Transforming insurance with AI

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Regional AI-Analytics Centre
Asia-Pacific, Middle East and Africa
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Agenda

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1. Future vision: digital and AI roadmap
2. Transforming the customer experience with AI
3. Benefits to insurers from AI
4. Actuarial support

"It's no longer good enough for underwriting decisions to be rule-based."

Forrester Wave Q4 2019

"We've likely seen the last "reflexive" systems… the industry now expects "intelligent" systems"

NMG Report 2019

"85% of big data projects fail due to integration difficulties and management resistance…"

Gartner 2019

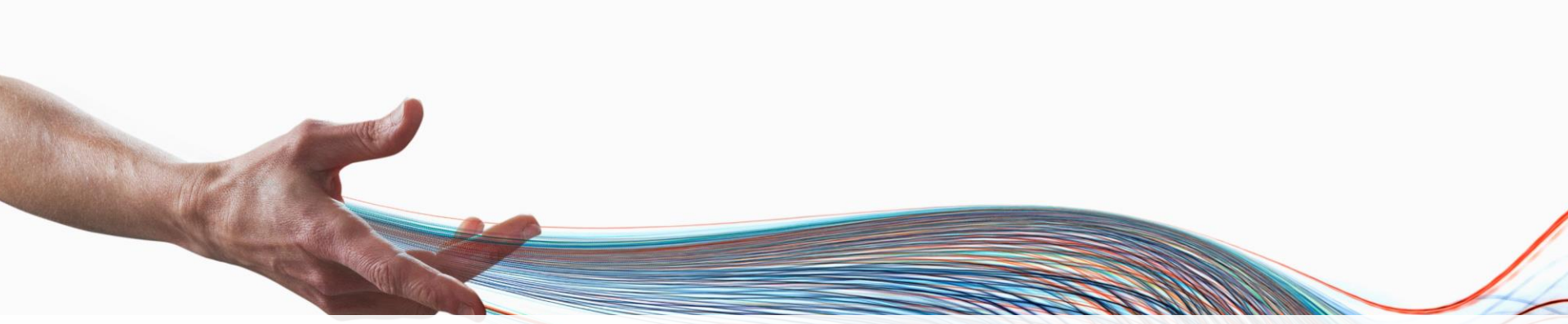
- ✓ 90% said: "actively investing in new data projects"
- ✓ 89% said: "new tech will transform firm long term"
- ✓ 50% said: "ML & AI having a noticeable impact on daily roles"

Insurance NEXIS 2020
Interviews 300 insurance execs

Insurance creates **€100B** businesses that live for **200-300 years**

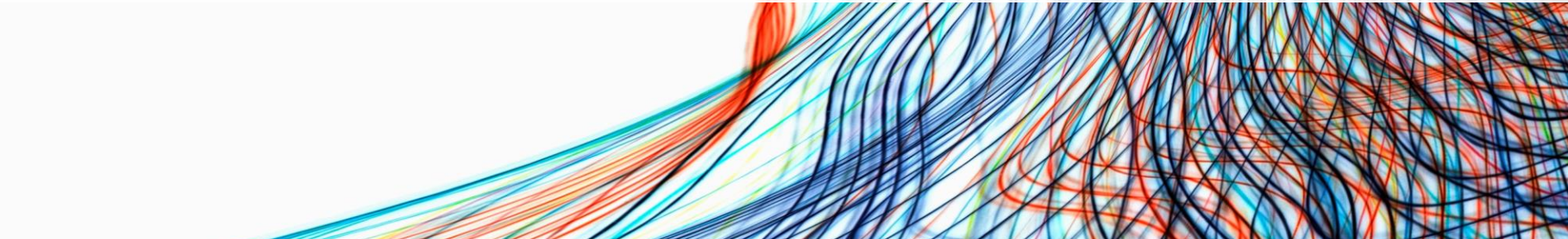
But the next insurance leaders will use **Bots, not Brokers,** and **AI, not Actuaries**

Lemonade CEO Daniel Schreiber



1 Future vision:

AI, digital and data-driven product innovation



Vision of the future

Enabled by data, AI, tech stack, domain experts, risk acceptance

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Data ecosystem

Auto-UW
(Application data)

Behavioural data
(from web application)

Back-office data
(e.g. final UW decisions, claims)

Customer photos, voice, video

External data

Merged and cleansed data

Analytics solutions

Insights, AI models, dashboards

Risk of implementing AI quantified & minimised

Analytics model ecosystem

Propensity to buy model
Understand customer needs and predicts propensity to buy. Incorporates external data

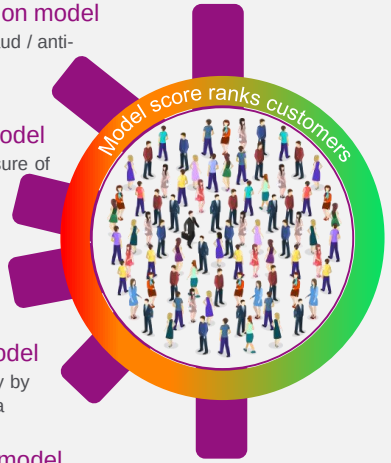
Fraud / anti-selection model
Predicts likelihood of fraud / anti-selection during UW

Misrepresentation model
E.g. predicts under-disclosure of BMI from photos

UW decision model
Increases STP, reduces medical evidence, etc.

Pricing predictive model
Increases pricing accuracy by incorporating external data

3rd party data UW model
Pre-approves customers for simplified UW offers using external data. Assesses the value of external data for replacing traditional UW without increasing risk



Claims decision model
Predicts final claims decisions, e.g. medical evaluation, payment decisions, fraud, etc.

Deployment

AI models called via cloud microservice

Deployed to insurers at:

Pre-PoS | PoS | Post sale

Insurers & partners

Customers & distributors

Augmenting underwriting with AI

Vision of the future: hybrid of AI, rules, human assessment

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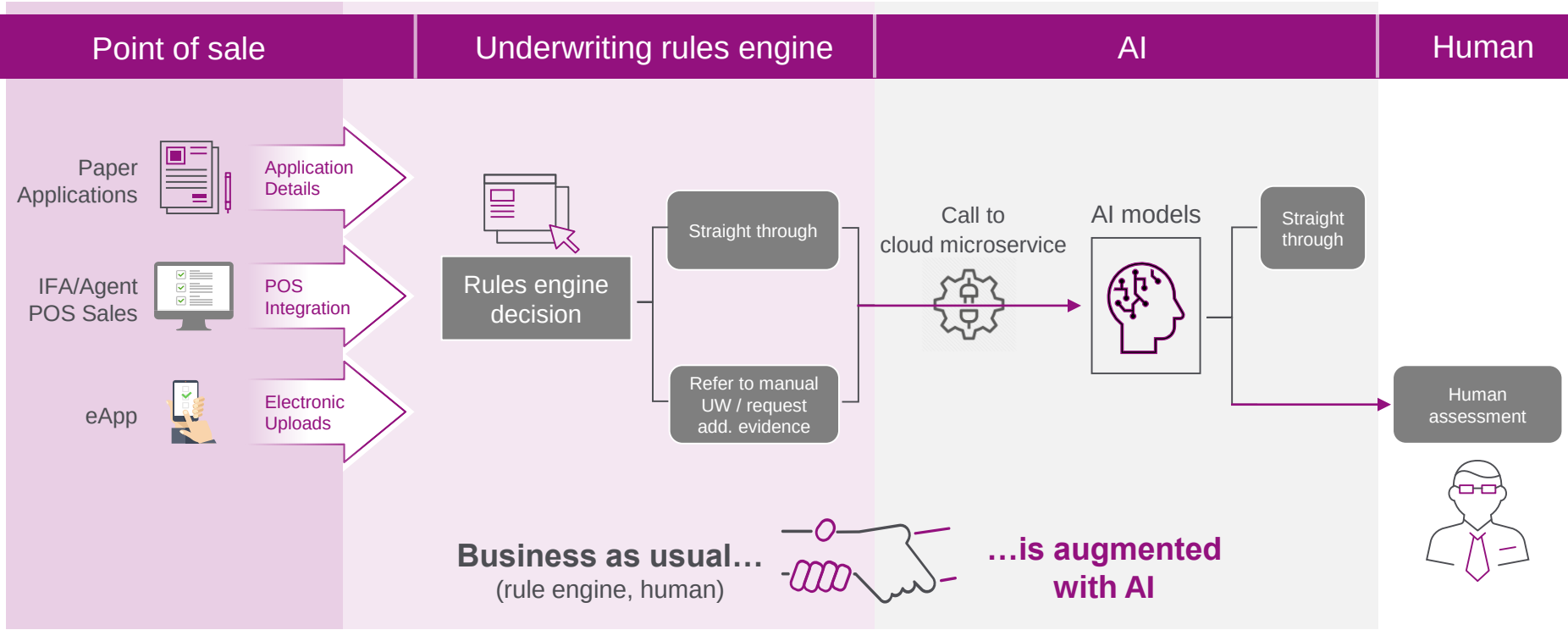

Digital & analytics roadmap

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Outcomes	Paper → digital	STP initiation	65%+ STA ▼ TATs ▲ Sales	Integrated analytics Deep Insights	Transformed customer experience Optimized operations and profitability
Insurer Digital Evolution	**(1) Digitize** ▪ E-application ▪ Back-office underwriting	**(2) Rule engine** ▪ POS underwriting ▪ Changes in UW philosophy ▪ Integrate internal and external data	**(3) Descriptive analytics** ▪ Dashboards for all stakeholders ▪ Optimize rules ▪ Identify problems to solve with AI	**(4) AI / predictive analytics** ▪ Analyze historical data ▪ Develop predictive models ▪ Quantification of risk	**(5) Model deployment** ▪ Integrate into POS ▪ E.g. Streamline UW, reduce questions, maximise STP ▪ Becomes a BAU process
Customer Satisfaction					
Technology Cloud enabled	eAPP	URE Rules designer	Descriptive analytics engine	Data extraction AI model dev tech	Model Integration, deployment, monitoring, maintenance
Reinsurance	**Consulting**: POS underwriting philosophy, rules development and optimization **Financing**: Solution finance via reinsurance			**Consulting**: AI / predictive model development, risk review and quantification, AI explanation, exec sign-off **RI risk transfer**: on business through AI models	

Claims

Data-led product innovation

General approach for developing bespoke products

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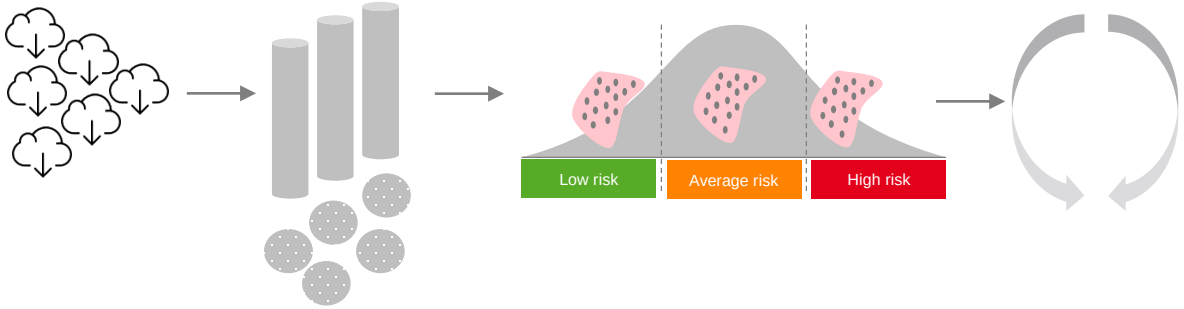
Case study

Access data from available sources

Perform analytics

Risk assessment, categorisation and proposition development

Post-sales engagement



- Application form
- Internal data
- External data

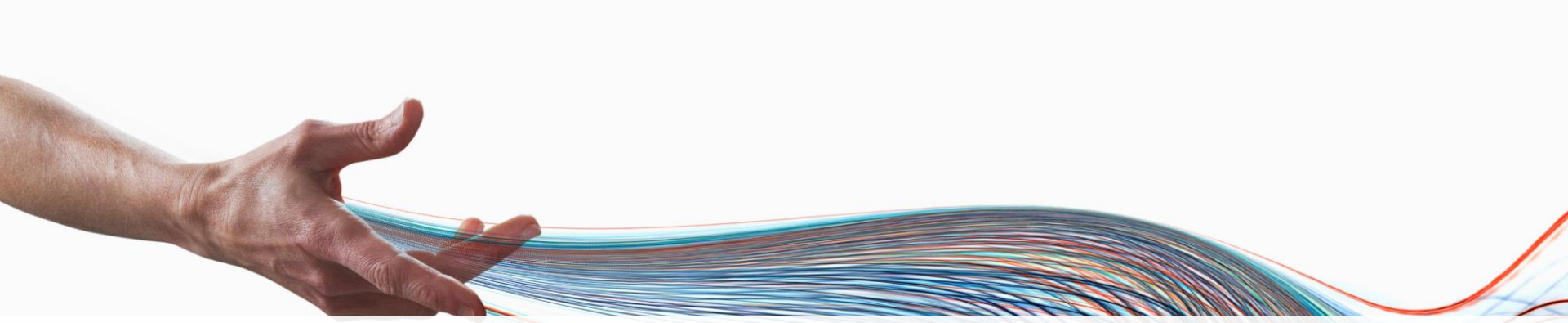
Gather insights, identify who to market to and who are likely to buy

- Underwriting approach and process development
- Product customisation and features development
- Execution method and sales campaigns

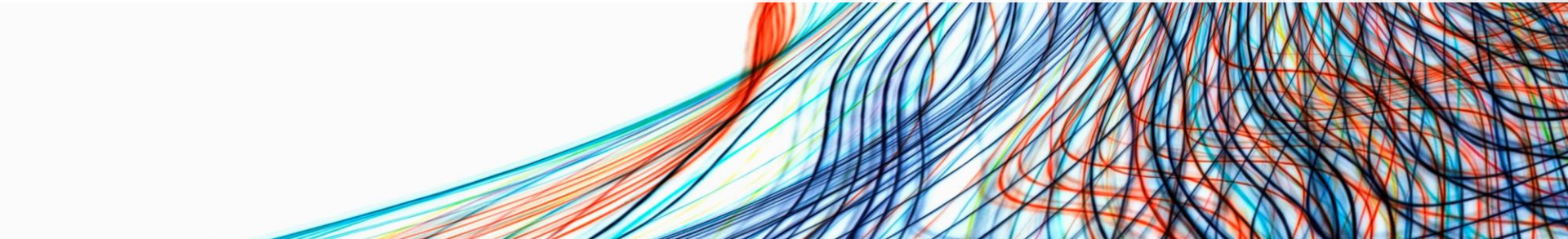
- Value added services
- Dynamic pricing,

Our data-led product innovation approach:

- Available data sources inform the type of product and target market considered.
- Identified customer needs are met by product design, used as “hero points” in marketing strategy.
- Insights from data are used to:
  - Develop the underwriting approach.
  - Customise the product structure, benefits and features offered.
  - Establish the most effective execution method and likelihood to purchase.
  - Set premium rates (initial and dynamic).
- Bespoke products are created for agreed target markets, segments or micro-segments (based on your chosen strategy).
- **Munich Re accepts the risk** associated with new data-led product initiatives.



2 Transforming the customer experience with AI



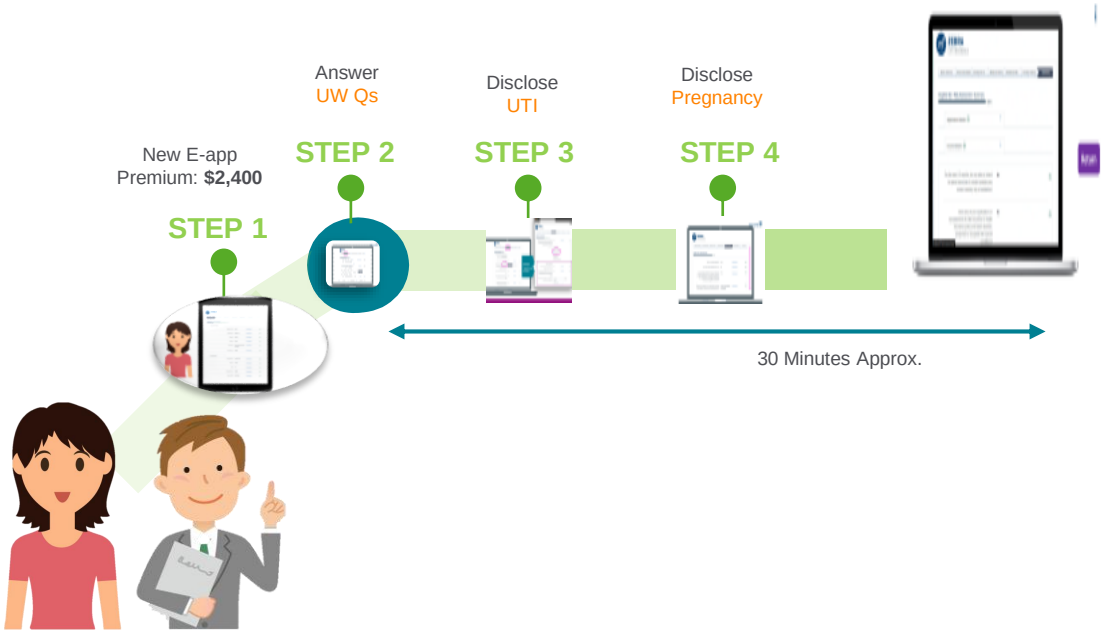
Persona profile

Angeline Tan

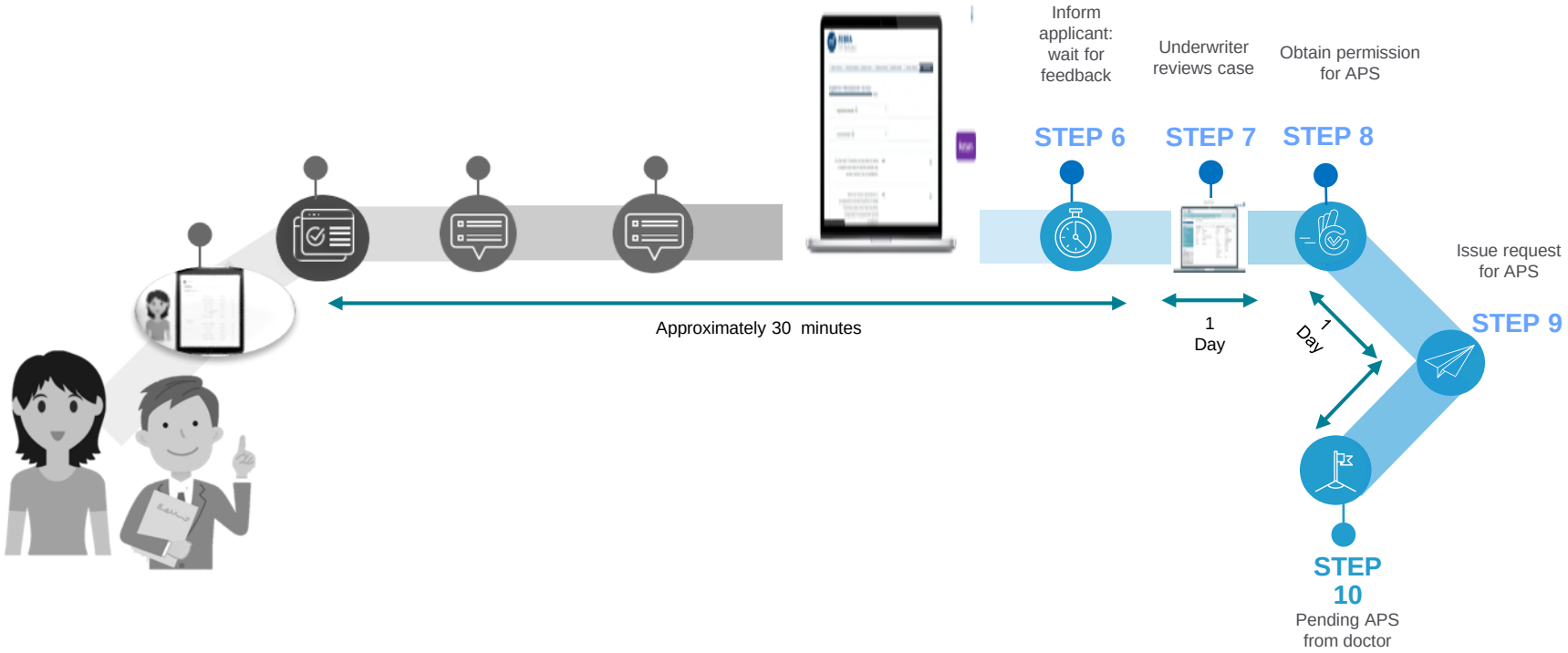
- Female, age: 34
- Occupation: Manager
- Applying for:
  - ✓ Life ($500,000)
  - ✓ TPD ($500,000)

- Conditions disclosed:
  - ✓ Smoker
  - ✓ Urinary Tract Infection
  - ✓ Pregnant for 30 Weeks

Current process



Current process



Current process

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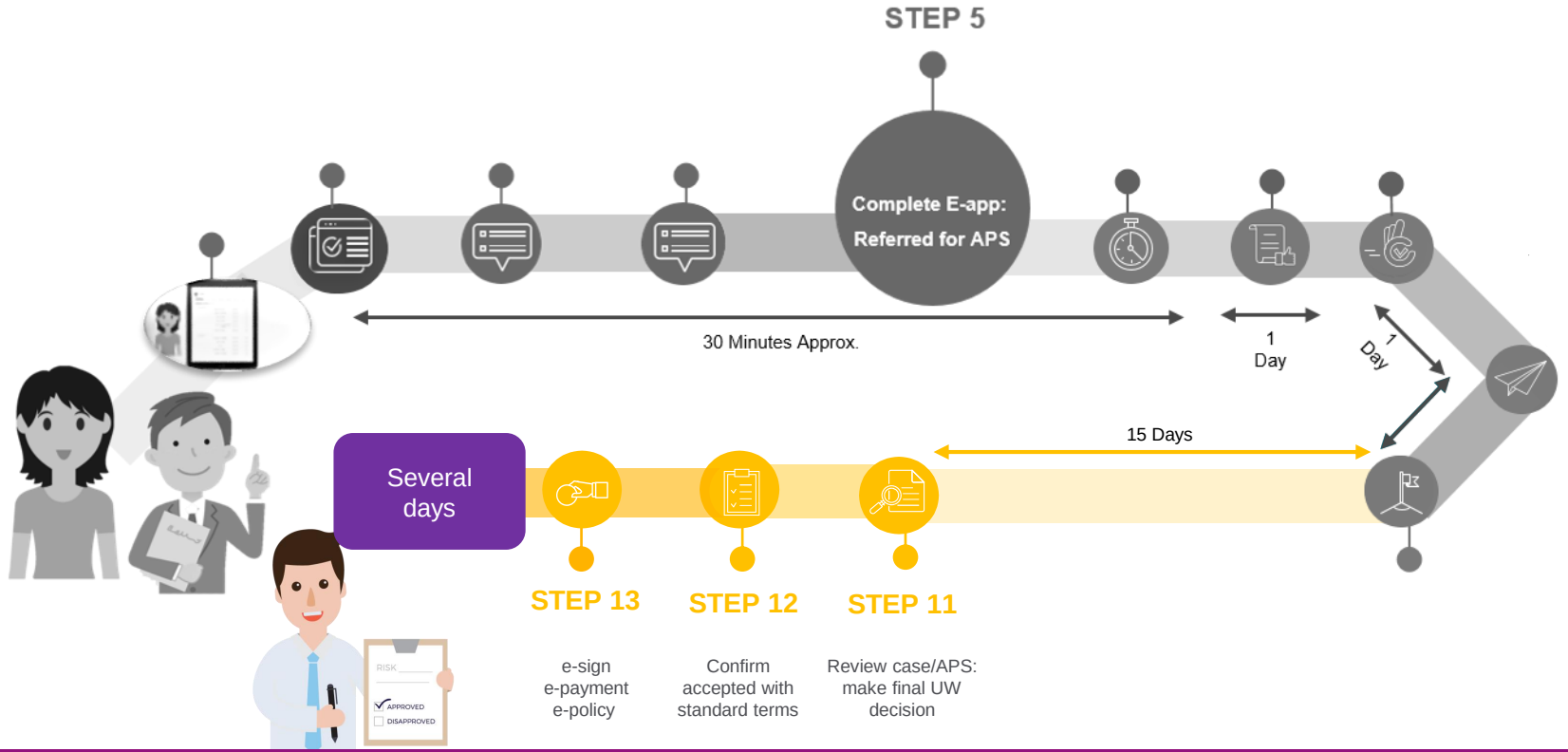

New customer experience: enabled by AI

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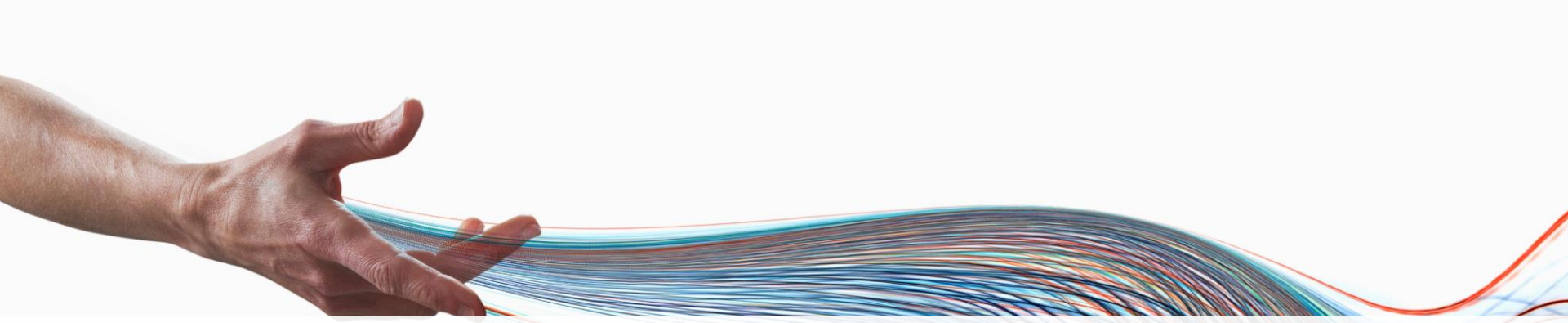
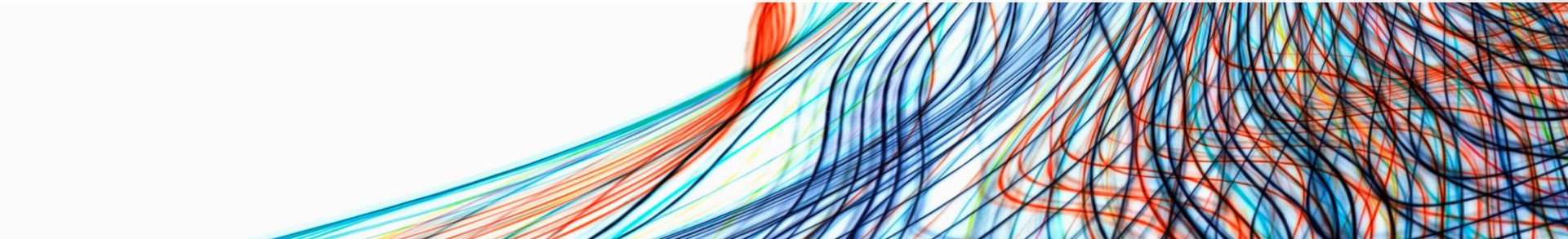
- Instant acceptance
- Reduced costs:
  - ↓ Medical evidence
  - ↓ Manual operations
  - ↓ Not taken ups (NTUs)



2 Benefits to insurers from AI



Augmenting underwriting with AI

Example pain points addressed

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INSURER BENEFITS
Improved CX & efficiency

- Increased STP, acceptable risk
- Shortened application, acceptable risk
- Reduced cost of underwriting
- Increased cost-effectiveness of medical evidence and NMLs
- Reduced impact of non-disclosure/anti-selection
- Reduced traditional UW using external data with acceptable risk
- Enhanced products based on customer analytics insights

Augmenting claims with AI

Integration into the claim adjudication process

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INSURER BENEFITS
Improved CX & efficiency

- Improved CX due to increased automation (STP) with quantified risk
- Reduced cost of manual claims assessment & optimised use of human claims assessment
- Reduced impact of fraud, waste, abuse
- Deeper customer segmentation by claims history enhances product development & pricing
- Data-driven rule enhancements

Existing partnerships deliver value to insurers

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Clients	Client needs	INSURER BENEFITS	Our approach
Multinationals	Delighting customers Increased STP Reduced medical evidence **Quantified & minimal risk increase**	↑ STP 26 to 70% (2.7 times higher) ↓ Medical evidence Minimal risk increase ↑ STP 35% to 60% (1.7 times higher) ↓ Medical evidence Minimal risk increase ↑ STP from 60% to > 80% ↓ Medical evidence Minimal risk increase	• Developed AI model to predict final UW decision using auto-UW & back-office data • Quantified & minimized risk of AI • Produced comprehensive risk report and assisted client with internal sign off • Deployed & integrated AI model into clients' IT environment • Implemented dashboards for real-time monitoring of model performance • Priced and reinsured risk
Multinational	Offer SIO products to eligible customers at fully UW rates	50% of applicants qualify for new SIO product at fully UW rates	• Developed AI model to predict final UW decision • Designed an SIO product using AI insights • Identify customers eligible @ fully UW rate
Multinational	~40% reduction in manually assessed medical claims	~40% reduction in claims needing manual assessment	• Developed AI model to predict final claims decision using back-office data • Integrated with insurers' claims process

Prediction of fraud and anti-selection

During the underwriting process

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AI models are developed with historic data…

Auto-UW
(Application data)

Behavioural data
(from web application)

Back-office data
(e.g. final UW decisions, claims)

Customer photos

External data

Merged and cleansed data

AI model development

…and deployed on new applications during UW

Customer applications

AI model score via cloud microservice

High-risk applications flagged for “Next Best UW Action”

INSURER BENEFITS

- Reduction in future claims due to fraud/anti-selection
- Improved profitability

Case studies:

Enabling digital banca strategies

For growth and better customer experience

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AI models are developed with historic data…

Auto-UW
(Application data)

Bank data
(Transactional data)

Back-office data
(e.g. final UW decisions, claims)

Customer photos

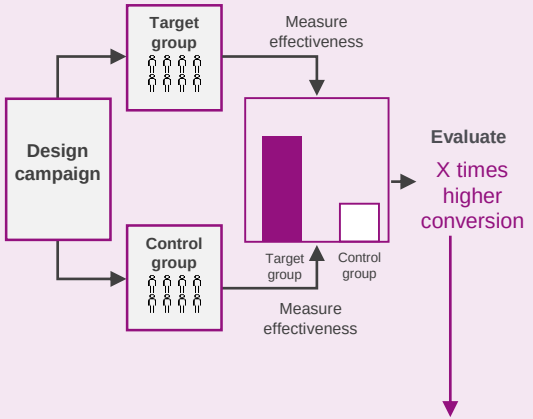
External data

Merged and cleansed data

AI model development

…and pre-approve bank customers for relevant offers

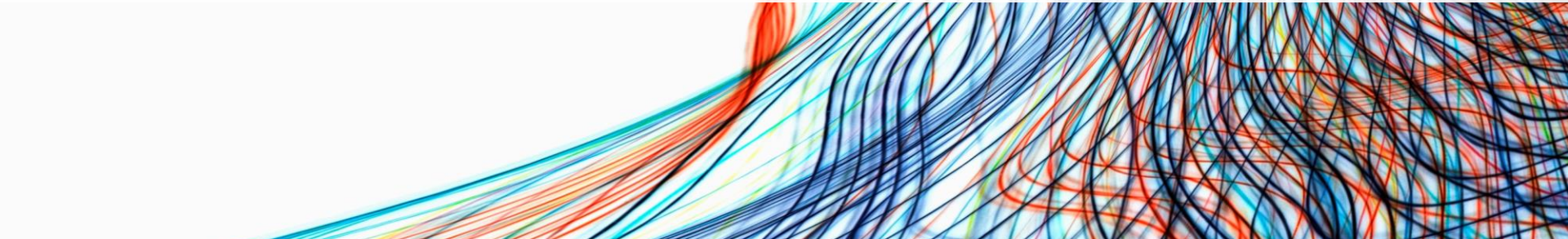
Ranking customers by likelihood to purchase



INSURER BENEFITS

- Increased sales without increasing marketing expenditure
- Enhanced customer experience from simplified UW

4 Actuarial support



Understanding the AI lifecycle

How do actuaries get involved?

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Discovery and project kick off	Data discovery	AI modelling	Translating insights into project outcomes	Deployment & integration	Monitoring & maintenance
• Problems to solve • Data understanding • Tech landscape • Benefits potential • Scope outline • Objectives / ROI	• Data extraction • Data processing • Exploratory analysis • Data prep sign off • Deep observations • Validate "hunches" • AI scope definition	• Model development • Model explainability • Model validation	• Risk quantification • Risk report • Risk sign off • Model sign-off	• API design & testing • Cloud hosting • Model deployment • Model integration • Rulebook update • Dashboard set-up	• Tools and services for maintenance • Model retraining • Regulatory and audit support

A successful AI use case starts by discovering **business problems** and understanding the operational **business context** in which the **solutions** must be **implemented** and **maintained**

Time → Development → Production

Actuarial support

Understanding the external (new stakeholder) environment

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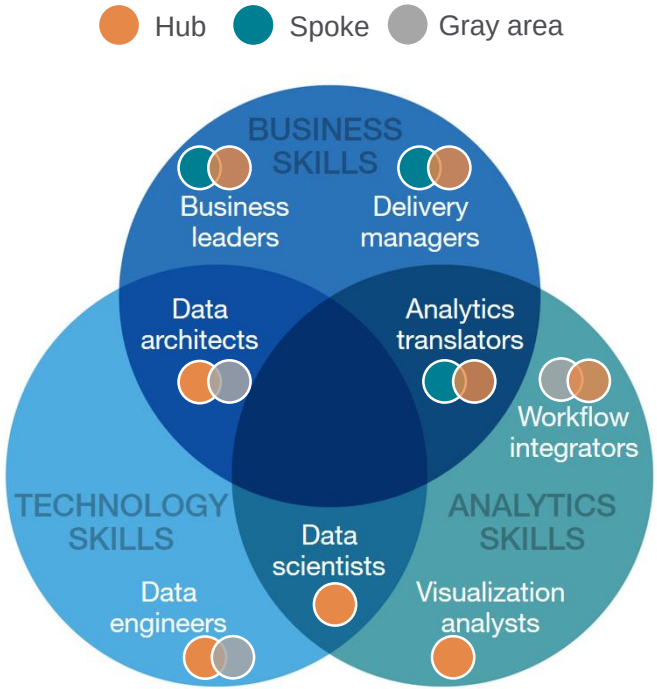
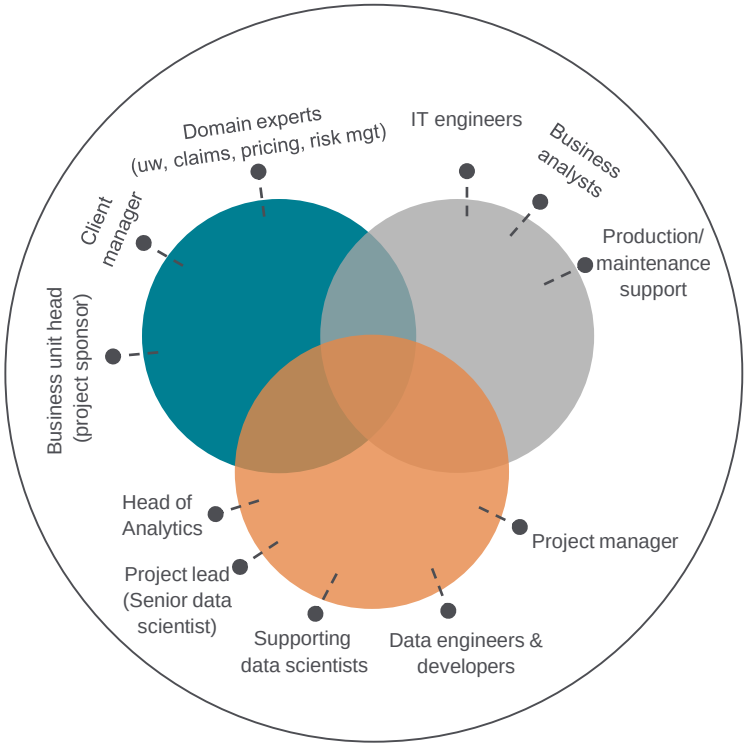
What skills are needed and where are they typically located?



Delivery team



Actuarial support

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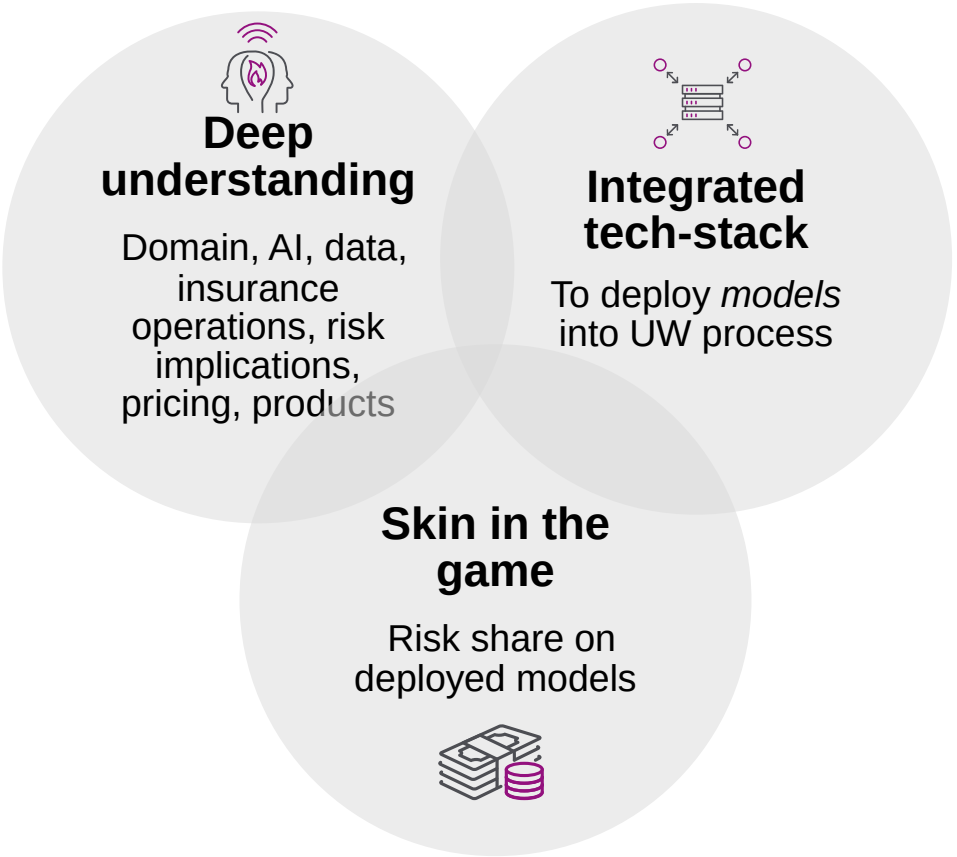
- Risk implications
- Translation of domain context
  - Data
  - Rulebooks
  - UW/claims practices
  - Business process flows
- High-order activities
  - Judgement
  - Generalizability
  - Anticipating unintended consequences
  - Asking the right questions
- Actuarial control cycle of the future
  - Earlier feedback than waiting for claims
  - Risk management at PoS enabled by predictive models and domain experts
  - Data, AI, tech driven



Integrated Analytics from Munich Re

Enables AI and digital solutions of the future

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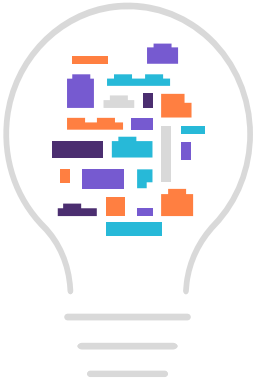
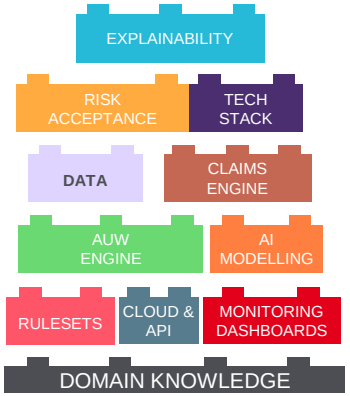
Research & client needs



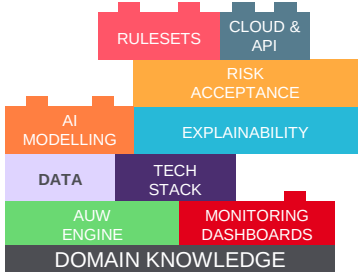
Client needs are uncovered and merged with R&D to…

Components



…inspire modular, best of breed components…

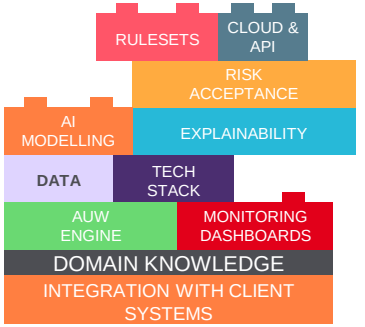
Capabilities



E.g. point-of-sale predictive uw

…which are integrated into horizontal and reusable capabilities…

Products & services



E.g. Augmented uw with AI

…that are packaged into products & services that meet business needs

Transforming clients' customer experiences and operational efficiency

Getting started
Engagement roadmap

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Discovery workshop
1 day + Presentation

- Problems to solve
- Data understanding
- Tech landscape
- Benefits potential
- Scope outline
- Objectives / ROI

Discovery phase
1-2 months

- Data extraction
- Data processing
- Exploratory data analysis
- Data prep sign off
- Deep observations
- Validate "hunches"
- AI scope definition

- ✓ Actionable recommendations
- ✓ Business case clarified
- ✓ Roadmap to success outlined

AI modelling & translation
2-3 months

- Model development
- Model explainability
- Model validation
- Risk quantification
- Risk sign off
- Model sign-off

Productionize model
1-4 months

- API design & testing
- Cloud hosting
- Model deployment
- Model integration
- Rulebook update
- Dashboard set-up

- ✓ Go live with new marketing, customer experience, streamlined operations, etc.

Model maintenance
Ongoing

- Tools and services for maintenance
- Model retraining
- Regulatory and audit support

Q&A

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