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The IFoA Conference 2022

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If You Want to Understand the Future of Actuaries You Need to Think Outside the Box

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and Associate OAC -City Actuaries

Sheila Moorcroft -Director, Realising your Future

Intro

An Actuarial View

- A. Sense and nonsense detection
- B. Sense and nonsense about actuaries
- C. A sensational future

A Futurist View

- D. Why foresight?
- E. What is foresight?
- F. Some examples

Joining it All Together

- G. Working Together

Language & Mental Models Complexity & Storytelling Problem Solving Heuristics

Dialogue +
Reconciliation

Collaborative
Intelligence

Knowledge
Management

Social Learning
Systems

Communication of
Complexity (GAR)
Heuristics
Systems Science

Sensing +
Responding to
Change
Statistical
Process Control,
Statistical
Engineering

Variance
Reduction
Actuarial
Engineering
Analytic
Futurism
Wider Fields

CITY ACTUARIES



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A) Forecasts that are credible vs questionable

Questionable:	Credible:
A temporary balance assumed to be permanent	Aligns with trends already underway
Goes against human nature and deep-seated cultural norms	Is based on something useful the pandemic revealed
Assumes vested interests will readily transform the systems that serve them	Notes the breakdown of outdated or artificial barriers
Reflect the forecasters own agenda	Acknowledges what is irreparable.

Josh Calder, Christopher Kent, and Kristin Nauth: “After COVID-19, Nothing Will Be the Same”

<https://medium.com/@calder.josh/after-covid-19-nothing-will-be-the-same-2ec9697c3c0f>



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A) Sense about Actuaries?

- Actuaries are generally known to be reflective, detail oriented, critical thinkers¹, but does this leave gaps?
- <http://www.theinvisiblegorilla.com/videos.html>
- Christopher Chabris and Daniel Simons in their famous experiment found that a numeric focus can lead to missing things in plain sight. Our brains filter out information we are not looking for.



¹ Personality Types of Actuaries, Leonie Tickle, Macquarie University, Presented to the Institute of Actuaries of Australia April 2009



A) Sense and Nonsense Process

PI 129. "The aspects of things that are most important for us are hidden because of their simplicity and familiarity. (One is unable to notice something -because it is always before one's eyes.)"

- Conduct a survey of what elements are important how they are connected. This effort may uncover inconsistencies directly.
- Line the survey up with others' surveys and compare to find further gaps and nonsense.

"To repeat: don't think, but look!" -Wittgenstein



PI 121. "A main source of our failure to understand is that we don't have an overview of the use of our words. – our grammar is deficient in surveyability. A surveyable representation produces precisely that sort of understanding which consists in seeing connections. Hence the importance of finding and inventing intermediate links."

Wittgenstein- Philosophical Investigations (PI)

PI 119. "The results of philosophy are the discovery of some piece of plain nonsense and the bumps the understanding has got by running up against the limits of language. They – these bumps – make us see the value of that discovery"

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B) Detecting Nonsense by Making Actuarial Work Surveyable

We Work in an Insurance Factory Open to the Elements, BUT:

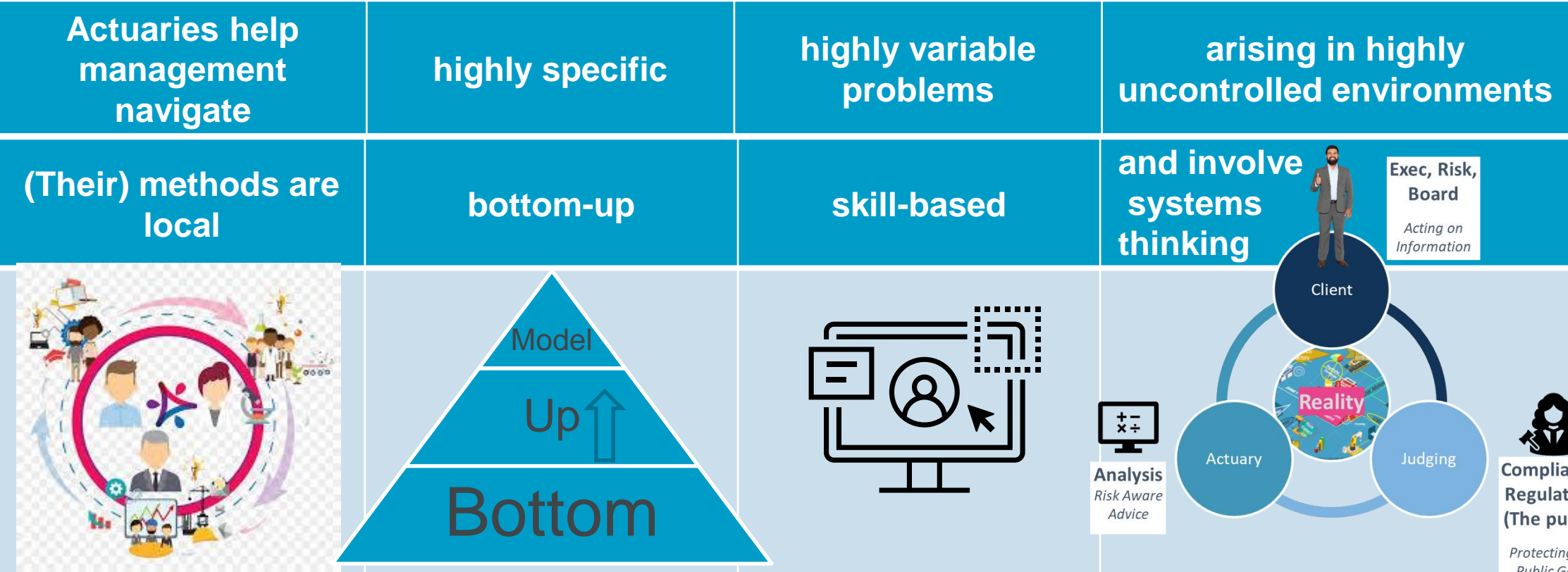
A Factory Floor Has Lots of Things Hidden in Plain Sight



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B) What is an Actuary?

- Value Proposition (What): Clients need us to **help** them navigate **financial issues** where past, present and future **uncertainties** are especially important.
- VP (How): Our **language, skills, knowledge** and **professionalism** help us reduce complexity and find pragmatic solutions, especially when **data** is limited or the situation is **changing**.



B) We Get Paid to Model, But Models Need to Adapt or Fail

Coherent Models

Models Coming from One Reality (orderly book, stable environment)



Mental Model

Model Equations

Computational Model

Can Become Incoherent

Applied to Another (chaotic book, changing trends)

Computational Model

Actual Model Mechanisms

Assumptions + Calculations

Interpretation of Model Mechanisms

Applied World

Input Data

Output Data



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B) A Little Nonsense About Actuaries Hidden In Plain Sight?

“As professional futurists, we don’t do predictions. Rather, we help people understand the possible range of futures and equip them to make smart choices about those futures.”

“Actuaries and analysts are experts in risk management. They use their mathematical skills to measure the probability and risk of future events and to predict their financial impact on a business and their clients.”

- “Predictions” vs. “possible range of future outcomes”
- Can we effectively assess the future, while looking backwards?
- How useful is probability in an uncertain world?
- How are our results used to make smart choices?
- Is a single expertise enough?
- What else?



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B) Other Professions also Uncover Things About Us

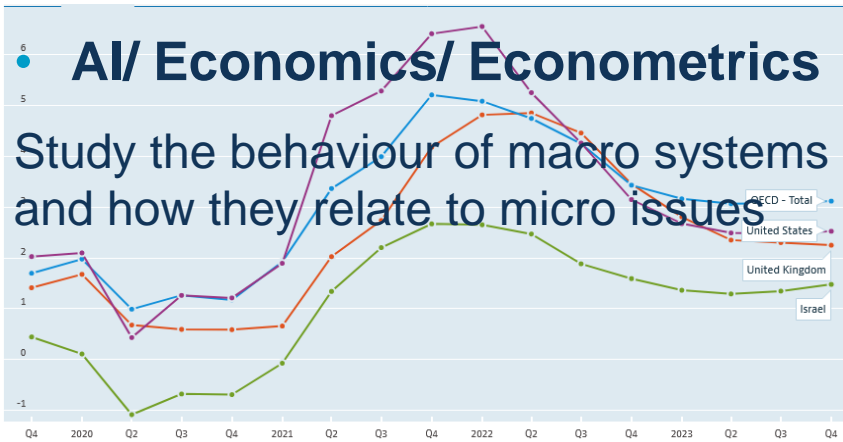
- **Industrial Statistics** → non-stationarity statistics

$$\sigma = \sqrt{\frac{\sum [x - \bar{x}]^2}{n}}$$

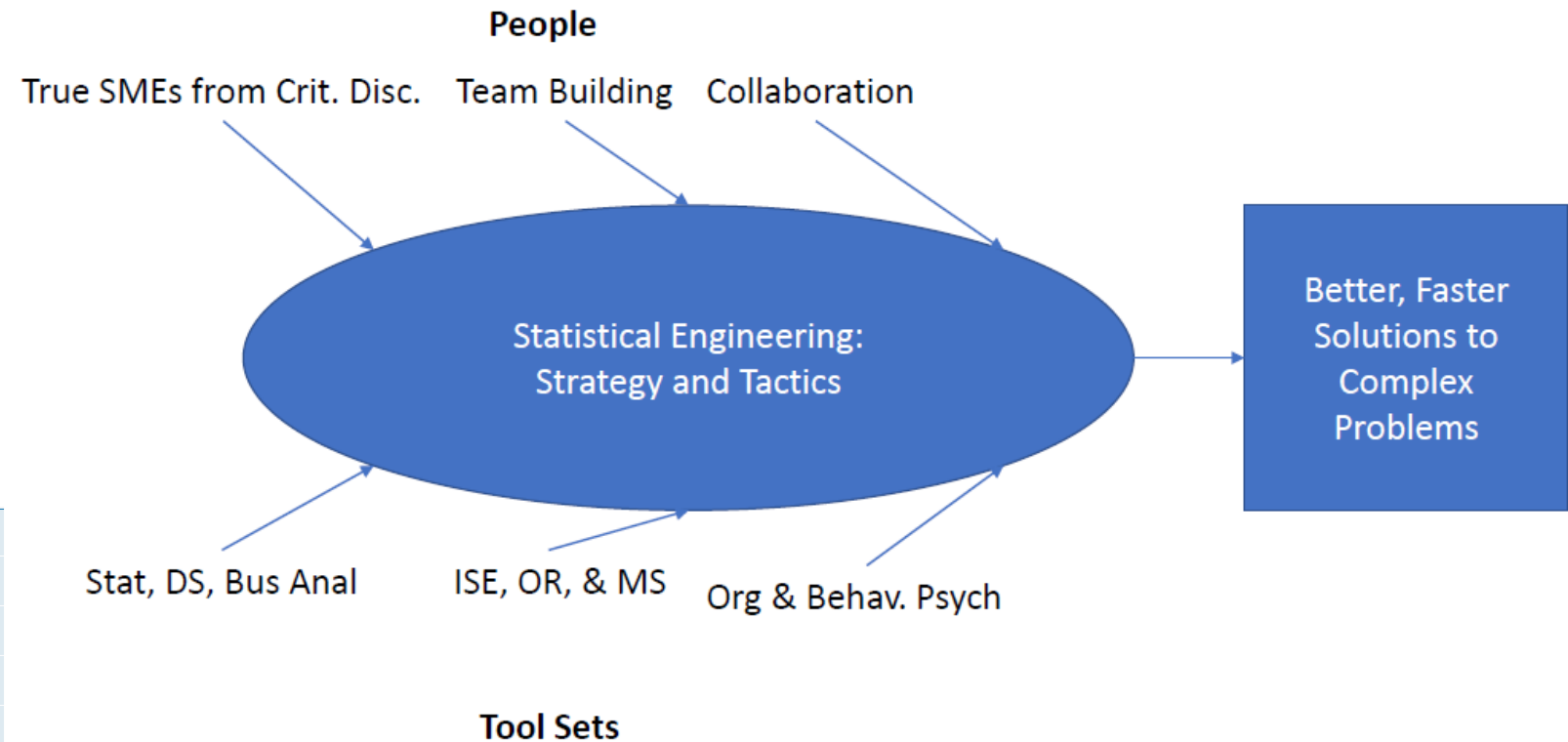
σ = lower case sigma
 \sum = capital sigma
 \bar{x} = x bar

$$\hat{\sigma} = \frac{\bar{R}}{d_2(n)}$$

Improvement Comes from Being:
On Target, With Minimum Variance,
Reduced at Source



- **Statistical Engineering** → Holistic Problem solving Strategies



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C) A Constantly Evolving Role as the World Changes

Age	Technical Innovations	Insurance	Social	Mathematical	Actuarial
Early	Simple calculation devices and algorithms, 1 st slide rule	Pooling on shipping risks, Policy Wordings Annuities	Need to share risk Need to borrow lawfully	Math Foundations Accounting developments	
1650-1750	Improvement and spread of slide rules	Term life Simple diversification Early with Profits	Need for Risk Transfer Avoid insurance abuse	Probability & Statistics foundations Utility Theory & idea of Risk Adjust. Valuation	Gaunt making the best of gaps in mortality statistics
1750-1810		Whole of life with profits	Growing middle class French Revolution	Bayesian Concepts improved calculation of mortality tables	Actuarial mgt. of with profits reserving methodology
1810-1900	Arithmometer (first widely used mechanical calculator)	Data Sharing,	Industrialisation Worker revolts	Improvements in mortality calculations Macaulay Duration	IFoA founded Equitable profits Calcs. Invest. Strategies
1900-1950	Punch card data processing and many computing prototypes	US worker compensation Motor insurance	Liberal Reforms World Wars Women's Rights	Continuous time stochastic processes Shewhart Charts	WC Credibility Asset price models GI exposures
1950-1975	Electronic Calculators Early computers	Increased Regulation	Globalism Human Rights	Option Pricing Black Scholes	Financial Economics into Actuarial work
1975-2000	Super computers Stochastic simulations	Mis-selling	Environment Information age	Public Key Cryptography Unscented Kalman Filter	GLM's Early Capital Models
2000-2025	Machine learning	Financial Crisis Solvency II	Trust/Social Responsibility Risk Aversion	Proliferation of boosting algorithms	Internal Models Models and Catch-up
2025+	Quantum computing	New Mgt. Problems	Social Needs	???	Wider Fields

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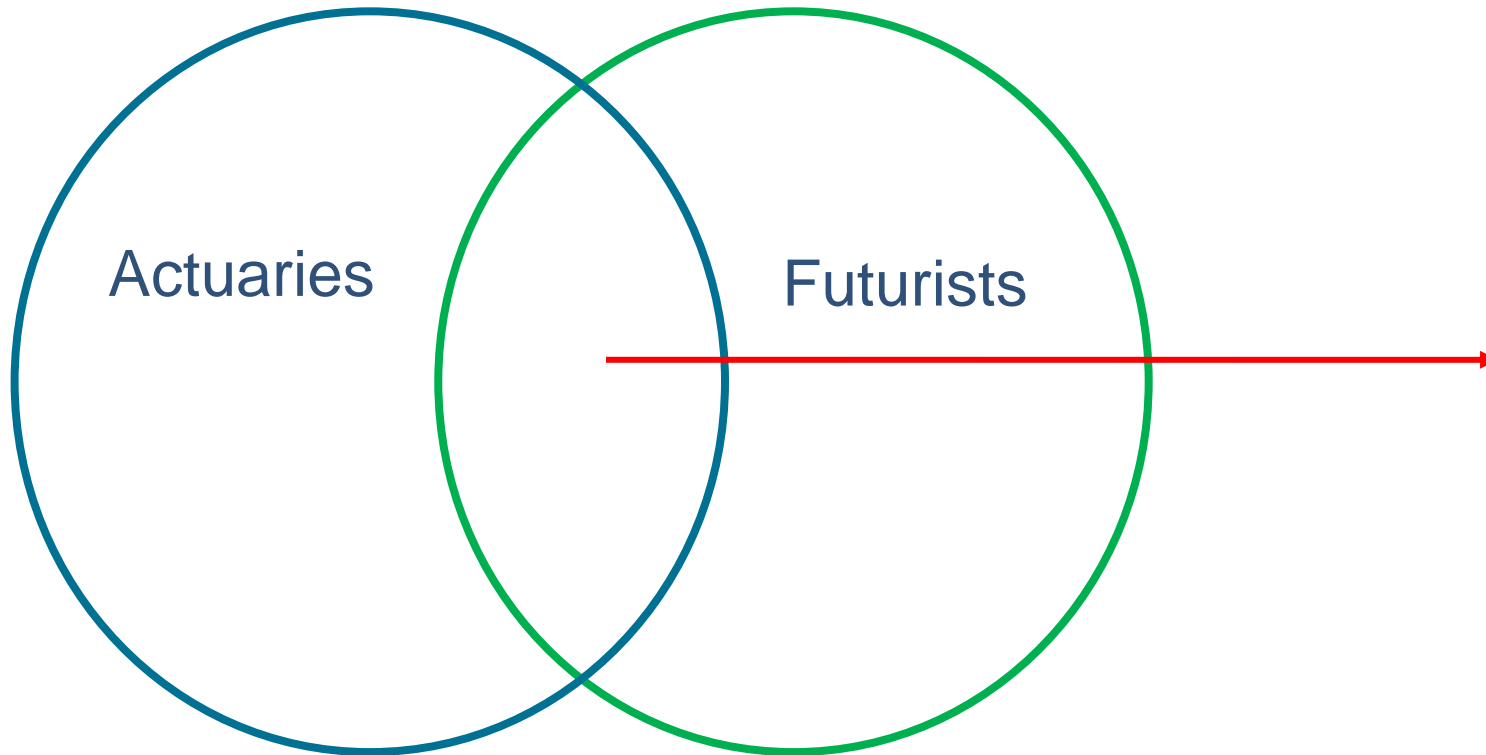
C) We Need to Follow and Collaborate With These Professions:

Profession	Help With
<ul style="list-style-type: none">• Foresight (Futurists)• Industrial Statistics• Statistical Engineering• Systems Sciences• Econometrics• Knowledge Management• Language Philosophy• Who Else?	<ul style="list-style-type: none">• Realism in Forecasts• Change Detection, Continuous Quality Improvement• Multidisciplinary problem solving• Problem Solving Strategies, Systems Pathology• Link External Effects to Internal Data• Holistic Knowledge Building• Error Avoidance• Professionalism, Data Skills,???



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Actuaries and futurists



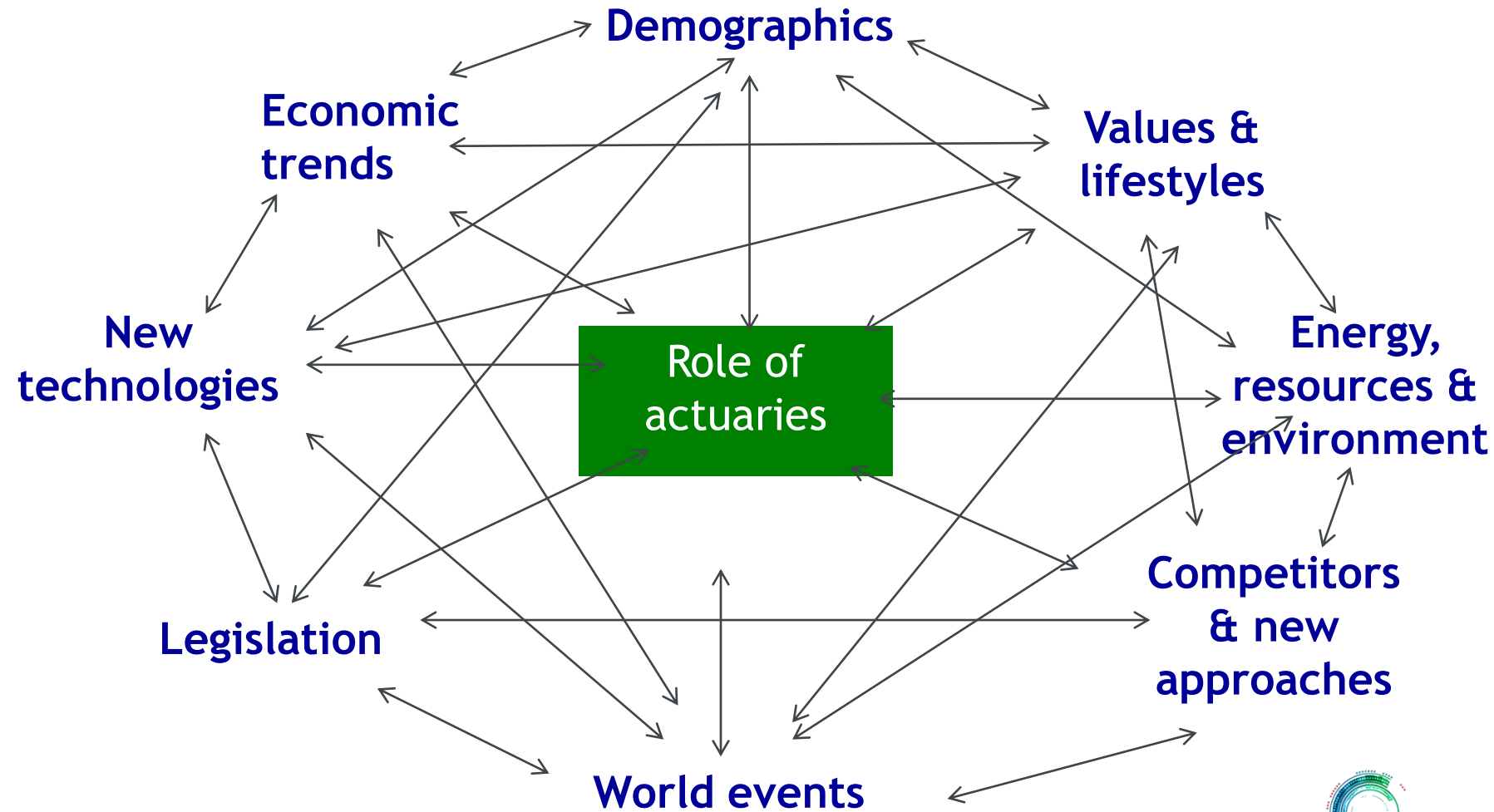
Similar aims

- Making sense from noise
- Enabling better decisions
- Reducing uncertainty
- Dealing with change



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A more complex web of change



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The challenge of change - Danger zone

How wrong can you be? False assumptions

Everything that can be invented, has been invented.

US commissioner for patents 1899

Air-planes are interesting toys, but of no military value.

French military strategist 1911

Who the hell wants to hear actors talk?

Harry M. Warner, Warner Brothers 1927

Computers in the future will weigh only 1.5 tonnes.

Popular Mechanics 1947

There is no reason for an individual to have a computer in his home.

President Digital Equipment Corporation 1977

640Kbytes of memory will be enough for most people in future.

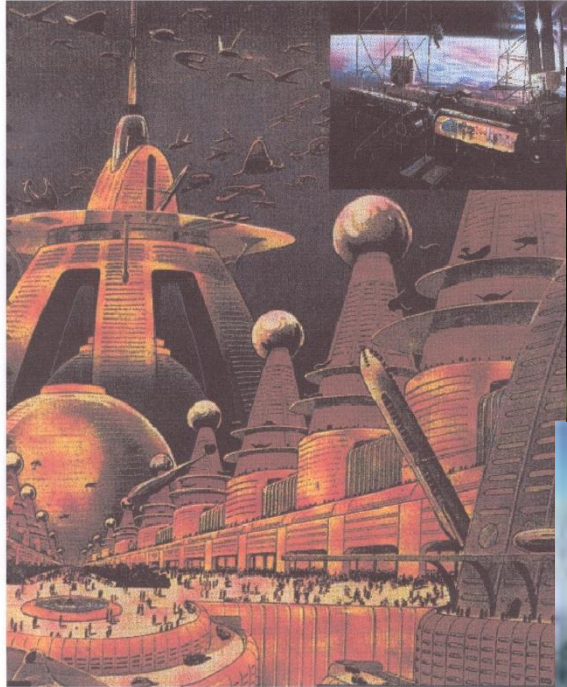
Bill Gates 1981



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The challenge of change — Danger zone

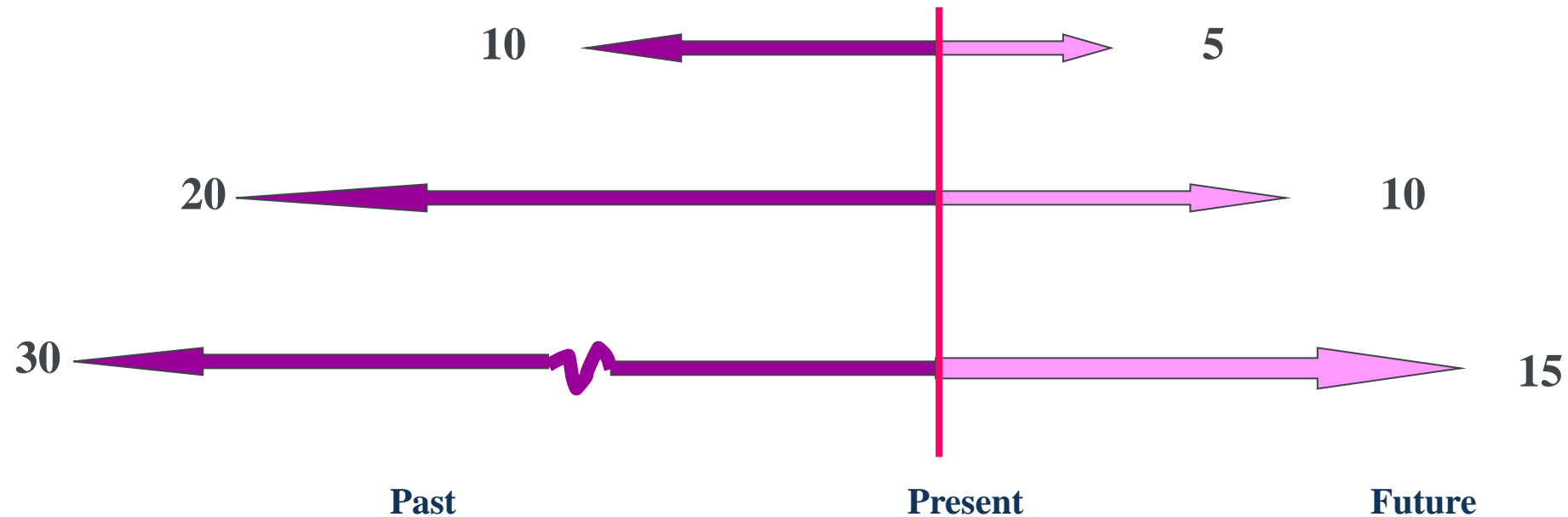
Or utopian/ dystopian images from science fiction — False assumptions



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The challenge of change

How much can and does change?



The past does not define the future, but is linked to the future



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Routes to the future



- Where to?
- How get there?
- What encounter?

What is Foresight?



- Seeing things differently
- Asking what if?
- Managing change



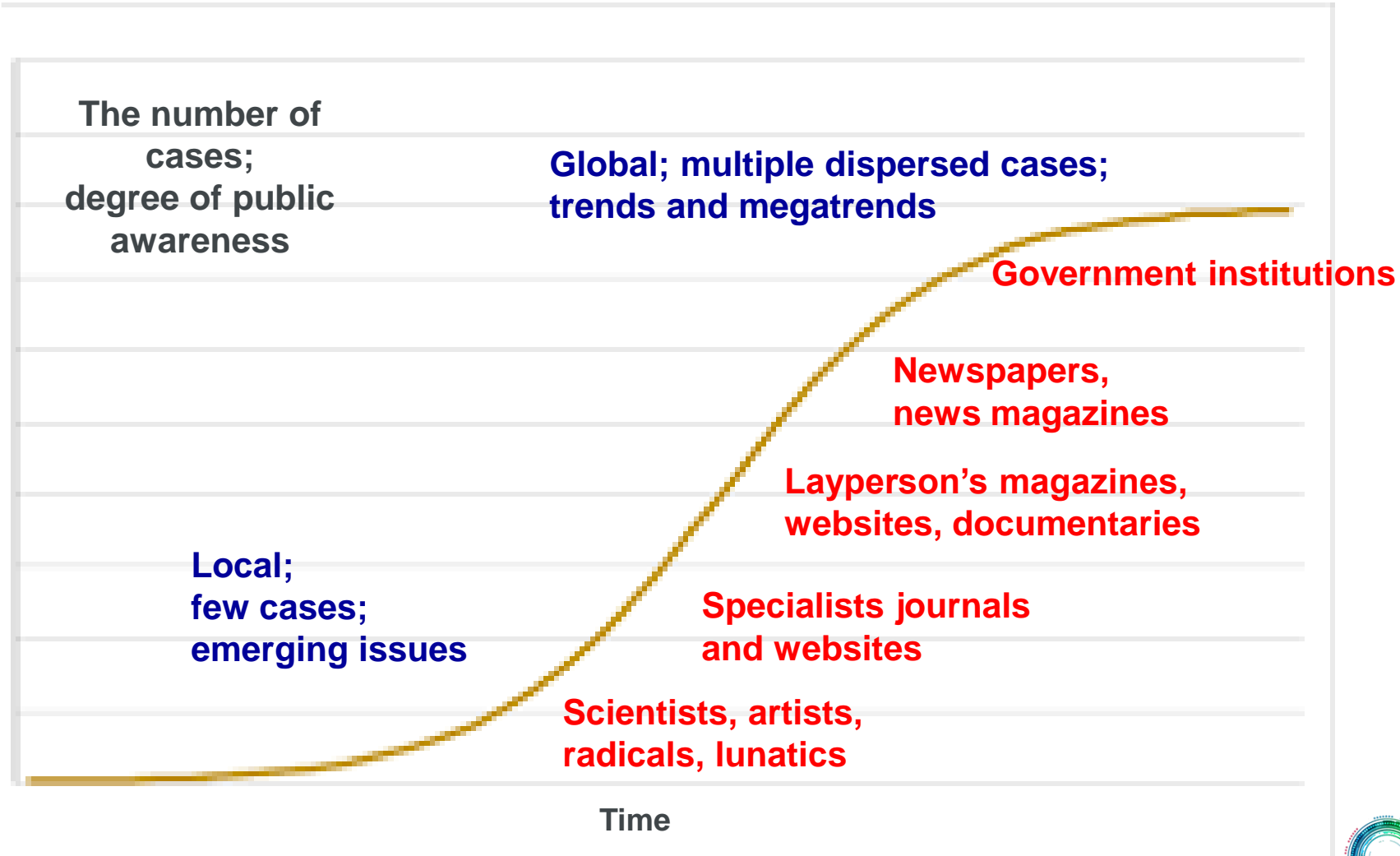
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Horizon Scanning – emerging changes



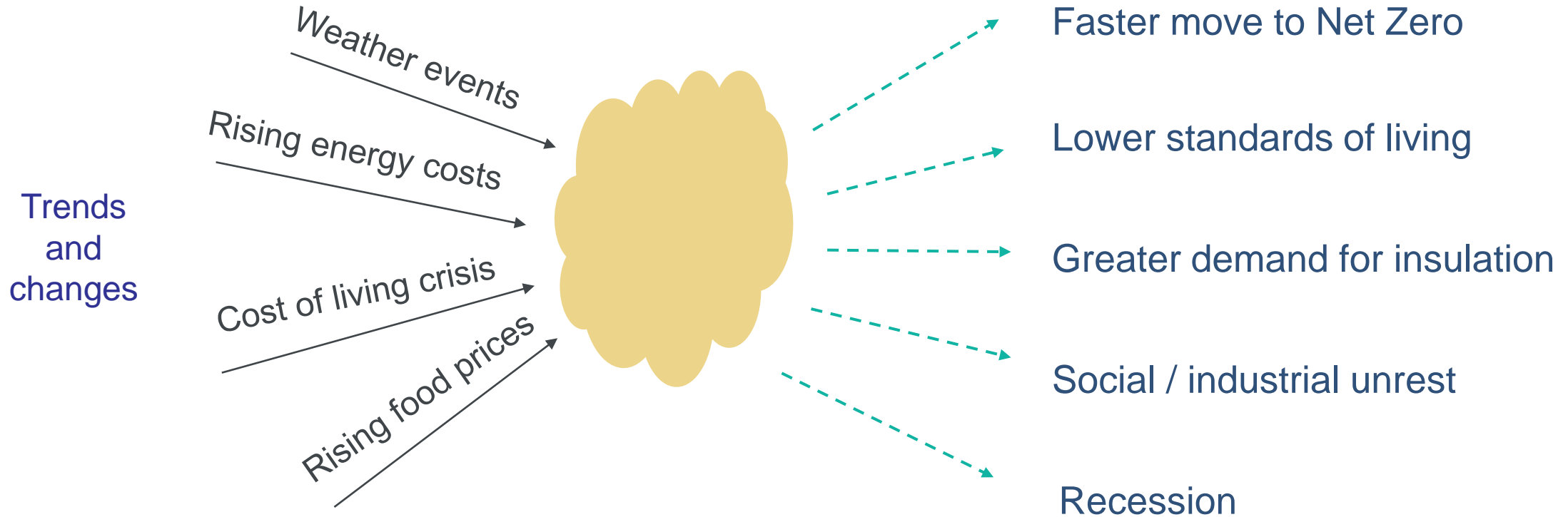
- To navigate a more complex environment
- To assess and respond to new circumstances
- To enable more informed decision making
- To create future oriented strategies

Horizon scanning – changes over time



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From scanning to analysis

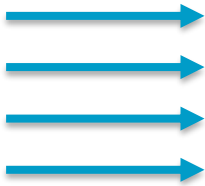


Key stages in scenarios

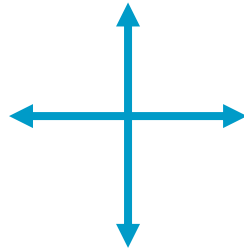
Core question



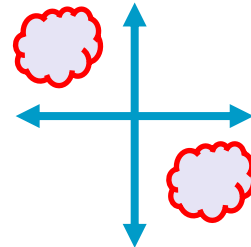
Where are we now?
What is driving change?



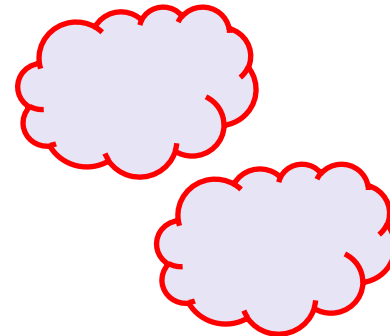
What will shape the future most?



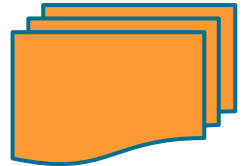
How might our world look in different futures?



Who will do what how in these futures?



What do we need to do to be ready?



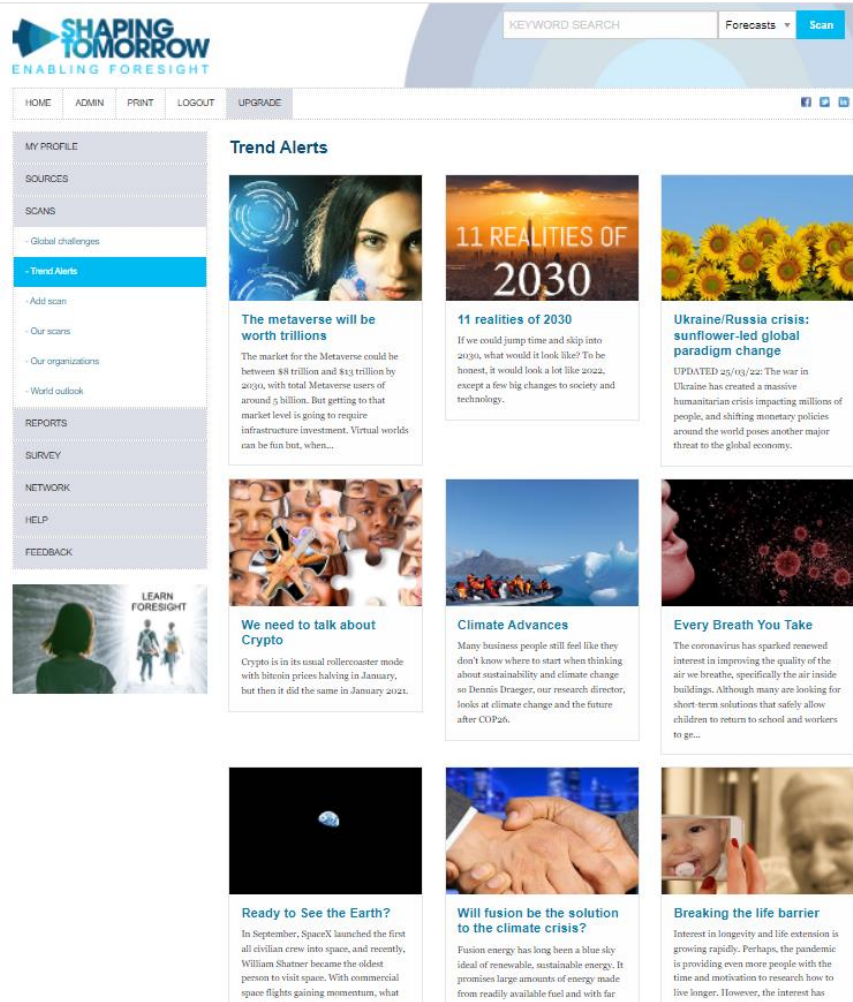
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Why black swans? Stuff happens



- High impact, Highly unlikely,
- Usually unforeseen
- Known unknowns/ unknown unknowns
- Identify possible events
- Develop resilience

How to get started?



- Curiosity and a range of sources
- A service such as Shaping Tomorrow
- Sharing ideas with colleagues
- A willingness to say ‘something different’
- Following up on ideas



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Think on these things!

- What effect might the successful use of air taxis at the Paris Olympics in 2024 have?
- The 'R' word - US recession by 2024, China slowing, UK stagflation?
- What will the growing acceptance of and increasing demand for assisted dying mean?
- What if climate change dramatically reduced the value of 20-30% of UK housing stock?
- If investors rapidly decarbonise their portfolios, what might happen to pension funds?
- How might decreasing levels of public trust of institutions, experts and research affect you?
- How might radical transparency i.e. everything trackable, on personal lifestyles and consumption affect health insurance?
- How could fully monitorable supply chains and production lines – courtesy of sensors/ Internet of Things change business insurance?



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Questions and discussion

- Discussions - getting started
 - What can we do to help management through the next recession?
 - What can we do to help management address growing climate change risks e.g. £340 billion losses estimated by Bank of England or rise of sea level by 35cm estimated by Tyndall Centre, by 2050?
- What is the real focus? - What is the core question
- What is our time frame? - How much leverage can we get?
- What is driving the direction of change? – A systems view and what data / information can we find?
- What are the potential impacts?
- What are our options? What could we do about them?
 - Thank you and any questions?



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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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