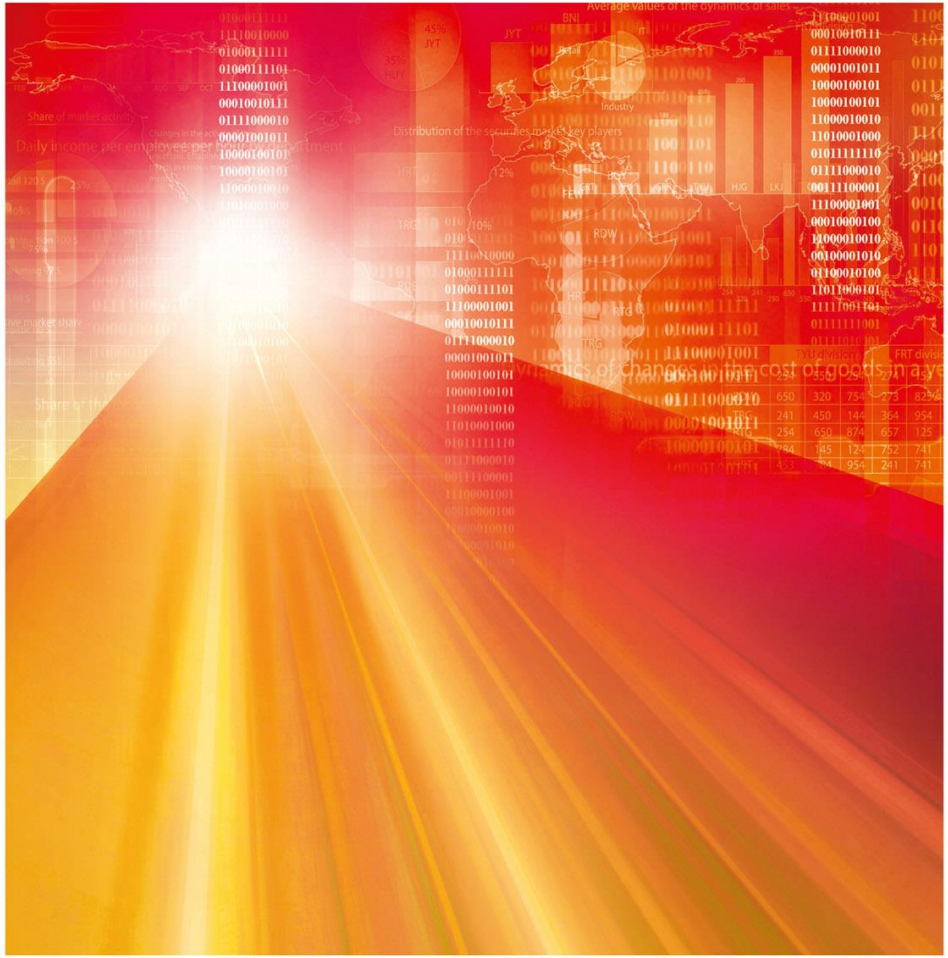
Enterprise Risk Management Seminar

Practical Risk Management

Actuaries Institute

20 September 2016 • Sydney



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Thinking differently about Emerging risks

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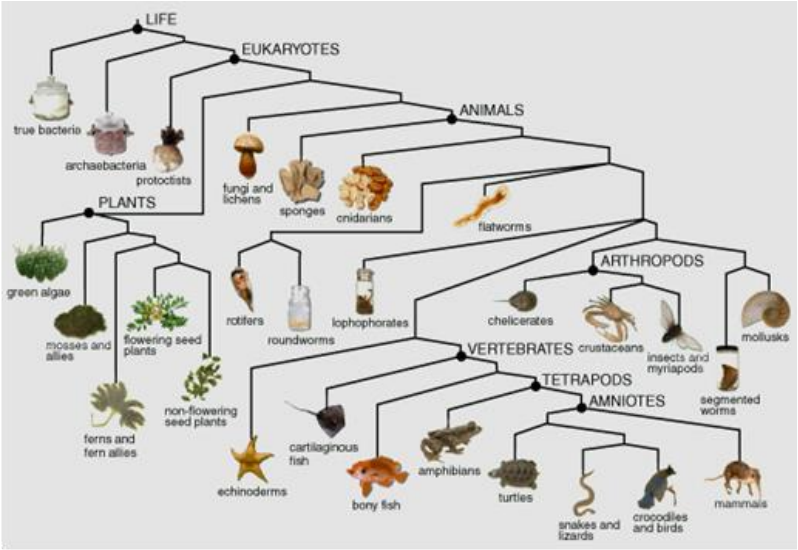
Systemic Consult Ltd

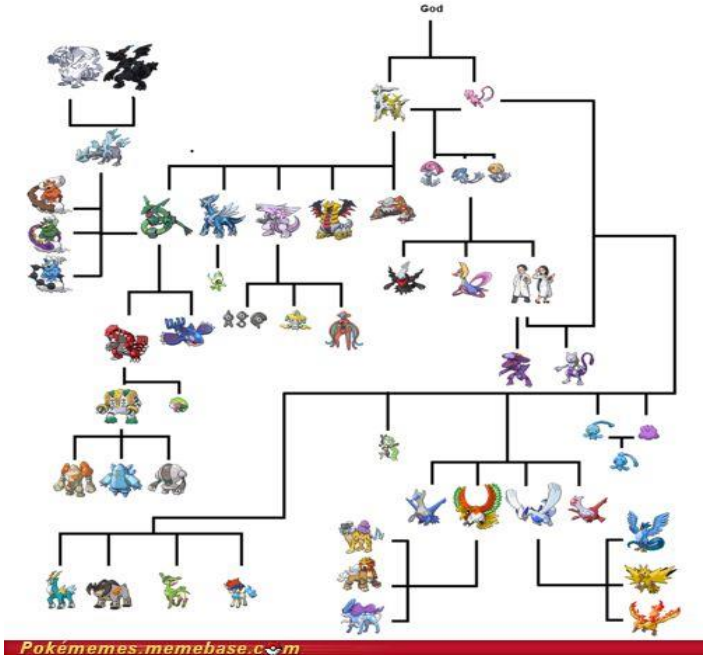
Managing Emerging Risks using their Characteristics

- Applying evolutionary tools and theory to manage and identify emerging risks
- Applying network theory to identify patterns to manage emerging risks
- How we can use models to understand emerging risk behaviour and help spot emerging risks.

Cladistics & evolutionary trees

Cladistics (Phylogenetic systematics) is the study of the evolutionary relationships between living or non-living things based upon analysis of the characteristics that define each thing.





Emerging risks or evolving risks

- Emerging risk events are (nearly always) simply new combinations of known risk characteristics
- We can analyse which risk characteristics exhibit evolutionary change and hence are more likely to evolve into new risk events



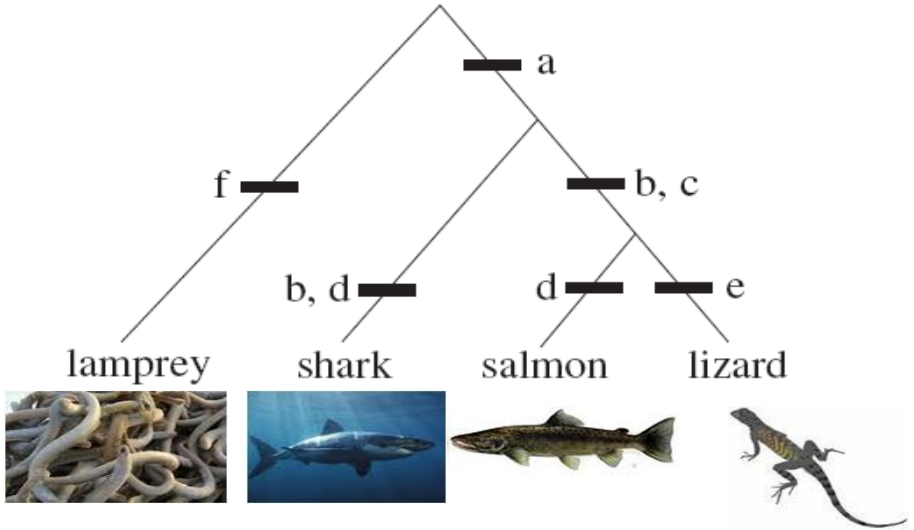




Cladistics technique - a simple example

Characteristics: (a) paired fins, (b) jaws, (c) large dermal bones, (d) fin rays, (e) lungs, and (f) rasping tongue

	a	b	c	d	e	f
lamprey	0	0	0	0	0	1
shark	1	1	0	1	0	0
salmon	1	1	1	1	0	0
lizard	1	1	1	0	1	0

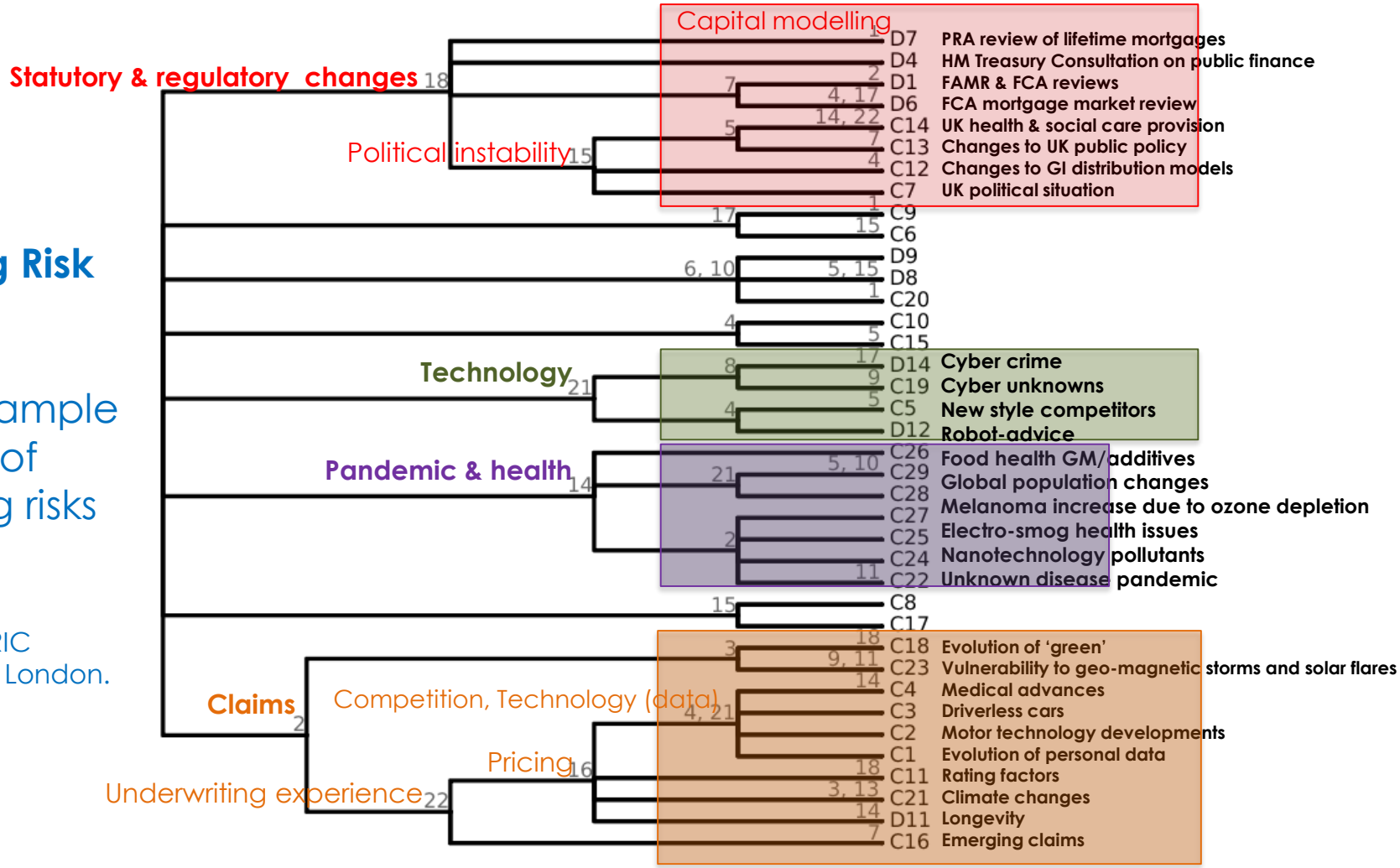


**For a detailed review of the methodology applied in the case study please refer to Allan, Cantle, Godfrey & Yin (2012) British Actuarial Journal*

Emerging Risk Tree

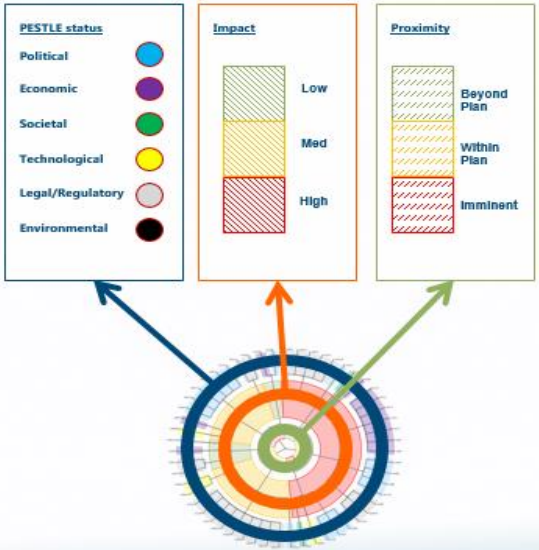
Using a sample data set of emerging risks survey.

Curtesy of ORIC International, London.



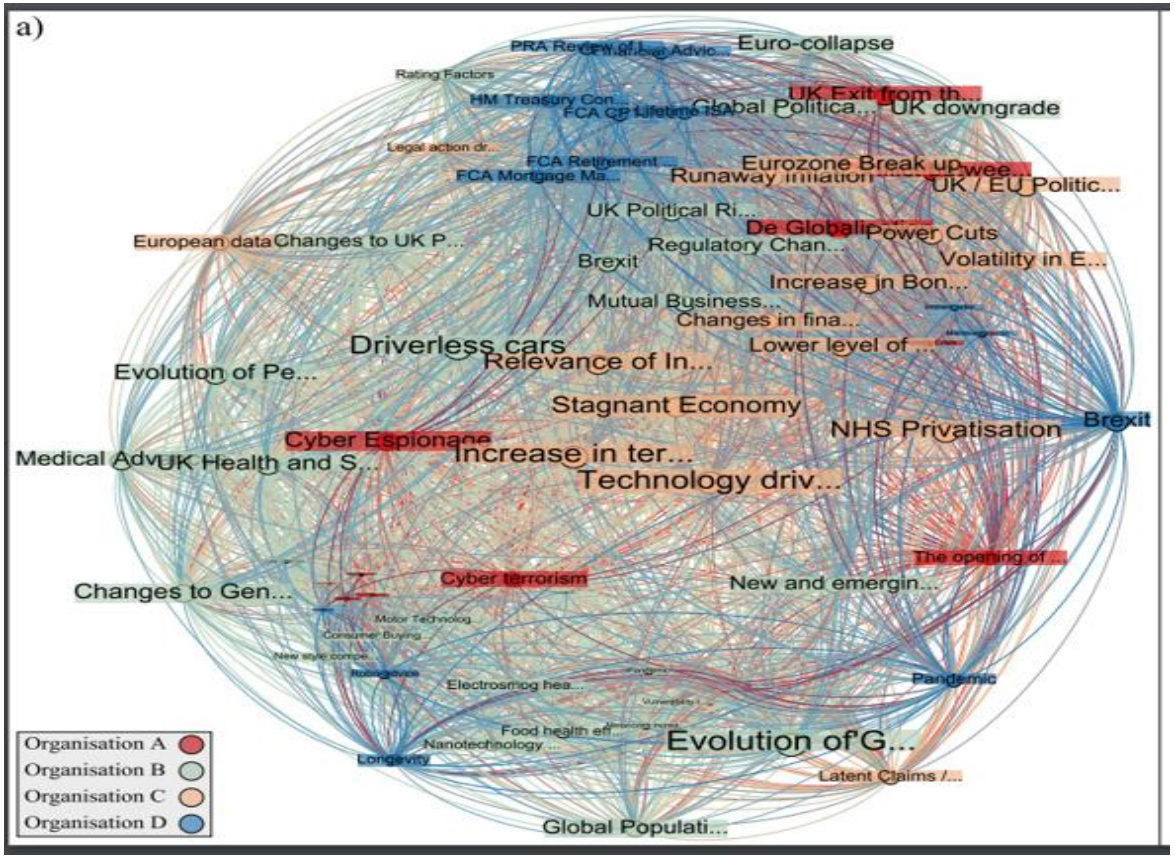
Overview of Emerging Risks Process

Character	Systemic Rating
Within planning period	30
High Impact	27
Medium Impact	22
LegalReg	21
Imminent	17
Political	16
Economic	11
Beyond planning period	8
Low Impact	6
Technology	4
Societal	2
Environmental	0

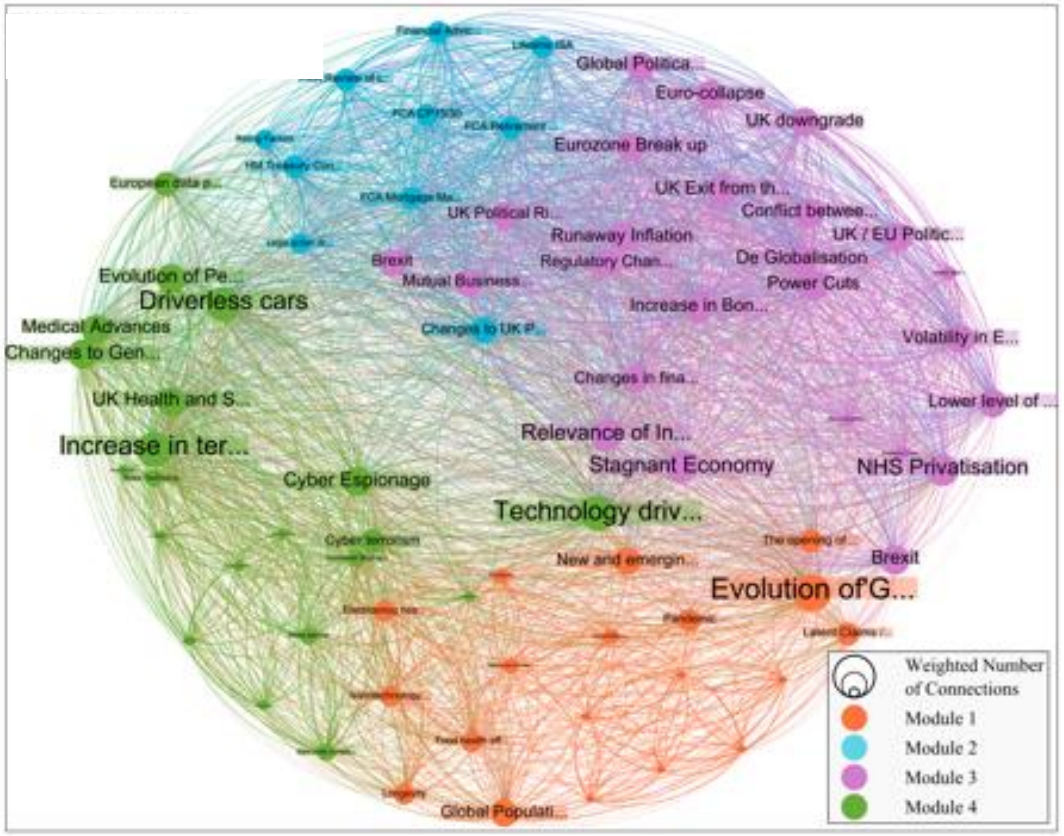


Curtesy Milliman

Emerging Risk Network



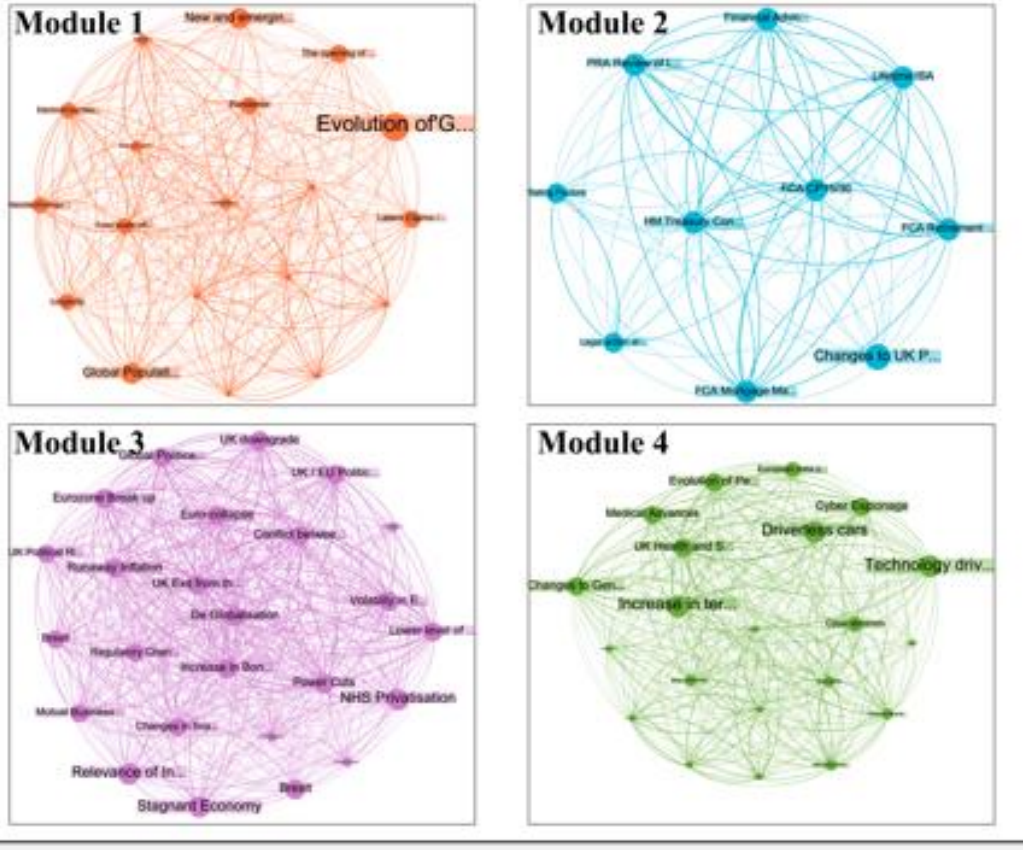
Clustered risk network



Modules have similar characteristics

Planet and Human Health (latent & new claims)

Socio-Economic

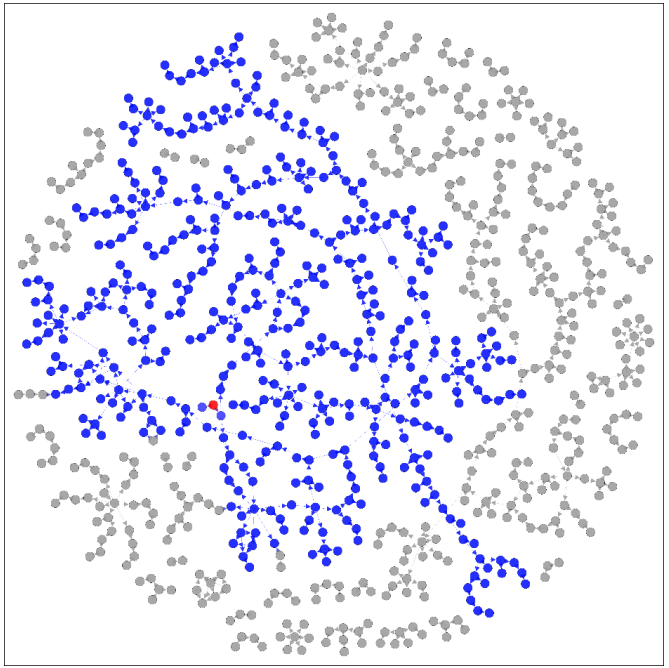


Statutory and Regulatory Change

Technology and Personal Data

Domino or Contagion an Emerging Risk

- Has systemic implications
- Key issue – without modelling there is no way of knowing, in the early stages, if this is just low level, regular issue or a **major problem**
- So model and then:
  - measure the potential of every node and rank them
  - Model potential benefits that can arise from local and global mitigation strategies



For more information see award winning paper at ERM Symposium, Washington, 2015, '*How resilient is your organisation? From local failures to systemic risk*' N. Allan, C. Ellinas, N. Cantle

Conclusions

- The past is helpful in understanding the future, especially through the use of characteristics
- It *IS* possible to spot emerging risks, and to do so formally and rigorously
- The signs and evidence of emerging risks is nearly always there, so make descriptions rich
- Evolutionary and network methods can focus management effort
- The data needed is already available, so combining evolutionary & network tools and methods is highly productive

Questions?

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