

FORESIGHT

METHODOLOGIES AND TOOLS: BUILDING SCENARIOS & STRATEGIES

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CONTENTS

-INTRODUCTION

-WHY FORESIGHT?

-WHAT IS FORESIGHT

-FORESIGHT HISTORY

-FORESIGHT METHODS



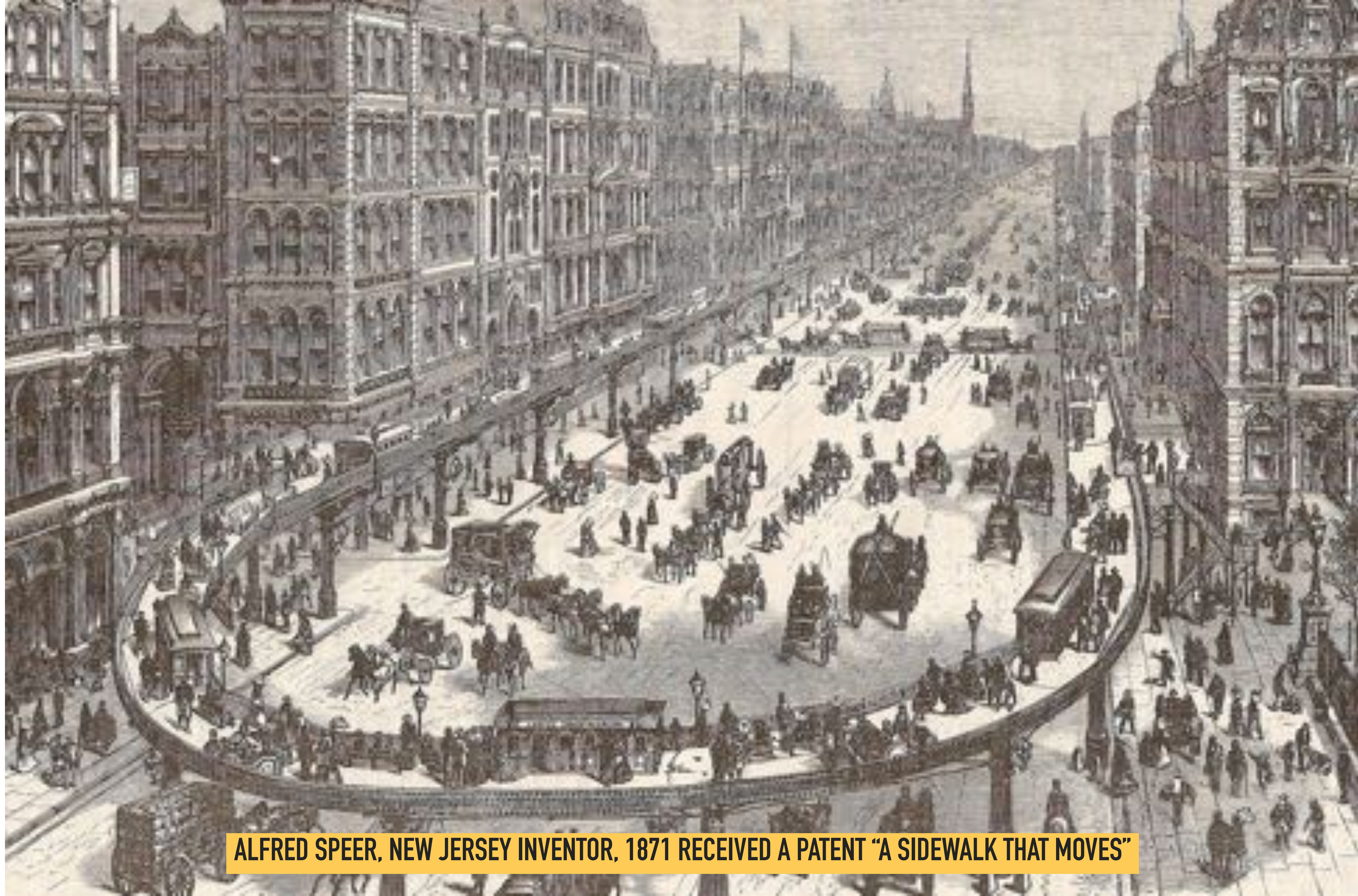
INTRODUCTION



1894

THE GREAT MANURE CRISIS





ALFRED SPEER, NEW JERSEY INVENTOR, 1871 RECEIVED A PATENT "A SIDEWALK THAT MOVES"

Regent Street, London



REGENT STREET LONDON UK 1900S: HORSE DRAWN CARRIAGES AND FIRST MOTOR CARS





CRAWLEY

2017, "CRAWLEY THE MOST TO BENEFIT FROM BREXIT", UK CENTRE FOR ECONOMIC PERFORMANCE



2020, "CRAWLEY THE WORST AFFECTED " , UK CENTRE FOR CITIES PANDEMIC RESILIENCE REPORT

WHY FORESIGHT?

Known Knowns and Unknown Unknowns



Donald H. Rumsfeld
Department of Defense News Briefing, 12 February 2002

There are **known knowns** – things we know we know.

There are **known unknowns** – that means: we know there are things we do not know.

But there are also **unknown unknowns** – the ones we don't know we don't know.

If one looks throughout history, it is the latter category that tends to be difficult.

V

VOLATILE

U

UNCERTAIN

C

COMPLEX

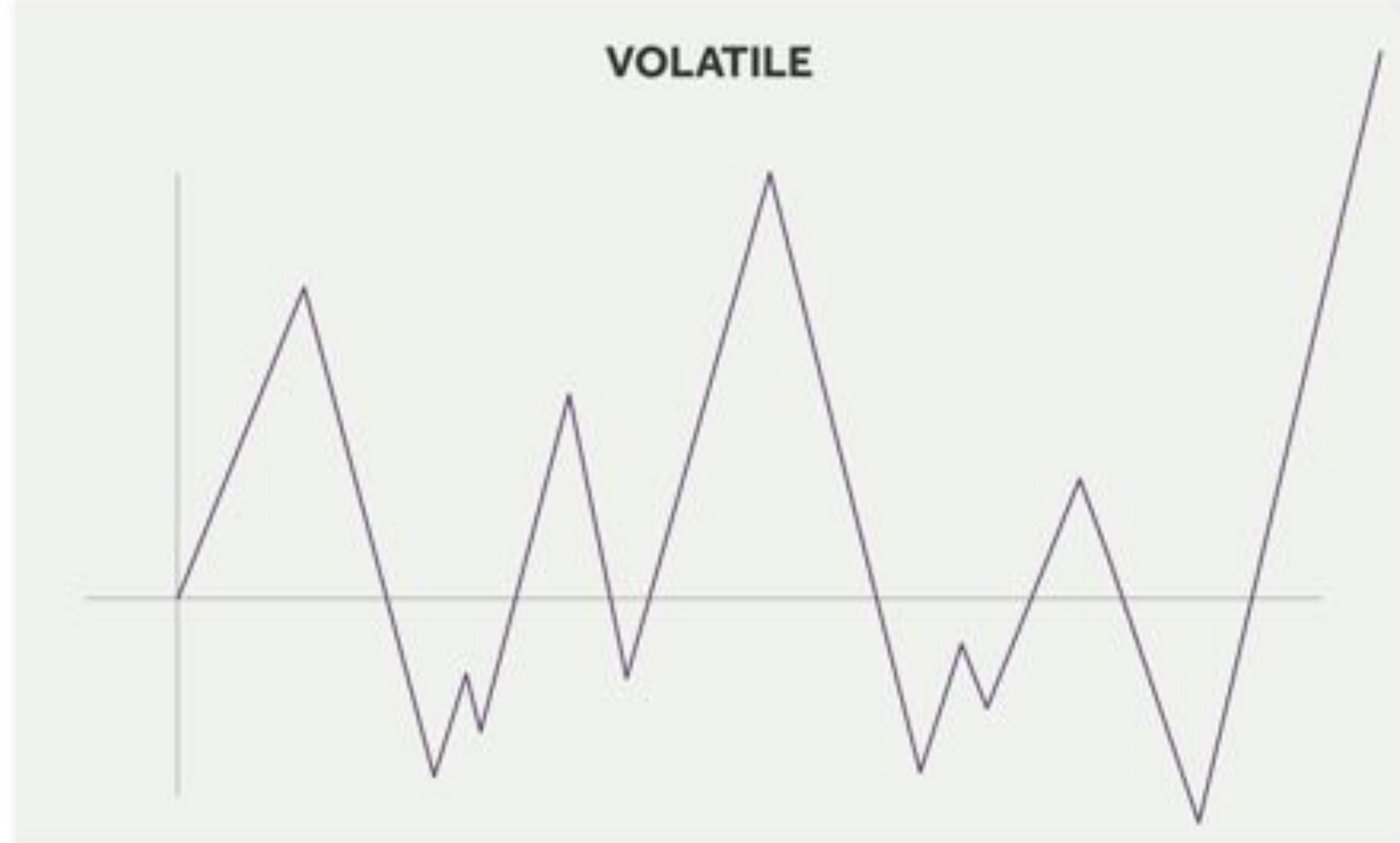
A

AMBIGUOUS

Limits to Predictability in a VUCA World

V

VOLATILE

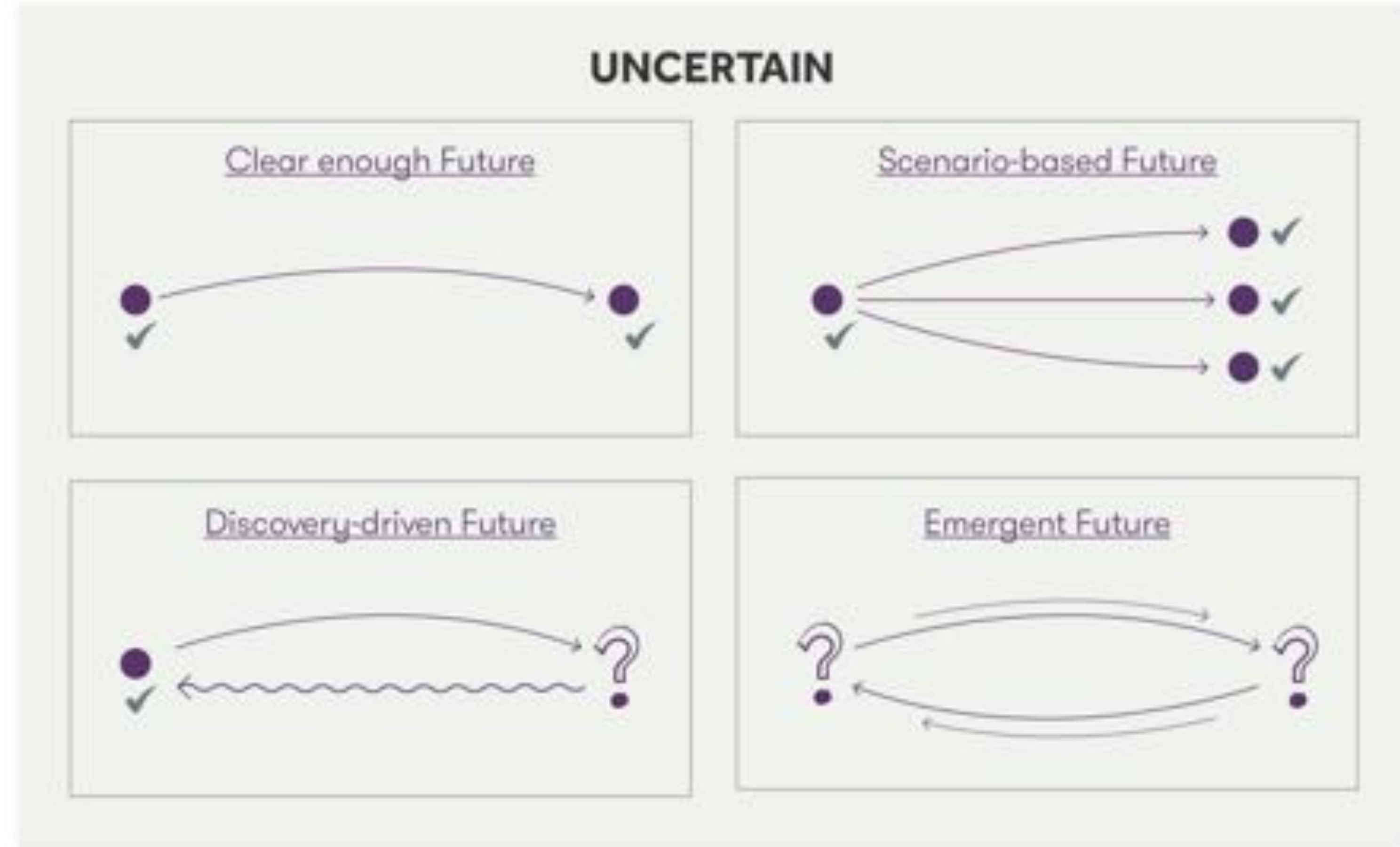


Speed of Change. We live in a world that's constantly changing, becoming more unstable each day, where changes big and small are becoming more unpredictable – and they're getting more and more dramatic and happening faster and faster.

As events unfold in completely unexpected ways, it's becoming impossible to determine cause and effect.



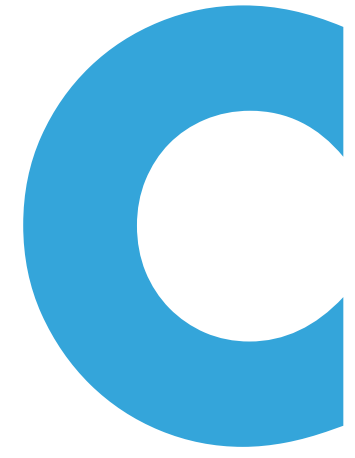
UNCERTAIN



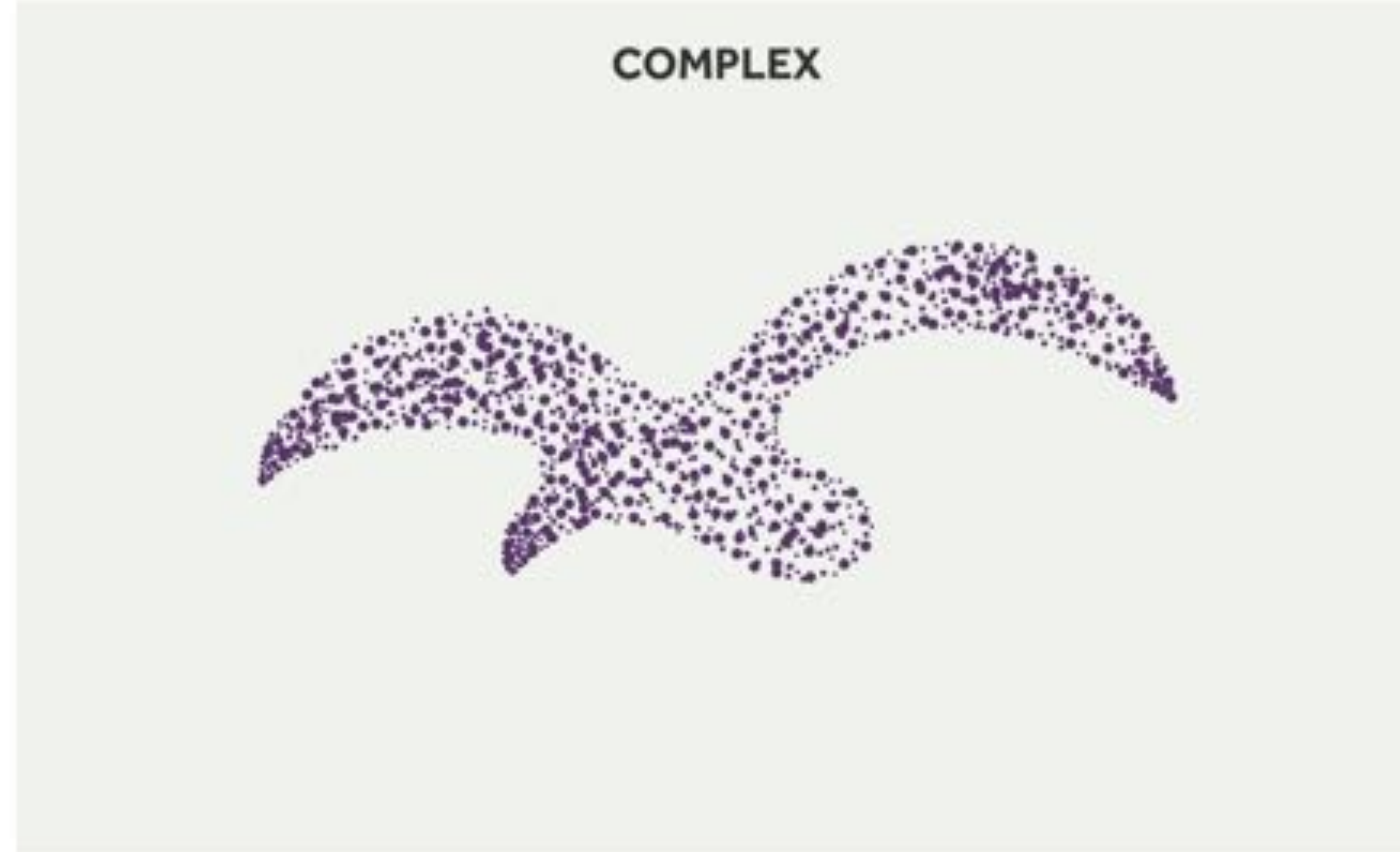
Lack of Predictability. It's becoming more difficult to anticipate events or predict how they'll unfold;

Historical forecasts and past experiences are losing their relevance and are rarely applicable as a basis for predicting the shape of things to come.

It's becoming nearly impossible to plan for investment, development, and growth as it becomes increasingly uncertain where the route is heading.



COMPLEX



Non-linear
Emergence
Interdependence
Feedback loops
Chaos

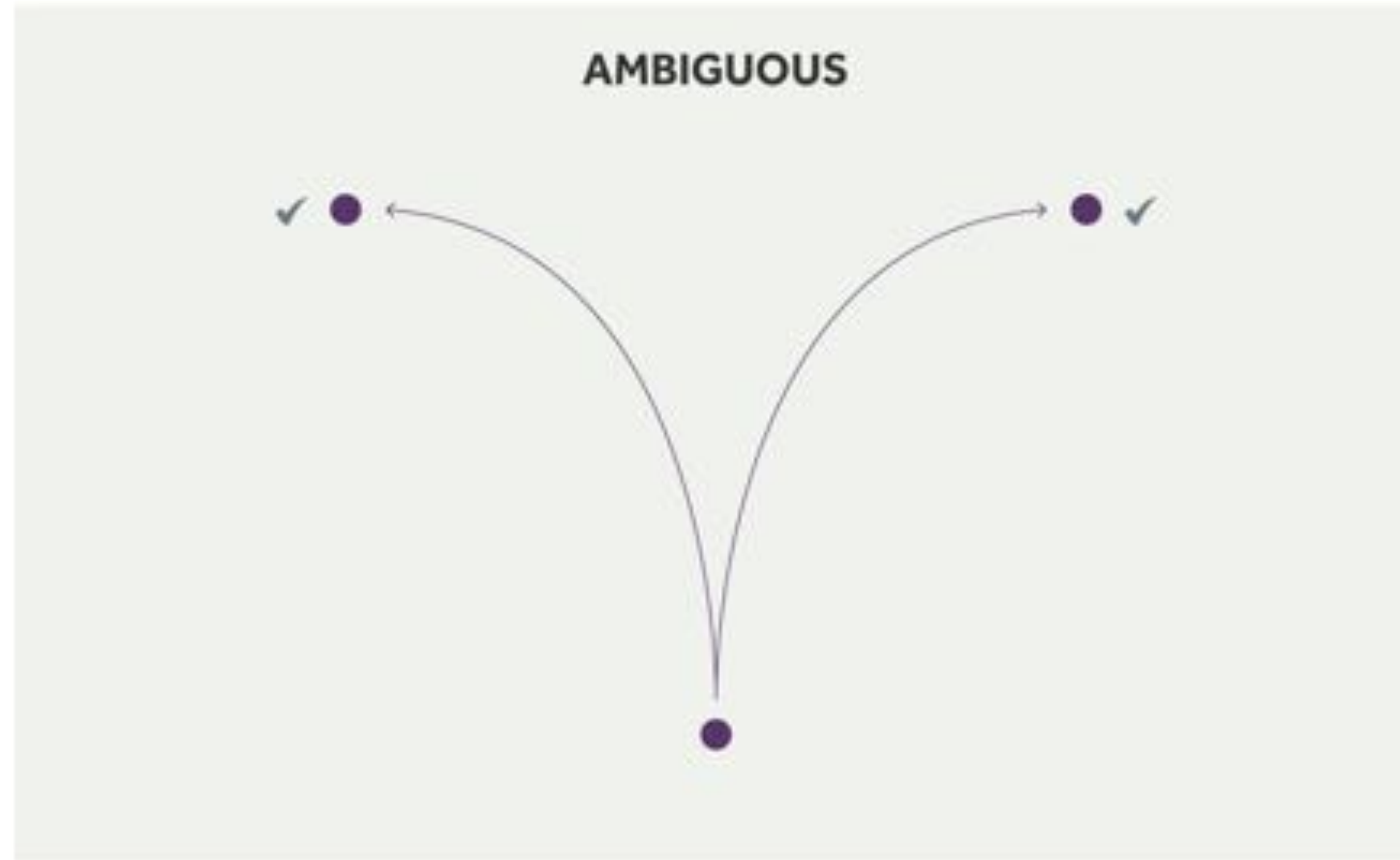
Our modern world is **more complex than ever**. What are the reasons? What are the effects? – Problems and their repercussions are more multi-layered, harder to understand.

The different layers intermingle, making it impossible to get an overview of how things are related.

Decisions are reduced to a tangled mesh of reaction and counter-reaction – and choosing the single correct path is almost impossible

A

AMBIGUOUS



“One size fits all” and “best practice” have been relegated to yesterday – **in today’s world it’s rare for things to be completely clear or precisely determinable.**

Not everything is black and white – grey is also an option.

The demands on modern organisations and management are more contradictory and paradoxical than ever, challenging our personal value systems to the core.

Six Blind Men and the Elephant

Connecting the Pieces

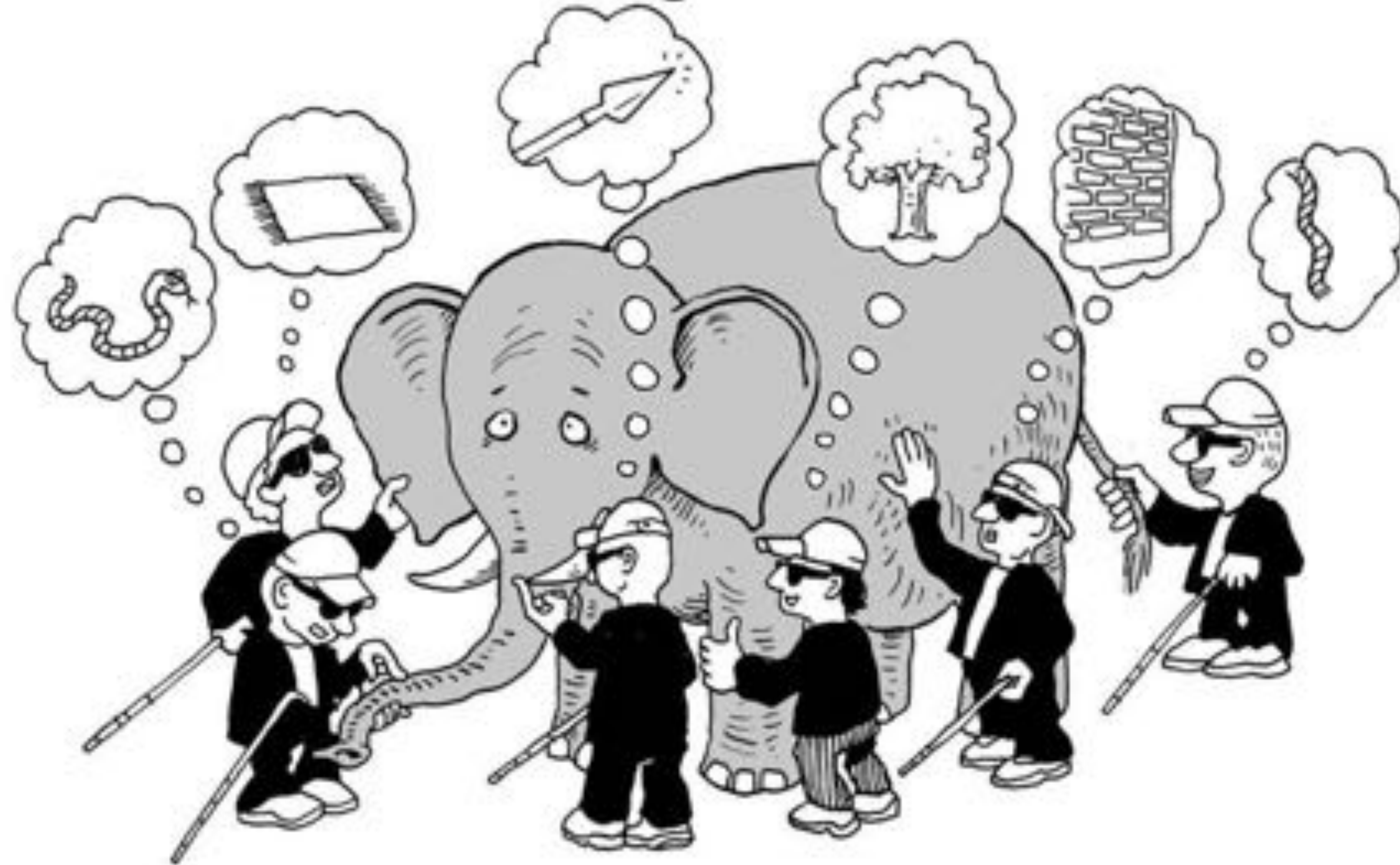


Illustration: Hans Møller/mollers.dk

Ambiguity

Opaqueness, Ambivalence, Vagueness

Hindsight vs. Foresight

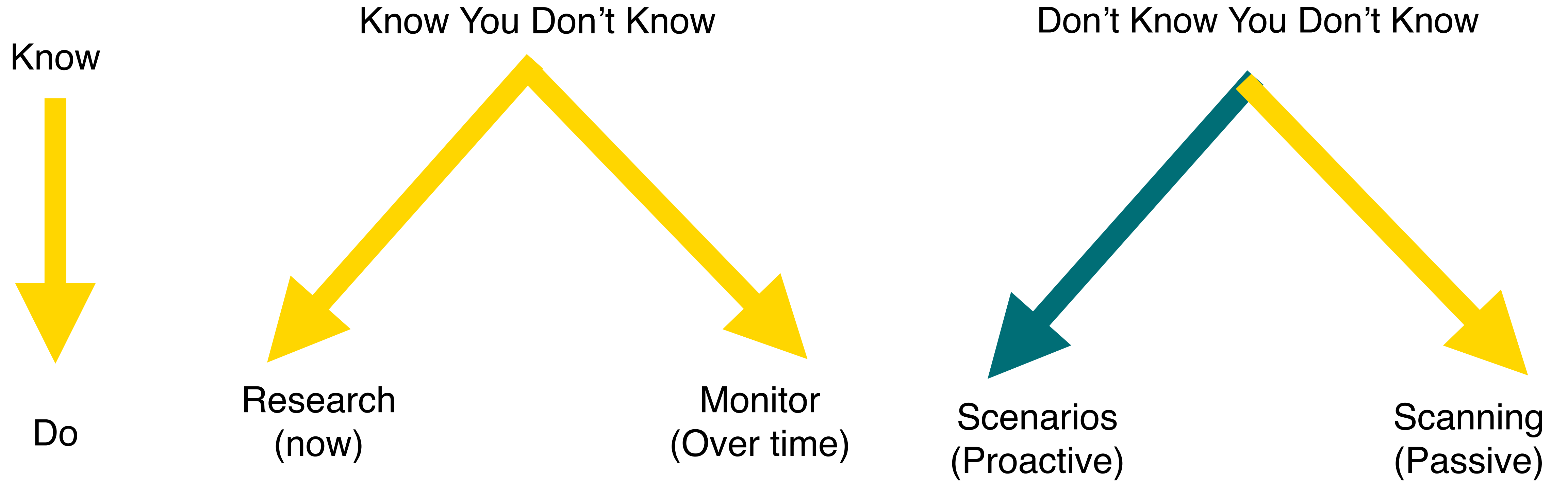


Hindsight vs. Foresight



WHAT IS FORESIGHT?

Why Foresight

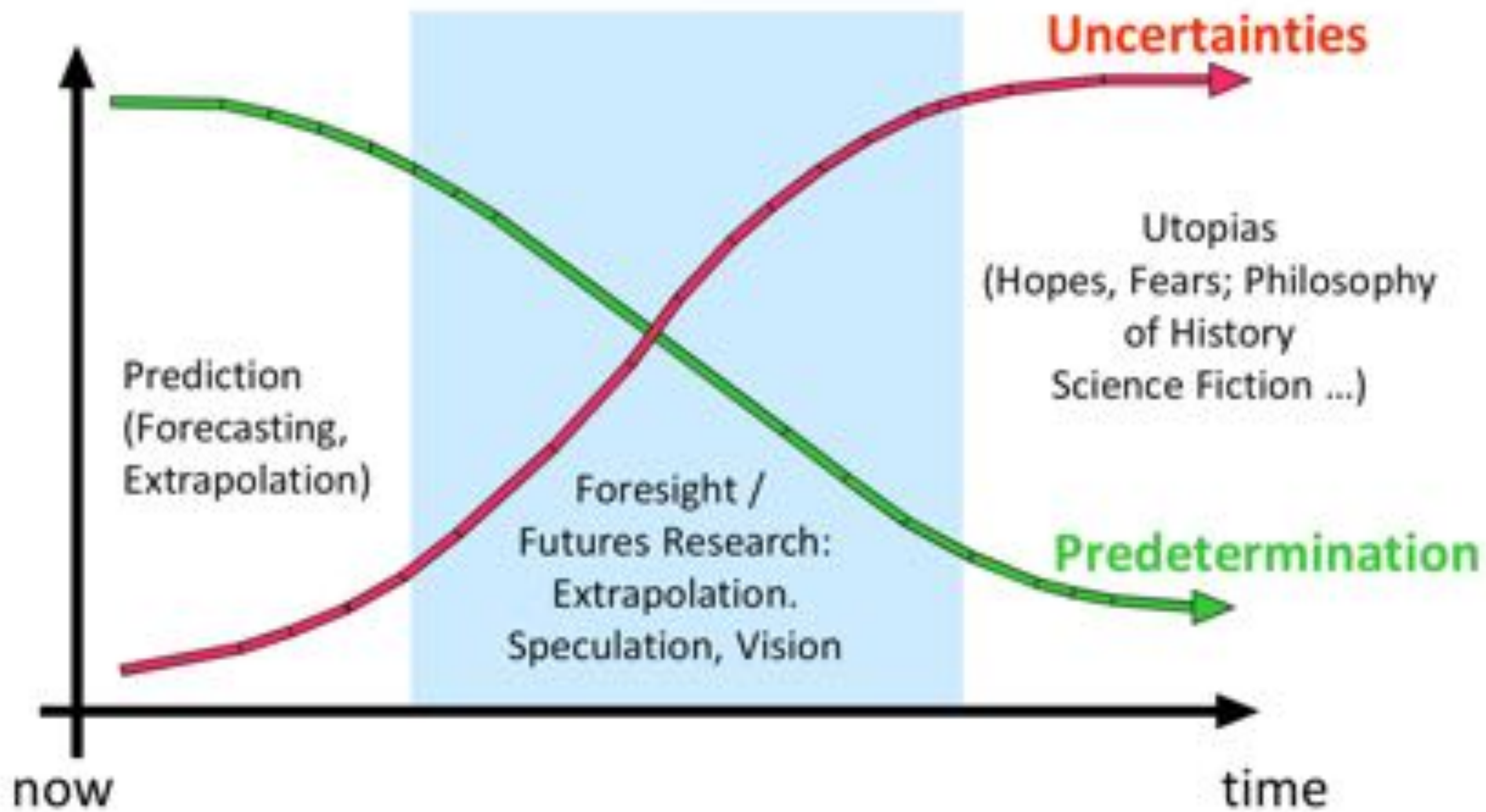


So what is Foresight ?

- A **reframing process** that involves the exploitation of insights to prepare for thinking, seeing, and acting in the future
- A process for **avoiding surprise** and **generating counterintuitive ideas**

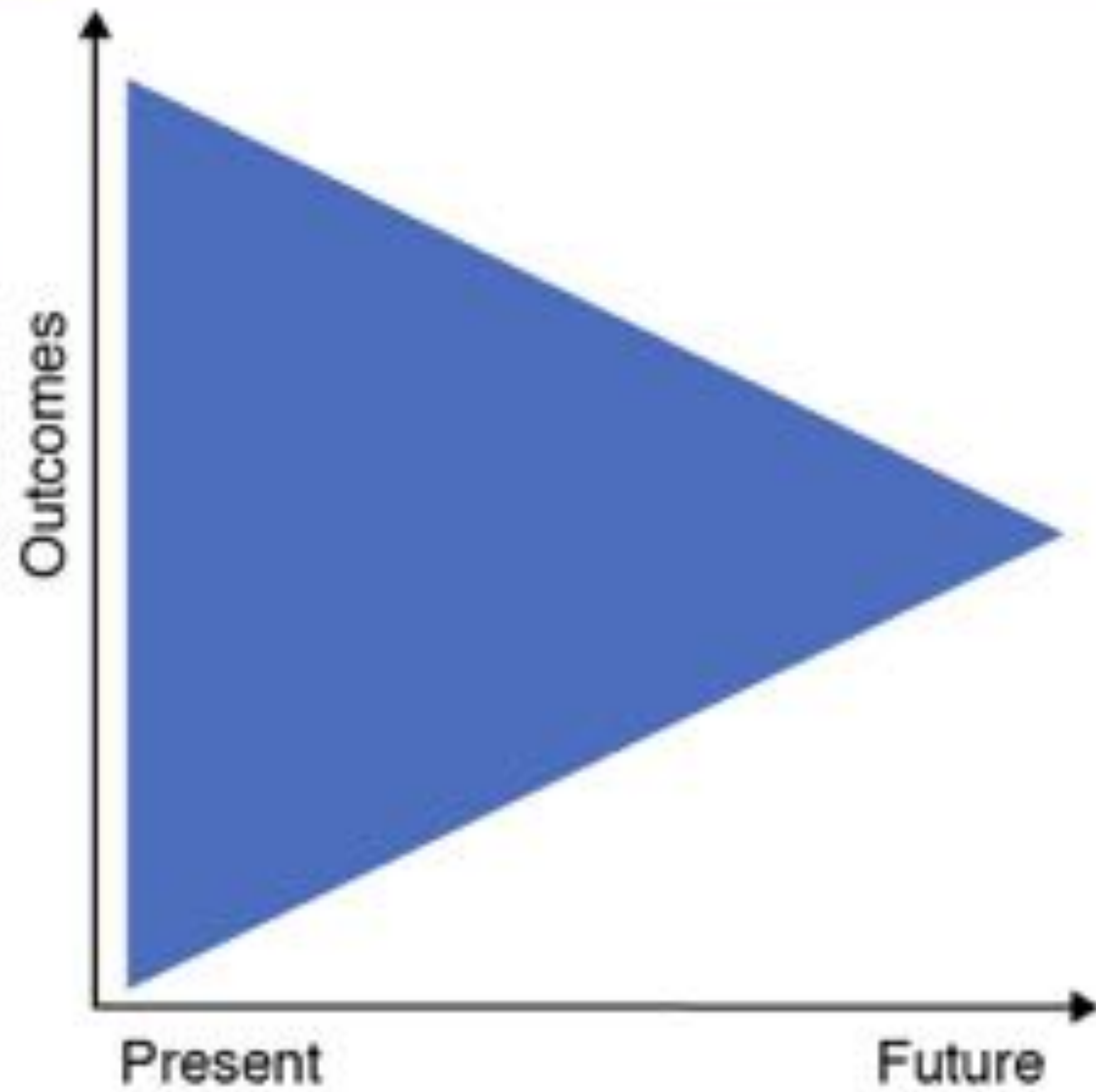
It is a more complex process distinct from:

- **Prediction:** a definitive statement about what will occur in the future
- **Forecasting:** qualified, usually bounded statement about future event or condition

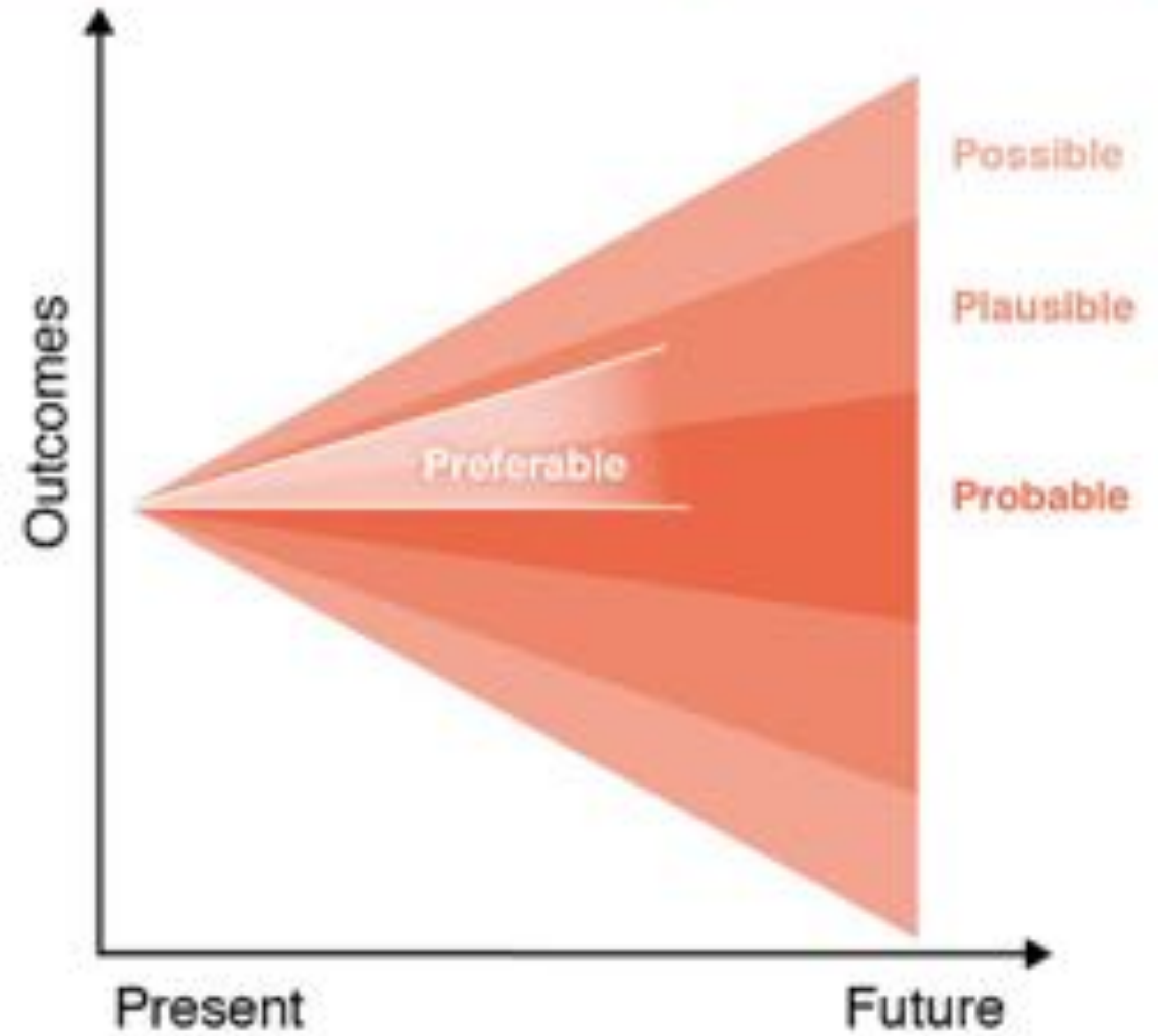


Foresight is Ignorance Management

Forecast



Foresight



General types Foresight analysis?

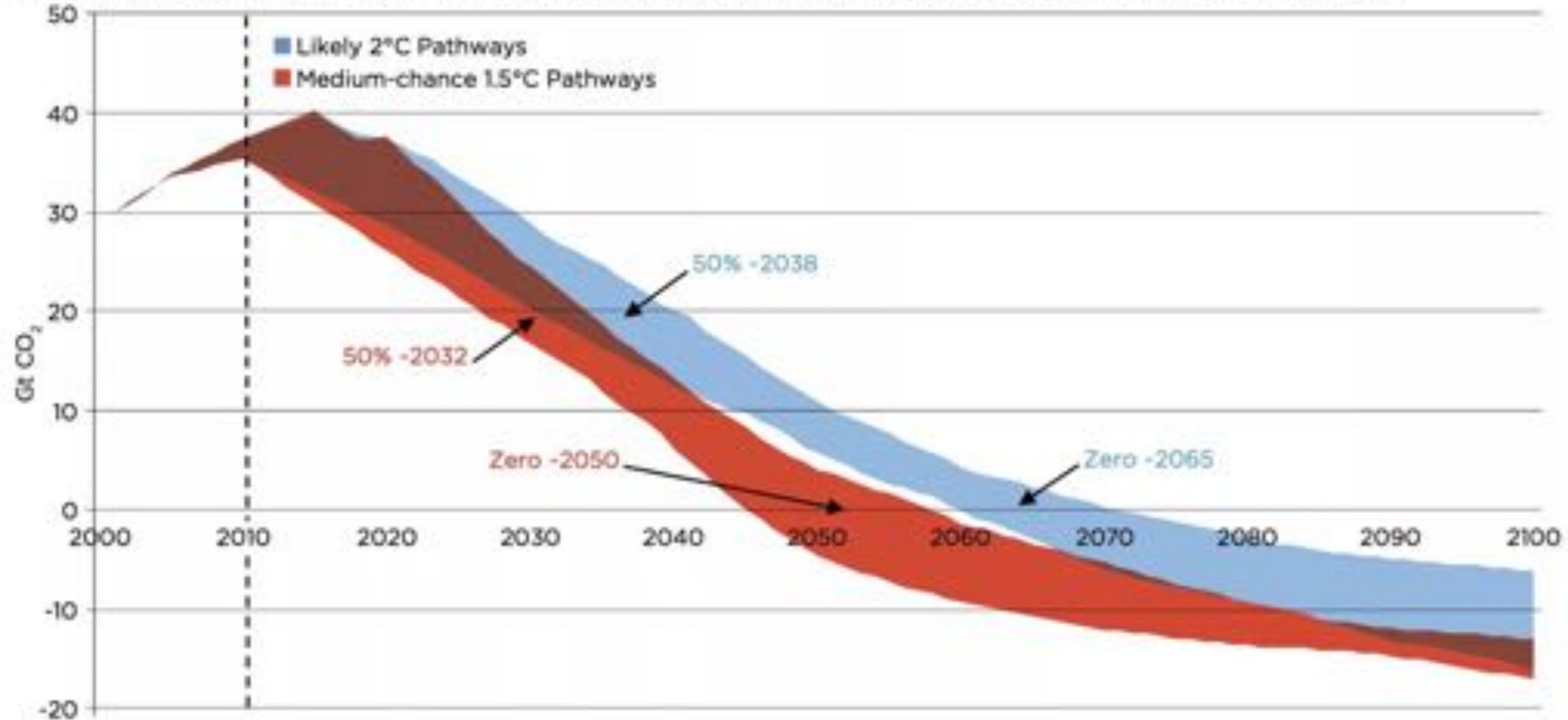
- **Normative scenarios:** Where do we want to go?
- **Explorative scenarios:** What could happen?
- **What-if scenarios:** Are we prepared?
- **System Dynamics:** What is my biggest lever for change?

Normative and explorative scenarios complement one another.

The art is to make them relevant for decision-making.

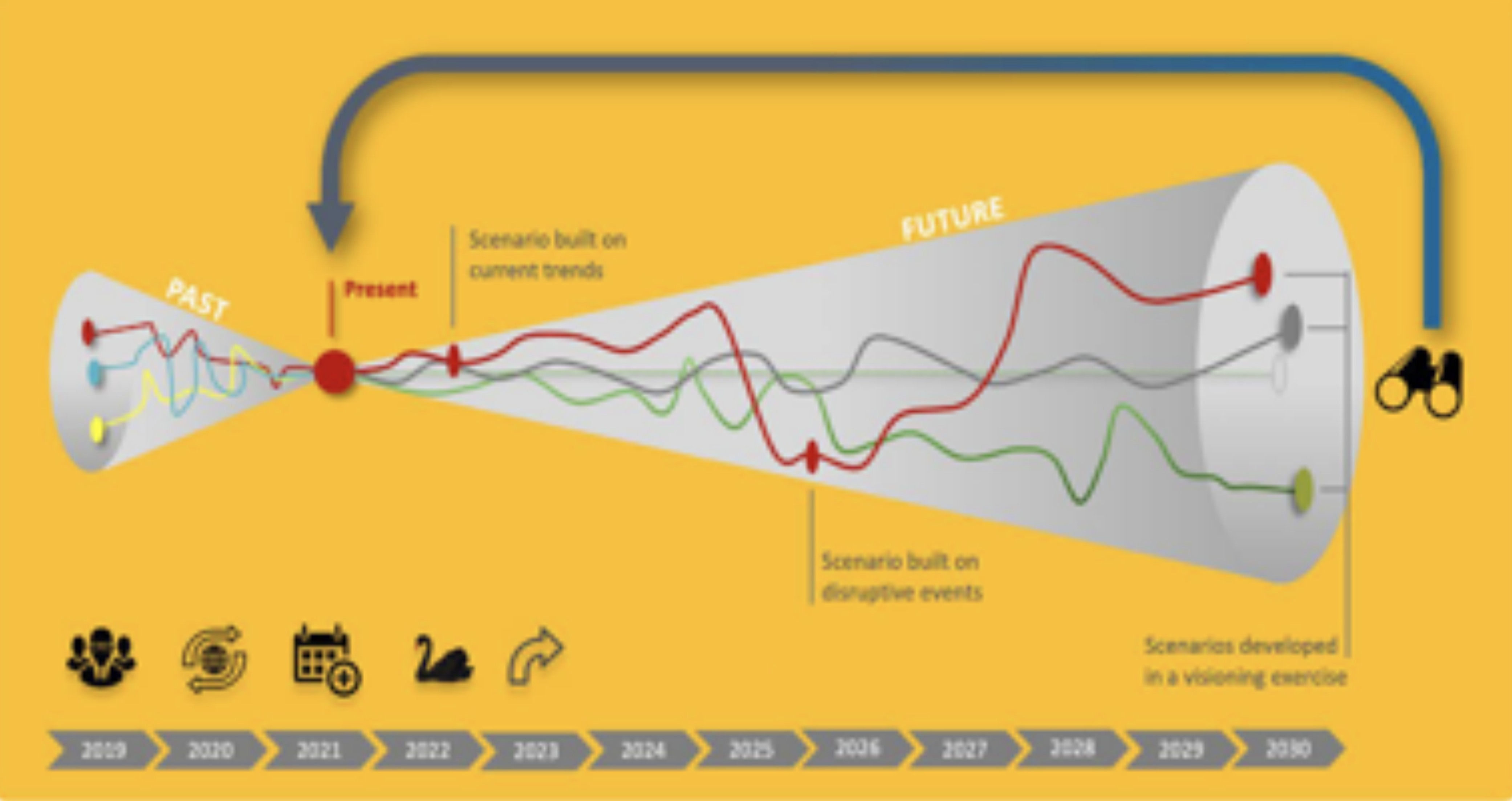
Normative scenarios: Where do we want to go?

Figure 1: Range of Global Emissions Pathways in Scenarios Consistent with Likely Chance of 2°C or Medium Chance of 1.5°C*



Sources: Joeri Rogelj et al

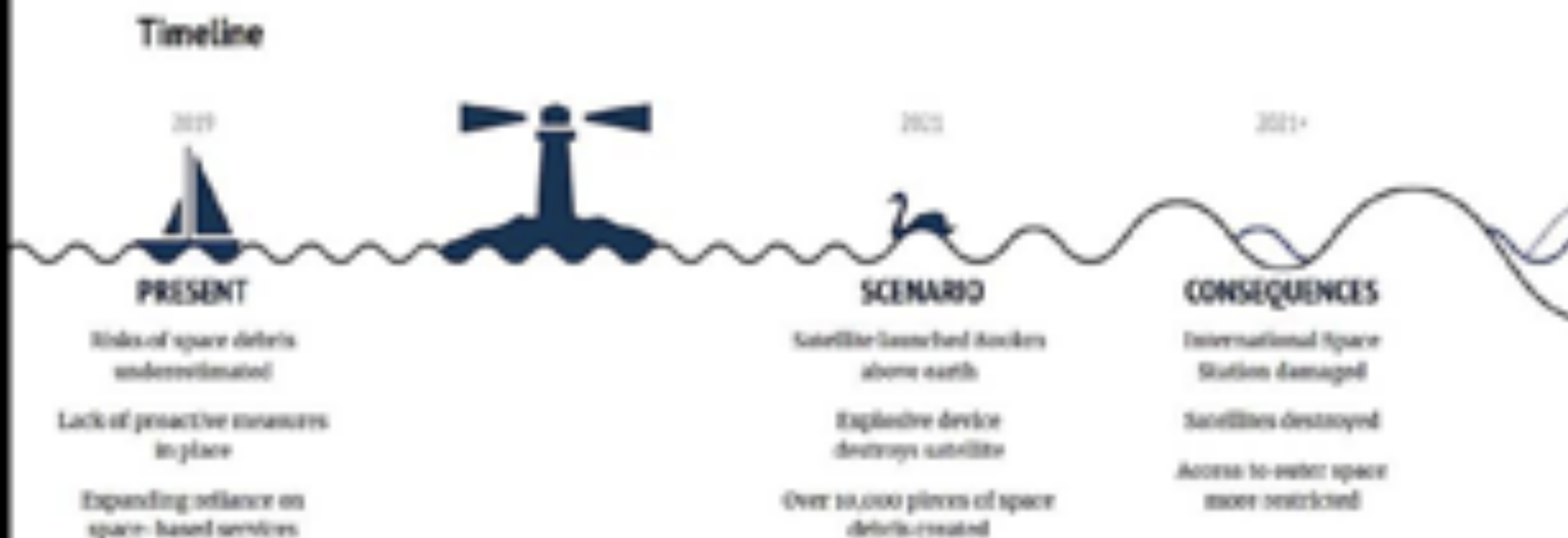
Explorative scenarios: Where could happen?



What if scenarios: Are we prepared (Black Swans)?



WHAT IF...A COUNTRY CREATES SPACE DEBRIS ON PURPOSE?



System Dynamics: Understanding Complex System Interdependencies

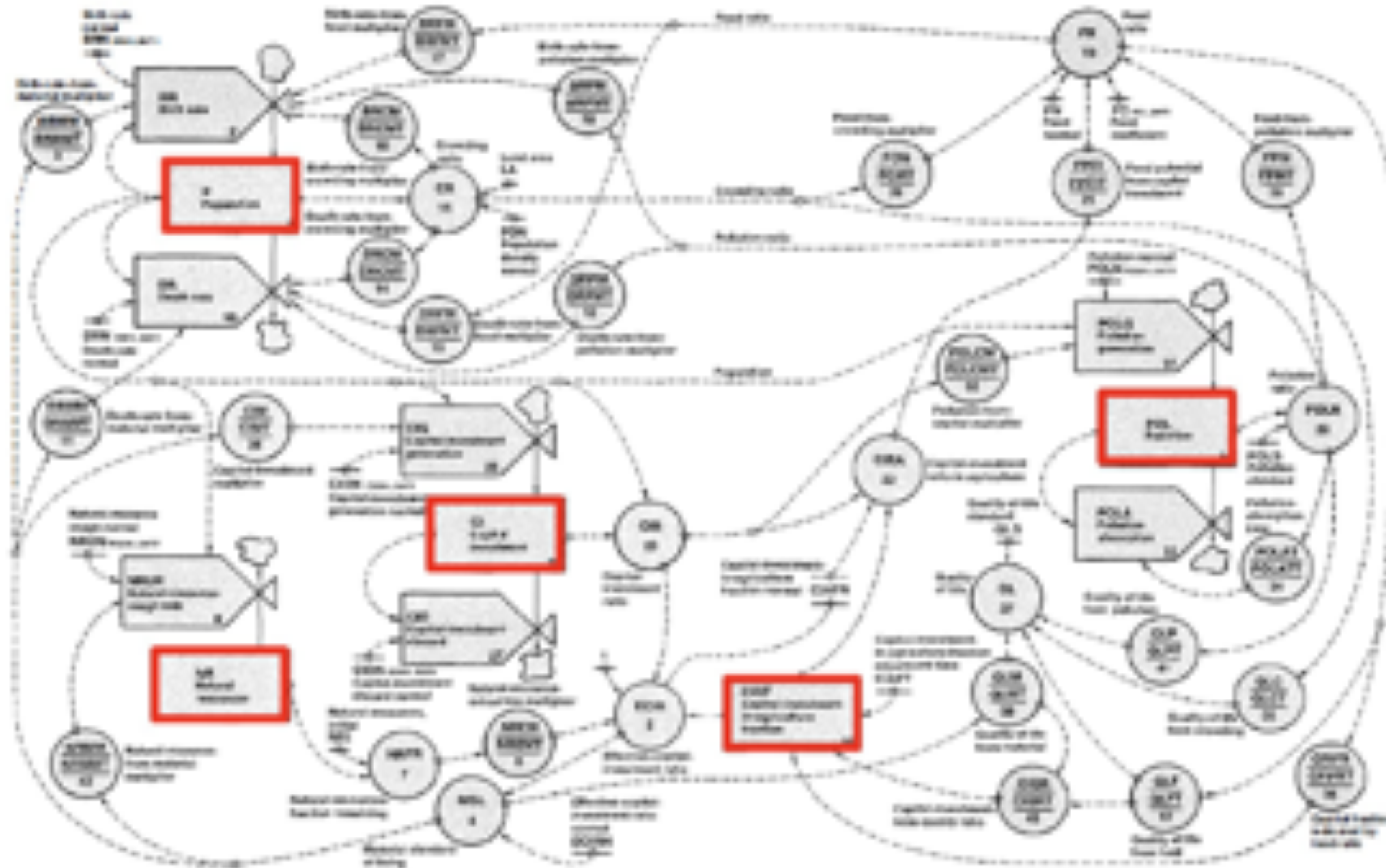
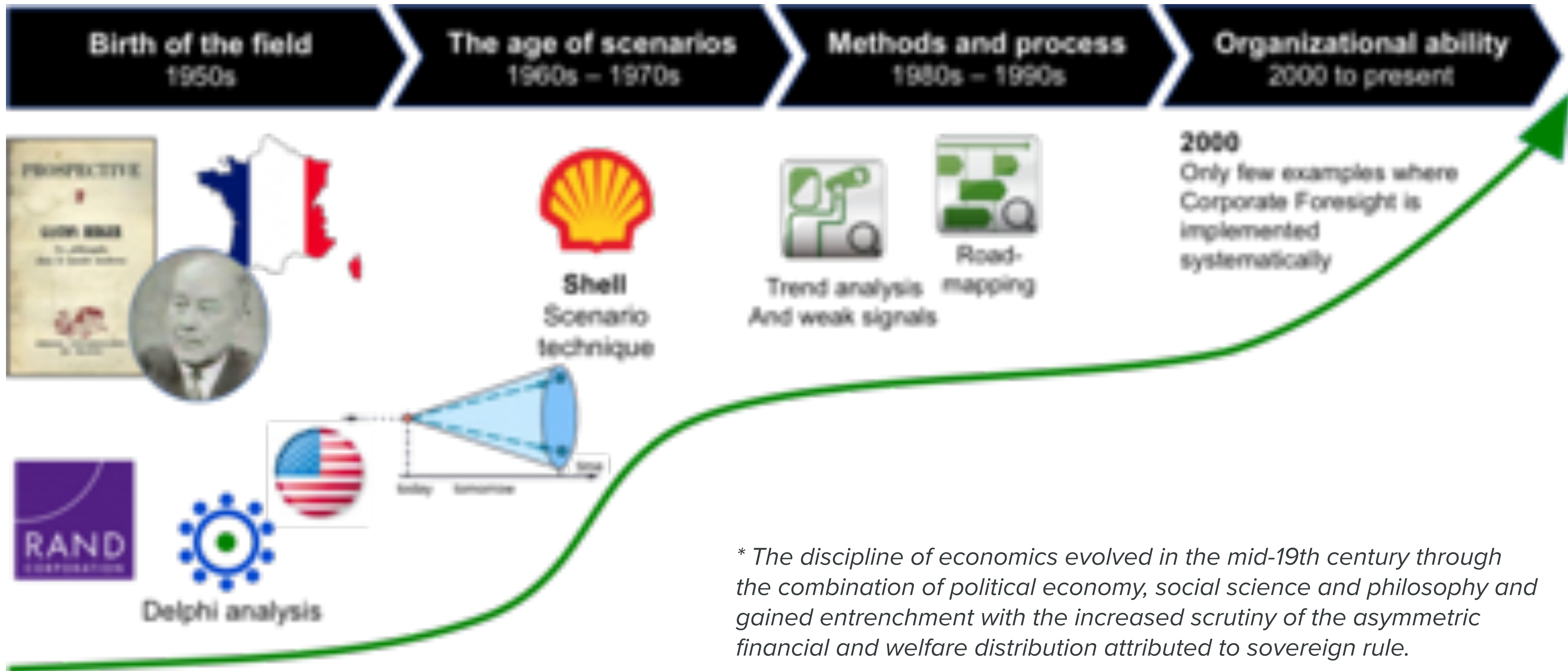


Figure 11: System dynamics of the supply chain management system. Source: MIT Center for Advanced Engineering Study, 2008.

FORESIGHT HISTORY AND PRESENT

FORESIGHT HISTORY



** The discipline of economics evolved in the mid-19th century through the combination of political economy, social science and philosophy and gained entrenchment with the increased scrutiny of the asymmetric financial and welfare distribution attributed to sovereign rule.*

THE SHELL CASE

- 1965: Quantitative, computer-driven financial planning was very much in vogue (still is)
- Royal Dutch Shell put into service what it called the **Unified Planning Machinery (UPM)**, a computer-driven system meant to bring more discipline to the company's cash flow planning.
- Shell's top executives realized that many of the commitments they had to make extended well beyond UPM's six-year time horizon—and that **even within that horizon, UPM tended to get a lot wrong.**
- In the early **1970s they shut it down.**



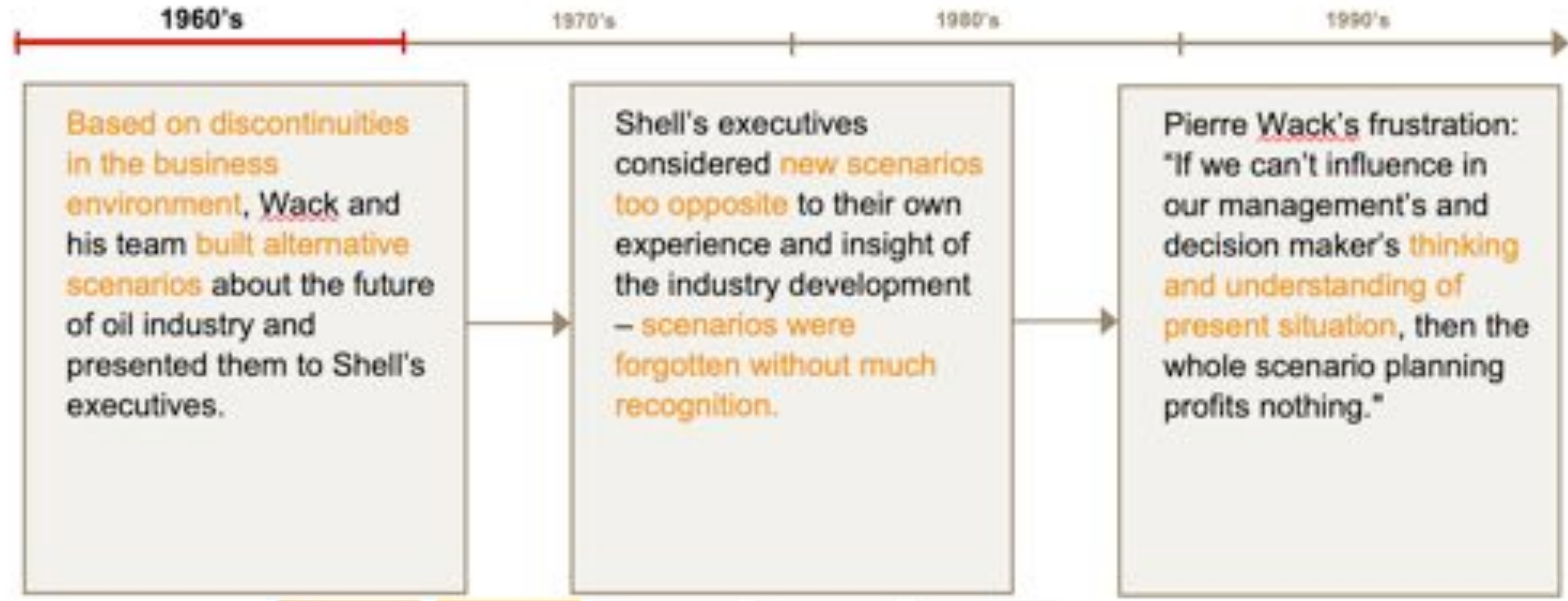
THE SHELL CASE

- **1965: Another initiative** less known started. The Long-Term Studies unit at the London Headquarters.
- The first output was the **"Year 2000"** report.
- The very first oil-price scenarios prepared by this duo were sent to senior executives by mid-1971



THE SHELL CASE

- Shell's business development team introduced a **new strategic thinking tool** - "scenario planning"



THE SHELL CASE

● It took four years for the management of Shell before they could take the possibility of so called "Oil crisis scenario" and its implications seriously - even though the signals were there to be seen.

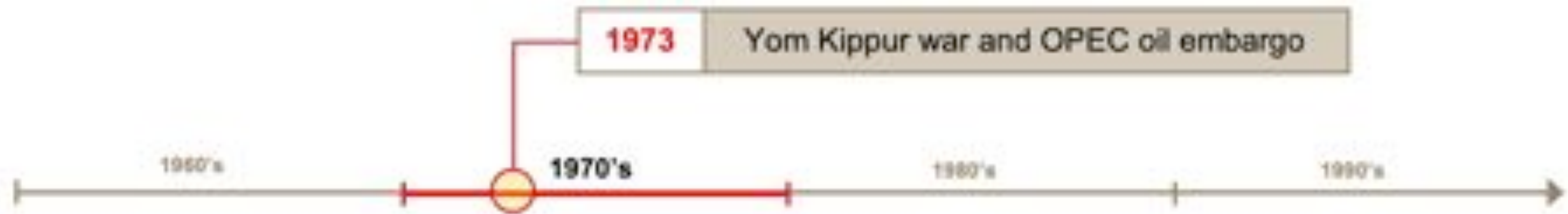
● **Observation:** Oil prices could rise into a new, much higher level before year 1975



In the end of 1960's Planning Director Pierre Wack saw discontinuities in Shell's stable, predictable and familiar business environment:



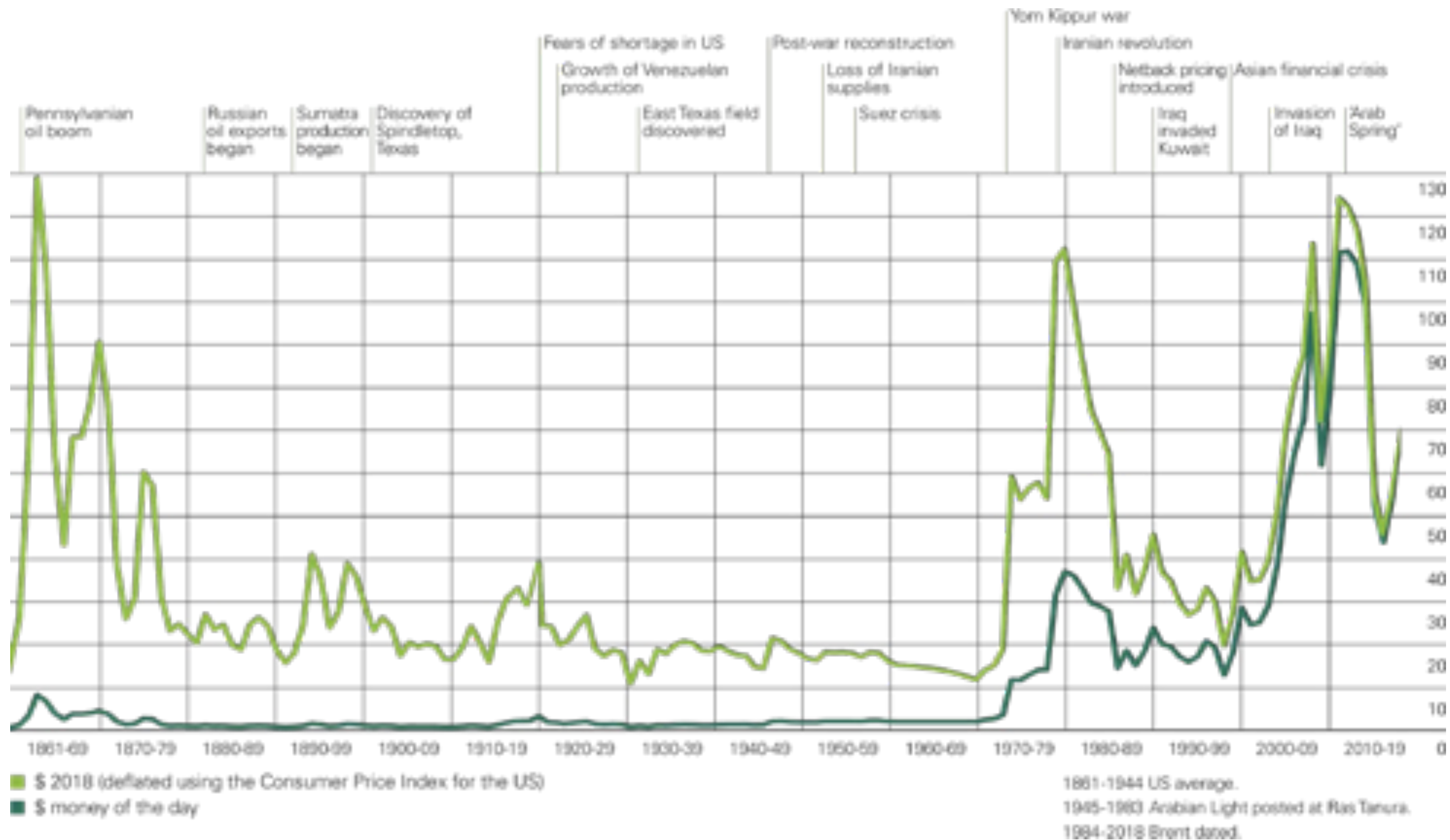
THE SHELL CASE



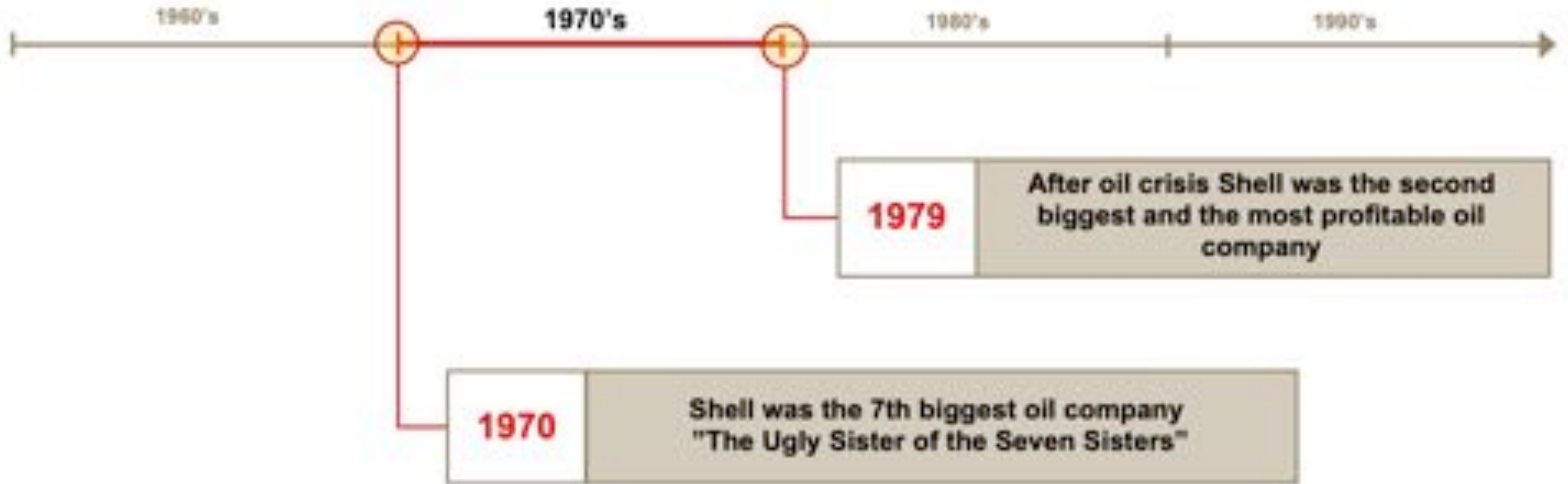
Shell's management acted differently than other oil companies
They made some radical changes in their strategy and action:

- Slowed down oil refinery investments
- Developed refineries, which could utilise any kind of petroleum
- Forecasted energy demand consistently on lower level and more accurately than their competitors
- Accelerated developing oil fields outside OPEC
- Decentralised decision making when their competitors centralised control to enable crisis management

THE SHELL CASE

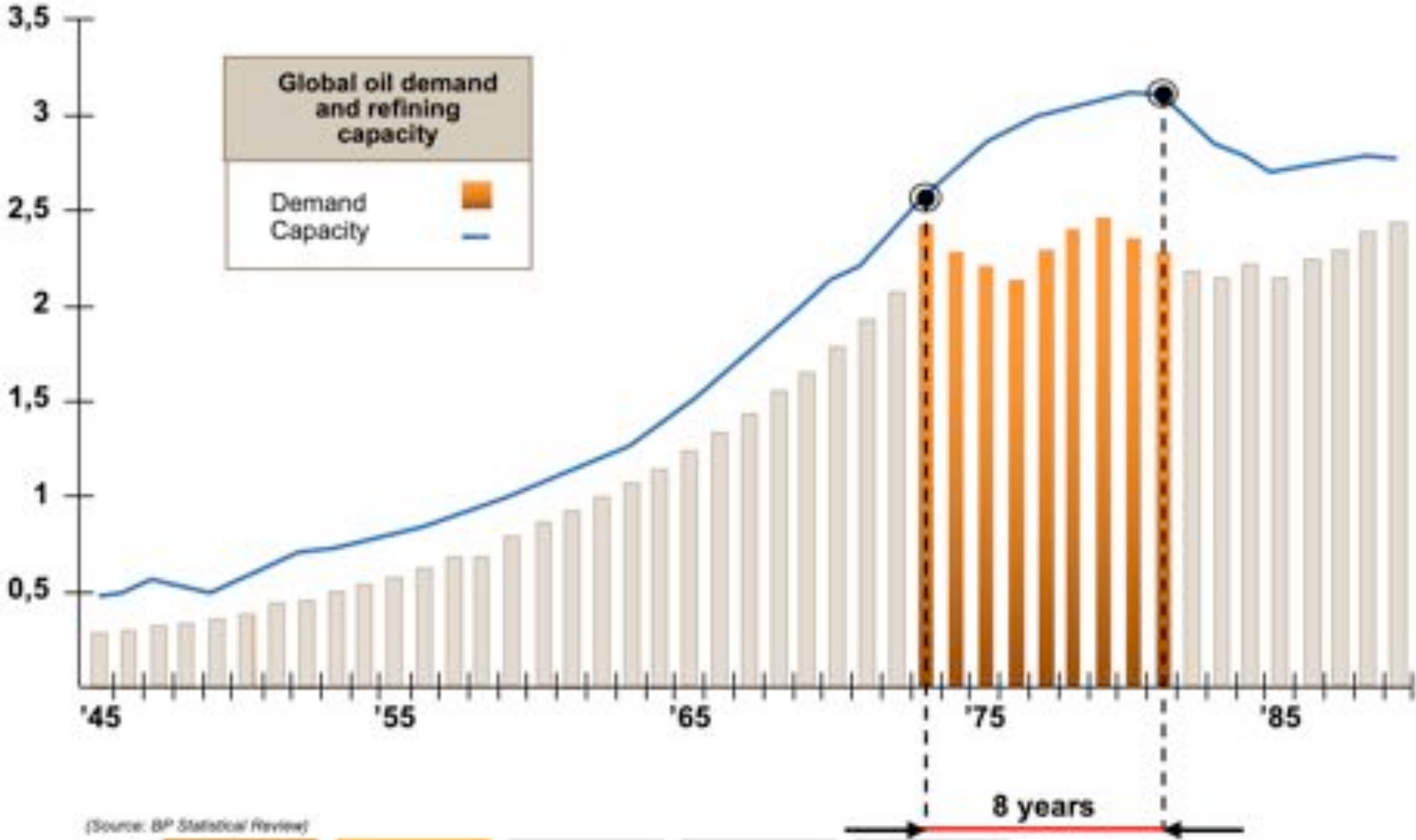


THE SHELL CASE



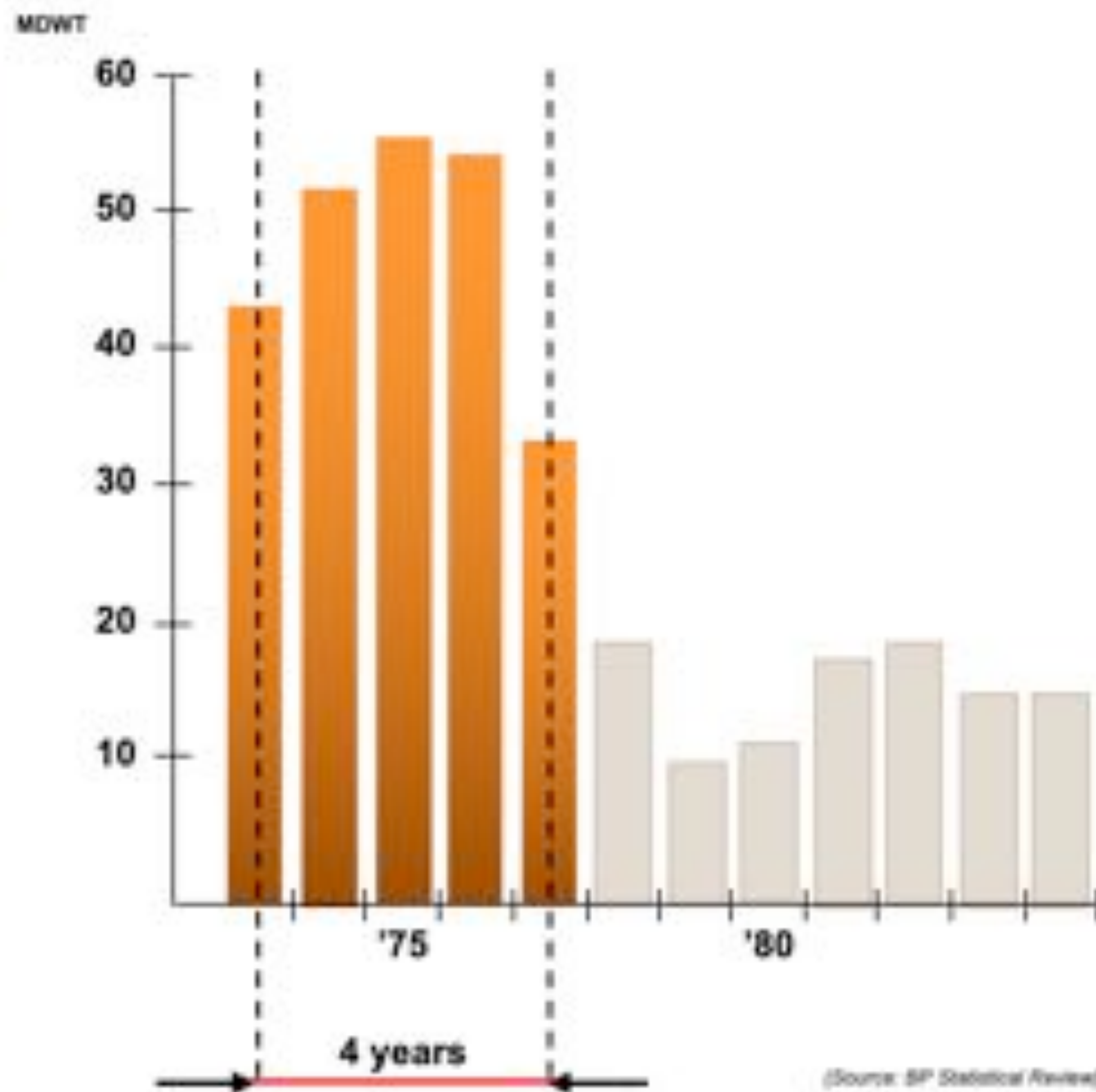
THE SHELL CASE

BTiannum



THE SHELL CASE

Demand for new oil tanker capacity



It was only in 1977 that new building orders for oil tankers started to drop off, even though demand flattened in 1973

Result: huge overcapacity of tankers and freight rates stayed rock bottom for many years

What if? Imagine a company that would have needed only one year to change its business.

WHAT ARE SCENARIOS

Scenarios are not
Forecasts
Variations of the same theme
Number oriented sensitivity analysis (partial sensitivity analysis or best and worst-case analysis, etc.)
Variations around the base-case forecast (high-medium-low)
Describing the alternative developments of internal matters of the organisation
Describing development of one factor or event and its contingency plans
Visions, strategies or politics

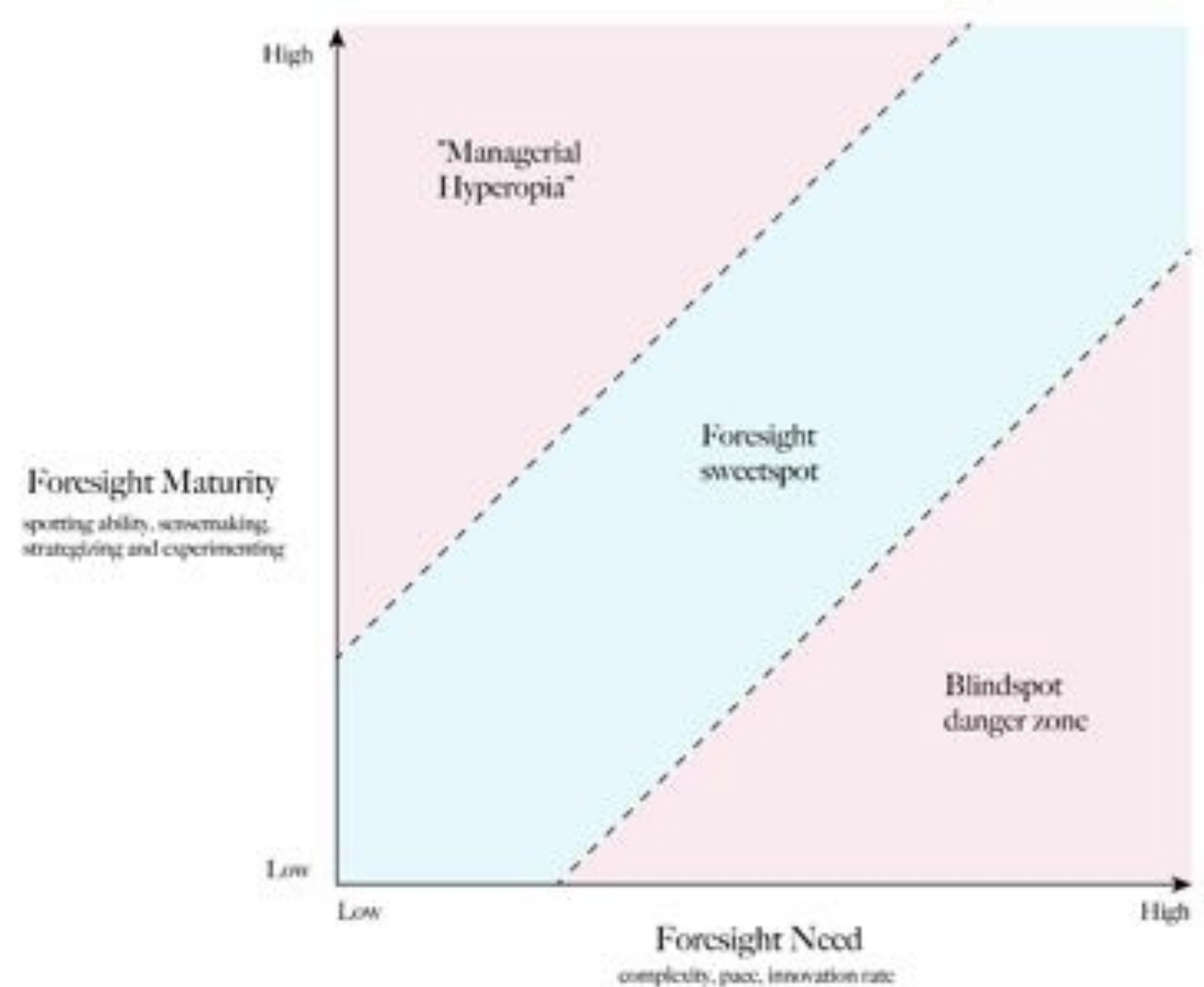
Scenarios are
Holistic descriptions of possible future operating environments
Alternative descriptions with different logic
Based on qualitative changes
Based on different basic assumptions with different dynamics
Describing the alternative developments of the external operating environment
Describing systemic relations between many factors and holistic implications of the system
Alternative external contexts for building visions, strategies and political agendas.

WHAT ARE SCENARIOS

- Scenarios are stories, not predictions.
- Scenarios are designed to help break the habit, ingrained in most corporate planning, that the future will look like the present.
- Scenarios must be plausible, with a logical story line, in order to encourage intuition and judgement.
- Scenarios create a safe space for dialogue and for acknowledging uncertainty.
- Must include some quantification to be credible—but the numbers must flow from the stories, rather than the other way around. Otherwise, there's always the danger that quantitative models will hide assumptions and constrain thinking rather than refine it.
- Because scenarios follow a rhythm distinct from the annual strategy cycle, they allow an organization to see realities that would otherwise be overlooked.

STRATEGIC FORESIGHT IN COMPANIES TODAY

- Strategic foresight has grown into a standard practice for many firms most of us know today, including **Siemens**, **Pepsi**, **Deutsche Bank**, **Boeing**, **Mercedes-Benz** and **Apple**.
- Those who did have systematic foresight processes (i.e. vigilant firms) had 33% more profitability and a staggering 200% higher market capitalization growth (Rohrbeck & Kim, 2018).



Based on Rohrbeck & Kim (2018)

STRATEGIC FORESIGHT IN COUNTRIES TODAY

Germany

- Unit for Strategic Foresight & Policy Planning, German Federal Chancellery
- Federal Ministry of Education and Research

<https://www.bundesregierung.de/resource/blob/998434/1662408/d95c8a3e27881d9c96a8ae18e56cd21f/2019-08-20-organigramm-bk-en-data.pdf?download=1>

<https://www.bmbf.de/en/bmbf-foresight-1419.html>

Finland

- Government Foresight Group , PM's Office
- Committee for the Future, Parliament

<https://vnk.fi/en/foresight>

<https://www.eduskunta.fi/EN/valiokunnat/tulevaisuusvaliokunta/Pages/default.aspx>

Singapore

- Center for Strategic Studies, PM's Office

<https://www.csf.gov.sg>

South Korea

- Futures Institute, National Assembly

<http://nafi.re.kr/eng/index.do>

Japan

- NISTEP research institute, Ministry of Education, Culture, Sports, Science and Technology (MEXT)

https://www.nistep.go.jp/en/?page_id=1730

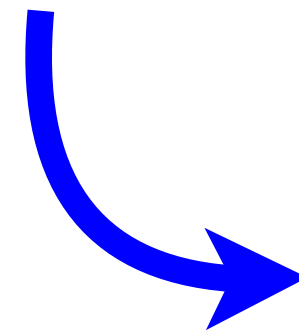
OECD , UN , EU, UNESCO, Canada, Spain, Wales, Dubai, UAE, France, Greece, etc

FORESIGHT & FUTURES LITERACY

The three levels of
futures studies

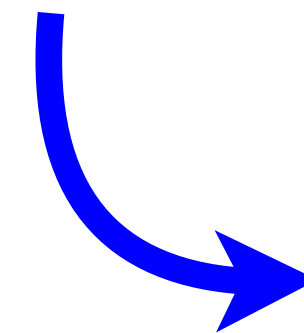
Forecasting

Predictive/quantitative/past-based/
continuity



Foresight 1.0

Non-Predictive/qualitative/
possible futures/ discontinuity



Foresight 2.0

Open/social/experimental/
Futures Literacy

Predicting / Mapping / Shaping



UNESCO

United Nations
Educational, Scientific and
Cultural Organization

"Building peace in the minds of men and women"

IN BRIEF

WHAT WE DO

WHERE WE WORK

PARTNERS

JOIN US

RESOURCES

Home > Futures Literacy

Futures Literacy

Futures Literacy: A Skill for the 21st Century



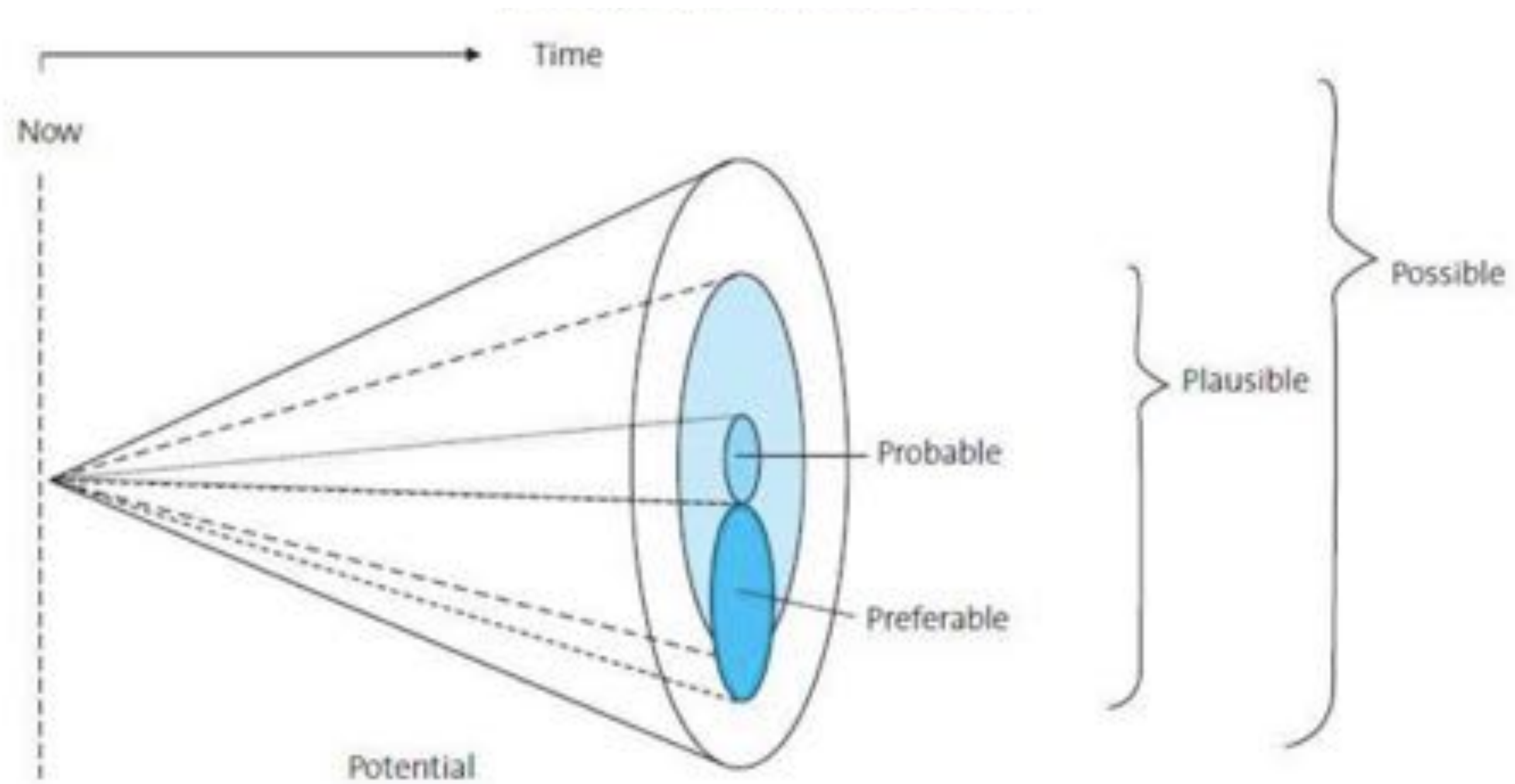
In its role as a **Global Laboratory of Ideas**, UNESCO is pioneering a powerful change in why and how people **'use-the-future'**.

WHAT HAS NOT BEEN **IMAGINED
WILL NOT BE FORESEEN IN TIME.**

PETER SCHWARTZ, THE ART OF THE LONG VIEW

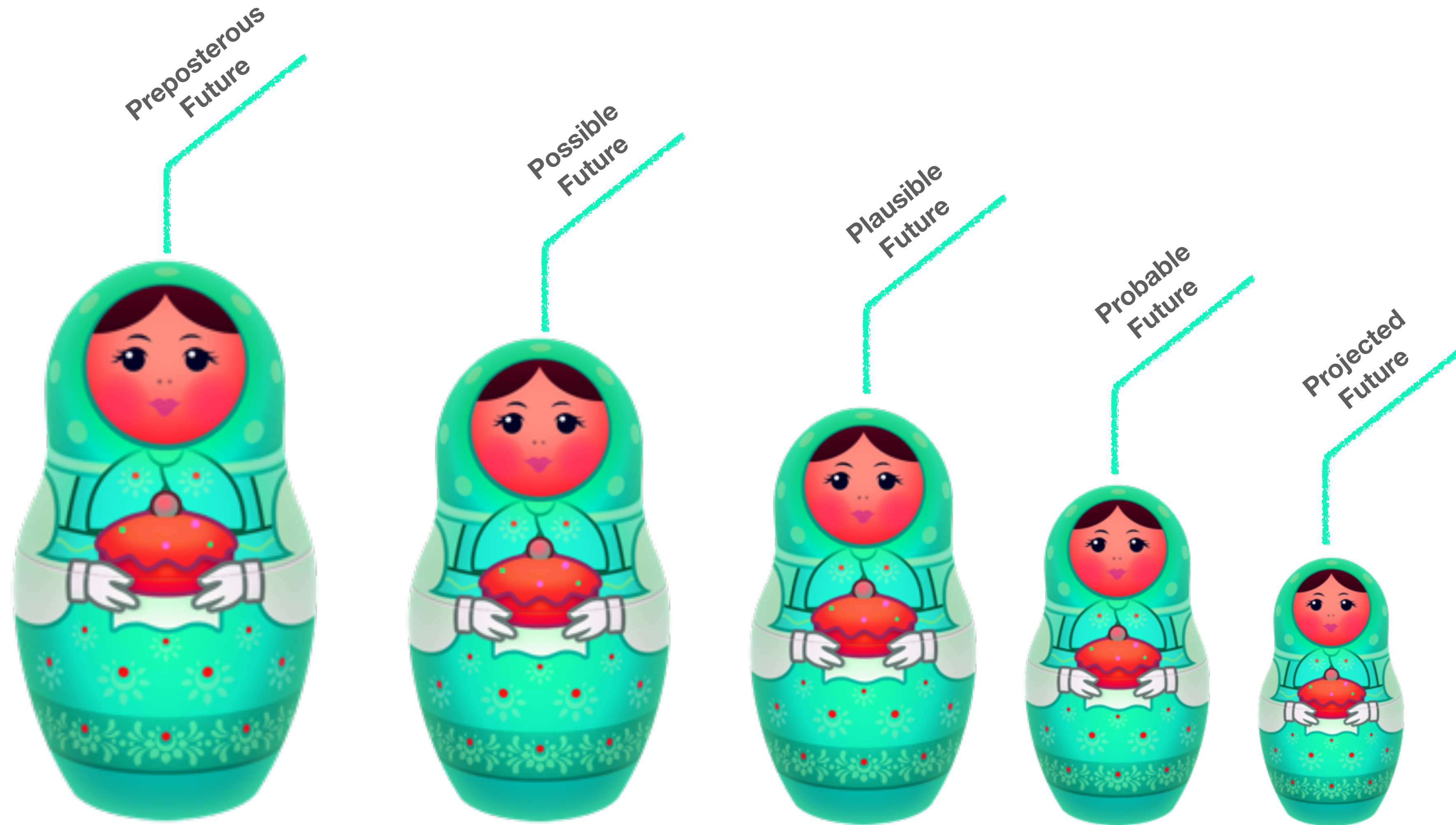
FORESIGHT METHODS

THE FUTURES CONE



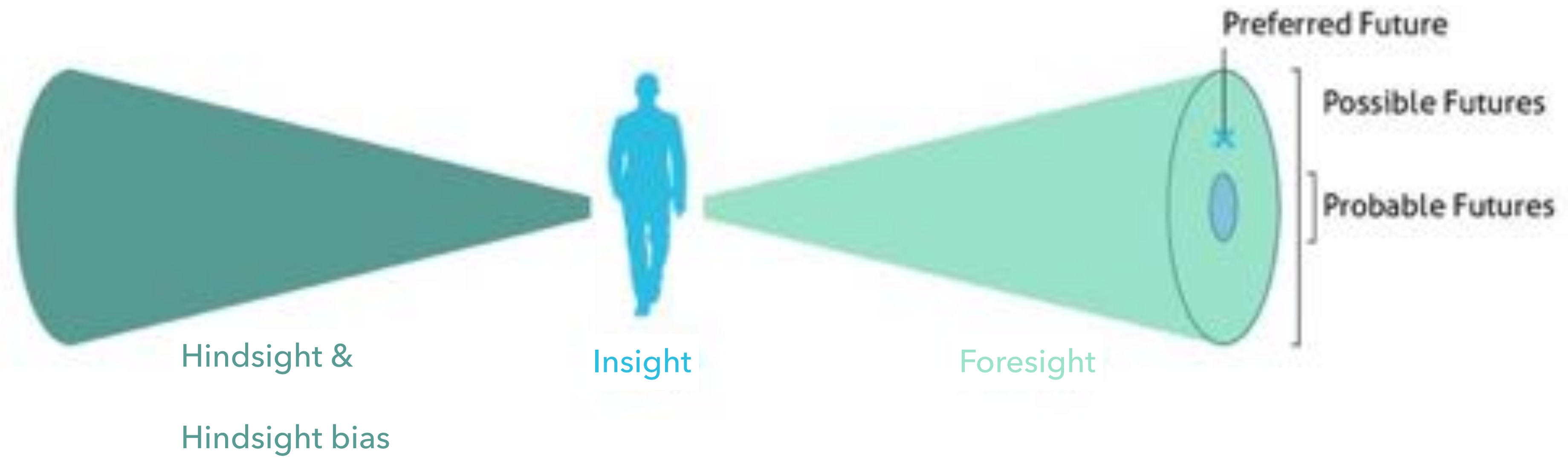
Source: Voros, 2003

THE MATRYOSHKA FUTURE DOLLS

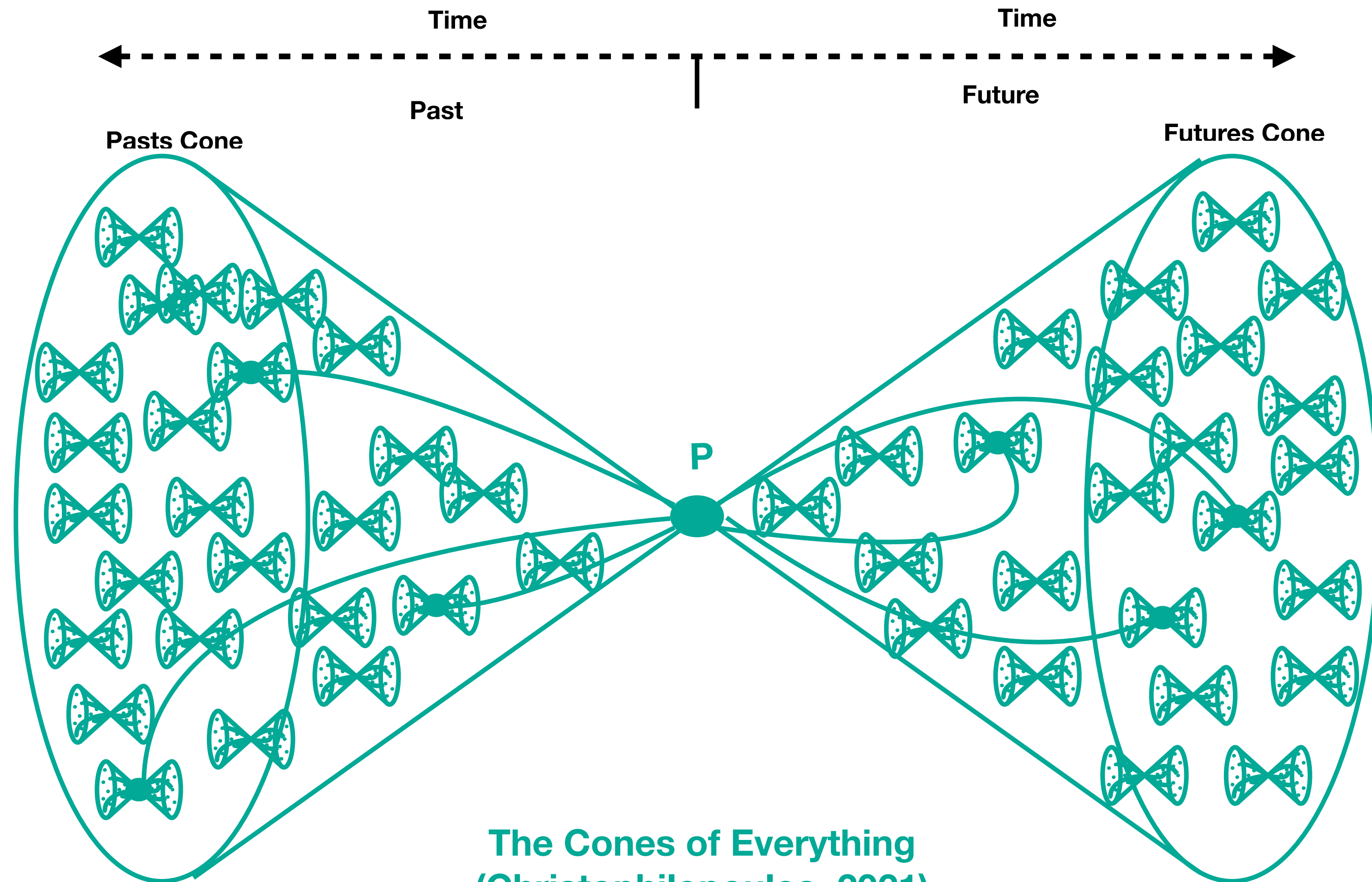


(Christophilopoulos, 2021)

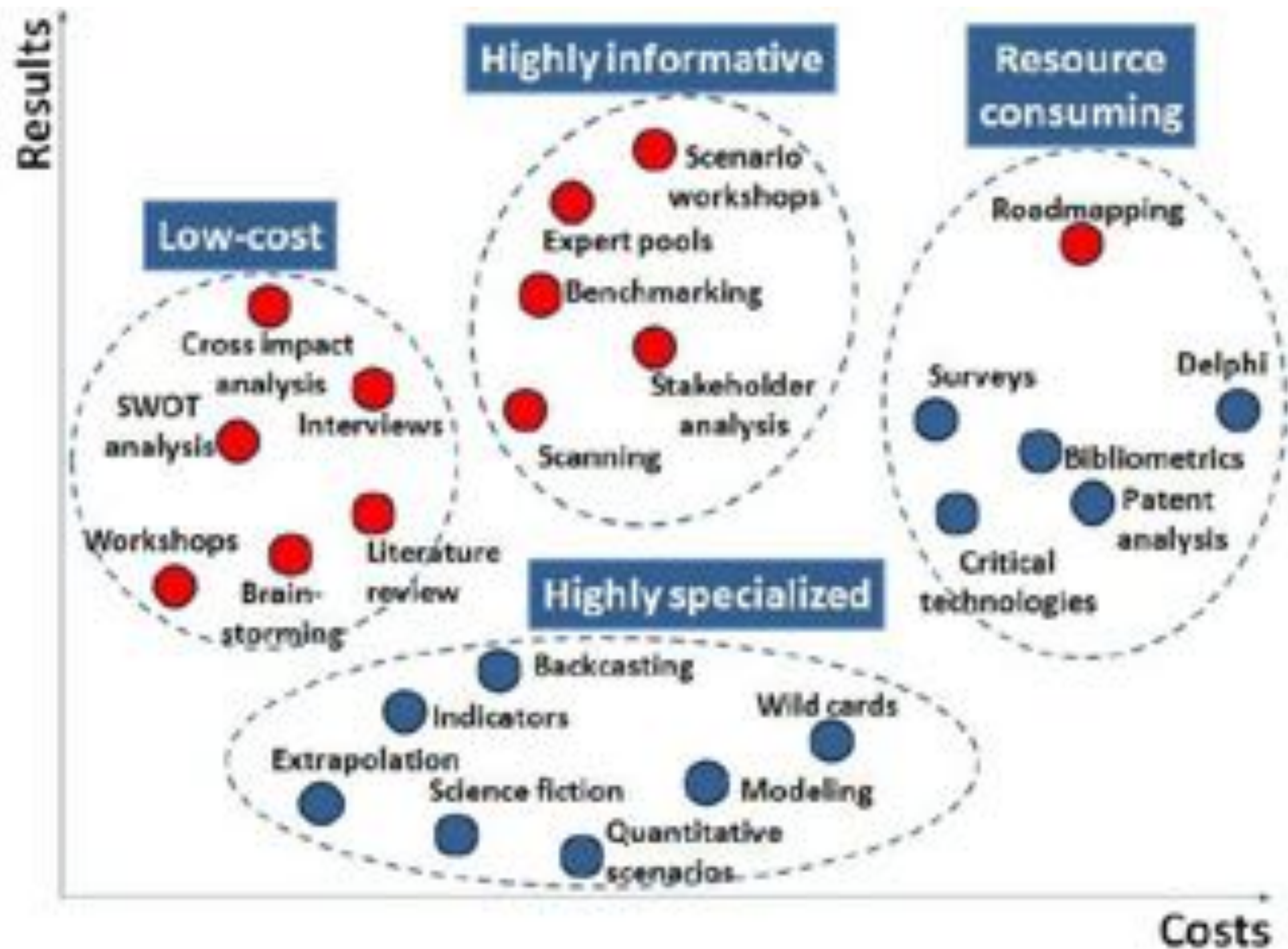
THE FUTURES CONE



THE CONES OF EVERYTHING



The Cones of Everything
(Christophilopoulos, 2021)



MEGATRENDS, TRENDS, WEAK SIGNALS, BLACK



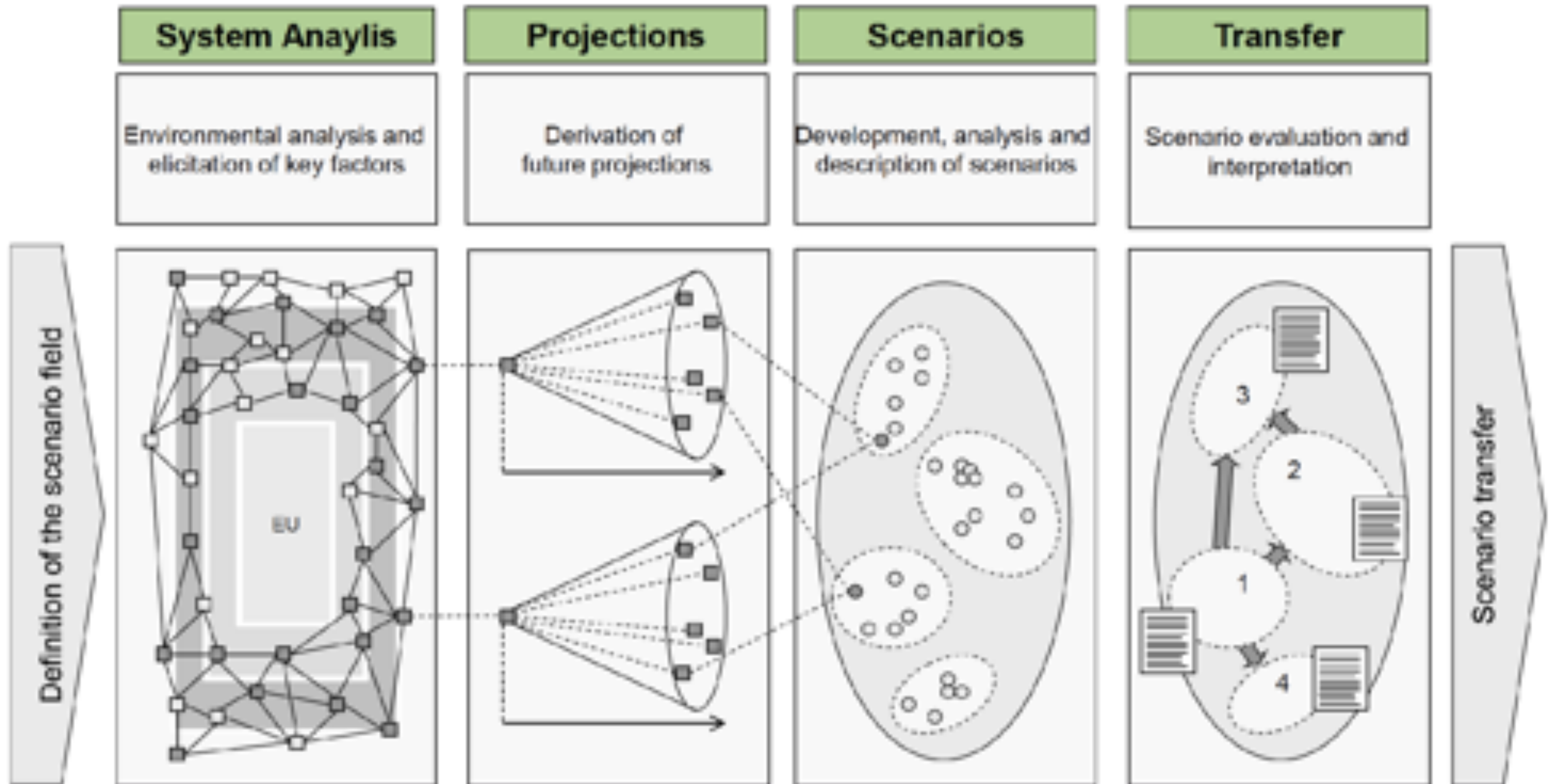
Megatrend = a major path of development, an identifiable cluster of phenomena with a clear direction of development.

Trend = long-term change moving in a clearly identifiable direction.

Weak signal = event or phenomenon that can be considered a first expression of change or a new trend in development.

Black swan = an unexpected and unlikely factor of change that has significant effects and that suddenly pushes a chain of events onto an uncertain path.

METHODOLOGICAL INTRODUCTION



MAIN METHODS

- ▶ **Horizon Scanning**
- ▶ **Trend Impact Assessment / Cross Impact Analysis**
- ▶ **Morphological Analysis / Field Anomaly Relaxation (FAR)**
- ▶ **Scenarios**
- ▶ **Science fictioning**
- ▶ **Games & Experiential futures**
- ▶ **Delphi**

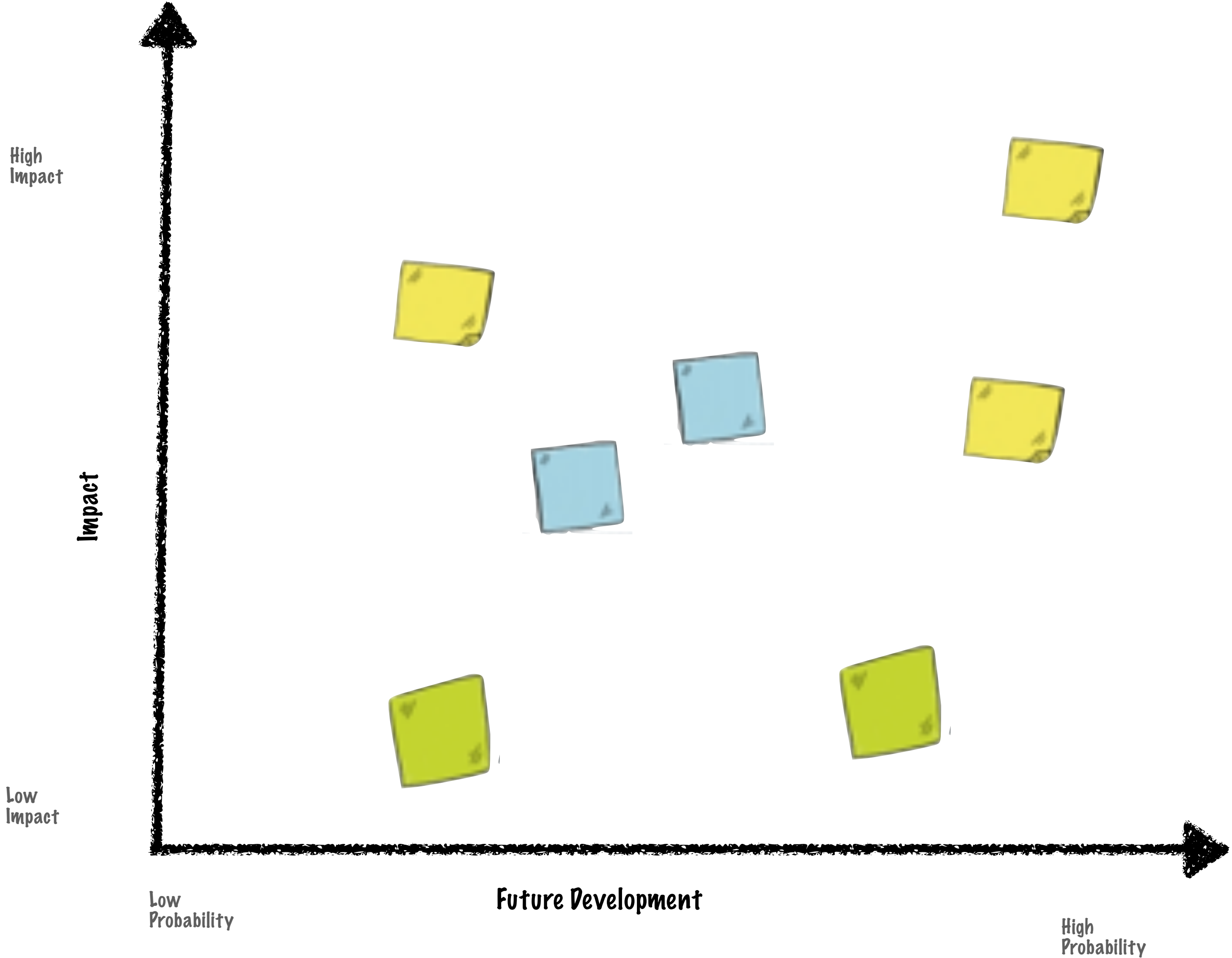
HORIZON SCANNING

- ***Anticipating the technological challenges of the battlefield of tomorrow*** : In a world in which technologies become the catalyst of numerous changes, and in which major innovations come no longer from the military, but from the civil industry, it is paramount to understand how these latter can impact the future of warfare. Translated into systems or into capabilities, technological disruptions will materialize as opportunities as well as threats. To anticipate them, a 360° horizon scanning is performed, covering the trends in Information & Communication, Energy, Nanotechnology & Materials, Life Sciences, Sensors, Robots and Autonomous Systems. (Page 13: https://deftech.ch/wp-content/uploads/2018/07/armasuisseWT_Defence-Future-Technologies-What-We-See-On-The-Horizon-2017_HD.pdf)

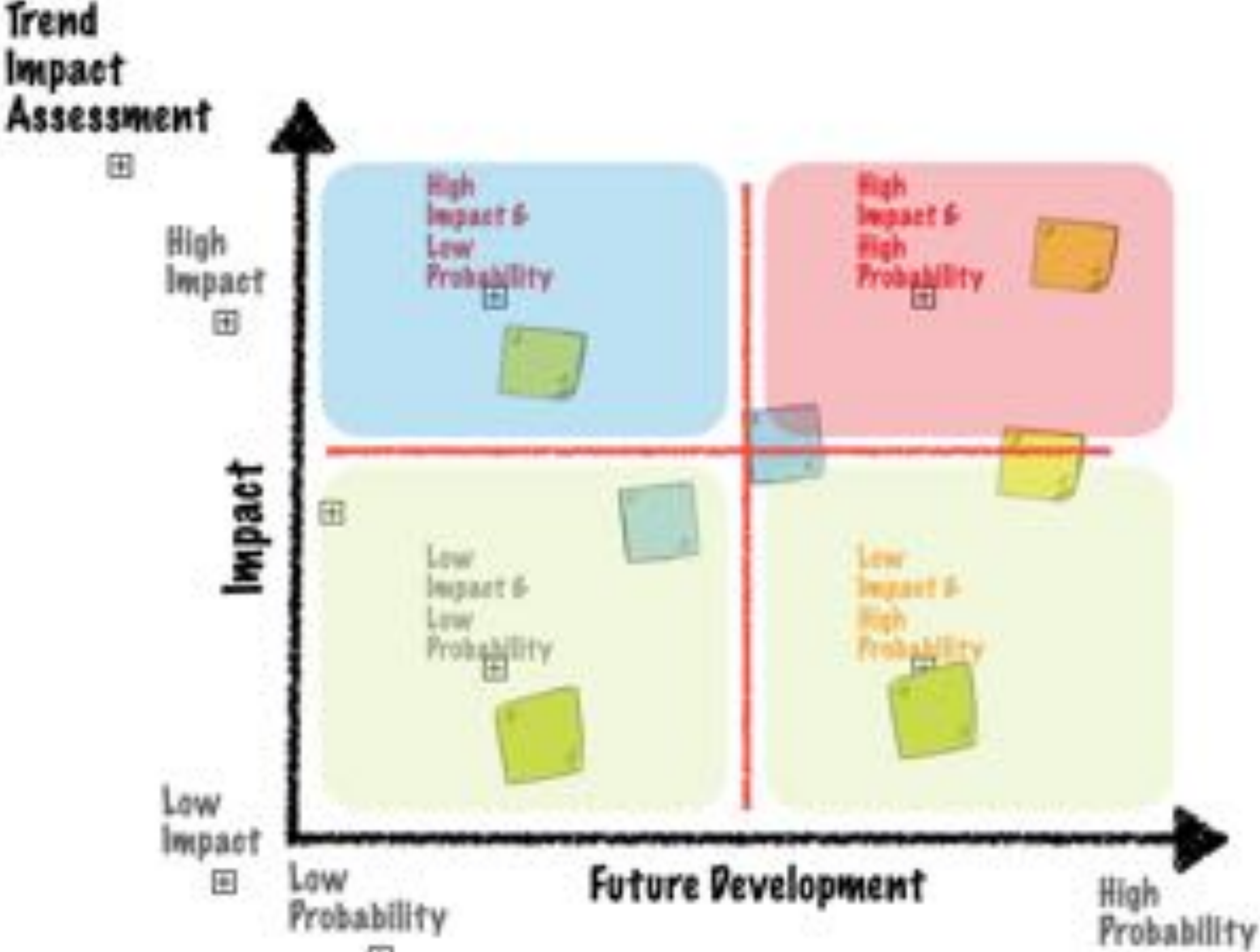


TREND IMPACT & CROSS IMPACT ANALYSIS

Trend
Impact
Assessment

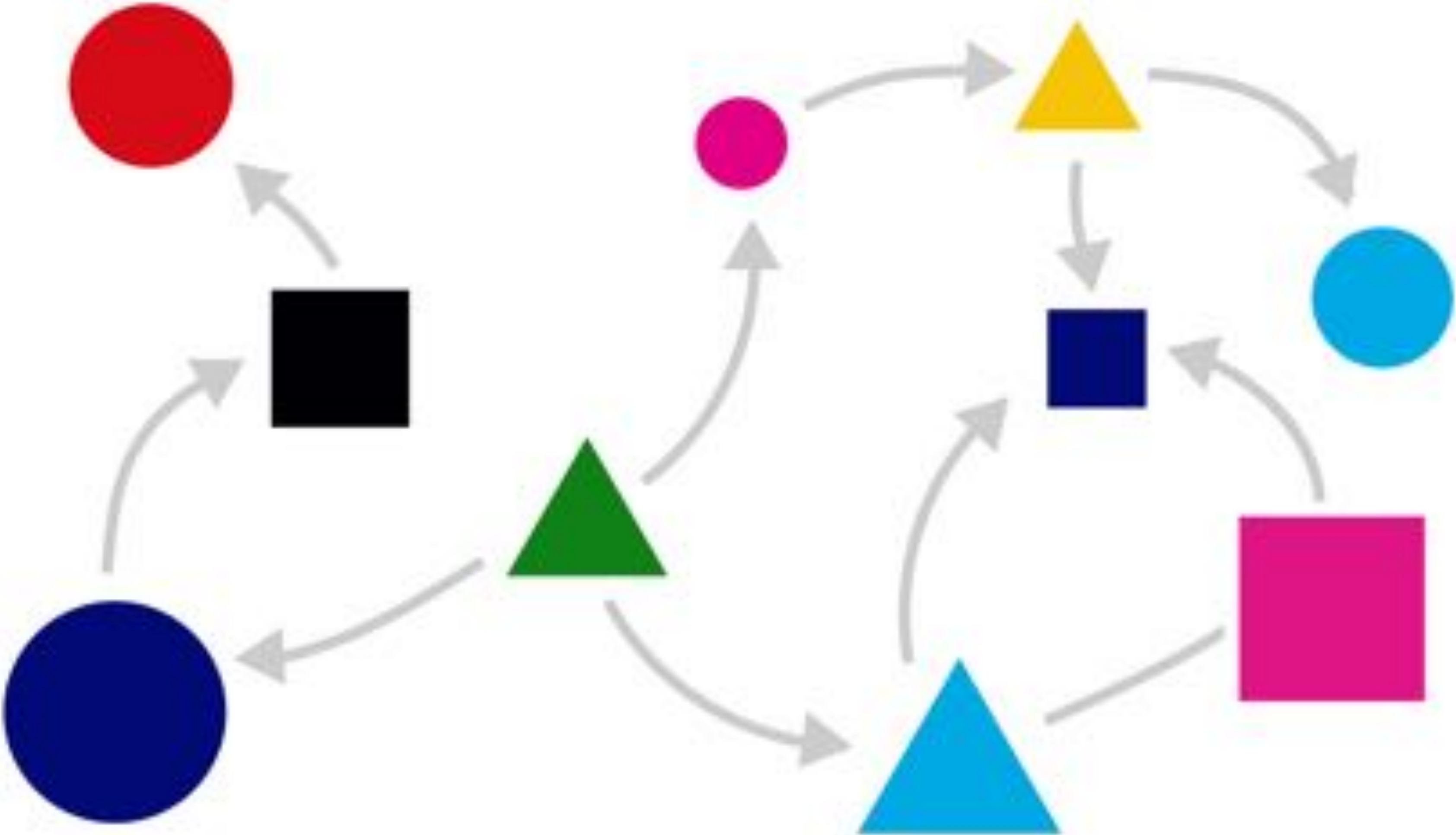


TREND IMPACT & CROSS IMPACT ANALYSIS

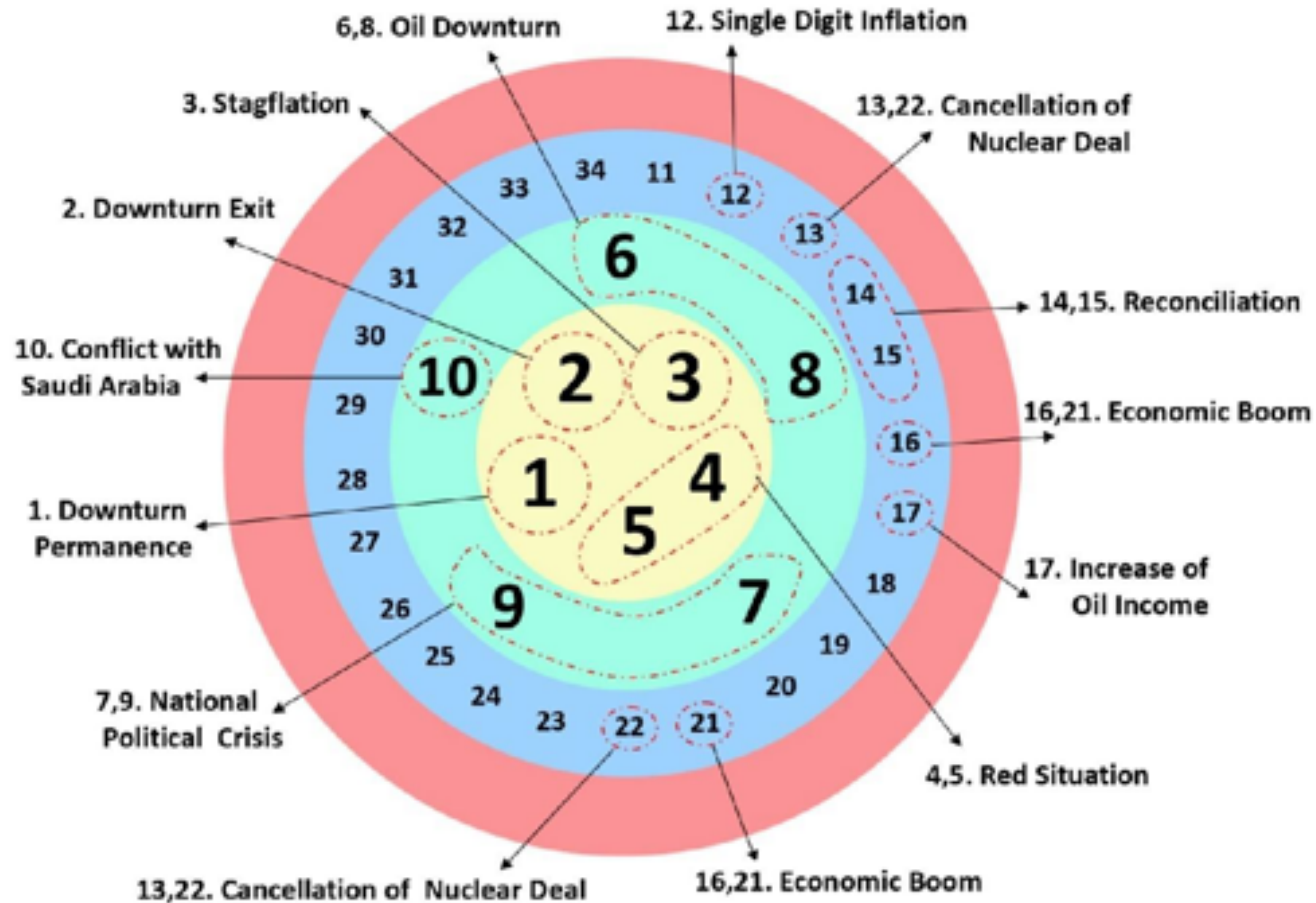


TREND IMPACT & CROSS IMPACT ANALYSIS

Cross Impact Analysis



MORPHOLOGICAL ANALYSIS / FIELD ANOMALY RELAXATION (FAR)



Iran's 1395 Scenarios (2016-2017)

SCENARIOS

Category:	Answers the question:	Main objective:	Methods/techniques:
- Predictive	"what will happen"	to clarify how specific drivers will develop	trend extrapolations; BAU scenarios
- Explorative	"what can happen"	to identify drivers (frequently using qualitative data)	forecasting; foresight; strategic scenarios
- Normative	"what should happen"	to assess how a specific target can be reached	normative scenarios; backcasting

Based on: Vergragt & Quast, 2011, and Nowak et al. 2011.

SCENARIOS



Evergreen Foresight Program
US Coast Guard



US Air Force

SCENARIOS

Dator's "Four futures"



US Air Force

SCIENCE FICTION

- **Federal Department of Defence, Switzerland**, <https://deftech.ch/wp-content/uploads/2018/07/Technological-developments-and-challenges-armasuisse-ST-DEFTECH-2018.pdf>
- **Crisis in Zefra, Canadian Army**, Crisis in Zefra is a fictional narrative designed to illustrate emerging concepts and technologies that could become part of Canada's Army of the Future. Set in 2025, this story follows what starts out as a routine patrol mission through the streets of war-torn Zefra, but the situation quickly degrades into a 'three-block-war' scenario. The aim of this publication is to stimulate both interest and debate on the conceptual development of Canada's Army. <https://deftech.ch/wp-content/uploads/2018/07/Technological-developments-and-challenges-armasuisse-ST-DEFTECH-2018.pdf>





- ***Red Team, France***, Launched in the summer of 2019, the Red Team initiative is an innovative, forward-looking exercise designed to foster reflection on strategic, operational, technological and organizational issues by France's Ministry of Armed Forces and outside groups. The Red Team project has been divided into four seasons and draws on the contributions of science fiction authors and screenwriters as well as scientists and military experts. <https://psl.eu/en/news/red-team-defense-season-1-scenarios-have-been-announced>

SERIOUS GAMES



Work/Technology 2050: <https://www.futures.gr/en/2019/02/01/ses-work-tech-2050/>

DELPHI/REAL-TIME DELPHI

EMERGING TECHNOLOGIES FOR POTENTIAL PREDETECTION OF TERRORISTS AND NEW COUNTER-TERRORISM STRATEGIES. / The Millennium Project for NATO

<p>Submit all rows Row 1 of 21</p>	 <p>Multi-spectral and other sensors that collect biometric data that identifies individuals such as facial recognition, gait, olfactory signals, iris patterns, etc. (details) click here for example click here for example click here for example</p>	<p>Imagine two worlds. One employs this approach, the other does not. If the world that does not employ this approach were to have 10 attacks, how many do you think would occur in the world that uses it?</p> <input type="text"/> Change as of: 1/1/2011 11:11 Submit only this row! go! Please provide reasons for your answers click here	<p>In the year 2025 how likely is the use of this approach by more than 50% of the security programs of developed countries?</p> <p><input type="radio"/> Very high (32) <input checked="" type="radio"/> High (38) <input type="radio"/> Mid range (8) <input type="radio"/> Low (3) <input type="radio"/> Very Low (0)</p> <p>Your answer has been entered, and you may change it at any time. Submit only this row! go! Please provide reasons for your answers click here</p>	<p>Considering factors such as cost, training, and negative unintended consequences, please rate the difficulty of introducing this technique?</p> <p><input type="radio"/> Very high (6) <input type="radio"/> High (28) <input checked="" type="radio"/> Medium (38) <input type="radio"/> Low (10) <input type="radio"/> Very low (3)</p> <p>Your answer has been entered, and you may change it at any time. Submit only this row! go! Please provide reasons for your answers click here</p>
<p>Submit all rows Row 2 of 21</p>	 <p>Software systems for automatic monitoring of social media. Three kinds of monitoring are involved: key word searches -- who talks to whom -- to identify networks that may connect suspect individuals, and message content -- in which individuals may reveal their intent or past activities. (details) click here for example click here for example click here for example</p>	<p>Imagine two worlds. One employs this approach, the other does not. If the world that does not employ this approach were to have 10 attacks, how many do you think would occur in the world that uses it?</p> <input type="text"/> Change as of: 1/1/2011 11:11 Submit only this row! go! Please provide reasons for your answers click here	<p>In the year 2025 how likely is the use of this approach by more than 50% of the security programs of developed countries?</p> <p><input checked="" type="radio"/> Very high (34) <input type="radio"/> High (25) <input type="radio"/> Mid range (14) <input type="radio"/> Low (3) <input type="radio"/> Very Low (0)</p> <p>Your answer has been entered, and you may change it at any time. Submit only this row! go! Please provide reasons for your answers click here</p>	<p>Considering factors such as cost, training, and negative unintended consequences, please rate the difficulty of introducing this technique?</p> <p><input type="radio"/> Very high (4) <input type="radio"/> High (16) <input checked="" type="radio"/> Medium (38) <input type="radio"/> Low (32) <input type="radio"/> Very low (3)</p> <p>Your answer has been entered, and you may change it at any time. Submit only this row! go! Please provide reasons for your answers click here</p>

DUBAI FUTURE FORUM

DUBAI FUTURE FORUM



THANK YOU