Finance, Technology & Epidemics

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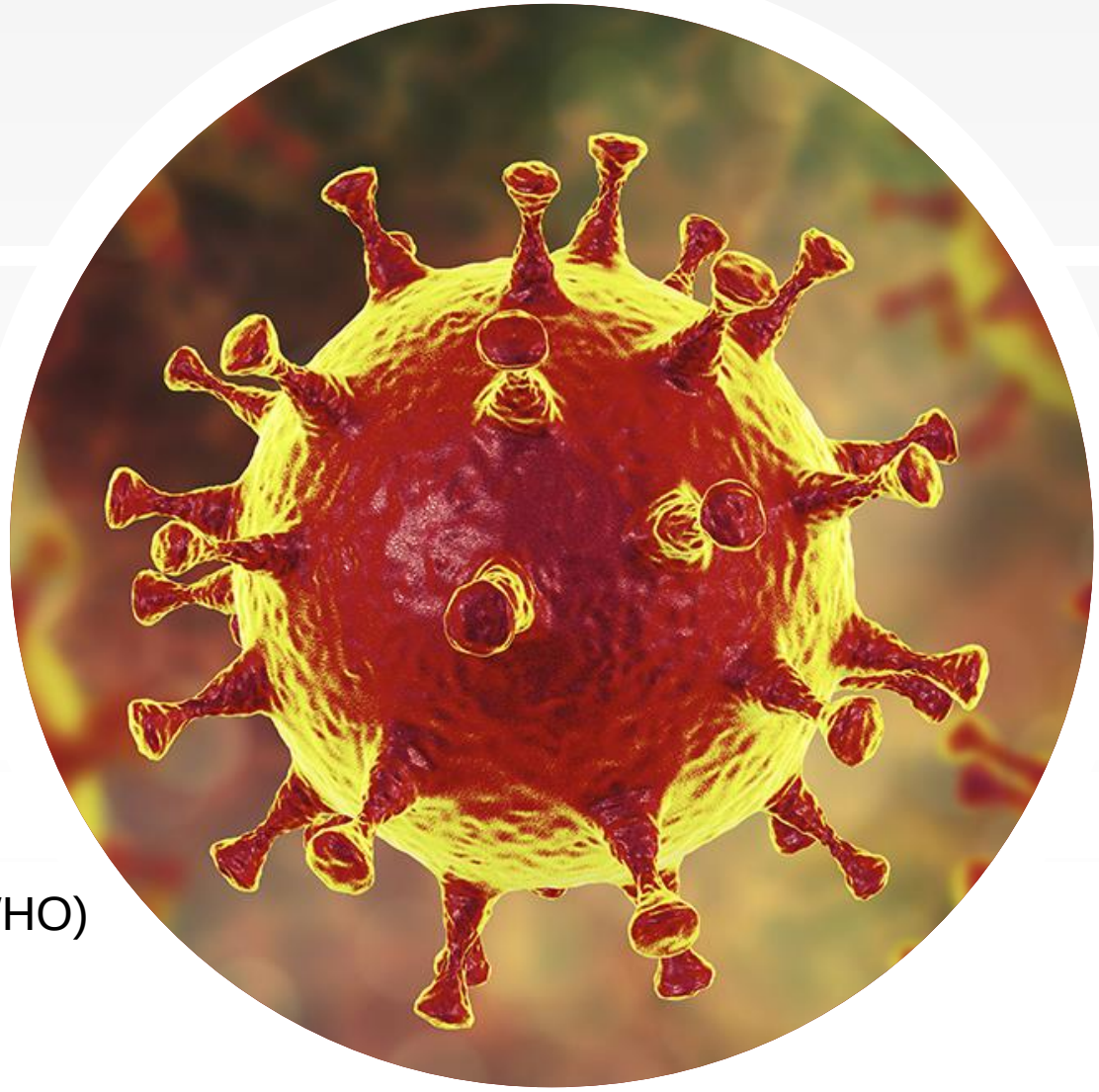
Coronavirus: The Epidemic

- Severe respiratory infection that could lead to death
  - Disease is officially named as COVID – 19
  - Virus is officially named as SARS-CoV-2
- Geographical spread
  - Initially observed in Wuhan, China
  - Gradually spreading to rest of the world
  - Public Health Emergency of International Concern (WHO)
- Impact of the epidemic outbreak
  - Disruption to businesses / travels
  - Wider economic impact globally



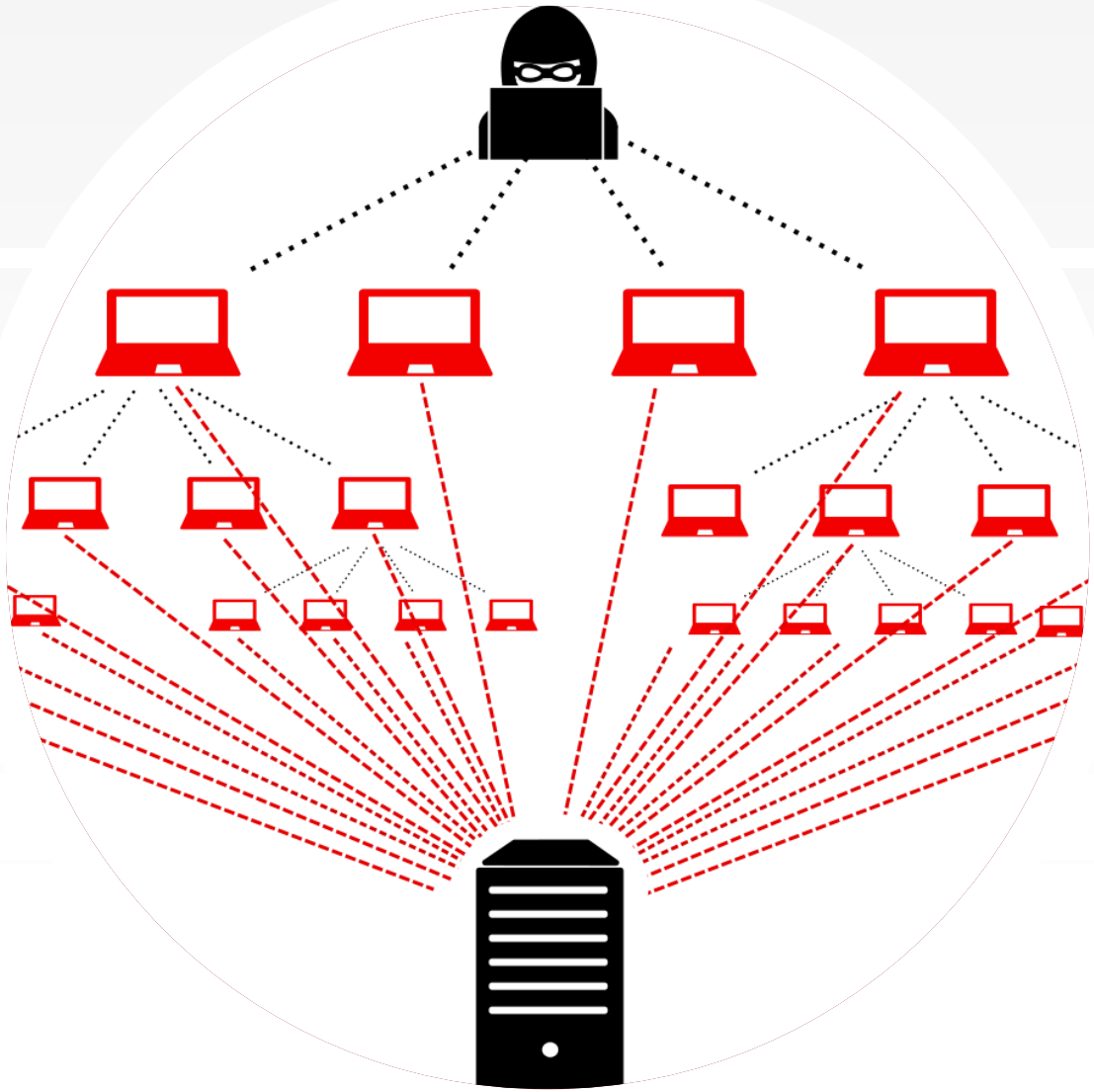
Coronavirus: The Infodemic

Infodemic defined

- An over-abundance of information – some accurate and some not – that makes it hard for people to find trust-worthy sources / reliable guidance when they need it

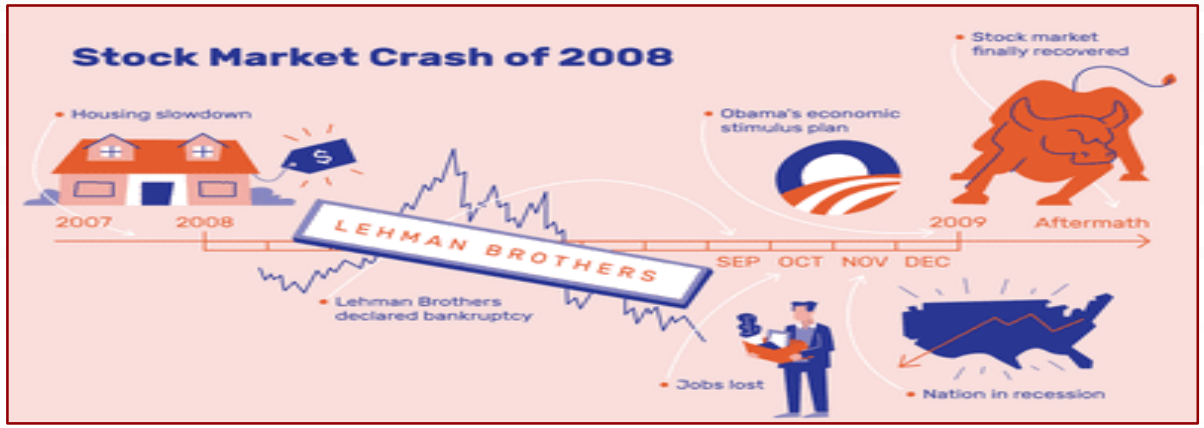
Examples of the infodemic news in circulation

- Chinese origins of the crisis
- Geo-political aspects including bio-warfare
- Religious / cultural interpretations
- Recommended preventive measures
- Transparency of information about the epidemic

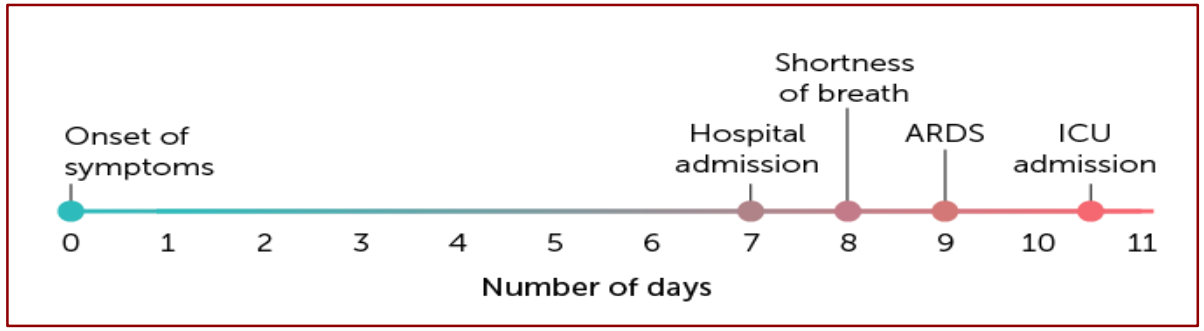


Challenge – Time for infection to spread

It took about 2 years for a financial contagion to unleash



It takes about 11 days for a viral outbreak to incubate



It takes 200 milliseconds for a digital ad to reach us

The Discussion Ahead

Andrew Haldane

Bank of England

Rethinking Financial Network

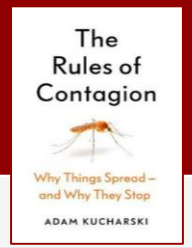
(2009)

Adam Kucharski

*London School of HTM**

The Rules of Contagion

(2020)

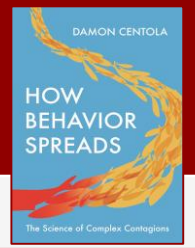


Damon Centola

University of Pennsylvania

How Behavior Spreads

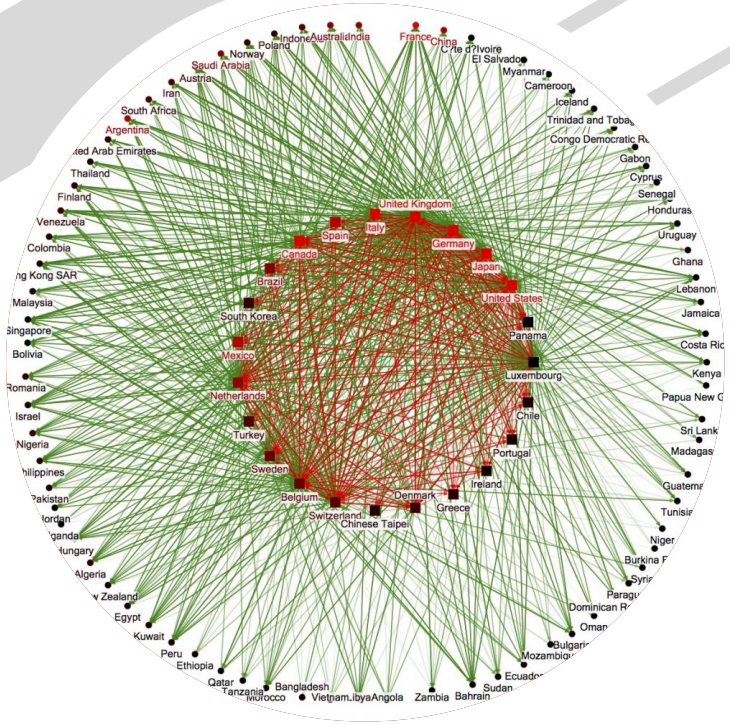
(2018)



** Hygiene and Tropical Medicine*

What drives a Contagion?

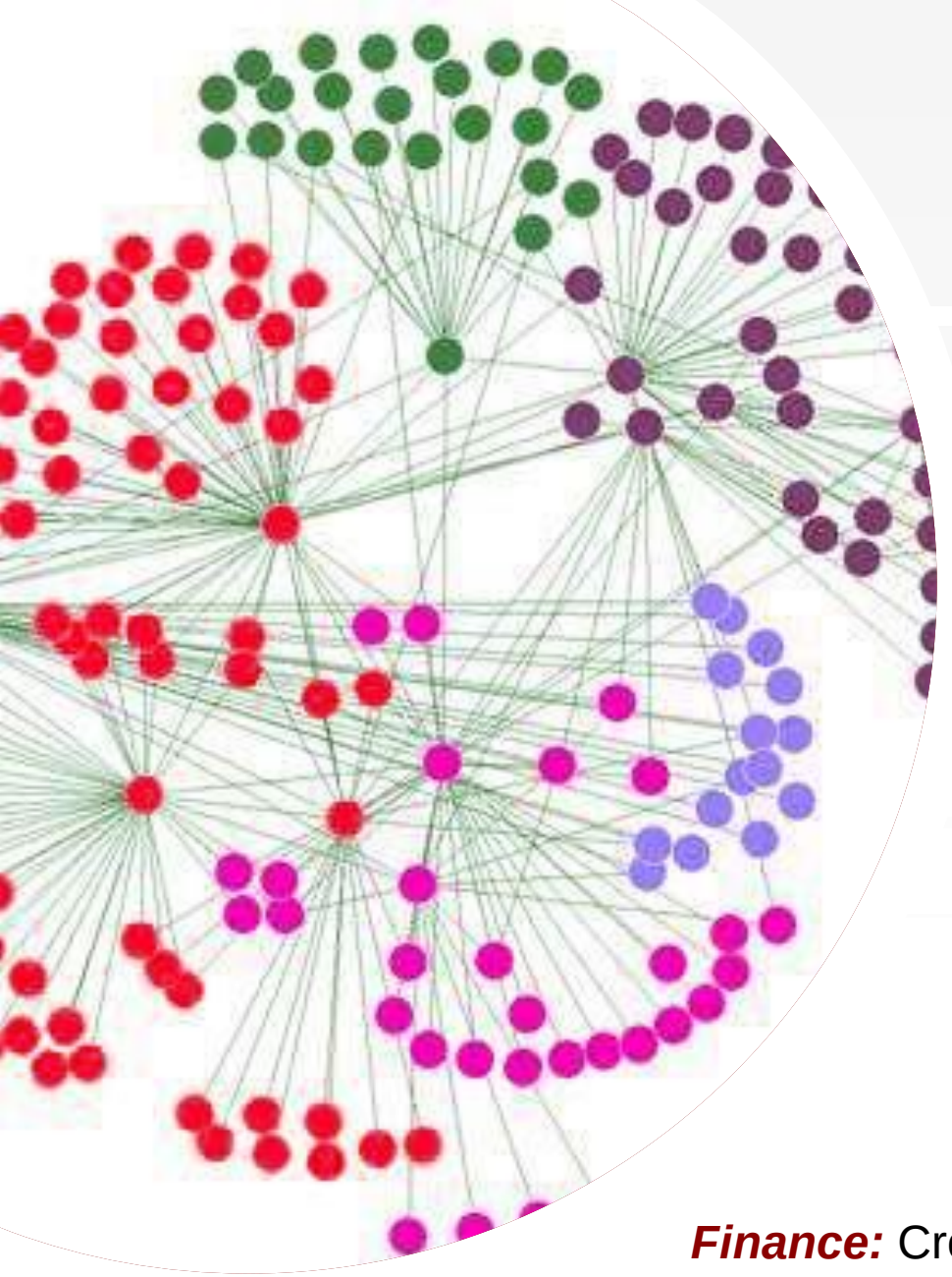
The Causes



> An external event strikes. Fear grips the system which, in consequence, seizes. The resulting collateral damage is wide and deep. Yet the triggering event is, with hindsight, found to have been rather modest.

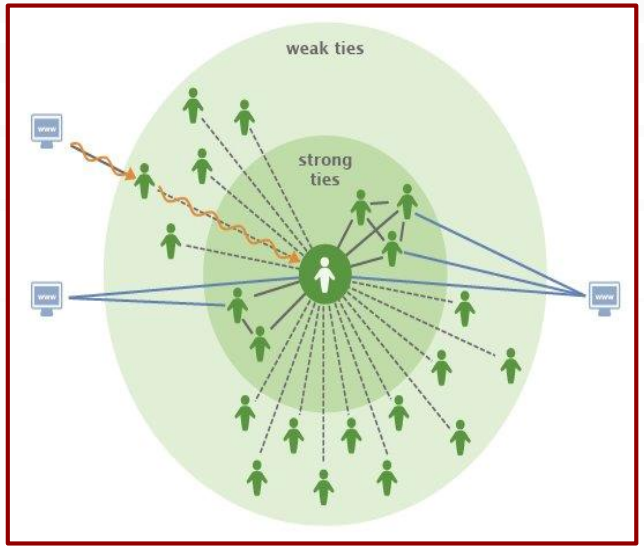
Andrew Haldane

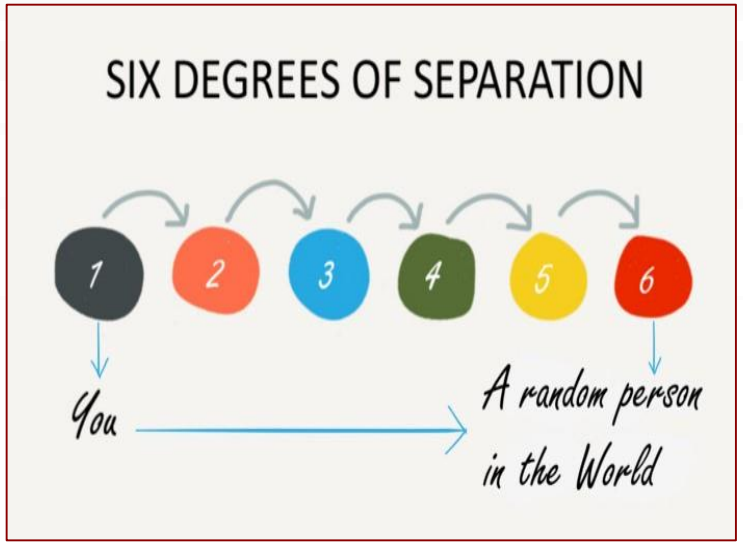
Rethinking Financial Network (2009)



Network Structure

- Network structure is characterized by “strong” or “weak ties”
- While strong ties are visible and influential outwardly, it’s the weak ties that transmit the infection in an influential manner





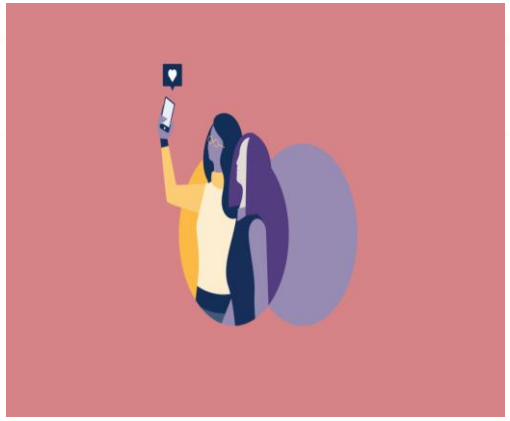
Finance: Cross-border, ***Epidemics:*** Travel Companions, ***Technology:*** Long Tail

Network Multiplier

Commonly referred to as ***"Reproduction Number"*** in Epidemics, similar to ***"Deposit Multiplier"*** in Finance

D*uration X* ***O****pportunities X* ***T****ransmission X* ***S****usceptibility*

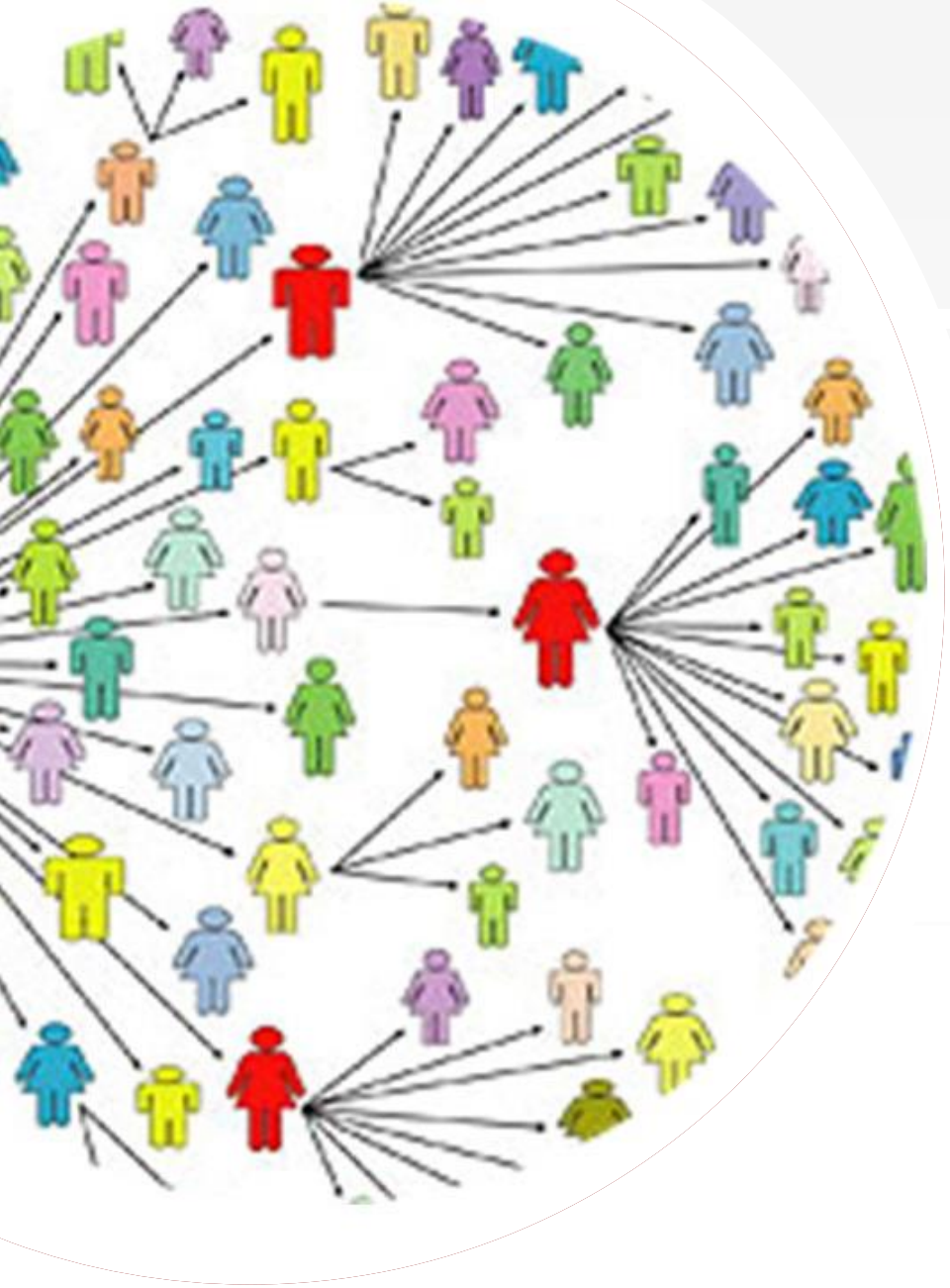
In Technology context, multiplier is exponential through campaign challenges involving nominations



#nomakeupselfie

#icebucket

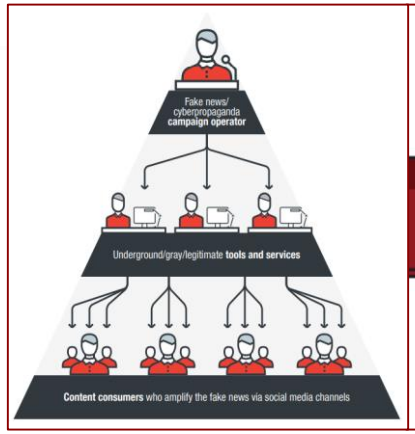
#necknomination

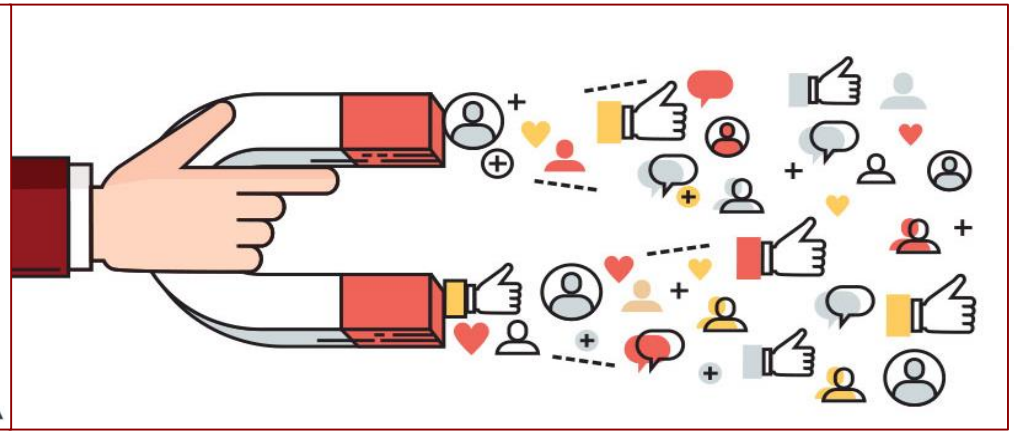


Network Amplifier

Network amplifiers are those nodes in the network who has bigger impact of influencing a large number of other nodes (and hence have higher power of transmission)

- ***Epidemiology:*** Super-spreaders or Super-spreading events
- ***Finance:*** Systemically Important Financial institutions (SIFIs)
- ***Technology:*** Online Influencers (positive / manipulative)





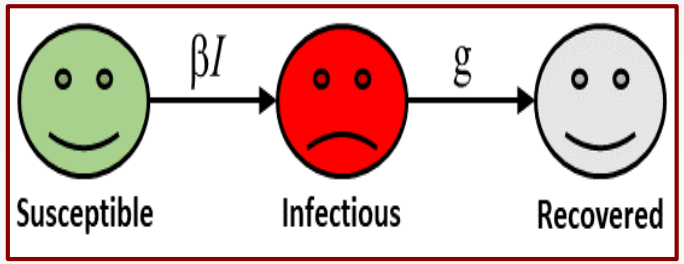
What slows down a contagion?

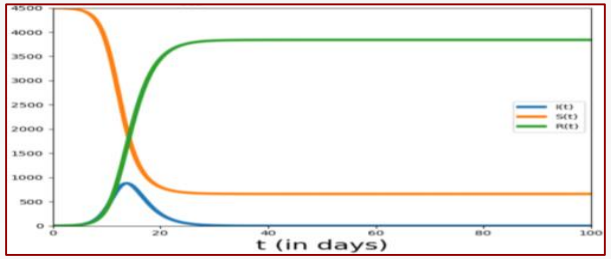
The Containment

“ Misinformation on the coronavirus might be the most contagious thing about it. And the best way to tackle these online rumors? Treat them like a real-life virus.

– ***Adam Kucharski***

The Rules of Contagion (2020)

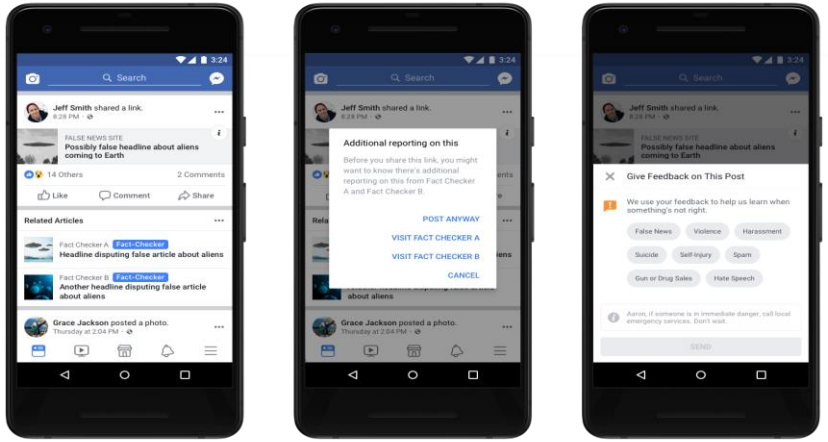


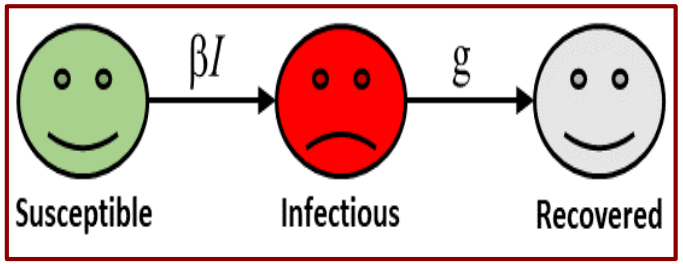


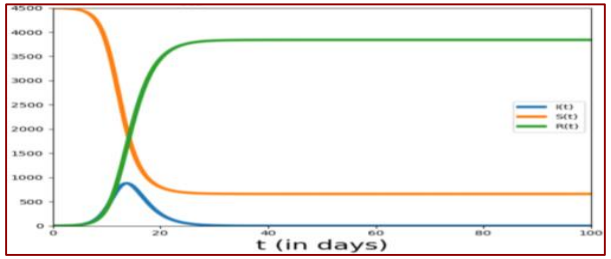
Isolation

Isolation refers to the mandatory measures administered to prevent the further spread of contagion

- ***Epidemiology:*** Quarantine
- ***Finance:*** Toxic Assets
- ***Technology:*** Review, Reduce, Report



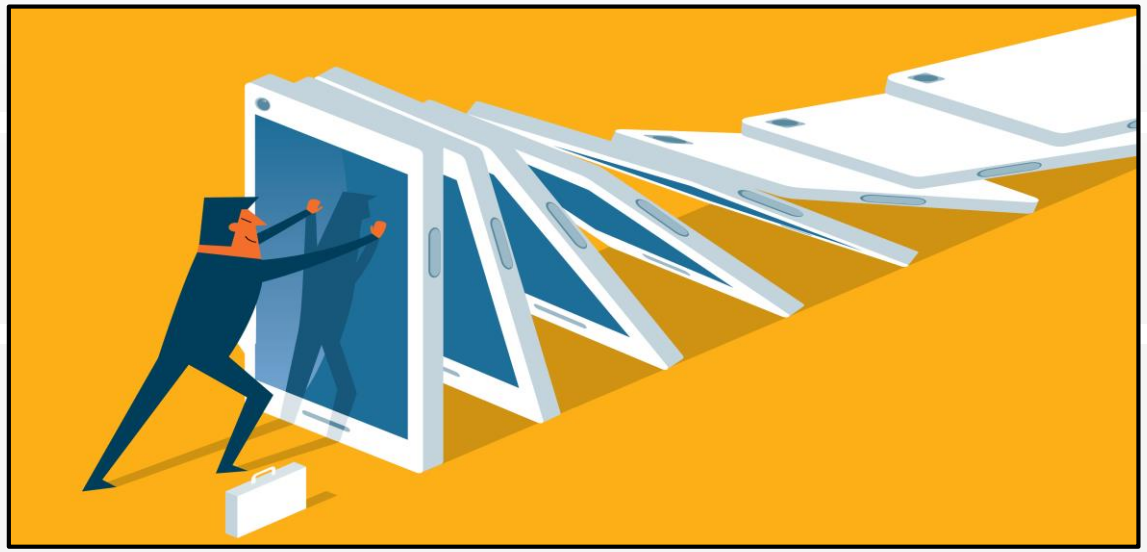


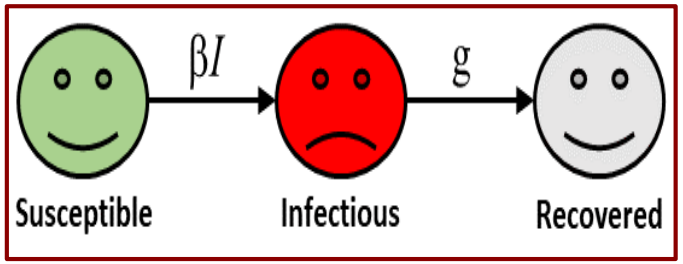


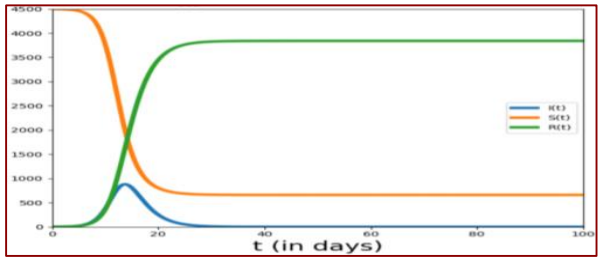
Identification

Of “super-spreaders” to minimize spread of contagion

- ***Epidemiology:*** Public Gathering Restrictions
- ***Finance:*** Capital Requirements for SIFIs
- ***Technology:*** Big Tech Companies’ Collaboration



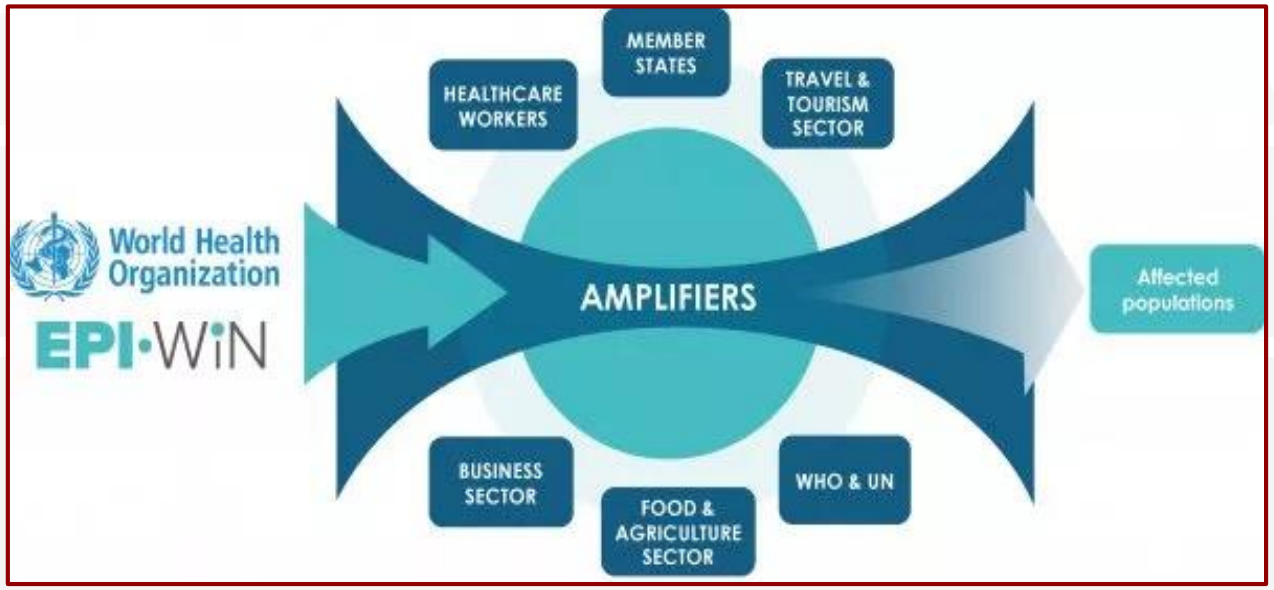




Infusion

Of “immunity” to enhance the resistance to virus

- ***Epidemiology:*** Vaccinating Susceptible Public
- ***Finance:*** Capital Resource Raising
- ***Technology:*** Genuine News Spreading



What strains the slow-down?

The Challenges

> “Why is it that HIV has spread rapidly around the world but relatively easy behaviors that could prevent HIV infection have not?

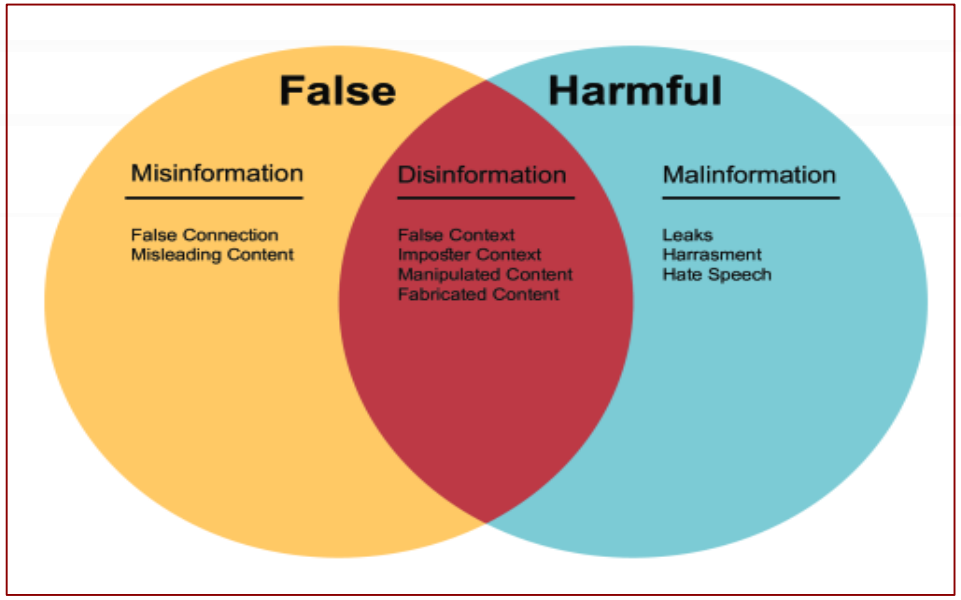
– ***Damon Centola***

How Behavior Spreads (2018)

Differentiated Approach

Required to propagate preventive behavior to counter infection

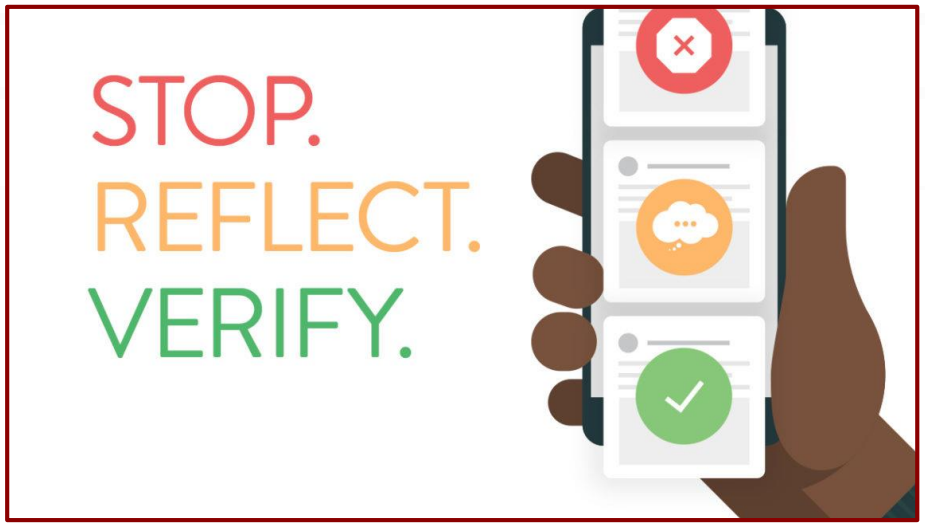
- ***Epidemiology:*** Focus on “education” than on “vaccination”
- ***Finance:*** Focus on “conduct” than on “capital”
- ***Technology:*** Focus on “vulnerability” than on “veracity”



Device Selection

For effective prevention of transmission of harmful infection

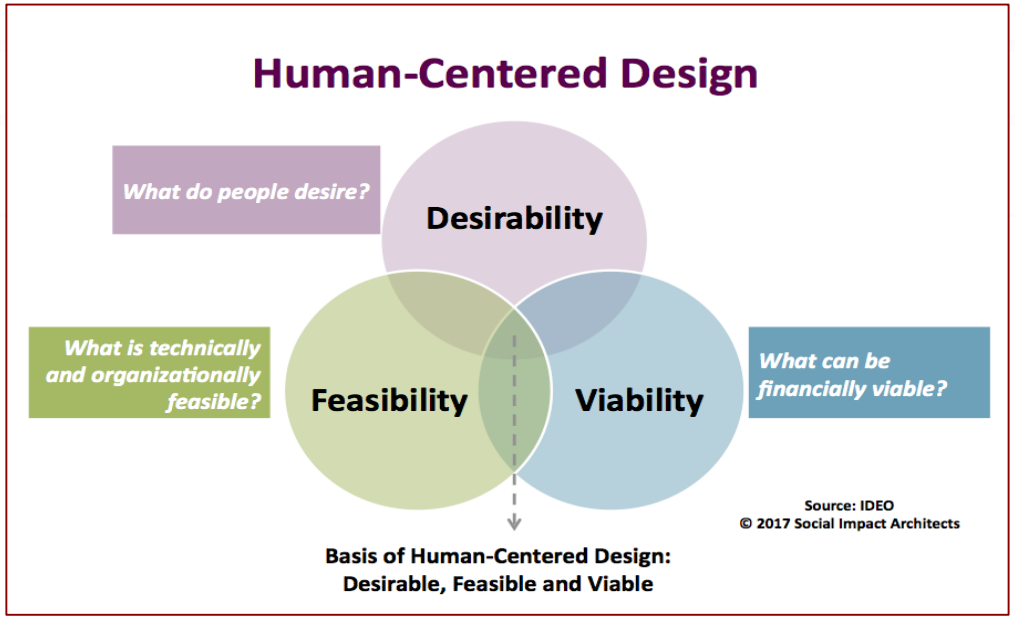
- ***Epidemiology:*** Face mask vs. health hygiene
- ***Finance:*** Competition vs. Consolidation
- ***Technology:*** Online vs. Offline



Design Consciousness

To consciously induce the targeted behavior into the population

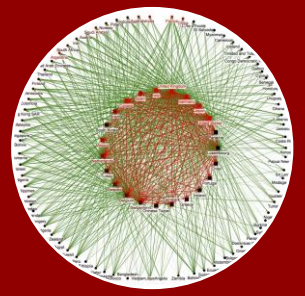
- ***Epidemiology:*** Case-control vs. Randomized-control
- ***Finance:*** Caveat Emptor Vs. Caveat Venditor
- ***Technology:*** Human Centered vs. Machine Centered



Conclusion

> *Falsehood flies, and the Truth comes limping after it, so that when men come to be undeceived, it is too late; the jest is over, and the tale hath had its effect*

Jonathan Swift
The Examiner No XIV (1710)



Causes

Network Structure
Network Multiplier
Network Amplifier

Containment

Isolation
Identification
Infusion

Challenges

Differentiated Approach
Device Selection
Design Consciousness

THANK YOU

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