

AI, Analytics & Actuaries

CANDIDATE CONNECT

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AI, Analytics & Actuaries

AI transforming
professional work

Changing nature and
understanding of risk

Transforming finance & mitigation
of risk (insurance)

Actuaries: Opportunity for innovation

AI/Machine learning: a quick primer



What is Artificial Intelligence (AI)?

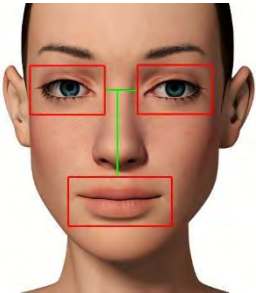
- Ability of a machine to perform cognitive functions we associate with human minds
 - Perceiving, reasoning, learning, and problem solving
 - Examples: robotics, computer vision, natural language, processing, virtual agents
- AI is best thought of as augmented intelligence.
- **Machine learning** is the process by which the machine gains intelligence

What is machine learning?

- Uses algorithms to find relationships in data to make predictions
- Not like traditional logic-based programming
- More akin to human learning: predict, “learn,” repeat
- Made possible by three developments:
 - Increased amount of digital data (**Big Data**)
 - Increased computing power (including storage)
 - Better algorithms (**e.g. Predictive Analytics**)

New technologies drive machine intelligence

Computer vision



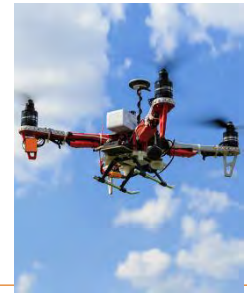
Natural language



Cognitive agents



Robotics and autonomous vehicles

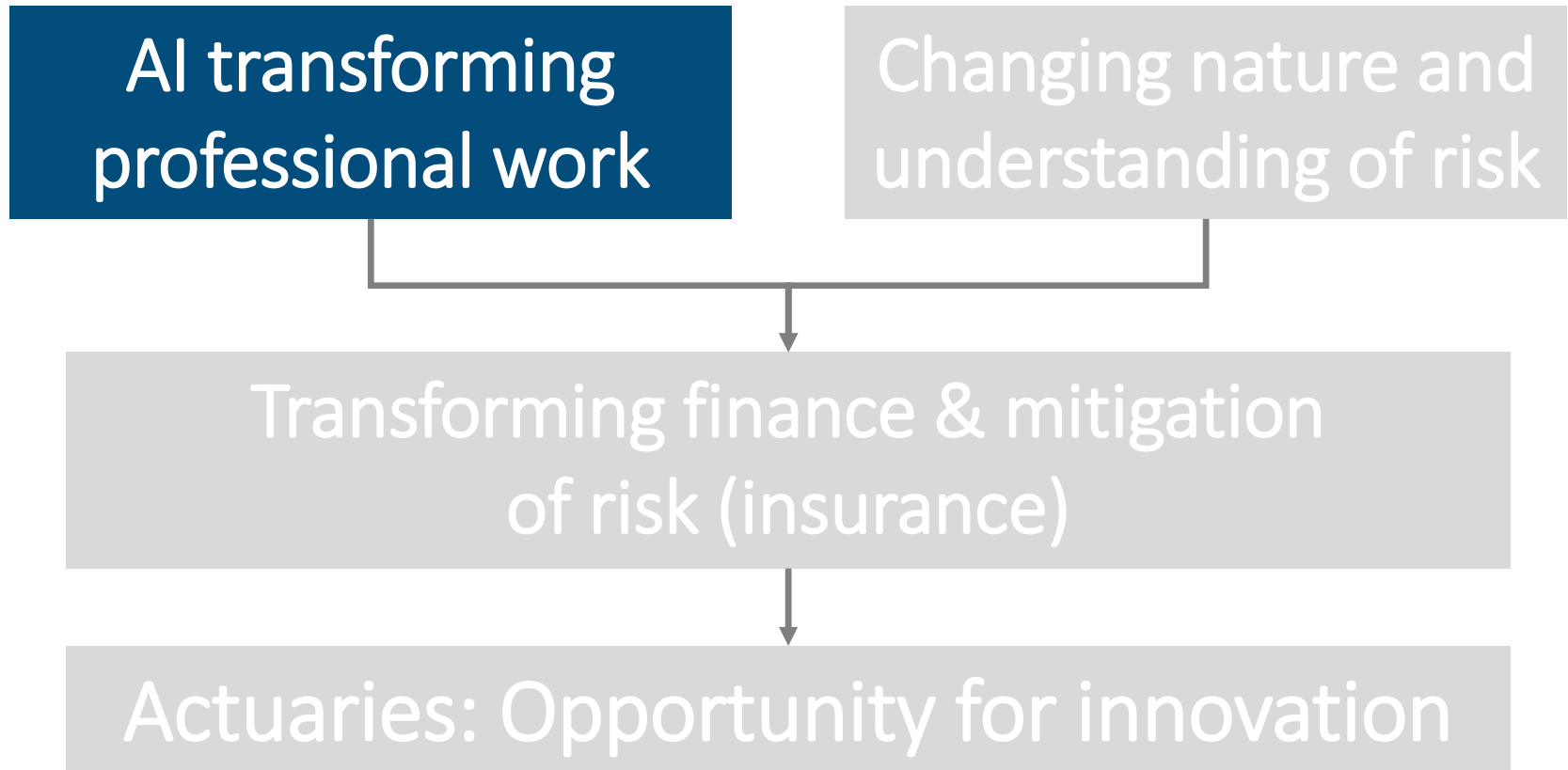


Machine learning & Deep learning



*“Artificial Intelligence (AI) is intelligence exhibited by machines, with **cognitive functions** that are associated to humans. Cognitive functions include all aspects of **perceiving, reasoning, learning, and problem-solving**”*

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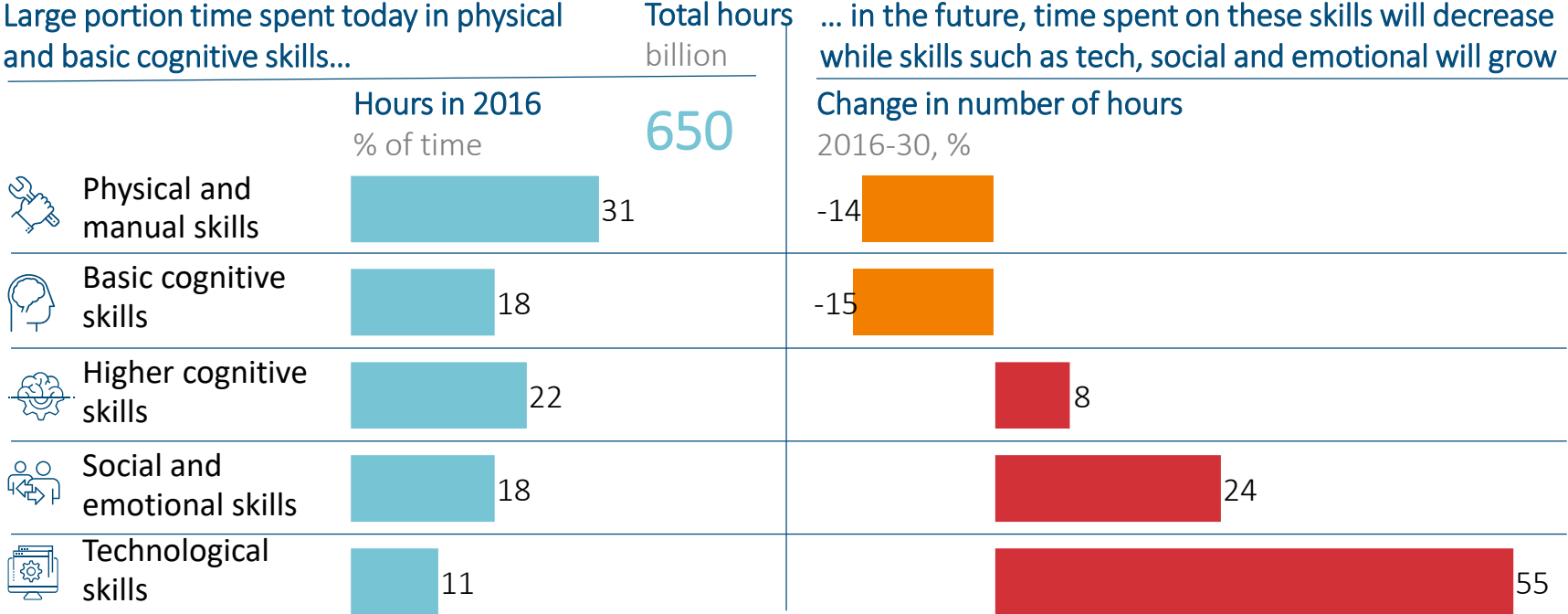
AI, Machine learning, automation will change role of professionals

- Automate many functions
- Create superior predictions
- Change what actuaries do, from prediction to judgment and creativity

Greater computer “intelligence” shifting human tasks to those that require more technological, social and emotional skills

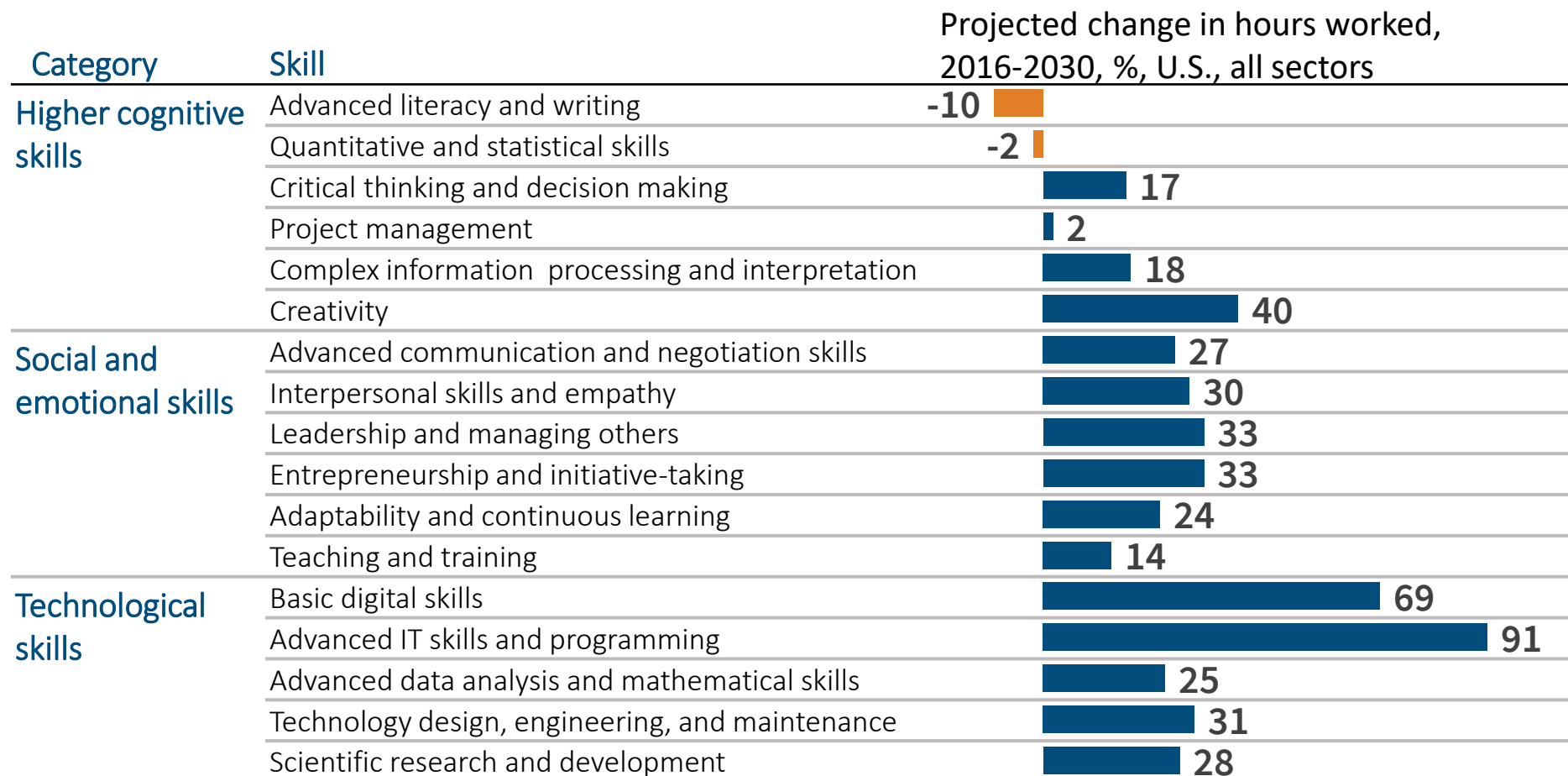
United States and Western Europe

All sectors

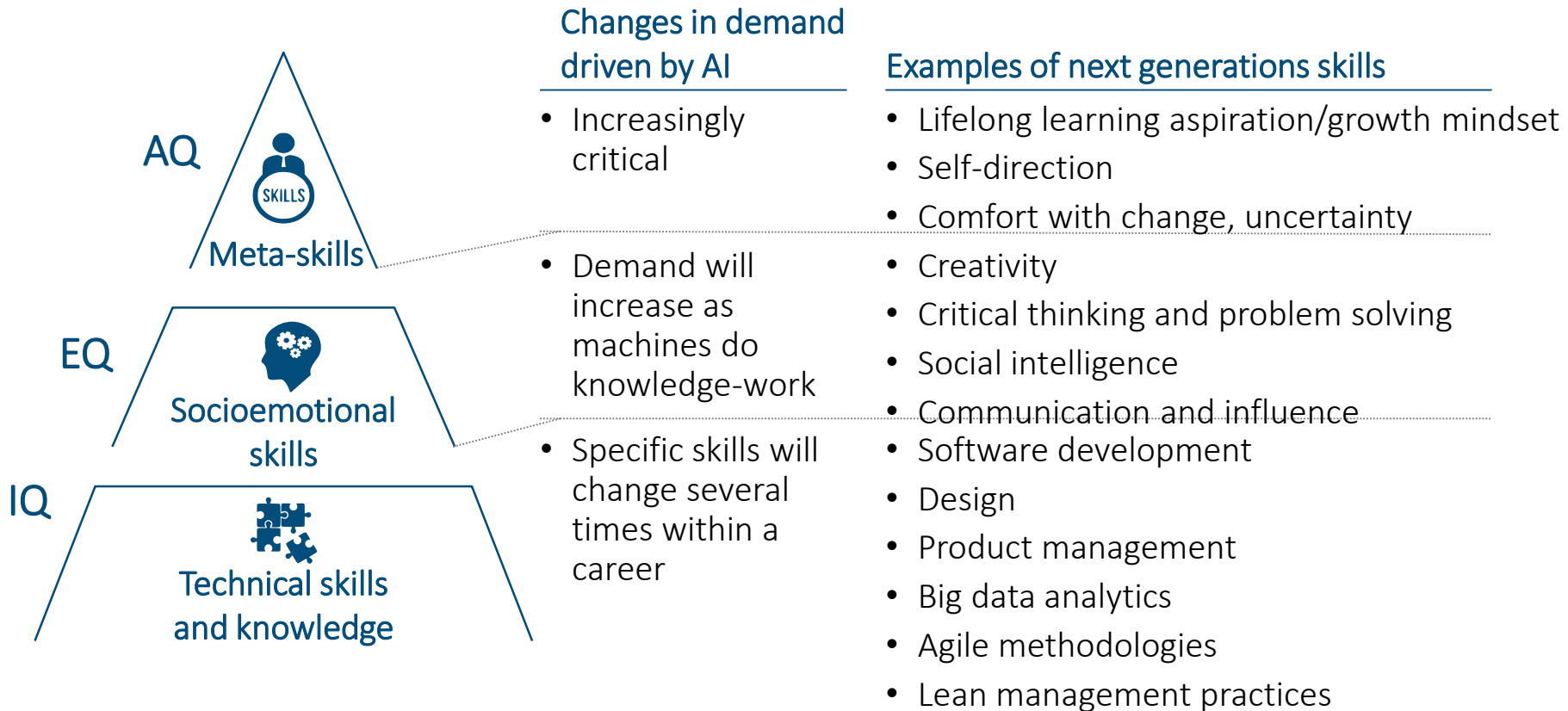


SOURCE: McKinsey Global Institute analysis

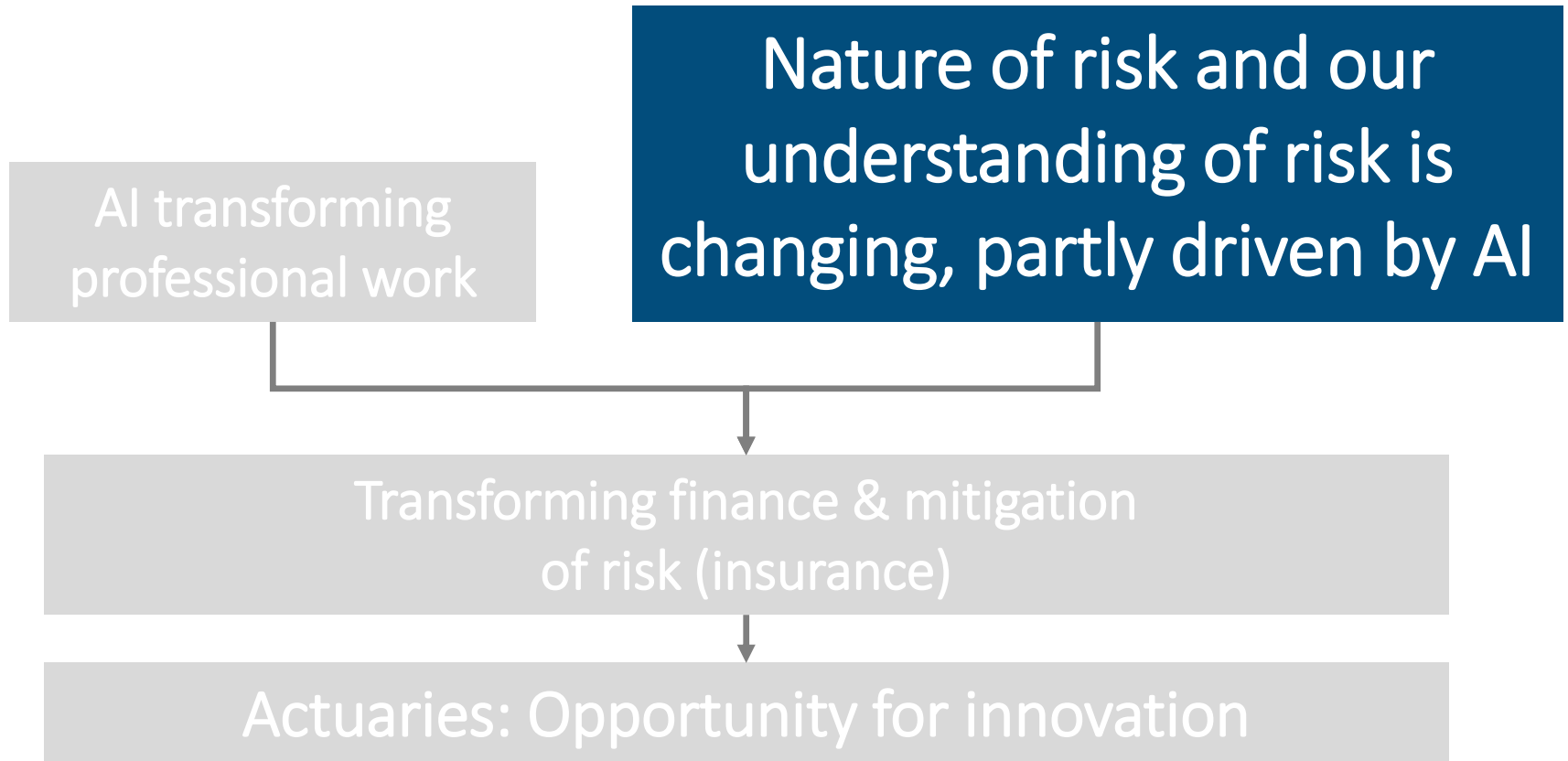
AI will change what professionals do



Adaptability and lifelong learning will be critical

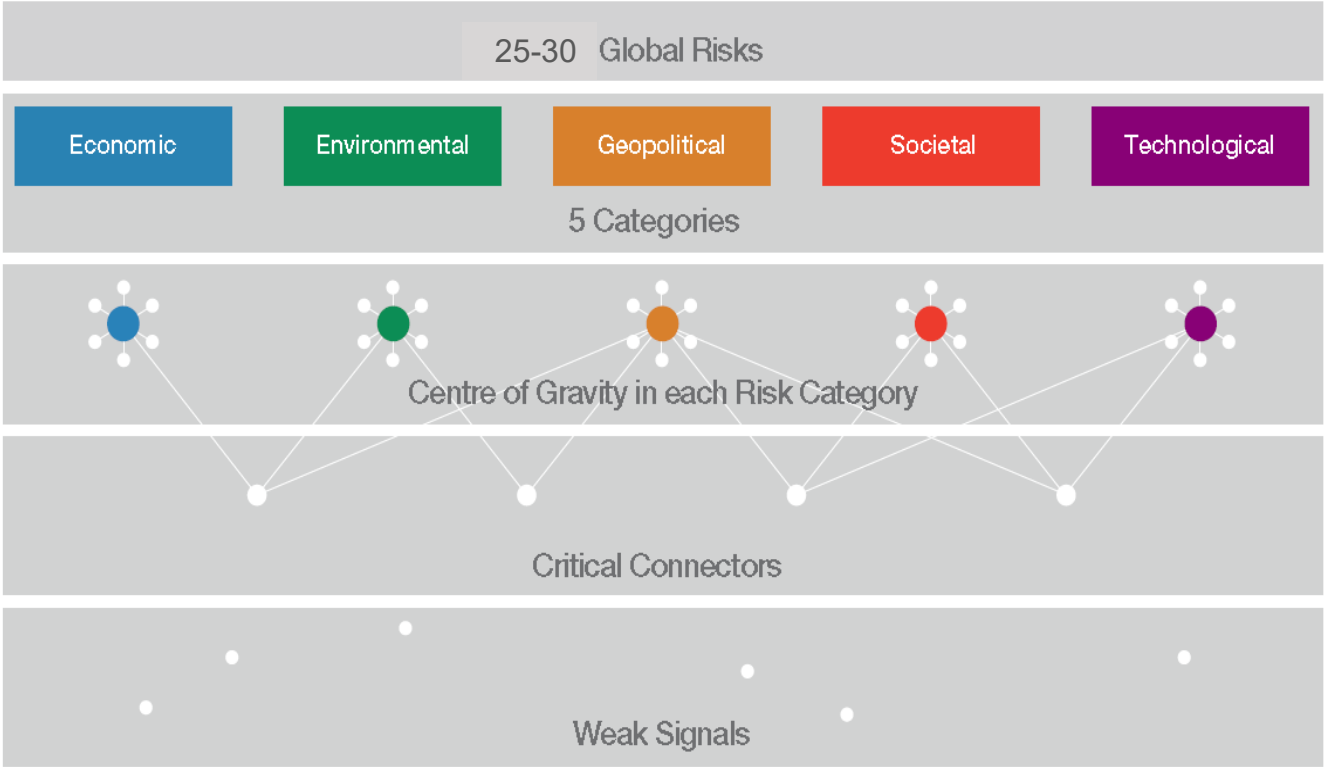
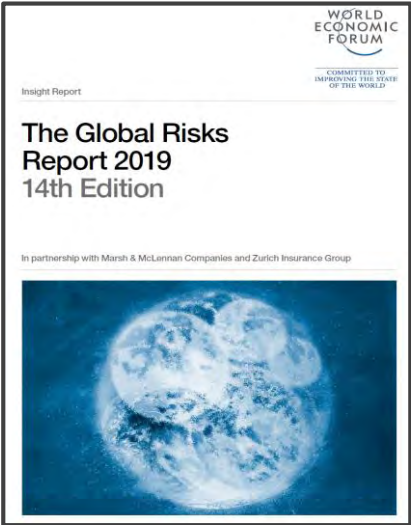


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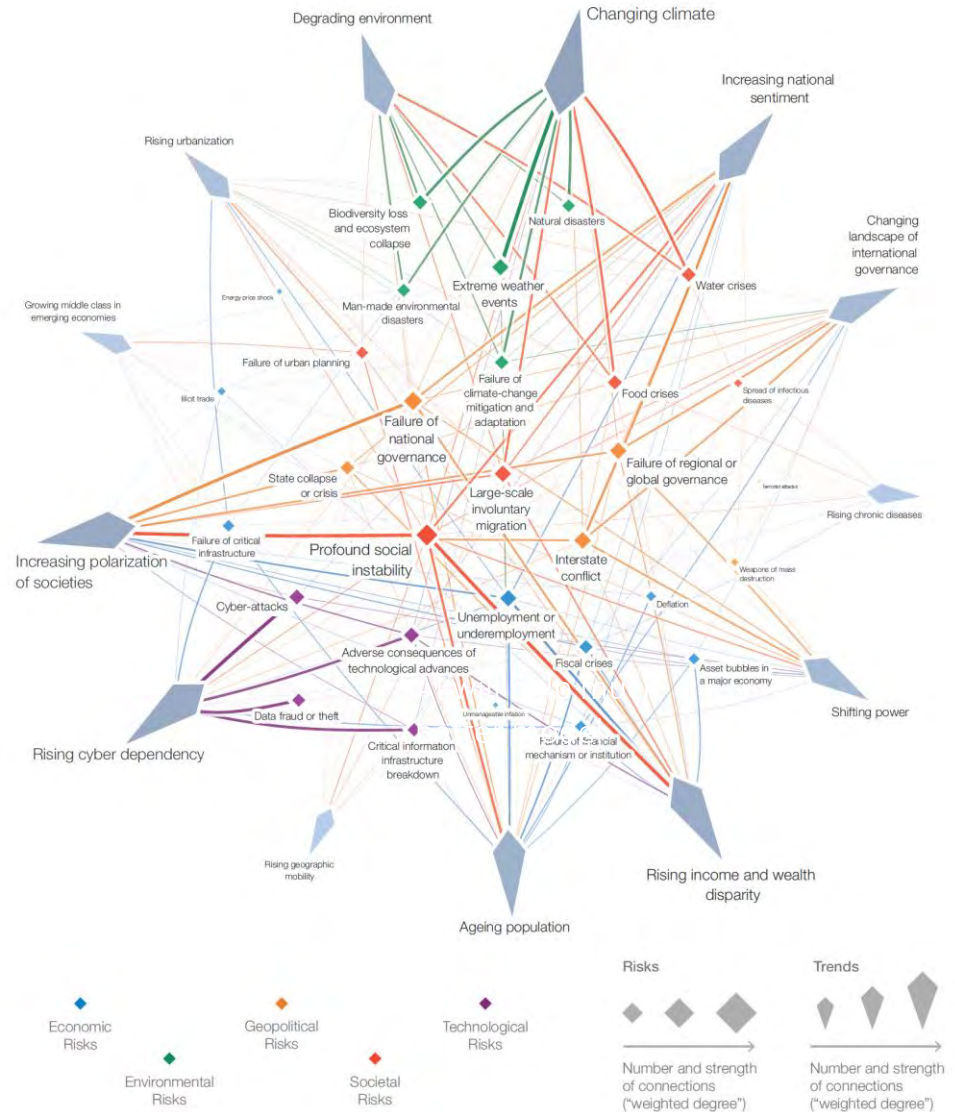
Global risk landscape is evolving quickly...
which may change how risks are quantified. Some risks will be more difficult to insure, while other new insurable risks will emerge.

From a (reassuring) siloed typology of Global Risks...



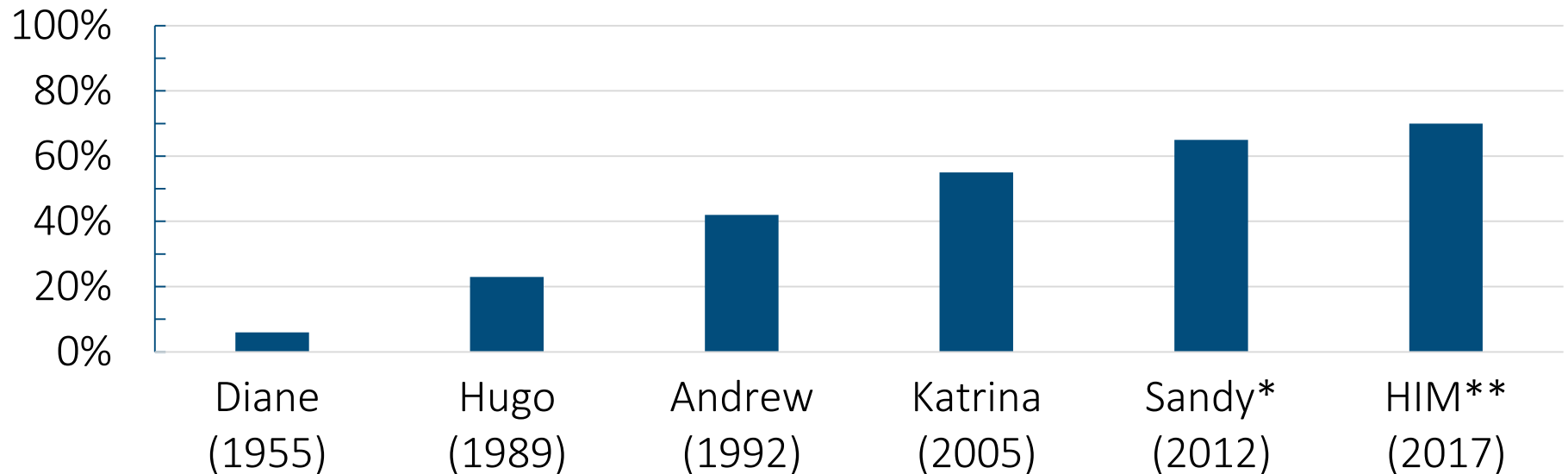
Source: World Economic Forum

...to growing interdependencies transforming the risk landscape.



Increasing catastrophic risk borne by US Taxpayers

Major U.S. Hurricanes
Percentage of Total Loss Paid by the U.S. Government



Sandy was classified as a Superstorm when it hit the US coast

** HIM: Hugo, Ivan and Maria

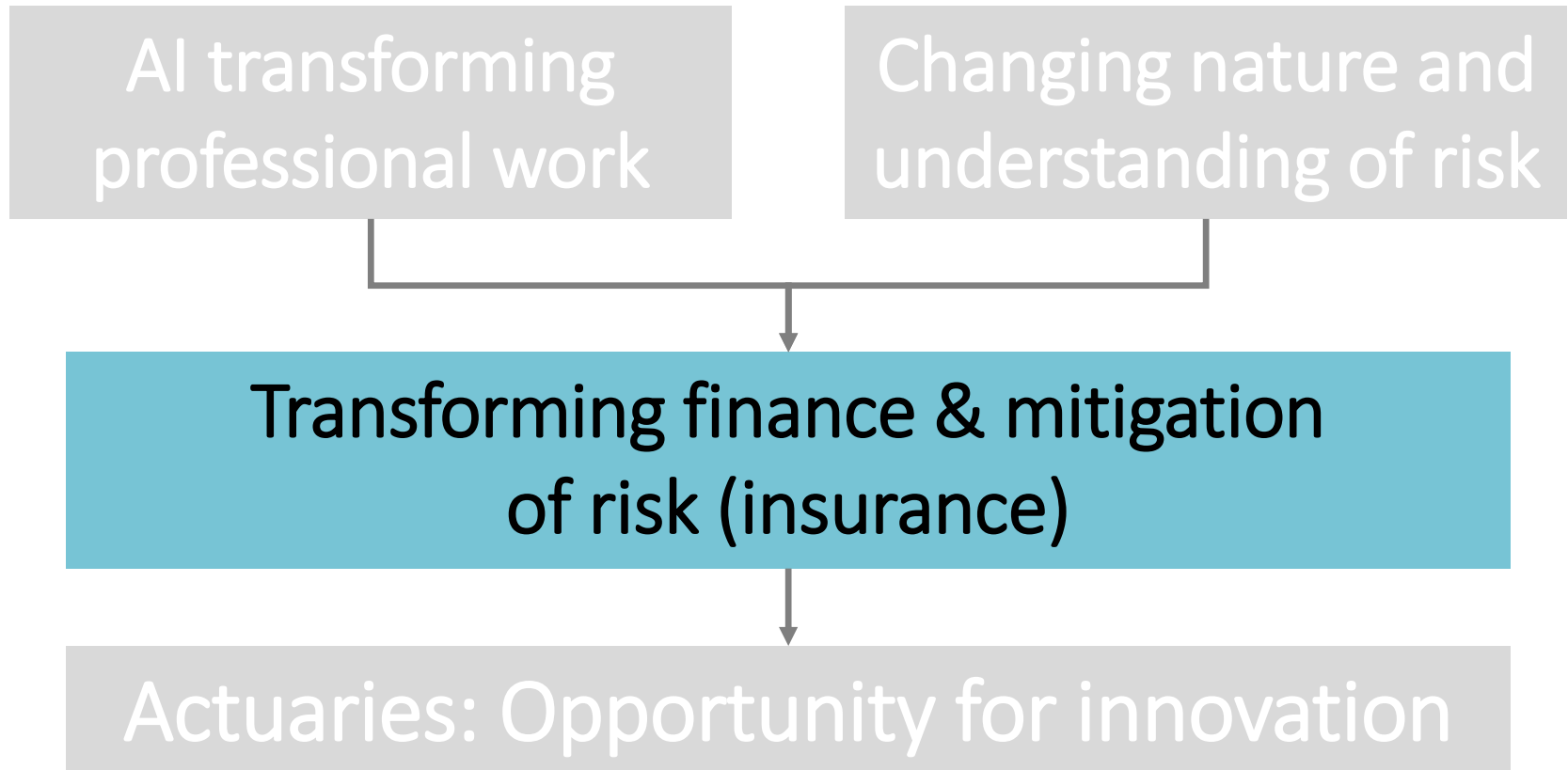
Property: Changing nature of risk

- Not just about insurance, but about risk mitigation and avoidance
- **Property risk:** coastal flooding risk increases due to rising sea levels
- Mitigation strategies:
 - Hard engineering (sea walls, storm surge barriers)
 - Nature-based defenses (marshes, mangroves)
 - Getting out of the way (moving people/infrastructure)
- **Property insurer risk:** Spreading wildfire risk in California

Morbidity: Changing nature of risk

- **Mortality & morbidity risk:** loss of biodiversity affects health and socio-economic development
- Lack of access to sufficient variety & quality of food → micronutrient malnutrition (2 billion people)
- Half the world's plant-based calories provided by three crops: maize, rice and wheat (famine/malnutrition risk)
- **Health insurer risk:** Gene therapies that can cure chronic diseases but carry million dollar price tag

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AI will change our understanding of risk: potential consequences

Frequent risks

- ▶ *Measurable*
- ▶ *Tech-based*
- ▶ *Too much data; “Risks of one”; threatens notion of risk pooling*

Life/Health: *Mortality, Morbidity*

P&C: *Auto, Property*

- ▶ *Aggregating and synthesizing “very big” data*
- ▶ *Measure, instead of predict*
- ▶ *Working with ecosystem partners*

“Barbell”



Therefore,
new risk
skills needed

Severe risks

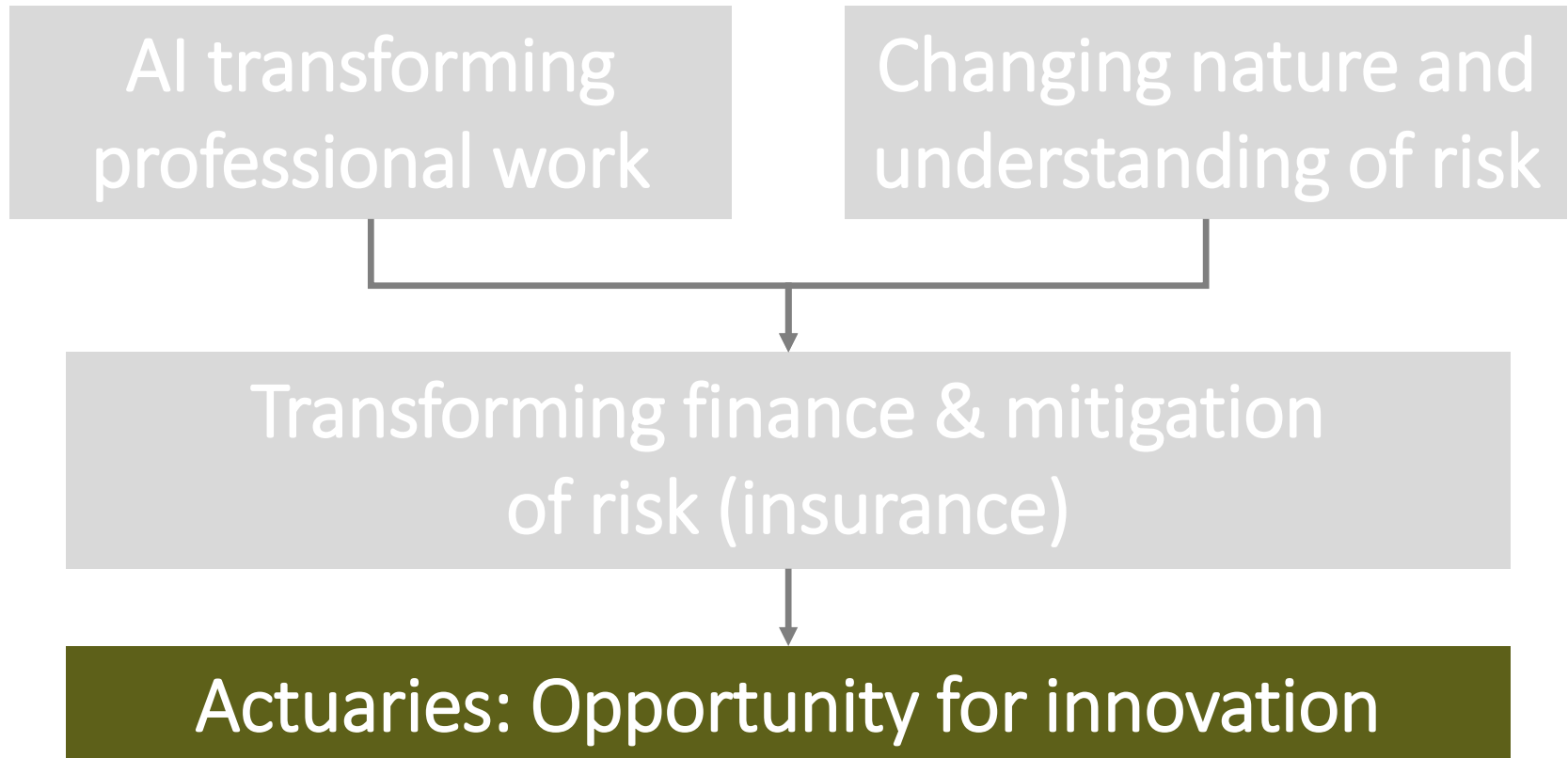
- ▶ *Unmeasurable*
- ▶ *Metastasizing*
- ▶ *Social & economic burden*

Life/Health: *Longevity*

P&C: *Catastrophes, Cyber*

- ▶ *Modeling uncertainty*
- ▶ *Building integrated service solutions beyond risk transfer*
- ▶ *Working with ecosystem partners*

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Opportunity for innovation

- AI/automation will transform how insurance is sold & administered
 - Underwriting/measuring risk
 - On-line sales environment
 - “Automated” claims processing
- AI (understanding of risk) and changing nature of risk will change what insurance needs to accomplish: understand, prevent & finance
- What will insurance look like 50 years from today?

Skills to meet the challenge

- **Understand data science** to harness its insights
 - Big data (data structures), data visualization
 - Analytics: models being used and how to work with them
- **Build the EQ/AQ skills**
 - Cross-functional data analytic teams
 - Communicate with data scientists
 - Communicate with regulators
- **Build creativity** : design the solutions to meet tomorrow's evolving changing risks, using insights of AI

Foundational skills: math, finance, business, actuarial math, risk

Questions



Thank you!





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ACTUARIES®**