“Learn from the Future” with Predictive Modeling

Joint Regional Seminar **“The Future of Insurance”** by
Faculty & Institute of Actuaries
Actuaries Institute Australia
Society of Actuaries

July 23rd – Aug 1st, 2014

EY 安永
Building a better working world

“Change is changing”

(Peter R. Porrino, EVP and CFO, XL Group)

”I think there is a world market for about five computers”

Tom Watson, Chairman of the Board, IBM 1943

"Computers in the future may weigh no more than 1.5 tons"

Popular Mechanics, forecasting the relentless march of science, 1949

“There is no reason for any individual to have a computer in his home”

President and Founder, Digital Equipment Corp., 1977

“What do 13 guys in Seattle know that we don’t?”

Ross Perrot (EDS) at the time when he was offered to buy Microsoft in 1980

“640K [of computer memory] ought to be enough for anybody”

Bill Gates, Founder, Microsoft, 1981

“The concept is interesting and well-formed, but in order to earn better than a ‘C’, the idea must be feasible”

Yale University Professor in Economics on
Fred Smith’s (founder of FEDEX) term paper on next-day parcel delivery

"When the winds of change are blowing some people are building shelters, and others are building wind mills"

Chinese proverb

is there an opportunity for actuaries?

Agenda

1 Predictive modeling & the WORLD

2 Predictive modeling & YOU

3 Case studies

Agenda

- What is Predictive Modeling?
- Why is Predictive Modeling required?

The Insurance CEO agenda is rapidly changing

intensely competitive industry

regulatory “storms”

thin margins

macro-economic growth is slowing down

low interest rates

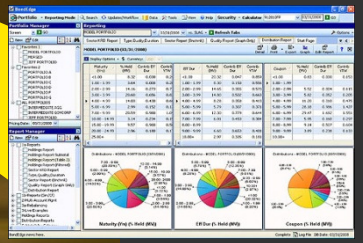
capital markets volatility

limited shelf-space

Some are still looking in the rear-view mirror…

KPIs reports historical

trends performance



… while others "predict the future"

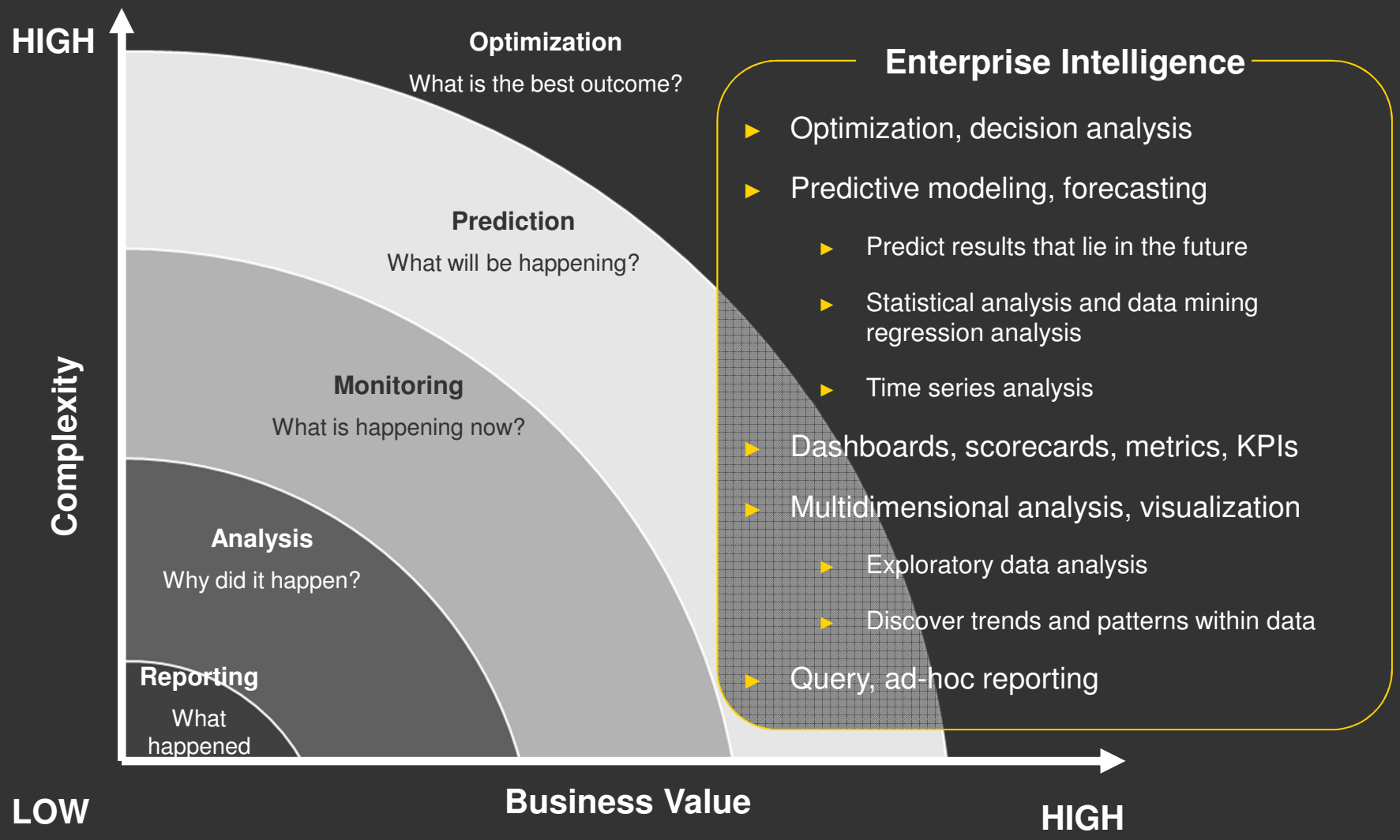
"how to improve growth rate by 10%?"

"should I spend $100 to retain or $150 to let go?"

"Who are my 'good' or 'bad' agents next quarter?"

"do I need to cross sell?"

The evolution of enterprise intelligence



Just a few definitions of predictive modeling

Predictive modeling is a strategy that involves the creation or selection of a model in an attempt to project the possible outcomes associated with a given action.

Source: wisegeek.com

Predictive modeling is the process by which a model is created or chosen to try to best predict the probability of an outcome

Source: Wikipedia

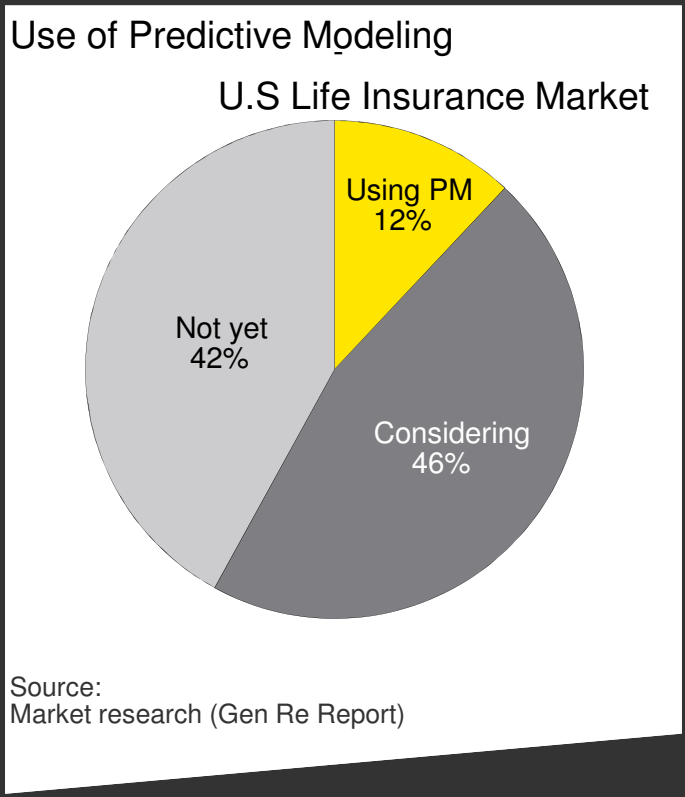
Predictive modeling is a … statistical technique to predict future behavior… a form of data-mining technology that works by analyzing historical and current data and generating a model to help predict future outcomes.

Source: Gartner Group

Predictive modeling *is a … collection of* mathematical techniques *[to find] a mathematical relationship between … "dependent" variable and "independent" variables to .. insert them into the mathematical relationship to predict future values of the target variable.*

Source: SAS Institute

Industry leaders searching for competitive edge



Key Drivers

- Earnings demands
- Management emphasis on profitable growth
- Customer relationship focus
- Pricing pressure
- Technology innovations
- Proven approach

Opportunities to leverage new information and advanced analytic tools

Predictive modeling

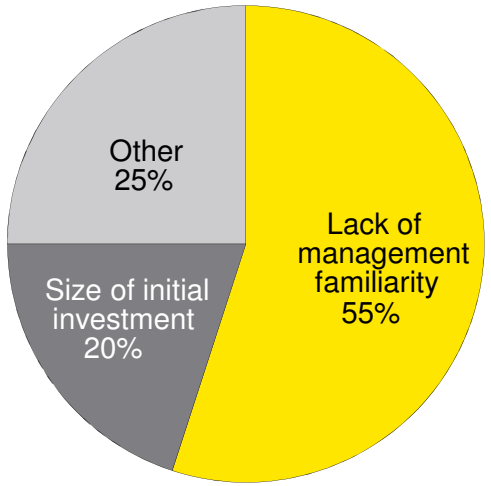
Life insurance is lagging behind

Key Inhibitors

- Product nature (long-term duration, low frequencies)
- Lack of management familiarity
- Size of initial investment
- Limited business understanding
- Enormous data preparation effort
- Lack of skills
- Modeling capability and capacity
- Proof of accuracy
- Implementation challenges

Hesitancy of implementation

U.S Life Insurance Market



Source:
Market research (Gen Re Report)

Agenda

1 Predictive modeling & the WORLD

2 Predictive modeling & YOU

3 Case studies

- Applications
- Myths

EY Predictive Modeling and Advanced Analytics pma^2

The ability to predict future events or behaviors in a statistically sound way

8 applications

- Acquisition
- Growth
- Retention
- Satisfaction
- Loyalty
- Efficiency
- Capacity
- Fraud

employee pricing process
customer
business agent / partner

4 steps

assemble data	build model	visualize results	integrate workflow
internal external social	regression classification machine learning	reporting slice-n-dice dashboards	operating models process library performance metrics

In the executives own words…

The myths of predictive analytics

- **I don't know where to start…** You can start from a compliance angle or from a customer-centric angle – Predictive Analytics is a tool for both.
- **We don't have data…** Nobody does. You will be amazed by how much can be predicted with the data you already have.
- **We do not have the capability…** Locate and leverage existing investments in your conventional data/analytics teams.
- **I do not like big projects…** Don't try to boil the ocean. Start with a concrete problem that needs to be solved. Expand as necessary.
- **I do not have a budget…** Convert predictive analytics into self-funding projects – based on the business case.
- **I don't know what a business case should look like…** The business case must be scenario-based, quantifying the benefits in a statistically-sound way, which is necessary to have a C-level conversation.
- **I don't get statistics…** A little visualization goes a long way…

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3 Case study

Case Study: Know Your Lapses

- Challenged by the slowing growth of premiums in one of the countries in Asia Pacific, the client requested that we investigate the lapse experience for a product with ~25% share in the country portfolio

Goals	Approach	Results Achieved
1. Power of predictive analytics	Long-term vs. short-term lapse behavior	82% accuracy for long-term lapse model
2. Optimize model for best fit	Quantified effect of lapse predictors	Identified 14 key predictors across policy, agency and customer categories
3. Estimate uplift benefits	Quantified uplift from implementing retention strategy	Identified potential for over $10M+ in saved premium income
	Recommended improvements	• Annual auto-pay / age group • Refine agency model • Enhance x-sell/u-sell

Case Study: Know Your Lapses

- For each of the variables respective impact on lapse propensity was computed. Each variable has varying impact on lapse that we expressed as the correlation co-efficient (lapse importance)

Agent Predictors

Variable	Importance
Agent tenure	97.11
Agent Age	29.14
Agent Gender	26.07

- Focused retention campaign for those who purchased a policy with short-tenured agents
- Review agency motivation / compensation structure
- Tailor specific training to weak performance of some agents

Policy Predictors

Variable	Importance
Surrender Charge	85.89
Payment Frequency	66.63
Claim Amount	63.39
Payment Method	44.71
Loan Taken	15.76
Loan Amount	10.88

- Incentivize annual auto payment
- Institute proactive calls for those customers likely to delay payment
- Examine the impact on lapses when increasing or decreasing surrender charge

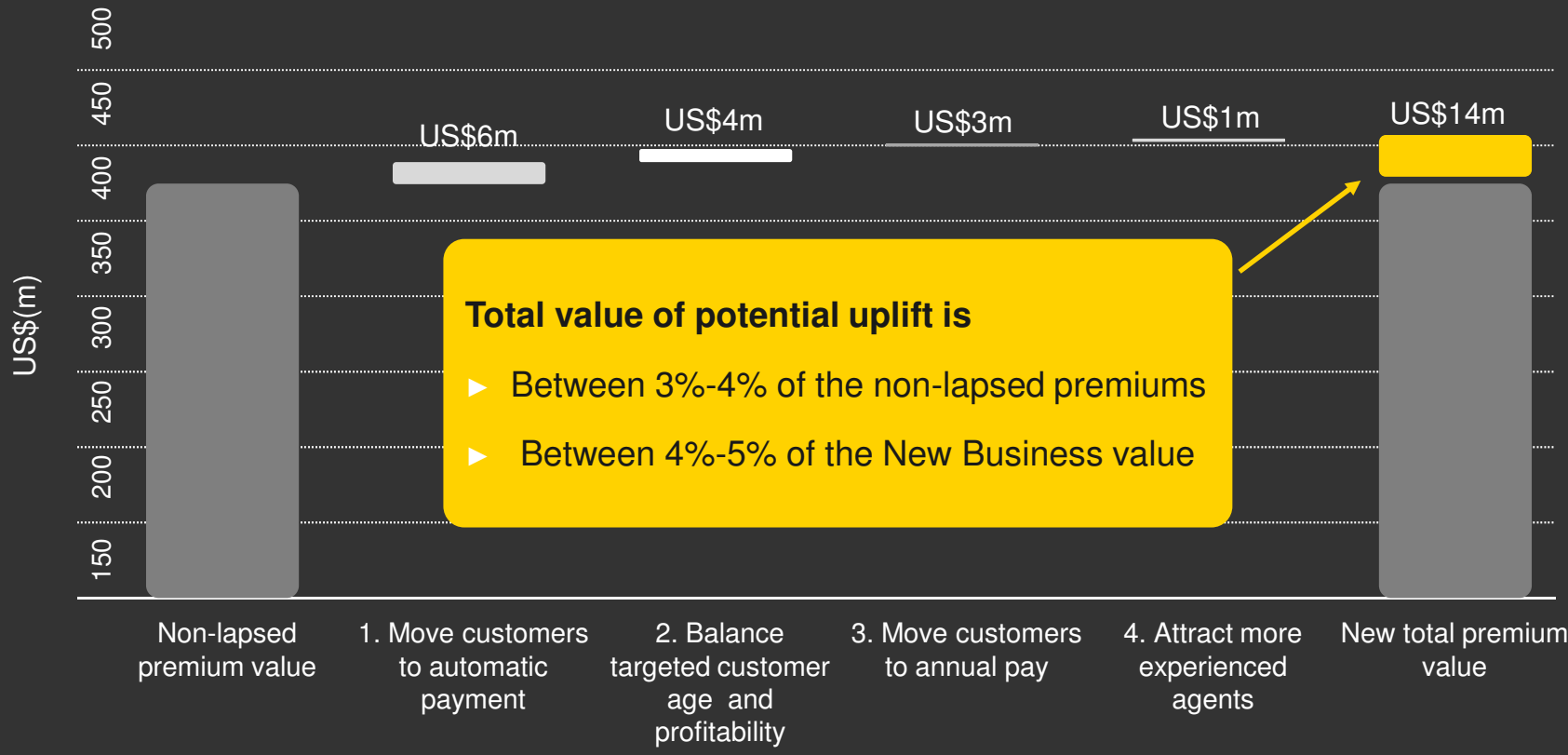
Customer Predictors

Variable	Importance
Policy Owner Age	49.88
Policy Owner tenure	11.51
Call Center Contacts (CC)	10.39
Products Held	9.64
Number of Contacts by CC	8.42

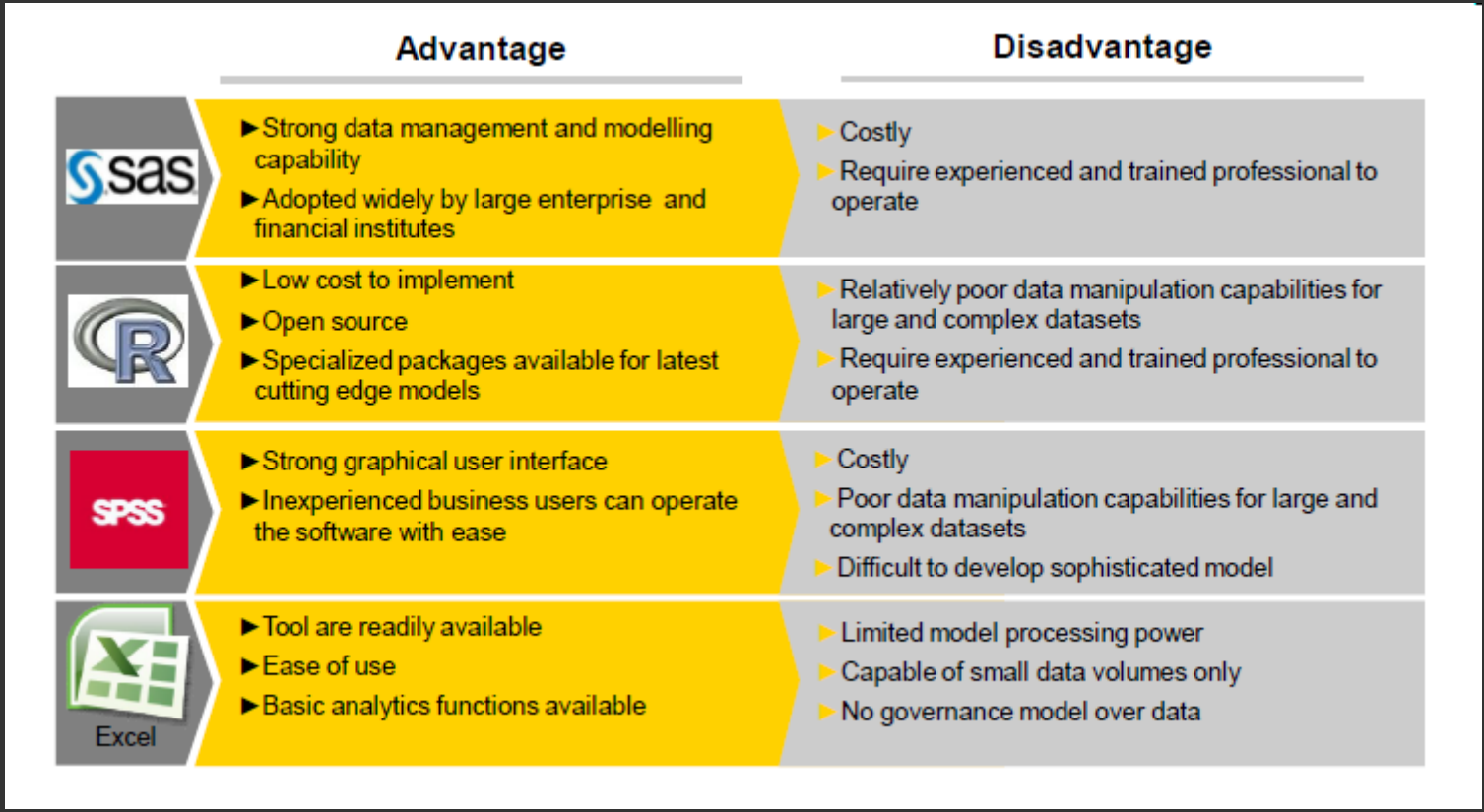
- Focused retention campaign for customers 41+ of age
- Evaluate the quality of the customer experience at every CC touch point
- Revisit feasibility of designing marketing campaigns based on tenure
- Re-focus on up-selling as opposed to cross-selling

Case Study: Know Your Lapses

- Quantified Business Case is based on the conservative estimates for the four selected scenarios with the largest quantifiable impact over a 3-year timeframe



A word on tools



Executive Summary

OR

embrace the change

… or lag behind?

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