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Liberty Mutual INSURANCE

CS-2: Actuaries' Impact on Technology Implementations

CAS In Focus Seminar
Chicago, IL

Speakers:
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Agenda

Topics
Introductions and Objectives
Overview of Technology Trends in the Insurance Marketplace
Roles and Considerations for Actuaries in Technology Initiatives
Questions for Panel?

Introductions and Objectives

Talking with you today

Maury Kenworthy, FCAS, MAAA, CPCU
Liberty Mutual Insurance
Senior Actuary
Boston, MA

Maury is a Senior Actuary in the Global Specialty group at Liberty Mutual, with over 10 years of experience. She has held roles in pricing, reserving, & ERM functions, with her latest position at Liberty as being largely responsible for rolling out a global Pricing Risk Management initiative. The intent of the initiative is to provide a framework for continuous improvement as it relates to pricing, to be adapted as appropriate for each business segment.

Kelly Cusick, ACAS, MAAA
Deloitte Consulting
Managing Director
Chicago, IL

Kelly is a Managing Director with the Actuarial, Rewards & Analytics practice of Deloitte Consulting with over 20 years of experience in actuarial and insurance consulting. Kelly is also a leader in Deloitte's Insurance Product and Underwriting practice. In this role, she advises clients on transformational initiatives related to underwriting, product management, and actuarial functions.

Peter Tomopoulos, ACAS, MAAA
Deloitte Consulting
Senior Manager
New York, NY

Peter is a Senior Manager with the Actuarial, Rewards & Analytics practice of Deloitte Consulting and has over 20 years of Property and Casualty actuarial and insurance consulting experience. In his role, Peter focuses on techniques and processes used by insurance companies in identifying, extracting, applying and analyzing business information and third party data throughout the insurance data lifecycle. Peter is an Associate of the Casualty Actuarial Society, and Member of the American Academy of Actuaries.

Nilay Doshi
Deloitte Consulting
Senior Manager
Chicago, IL

Nilay is a leader in the Insurance Technology practice at Deloitte Consulting for P&C Insurance leading large Core Systems and Digital Transformation programs. With over 17 years of professional services experience, he gained deep strategic industry insights delivering solutions for policy, rating, billing and claims for most P&C LOBs from personal, commercial and specialty over various channels including: direct, web, agent and MGA.

Course Objectives

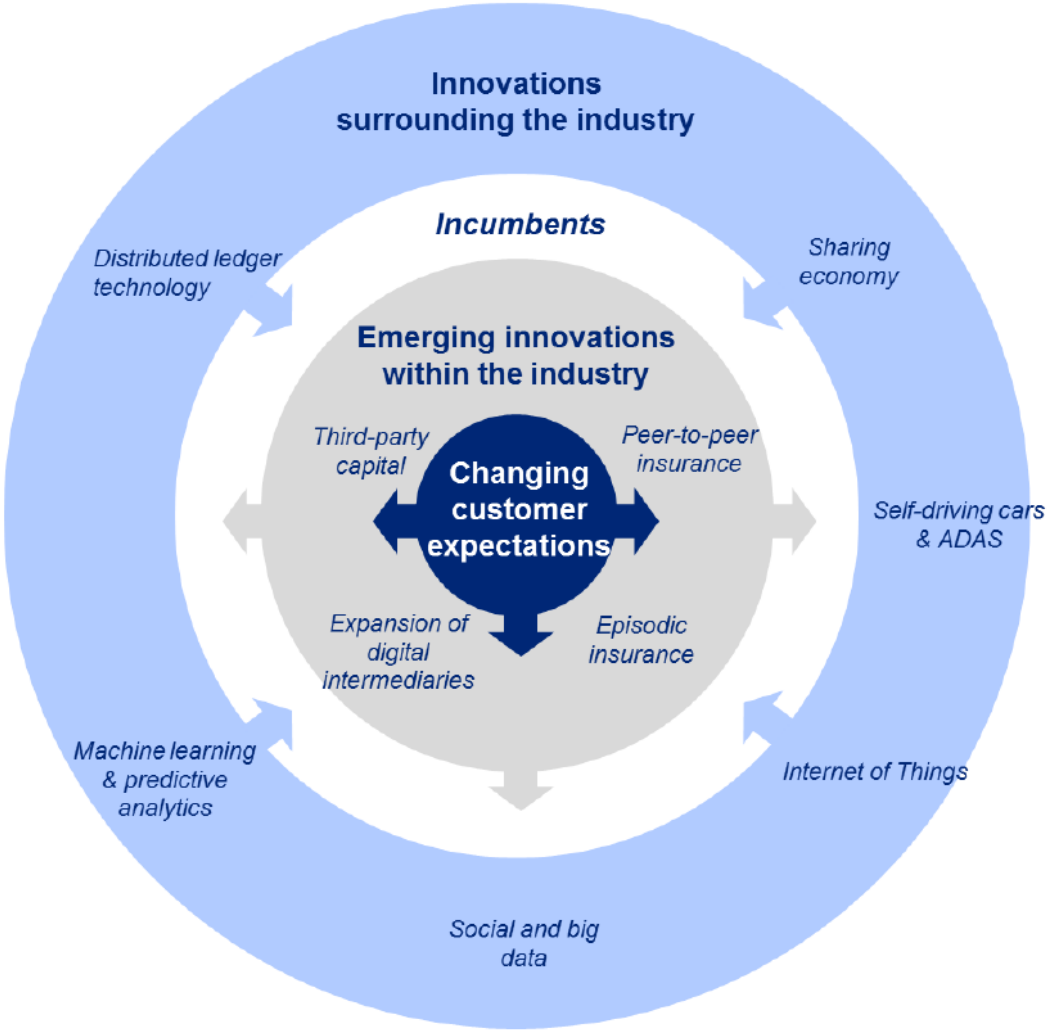
The session will focus on:

- How insurers are increasingly relying on technology to meet strategic objectives across the entire business lifecycle
- Recent trends in insurance technology and why it is becoming imperative that insurers have modern, flexible, connected core systems
- How actuaries can become critical functional resources for technology initiatives, particularly policy administration system (“PAS”) implementations

Overview of Technology Trends in the Insurance Marketplace

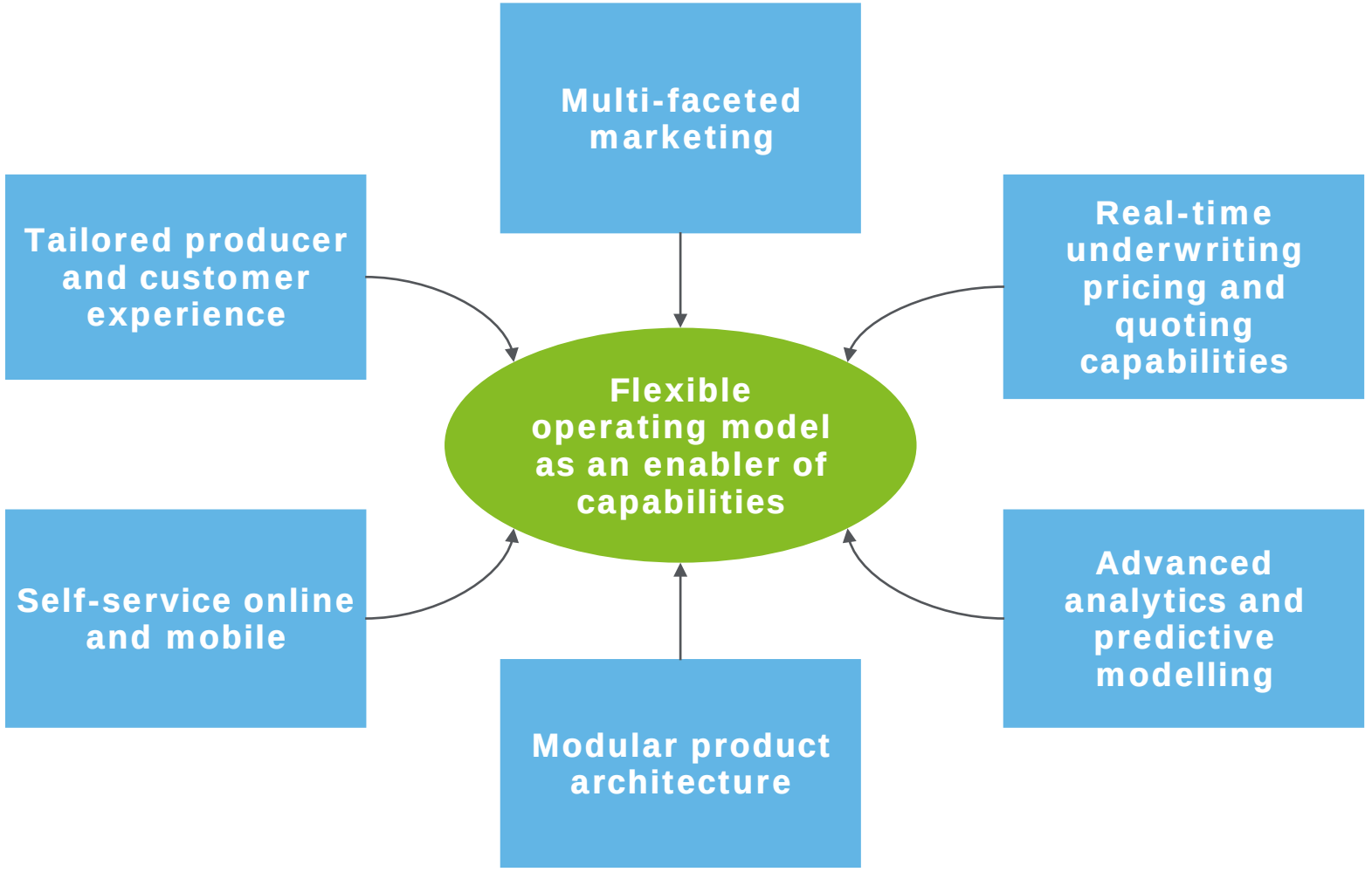
The Case for Change

Innovations within the industry and external transformative forces have the potential to reshape customer behavior and market structure



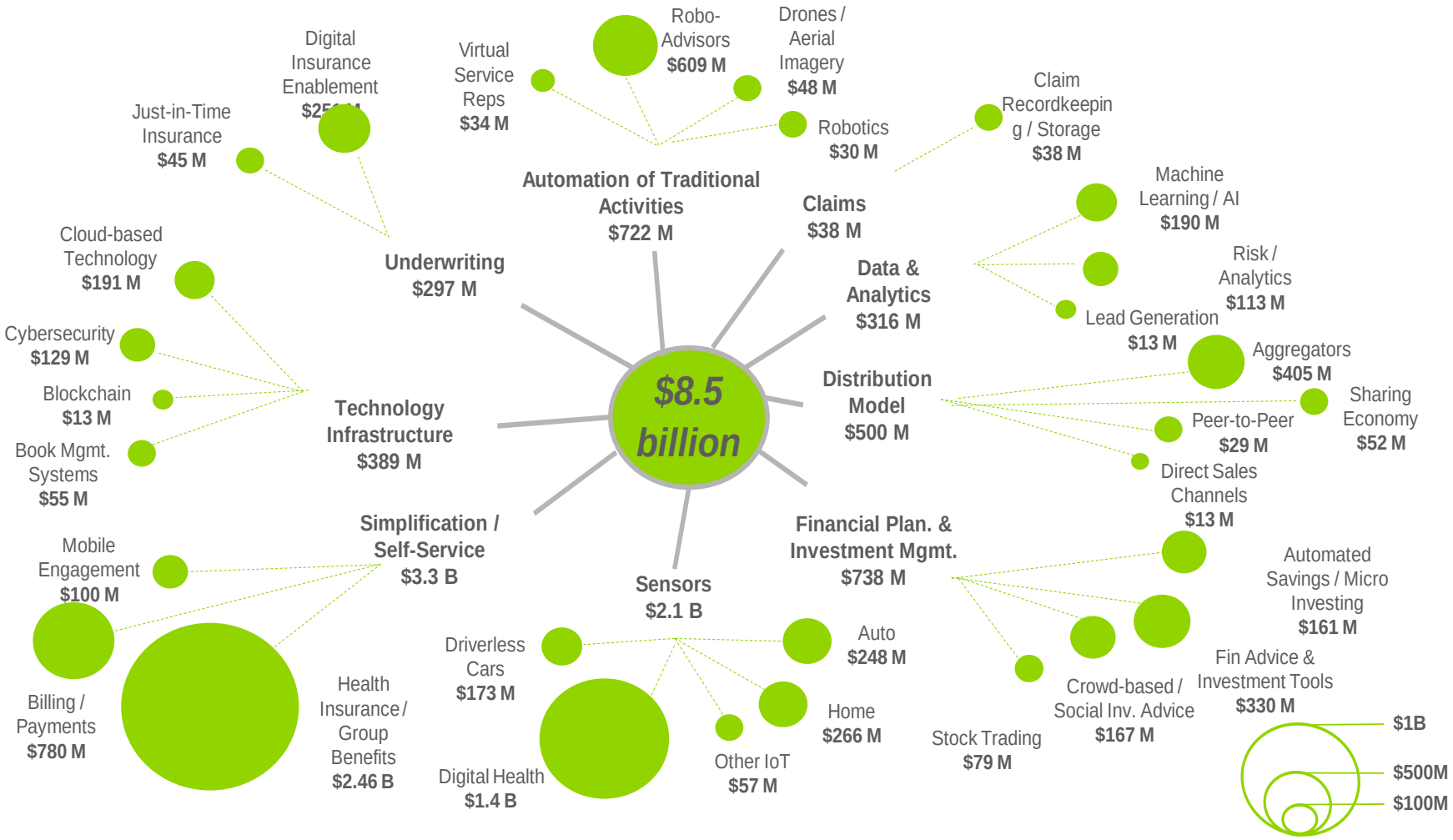
Profile of a Nimble Insurer

Insurance carriers are evolving capabilities at an unprecedented pace, with the aim to become more nimble in response to the rapidly changing marketplace



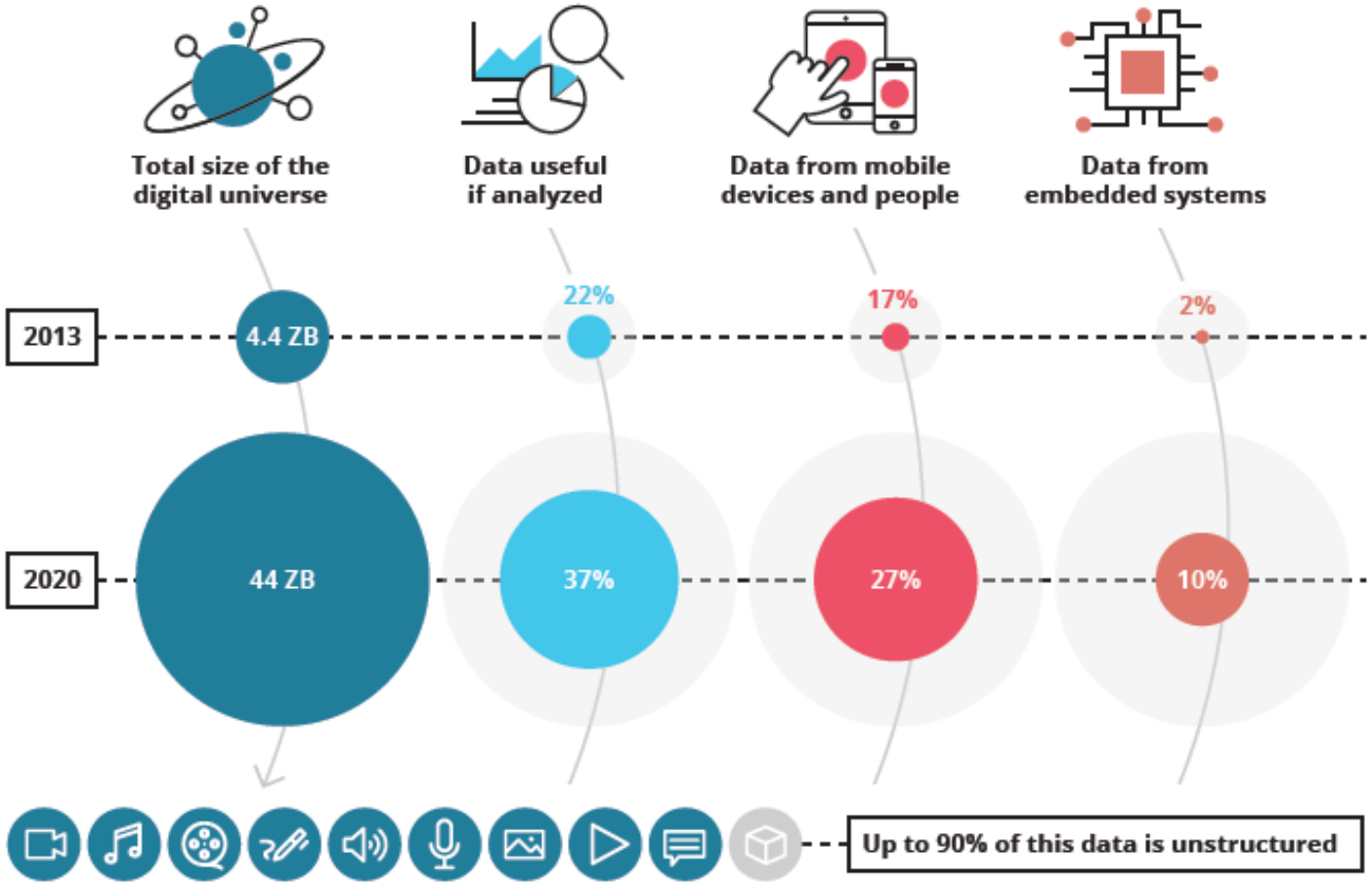
InsurTech: $8.5B in Investments To Date

The largest areas of growth will be self-service to drive simplification and sensors to derive value with real-time insights



Innovations Surrounding the Industry

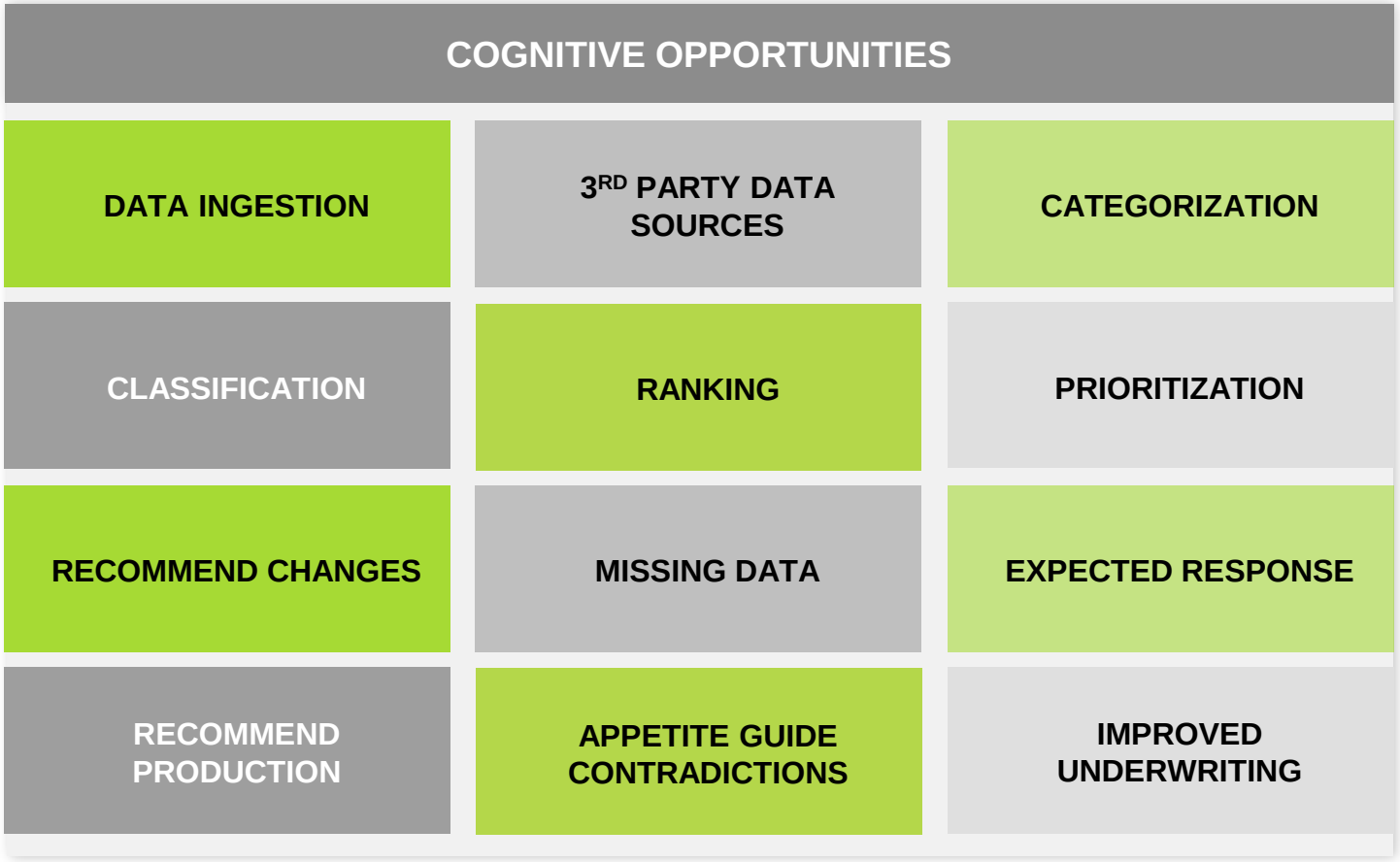
Evolving analytics efforts focus on illuminating powerful strategic, customer, and operational insights hidden within untraditional and “dark” data sources



Sources: EMC Digital Universe with research and analysis by IDC, “The digital universe of opportunities: Rich data and the increasing value of the Internet of Things,” April 2014; International Data Corporation, “IDC iView: Extracting value from chaos,” 2011, www.emc.com/collateral/analyst-reports/idc-extracting-value-from-chaos-ar.pdf, accessed December 29, 2016.

Innovations Surrounding the Industry

Advances in cognitive computing can help organizations move from the world of retrospective analysis to one where systems make inferences and predictions



Polling Question 1

Which is the most important trend impacting your organization's business strategy?

A. Sharing Economy

B. Self-Driving Cars and Advanced Driver Assistance Systems

C. Internet of Things

D. Social and Big Data

E. Machine Learning and Cognitive Insights

Innovations Within the Industry

Increasing demand for self-service oriented channels is prompting insurers to invest in digital strategies and capabilities that enable quicker response times

Feedback from surveys of small business owners provides insight into the buying preferences of commercial insurance customers in a digital era:

>50% at least somewhat likely to **purchase business insurance online** directly from an insurer

>60% said they receive **no service from their agents beyond shopping for coverage**

94% cited the **ability to compare prices and coverage from different insurers on one website** would increase comfort in buying online

82% desire **real-time communication in online purchases**, while eliminating the hurdles presented by automated-response telephone mechanisms

Sources:
Voice of the Small Commercial Insurance Consumer Survey, Deloitte Center for Financial Services
Deloitte Center for Financial Services, Small-Business Insurance in Transition: Agents difficult to displace, but direct sellers challenge status quo

Innovations Within the Industry

Insurers are engaging with InsureTech innovators in multiple ways to enhance presence in new and adjacent markets

The Case for Modern Systems

This changing environment favors insurance carriers that can conceptualize, develop, test and deploy new products at a high speed. The ability to do this quickly can be learned, but it is imperative that a carrier have a modern platform that can support product development.

- **System Architecture** to support re-use, standardization, and comprehensiveness – all product details and information in one place

- **Products** can support configuration and track adoption and performance; product configuration that can easily integrate with existing legacy systems

Given the changing environment, having the proper resources to support the development and configuration of products in technology systems will become even more critical.

The Case for Technology Enablement

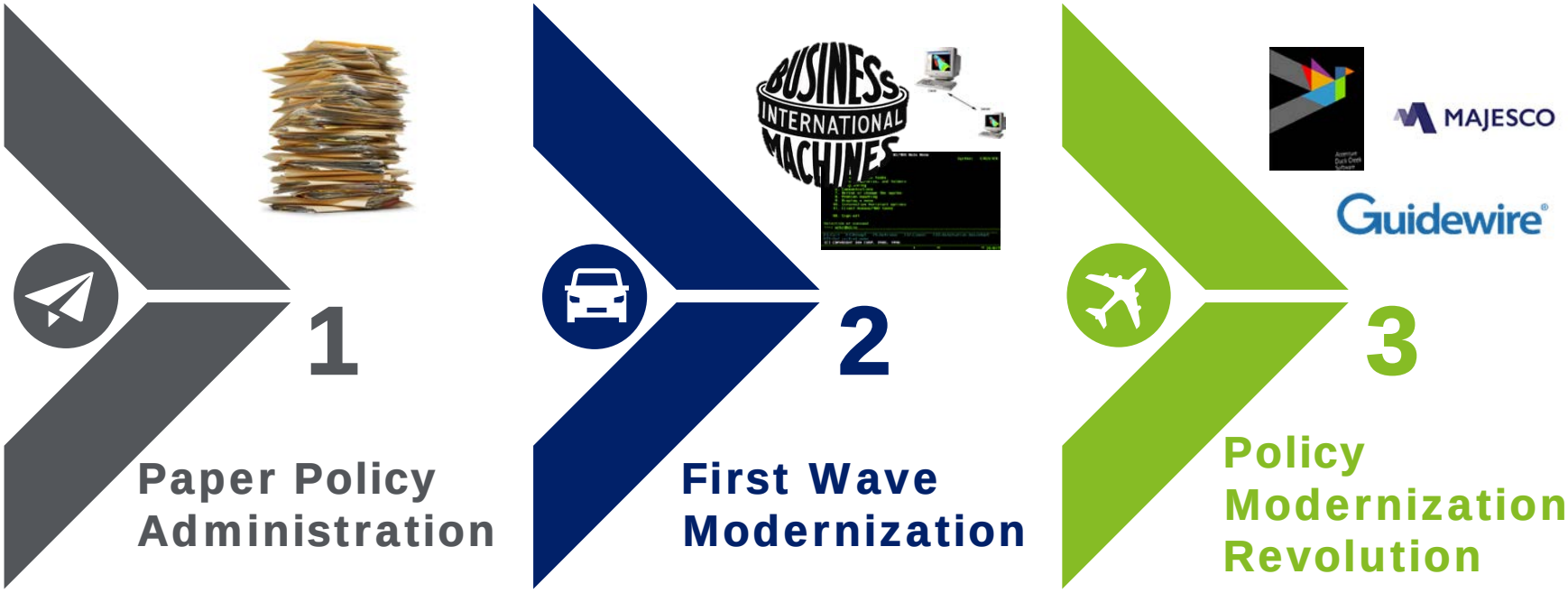
Technology enablement can drive further benefits from automation and performance support, but it can also serve to sustain process and operating model benefits that can deteriorate over time.

Common technology enablement opportunity areas:

- Lack of integration of existing (multiple) tools
- Expansion of automated underwriting (includes steps and end-to-end)
- New or improved self-service capabilities
- Improved operational metric tracking and reporting
- Big data storage and extraction
- Improved UW Support tools (knowledge management, collaboration, analytics, etc.)
- Workflow enablement

Evolution of Policy Administration

Our industry has evolved from paper based policy administration to a ridged electronic automation – now we are in the modernization revolution



Polling Question 2

Which technology enablement opportunity is most critical for your organization?

A. Integration of Existing Systems and Tools

B. Expansion of Automated Underwriting

C. Improved Customer and Agent Self-Service Capabilities

D. Improved Operational Metric Tracking and Reporting

E. Big Data Storage and Extraction

Roles and Considerations for Actuaries in Technology Initiatives

Polling Question 3

How many technology initiatives have you worked on?

A. None

B. One

C. Two to Four

D. Five or More

The Actuary Value Proposition

Actuaries analyze and manage the risks within insurance companies through their pricing, reserving, analytics and risk management roles. Thus, they understand the business of insurance & products offered, and provide context in a number of areas in an implementation.

Upstream Data Capture

Most system implementations rationalize the data capture process to **maximize the efficiency and leverage** across systems, LOBs, coverages, etc. Actuaries help set the bounds of what are the limits to this rationalization, so we can help define the most efficient way to capture data at the granularity needed

Industry Trends

Having an understanding of P&C insurance industry trends also helps to set the direction and provides a useful backdrop in **prioritizing LOBs, states, products, or features**, and managing scope of the effort.

Line of Business Specific Nuances

Actuaries can provide context to line of business-related nuances such as ones related to **data needs, how information is consumed, and variances in reporting granularity** (for sub-coverages)

Interaction with Developers

Actuaries can help provide context to developers & Business Analysts who don't have as **much in-depth experience in the information that the insurers collect, store, analyze and report.** Actuaries can help clarify requirements, identify areas where requirements may be missing, or help explain the product architecture or coverages

The Actuary Value Proposition

Many system implementations fail to achieve the desired business benefits when companies do not focus on the underlying business needs. With their strong knowledge of products and coverages, actuaries play a pivotal role in helping reduce this risk and keep the project on course.

Downstream Reporting

When designing reporting functionality, actuaries can better **assess the downstream impact** due to their deep knowledge of how reported data is used particularly as it relates to pricing and reserving. Thus, actuaries can raise concerns early on to prevent costly data transformations or change requests in the future.

Regulatory Requirements

In highly regulated LOBs such as Personal Auto and WC, actuaries are able to provide details on the legal context to help articulate requirements that capture and **comply with regulatory variances across LOBs and states**. This is helpful in systems that enable multi-state and packaged policies.

Integrations

Actuaries have a deep knowledge of the insurance product, how it operates, and the third party data related to each product. Thus, actuaries are able to give insight when identifying opportunities to **leverage integrations to save time and user input** and also when **estimating scope and complexity** for integrations.

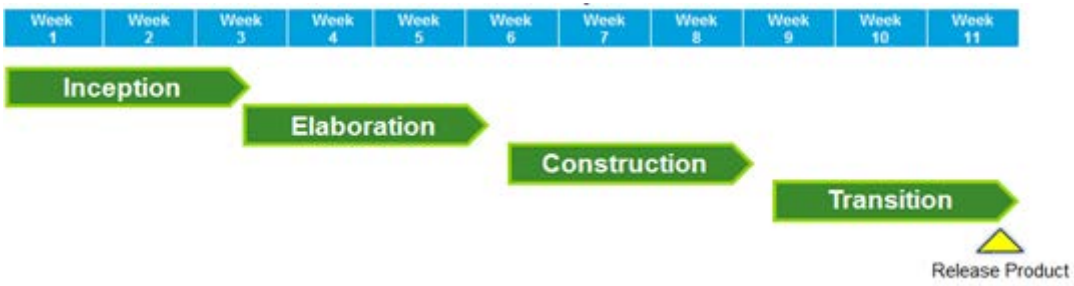
Compliance

Actuaries' knowledge of rating and regulatory requirements can help contribute to conversations on any changes to the product. If insurers are changing their underwriting guidelines or adding a new coverage, **actuaries can verify if insurers need to refile** which may impact the timing of when changes can be fully realized.

Detailed Comparison of Methodologies

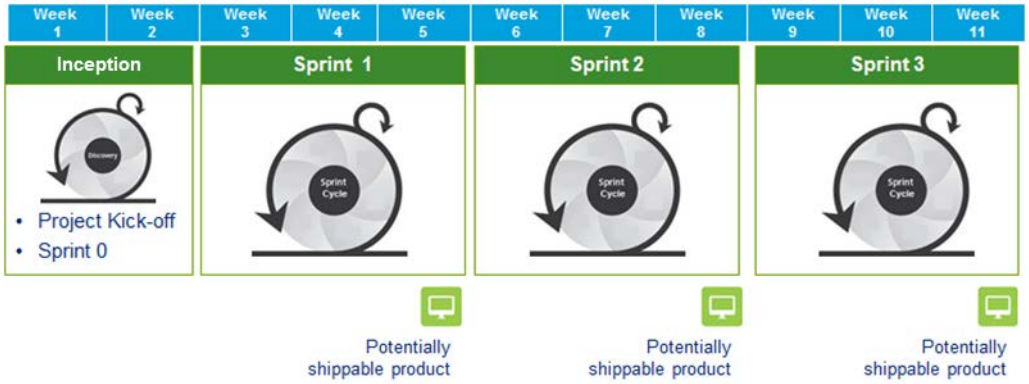
Agile is focused on flexibility and speed, while Waterfall prefers planning and predictability.

Waterfall development



- Is linear & sequential; favors predictability
- Prioritizes processes & tools
- Spans months from planning to final product
- Defines comprehensive list of requirements at outset of development lifecycle
- Prefers comprehensive documentation
- Creates static requirements documentation at beginning of project

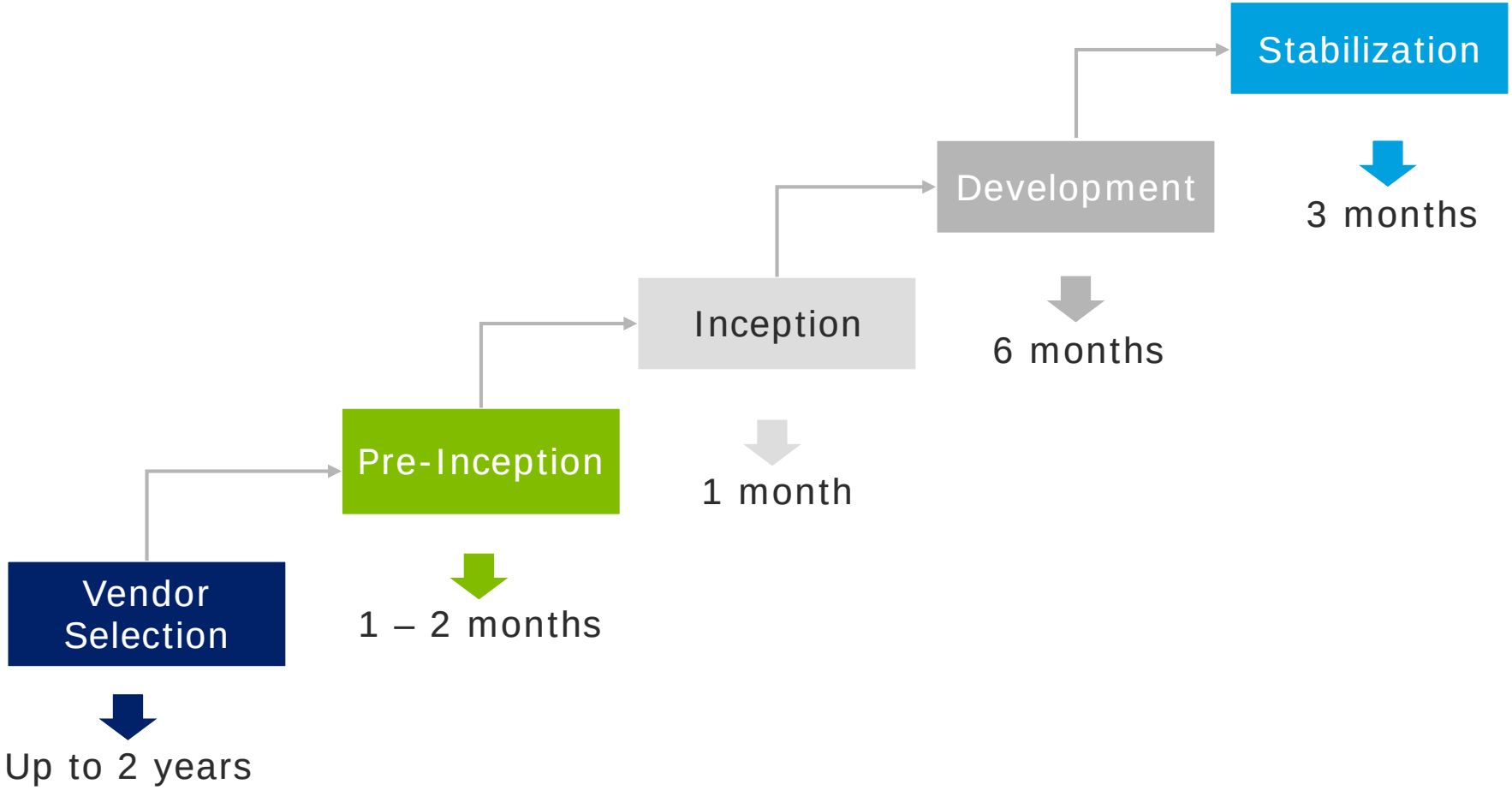
Agile development



- Is iterative; favors adaptability
- Prioritizes individuals & interactions
- Produces working software in increments over 3 week “sprints”
- Defines high-level requirements or “Epics” in product & release plans
- Defines and refines “User Stories” at sprint planning for each Sprint
- Prefers working software
- Creates and iterate living, breathing user stories

Stages of Agile PAS Implementation

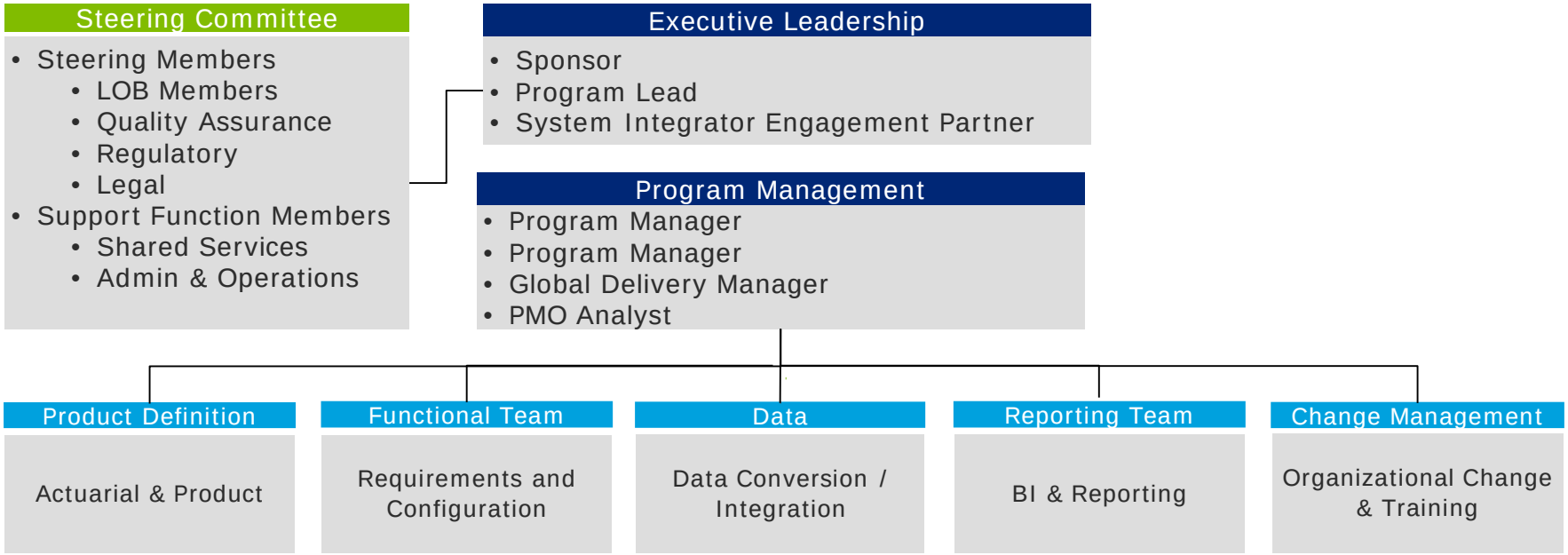
The Agile approach is the mostly commonly used approach among companies for technology implementations, especially PAS.



Scope is validated at each stage of the Agile PAS implementation.

The Team

Actuaries play a role as defining the product and can become critical functional resources for technology initiatives. Actuaries play in primary roles but can play different roles across the team depending on the situation



Stage 0: Business Case and Vendor Selection

Actuaries can provide functional support to this initial discovery phase

Recommended Activities

- Understand current uses, deficiencies in existing core system, and features desired in future systems
- Develop and present business case for upgraded PAS
- Identify and screen vendors
- Request for Information ("RFI") design:
  - Operational experience
  - Functional capabilities
  - Technical capabilities
- Hold discovery calls and preliminary screenings with vendors
- Facilitate vendor demonstrations

Actuarial Impact

- Participate in interviews with existing PAS stakeholders
- Quantify costs and benefits of an updated PAS
- Define required Functional Capabilities for the new PAS
- Participate in vendor screenings
- Participate in scoring criteria design
- Participate in vendor demonstrations and scoring

Stage 1: Pre-Inception

Actuaries' product and rating knowledge becomes valuable in the planning stage of PAS implementation

Recommended Activities

- Define core operational and process components
- Define products
  - Develop a new product
  - Refresh /enhance an existing product
- Develop product architecture
- Develop product specifications
- Filings for new product
- Conduct market analysis

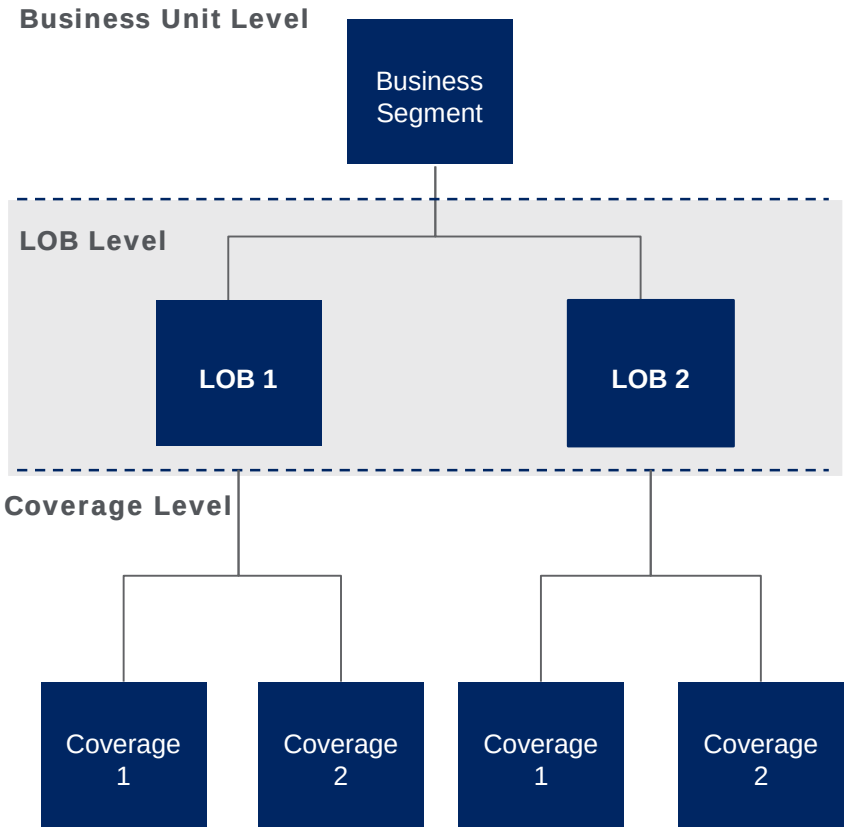
Actuarial Impact

- Articulate and develop product architecture
- Develop product specifications
  - Define rating algorithm, and ID opportunities to rationalize across segments
  - Identify rating required fields
  - Determine the dependencies between the rating fields
  - Define form attachment logic
  - Define business rules and logic
- Strategic use of bureau rules, rates and forms, if appropriate
- Provide insight into the complexity of product configuration for various LOBs

Stage 1: Pre-Inception

Product architecture enables a comprehensive mapping of the coverage components and dimensions for products

Hierarchical Components



Component

Line of business and coverage components can be assembled to create products and market offerings

Dimensions

- **Underwriting**
- **Coverage**
- **Forms**
- **Rating**
- **Rules**
- **Data Capture**

Dimension

Dimensions are items mapped to a line of business or coverage component, which can be re-used when assembling products and market offerings

Stage 1: Pre-Inception

Product specifications for each dimension category are used to configure the system for a particular product or market offering. Below are some examples of product specifications by category

Underwriting	• Underwriting questions • Underwriting rules • Automated alerts / guidance
Coverage	• LOB / coverage mapping • Coverage attachment rules • Limits / deductibles / attachment points • Terms and conditions • Terms and conditions rules
Forms	• Forms list and categorization (dec. pages, policy forms, endorsements, notices, etc.) • Forms attachment rules • Fill-in information for variable forms
Rating	• Rating algorithms • Rate and factor tables • Pricing modifications • Rating rules
Data Capture	• Customer / Broker data • Underwriting data • Coverage data • Exposure data • Rating and Pricing data

Case Study 1

Client Overview

Global firm implementing a single platform to be used across regions, while creating some consistency in pricing.

Issue

- Each region operates semi-autonomously
- Platforms used vary by region and product line
- Inconsistent data collection and standards

Solution

- Development of a new platform to be used for several products and regions – complete end to end system, including policy issuance, pricing, and reporting
- Actuarial support provided in facilitating discussions around rating, data capture, and reporting, making sure to keep alignment with the business
  - Ways to enhance current pricing factors and algorithms, while also creating some consistency
  - Incorporating key metrics

Impact

- Actuaries were heavily involved in several stages throughout the process, including:
  - Product architecture, and helping to develop a framework to apply to other lines of business, to support efficient ongoing development
  - Identifying requirements to meet business objectives around pricing and analytics, including insight on collecting data on a global level and in a consistent fashion

Stage 2: Inception

Actuaries' expertise in rating and analytics are crucial to PAS design, particularly in the development of functional specifications

Recommended Activities

- Establish release schedule
- Translation of product specifications
- Develop functional specifications
- Design user interface and screen flow
- Understand integration points, e.g. consider billing and commission integration

Actuarial Impact

- Refine or optimize rating algorithms
- Investigate where streamlined processes and straight through processing ("STP") can bring efficiency
- Provide insights for analytics and business intelligence
  - Leverage analytics platform within PAS
  - Design data extracts for analysis outside of PAS
- Define business rules & validation logic
- Incorporate reporting requirements of statistical bureaus and the state DOIs

Case Study 2

Client Overview

A global technology company that provides insurance technology solutions to the P&C insurance industry (policy admin, claims, broker, etc.)

Issue

- Entrance into the US Admitted Market with an end to end solution
- While the client had a portfolio of technology products in the global insurance marketplace, including a PAS used mainly by specialty carriers in the US, they had targeted entry into the US Admitted market.

Solution

Actuaries provided subject matter expertise and knowledge in the following areas:

- General knowledge of bureaus and downstream impact
- Bureau rating, including the rating factors and algorithm
- Bureau forms library, including understanding all fields and components included within hundreds of dynamic forms and linking them back to the fields within the rating tables
- Bureau reporting, including premium and loss requirements, specifications and logical mapping tables

Impact

- Developed functional specifications for both the PAS and the rating algorithm
- Prioritized functional specifications and features to be included within the PAS (what was “nice to have” vs. “can wait”)
- Technology company brought a functioning PAS to the marketplace

Stage 2: Inception

Automated underwriting processes via STP can shorten turnaround times and increase consistency in underwriting outcomes

Eligibility & Triage	Product & Coverage	Predictive Risk Scoring	Rating & Pricing	Risk Assessment
Determine risk class for insured Decide if class is eligible for <u>any</u> product / coverage	Specify available coverages and coverage levels based on selected product and insured characteristics	Use advanced analytics to generate a score that predicts relative risk of the insured	Apply rate rules to calculate objective premium and model score to guide pricing adjustments	Enforce UW guidelines, including actions based on model score

Supported with third party data, predictive models, and rules engines

Stage 2: Inception

Help improve performance and drive strategy by asserting need for advanced analytics

New policy system creates analytics opportunities

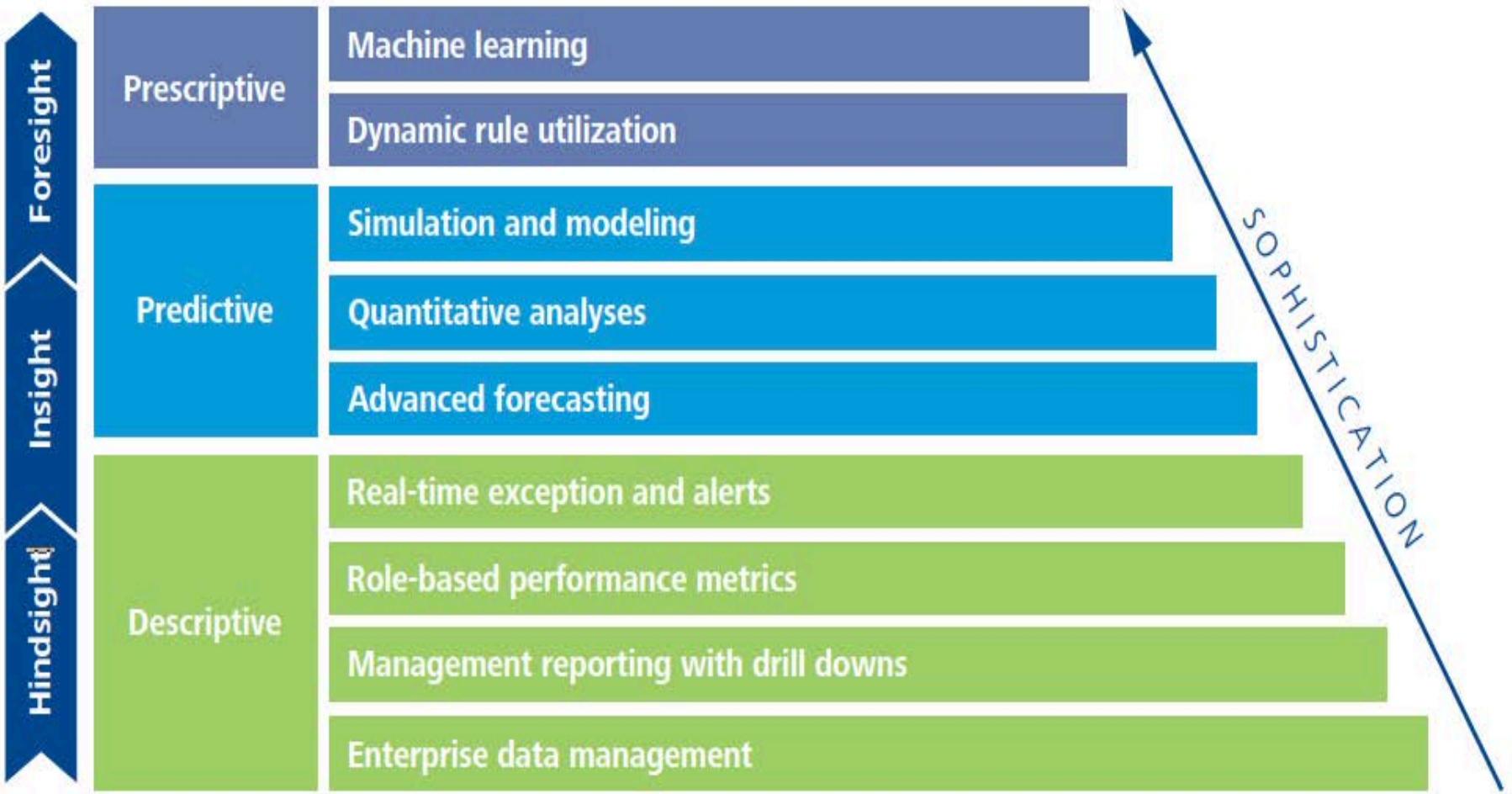
- Data and analytics is the “life blood” of the P&C insurance industry
- Competition is driving analytics advancements
- Investment in a new policy system is a unique opportunity to address analytics

Focus on the three “A’s” for success:

Accumulate	• What are third party data needs today? In the future? • How do I maximize the data capture of underwriting information?
Analyze	• What tools are required by underwriters? Actuaries? Management? • How do we transform data into information?
Actionable	• What are the predictive model requirements today? In the future? • How can I enable rapid changes to product, pricing, etc.?

Stage 2: Inception

Actuaries can help bring insights to companies from data and make it actionable



Stage 2: Inception

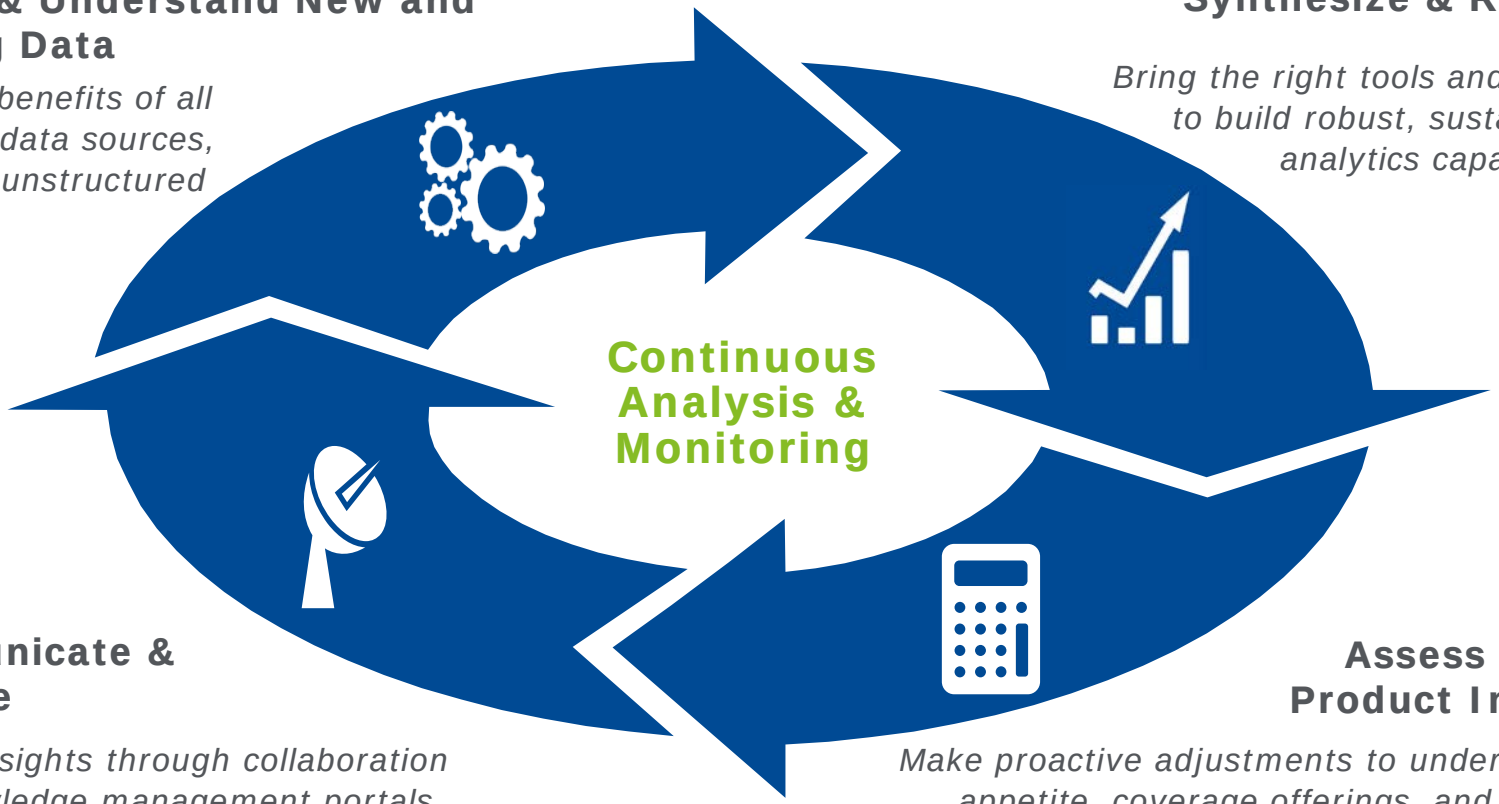
Harnessing the ability to generate and utilize risk insights is a competitive advantage

Gather & Understand New and Existing Data

Mine the benefits of all available data sources, including unstructured data

Synthesize & Report

Bring the right tools and talent to build robust, sustainable analytics capabilities



Communicate & Educate

Deliver insights through collaboration and knowledge management portals

Package insights to develop thought leadership for customers and producers

Assess UW & Product Impact

Make proactive adjustments to underwriting appetite, coverage offerings, and pricing

Provide a fact base to enhance and support risk selection and pricing decisions

Stage 3: Development

Actuaries are key advisors to product configuration and development activities, and may have the skill sets to participate directly

Recommended Activities

- Product configuration and development
- Implementation of rating algorithm

Actuarial Impact

- Interact with developers to ensure that build follows functional specs
- Prioritize development needs – keep perspective on what's important
- Keep an open mind on process to get to end state
- In some cases, with a strong programming language background, actuaries build and implement the rating engine themselves

Stage 4: Stabilization

Actuaries are an important resource for the testing and development teams in identifying and prioritizing defects

Recommended Activities

- Four Phases of Testing
  - **Unit Testing** – Developers test the functionality they have built
  - **Component Testing** – Testing team tests the system based on functional specifications
  - **End to End Testing** – Testing team tests full system with all integrations built in
  - **User Acceptance Testing ("UAT")** – Stakeholders and end users test the new system

Actuarial Impact

- Work with testing team to design and validate test scripts
- Provide pre-existing pricing tools (e.g., in Excel) to developers and testing team as means to test PAS output
- Actuaries should not do comprehensive testing themselves
- However, hunter testing by actuaries can provide valuable feedback to the testing team and help them prioritize system issues and defects to be fixed

Case Study 3

Client Overview

Super regional firm offering both personal and commercial lines

Issue

- Products are antiquated and non-profitable. There is a need for new coverages, features, rules and rates
- Legacy platforms that are inefficient and difficult to update. New technologies, such as telematics, are difficult to implement

Solution

- Development of a new product platform – complete for Policy issuance, Billing and Claims
- Actuarial support provided in product definition, product reconciliation, building rating – including factors and algorithms, functional design, statistical reporting, as well as designing key performance metrics

Impact

- Actuaries were heavily involved in the current product analysis, new product definition, functional design, configuration, test case/scenario development and actual testing of the Personal and Commercial products
- Delivered products thus demonstrated modern/leading features, policy and rating capability
- Delivered products able to align with new package solution, industry standard templates and greatly reduced speed to market

Tips in Assisting with a Technology Implementation

- ✓ **Get involved early** – technology implementations take months, even years to complete. Usually an actuary is pulled in as needed. Waiting to be pulled in might get you in too late, e.g. UAT
- ✓ **Provide support outside of simply the ending numerical analysis** – in all technology implementations, actuaries have certain roles. Expand beyond those roles which will challenge you and help you grow your insurance and technology knowledge
- ✓ **Data is paramount** – actuaries play a key role in ensuring that others receive consistent and accurate data necessary for analysis
- ✓ **Monitor the results** – technology implementations contain a lot of moving parts that should be monitored. Assuming everyone has the correct level of knowledge is never a good thing. Monitor all results seen to ensure that changes are properly accounted for and things that should not be changing, do not change
- ✓ **You control your destiny** – in the end, you will be using in some way/shape/form the implemented technology. The more you can be involved, the more suggestions you make, the better the product will be in the end for yourself as well as your company

Questions for Panel?