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Actuaries and Consultants

Property & Casualty
Predictive Analytics and ERM

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Outline

➢ PA defined
➢ Use Cases in P&C
➢ ERM Benefits and Considerations

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Predictive Analytics Defined

Predictive analytics encompasses a variety of statistical techniques from data mining, predictive modelling, and machine learning, that analyze current and historical facts to make predictions about future or otherwise unknown events

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Predictive Analytics Def (cont.)

"The most common mistake that derails predictive analytics projects is to jump into the machine learning before establishing a path to operational deployment"

Eric Siegel, Ph.D., is founder of the Predictive Analytics World and Deep Learning World conference series and executive editor of The Predictive Analytics Times. He is the author of the award-winning book Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die

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Predictive Analytics Def (cont.)

"Prepare your staff to manage machine learning integration as an enterprise endeavor, and then allow your staff to determine a more informed choice…"

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Use Cases in P&C

team work

- Reserving
- Subrogation
- Claims
- Ratemaking
- Fraud

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Use Case 1 - Reserving

Medical Professional Liability Insurance ("MPL")

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Use Case 1 - Reserving

➢**Business Risk** Closed MPL claims reopen and trigger additional loss and LAE payments

➢**Problem** A MPL claim involves a claimant that has recovered from injuries, and the claim has been "closed" due to perceived full payment. No case reserves are being held for this claim. Suppose one year later legitimate injuries resurface that trigger additional payments needed

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Use Case 1 – Reserving (cont.)

➢**Solution Using PA** Can we use past historical claim details on reopened MPL claims to develop an algorithm that will "Score" closed MPL claims?

➢A higher score represents a higher chance of a claim reopening over the next year

➢Management and actuaries use scores to refine reserving processes

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Use Case 1 – Reserving (cont.)

ERM Benefits and Considerations

➢Improved predictive accuracy and reducing uncertainty

➢Geographic differences can be built into the model

➢The model may not be limited to claimant data

➢ERM personnel should interact with the CFO and/or Chief Actuary

Could this be your Reserving Risk Trend?

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Use Case 2 - Subrogation

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Use Case 2 - Subrogation

➢**Business Risk** Reduced income from not identifying and subrogating from third party insurers

➢**Problem** Insured is involved in a not-at-fault auto accident that results in a total loss of the vehicle. The claims adjuster assigned to the insured's claim promptly pays the claim. High employee turnover in the subrogation department results in this claim slipping through the cracks. Management recognizes that the enterprise may be missing subrogation opportunities

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Use Case 2 – Subrogation (cont.)

➢**Solution Using PA** Use past historical details on claims that have been successfully subrogated to develop a statistical algorithm that will "Score" a group of claims at once (e.g. monthly or quarterly)

➢ High score represents a higher chance of a claim being eligible for a subrogation recovery

➢ Subrogation department uses the scores to prioritize or double check certain claims

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Use Case 2 – Subrogation (cont.)

ERM Benefits and Considerations

➢May be a solution to reduce risk to income when operational challenges exist
➢Competition
➢Useful insights for pricing and reserving managers

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Use Case 3 – Claims Settlement
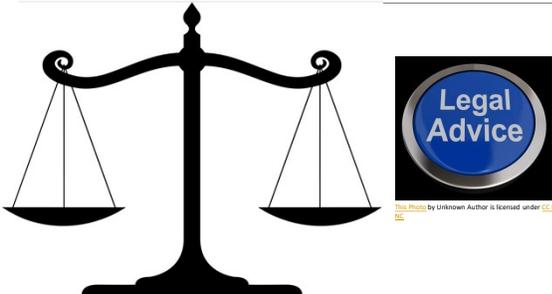
Legal Advice

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Use Case 3 – Claims Settlement

➤**Business Risk** The process to decide whether to settle a claim versus engage in claim litigation in the insurer's defense may not be efficient

➤**Problem** A mid-sized enterprise writes a significant amount of property lines business. Management recently approved expanding commercial liability offerings in response to the ERM identified diversification benefits

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Use Case 3 – Claims Settlement

➤**Solution Using PA** Research external data sources, sold by a data vendor, that contain sufficient details on case outcomes for litigated commercial insurance claims

➤Use the vendor data to develop a decision tree that will guide the enterprise on a "Yes" or "No" initial recommendation on whether or not to litigate a particular claim

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Use Case 3 – Claims Settlement

ERM Benefits and Considerations
➤What if the model is wrong?
➤Integrity of modeling data
➤Privacy
➤ERM personnel may play a role in promoting consistency in data quality and predictive analytics' best practices that are in line with the enterprise's goals

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Use Case 4 - Ratemaking

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Use Case 4 - Ratemaking

➤**Business Risk** The pricing/underwriting structure is not meeting management goals

➤Management goals include targets for new business growth, policyholder retention, profitability and satisfying regulatory requirements

➤**Problem** An enterprise identifies increased competition in the Homeowners market as contributing to a decrease in policyholder retention and a deterioration in their non-catastrophe loss ratio over the past year

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Use Case 4 – Ratemaking (cont.)

➤**Solution Using PA** Create a statistical algorithm that will improve risk segmentation

➤Data vendor is used

➤Select new, statistically significant rating variables

➤An algorithm is designed to combine all the rating variables into a score calculation

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Use Case 4 – Ratemaking (cont.)

ERM Benefits and Considerations

➢Assists management in meeting goals

➢Loss control and risk mitigation

➢Surviving regulatory scrutiny and satisfying statutory requirements

➢Speak with attorneys, compliance staff or state association

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Use Case 5 - Fraud

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Use Case 5 - Fraud

➢**Business Risk** Severe fire claims resulting from fraud

➢**Problem** Actuaries at a large enterprise observe an uptick in total-loss fire claim frequency in a geographical area with a large concentration of policyholders. ERM policies encourage cross-discipline communication, which reveals that at a large employer in the area recently went out of business and many remain unemployed

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Use Case 5 – Fraud (cont.)

➤**Solution Using PA** The large enterprise has a lot of data

➤A decision tree to indicate "Yes" or "No" can be developed using historical data and the conditions that existed when a claim was accurately determined to be fraudulent

➤This decision tree can then proactively be used by the enterprise to proactively identify claims that are more likely to be fraudulent

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Use Case 5 – Fraud (cont.)

ERM Benefits and Considerations
➤Data reliability
➤Decision tree vs scoring algorithm
➤Do benefits outweigh costs
➤Improve financials and keep premiums down

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Key Points

➤ Do benefits outweigh costs?

➤Adverse impacts

➤Interdisciplinary communication

➤Enterprise PA culture

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Questions?

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Thank You

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