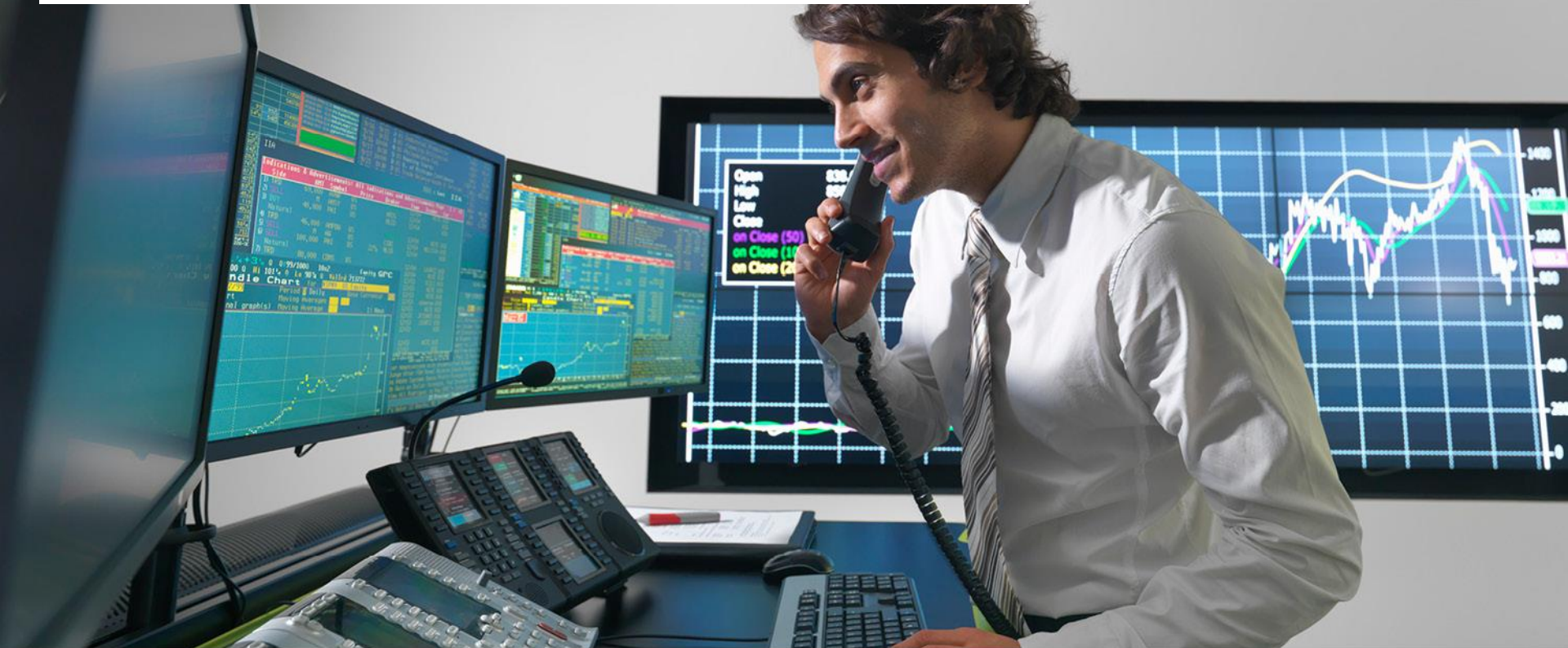


CAS 2019 Spring Meeting

Actuarial Innovation

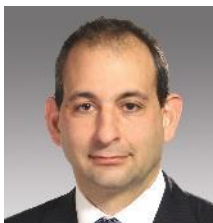
Serhat Guven, FCAS, MAAA
Willis Tower Watson

May 2019



CAS 2019 Spring Meeting

Actuarial Innovation



Serhat Guven, FCAS MAAA

America's Leader for Willis Towers Watson's Insurance Consulting and Technology group



Willis Towers Watson

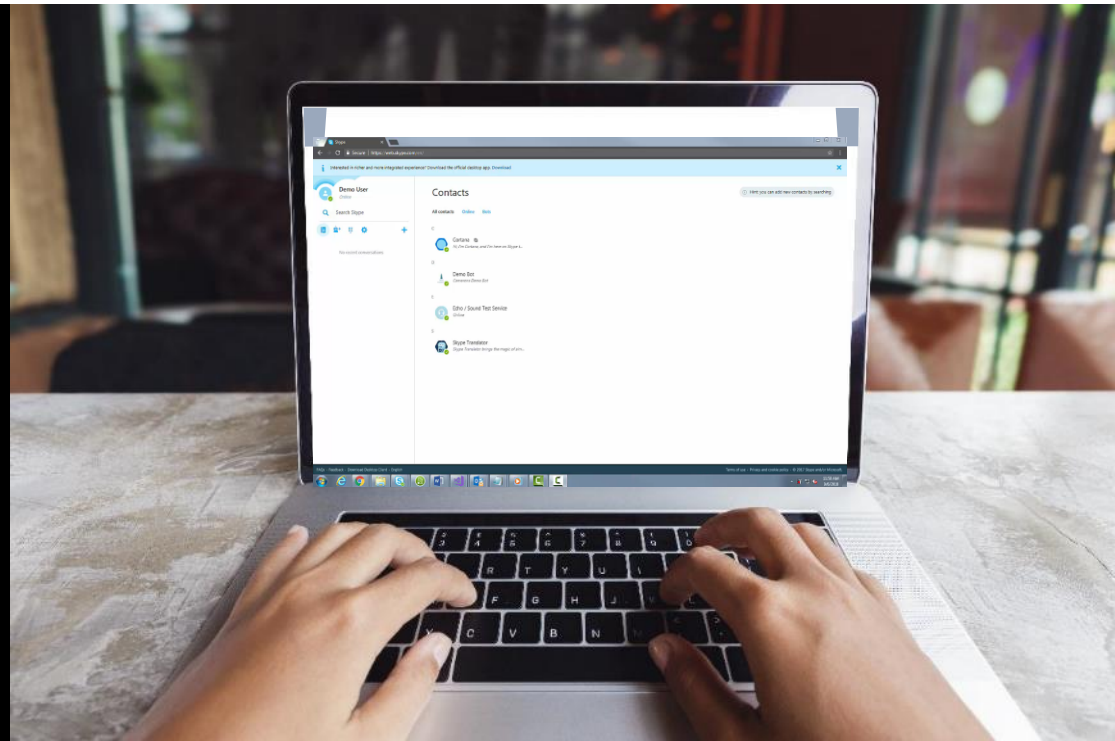
The partner of choice for innovation and transformation in the insurance industry.

We offer a powerful combination of advisory services for insurance companies, integrated with technology solutions and market-leading software that is underpinned by unparalleled analytical capabilities.

Driving Innovation

It is all about the consumer...

AMAZON AND GOOGLE
HAVE CHANGED
CONSUMER
EXPECTATIONS



Technology, Sophistication, and Automation

Insurance industry themes and market trends

- Insurtech and technology investments:
 - Improve interconnectivity of systems
 - Shift towards digital platforms to improve business processes
 - Increases consumer engagement and satisfaction
 - Makes it possible to gather more data than ever
- Advanced analytics unlocks the value from technology investments:
 - Prioritizing back room operations
 - Streamlining the underwriting process
 - Understanding policyholder behavior
 - Targeting distribution and prospects
 - Designing products that maximize cross sell
 - Claims triaging and optimization
- Operational effectiveness connects solutions
 - Speed to market
 - Workflow automation and expense reduction
 - Process improvements through connectivity



Example applications

- Vehicles – UBI, proactive maintenance
- Home – energy monitoring, security/fire/flood alarms, metrics collection
- Person – fitness management, smartphone services
- Container tracking, livestock monitoring
- Industrial process monitoring

Solutions needs to support strategy

Customer experience – growth - innovation

- Internal and external solutions have to align with core strategy

Customer Experience

- Technology provides more data about the customer to develop individual solutions that maximize engagement
- Individual solutions use analytics that are less transparent
- Key solutions in aligning customer strategy with technology solutions: single customer views, underwriting, pricing, and claims

Growth

- Successful expansion into new regions and classes through a test and learn strategy
- Need to exercise caution especially with uncertainty in regulation or newer class
- Key solutions to grow prudently: broader market knowledge and experience

Innovation

- Impact and integration with all infrastructure – both legacy and modern
- Effectiveness requires deployment with accuracy and speed in a real time framework
- Key solutions to improve decision making: Efficiently connecting analytics to systems to deliver underwriting workbenches and real time decision engines

Innovation driving analytics and customer engagement

Artificial intelligence – sounds exciting!!

- McKinsey: Tech giants invest \$30Bn in AI R&D in 2016
- Accenture: Financial Services companies investing in AI could boost revenue by 32% within 5 years
- Multiple disruptive opportunities in insurance:
 - Enhanced understanding of customer and risk
 - Automation of First Notice of Loss processing
 - Tailored robo-advise
 - Underwriting automation
 - Fraud detection

Google

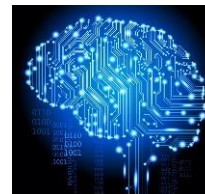
The last 10 years have been about building a world that is mobile-first ... but in the next 10 years, we will shift to a world that is AI-first, a world where computing becomes universally available — be it at home, at work, in the car, or on the go.

Sundar Pichai, CEO Google

Microsoft

Our strategy is to build best-in-class platforms and productivity services for an intelligent cloud and an intelligent edge infused with artificial intelligence (“AI”)

Microsoft’s vision statement (2017 10-K Filing)

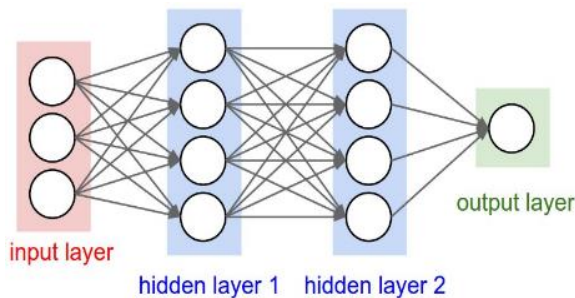


- **Deep Learning**
- **Multi-Agent Systems**
- **Automated Planning and Scheduling**

Innovation driving analytics and customer engagement

Artificial intelligence – what is it...really

- Large scale neural network (often millions of nodes and many layers)
- Recursion and non-linearity
- Many network architectures supporting a diversity of applications
- Single learning operation replaces feature extraction and modelling



Convolutional Neural Networks

- Optimized for image analysis
- Network learns at multiple levels of abstraction (e.g. edge, wheel, car)
- Advanced systems have exceeded human-level image classification ability

Vehicle claim severity validation & estimation



Image analysis supporting medical diagnosis



Recurrent Neural Networks

- Optimized for classification and prediction of time series, natural language text & speech synthesis
- Advanced systems have exceeded human levels of reading comprehension

*Sentiment analysis
Machine translation
Image captioning*

*Comprehension
Claim triage*



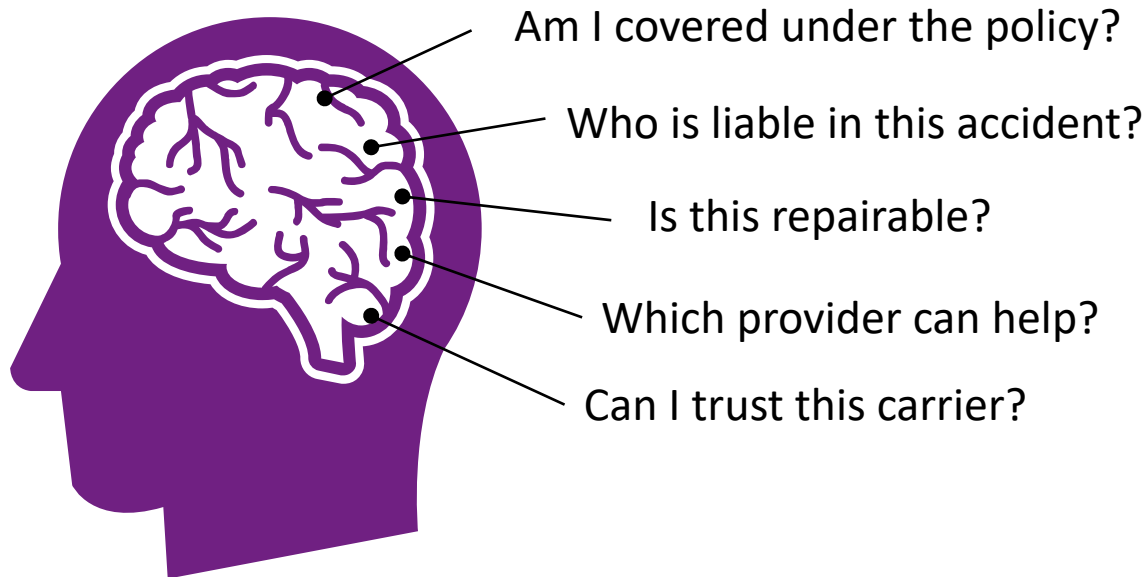
“A woman is throwing a Frisbee in a park”

Claim notes: Mild arthritic change in the right L0-S0 facet joint with minimal bulging of the annulus. No focal herniation. Otherwise, unremarkable MR scan.

What does the customer want

Keep it simple...

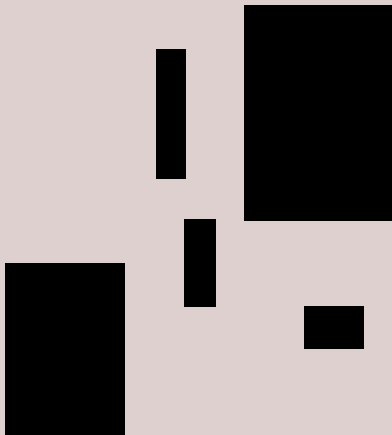
- Insurance is contractual protection that requires complex decision making and judgement



Innovations should make the insurance transaction easier/ faster/ better for the customer!

Case Study

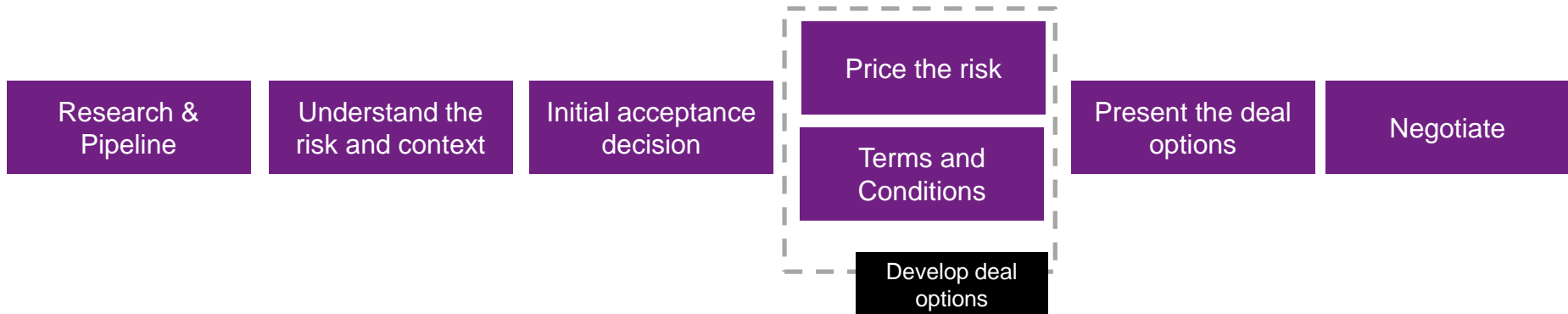
Innovations in the Underwriting Process



Core business functions and workflows

Innovations through key processes in core operational areas

An underwriting process



Getting to the Future State

Four Major Areas of Development



**Data Strategy
& Delivery**



**Analytics &
Prediction**



**Business
Decision &
Reporting**



Deployment

Data Strategy and Delivery

Expand Data Capture to Enhance Underwriting



Portfolio Planning

- Competitive analysis
- Understand the universe of risks
- Growth strategies
- Target marketing
- “As-if” scenarios

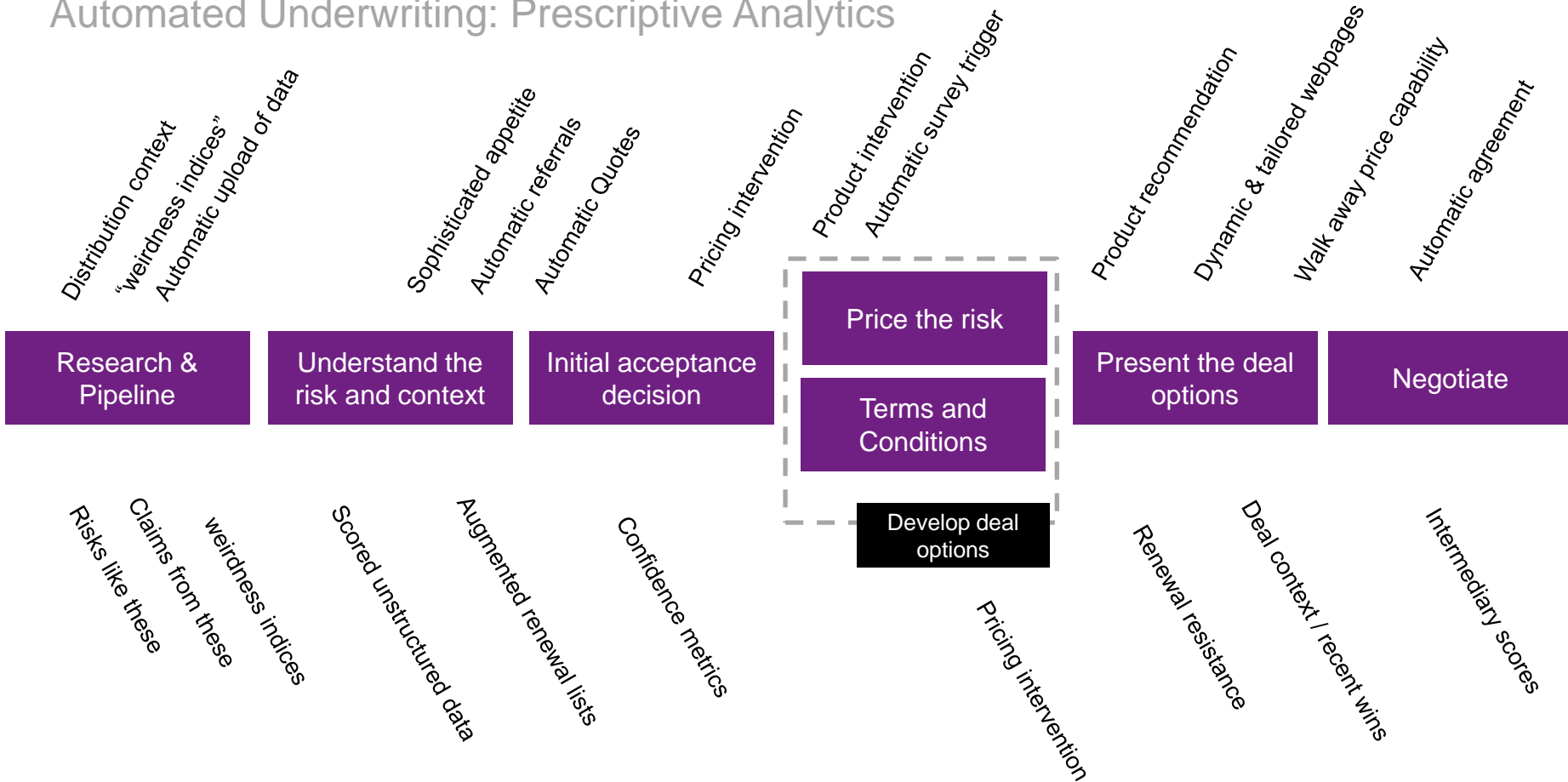
New Opportunities

- E&S
- Other products

Deploying Analytics to Support the Business

Analytic applications across the Underwriting process

Automated Underwriting: Prescriptive Analytics

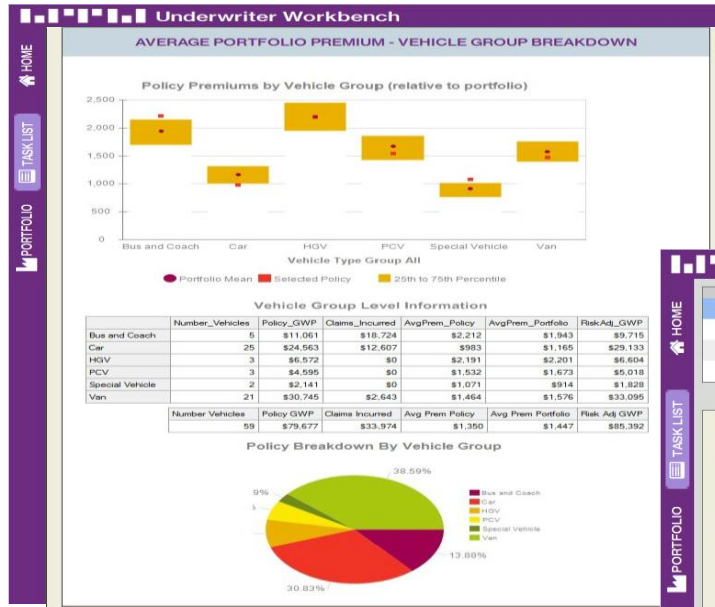


Underwritten Cases: Descriptive and Predictive Analytics

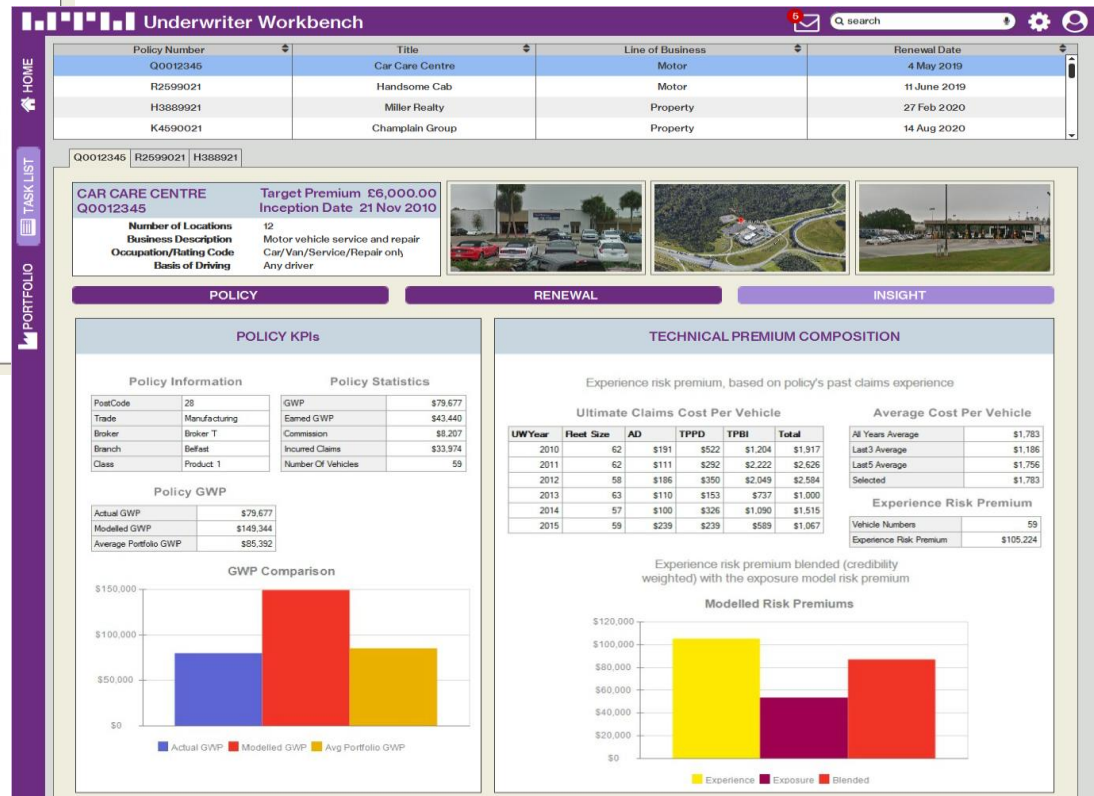
Modern well integrated environment

Provide information to the underwriter to support decisions

- Technology & Data in action
- An analytically driven workbench



- Screens for executing work
- Screens presenting insight
- Context sensitivity



Effective innovation requires seamless integration

Agile design and deployment -

The screenshot displays the Faultless Insurance website interface. At the top, there is a navigation bar with 'Home' and 'Get a Quote' links. The main content area features a large heading 'Car insurance tailored to fit you' with four bullet points detailing services like 24/7 emergency helpline, enhanced vandalism cover, multi-car discounts, and guaranteed repairs. To the right of this text is an illustration of a green car. Below the main content, there are three distinct sections: 'What our customers say about us' with three testimonials, 'Do you have a pet?' with information about pet insurance, and a promotional box offering '10% off other products you buy'. At the bottom right, there are two award logos: 'Insurance Excellence Award' and 'Exemplary Customer Service Award'.

Benefits of Effective Innovation

It is not just change for the sake of change

Sophistication

- Enhanced profitability from **sophisticated** decision support and approaches
- Can make **wider use of data** sources

Speed to market

- Increased **agility** of pricing and portfolio management
- From MI to decision to execution within a day (or hour)

Operational efficiency

- Significant **cost reduction** through effective, rapid and accurate delivery of rates from conception to production all in **environment**

Accuracy

- Integrated workflow - audit and security for **governance**
- Significantly reduces risk of errors

Conclusion: Revolution requires change

It is a lot more than buying shiny things

- Controlled, restricted
- Theoretical correctness
- Long review cycle and MI
- Predict and measure
- Monthly/weekly change slots
- Reliant on IT support
- Manual processes
- Empowered, encouraged
- Commercial focus
- Rapid review cycle and MI
- Test and learn
- Intra-day changes
- Direct systems access
- Increased automation



Traditional

Future

Thank you

