SAMI Research

Meta-Megatrends:

Review of different approaches

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SAMI Consulting
Robust decisions in uncertain times

SAMI CONSULTING

META-MEGATRENDS

How many ways can we look at the future?

OVERVIEW

Megatrends are sufficiently well-understood areas of change that strategists and planners would do well to take into account when developing their plans. Naturally, depending on the topic or area of study, different megatrends will vary in relevance and importance – there will be no one definitive set. Also many trends intersect and interact with each other, so it is natural that different people present them differently.

This research note is a review of the megatrends produced by a number of different government agencies and consultancies to see how they compare and what can be learnt. As well comparing the actual trends identified, we examine the different approaches used to create them, and the related concepts that some introduce. Finally we consider the ways in which uncertainty is addressed – megatrends are not complete predictions - and the different uses the various examples could best be suited to.

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How many ways can we look at the future?

Introduction – Megatrends and SAMI Consulting

The future is inherently uncertain. But we constantly make predictions – we have to, even if it is to assume that nothing will change. For short-term forecasting or for structurally rigid systems (such as a roulette wheel), these predictions can be pretty good. Even for more complex dynamic systems like the weather, technology is helping us get better at forecasting.

For multi-factored, closely integrated social systems, life becomes more difficult. Good mathematical models can take us so far. But pretty soon uncertainty creeps back in. Then we have to look at more qualitative underlying drivers of change – what futurists have taken to calling "megatrends".

SAMI Consulting is no different. SAMI is a well-established foresight and futures consultancy, helping clients make "robust decisions in uncertain times". Over 30 years we have delivered some 250 projects in over 25 countries. We are expert in various futures thinking tools and techniques, and maintain a regular horizon scanning activity to keep abreast of changing dynamics in social, technological, environmental, economic and political (STEEP) dimensions.

In 2018, we developed a collection of "**Drivers of change**" based on our general scanning work. This was developed further into a book by SAMI people: **Megatrends and How to Survive Them** – Patricia Lustig and Gill Ringland. They posted summaries of these in blogs on SAMI's website in 2018 and 2019 . These are also available on their own website.

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So we thought it would be valuable to review the megatrends produced by a number of different government agencies and consultancies to see how they compare and what can be learnt – hence this research note. As well comparing the actual trends identified, we examine the different approaches used to create them, and the related concepts that some introduce. Finally we consider the ways in which uncertainty is addressed – megatrends are not complete predictions - and the different uses the various examples could best be suited to.

SAMI's drivers of change

SAMI identified twelve key drivers of change:
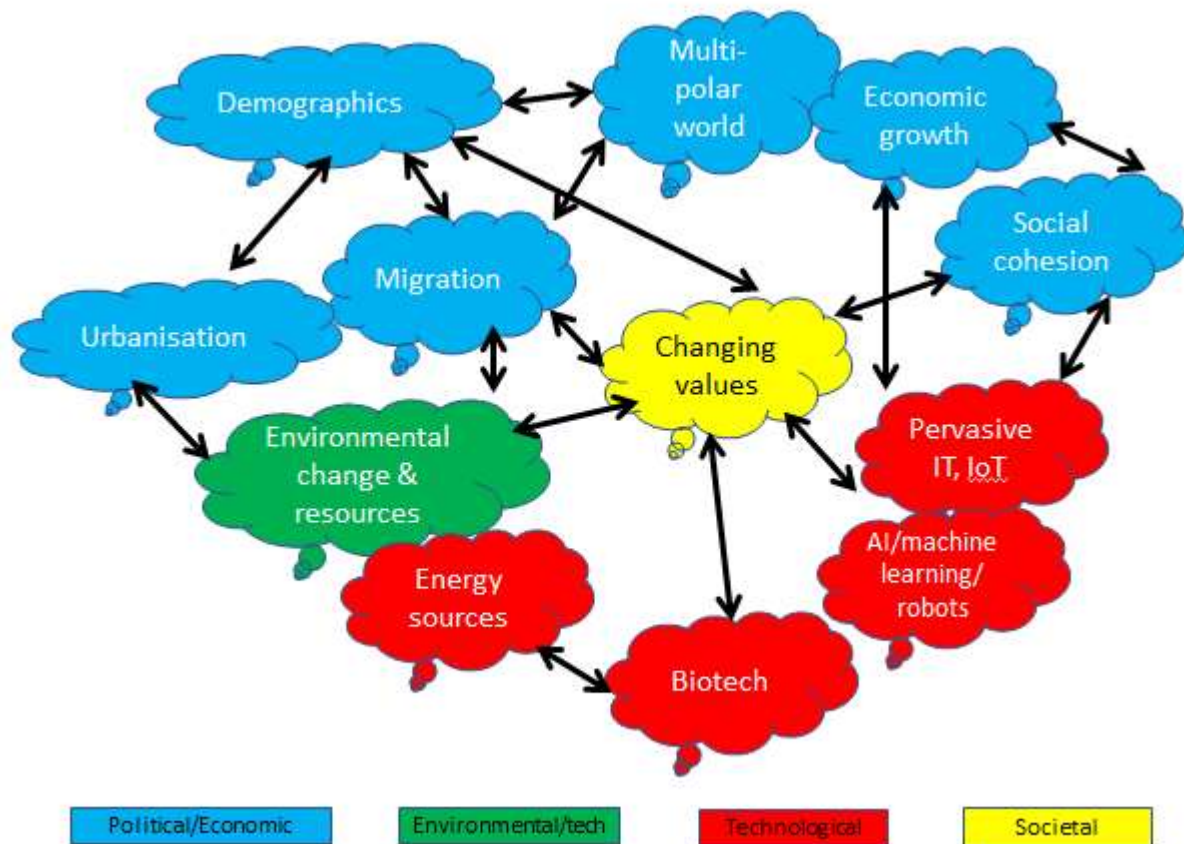
- **Demographics:** Growing world population, driven by increasing longevity, especially in Africa (and not by increasing numbers of babies being born); also an ageing population
- **Multi-polar world:** Shifting global economic centre of gravity from West (and OECD) to East and South (especially Africa).
- **Economic Growth**: Increasing returns to capital at the expense of labour; growing inequality within countries. Regional and sectoral distribution of economic growth set to evolve with pace of growth uncertain.
- **Social Cohesion:** Deteriorating social cohesion leading to unrest until "third culture" becomes the norm.
- **Climate and Environmental Change:** Climate change leading to even more extreme weather events, such as more hurricanes, higher sea levels, more floods and more droughts, acidified oceans, bleached corals, California fire and mud slides, Australian fire, etc.
- **Energy Sources:** Energy sources are **i**ncreasingly diversified and decentralised as energy mix shifts.
- **Pervasiveness of IT/IoT:** plus blockchain/FS/data/smart infrastructure
- **Machine learning and 4.0, robots:** Increasing sophistication of machine learning and adaptive IT systems (face recognition, AI, robotics, cobots, AI journalists, automated trading, etc) – impact on jobs
- **Biotech:** Emerging bio-age (personal medicine, manufacturing in fermentation vats, bio-engineered chemical production, biodata storage etc.).
- **Migration:** In Europe 1 million plus young immigrants a year from mostly Middle East and North Africa. Globally 21.5mn displaced yearly by natural disasters.
- **Urbanisation:** Continuing shift of population from rural environments to city life.
- **Changes in personal values:** Personal aims and ambitions – how do the generations compare?

These drivers were also classified by STEEP.

SAMI's document identifies for each driver:
- where the trend is now
- how we expect it to develop in the medium term, and by 2030
- what might push in the opposite direction;
- critical uncertainties – a range of possible outcomes;
- wildcards – low probability events that could disrupt the expected mega trend.

Compare and contrast
Fifteen government and consultancy sets of megatrends are analysed in the Appendices.

All of them - if not explicitly, then as contributory factors – include:
- Demography
- Climate change
- Technological advance - AI, IoT, big data (though fewer include biotech)

Other commonly identified trends were:
- "Multi-polar world" (shifting power bases)
- Social cohesion (inequality)
- Urbanisation/megacities

SAMI's set of megatrends and that of the EC Joint Research Council are very similar.

Some factors were identified by only a small number of groups:
- Migration – which is perhaps rather surprising
- Gender shift
- New governing systems
- Diversified education and training (though this could be covered under Technology by some).

Comparison of Megatrend sets

MEGATREND	SAMI	EC JRC	EEA	EP	MOD	NIC	McKinsey	KPMG	PWC	DELOITTES	IPSOS	EY	ARUP	RED BULL	ST	Σ 15
Demographics	x	x	x	(x)	x	x		x	x		x	x		x		11
Multi-polar world – west to east	x	x	x	x	x	x	x	x	x						x	10
Economic Growth	x		x	x				x								4
Social Cohesion (inequality)	x	x		x		x	x			x	x		x		x	9
Climate and Environmental Change – resources, ecosystems	x	x	x	x	x	x	(x)	x	x	x			x	x	x	13
Energy Sources	x															1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Pervasiveness of IT/IoT; 3D printing	x	x	x		x	x	x	x	x	x		x		x	x	12
Machine learning and 4.0, robots (nature of work)	x	x								x		x				4
Biotech	x		x						(x)							3
Migration	x	x														2
Urbanisation Megacities	x	x	x		x			x	x	x	x	x			x	10
Changes in personal values	x	x			x			x	x	x	x	x				8
Consumerism	(x)	x								x	x	x		x		6
Diversified education and learning		x		x												2
Health challenges technology		x	x	x		x				x	x	x		x		8
New governing systems		x			x	x				x						4
Changing security paradigm			x		x	x				x	x				x	6
Pollution			x												x	2
Beyond globalisation						x				x		x				3
Business models							x			x		x			x	4
Competition for talent								x								1
Empowered women										x						1
Transparency										x						1
Gender Shift												x				1

(Note: comparison may not be precise because of different interpretations of terms)

The overall number of megatrends by related STEEP category were:
- Society -   8
- Technology -   6
- Environment - 2
- Economy -   6
- Politics -   8

(Note some are related to more than one STEEP category)

This is interesting in that, in general discussion, attention is very often focussed most on technology. It seems that the futurists felt it important to emphasise other factors, with socio-political ones coming out top.

Methodologies

The lists are generally built up by groups of experts and scanners. Shaping Tomorrow (ST) is an AI-based approach, gathering information from a wide range of sources.

There is no general definition of "megatrend" – it is assumed that the reader will have a rough idea of what it means. Most groups attempted to produce a set of a manageable size - 8 to 12 – though PWC had as few as 5, and Deloitte as many as 35.

Some added more depth and structure to the exercise:
- MOD identify 5 themes, 13 geographies, 6 drivers, 16 focus areas
- McKinsey identified 75 global trends and gathered them into 9 forces ("crucibles") in 3 groups
- Deloittes found 35 drivers of change, which they grouped via inter-related STEEP factors into 10 megatrend "stories"
- EY had three "primary forces", 10 megatrends, and 6 "convergence themes"
- Shaping Tomorrow categorised trends in three "waves", and rated them by "intensity" and "tipping point".

Naturally, those with a particular agenda tended to focussed on those specific issues - MOD and NIC on security, EEA on ecosystems. Others would tend to group together the greater detail into a more generic trend.

Most Megatrends sets simply described the changes that were occurring. Others – KPMG, EEA – were more normative, looking to stimulate a response.

Visual depiction

The complexity of inter-related trends merits a visual approach. Deloittes, EY, Ipsos and Shaping Tomorrow have sophisticated images showing the inter-relationships. Arup has a scenario cross diagram.
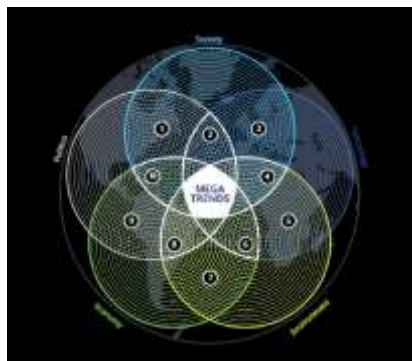
Uncertainty

Although Megatrends can be taken to be long-lasting fundamental drivers of change, it is important to recognise that they do not pre-determine the future. There are potential counter-trends and wildcards that introduce uncertainty.

The extent that this is recognised in the various presentations varies:

- SAMI explicitly identify counter-trends, critical uncertainties and wildcards
- The EP Global Trendometer has key uncertainties and possible disruptions
- MOD plot their focus areas on an impact/uncertainty chart and list "watch points" – indicators that a future world is likely to emerge – and "discontinuities" – factors that will change the path of a trend.
- NIC identify three future scenarios
- McKinsey's "crucibles" are areas where the direction of the reactions under way is unclear
- EY maintain an ongoing list of "weak signals" on their website
- Arup identify 4 scenarios

Using megatrends

SAMI and the EC Megatrends Hub offer training in the use of Megatrends. Generally a sensible approach is to:

- Supplement starter sets of Megatrends with specific trends relating to the topic under consideration eg through further horizon scanning, expert interviews, Delphi

- Identify the most *relevant* trends.

- Create scenarios around the uncertainties in the key trends

- Create policies and strategies, and test these against the scenarios

- Continue monitoring to see which scenarios may be emerging (MOD's "watch-points")

Concluding thoughts

The first powerful use of Megatrends is to demonstrate that the future will not be like today - that decision-makers need to plan with a view of the future. There is a need to question core assumptions and imagine other possibilities.

Secondly, megatrends by their very nature will change. Continued monitoring is required to track the ways in which they are moving.

Consequently, SAMI are planning a review of its Megatrends later in the year. This may add in some trends identified by other groups – health and security perhaps – and combine others to maintain a reasonable total number.

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The EC Megatrends Hub

[EC Megatrends Hub (Joint Research Centre)](#)

14 megatrends. Each megatrend features current developments and forecasts, indicators, potential implications, as well as references for further information.

The public is invited to contribute to the megatrends.

- Diversifying inequalities: [Income inequality among countries](#) has been decreasing, while that within countries is increasing.

- Climate change and environmental degradation: Anthropogenic greenhouse gas emissions are [continuously increasing](#), largely driven by economic and population growth.

- Increasing significance of migration: While the share of international migrants in the world population has not grown significantly over the past decades, the significance of migration as a social and political concern has intensified significantly.

- Growing consumerism: By 2030, the global middle class is expected to reach 5.3 billion people. This means an additional more than 2 billion people with increased purchasing power than today. Most of this growth will be in Asia.

- Aggravating resource scarcity: Global demand for materials has increased ten-fold during the 20th century and is set to double again by 2030, compared to 2010. Demand for water, food, energy, land and minerals will continue to rise substantially.

- Increasing demographic imbalances: By 2030, the world's population is estimated to reach [8.5 billion](#), while getting older and increasingly urban. Change will be uneven across regions, with rapid population growth in many still-developing economies, but stalled, or shrinking, populations in many developed countries

- Expanding influence of the East and South: The shift of global economic power from the established advanced economies in North America, Western Europe and Japan towards the emerging economies in the East and South is set to continue.

- Accelerating technological change and hyperconnectivity: Advancements in genetics, nanotechnology, robotics and artificial intelligence, photonics, quantum and other emerging technologies and the synergies among them are accelerating.

- Changing nature of work: Digitalisation and hyperconnectivity, new generations entering the workforce and older generations working longer are changing the forms of employment, career models, and organisational structures.

- Diversification of education and learning: New generations and hyperconnectivity are rapidly

changing both educational needs and modes of delivery.

- Shifting health challenges: Advancements of science and better living standards have increased the opportunity to longer and healthier lives and reduced the incidence of infectious diseases. However, obesity, malnutrition, antimicrobial resistance, and non-communicable diseases are increasingly becoming the health burden of our century.

- Continuing urbanisation: By 2030, urban population share is expected to reach 60% and 68.4% by 2050. Much of the urban population growth is expected to take place in Asia and Africa.

- Increasing influence of new governing systems: The expanding influence of non-state actors, the emergence of a global conscientiousness, the prominence of social media platforms and internationalisation of decision-making are forming new, multi-layered governing systems over traditional decision-making structures.

- Changing security paradigm: The emerging security paradigm is framed by new asymmetrical warfare, increasingly easy access to increasingly powerful weapons, violent extremism, conflicting motivations, and a relatively chaotic organisation of the parties involved.

11 megatrends that are considered to be of key importance for Europe's long-term environmental outlook. Structured as Drivers, Trends and Implications.

- Diverging global population trends: The world population may rise beyond 9.6 billion by 2050, despite a slowing rate of growth. Most of the increase is likely to occur in urban areas in developing regions. Growing and younger populations in the developing world, the global growth of an affluent middle class, and ageing populations in developed countries will influence migration flows, creating a mixture of benefits and risks in developed and developing regions.

- Towards a more urban world : Urban areas in developing countries will absorb most of the global population increase, with 67 % of people living in cities by 2050. Most of the growth is expected to be in megacities, particularly slums. Compact cities are the most efficient and environmentally sustainable way to secure the welfare of a growing population.

- Changing disease burdens and risks of pandemics: The global burden from non-communicable disease now outweighs that from communicable disease. However, the threat of global pandemics continues, partly driven by increasing mobility.

- Accelerating technological change: The pace of technological change, particularly in the fields of information, communication, nano- and bio-technologies, is unprecedented.

- Continued economic growth? Economic output is projected to treble between 2010 and 2050, although growth is expected to decelerate in many countries as they become more prosperous. In Europe, slowing growth is straining public finances for environmental protection and increasing social inequality.

- An increasingly multipolar world: Driven by structural change, fast-growing workforces and trade liberalisation, developing regions are rapidly increasing their share of global economic output, trade and investment. For Europe, this rebalancing presents competitive threats but also economic opportunities in meeting the demand of a fast growing global middle class.

- Intensified global competition for resources: Global use of material resources has increased ten-fold since 1900 and is set to double again by 2030. Escalating demand may jeopardise access to some essential resources and cause environmental harm.
- Growing pressures on ecosystems: The demands of a growing global population with rapidly changing consumption patterns for food, mobility and energy are exerting ever-increasing pressure on the Earth's ecosystems and their life-supporting services.

- Increasingly severe consequences of climate change: Recent changes in the global climate are unprecedented over millennia and will continue. Climate change is expected increasingly to

threaten natural ecosystems and biodiversity, slow economic growth, erode global food security, harm human health and increase inequality.

- Increasing environmental pollution: Globally, levels of air pollution and releases of nutrients from agriculture and wastewater remain high, causing acidification and eutrophication in ecosystems, and losses in agricultural yield. In the coming decades, overall pollution levels are projected to increase strongly, particularly in Asia.

- Diversifying approaches to governance: governments are facing a mismatch between the increasingly long-term, global, systemic challenges facing society and their more national and short-term focus and powers.

Global
Trendometer
2019

European Parliament Global Trendometer 2019

European Parliamentary Research Service

Identifies, tracks and analyses a selection of trends ranging across social, economic, and political subjects. It focuses on the medium- to long-term, and seeks to uncover implications for the EU. The purpose is to support the deliberations of EU decision- and lawmakers.

Each topic area covers: background, key trends, key uncertainties, possible disruptions.

TOPICS:
- European democracy 4.0: Towards a deliberative anticipatory democracy?
- The future of EU social policy
- Instability scenarios in Northern Africa to 2030
- China's social credit system: A 21st century panopticon?
- Auditing algorithms to avoid bias
- Collective nostalgia: Longing for a future in the past
- The history and future of life expectancy in Europe
- Space: Our final frontier?
- 'MAGA' (Make America Great Again) and the future of political language

As well as essays on these topics, the report includes "vignettes" illustrating specific points.

The essays are then mapped against "Megatrends" (effectively STEEP)
- Economic Transition
- Environmental challenges
- Geopolitical shifts
- Social change
- Technological change

It also maps the topics against ESPAS global trends

MOD Global Strategic Trends (6th Edition - 2018) – The future starts today

Global Strategic Trends provides a strategic context for those in the MOD, and wider government, who are involved in developing long-term plans, policies and capabilities. Elements have been used to help develop the National Risk Assessment.

5 Thematic chapters:
- Environment and resources
- Human development
- Economy, industry and information
- Governance and law
- Conflict and security
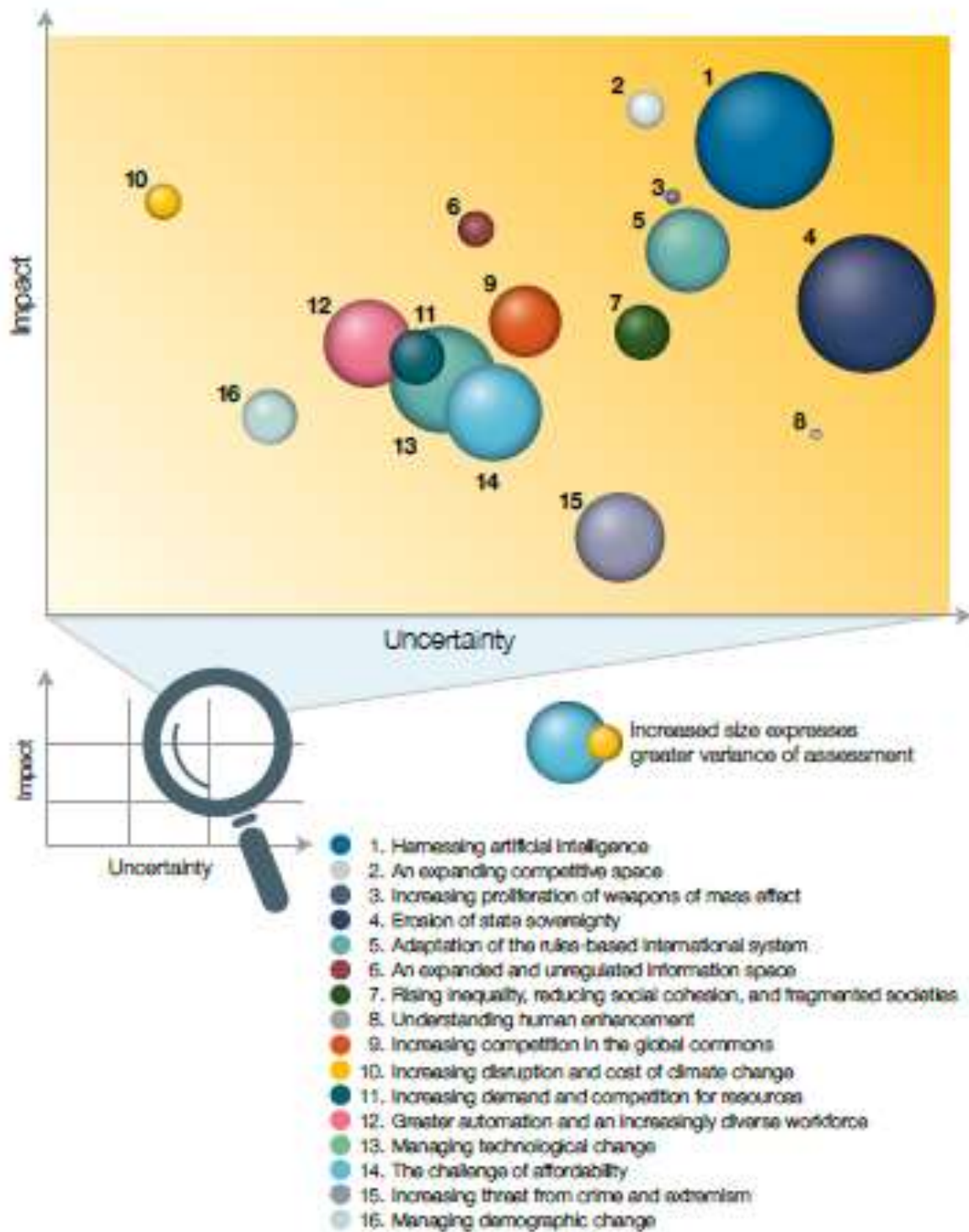
Plus 13 geographical chapters

Distilled into 6 key drivers
- Trends that require adaptation
    o Increasing human empowerment (less poverty, better education and health; technology)
    o Power transition and diffusion (multi-polar world)

- Trends that require exploitation or mitigation
    o Centrality of information: increasing on online activity => risks and opportunities
    o Accelerating technological advancement: 4th Industrial Revolution

- Trends that require action
    o Increasing environmental stress
    o Changing populations and evolving habitats: ageing Western population, urbanisation

16 focus areas "where the potential for profound change to humanity is high". Each is assessed for impact and uncertainty.

Exploring uncertainty

Key:
1. Harnessing artificial intelligence
2. An expanding competitive space
3. Increasing proliferation of weapons of mass effect
4. Erosion of state sovereignty
5. Adaptation of the rules-based international system
6. An expanded and unregulated information space
7. Rising inequality, reducing social cohesion, and fragmented societies
8. Understanding human enhancement
9. Increasing competition in the global commons
10. Increasing disruption and cost of climate change
11. Increasing demand and competition for resources
12. Greater automation and an increasingly diverse workforce
13. Managing technological change
14. The challenge of affordability
15. Increasing threat from crime and extremism
16. Managing demographic change

Increased size expresses greater variance of assessment

and 40 strategic implications.

Also:
- "watch points" – indicators that a future world is likely to emerge
- "discontinuities" – factors that will change the path of a trend.

Watch points

- Shifts in the rate of climate change.
- Changes to the frequency, duration and intensity of extreme weather and the damage caused.
- Speed of change in natural habitat, for example, biodiversity, soil quality and desertification.
- Effects of, and policy on, climate change.
- Progress towards climate targets.
- Adoption of carbon capture technology.
- Societal attitudes on environmental issues.
- Complexity of materials, their impacts on the environment and effectiveness of waste treatment.
- Increased seabed mining and drilling.
- Progress towards sustainable non-carbon based economy.
- Conflicts over resources.

Discontinuities

- Abrupt changes in the natural environment.
- Ecosystem tipping point reached.
- Unilateral adoption of geoengineering.
- Public acceptance of sustainability and its costs.
- Breakthrough in energy technology (cold fusion).
- Rapid technological development enabling local production of food, water and energy.
- Pandemics infect both crops and livestock.
- Uncontrolled spread of invasive species.
- New resource with one monopoly supplier.
- Major competition in the global commons.
- Attack on transoceanic fibre-optic cables and/or space systems.

[US National Intelligence Council](#) **(2017)**
Global Trends – "The paradox of progress"
The achievements of the industrial and information ages are shaping a world to come that is both more dangerous and richer with opportunity than ever before. Whether promise or peril prevails will turn on the choices of humankind.

- The rich are aging, the poor are not: Working-age populations are shrinking in wealthy countries, China, and Russia but growing in developing, poorer countries, particularly in Africa and South Asia, increasing economic, employment, urbanization, and welfare pressures and spurring migration.

- The global economy is shifting: Weak economic growth will persist in the near term. Major economies will confront shrinking workforces and diminishing productivity gains while recovering from the 2008-09 financial crisis with high debt, weak demand, and doubts about globalization.

- Technology is accelerating progress but causing discontinuities: Rapid technological advancements will increase the pace of change and create new opportunities but will aggravate divisions between winners and losers. AI, automation and genome editing

- Ideas and Identities are driving a wave of exclusion: Growing global connectivity amid weak growth will increase tensions within and between societies. Populism will increase on the right and the left, threatening liberalism.

- Governing is getting harder: Publics will demand governments deliver security and prosperity, but flat revenues, distrust, polarization, and a growing list of emerging issues will hamper government performance.

- The nature of conflict is changing: The risk of conflict will increase due to diverging interests among major powers, an expanding terror threat, continued instability in weak states, and the spread of lethal, disruptive technologies.

- Climate change, environment, and health issues will demand attention: A range of global hazards pose imminent and longer-term threats that will require collective action to address—even as cooperation becomes harder. More extreme weather, water and soil stress, and food insecurity will disrupt societies.

Plus three main scenarios of the future:
- Islands: changing economic and technological conditions might lead some to turn inward, reduce support for multilateral cooperation, and adopt protectionist policies; others might look to find ways to leverage new sources of economic growth and productivity.

- Orbits: future tensions are created by competing major powers seeking their own spheres of influence while attempting to maintain stability at home. The trends of rising nationalism, changing conflict patterns, emerging disruptive technologies, and decreasing global cooperation might converge to increase the risk of interstate conflict.

- Communities: the enormity of future economic and governance challenges tests the capacity of national governments to cope, creating space for local governments and private actors and thus questions assumptions about the future of governance.

McKinsey (2017)

McKinsey identify nine major global forces and their interactions. Significant tension runs
through each of them, such that they characterize them as "crucibles," or spaces in which concentrated
forces interact and where the direction of the reactions under way is unclear.

First they developed a curated list of 75 global trends that they believe will critically shape business
decisions over the next 5 to 10 years. These were gathered together into the 9 forces in three groups.

Global growth shifts – moderated growth since 2008
- Beyond globalisation: Brexit and protectionism, localisation; global capital flows falling, but cross-
border data flows rising fast
- ICASA (India, China, Africa, and Southeast Asia) growing fastest, but have distinct challenges
- Resources (un)limited: technology reducing resource intensity vs growth in demand

Accelerating industry disruption – driven by technology
- Combinatorial-technology: connectivity, IoT, data, AI reinforce each other; blockchain
- C2B: Customer in the driver's seat: mix of personalisation and blockbusters
- Ecosystem revolution: blurring of boundaries between industries and changing value chains (linear,
platform, any-to-any).

New societal deal - embedding society's concerns in business priorities
- The dark side: cyberthreats; co-operative defence
- Middle-class progress: increasing inequality – missing middle; issues of trust
- Economic-growth experiments: lack of success of traditional policies creates a new need

KPMG Future States (2014)

Focussed on Megatrends affecting Government to 2030. While their individual impacts will be far-reaching, the trends are highly interrelated and thus demand a combined and coordinated set of responses.

- Demographics
- Rise of the individual
- Enabling technology
- Economic interconnectedness
- Public debt
- Economic power shift
- Climate change
- Resource stress
- Urbanization

PwC

Identify 5 major groups of trends. In each, question what they mean for business and government.

Climate change and resource scarcity
- Increased certainty and accuracy about the impacts
- Seas rising faster
- The 'water, energy, land nexus'
- Policy developments reflect scientific consensus – but do they go far enough?
- A clearer, harder economic rationale
- Growth in alternative energy

Demographic and social change
- The pace of change will vary substantially across different regions.
- Impacts of an ageing population
- Empowering a new generation
- Capturing the benefits of an older workforce
- More women in work
- Women in charge of global consumption
- Far greater expectations of working internationally
- Living longer, costing more
- Implications for retirement

Rapid urbanisation
- 2 billion new urban citizens
- 85% of global GDP was generated in cities
- Challenges for national and local governments
- Investment needs for infrastructure and services
- Cities consume 75% of world natural resources and account for 80% of global greenhouse gas emissions
- Technology enabled change – smart cities
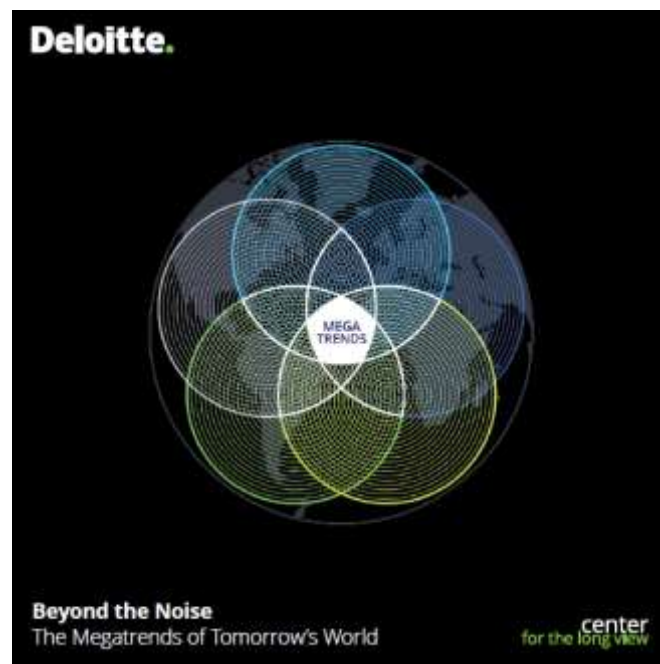- Bottom up approach: new business models, sharing economy

Shift in global economic power
- Drop in commodity prices has stalled growth in emerging countries
- India continues to grow – could overtake US by 2050
- Commodity dependent economies in Africa hit hard
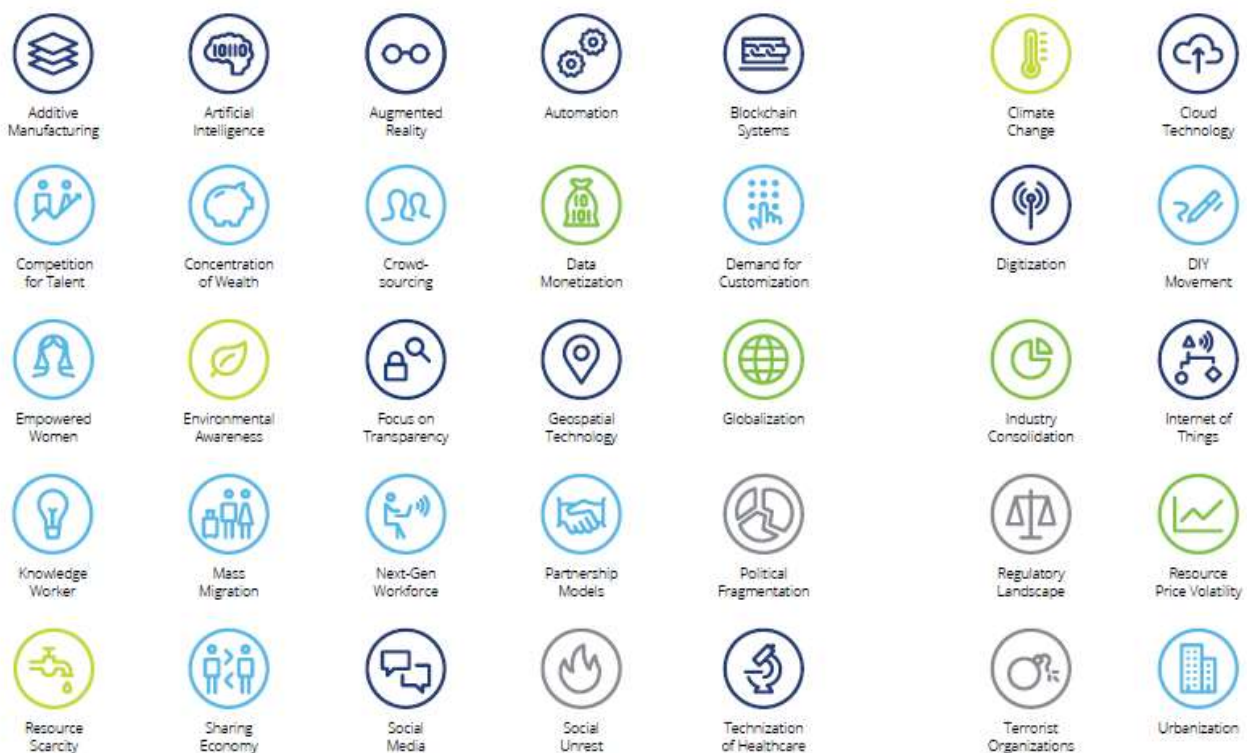- China and India continue to raise their productivity level towards western levels

Technological breakthroughs
- 12% adults in Sub-Saharan Africa have a mobile money account; compared with 2% globally
- From B2C to 'all to all'
- Consumers leapfrog corporate technology
- The millennial mindset – tech as a "natural language"
- Key maturing technologies: AI, Blockchain, Drones, IoT, Robots, VR, 3D-printing
- Data explosion: 44 times greater in 2020 than it was in 2009
- Connected everything: implications for business models
- A world of multidimensional change

Beyond the Noise
The Megatrends of Tomorrow's World

Deloitte's (2017)
35 drivers of change

Additive Manufacturing	Artificial Intelligence	Augmented Reality	Automation	Blockchain Systems	Climate Change	Cloud Technology
Competition for Talent	Concentration of Wealth	Crowd-sourcing	Data Monetization	Demand for Customization	Digitization	DIY Movement
Empowered Women	Environmental Awareness	Focus on Transparency	Geospatial Technology	Globalization	Industry Consolidation	Internet of Things
Knowledge Worker	Mass Migration	Next-Gen Workforce	Partnership Models	Political Fragmentation	Regulatory Landscape	Resource Price Volatility
Resource Scarcity	Sharing Economy	Social Media	Social Unrest	Technization of Healthcare	Terrorist Organizations	Urbanization

"These drivers intersect, collide, catalyze and create Megatrends".

10 megatrends, with "stories" by STEEP intersections
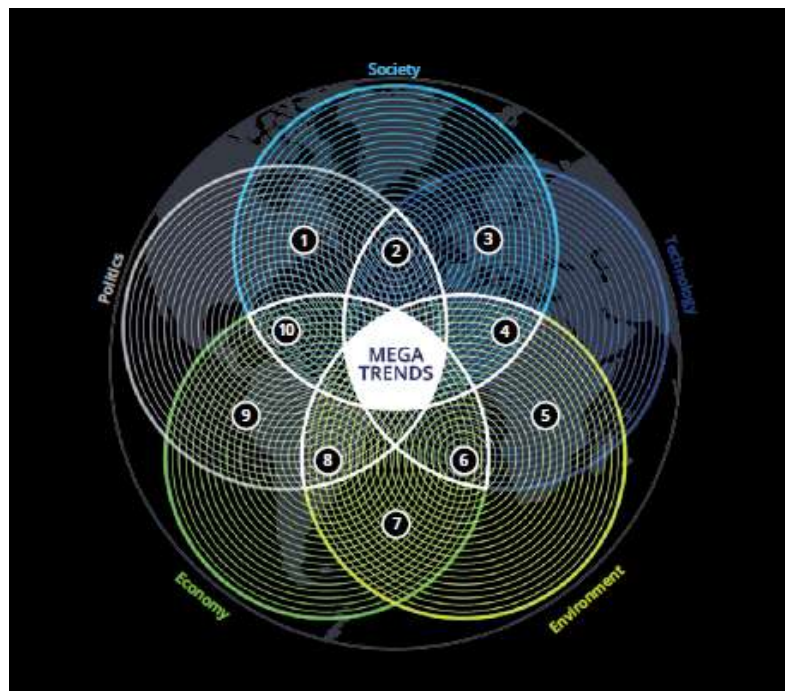
1 Empowerment
The growth and re-invigoration of ideas and self-worth

2 Polarization
The rise of divisiveness and divergence

3 Hyperconnectivity
The emphasis of interconnectedness and collective behaviour

4. Disengagement
The evolution of ways in which we communicate and interact

5 Ageing
The changes in values, cultures and priorities across generations

6 Dematerialisation
The shift in the value structure from physical to intellectual

7 Scarcity
The unsustainable consumptions of our natural resources

8 Blurring boundaries
The emergence of business eco-systems across traditional silos

9 Erosion of governance
The decline of the traditional world order; direct democracy

10 Displacement
The movement of people, ideas and challenges across the globe

Ipsos

1. **Dynamic populations:** growth; variable birthrates; ageing

2. **Growing opportunity and growing inequality:** growing middle-class; young in developing countries are optimistic; adult literacy improved; 60% of world population doesn't have internet access;

3. **Megacities:** by 2050 66% live in urban areas; but most prefer not to

4. **Increasing connectiveness and decreasing privacy:** multiple new platforms; "human right"; privacy worries; changing behaviour

5. **Healthier and sicker:** global life expectancy rising; 91% access to clean water; in most countries people die of being overweight rather than underweight

6. **Rise of individual choice and the fracturing of the mass market:**

7. **Rise of the individual and decline of social cohesion:** fewer marriages; more single-person households; crime against the person is falling; crime rising in developing markets

8. **Cultural convergence and increasing extremes:** English dominates international conversations; most people identify with a religion; but feel we live in a dangerous world; and are concerned about immigrants

9. **Always on versus off the grid:** 20% employees work remotely some of the time; increasing wish to work for ethical companies; automation reducing working hours

10. **Emergence of public opinion as a revolutionary force:** dissatisfaction with government; precariat

EY (2018)

Looks at disruption through a framework that highlights four distinct kinds of change: primary forces, megatrends, future working worlds and weak signals.
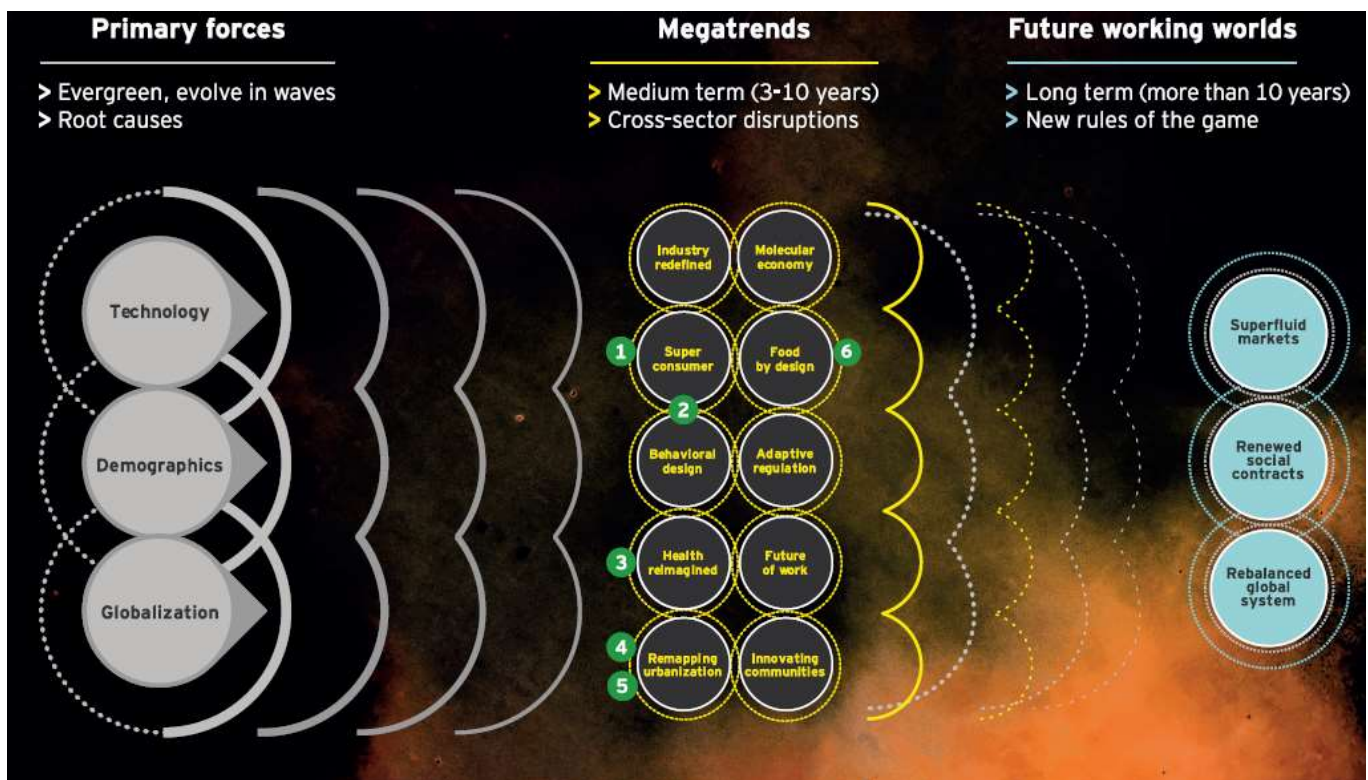
Megatrends

1. **Industry redefined:** digital innovation is melting industry boundaries
2. **Super-consumer:** consumers augmented by technology eg AI
3. **Behavioural design:** social and mobile media; human augmentation
4. **Health redefined:** a health paradigm that is predictive, personalized, proactive and participatory
5. **Remapping urbanisation:** responding to sustainability challenges; transforming transportation and reinventing work reshape urban centres
6. **Molecular economy:** physical, digital and biologic systems converge to create clean, efficient and distributed production processes (nanotech)
7. **Food by design**: Innovations at the intersections of food, biotech, wellness and digital are emerging to design new ways to eat

8. **Adaptive regulation:** using big data and algorithms to prevent breaches before they can even occur; regulations that rewrite themselves to keep up with ever-changing market conditions
9. **Future of work:** change driven not just by technology but demography and culture
10. **Innovative communities:** limits to growth, and the forces of disruption continue to drive change that creates new opportunities for legacy cities and smaller cities.

Convergence themes
1. Shopping-buying divergence
2. Lifestyle as a service
3. Precision health 4.0
4. Urban mobility ecosystems
5. Smart neighbourhoods
6. Food facts not fiction

Weak signals are tacked on the website - ey.com/weaksignals

Arup scenarios 2019 (for 2050)
Key axes: planetary health and societal condition. Improving or declining.

The science-based targets of the nine Planetary Boundaries, Arup's Drivers of Change cards, as well as the United Nations' Sustainable Development Goals (UN SDGs) were used to set parameters and guide the scenario development.
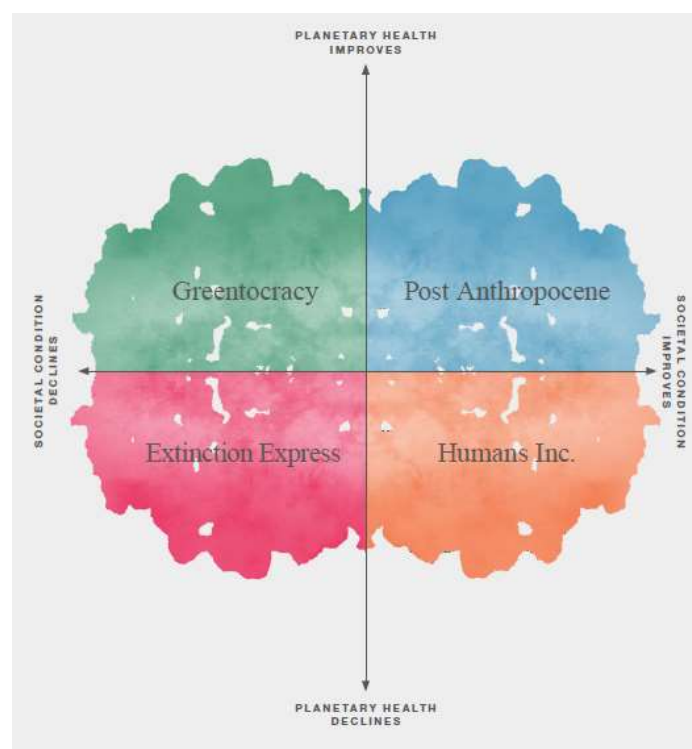
POST ANTHROPOCENE shows how societal conditions and planetary health might exist in a harmonious relationship, fortifying each other for mutual progress and benefit.

GREENTOCRACY describes an improvement in planetary health which has been enabled by severe restrictions on human society: restrictive living conditions, conflict and authoritarian regimes prevail.

EXTINCTION EXPRESS: depicts both declining planetary health and societal conditions. It is questionable how much longer humanity can survive.

HUMANS INC. represents our current trajectory; a world in which societal conditions advance at the cost of planetary health.

[Red Bull](#) (2019)

Megatrends consist of countless sub and secondary trends, they interlink and influence each other, constantly creating new ways of improving our lives.

Factual information is derived from Swiss futurologists and the documentation of [Zukunftsinstitut GmbH](#), Frankfurt am Main.

Digitisation: human creativity and artificial intelligence working in close harmony as, in times of rapidly growing digitisation, machines have acquired a few cognitive characteristics which make them far superior to us.

Healthy living: new foods (eg insects); less meat; urban farms; more informal meals

Individualisation: changed social structures, especially diversity, gender shift, neo-tribes and the LGBTQ community; mindfulness

Generations: Gen Z is adopting extremely conservative behaviours: they're having sex later, they want long-term relationships and, above all, they have a completely different attitude to money from millennials - 64 percent having already started to save up for their future.

Gender shift: breaking down gender stereotypes; sex lives are becoming more individual and diverse bringing technology more into play; wearables, virtual and augmented reality, sex robots.

Neo-ecology: intelligent systems designed to achieve effectiveness in complex cycles, rather than increase efficiency
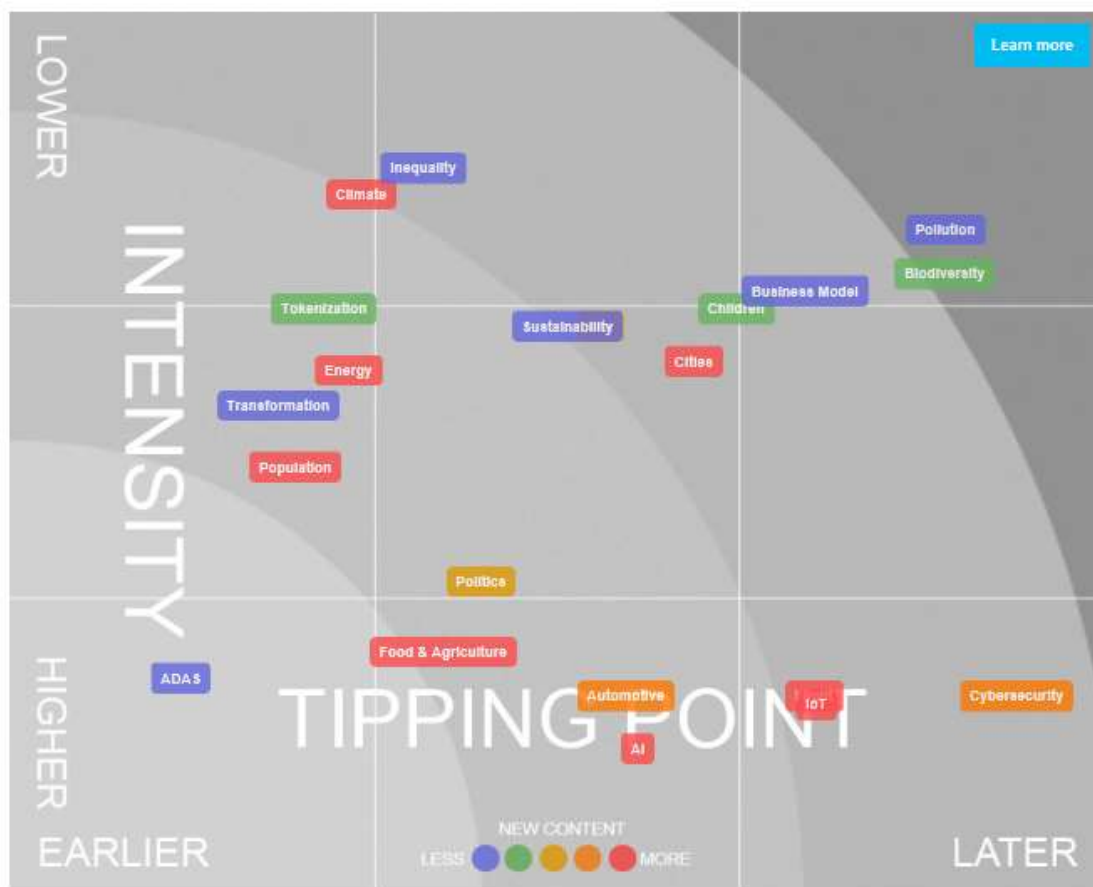
Shaping Tomorrow **(2020)**
AI-based tool (Athena) searching many sources and classifying trends as:

Emerging wave = new and potentially transformational for entrepreneurial players (top-right)
Differentiating wave = high differentiation from slower players (middle)
Business value wave = well recognized by all players (bottom left)

INTENSITY: The y-axis is a measure of the aggregated, average strengths of the forecasts being made.

TIPPING POINT: The x-axis is a measure of how quickly the aggregated, average forecasts will likely arrive and before the public will accept them as the existing paradigm.

Colour coded to indicate how much new content found – ie most topical