

Underwriting Overhaul

OCTOBER 2015



Big Data will improve underwriting?

- Yes
- No
- Maybe

In Retail, Airlines, Banks, Insurance, ... we were working with vast amounts of data and found that Big Data was more of the problem than the answer

Starting with Big Data often became an industry boast of having the largest data sets. The problem was trying to find the "needle" in these enormous haystacks



Other concordant problems we observed at our clients

- IT costs increased disproportionately when they had a Big Data initiative
- Business value was delayed as IT collected "all of the data" (an unending task)
- Frustration built in management and in the ranks, as the organization was overwhelmed by data

The solution was knowing which end of the stick to grab

The key to making better commercial decisions is working backwards from the desired impact to determine the necessary data and analytical tools



What are the impacts that I am looking to make?

What decisions have the potential to lead to those impacts?

What insights do those decisions require?

And finally, what data (and Tools) are required to drive those insights?

But even with the right perspective, organizations will need to solve the 7 common technological and organizational problems before unlocking the potential for better underwriting

1

Information is locked away in
DATA DUNGEONS



2

IT and the business have
CLASHES OF PRIORITIES



3

There's disagreement about
WHAT IS POSSIBLE



4

Big data rhetoric is fueling
EXISTENTIAL FEARS



5

Projects have immensely long
TIME HORIZONS



6

Too much is done based on
GUT INSTINCT



7

There are deep problems of
GOVERNANCE



Performance indicators of organizations where the answer is Yes to Big data improving Underwriting

They can...

- Solve the intractable problem of joining business with technology
- Operate at new clock speeds: months should become weeks
- Work in an iterative fashion, incrementally improving in each cycle
- Achieve complete buy-in from the underwriters
- Create measurable and significant business improvements

The capabilities you will need to be able to say Yes



Customized decision support tools & reporting

End user tools developed in an agile framework; web- and mobile-enabled platforms for interactive decision support



Advanced analytics engines

Analytical engines and a range of tools and techniques, from regression to machine learning to text mining...



High-performance computing

A private computing cloud spread across multiple datacenters, with security and authentication certifications



Data Ingestion & Integration

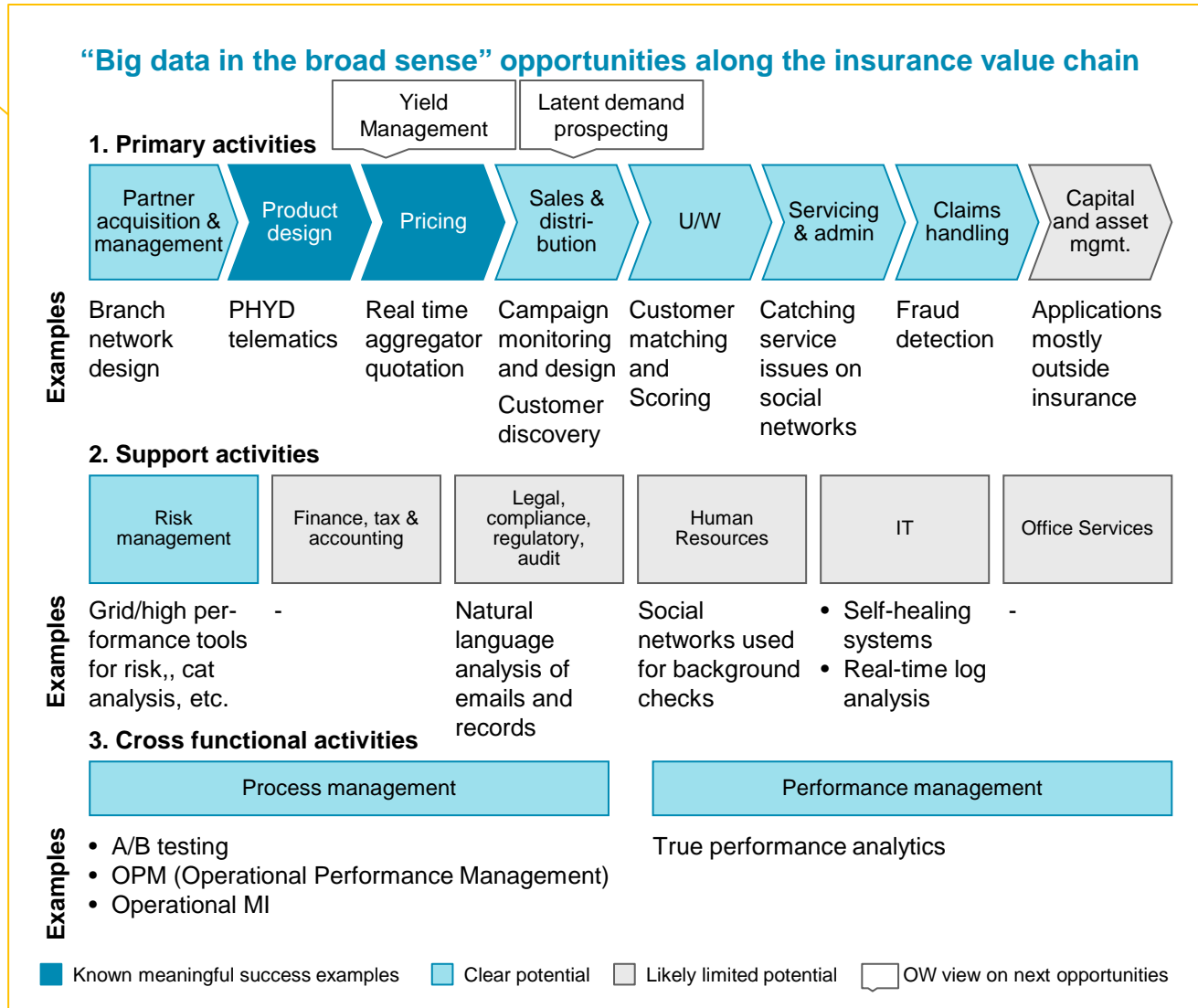
Ability to unify data from internal and third party sources to construct a decision data layer

Insurance: our ideas of where the opportunities lie

Digitalization in insurance – strategic digitalization: digital value chain

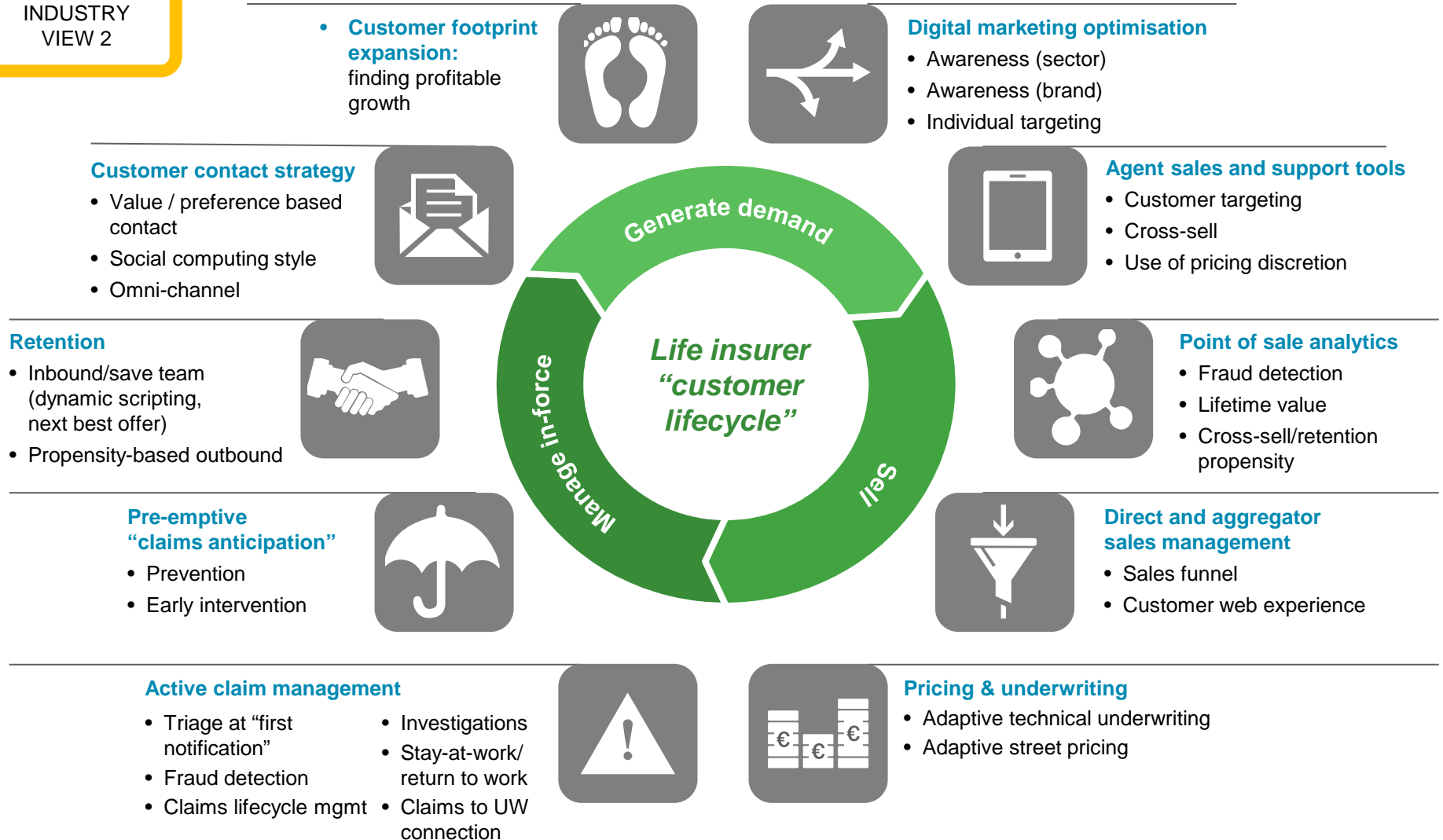
Areas of early successes across the industry

INDUSTRY
VIEW 1



Across the lifecycle, insurers are beginning to make better decisions which are lowering risks, improving margins, increasing customer retention and reducing fraud

INDUSTRY
VIEW 2

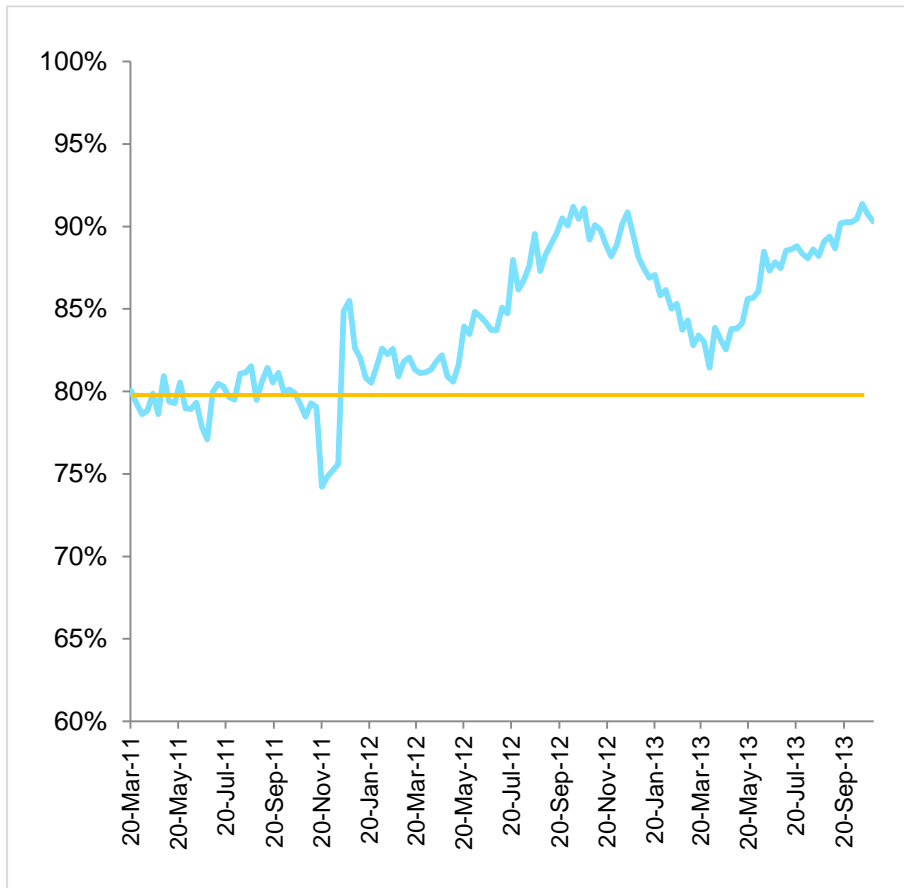


Our clients deal with the following, common challenges

- **Pace of change in the industry is increasing driven by:**
 - Increased Internet price transparency for consumers
 - Changing technology causing adverse risk selections (e.g. telematics)
 - Competitors actively seeking out new proprietary data sources and seeking to “outmix” you
- **Ability to leverage data / analytics fully is tough because of:**
 - Legacy systems which don’t talk to each other (x-product; x-function)
 - IT departments not well set up for fast response and agile analytics
 - Cycle times sometimes geared to actuarial perfection vs commercial pragmatism
- **Insurance organizations are not set up for clarity and agility:**
 - Technical pricing often a “black box” to the rest of the business
 - KPIs are not always helping drive clarity across the organization for performance
 - Talent challenge on the above skills vs new economy players

Pace of change: We are finding in European markets a competitive 'treadmill' of 4% pts of loss ratio per year

New Business scored loss ratio over time
Disguised client example, cycle adjusted



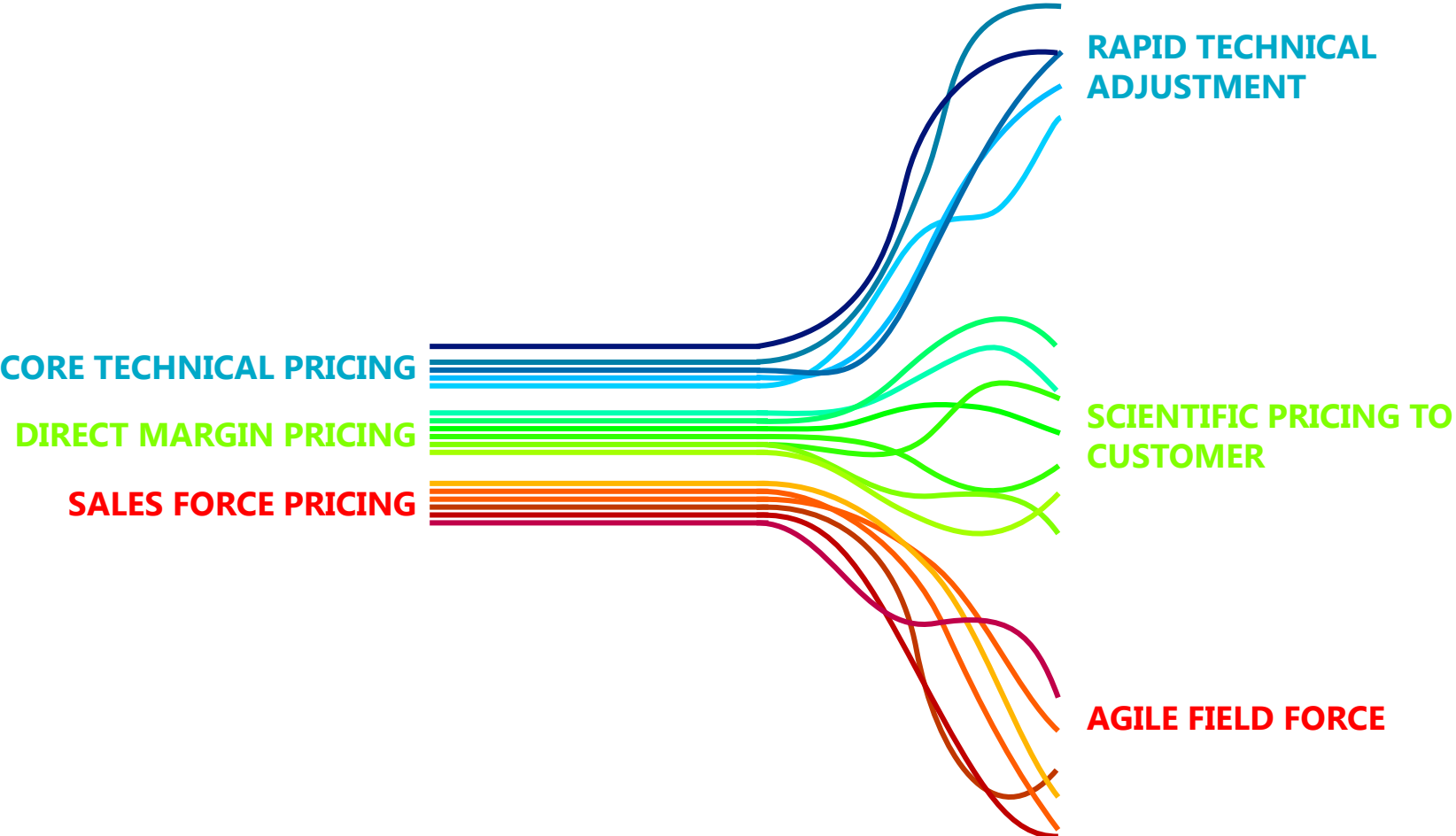
Business thought it was writing policies at this level of LR

In fact when it rescored the business, it found it had been facing a 4% pts competitive headwind per year



To help our insurance clients win in this new world, we are helping them become more dynamic in three main areas of their business

STATIC → **DYNAMIC**



What do we mean in each area?

DYNAMIC



**RAPID TECHNICAL
ADJUSTMENT**

Technical models **always lag reality:** adjust where recent trends show the past is no longer predicting the future

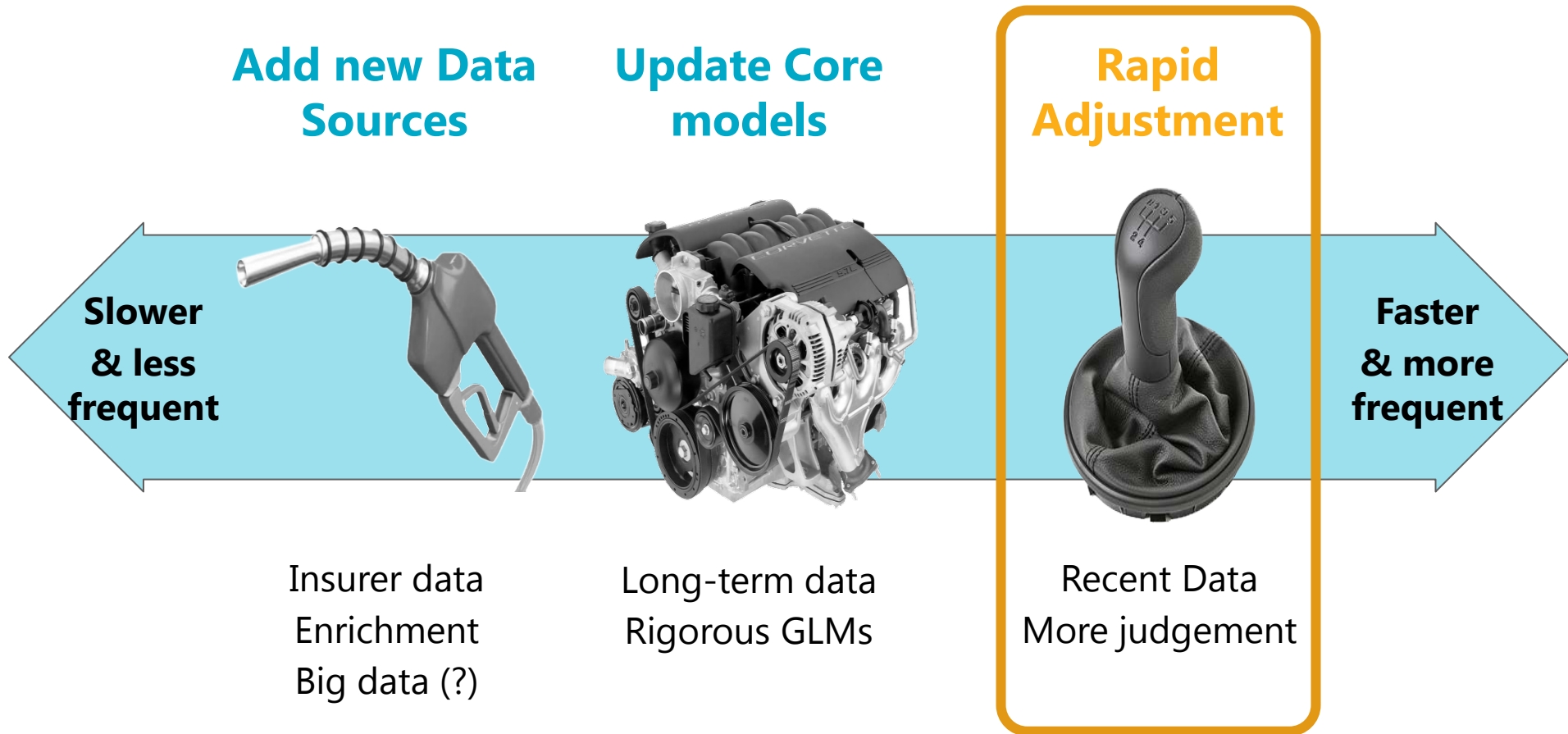
**SCIENTIFIC PRICING
TO CUSTOMER**

Understand the **decisions the customer actually makes:** competitor positioning, customer switching,...

AGILE FIELD FORCE

Empower and enable **rapid decision making** by the field

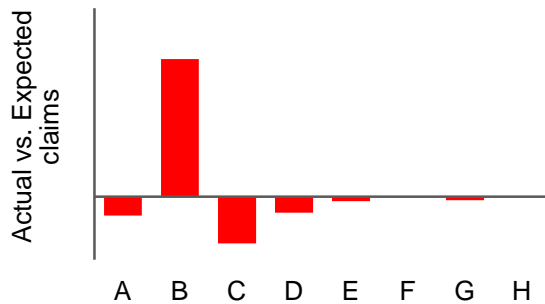
Making rapid adjustments to models is distinct and different from full technical model updates



The last few months' data is the **"canary in the mine"**

In one personal lines client, we have deployed analytics to identify where technical models are no longer good predictors of the future

Calculate deviations in actual and expected claims



Rating factor (e.g. age)

- Across rating factors
- Adjust for seasonality

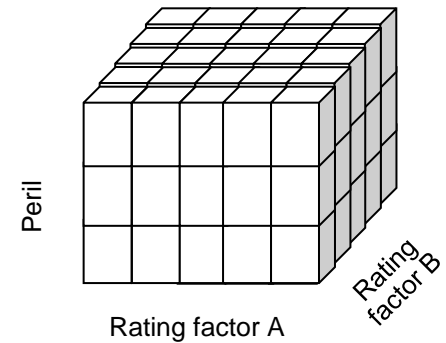
Statistical test identifies issues

$$\frac{\partial}{\partial a} \ln f_{a, \sigma^2}(\xi_1) = \frac{(\xi_1 - a)}{\sigma^2} f_{a, \sigma^2}(\xi_1) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left\{-\frac{(\xi_1 - a)^2}{2\sigma^2}\right\} \frac{(\xi_1 - a)}{\sigma^2}$$

$$\int \mathcal{T}(x) \cdot \frac{\partial}{\partial \theta} f(x, \theta) dx = M\left(\mathcal{T}(\xi) \frac{\partial}{\partial \theta} \ln f(\xi, \theta)\right) = \int \mathcal{T}(x) \frac{\partial}{\partial \theta} f(x, \theta) dx$$

- Allow for development
- Filter out small cells

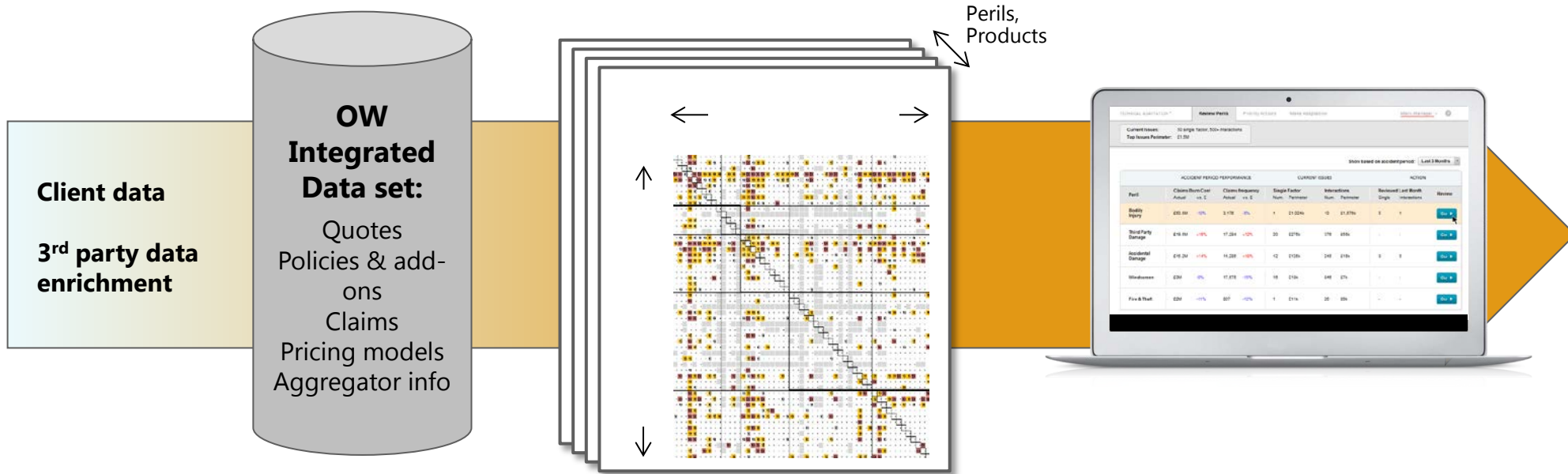
Massively automate



- Test every peril, rating factor, interaction
- High significance threshold

Our approach leverages huge automation of claims and risk data, enriched with 3rd party information

Illustrative of our capabilities:



Integrated data

Uploaded in a matter of days to OW secure environment

Massively automated analytics

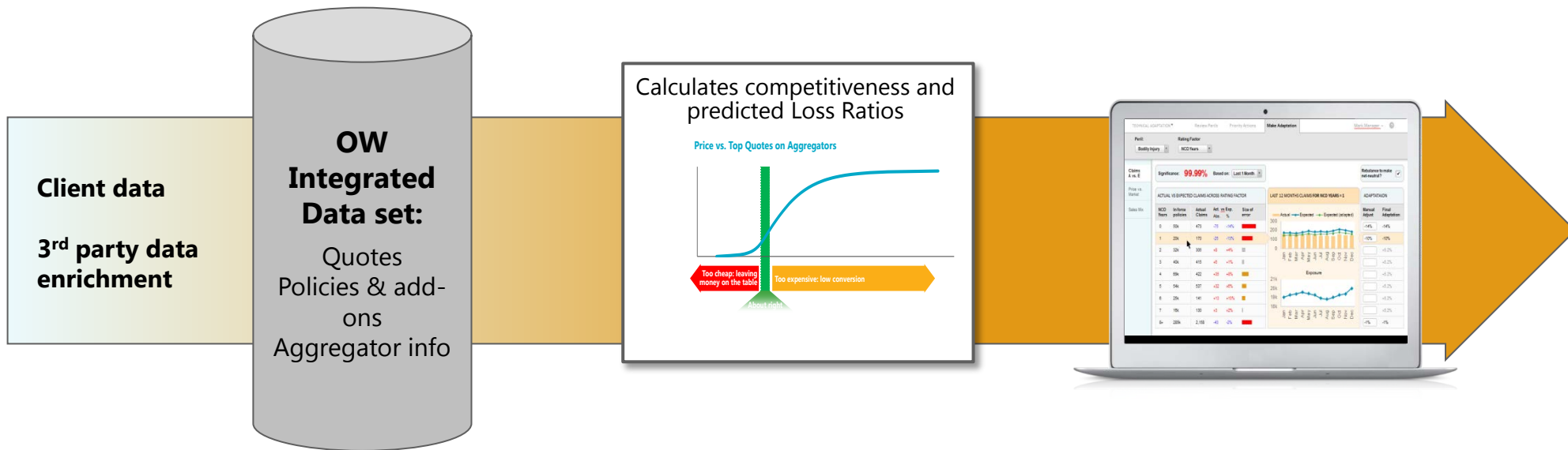
~50 of recommendations based on ~10,000 risk factor combinations from 1,000,000+ derived data points based on 250,000,000+ individual quotes

Decision Support Tools

Web tools designed with the users, for the users

First wave of improvements: 2% COR Impact

We use a similar analytic and reporting process to drive better decisions on price to customer



Integrated data

Uploaded in a matter of days to OW secure environment

Massively automated analytics

Assesses price competitiveness by all quotes (whether successful or not) and aggregates up by street pricing factor

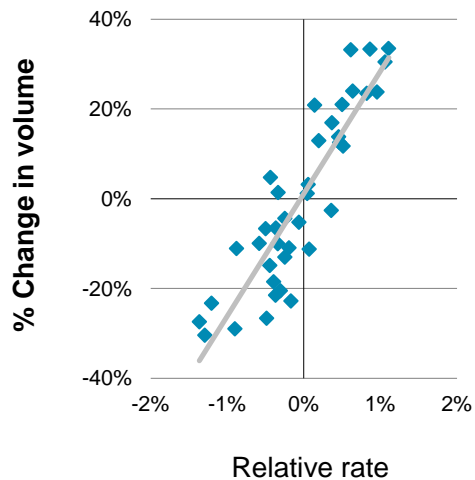
Decision Support Tools

Output is a report detailing volume and margin opportunities

In the past, we've helped insurers use different price elasticities by customer to improve performance

Example: Annuities pricing

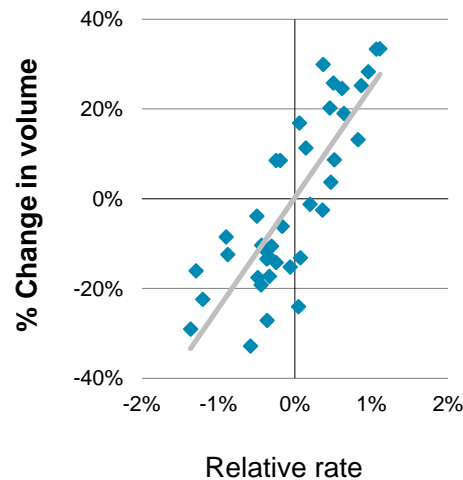
Direct business



Elasticity of 27.3

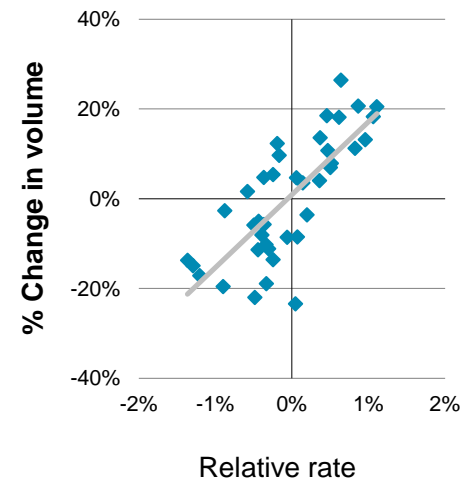
All things being equal price more competitively

Larger financial advisors



Elasticity of 24.8

Small Financial advisors



Elasticity of 16.3

All things being equal price less competitively



Now, with prices more transparent, competitiveness of price to customer is the most critical metric to track

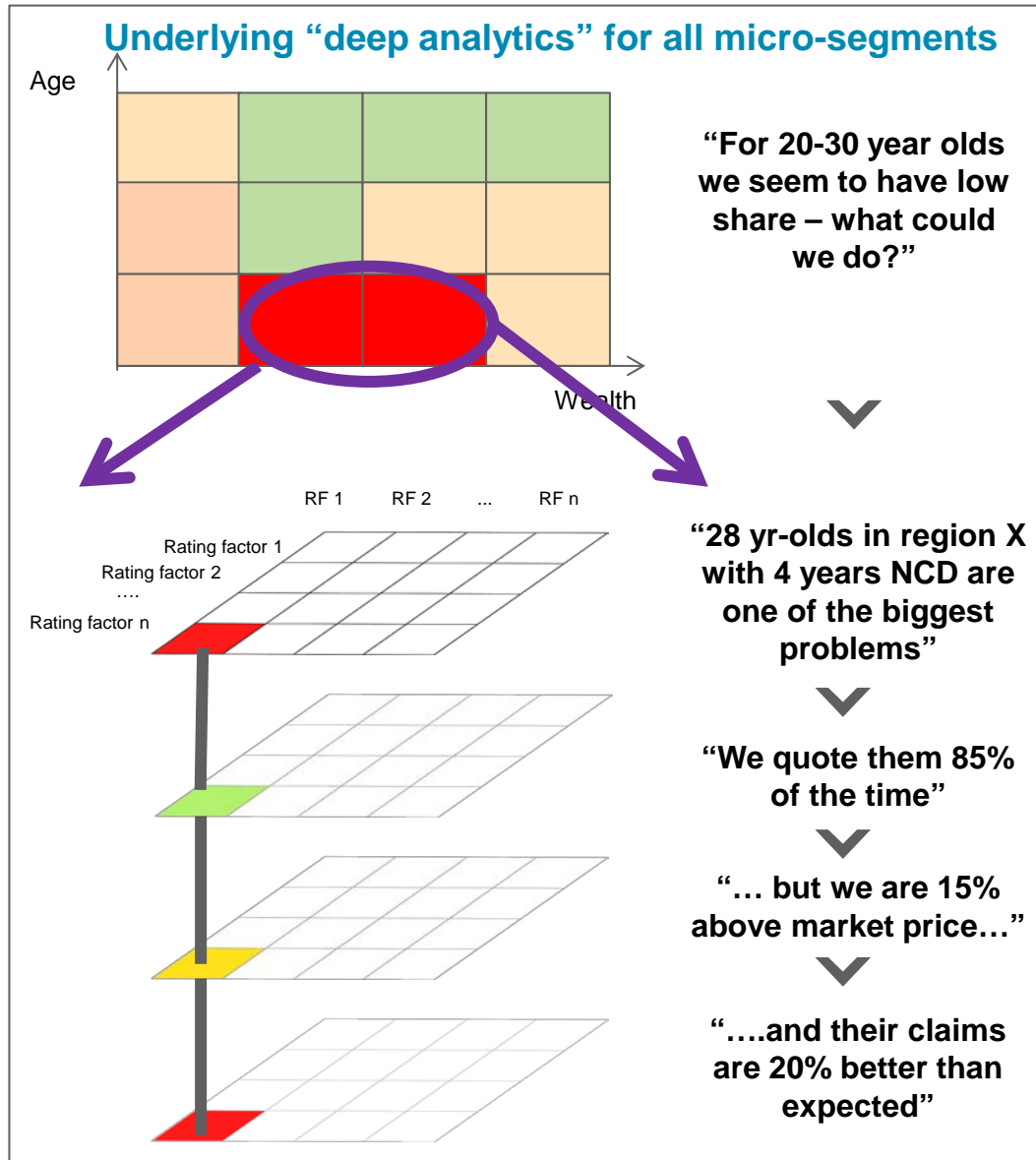
Price vs market price ¹	Percentage of quotes	Percentage of policies
>15% below market	7%	35%
0-15% below market	7%	45%
0-20% above market	15%	15%
>20% above market	70%	<5%

Implications

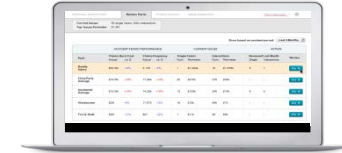
- Money being left on the table when you are “too” cheap
- Significant volume missed in the market where you are very uncompetitive
- Also read across to the technical price – when you are very cheap, often you are very wrong in your estimations of risk

1. Defined as average of top 5 brands quoting for this customers' policy online

Bringing it all together...



Intuitive reports supporting real life decisions



What are the largest 20 micro-cells where XXX’s technical claim prediction is most wrong?

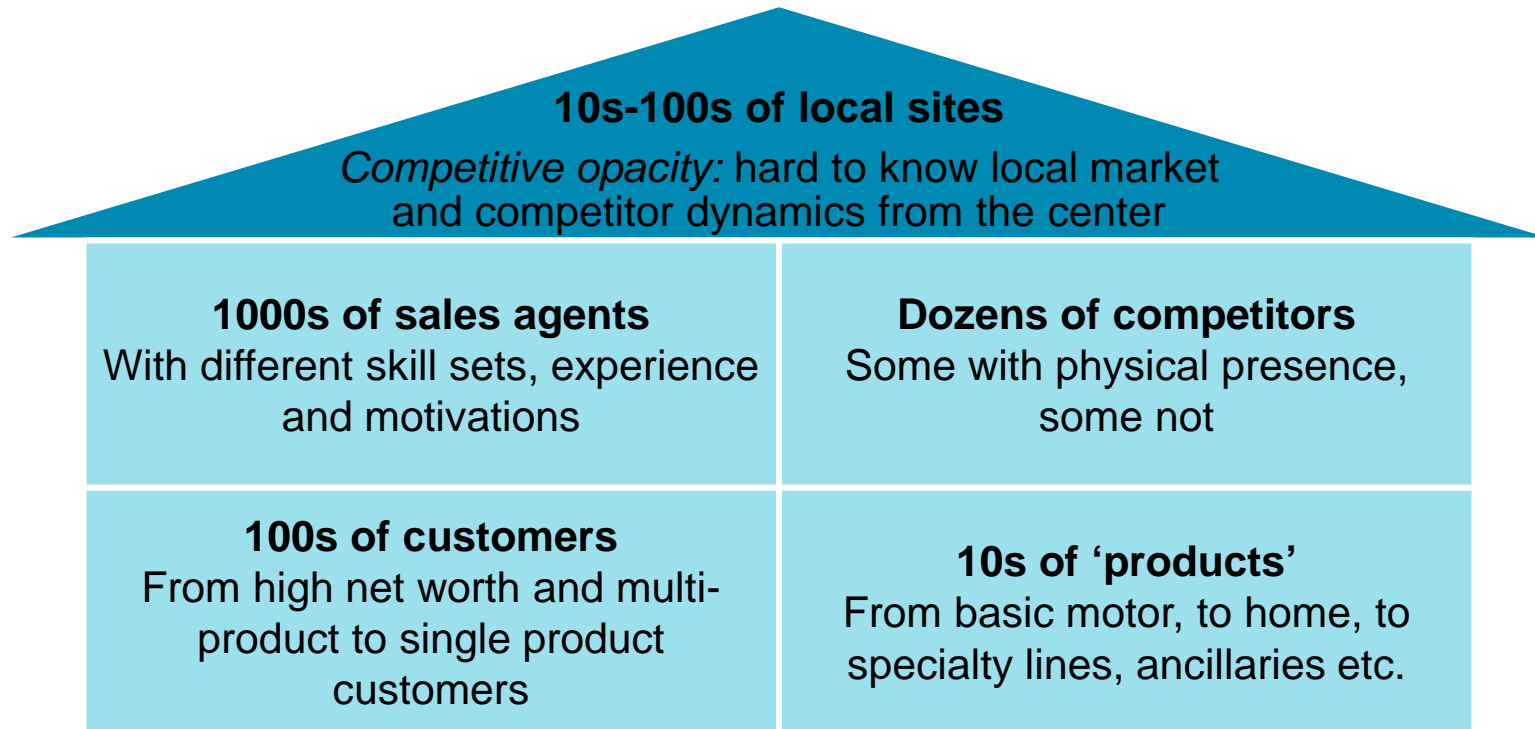
Where are the top 20 micro-cells where XXX are “not competitive enough”?

What are the top 20 cells where XXX are wrong on technical cost but “nearly competitive”?

What are the top 20 cells where XXX needs to act to make money?

- Stop
- Re-price
- Grow

Managing insurance field sales force sales and pricing decisions adds further complexity



These characteristics make the field **especially hard to manage well**, creating challenges on both the operational and commercial sides of the business

Opportunities lie in making **hundreds of commercial decisions a little bit better**, adding up to a substantial overall upside

Our Labs capability has developed *intuitive* webtools which bring smart pricing science to the field...

Example field sales force pricing tool: (Non insurance)

The screenshot shows a pricing tool interface for Acetone (193941) for customer TESORO NW COMPANY (100594). The interface includes a search bar, a product selector, and a 'Go' button. A central panel displays a 'Deal Score' of 50 and a 'Target Price' of \$1,180. A 'Price' slider is set to 1,180. A 'Market' section shows a price history graph and a text box indicating a '\$0.09/# reduction from last month. Expect falling Propylene cost to carry Acetone down through April (7.5 - 10.0)%'. A 'Price History' graph shows price evolution over time. A 'Competitors' table shows market averages for 1, 3, and 12 months. A 'Next' button is visible at the bottom right.

Score to show linkage to sales team bonus

Users can send insights directly to SalesForce.com

Shows how market price has evolved for the product over time

Simple slider bar to allow sales team to alter discounts

Smart price recommendations using margin, and elasticity

How would your underwriting life change in a world where the answer to Big Data is Yes?