



Institute
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Emerging Risks: Opportunities and Threats of Disruptive Technology

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What is an emerging risk?

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2

Defining emerging risk

- A risk is emerging when the understanding of one or more constituent elements of the risk's current dynamics is not developed.
- Emerging risk is broken down into three constituents: hazard, exposure and vulnerability:
 - **Hazard:** A danger, peril or, more generally, an uncertain event or series of items that have the potential to threaten the firm directly or indirectly;
 - **Exposure:** The instance of being subjected, in the course of executing a business strategy, to the action of a hazard;
 - **Vulnerability:** A weakness or a strength (e.g. in a business model or any of its constituent systems and processes) that makes a firm susceptible to hazard.
- The objective is to identify specific risks, rather than broad, thematic concerns.

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3

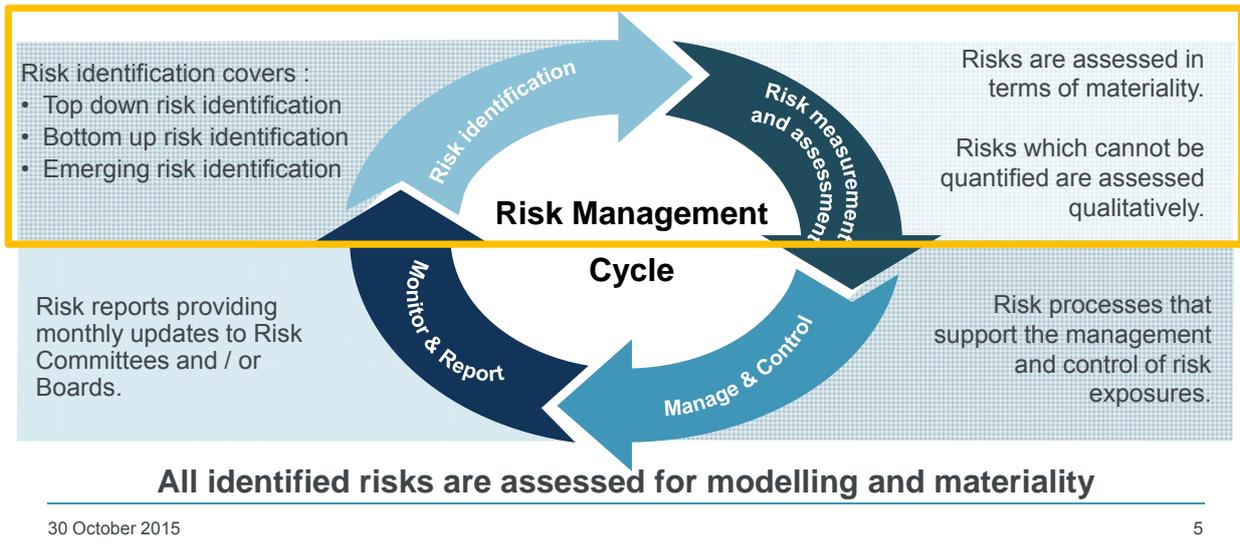
Types of emerging risk: the IRGC suggests three categorisations

1. **High uncertainty and a lack of knowledge about potential impacts and interactions with risk absorbing systems given the lack of scientific knowledge and experience**
 - Possible interactions with existing technologies along with mitigation tactics are unknown or unproven and lead to open exposures, e.g., nanotechnology
2. **Increasing complexity, interactions and systemic dependencies leading to non-linear impacts and surprise**
 - The lack of knowledge about the way familiar risks are interconnected and dependent on other risks, e.g., an accumulation of risks in the industrial internet of things such as automation, robotics, machine to machine communications.
3. **Changes in context that may alter the nature or probability of expected impacts from existing technologies, products, processes**
 - E.g., how aviation deals with drones

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4

Emerging risk within risk management



What we mean by disruptive technology

Disruptive technology – a definition

- A technology that, when introduced, either radically transforms markets, creates new markets, or destroys existing markets for other technologies
- This brings both opportunities and threats



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7

Emerging technologies and where we see them

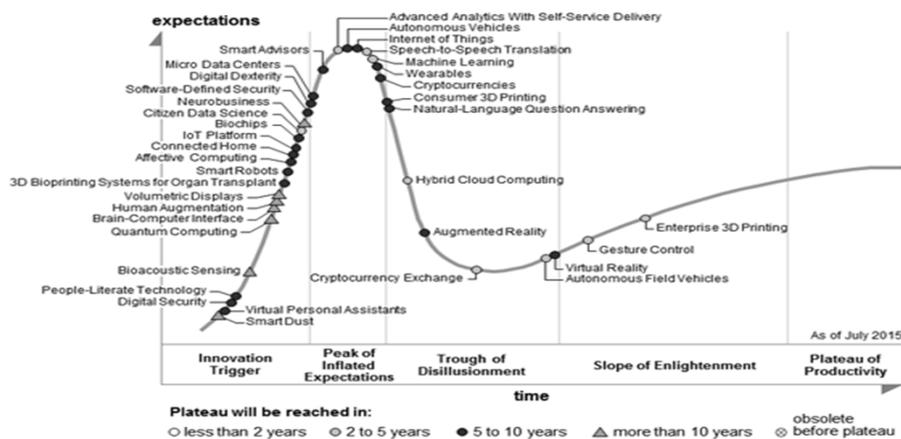


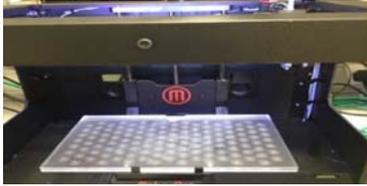
Figure 1. Hype Cycle for Emerging Technologies, 2015.

Source: Gartner (August 2015).

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8

What we are seeing today



3D printing: brings with it implications for liability



Household connectivity: heat, health, water, doors, intruder, windows, access...



Semi-autonomous vehicles, e.g., assisted parking



Fossil & Google: Android Wear



Apple Pay, EE cash on tap, & Zapp



Google Glass & optical health insurer VSP



Google Compare – insurance aggregator site

Firms partnering with technology companies



Robots replacing humans in the performance of repetitive tasks



Advances in non-invasive personal health monitoring: a movement from prevention to prediction, e.g. Ginger IO

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9

What might we see in the future?



Regulatory change catching up with the pace of change of technology



Beyond 4D printing comes self-assembly: swarming robots and biological molecules



Greater awareness of cognitive biases and how they affect decision-making: brain activity



Embedded chips: the 'Internet of Us' – Kaspersky lab are chipping people today



Nanobots: uses in areas such as precise drug delivery and clearing pollutants



Qualcomm Tricorder competition: a handheld, portable, wireless device to monitor and diagnose health conditions

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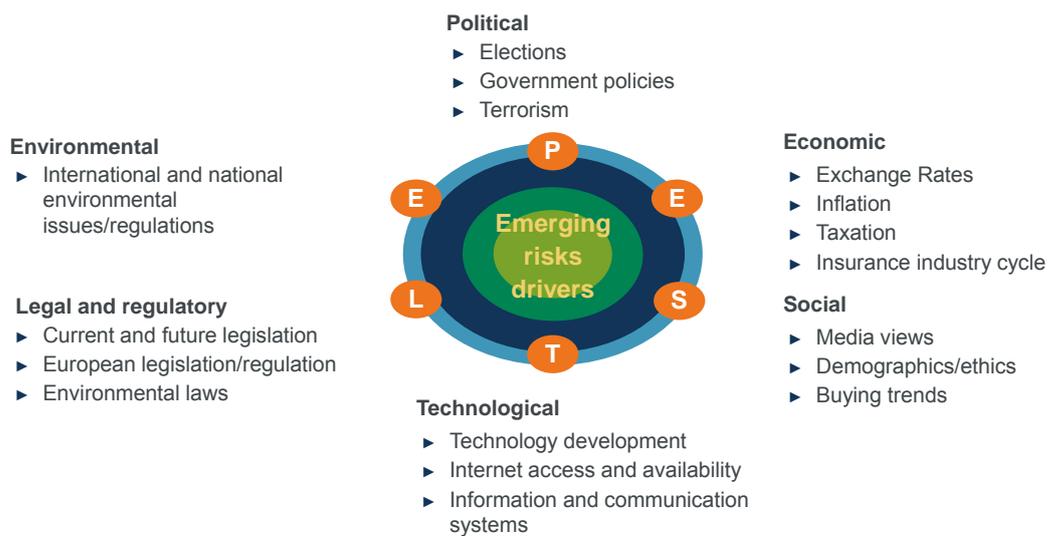
10

Current ways to identify emerging risks

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11

Identify: PESTLE analysis



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12

Contributing factors to emerging risk



Source: International Risk Governance Council (IRGC).

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13

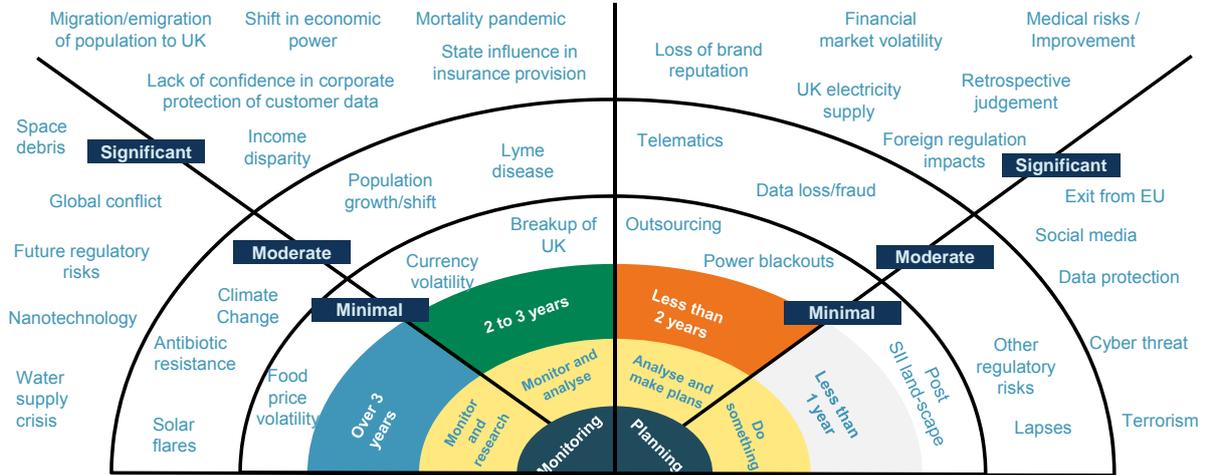
Why these approaches fail: behavioural biases

- **Anchoring:** tendency to rely too heavily, or 'anchor' on a past reference or on one trait or piece of information when making decisions
- **Availability bias:** likelihood of an alternative is judged depending on how easily it is imagined or brought to mind
- **Confirmation bias:** tendency to search for or interpret information in a way that confirms one's preconceptions
- **Endowment effect:** the fact that people often demand much more to give up an object than they would be willing to pay to acquire it
- **Framing effects:** tendency to select inconsistent choices, depending on how a question is framed
- **Hindsight bias:** tendency to see past events as being predictable at the time those events happened ('I knew it all along')
- **Over-optimism:** tendency to be over-optimistic, overestimating favourable and pleasing outcomes
- **Overconfidence:** excessive confidence in one's own answers to questions

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14

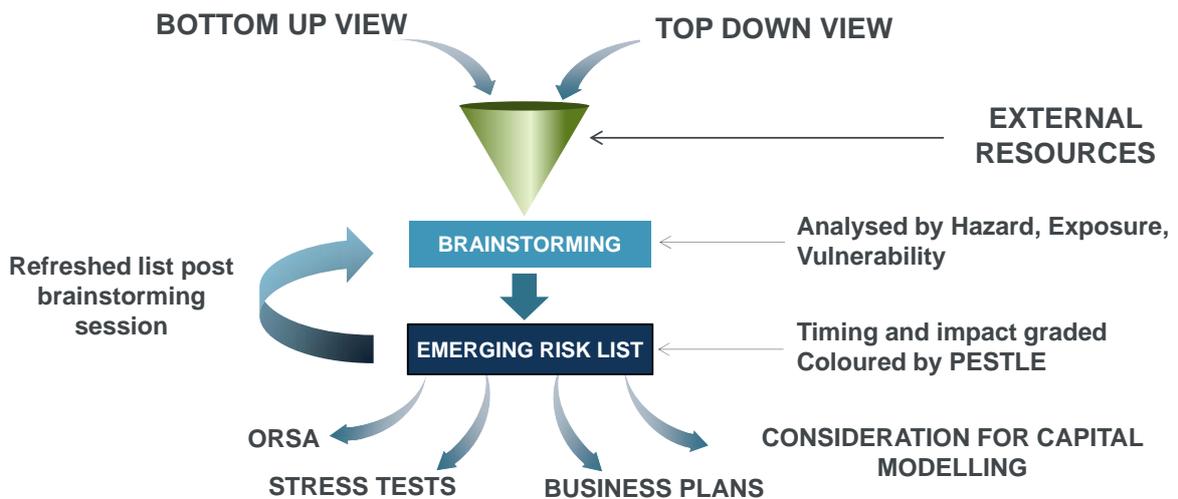
Evaluate: example risk spectrum



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15

Emerging risk management process



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16

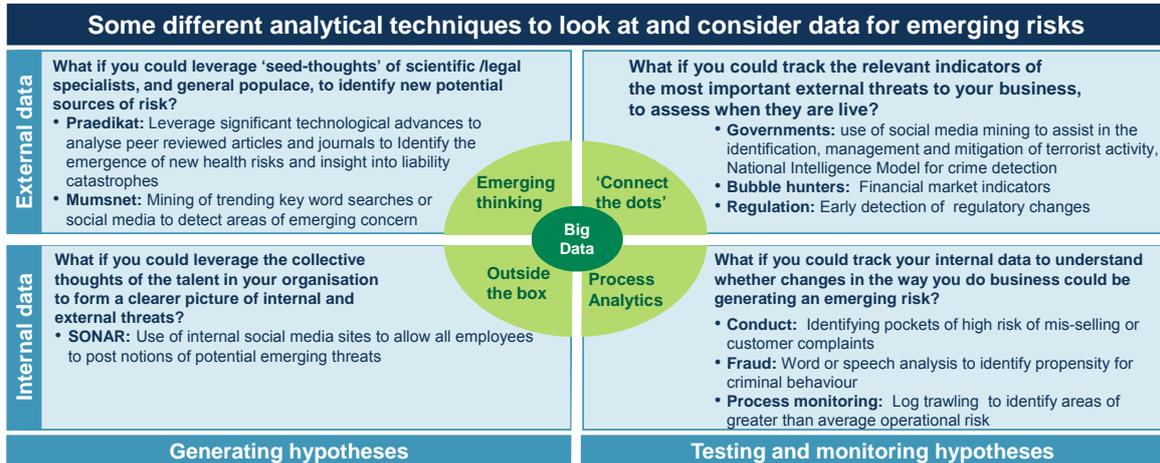
Use of emerging risk assessment outputs

Emerging risk identification is integrated into existing risk management processes.

- Therefore the output is used to:
 - Describe aspects of **known risks** where pro-active review is undertaken;
 - Generate **scenarios** for stress testing;
 - Test assumptions underpinning a **business plan**;
 - Identify specific topics for in-depth **investigation and research**; and
 - Inform the **ORSA**.

Alternative ways to identify and monitor emerging risks

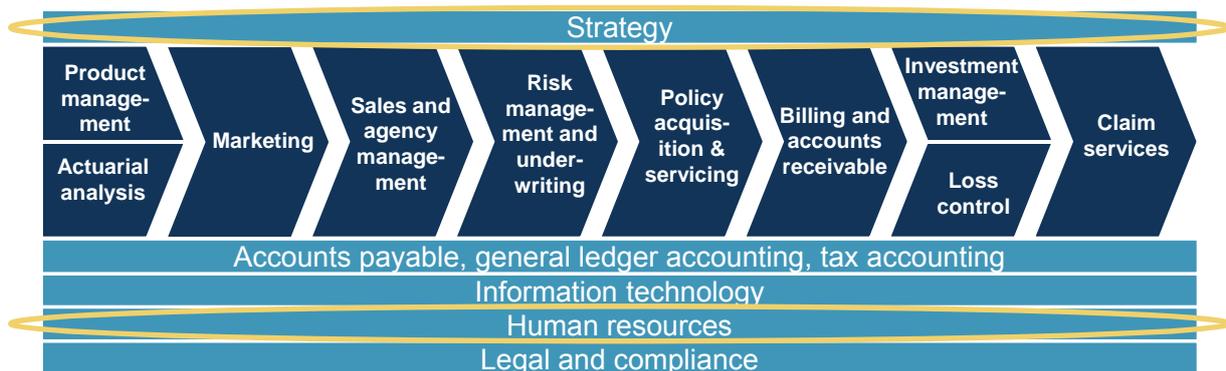
Application of increasing data availability and analytics tools to risk management



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19

Consider top-down and bottom-up impact on the business model



Look far enough into the future and use scenario analysis

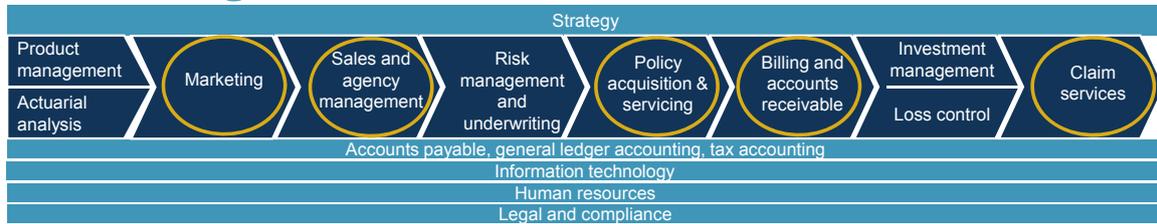
Consider if risks are embedded in the undertaking's culture

Make sure the key risks have owners and action plans

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20

Case study: global insurance company – the increasing use of the internet



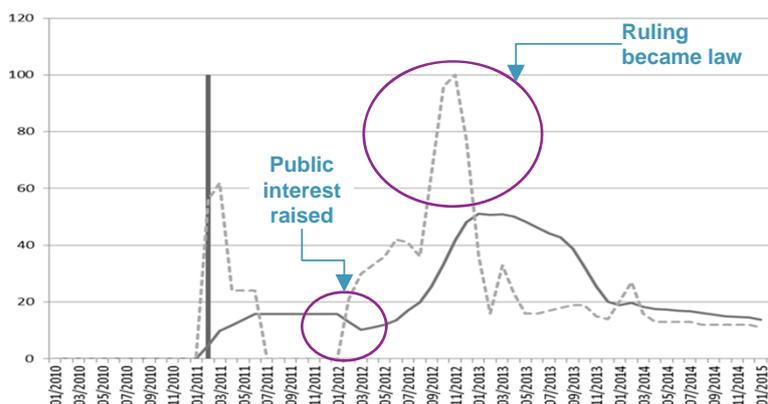
Case study: global insurance company – customers moving from call centres to using the Internet

- Company XXXX invested heavily in having a sizeable on-shore call centre in the early 2000s
- Around 2003-2005 there was exponential growth in the use of the Internet
- Company XXXX had not foreseen, or anticipated, the impacts this could have on their business model: customers wanted to purchase policies, manage them, and interact with the company via the Internet
- Use of the call centre dropped markedly; some customers moved to competitors who offered services via the Internet
- Instead of reducing the size of their call centre, Company XXXX chose to cut costs by off-shoring; they later needed to address this decision and to reflect their customers' preferences with connecting via the Internet and for call centres being on-shore

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21

Ongoing monitoring: e.g. test-achats (ECJ gender ruling)



- Announcement was made on 1 March 2011
- Our (retrospective) Early Warning Indicator triggered in February 2011
- Became law 21 December 2012

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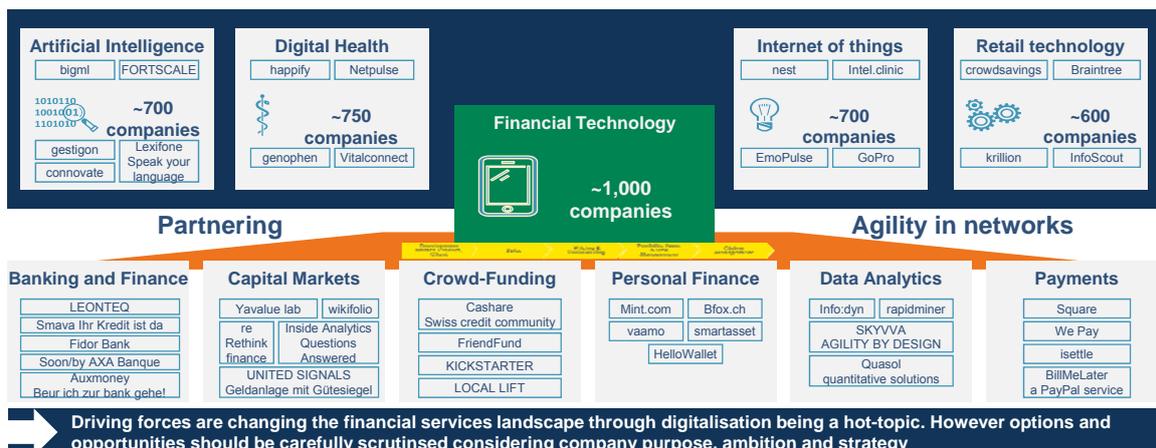
22

How companies are considering upside and downside risks of disruptive innovations

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23

Market developments: ecosystem and partnering



¹ Pictures/numbers of companies are an excerpt and do not claim to be complete.
Source: EY Analysis, Venture Scanner, FinTech Forum.

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24

Where are insurers placing bets on technology?

What is it?

Benefits

Allianz and Panasonic

Panasonic has Nubo, a 4G HD home security camera which together with its other IoT home devices will alert the insurer in case of damage to the policyholder's property.

- ▶ Connected home solution
- ▶ Can detect changes in heat, moisture, windows or doors opening, access through the front door, and presence of people in the home
- ▶ It will alert Allianz of any impacts to the home in real-time if these are out-of-the-ordinary
- ▶ For example, Allianz would know if moisture levels, such as from a water tank leaking, increase, so they would be able to talk with their policy-holder on any claims actively, rather than in response to the policy-holder making contact

AXA and Venturer consortium

AXA has joined a group investigating performance of autonomous cars in Bristol, UK. The test track development is being led by Williams F1.

- ▶ Group includes tech companies, universities, AXA, local authorities, and Williams F1
- ▶ AXA is able to gain a wealth of information about the performance of autonomous cars in test situations
- ▶ Helps them decide on how to model risks and what key areas might be
- ▶ Wording of policies for autonomous vehicles
- ▶ Pricing implications
- ▶ Puts them in a position to be an early responder to the autonomous car market as it develops

Technology and hyperconnectivity are changing the dynamics of consumer behaviour



Companies need to reinvent and update their customers' experience. Those who do not adapt to the new reality risk becoming irrelevant to the consumer.

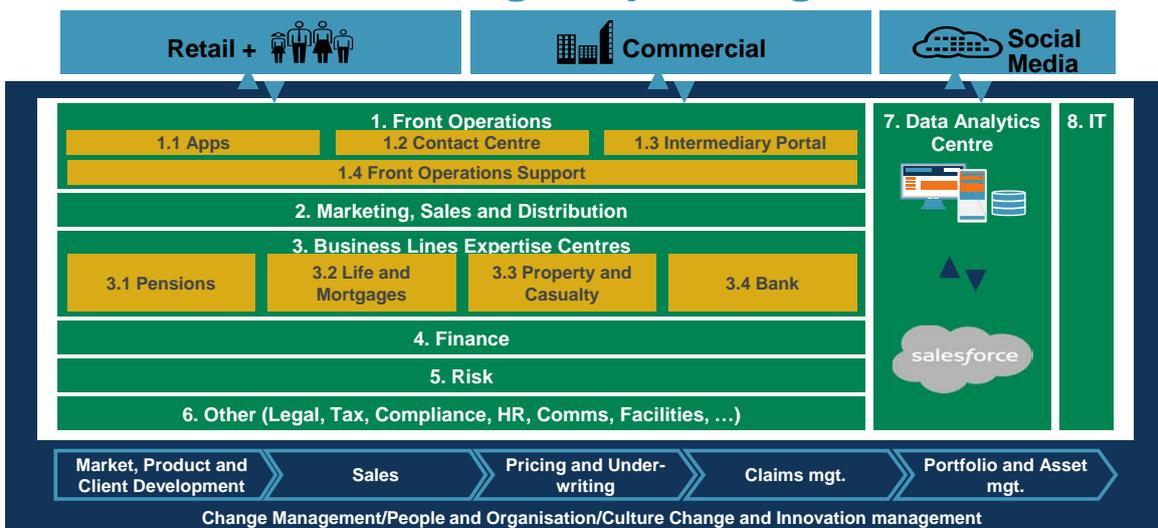
Case study: the hyperconnected, customer-centric banking experience



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27

Customer Centric Target Operating Model

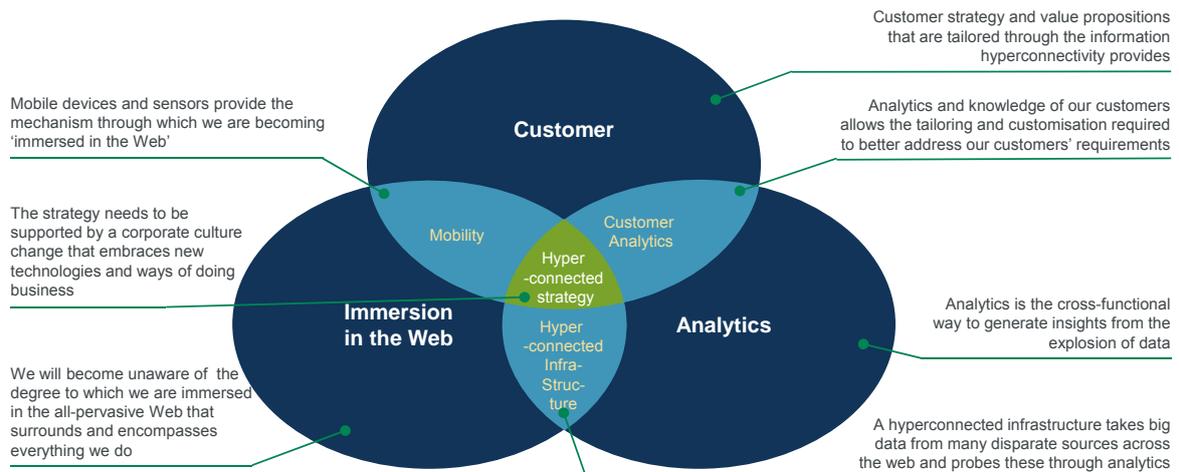


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28

Considerations: hyperconnectivity and accumulation

How the hyperconnected insurer might look



BoE and PRA paper on climate change, Sep 2015

“While RCP scenarios will therefore impact upon individual risk factors in different ways, one could consider all scenarios presenting an increase in the overall level of risk relative to the present day. As discussed [...] there are indications existing levels of warming [...] are having an impact on insurance firms (for example, increased losses as a result of sea level rise). [...] The impact of potential non-linear changes is also important to consider, and there are a range of views as to when these non-linear effects can occur.”



Source: Bank of England and PRA; The impact of climate change on the UK insurance sector; September 2015

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31

An emerging risk example: climate change

Risk component	Driver	Risk confidence level
Hazard	Disruption in the certain business lines, higher unexpected incidence of claims. Areas impacted include: <ul style="list-style-type: none"> • Distribution reach whether on-line or off-line • New business production interruption 	Less developed
Exposure	Multiple including: <ul style="list-style-type: none"> • Increased operating costs • Investment losses - actual and market value – property and affected industries • Customers in climate impacted locations 	Less developed
Vulnerability	<ul style="list-style-type: none"> • Investment portfolios backstopping liabilities • Uncertainty about business models adaptability 	Less developed

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32

What can firms be doing or considering now

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33

Summary: emerging risks

Talking about emerging risks is a good thing

- The ability to predict new and emerging threats has great value
- However we need to recognise and address the limitations posed by behavioural biases in current approaches
- We can address these to some extent by better structuring of the conversation, but this is only part of the answer

Doing something about them would be even better

- Analytical tools exist which can utilise external and internal data to support emerging risk hypothesis generation, testing and Early Warning Indicators
- Embedding these into a structured business process will support getting maximum value from the insights
- Consider the impacts on the risk taxonomy, and risk appetite framework

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34

Summary: disruptive technology

Customer-centric operating model

- Customer-centric value chain, pursuing an analytics-driven strategy, and exploiting benefits of connectivity through an operating model designed for a business embracing technology

Technology is the enabler

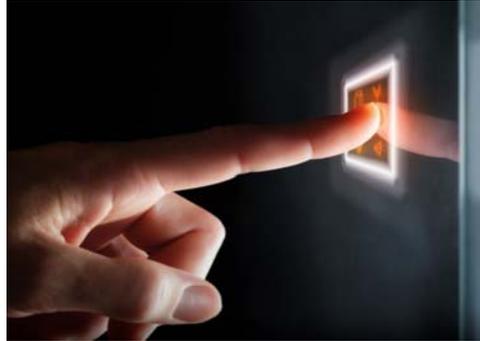
- Advances in mobile communication, sensors, and location awareness form the basis for our hyperconnected world

Advanced analytics and automation make analyses faster and more accurate

- Allows companies to test opinions to support decision-making more rapidly

Uncovering the unknown

- Relationships previously believed to be unrelated are revealed, providing opportunities for risk management, trading, customer analysis, and marketing



Our technology-enabled future will see companies gaining competitive advantage through embracing big data and advanced analytics

Questions

Comments

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