Institute of Actuaries of India
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CELEBRATING 75 YEARS OF INDIAN ACTUARIAL PROFESSION EST. 1944

International Actuarial Association
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Actuaries : Striving for excellence, creating sustainable future

21st Global Conference of Actuaries

17th - 19th February 2020 | Mumbai, India

InsurTech: New Frontiers for Predictions & Judgements

Presented by David Sandberg FSA, MAAA, CERA
Society of Actuaries Elected Board Member

Wednesday, February 19, 2020

Framework of Sustainable Insurance

- Volatility Creates Permanent Losers and Threatens Stability of Insurance
- Premium/Cost of Sustainable Insurance =
  - Mean Cost of Risk (M)ean
  - Cost of Volatility of Risk (V)ariance
  - Cost of Uncertainty about the Mean and the Variance (U)ncertainty
  - Cost to Market, Sell, Build & Service Product, Fund Payments and Monitor Emerging Risks (E)xpenses

Navigating Complexity of InsurTech

- Which Segment of Value Chain is Being Targeted?
  - Distribution
  - Customer
  - Selling
  - Maintenance & Servicing (Claims, U/Wing, Reserving)
  - Pricing
- Is Solution Efficiency Based or Transformation Based?

My Fundamentals of Actuarial Practice – How to MIND THE GAP

- Validate/Assess Gaps via independent models/frameworks or sources of data
- Predictions/Assumptions are Transparent so they can be tested via Feedback Loops
- What Gaps could blow up/sink the ship and can they be mitigated?
- Gap Between Risk & Uncertainty

GAP Between Risk & Uncertainty

- Risk means lots of data to reliably estimate means and variances of a risk class. Quantitative/machine based solutions are easy to apply.

- Uncertainty means risk distribution parameters are unknown, difficult to estimate or not stable over time. Judgement based design is needed to ensure sustainability of insurance

Two Contrasting Approaches to Add Value

- Do it Faster, Cheaper, More reliably with IT/Machines
- Manage the M and V and U by Innovation via Changed Behavior, Creativity and Judgements of Company Workers and Policyholders

End Results?

- Increased volume & greater penetration of coverage
- Commodity (price competitive) insurance may become a subset of an experience or part of a trusted advisor role for a Lifetime of Individualized Risk Management Guidance
- Can't simplify complex interdependent risks
- Refined Risk segmentation leads to uninsurable pools or discrimination
- Valuation of data "asset" – What does that mean?

Social/Cultural Challenges

- Respectable navigating of privacy barriers
- Corporate culture – Are customers and employees a community or a collective? Personalized touches or Impersonal? Empowered or Alienated
- Fragmentary, incomplete social media data
- Demystify the Black Box – bad data in = wrong output & reputational damage + little understanding of why data is wrong
- Correlation does not equal causation
- Many predictions are buried in written documentation. Can I get access to written documents U/Wing files, claim reports, medical files, annual reviews, open ended surveys?

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The Case for Change: AI, Analytics & Actuaries

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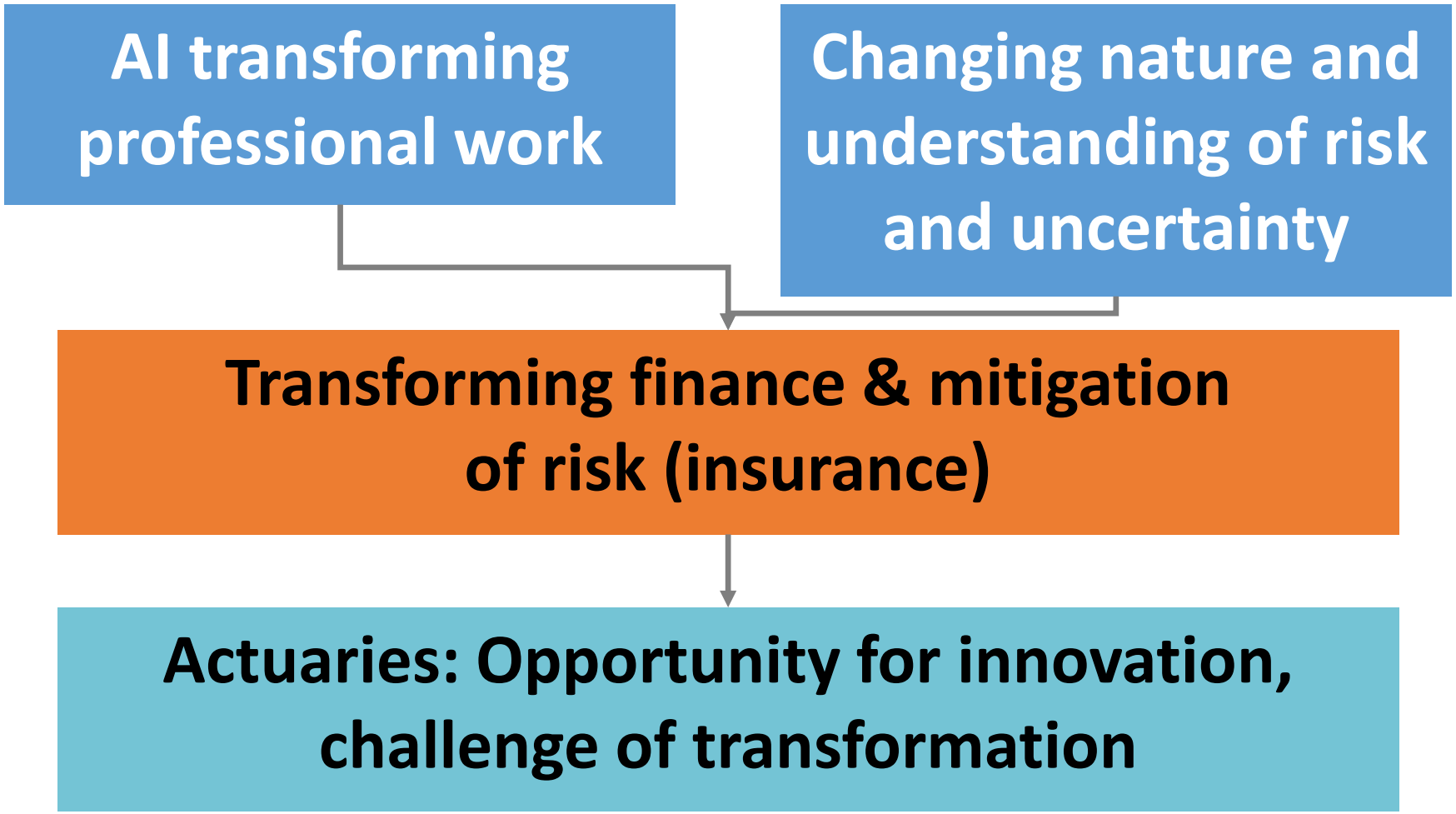
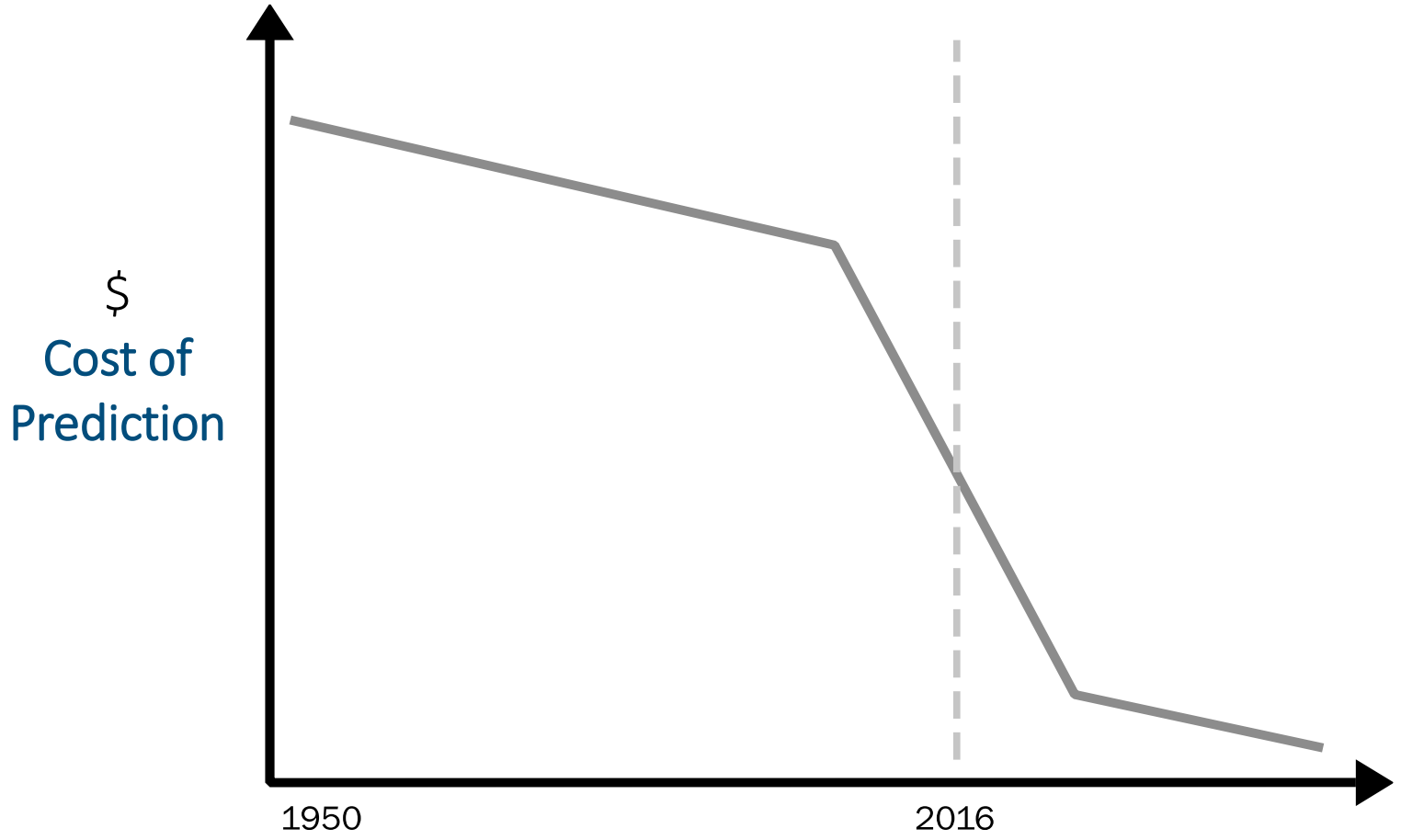
AI, Analytics & Actuaries



Artificial Intelligence reduces the cost of prediction



SOURCE: Ajay Agrawal, Joshua Gans, Avi Goldfarb, *Prediction Machines: The Simple Economics of Artificial Intelligence, 2018*.

Skills (intelligence) taxonomy

		Examples
 Meta-skills	AQ: Adaptability Quotient	• Lifelong learning /growth mindset • Self-direction • Comfort with change, uncertainty
 Socioemotional skills	EQ: Emotional Intelligence	• Creativity • Critical thinking/problem solving • Social intelligence • Communication and influence
 Technical skills and knowledge	IQ: Technical Intelligence	• Statistics, mathematics • Programming (traditional) • Predictive analytics/big data

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 & Australia
- Crop Risk – Loss of glaciers in the Himalayas

Mortality, morbidity & inequality

- Consequences of widening gap of mortality & morbidity experience between the poor and the rich (U.S.)
- Morbidity: poor more likely to have a chronic disease or condition
- Mortality: diverging changes in estimated life expectancy
- In the U.S., decreasing life expectancy for less educated non-Hispanic white populations driven

New risk skills needed

High Frequency/ Low Severity Risks	Low Frequency/ High Severity Risks
• Aggregating & synthesizing big data • Measure & manage the risk, instead of “predicting” • Incorporate insurance in other products	• Models that consider changing conditions • Integrated solutions that go beyond risk transfer • Create better ecosystems

Actuaries must understand the risk ecosystem and create solutions beyond measurement to manage and mitigate that risk in the age of AI/big data

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 5, 10 and 15 years from today?

Challenge of transformation

- **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

Evolving for the Future – It's more about skill sets

- Education that **focuses** on the new skills employers want, e.g. data science, solving business problems
- Education delivery that focuses on new ways to **demonstrate skills**, e.g. certificates & micro-credentials
- Expanded **reach** internationally to focus on the fastest growing insurance markets around the world
- **Leverage** research to create new value for members and the profession
- **Broaden** the array of professional development offerings to provide new skills in a form that fits with busy professional lives

Example: Evolution in accounting profession

- Proposed CPA licensure model (U.S.) emphasizes core plus disciplines
  - Tax compliance & planning
  - Business reporting & analysis
  - Information systems and controls
- Wider definition of use of accounting skill set

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Thank You

For more content about **AI, data analytics and how it impacts actuaries** and the insurance industry visit **SOA.org** and **TheActuaryMagazine.org**