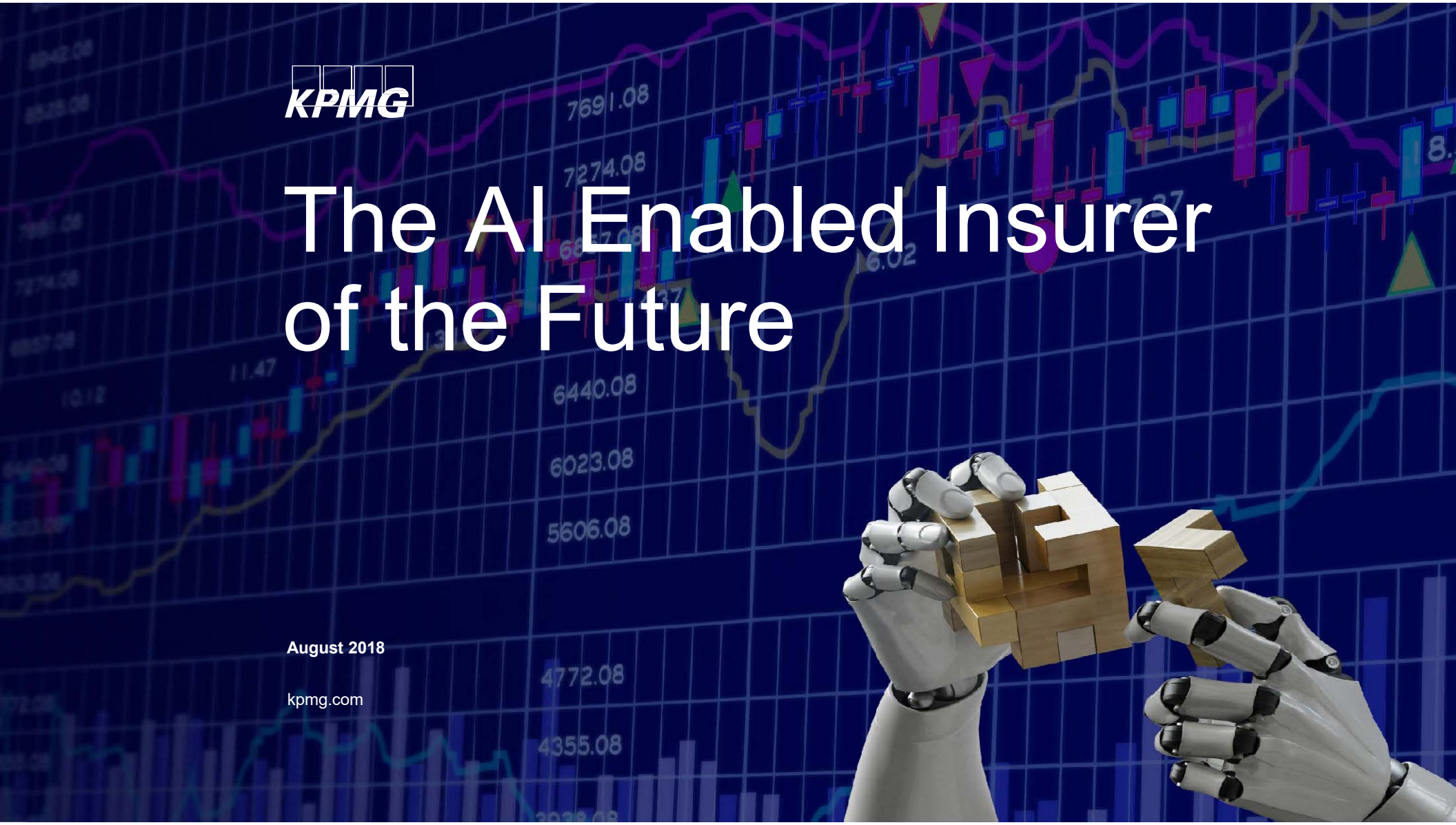
KPMG

The AI Enabled Insurer of the Future



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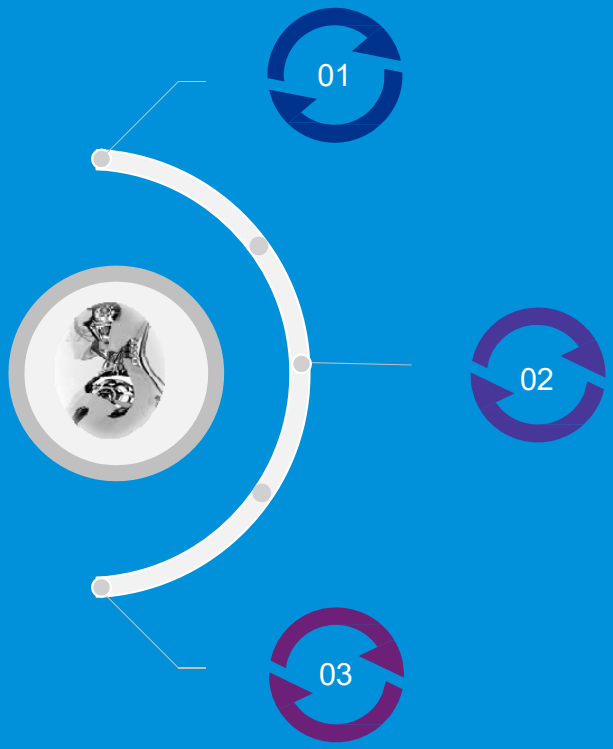

What is AI?

Artificial intelligence ("AI") is an area of computer science that emphasizes the creation of intelligent machines that work and react like humans. The traditional problems of AI research include

Reasoning and problem solving

- to developed algorithms that imitated step-by-step reasoning that humans use when they solve puzzles or make logical deductions

Knowledge representation

- to gather together explicit knowledge possessed by experts in some narrow domain

Automated planning

- to visualize the future—a representation of the state of the world and be able to make predictions about how their actions will change it

Machine learning

- To study of computer algorithms that improve automatically through experience. Unsupervised learning is the ability to find patterns in a stream of input. Supervised learning includes both classification and numerical regression.

Natural language processing

- To give machines the ability to read and understand human language include information retrieval, text mining, question answering and machine translation.

Perception

- to use input from sensors (such as cameras, microphones, wireless signals, and active lidar, sonar, radar, and tactile sensors) to deduce aspects of the world, such as speech recognition, facial recognition, and object recognition.

Motion and manipulation

- a.k.a. robotics. AI is heavily used in this area.

AI at the Center of Insurance Value Chain

Insurers are investing in AI knowing that such investments create learnings applicable across the insurance value chain

AI Enabled Insurer of the Future

Ultimately we expect AI to improve every element of the insurance value chain





Customer	Agent	Underwriting	Claims	Actuarial (pricing, reserving)
– Know what the customer wants, how wants to be served – Chatbot for most inquiries – Intelligent assistant guide for CSR in best questions to ask or responses to give – Micro-segmentation and improved assignment of prospect and agent	– Ability to use enhanced, individualized customer data to and AI to personalize the customer experience – Proficiency with social media tools and analytics to engage customers and understand demands – Partnering with carriers to develop tailored solutions and approaches to customers – Early warning of agent at risk / attrition	– Ability to interpret new data and sources including the Internet of Things – More accurate underwriting from use of broader data set – Business intelligence – Refined customer analytics to focus on complexity – Shift away from routine underwriting, increasing turnaround time – Leverage D&A/AI to better manage risk: focus on speed & quality	– Real-time fraud detection – Ability to service more complex events and resolve customer issues – Specialized relationship management skills – Service larger commercial clients or high net work individuals and families – Proficiency in claims analysis technologies – Leverage external data and AI for superior claim service and avoidance – Fast, easy seamless experience	– More accurate DL reserving due to broader data set, self-learning enables quite updating – Enables granular and faster pricing reflecting micro-segment / insured's risk – Discover business performance trends that require more detailed actuarial analyses

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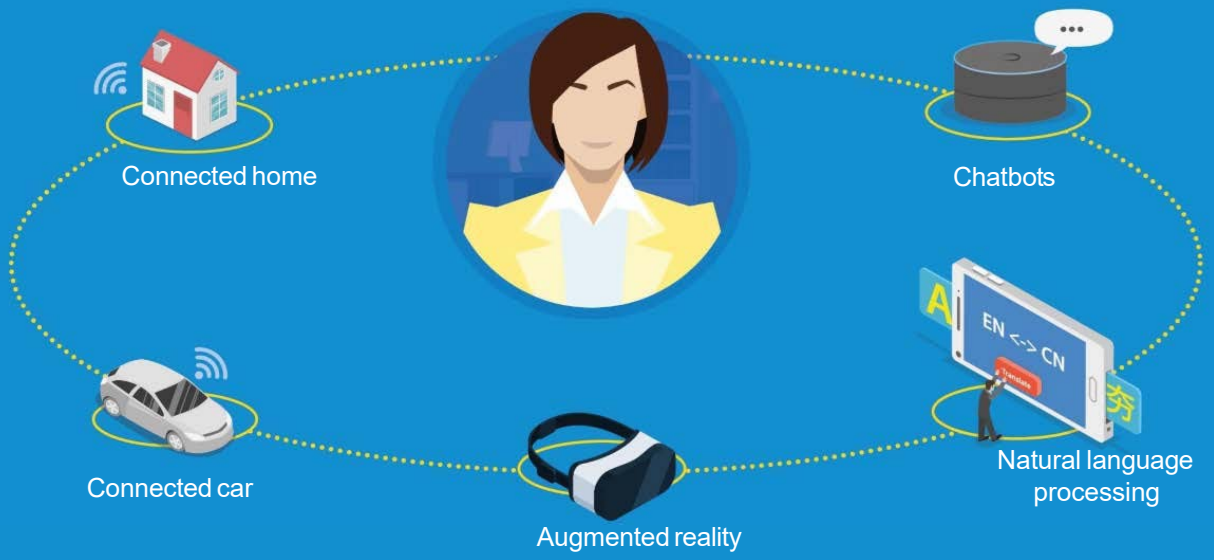
AI Enabled Insurer of the Future

Reinventing Insurance Propositions: New Experiences

AI embedded into every customer interaction channel



Implications

For Business

- Intelligent experiences
- Personalized experiences
- Demonstrate empathy
- Every channel is smart
- Listen to signals

For Technology

- Select AI platform
- Embed AI in all channels
- Personalized engines

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Reinventing Insurance Propositions: New Insights

AI and Big data generate richer insights into the customer risks and needs

Implications

For Business

— Listen to signals
— Customer permission
— Apply data regulation

For Technology

— Cloud based
— Standardize data lakes
— Improve cyber severity

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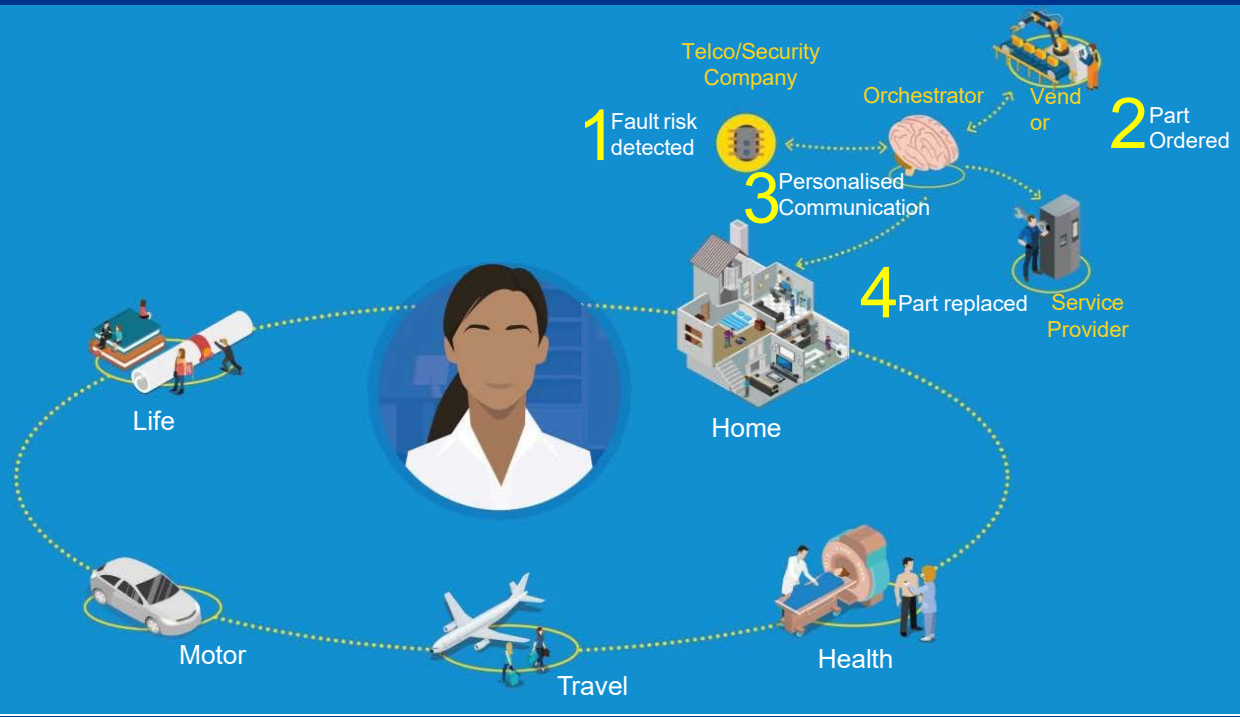
Reinventing Insurance Propositions: Ecosystems

Customer needs will be served through AI driven orchestration of partners



Implications

For Business

- Orchestrator Personal assistants
- New business models
- New partners
- Join ecosystems
- Form ecosystems
- Manage ecosystems
- Extended labor force

For Technology

- Virtual assistants
- API management
- Workflow management
- Smart contracts

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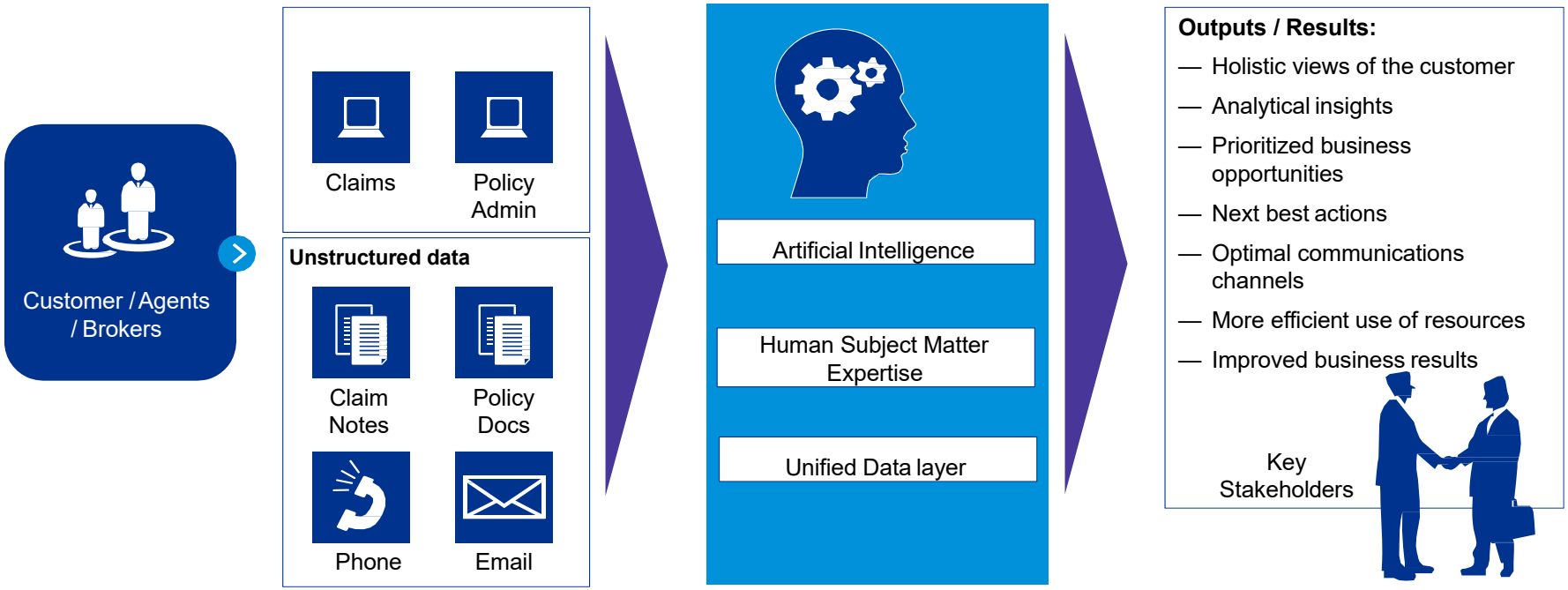
AI at the Center of Insurance Value Chain

Insurance AI platforms will allow deeper human observation and insights through advanced analytics.



AI Insurer of the Future

Businesses Increase Value by Responding to the Market

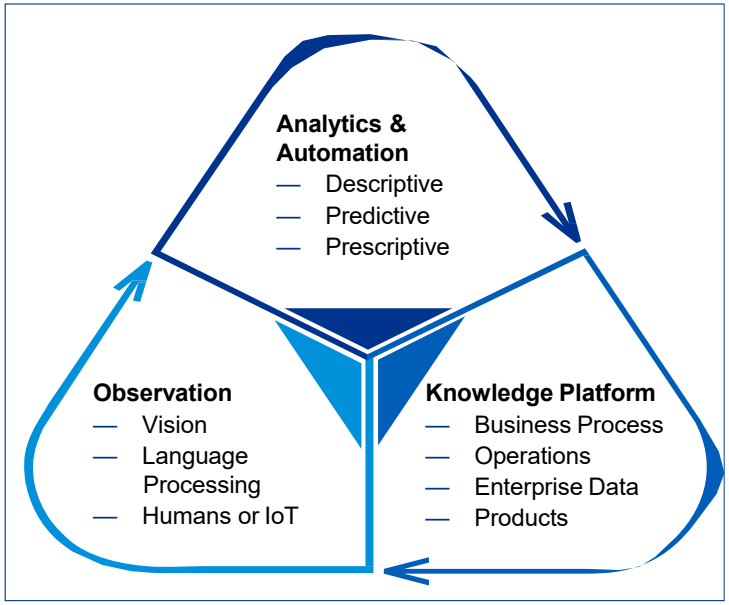
Business observation is primarily done by humans and is now becoming increasingly possible and inexpensive to automate.

This is primarily due to the increase in AI research and development. Proprietary and open-source versions of AI software are becoming increasingly available under a variety of financial models.

New Business Opportunities

- Market Intelligence
- Risk Mitigation
- Sales
- Customer Requests
- Knowledge

Artificial Intelligence



Business Tools & Results

- Executive Dashboards
- Automated Transaction Processing
- Increased and accelerated insights
- Optimization

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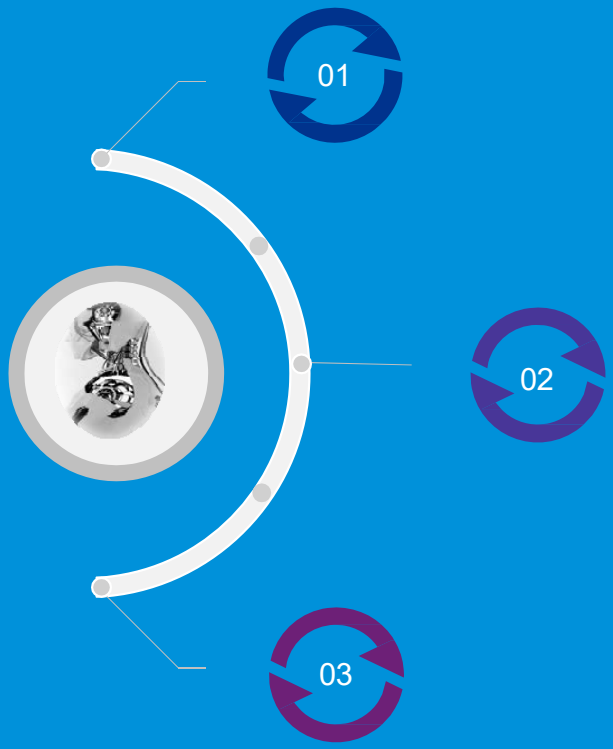


Actuarial: Key AI Characteristics

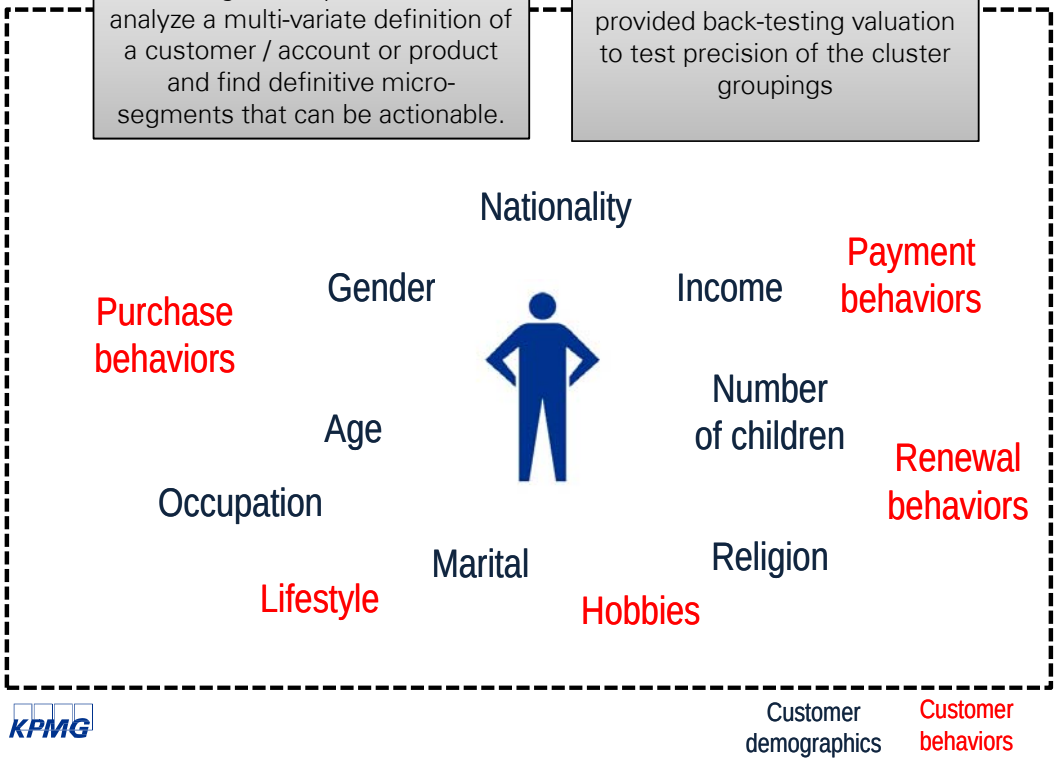
- AI can help transform the Actuarial function to be **less assumption driven and more predictive** through machine enablement
- Focus should be on capabilities that will enable actuaries to make **data driven decisions**
- AI can help identify and highlight **business performance trends** rapidly and leverage internal and external indicators beyond reporting automation
- AI - Machine Learning methods can provide an approach to actuarial models to **self-learn with each run** and drive the scenarios where scrutiny is required by the senior actuaries that will **further train the models**.
- Actuaries will become the **custodian of the process** and drive the complex assumptions and reporting rules

How does AI apply?

The **AI technology** is able to define unique micro segments based on not only customer demographics but more so, customer behavior. Using both unsupervised and supervised machine learning techniques to surgically profile down to the individual level.

Unsupervised Machine Learning
clustering techniques are able to analyze a multi-variate definition of a customer / account or product and find definitive micro-segments that can be actionable.

Supervised Machine Learning
classification
provided back-testing valuation to test precision of the cluster groupings



AI pricing tool

Pricing Model

Logistic Regression – it measures the relationship between many variables to the risk by estimating probabilities using a logistic function.

The output is an equation (pricing formula) to **determine the price** for different customers with various level of risks

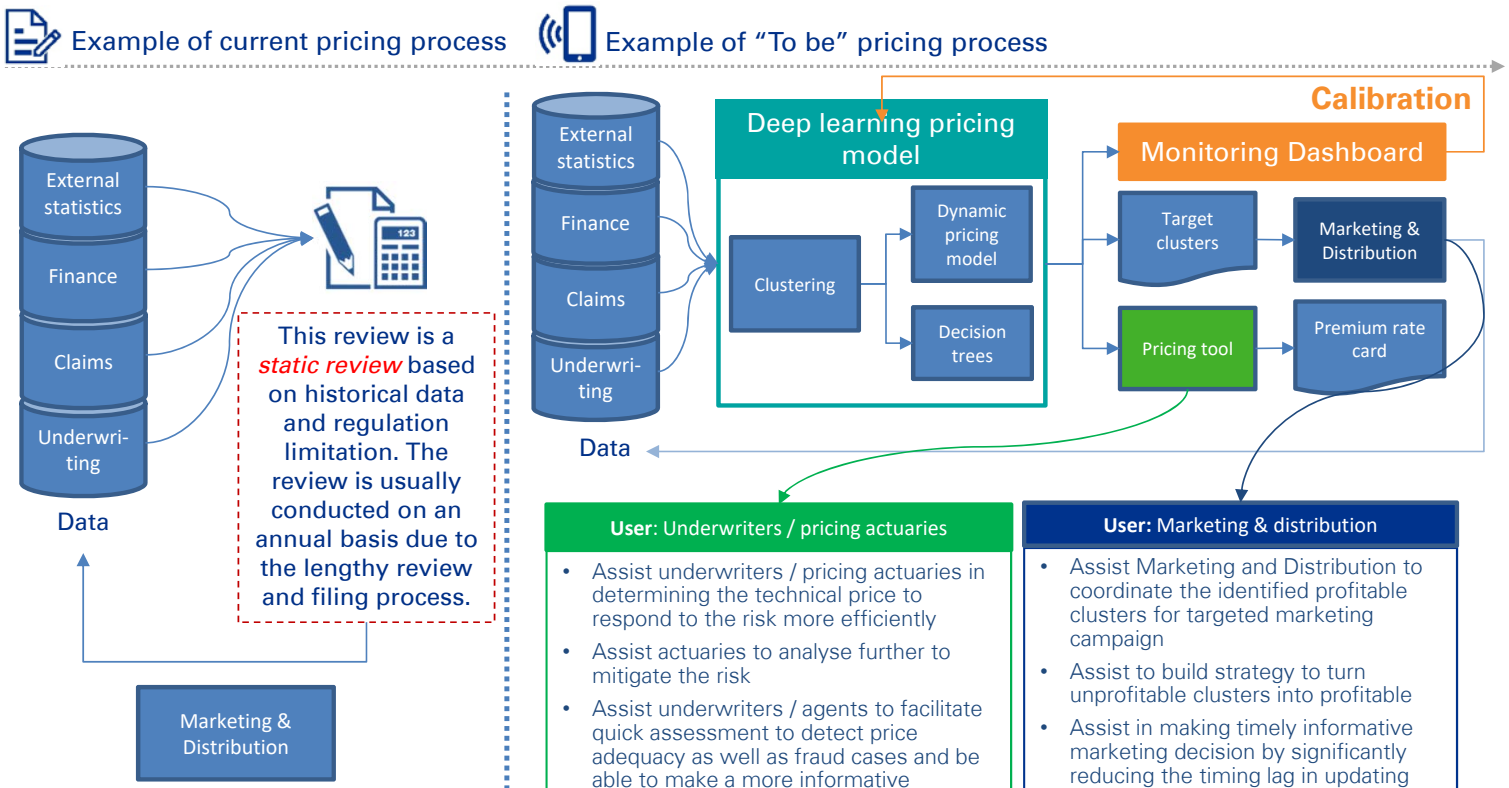
Scorecard

Random Forests (RF) algorithm –is an ensemble learning method that combines multiple decision trees that are trained to classify PROFITABLE vs UNPROFITABLE.

The output is a stochastic measure that represents the probability that a customer will fall in the PROFITABLE vs UNPROFITABLE class. This stochastic measure is calibrated into a scorecard that will be used for **risk scoring.**

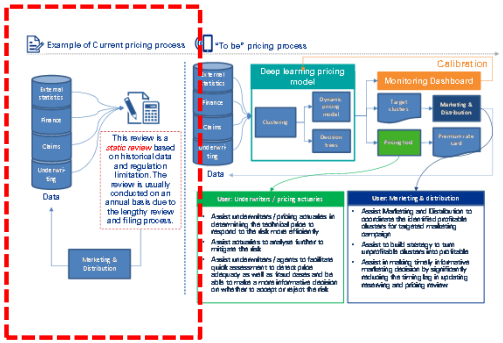
Actuarial – Current vs. future pricing process

Example of “To be” pricing model will enable insurance companies to respond to market trends quickly and more accurately



Actuarial – Current vs. future pricing process

Example of current pricing process (Health insurance)



<u>Underwriting variables</u>

- Plan type and features, i.e. coinsurance, deductible, limits etc.
- Customers features, i.e. age, gender, residence status, existing life policy
- Medical history / record
- Distribution channel
- Basic health plan covered by Medishield life scheme

<u>Finance and Claims variables</u>

- Premium and commissions
- Expenses and rebate
- Claims cost, i.e. inpatient, outpatient, surgery etc.
- Treatment information, i.e. dates of treatment, type of treatment, duration of treatments at which type of hospital

<u>External statistics</u>

- Reinsurance
- Ministry of Health

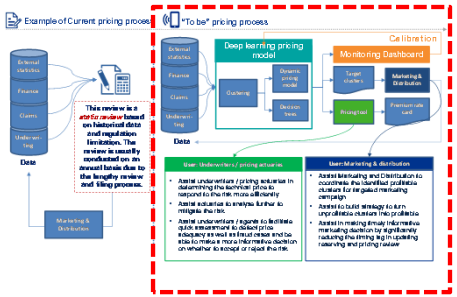
Marketing and distribution

This review is a *static review* based on historical data and regulation limitation. The review is usually conducted on an annual basis due to the lengthy review and filing process.

External factors i.e. demographic changes, economic changes, customer behaviours changes might make the historical trend to be irrelevant.

Actuarial – Current vs. future pricing process

Example of "To be" pricing process



Calibration

Underwriting variables

- Plan type and features, i.e. coinsurance, deductible, limits etc.
- Customers features, i.e. age, gender, residence status, existing life policy
- Medical history / record
- Distribution channel
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Finance and Claims variables

- Premium and commissions
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External statistics

- Reinsurance
- Ministry of Health

Customers focus statistics

- Financial status i.e. income, housing type, family status
- Family health history / record
- Customers life journey on insurance product

AI technologies

Instead of conducting a lengthy pricing review on an annual / bi-annual basis, use AI deep learning to re-design your underwriting and pricing process which allows you to use more underwriting features / variables to measure and reflect the risk on a timely basis and to improve the customer experiences

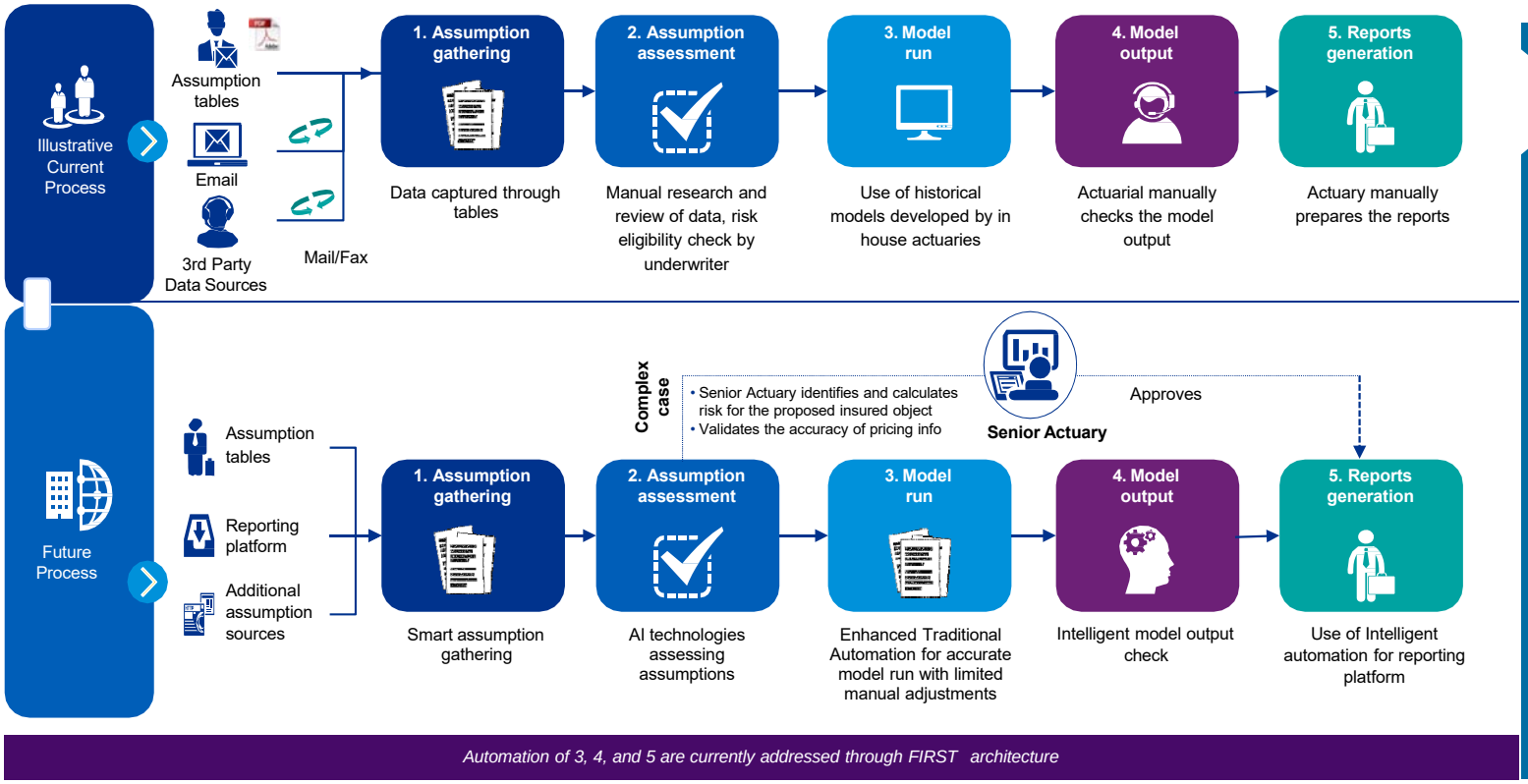
Dynamic pricing model

Score card

Marketing and distribution

Actuarial – Current vs Future State Process Map

Actuarial: Automating Assumption process can make the actuarial decisions more accurate and efficient



Automation of 3, 4, and 5 are currently addressed through FIRST architecture

Key Benefits

- More accurate assumptions, based on predictive analytics with no biases
- Continuous training / learning of the models
- End-to-end automation to enable faster, cheaper, and efficient actuarial process
- Actuaries to become “custodian” of the process

Actuarial – Next steps

Actionable insights

Build dashboards / reports / tools to gain insight of customers behaviors in the market and responds to the market immediately

Identify target customers

Identify and develop strategy to attract good customers and to convert bad customers in to profitable customers

Measure the risk and make informative underwriting decision immediately

Continuous calibration of pricing tool enable GE to determine the risk premium using many more customers' features / characteristics / behaviors / trends / economic factors

Redesign the product to tailor the customers' need / behaviors

Take into account the level of influential customers' need / behaviors as part of the product development process to align the products with customers' need and improve the customers experience

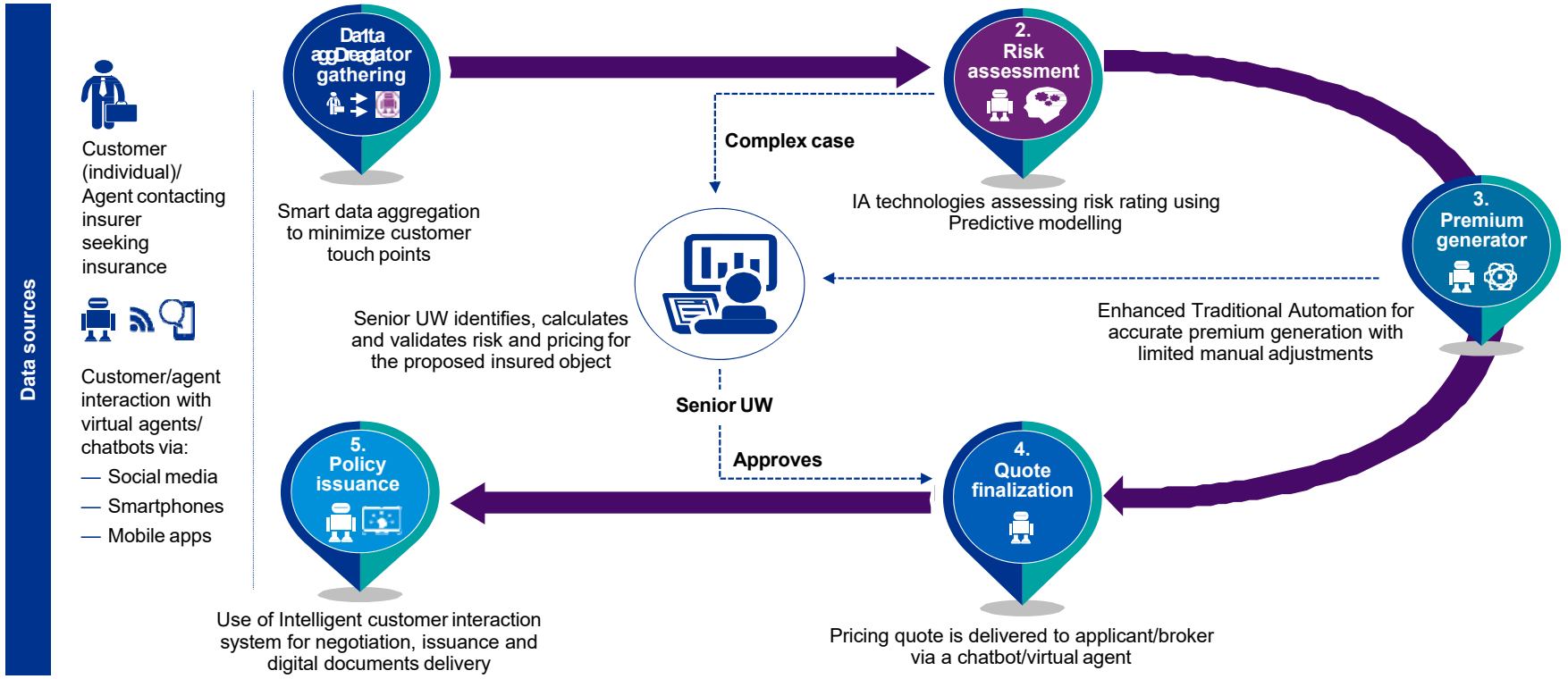
Underwriting – Vision

Underwriting – A paradigm shift

Method for underwriting risk has not changed significantly over the last several years. There is a need to fundamentally transform the risk assessment process to enhance customer experience and improve processing times by leveraging disruptive technologies.

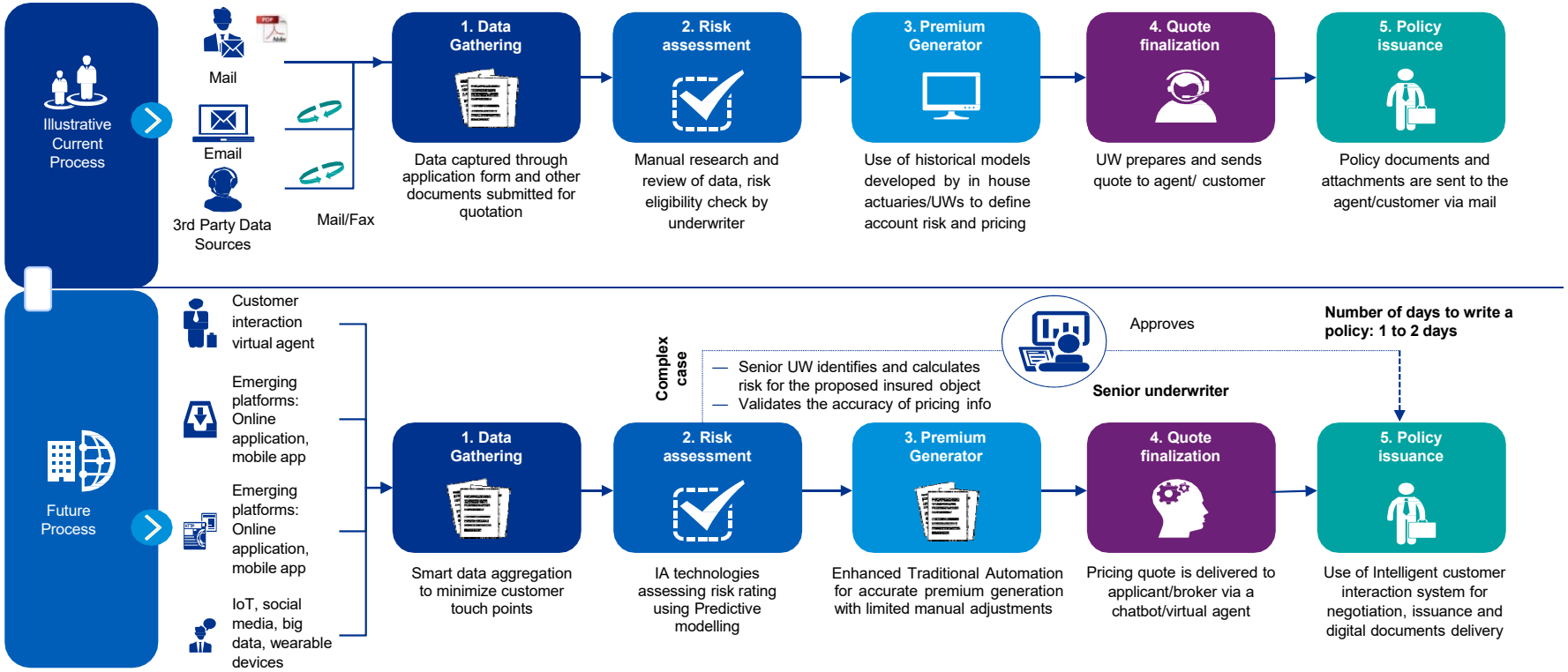
Change Drivers	Existing Underwriting Process	Future Underwriting Process
Making it imperative for insurers to respond to these changes are: 1. More accurate risk profiles 2. Availability of significantly large number of signals 3. Emerging technology disruptions	**Customer Experience** Customer spends days waiting for the policy to be issued and then goes through multiple hand-offs to provide all the required documents in order to receive the policy.	**Customer Experience** A digital experience is provided to the end customers.
	Manual UW Processes It takes up to ***10-20 days*** to complete the end-to-end underwriting process. The process is error-prone, inconsistent across countries.	**Automated UW processes, more accurate risk profile, and appropriate adjustments to policy price based on the proposed insured's fact patterns / portfolio pattern**
	Role of Underwriter In general, an underwriter is responsible to collect, combine and review documentation for submissions, with heavy reliance on a few highly-skilled resources. Manual effort involved limits an underwriter's capacity to consider historical performance or learn from past experience.	**Role of Underwriter** Underwriter becomes the "custodian" of the process and continues to provide learning to the bots.
	Data There are multiple data sources through which the data needs to accessed in order to assess the risk and validate the information.	**Data** A comprehensive set of signals
	Operating Model The operations is not aligned with the customer needs and not cost-efficient.	**Operating Model** A customer focused operating model to align with the needs of customer.

Underwriting: The Process for Insurance Proposals can be Automated End-to-end Using Cognitive Platforms with Only Complex Cases Seeking Senior Underwriter's Approval



Underwriting – Current vs Future State Process Map

Underwriting: Automating Data Gathering and Risk Assessment Processes, Insurers can Reduce Average Turnaround Time for Underwriting Decisions



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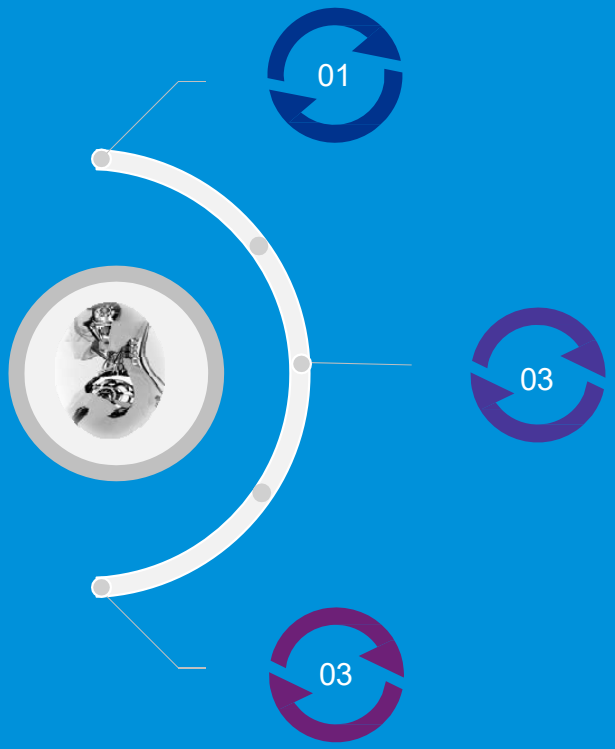

KPMG's AI Enablement Portfolio:

KPMG Ignite

Realizing the promise of AI requires more than just technology, its power must be grounded on a foundation of trusted data and analytics, and deep-rooted domain knowledge.

This notion fueled the idea behind our AI Enablement Ecosystem, KPMG Ignite, which works as an assembled ecosystem of best-in-class components, people, and technologies. Our ability to *apply* relevant domain knowledge allows us to leverage these best-of-breed components in order to create AI solutions that are custom-fit for the most complex business problems.

Client-centricity is at our core. Solutioning *starts* with the business problem or opportunity, and is always keenly focused on improving the consistency, efficiency and time to make decisions and take action.

Overview

Ignite is the KPMG's portfolio of artificial intelligence capabilities. It includes domain expertise, integrated open source tools and frameworks, strategic technology partnerships, KPMG-developed technology, frameworks, and patterns, as well as research and experimentation.

KPMG Ignite drives value in five key ways:

Increases accuracy through 100% coverage vs. traditional sampling approaches

Reduces costs and development time needed to produce insights

Enables humans to achieve and manage precise consistency

Leverages the knowledge and experience of the very best subject matter experts

Increases transparency through audit logs that show how data has been processed

Pipeline Analytics

What is KPMG Ignite?

Ignite is KPMG's portfolio of artificial intelligence capabilities.

It unlocks the value of AI by enhancing and accelerating our clients' long-term strategies for intelligent automation and cost management, growth and customer engagement, and risk and regulatory compliance.

KPMG Ignite includes methods, tools, approaches and resources that focus on improving the consistency, efficiency and time to make decisions and take action. In addition, we wrap this portfolio with highly- skilled resources who know apply relevant domain knowledge to leverage these capabilities and continue to innovate on emerging technologies.

KPMG Ignite Technology Ecosystem
An ecosystem of leading technology partners combined with tested open source tools, libraries & APIs that we utilize to build and deliver AI solutions

KPMG Ignite Platform
KPMG-built accelerators, patterns and tools that enable rapid AI solution development and delivery

KPMG Ignite Frameworks and Methods
A set of frameworks and methods that describe and guide how we approach client-specific AI solutions and make them repeatable.

KPMG Ignite Teams
Highly skilled resources that utilize the best tools and approaches to build AI solutions (best-of breed, tech agnostic)

KPMG Ignite Research, Innovation, Development
Ongoing testing, prototype development and innovation on emerging AI tools and approaches

Who to Contact ?

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