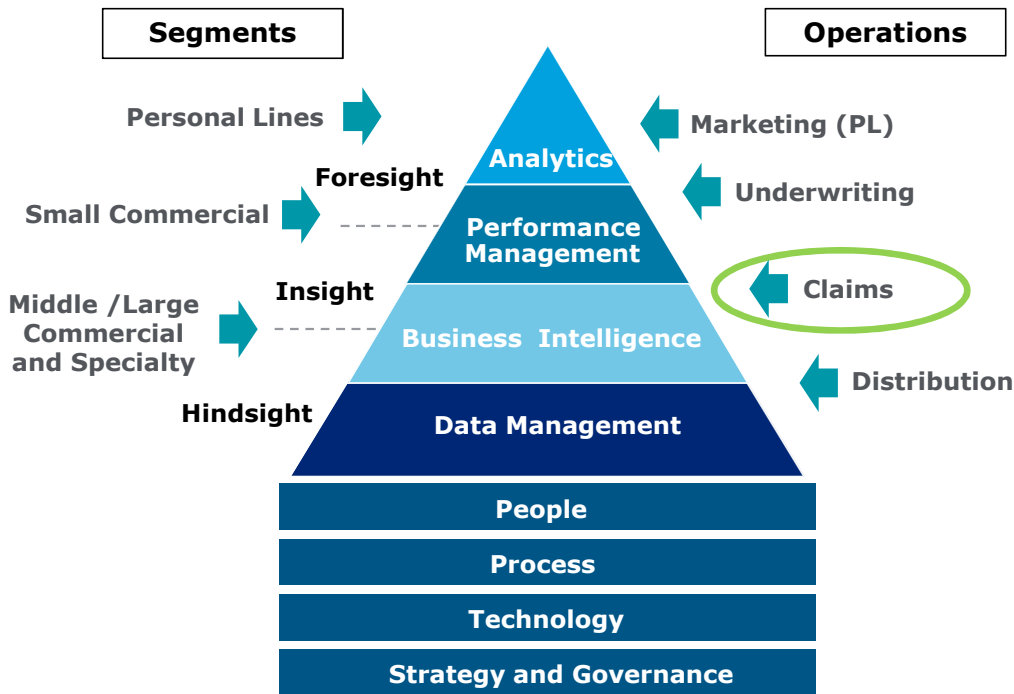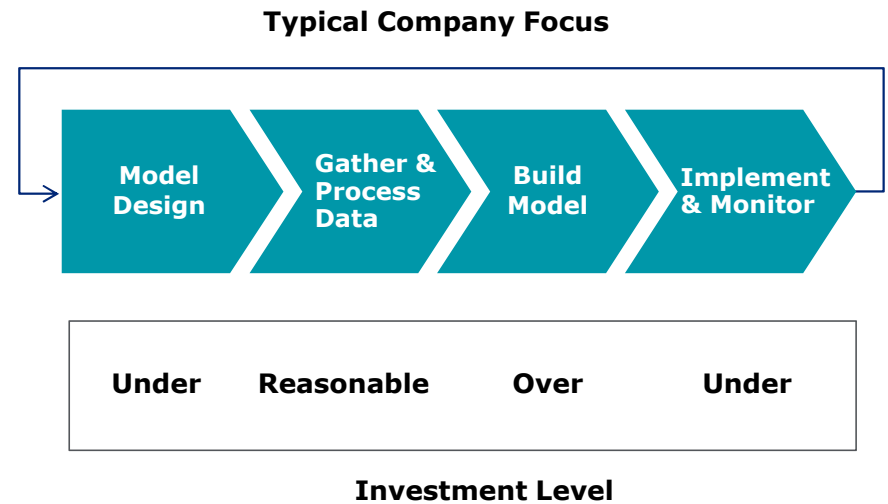
Setting Context

Maturity of Advanced Analytics in Insurance

Analytics is a key driver to smarter, more efficient operations. Opportunities exist in the less mature segments and operational areas with the right approach.

Analytics Maturity

Segments

Operations

Personal Lines →

Foresight

← Marketing (PL)

Analytics

← Underwriting

Small Commercial →

Performance Management

Insight

← Claims

Middle /Large Commercial and Specialty →

Business Intelligence

Hindsight

← Distribution

Data Management

People

Process

Technology

Strategy and Governance

Analytics Approach

Typical Company Focus

| Model Design	Gather & Process Data	Build Model	Implement & Monitor
Under	Reasonable	Over	Under

Investment Level

Claim Analytics – Marketplace Solution Designs

Different claim solution designs exist in the marketplace today. Not all solution designs are the same. Some are more impactful than others given their business process depth, breath and the focus of the solution.

3rd Party BI

Representation

Subrogation

Severity

Suit

Fraud

Reserving
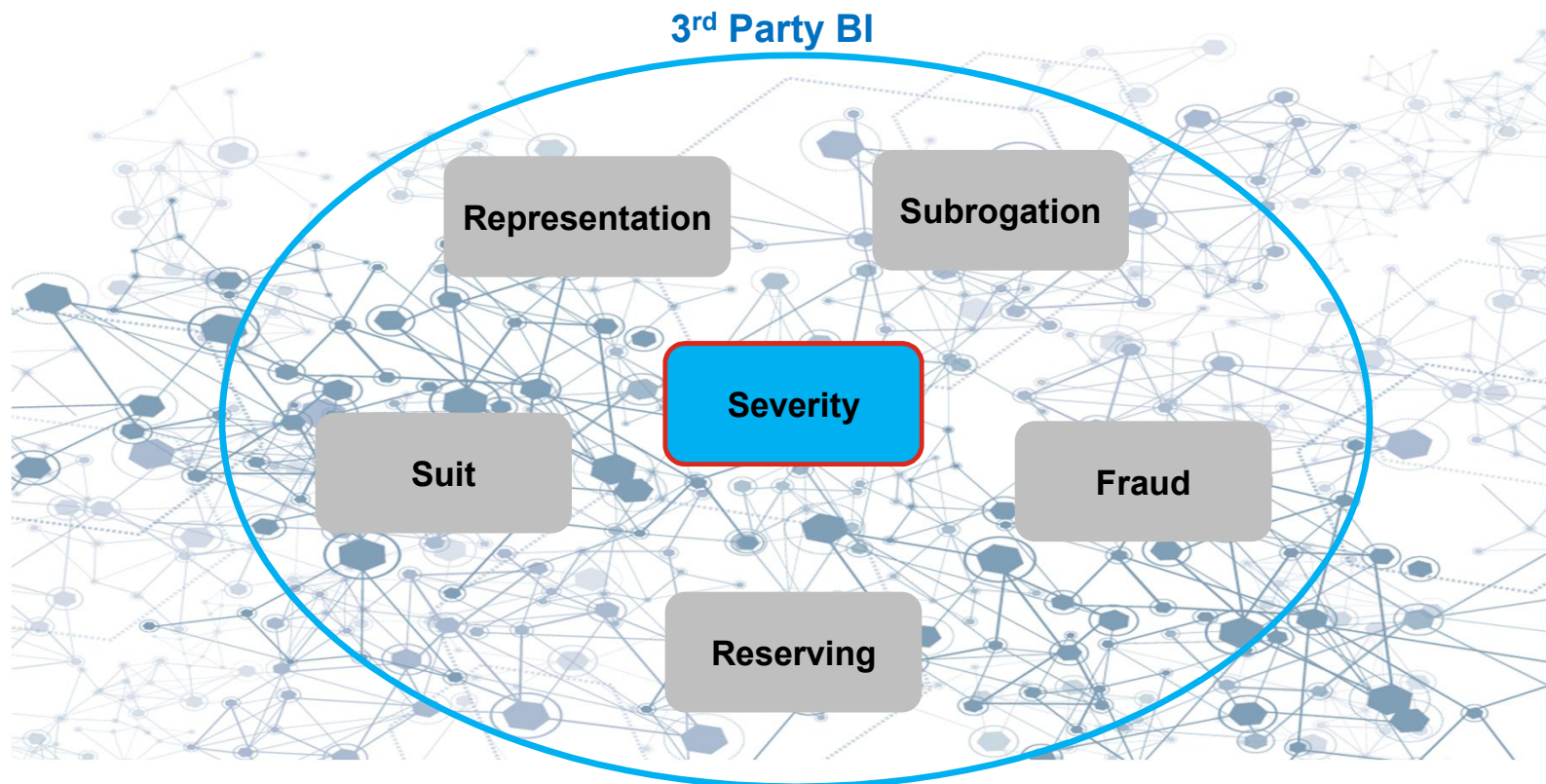
Solving the 80/20 rule is the KEY to savings

Typically 20 percent of claims are responsible for 80 percent of the losses. **Only one-third of these most costly 20 percent are recognized at first report.** Quickly and prospectively identifying this adverse segment of claims enables proactive management strategies that can drive more effective business results.
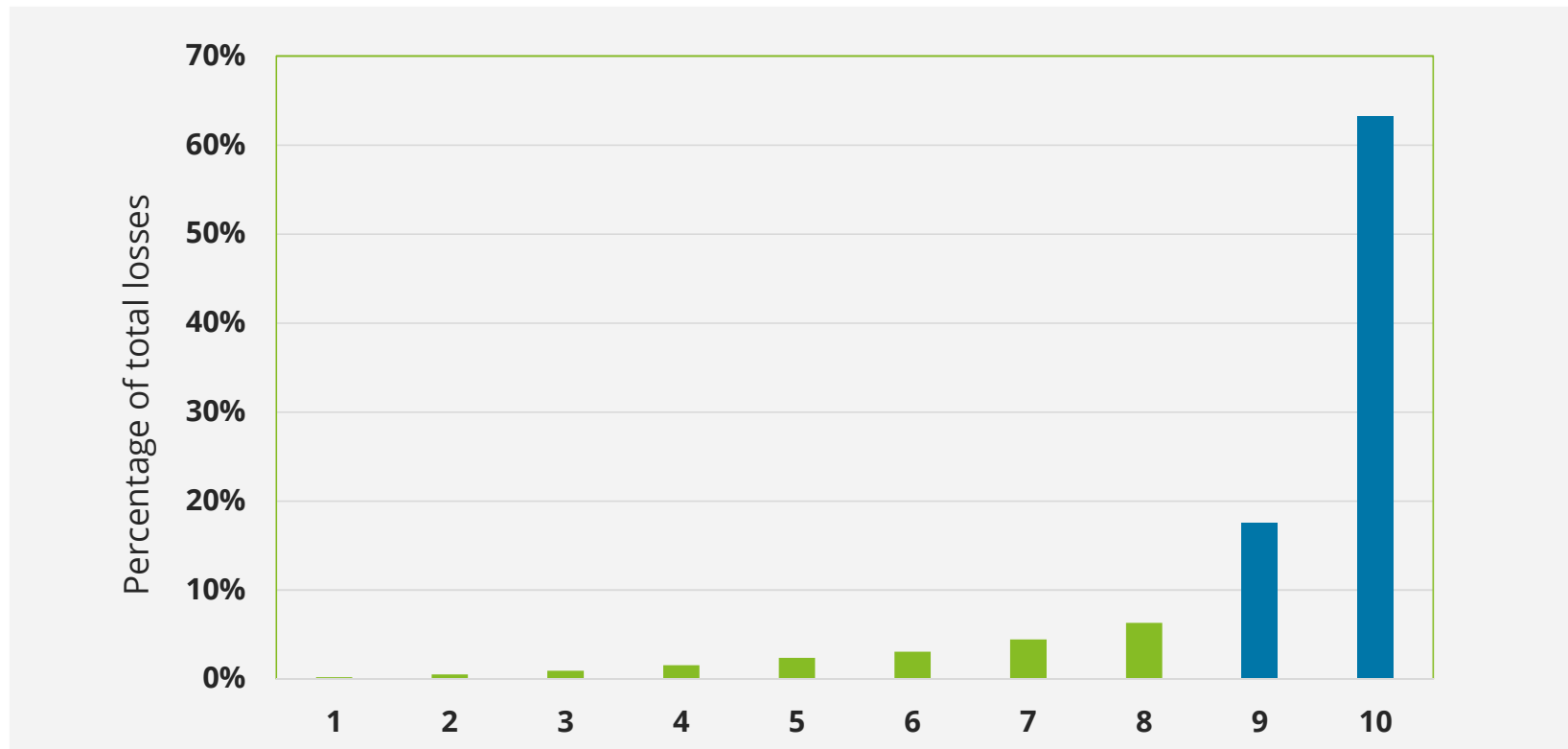
Model Design Considerations

Loss and Expense Severity Model Design

We have found improved segmentation by modeling loss separately from expense. It is also important to have models that take into account new information as it becomes available during the life cycle of a claim.

Third Party BI Models

- Third Party BI claims predictive models
  - Loss Model
  - Expense Model
- Separate Loss and Expense models allow for more precise analysis of claim cost drivers

Through Time Model

- A claim's projected ultimate severity and duration changes dynamically as new information emerges
- The BI model recognizes the dynamic nature of claims and provides through-time updated scores driven by new information (e.g., supplemental information, legal information, settlement requests/negotiations, etc.)

FNOL (2 Models)
- Loss Model
- Expense Model

Legal Information

Supplemental Information

Through Time (2 Models)
- Loss Model
- Expense Model
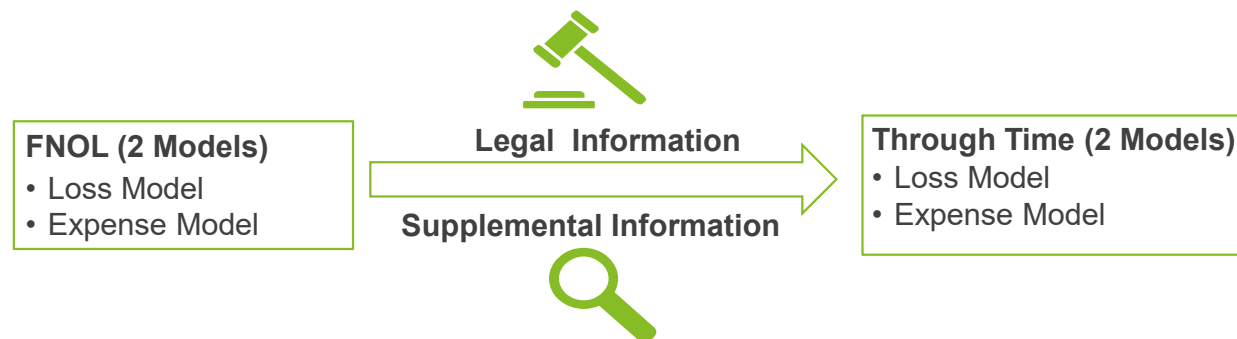
Additional Design Considerations

There are a numerous model design considerations as highlighted by the following examples.

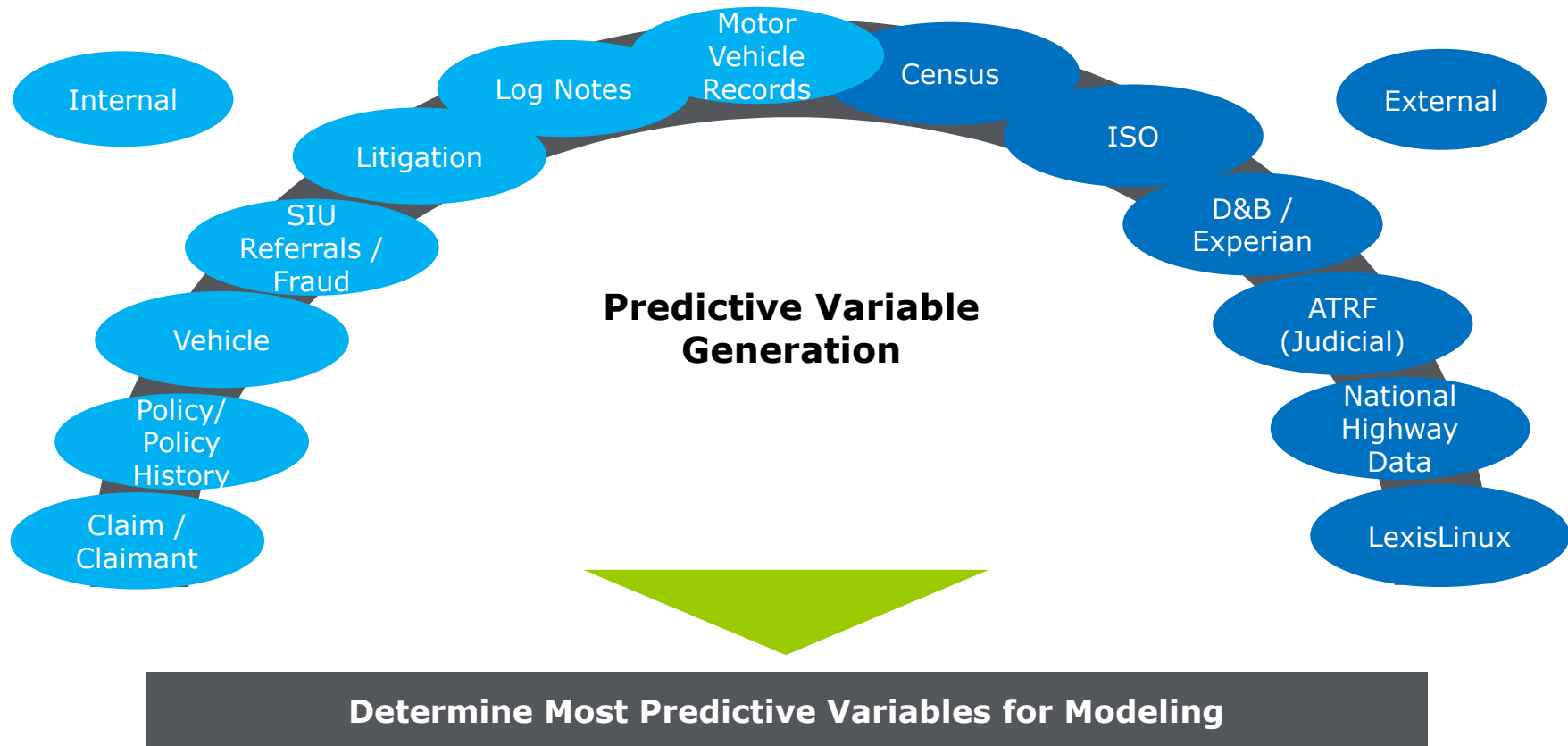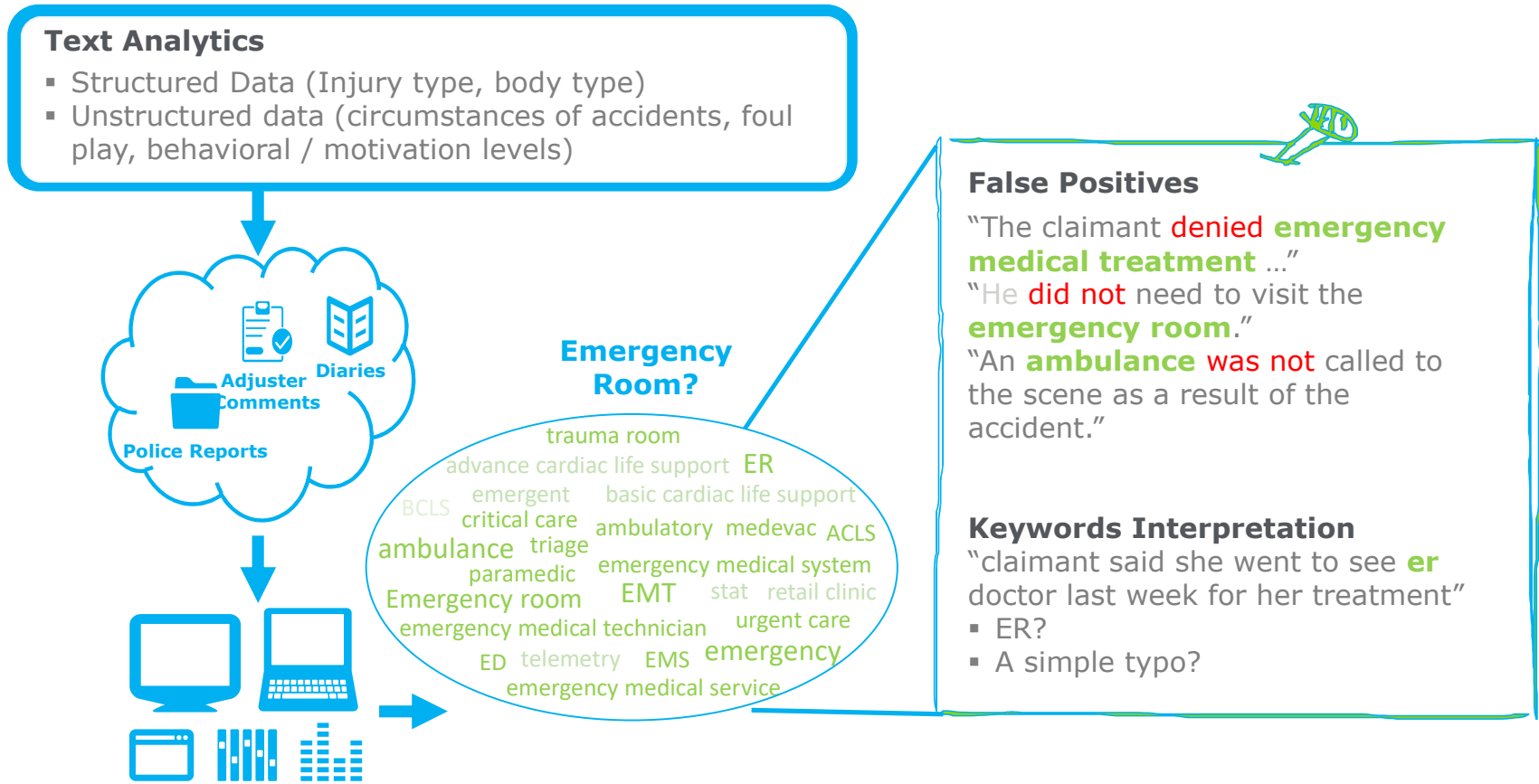| Actuarial Adjustments	• Excluding immature claims • Adjustment for loss development using case development factors • Severity trending to bring historical claim to current level • Adjustment for policy limit to a common level
Data Credibility Challenge	• Pooling Multiple years of experience or different LOBs for analysis • Simpler techniques, such as GLM, rather than complex techniques • Using bootstrap cross validation if data size is limited
Similarities and Variations By LOBs	• Many claim, claimant, and external characteristics are similar across lines of business, such as claimant demographics, claim reporting patterns, claimant counsel's profiles, etc. • Some other characteristics are unique by lines of business, such as cause of loss, injury types, etc. • Data from different lines of business can be pooled to increase credibility to extract common patterns across different lines of business

Varied Data Sources for Improved Segmentation

Risk characteristics can span numerous categories of internal and external data sources.

Predictive Variable Generation

Internal — Log Notes, Litigation, SIU Referrals / Fraud, Vehicle, Policy/Policy History, Claim / Claimant, Motor Vehicle Records

External — Census, ISO, D&B / Experian, ATRF (Judicial), National Highway Data, LexisLinux

Determine Most Predictive Variables for Modeling

Using Text Mining to Enhance Results

Deloitte's modeling process included advanced text mining of claims notes to test and select variables that are consistently predictive of claims severity.

Text Analytics

- Structured Data (Injury type, body type)
- Unstructured data (circumstances of accidents, foul play, behavioral / motivation levels)

Adjuster Comments

Diaries

Police Reports

Emergency Room?

trauma room
advance cardiac life support ER
emergent basic cardiac life support
BCLS
critical care
ambulance triage ambulatory medevac ACLS
paramedic emergency medical system
Emergency room EMT stat retail clinic
emergency medical technician urgent care
ED telemetry EMS emergency
emergency medical service

False Positives

"The claimant denied **emergency medical treatment** …"
"He did not need to visit the **emergency room**."
"An **ambulance** was not called to the scene as a result of the accident."

Keywords Interpretation

"claimant said she went to see **er** doctor last week for her treatment"

- ER?
- A simple typo?

Sample Variable Profiles

From years of research and development, we have identified a large number of risk characteristics that are typically available at FNOL or shortly thereafter for most Auto BI claims.

**Variable Distribution - Personal Auto Model**
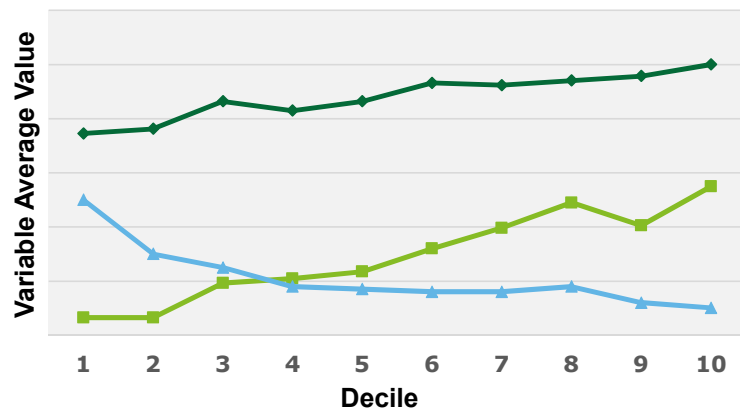
- **Claimant Age** – Older claimants tend to have higher loss severity

- **Luxury Cars** – Luxury car owners tend to have higher loss severity

- **Lag between Accident and Expiration Date** – the closer the accident date to the policy expiration date, the higher the expense severity
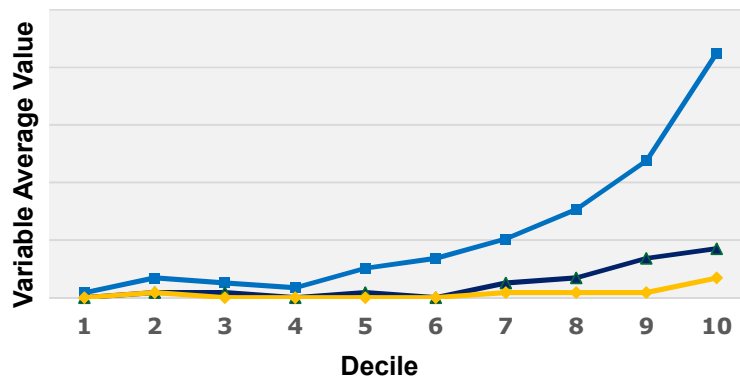
- **Emergency Room** – Claims with an emergency room visit tend to be more severe

- **Burn** – Claims caused by a burn tend to be more severe

- **Death** – Claims that resulted in death tend to be more severe

Segmentation Power of Auto BI Models

The performance of the loss and expense severity models can be powerful, even at FNOL.

Loss FNOL

Loss 45 Days

Expense FNOL

Expense 45 Days
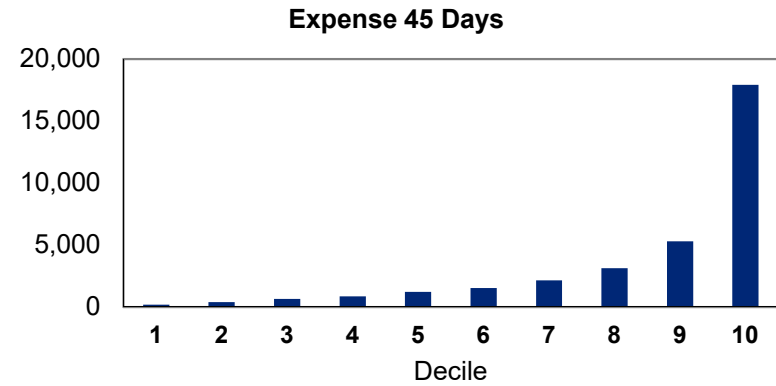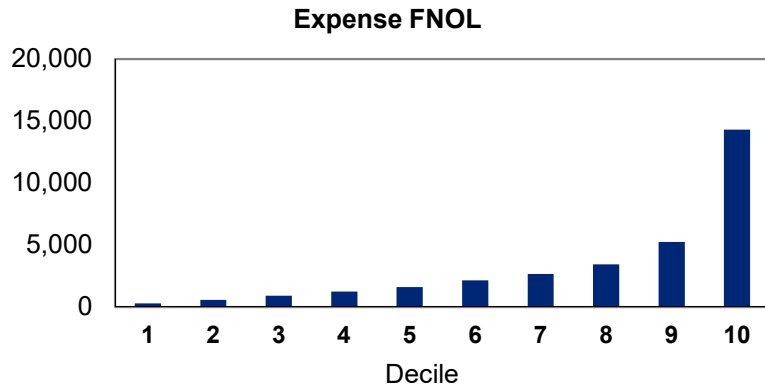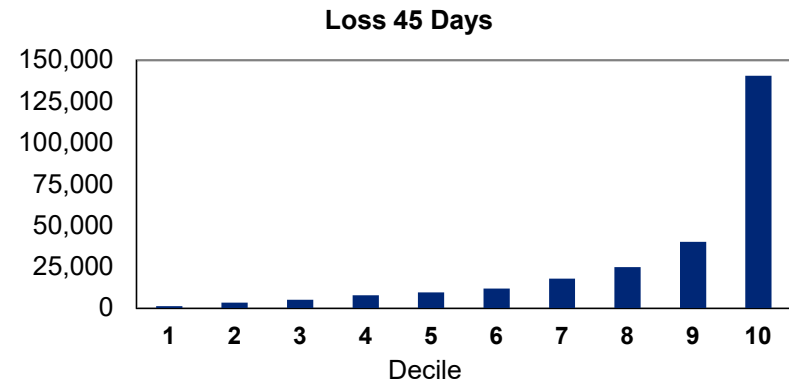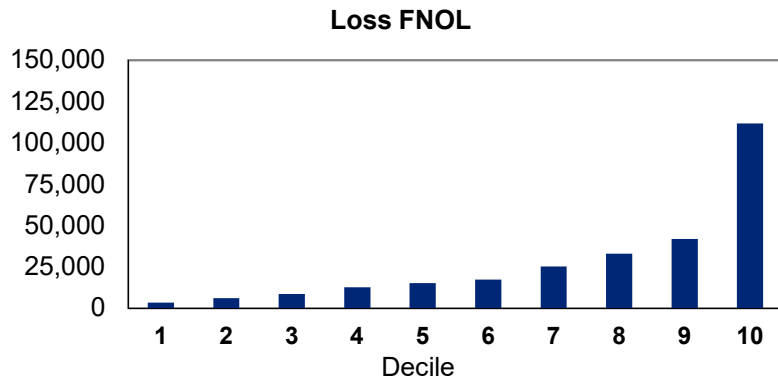
FNOL Model Can Outperforms Claim Adjusters

Comparison of FNOL model results with claim adjusters reserving activity for a top 10 personal auto writer.

Accuracy of Estimates
Percentage of the $100K+ claims*

FNOL Model Validated Results		Claims Adjusters			
		Claim reserve relative to closed value	*Accuracy of Estimates*	**@ 15 Days**	**@ 120 Days**
Deciles 1 – 7	20%	**Severely Under Reserved** Less than 50% of closed value***	🔴	77%	47%
Deciles 8 & 9	26%	**Under Reserved** 50 to 75% of closed value	🟡	4%	8%
Decile 10	54%	**Adequately Reserved** 75%+ of closed value	🟢	20%	45%

* Based on Deloitte's FNOL model validated on 200K closed claims with $2.2B of paid losses total; 3500 of the 200K closed claims had a final value of $100K or greater
** Decile 1 is model predicted least severe 10% of claims and decile 10 is predicted most severe 10% of claims
*** Example – a claim that closed for $100K and had a $30K reserve at 120 days would have a 30% reserve relative to closed value

Business Implementation

Today's Challenge with Operationalizing Analytics

The inability of insurers to effectively operationalize their claims analytics models is undermining heavy investments being made to create actionable, value-laden insights

No operationalization framework and insufficient governance

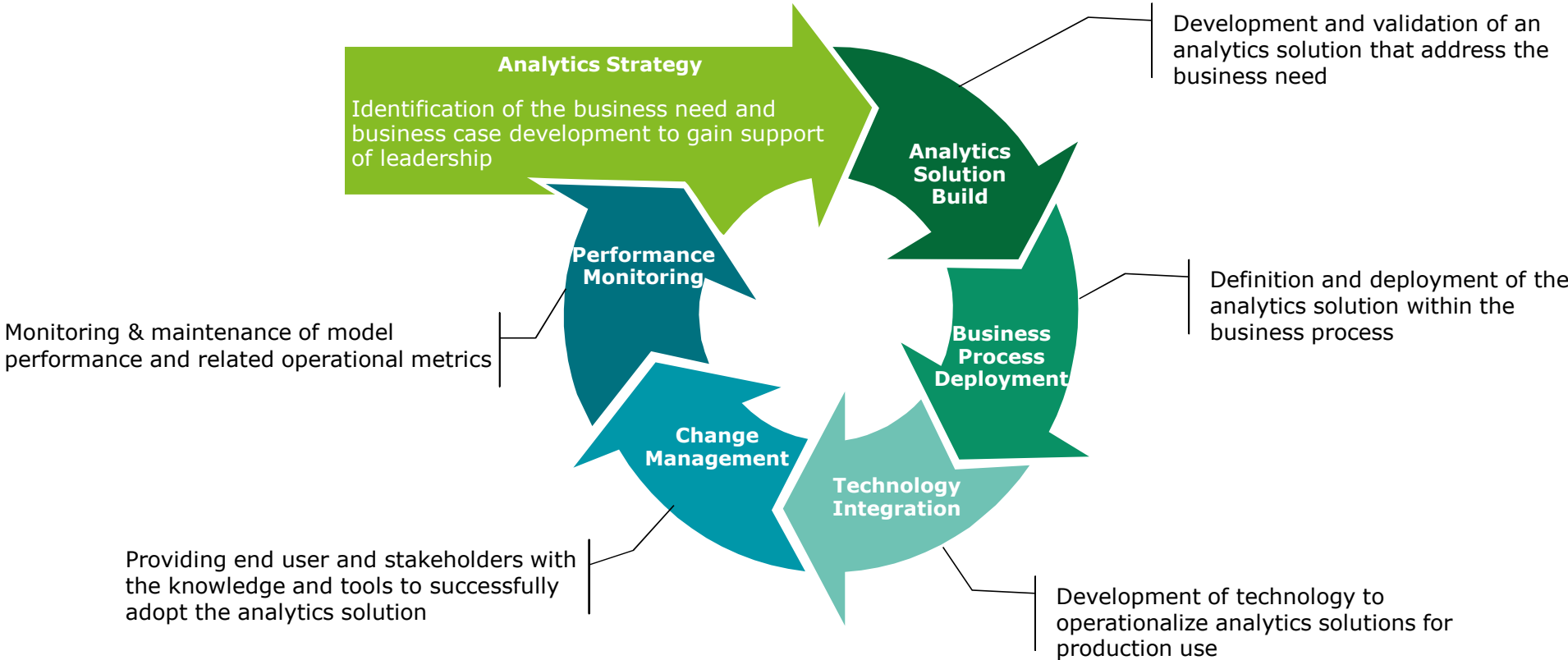**Lack of model output integration with end-user systems and workflows**

Misaligned leadership expectations and lack of executive commitment
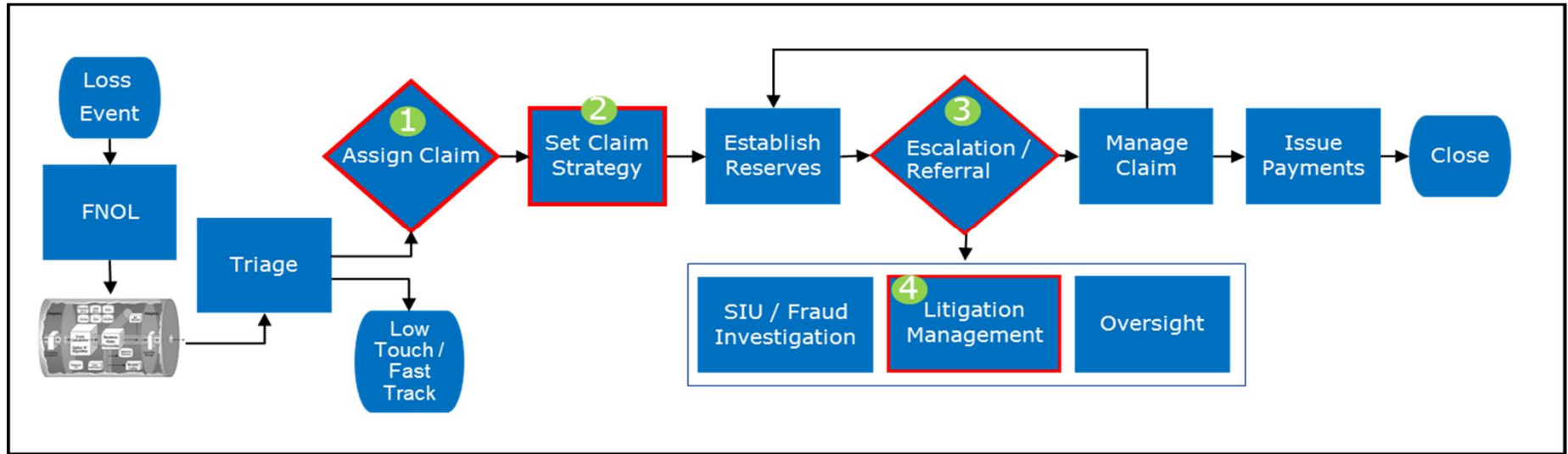
Ambiguous accountability model and cultural reticence to change

End-to-End Model Development and Deployment Approach

A holistic view incorporating business implementation is critical to realize sustained financial benefits from the integration of predictive modeling into the business process.

Development and validation of an analytics solution that address the business need

Definition and deployment of the analytics solution within the business process

Development of technology to operationalize analytics solutions for production use

Providing end user and stakeholders with the knowledge and tools to successfully adopt the analytics solution

Monitoring & maintenance of model performance and related operational metrics

Analytics Strategy

Identification of the business need and business case development to gain support of leadership

Analytics Solution Build

Business Process Deployment

Technology Integration

Change Management

Performance Monitoring

Business Workflow Applications – 3rd Party Liability

❶	❷	❸	❹
▪ Projected severity matched to skill ▪ Improves existing routing rules ▪ Reduced re-assignments ▪ Provides enhanced personnel management criteria	▪ More focused investigation ▪ Allows for more informed resolution strategies based on enhanced claim information ▪ Lower litigation rates through accelerated resolution strategies ▪ More consistent initial reserves	▪ Enhance quality of referrals that improves efficiency and effectiveness (i.e., for SIU) ▪ Reduces manual referral identification efforts ▪ Reduction of lag times	▪ Immediate indication of case severity ▪ Improved matching of law firm or staff counsel to claim exposure ▪ Insight into settlement value & timing ▪ Indication of need for resource triage (round table, etc.)

Analytics Enabled Organization

Sample Business Rules

Application	Objectives	Example Business Rules
Assignment & Investigation	• Assign claims based on score to place higher scoring claims with more experienced examiners • Investigate high scoring claims to help determine liability • Implement more aggressive contact requirements for higher scoring claims	• Refer claims scoring 90+ directly to Tier 3 • Refer claims scoring 1-60 to Tier 1; 61 - 89 to Tier 2 • Request surveillance video on claims scoring 90+
SIU	• Focus SIU services on high-scoring claims	• If Score is 90+ and 1 or more red flag is present, mandate SIU referral
Litigation / Advisory	• Utilize experts or consult advisors as appropriate based on the characteristics of the claim and score	• If Score is 80+ consider discussing with legal advisor
Oversight	• Increase oversight on high scoring claims	• If Score is 90 or above consider a roundtable • If Score is 65+ or above set a 30 day diary
Settlement	• Use the model output to help craft settlement strategy	• Consider a settlement conference and/or pre-suit mediation on non-litigated claims on certain high-scoring claims

The Impact On Litigation Strategies and Expenses

Effectively assessing indemnity and expense complexity at first notice provides key insights into litigation strategy and ongoing management.
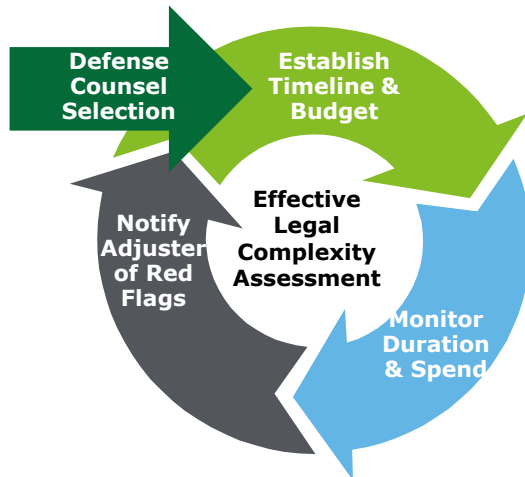
Assessment Criteria

- The ongoing case resolution can be guided by the predictive assessment of the case's estimated fair settlement value and associated legal costs.

- Legal expense budget will guide the expected allocation of time with interactions between defense counsel and claim adjuster if changes to the budget are warranted.

- An accurate assessment of claim legal complexity provides the estimation of the fair settlement value. Armed with this insight the defense counsel can act when the time is right – **"right settlement at the right time"**.

Ongoing Management

Once a claim enters the litigation life cycle, it is critical to have a baseline legal timeline and expense budget in place for ongoing monitoring and early detection of slippage.

- **Duration and Expense Budgets** – in the current state, law firms establish their own budget; with predictive modeling, legal complexity guides can enable the establishment of a reasonable budget.

- **Resources** – in the current state, law firms subjectively select resources and staffing models; predictive modeling introduces objective considerations for resource assignment and utilization.

Deployment, Learning, and Communications

Leading Practices

Leadership

- Generate buy-in from the top down – *executive support is key*

Business Requirements

- Clearly define the business application(s) of the model
- *Involve end users* in business rule development

Deployment Planning

- Identify dependencies, critical success factors and roles and responsibilities for deployment
- *Define deployment approach* (e.g., staggered vs. full roll-out) and stick to a roll-out schedule

Communications and Training

- Create effective communications and *keep stakeholders informed*
- Develop and deliver targeted trainings for end users

Go-Live

- *Be prepared for FAQs* and trouble-shooting
- Monitor issues and feedback in production

Ongoing Performance Management

Performance management metrics and business intelligence tools help quantify the impact of predictive models and provide insight into how they are being used in day-to-day operations.

	Monitoring Performance Metrics	**Operational Performance**
Purpose	• Highlights distribution trends that are developing • May suggest that underlying model data and output be evaluated to understand the trends	• Provides on-going indication of results • Allows for business workflow rules to be refined
Sample Metrics	• Score Distribution by Decile: – by Loss vs Expense Model – by State – Etc. • Variable/Reason Message Analysis: – Variable Means by Score – Reason Message Volume by Score • Rescore Score Disruption Analysis	• Pre vs. Post Implementation Average Claim Costs • Assignment by Score • Claim Closure Rates • Non-Represented vs Represented vs Suit • Re-assignment Rates • Number of Referrals by Score – SIU Referrals and outcomes • Rule Override Rate (i.e., tracking how often rules were not adhered to)

Discussion

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