Four Struggles

Globalization, Outsourcing and Technology

Stephen Downes

National Research Council Canada

Overview

- The Premise of Globalism
- Changing Governance
- The Rise of Networks
- Four Struggles

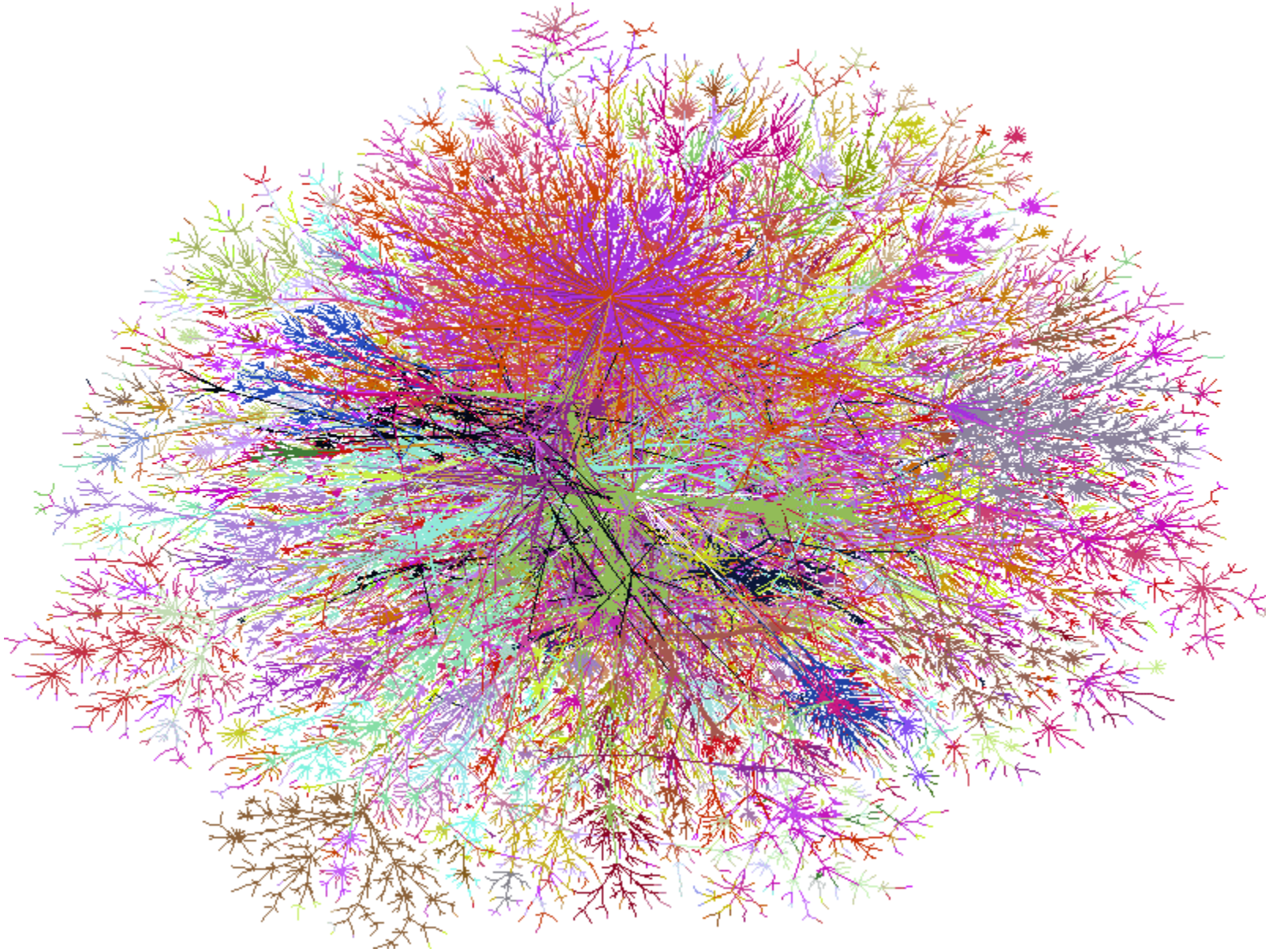
The Premise of Globalism

- Scholte: Five Dimensions of Globalization
  - Internationalization (markets, exchange and interdependence)
  - Liberalization (freedom of movement)
  - Universalization (global experiences)
  - Westernization or modernization (Monoculture
  - Deterritorialization (common social space)

The Premise: A Shared Social Space

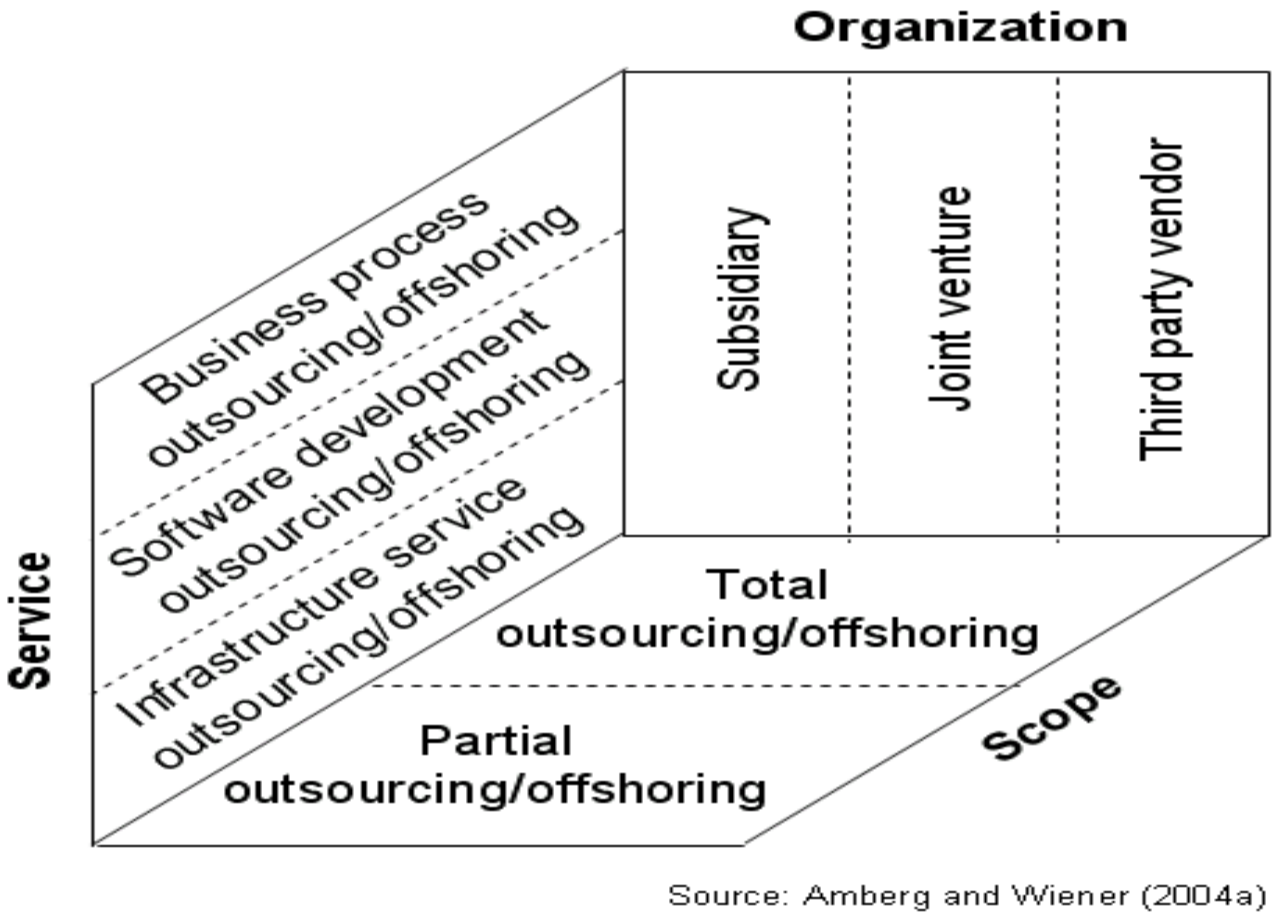
“In the example of microfinance above and in our uses of blogs, wikis, and other technology-enabled communication and collaboration tools, you are experiencing redefined social spaces.” P. 4

Global Information Systems



Source: Bill Cheswick http://www.cheswick.com/ches/map/gallery/index.html

First Phase: IT Outsourcing



Source: Amberg and Wiener (2004a)

Source: Michael Amberg
http://www.international-outsourcing.de/CSF-Tool/research_background/definition.html

Offshore Outsourcing

- Conventional Outsourcing (contract)
- Joint Venture (partnership)
- Build-Operate-Transfer (Client may buy)
- Captive Center (subsidiary)

Second Wave of Outsourcing

- Commodification of Work
  - Subjective skills and know-how
  - Trained labour
  - Service function (call centres)
- Issues (?)
  - Cultural Factors
  - Geographical Distance
  - Infrastructure and Security
  - Morale

Criticisms

- This model based on bracketing other forms of globalization (especially libralization and mobility)
    - Think of the NB experience. Where people *have* mobility, they use it to escape low wages
- But more – this model is not sensitive to the transformative impact of global networks
  – *Especially with regard to management, power and control*

Changing Governance

Paul S. Adler and Charles Heckscher

Table 1.1. Three Principles of Social Organization

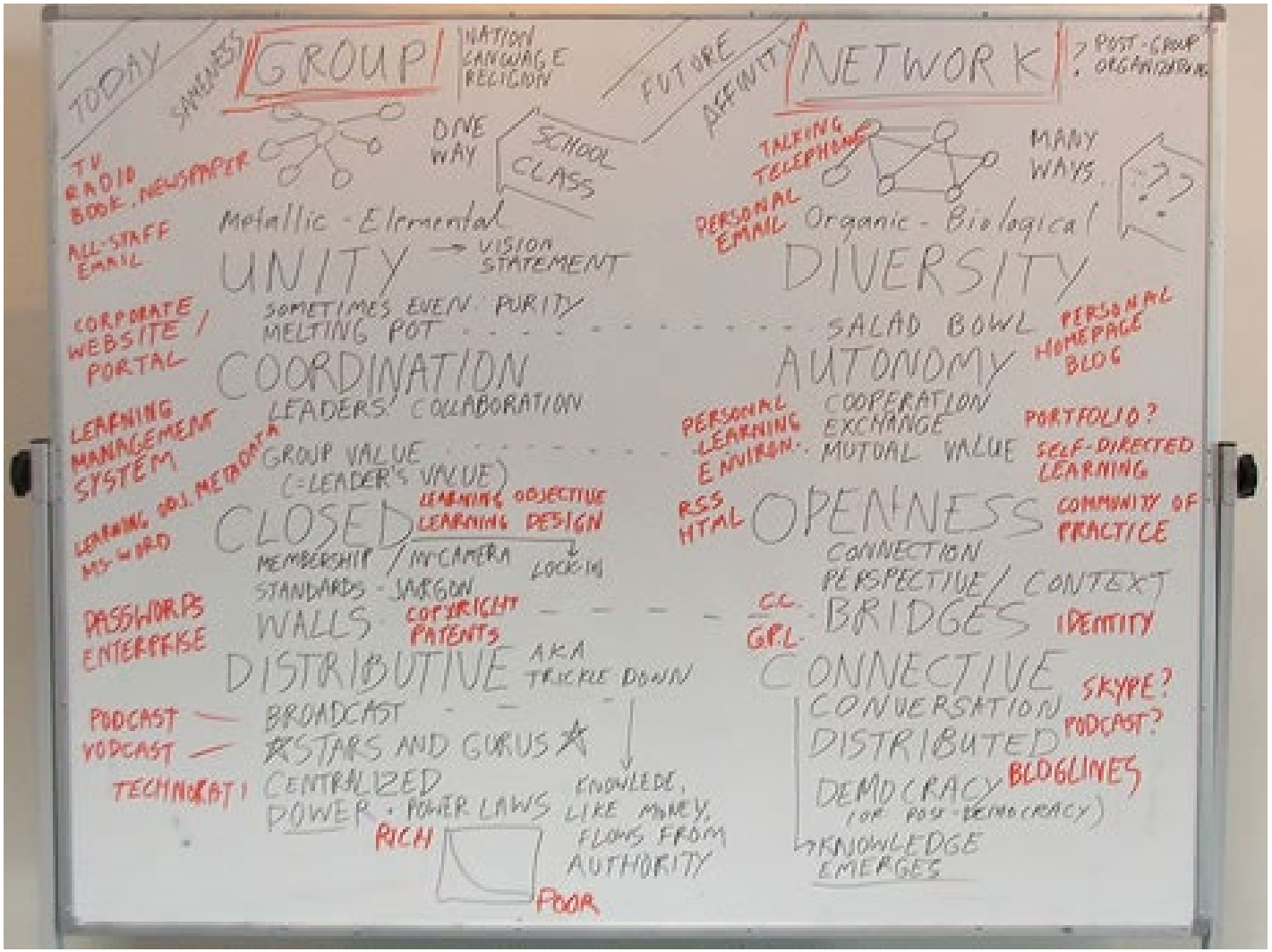
	Hierarchy	Market	Community
Coordinating mechanism	Authority	Price	Trust
Primary benefits	Control	Flexibility	Generation and sharing of knowledge
Resources produced	Organizational capital	Economic capital	Social capital
Fits tasks that are	Dependent	Independent	Interdependent

Source: Adler and Heckscher, The firm as a collaborative community (2006)
http://tinyurl.com/y998q29

Table 1.2. Three Forms of Community

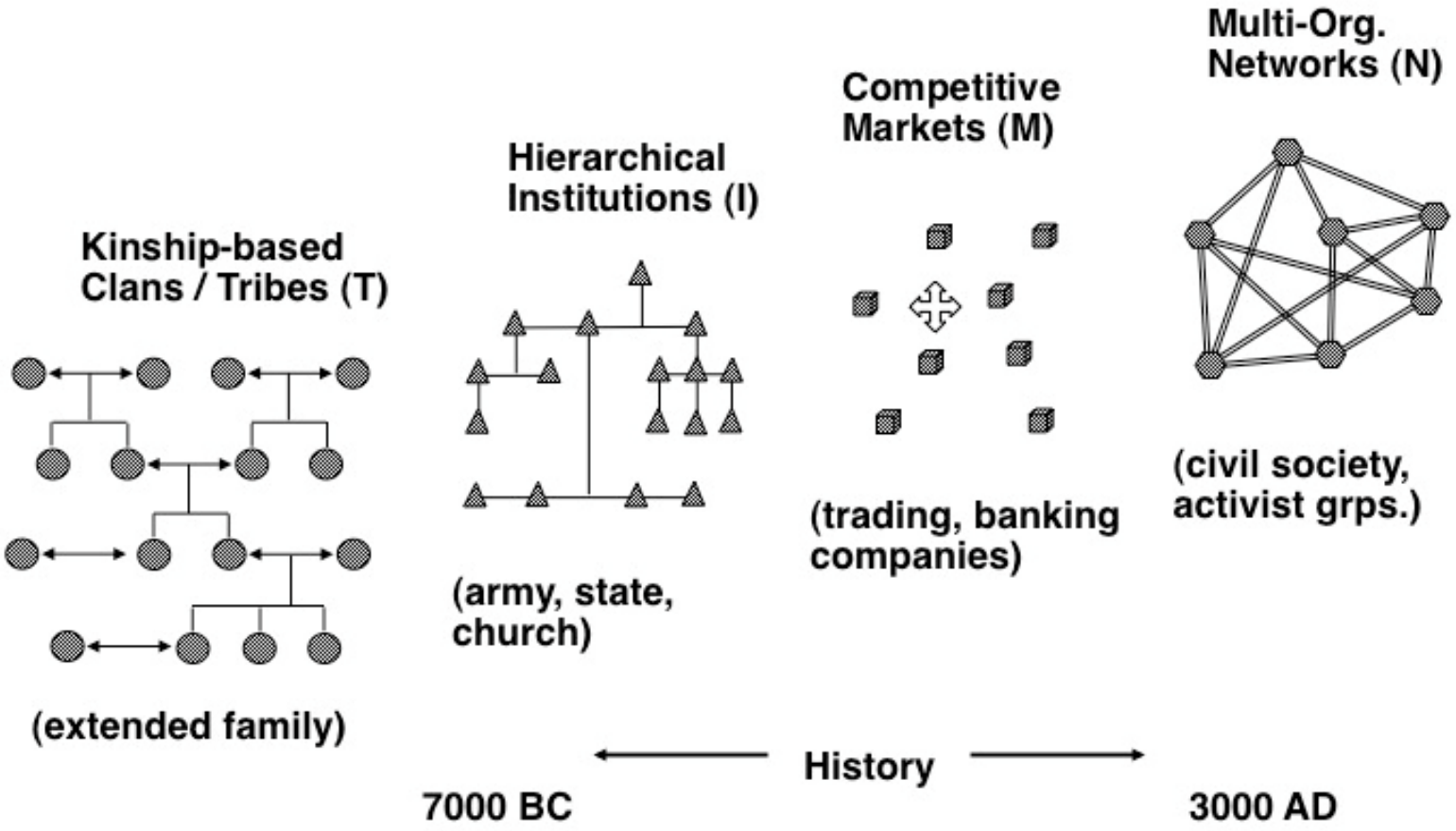
	Gemeinschaft community in the shadow of hierarchy	*Gesellschaft* community in the shadow of market	*Collaborative* community as the dominant principle
Values	*Trust based on*: • loyalty • honor duty • status deference	• integrity competence • conscientiousness integrity	• contribution • concern honesty, • collegiality
	Legitimate authority based on: • tradition or charisma	• rational-legal justifications	• value-rationality
	Values: • collectivism	• consistent rational individualism	• simultaneously high collectivism and individualism
	Orientation: • particularism	• universalism	• simultaneously high particularism and universalism
Organization	• mechanical division of labor coordinated by common norms	• organic division of labor coordinated by price and/or authority	• organic division of labor coordinated by conscious collaboration
	• organization through vertical dependence	• organization through horizontal independence	• enabling (horizontal and vertical) interdependence
	• the structure is local, closed	• global, open	• 'glocalization'
Identities	• status-dependent	• independent	• interdependent self-construal interactive social character

Groups and Networks



Source: http://www.downes.ca/post/42521

Four Forms Behind the Organization and Evolution of All Societies — TIMN



Source: David Ronfeldt
http://twotheories.blogspot.com/2009/02/overview-of-social-evolution-past.html

The Four TIMN Forms Compared: Each Grows for Different Reasons

	TRIBES	INSTITUTIONS	MARKETS	NETWORKS
ERA OF RISE	Neolithic	agrarian	industrial	post-industrial
STRUCTURE	kinship	hierarchy	atomized	web-like
STRENGTH	belonging	power, authority	trade, invest.	social equity?
KEY VALUE	solidarity	order	freedom	justice
KEY REALM	family/culture	state, army	economy	civil society?
KEY PRODUCT	shared "gifts"?	public goods	private gds.	collective gds.?
WEAKNESS	administration	econ. transaction	social equity	info. overload?
DARK /SIDE	nepotism	corruption, abuse	exploitation	deception?
INFO. TECH.	early language	writing, printing	teleg., telephony	Internet
BODY ANALOG	skin / look	skeletal system	circulatory sys.	sensory sys.

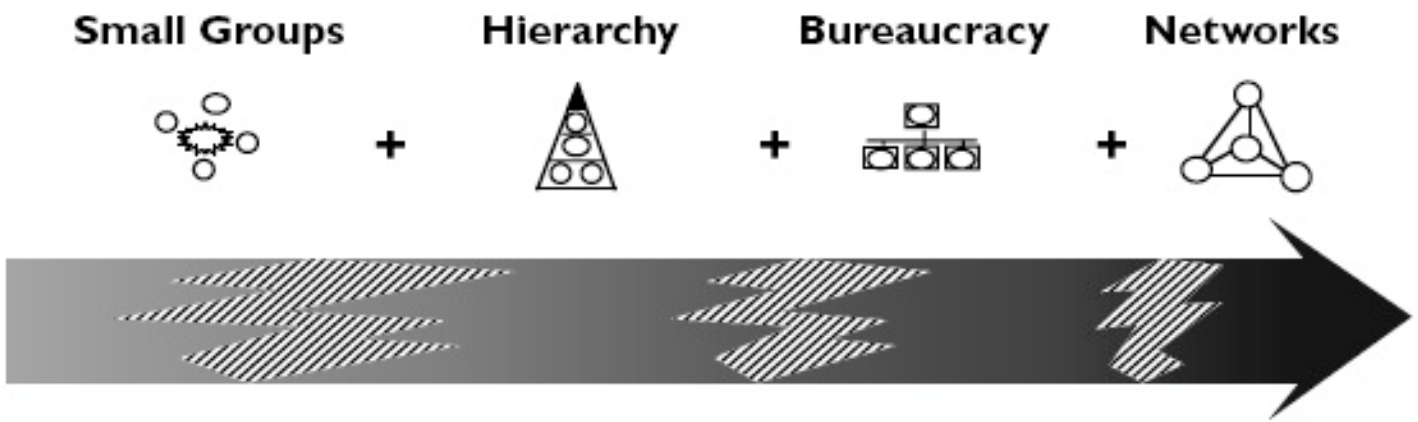
Source: David Ronfeldt
http://twotheories.blogspot.com/2009/02/overview-of-social-evolution-past.html

Four TIMN Stages of Social Evolution

Monoform societies	T	Most of the world, most of history: lately, Afghan tribes, L.A. gangs
Biform societies	T+I	Ancient empires, absolutist states; lately, Soviet Union, Castro's Cuba
Triform societies	T+I+M	Since 18th C., England, America; lately, Chile, China, Mexico, Russia
Quadriform societies	T+I+M+N	Candidates: 21st C. post-industrial democracies with myriad NGOs

Source: David Ronfeldt
http://twotheories.blogspot.com/2009/02/overview-of-social-evolution-past.html

Figure 2.2 Four Ages of Organization



Source: Jessica Lipnack and Jeffrey Stamps, Virtual Teams
http://www.netage.com/pub/books/VirtualTeams%202/CHAPTERS%20PDF/chapter02.pdf

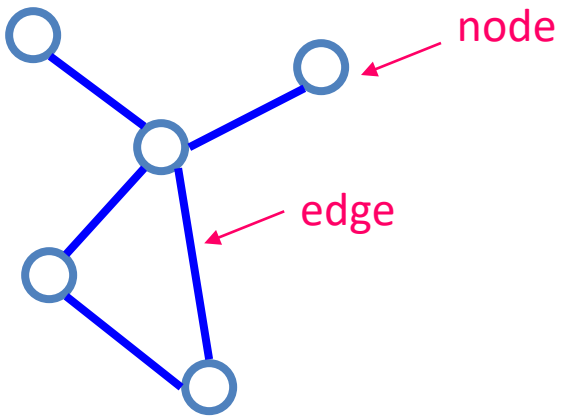
The Rise of Networks

- A. What are Networks?
- B. Network Structures

A. What are networks?

- Networks are collections of points joined by lines.

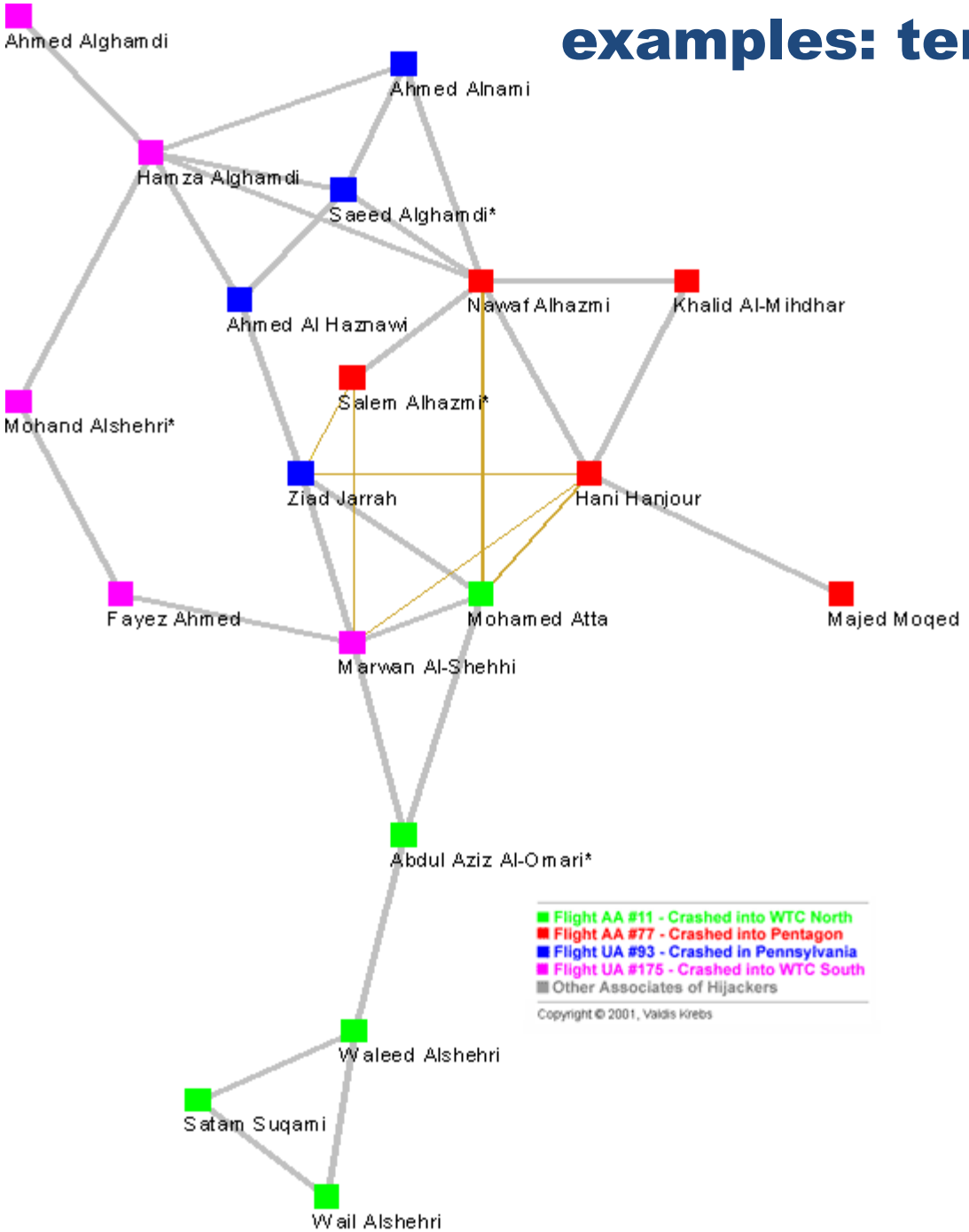
"Network" ≡ "Graph"



points	lines	
vertices	edges, arcs	math
nodes	links	computer science
sites	bonds	physics
actors	ties, relations	sociology

Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

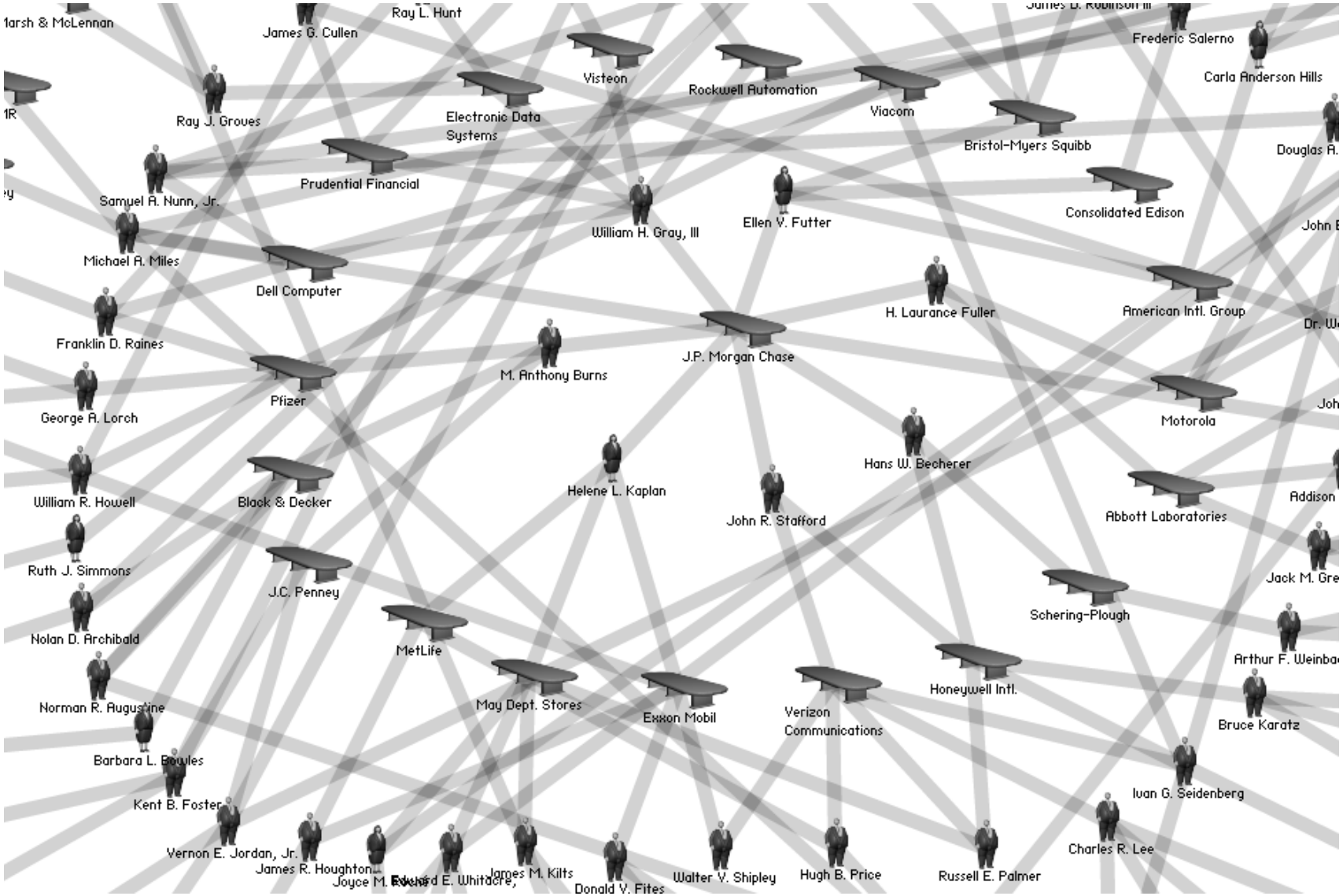
examples: terrorist networks



"Six degrees of Mohammed Atta"

Uncloaking Terrorist Networks, by Valdis Krebs

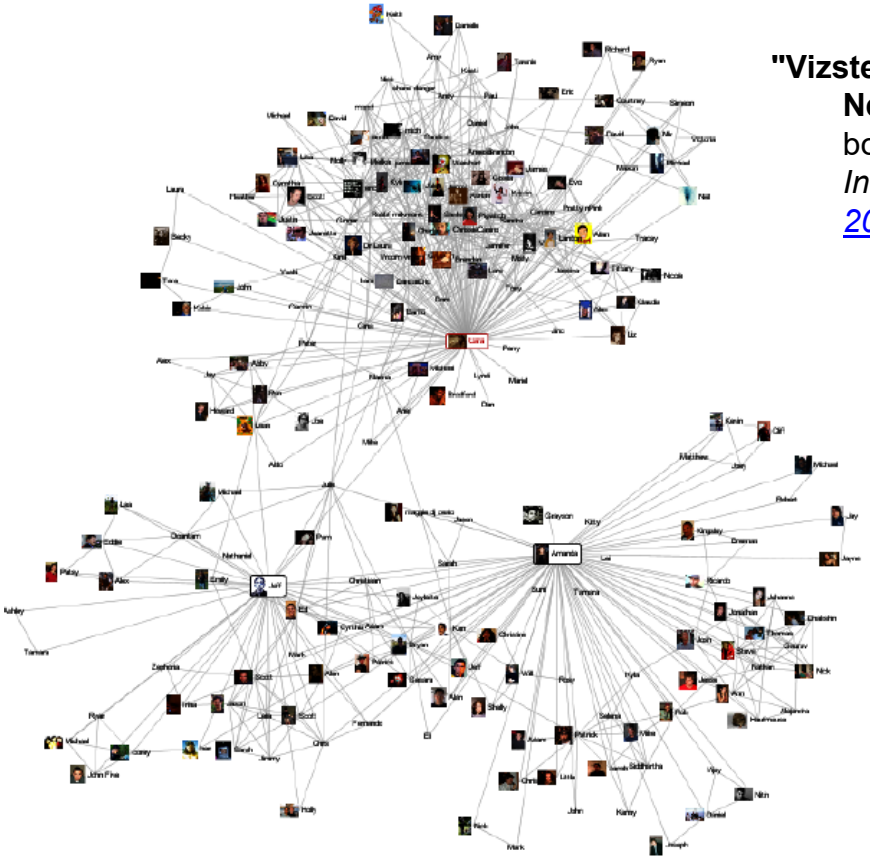
examples: boards of directors



Source: http://theyrule.net

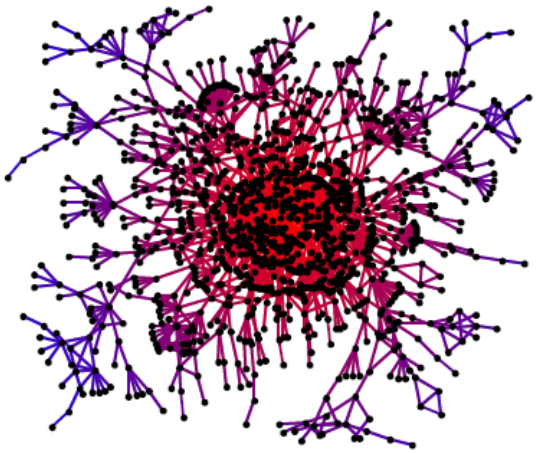
examples: online social networks

- Friendster

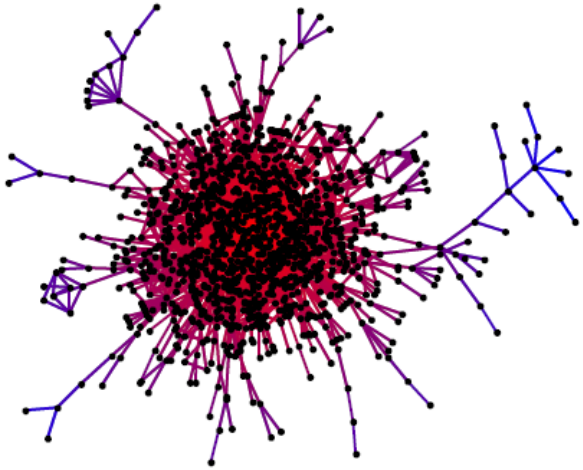


"Vizster: Visualizing Online Social Networks." Jeffrey Heer and danah boyd. *IEEE Symposium on Information Visualization (InfoViz 2005).*

examples: Networks of personal homepages



Stanford

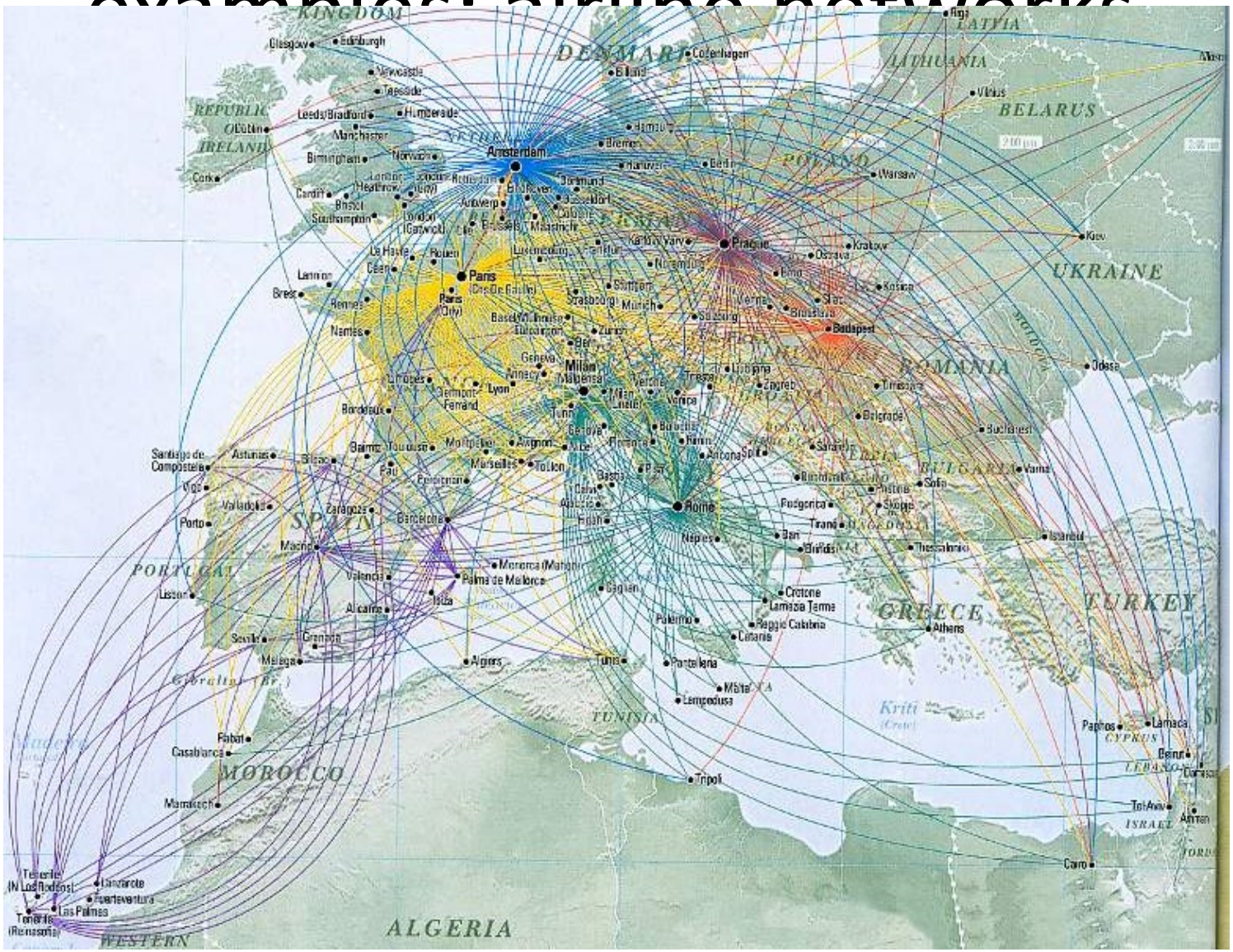


MIT

homophily: what attributes are predictive of friendship?
group cohesion

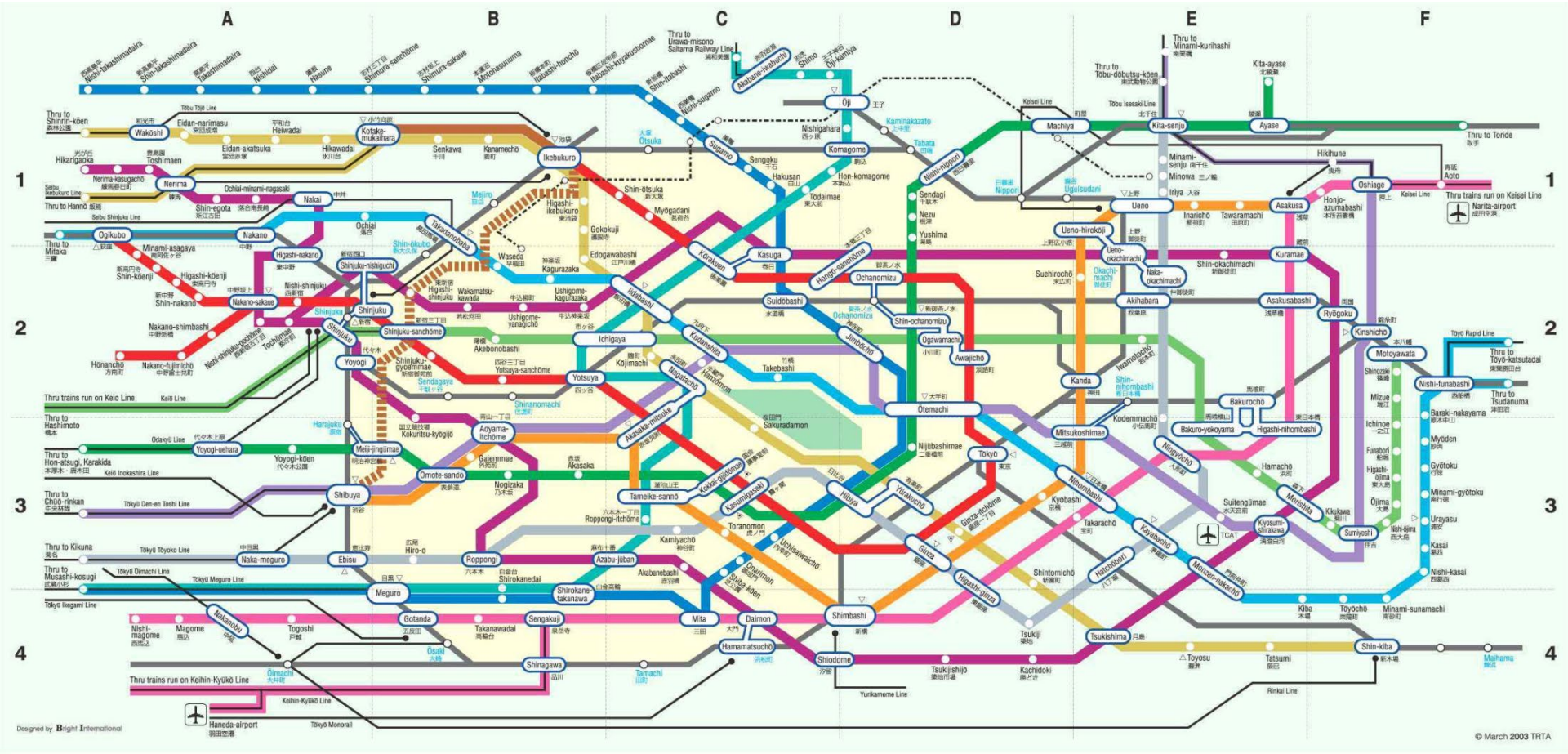
Source: Lada A. Adamic and Eytan Adar, 'Friends and neighbors on the web', *Social Networks*, 25(3):211-230, July 2003.

examples: airline networks



Source: Northwest Airlines WorldTraveler Magazine

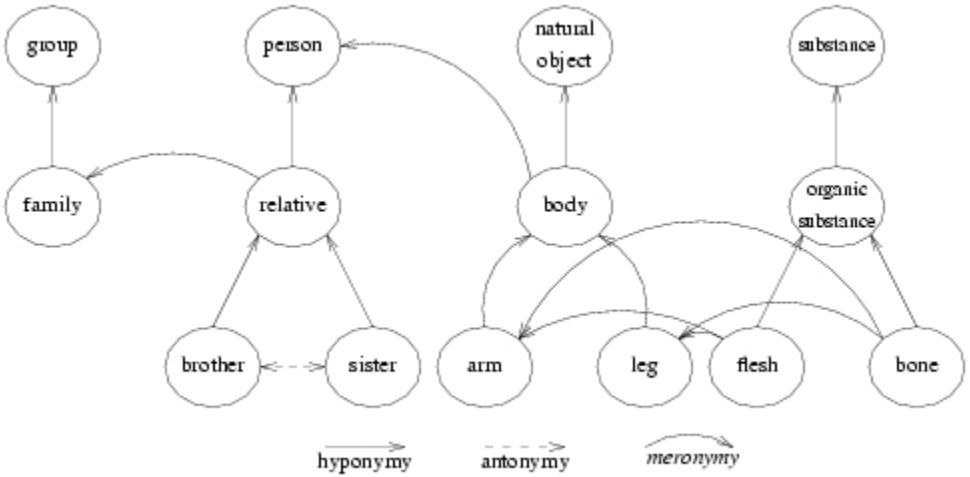
examples: railway networks



Source: TRTA, March 2003 - Tokyo rail map

other examples, e.g. natural language processing

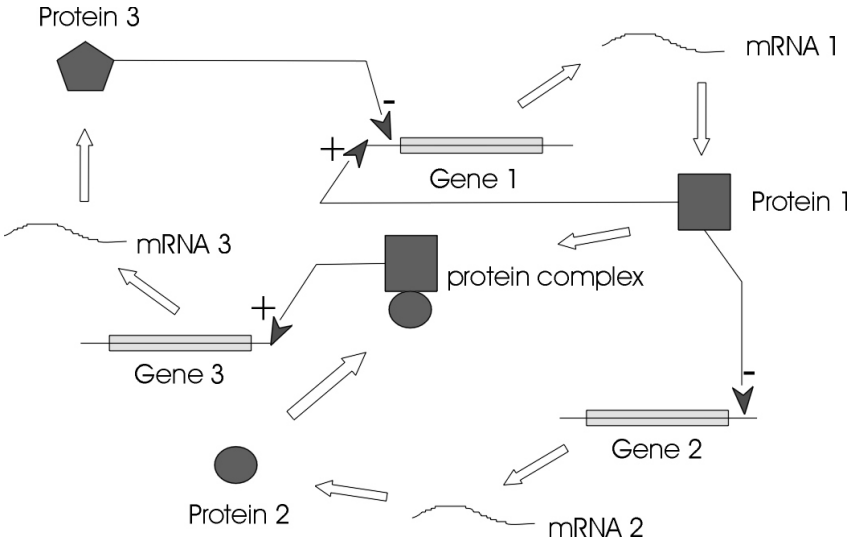
- Wordnet



Source: http://wordnet.princeton.edu/man/wnlicens.7WN

examples: gene regulatory networks

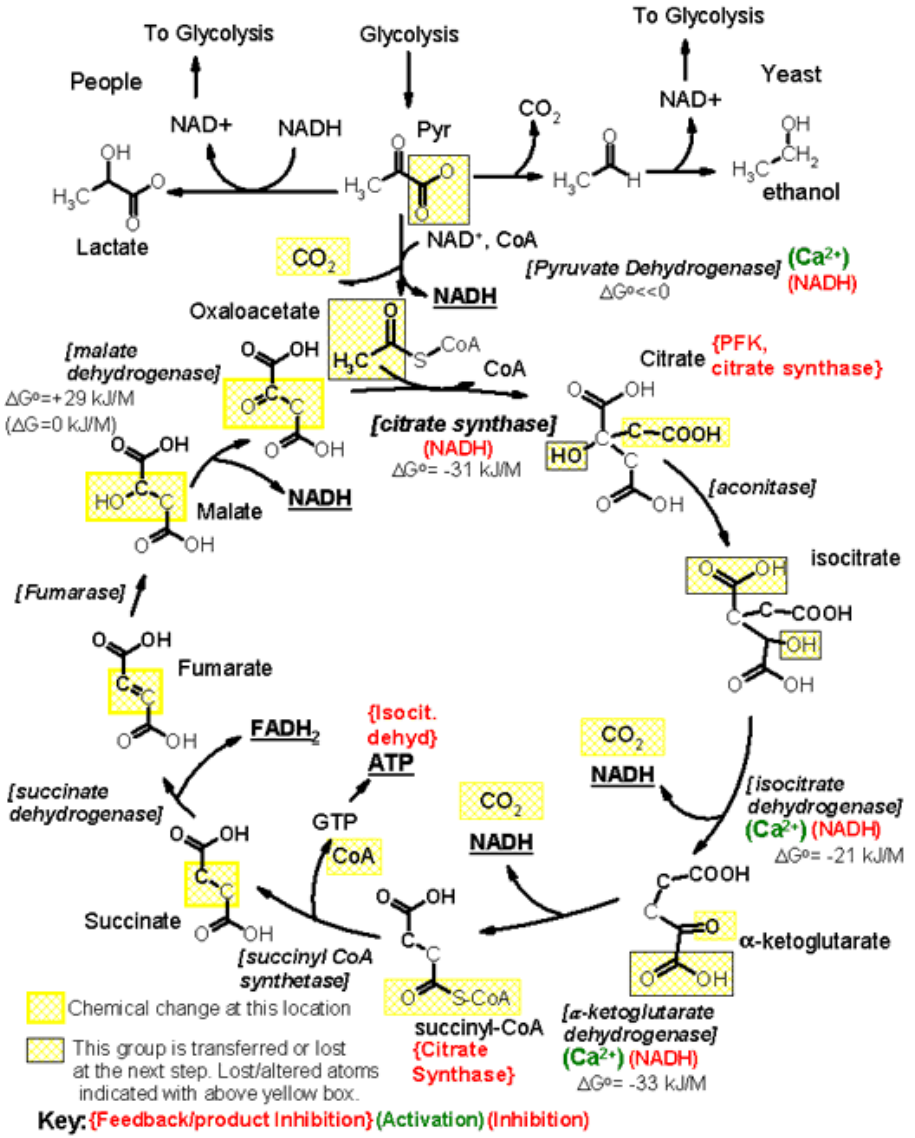
- gene regulatory networks
  - humans have only 30,000 genes, 98% shared with chimps
  - the complexity is in the interaction of genes
  - can we predict what result of the inhibition of one gene will be?



Source: http://www.zaik.uni-koeln.de/bioinformatik/regulatorynets.html.en

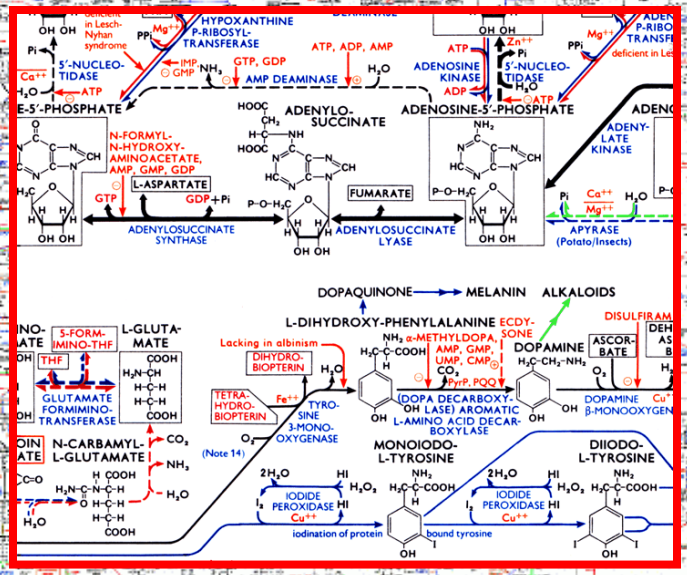
examples: metabolic networks

- Citric acid cycle
- Metabolites participate in chemical reactions



Source: undetermined

Biochemical pathways (Roche)



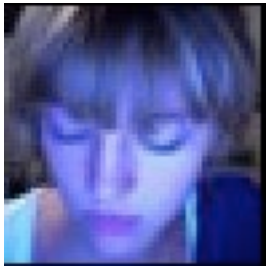
Source: Roche Applied Science, http://www.expasy.org/cgi-bin/show_thumbnails.pl

B. Network Strctures

- Robustness
- Search
- Spread of disease
- Opinion formation
- Spread of computer viruses
- Gossip

Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

How do we search?



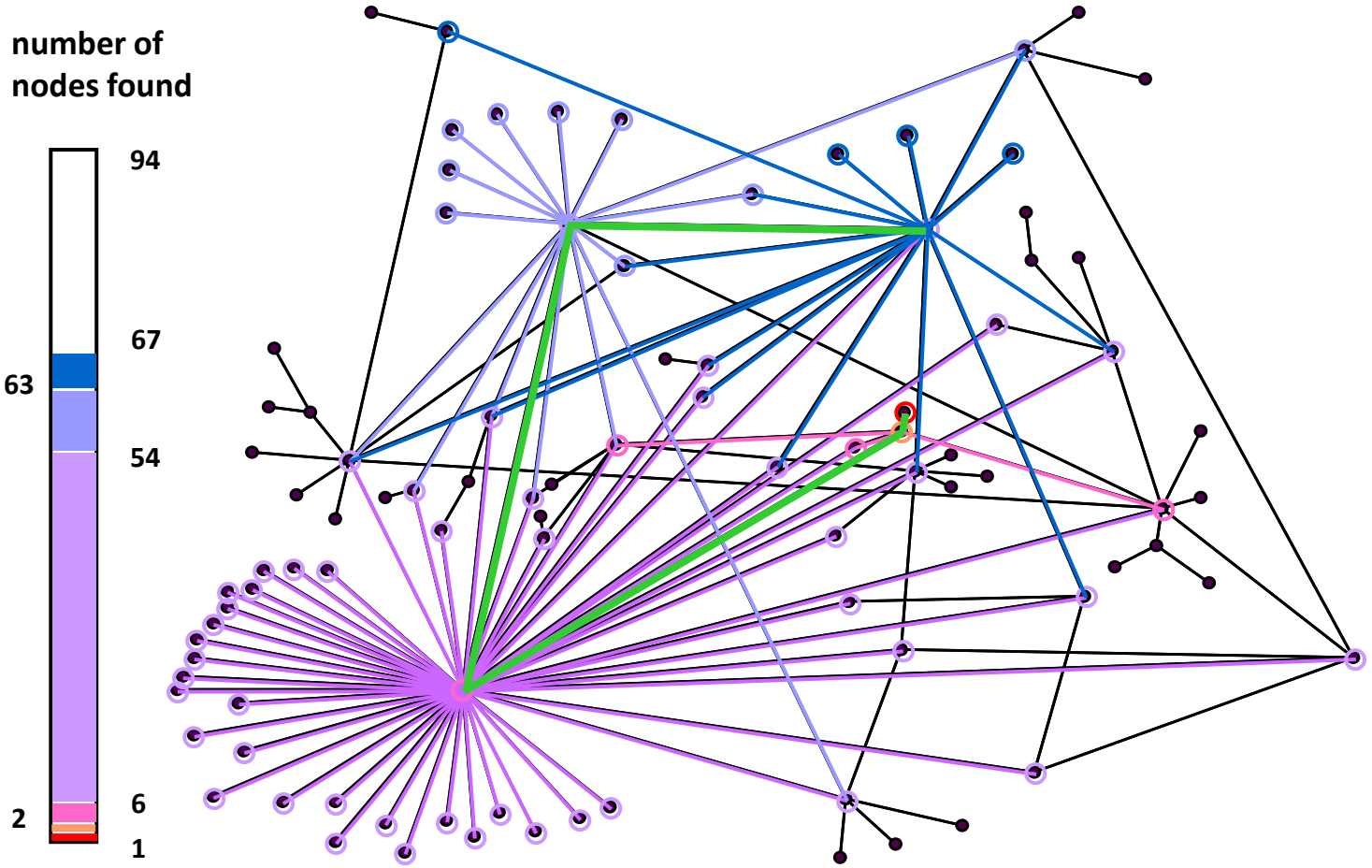
Mary

Who could introduce me to Richard Gere?

Bob

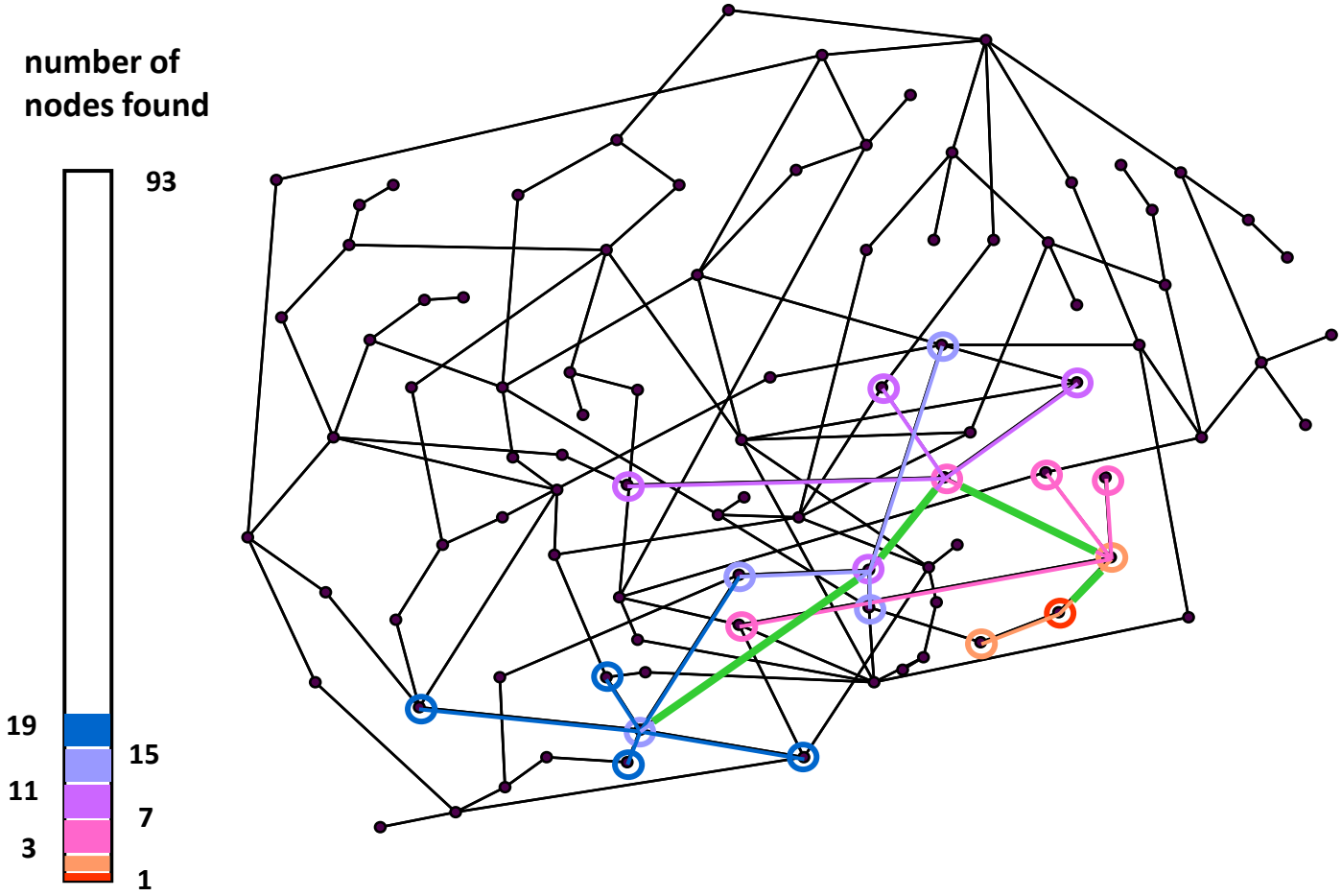
Jane

power-law graph



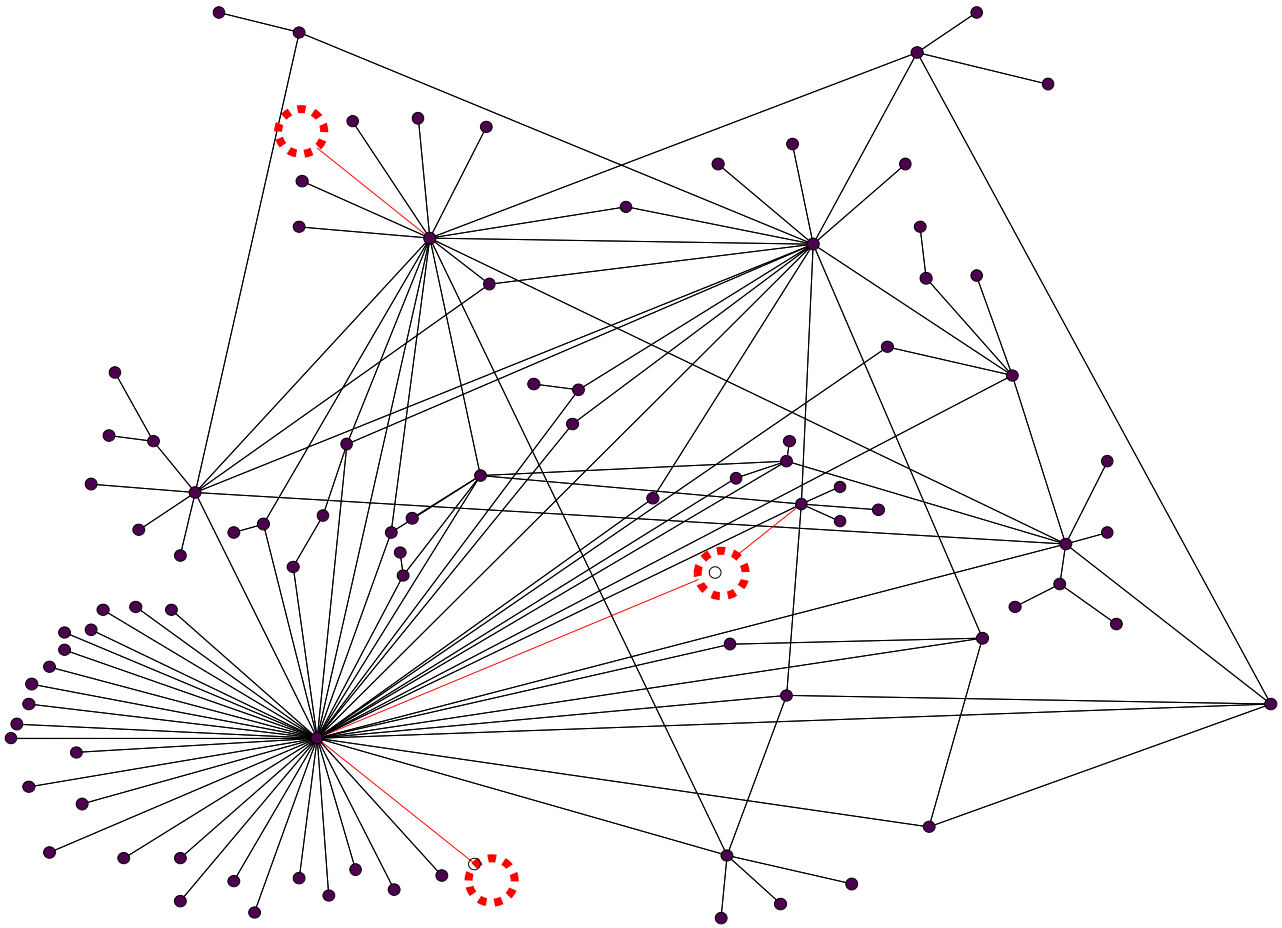
Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

Poisson graph



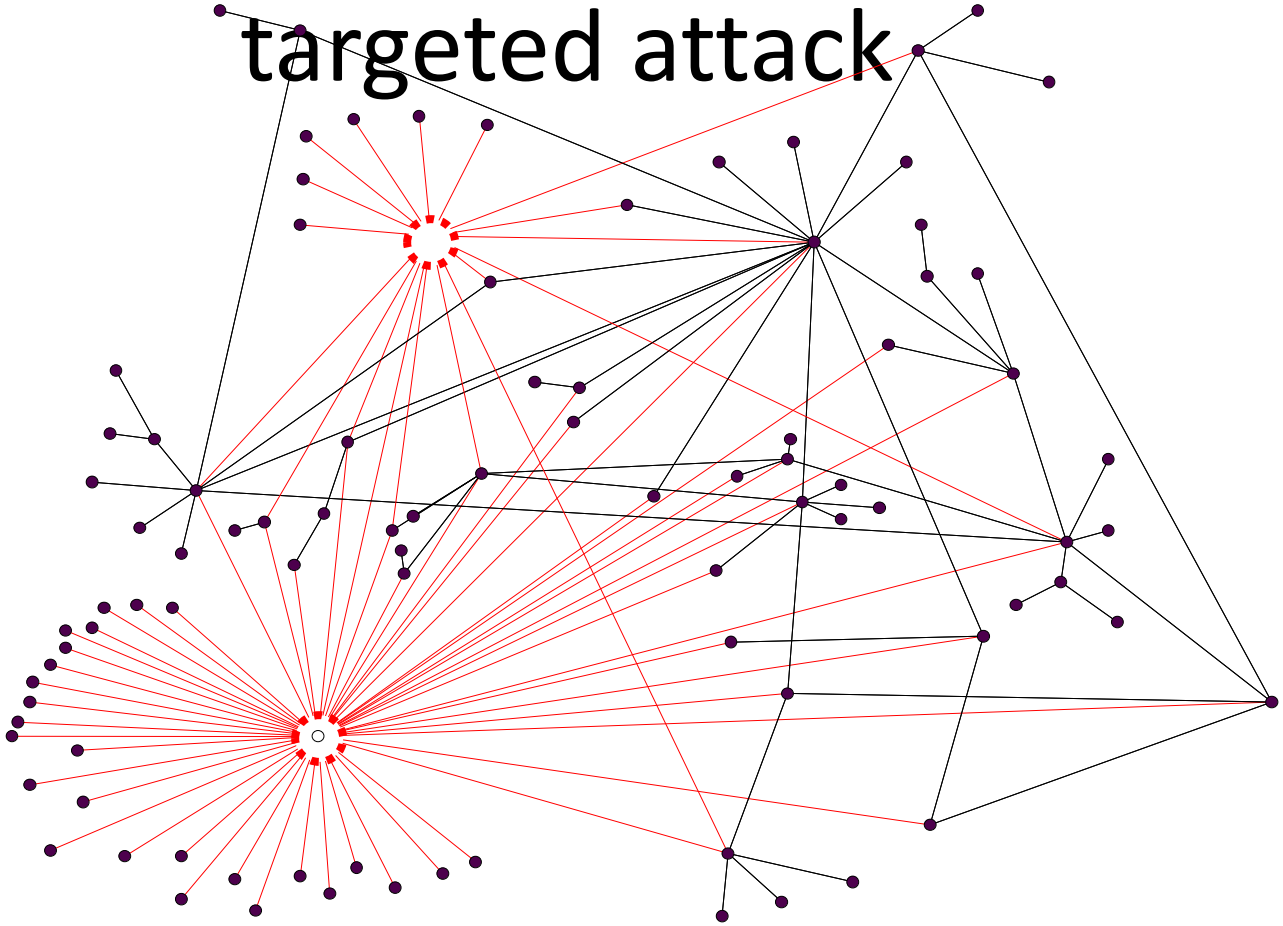
Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

Power-law networks are robust to random breakdown



Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

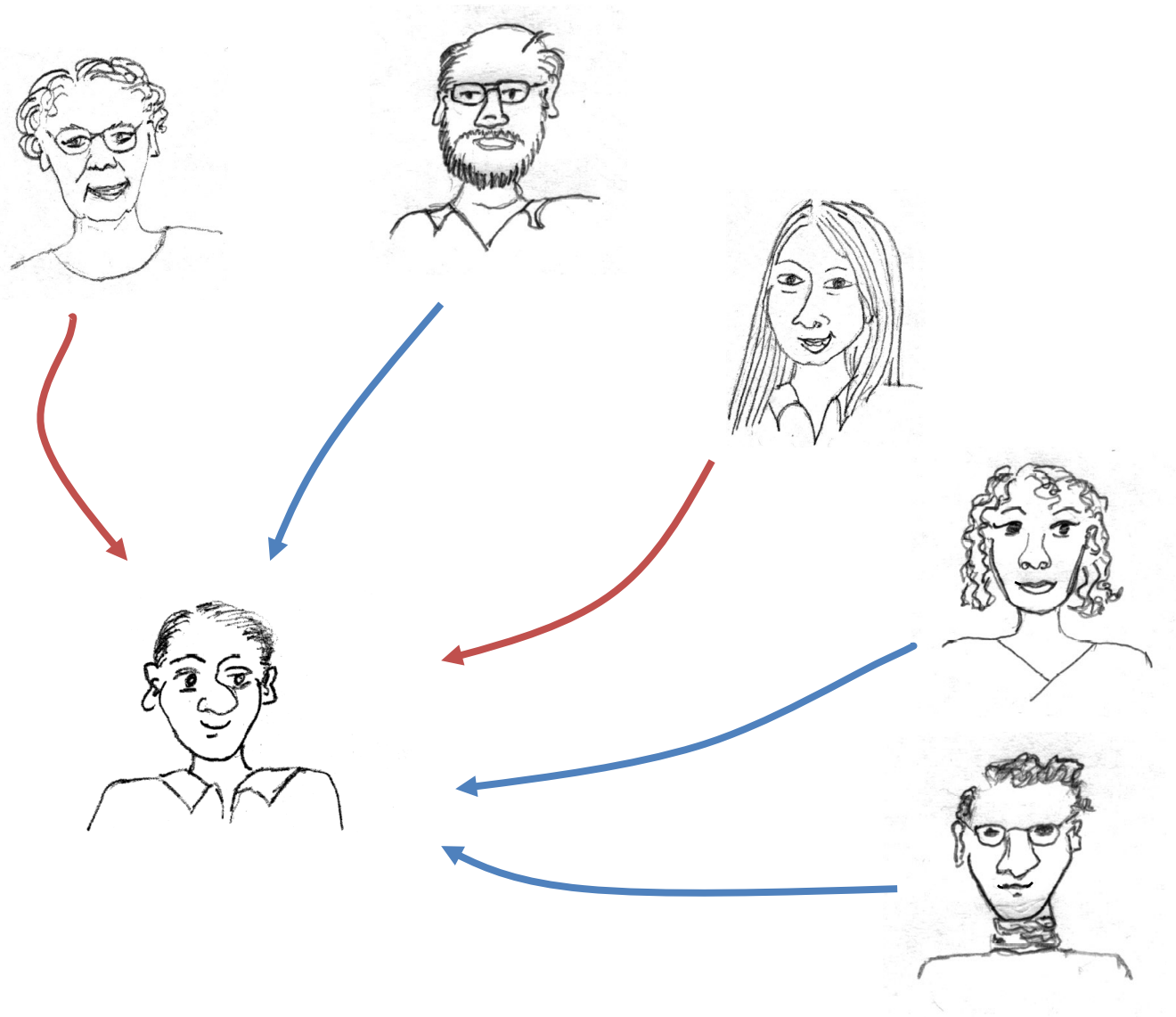
But are especially vulnerable to targeted attack



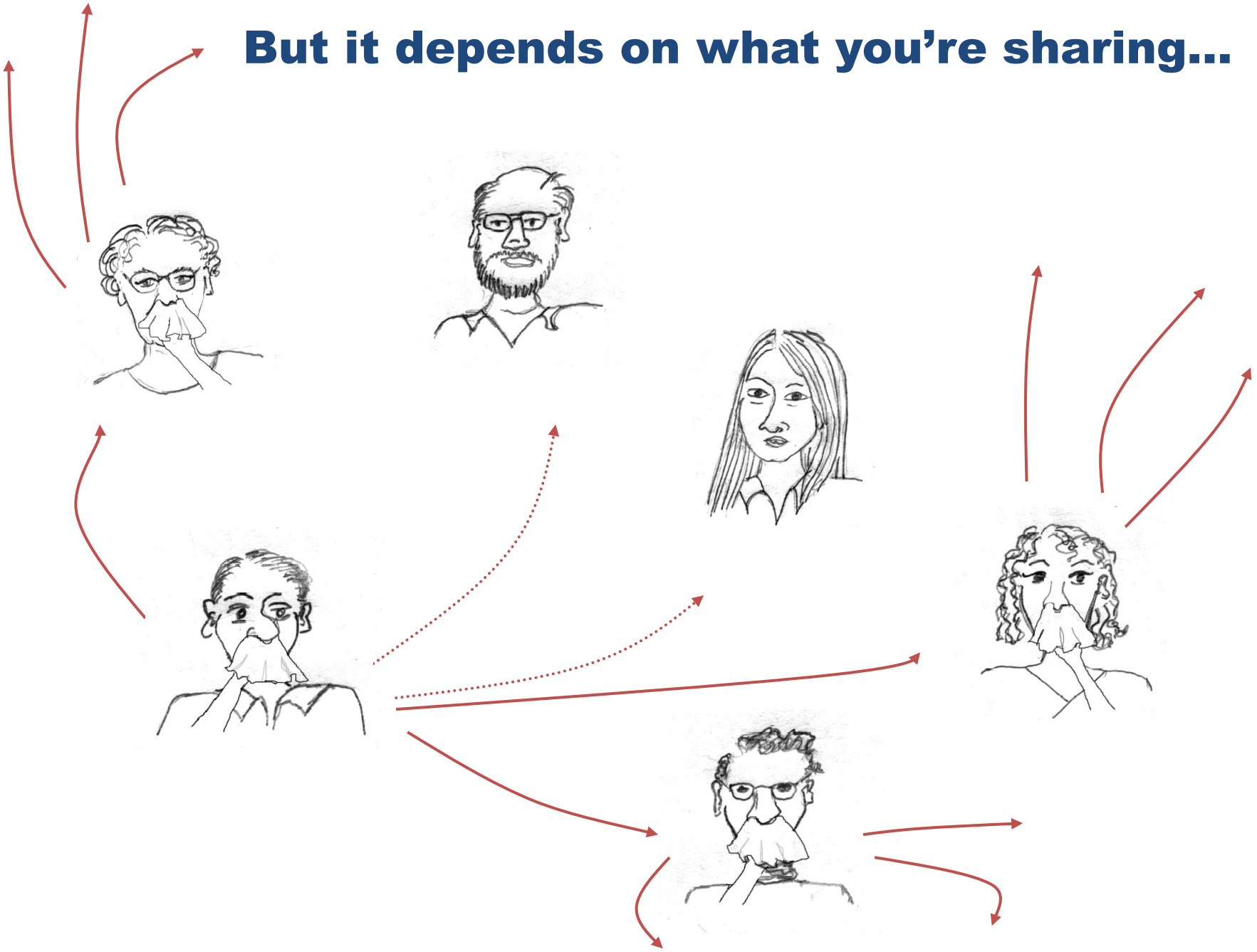
- Targeting and removing hubs can quickly break up the network

Source: https://open.umich.edu/education/si/si508-fall2008/sessions-1/week01

In social networks, it's nice to be a hub



But it depends on what you're sharing...

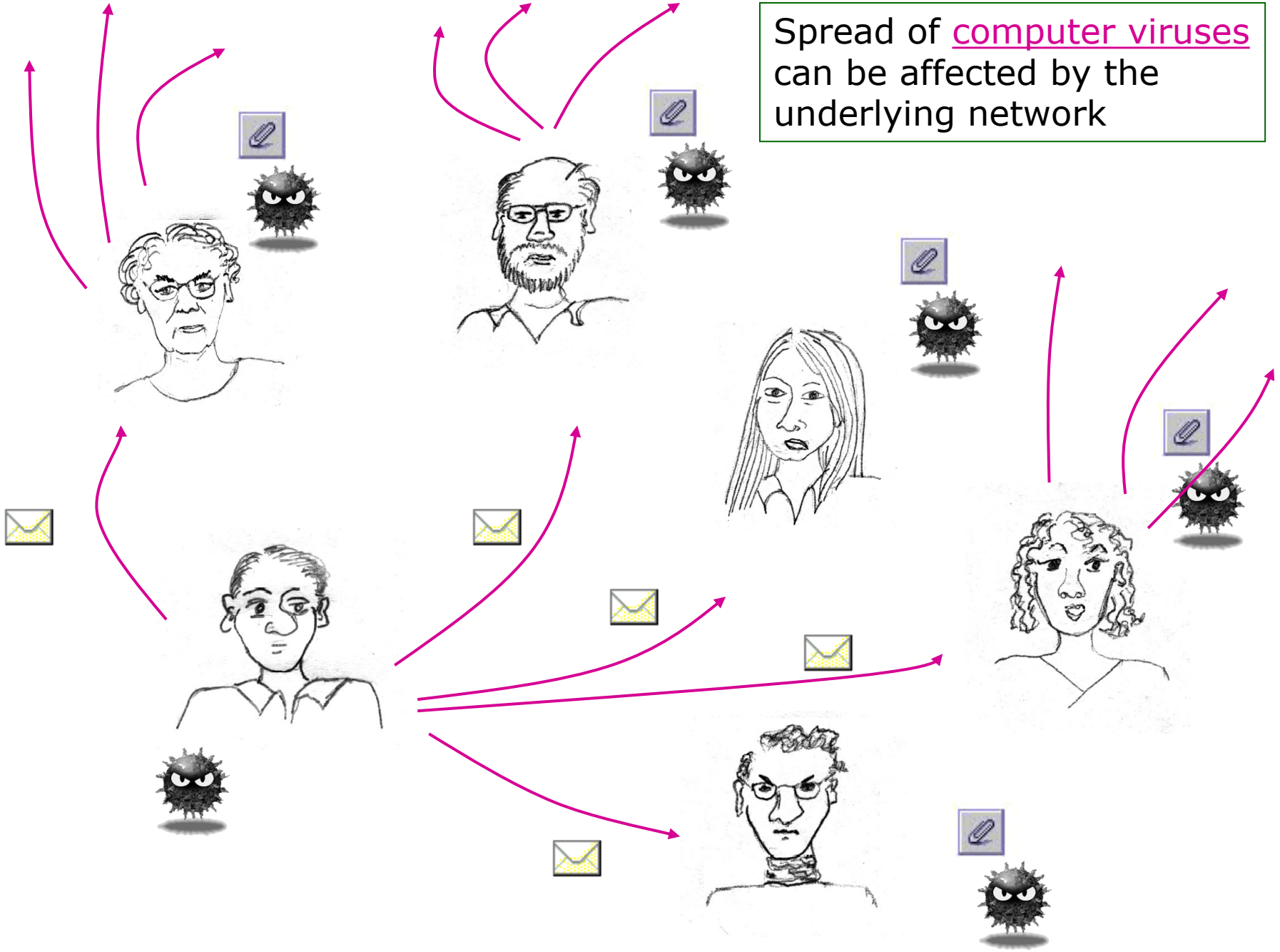


The role of hubs in epidemics

- In a power-law network, a virus can persist no matter how low its infectiousness

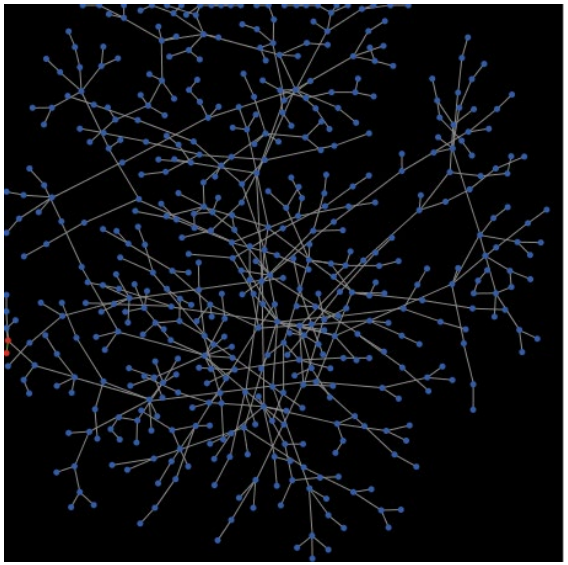
- Many real world networks do exhibit power-laws:
  - needle sharing
  - sexual contacts
  - email networks

Spread of computer viruses can be affected by the underlying network

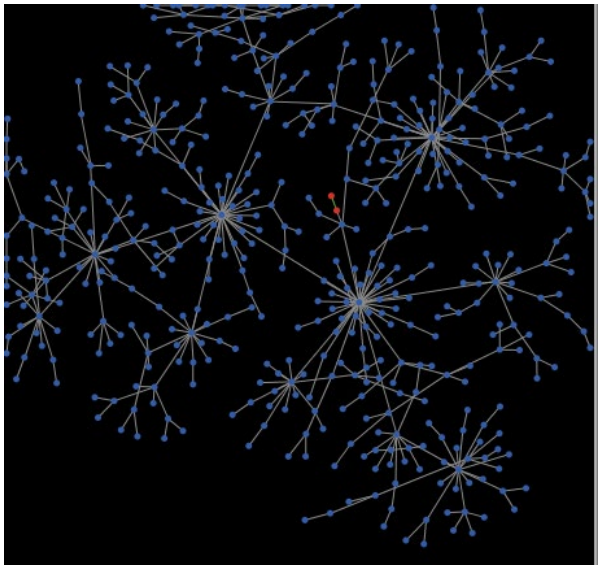


SI models & network structure

- Will random or preferential attachment lead to faster diffusion?



random growth

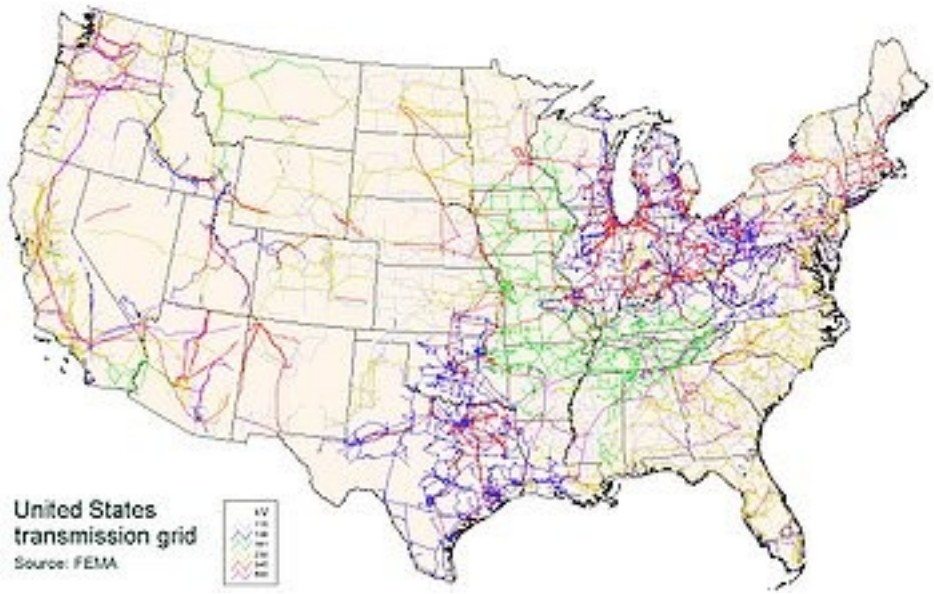


preferential growth

http://projects.si.umich.edu/netlearn/NetLogo4/BADiffusion.html

resilience:
power grids and cascading failures

- Vast system of electricity generati
  essentially
  a single network
- Power flows through
  all paths from source to sink
  (flow calculations are
  important for other networks,
  even social ones)
- All AC lines within an
  interconnect must be in sync



- If frequency varies too much (as line approaches capacity), a circuit breaker takes the generator out of the system
- Larger flows are sent to neighboring parts of the grid – triggering a cascading failure

Source: .wikipedia.org/wiki/File:UnitedStatesPowerGrid.jpg

Cascading failures

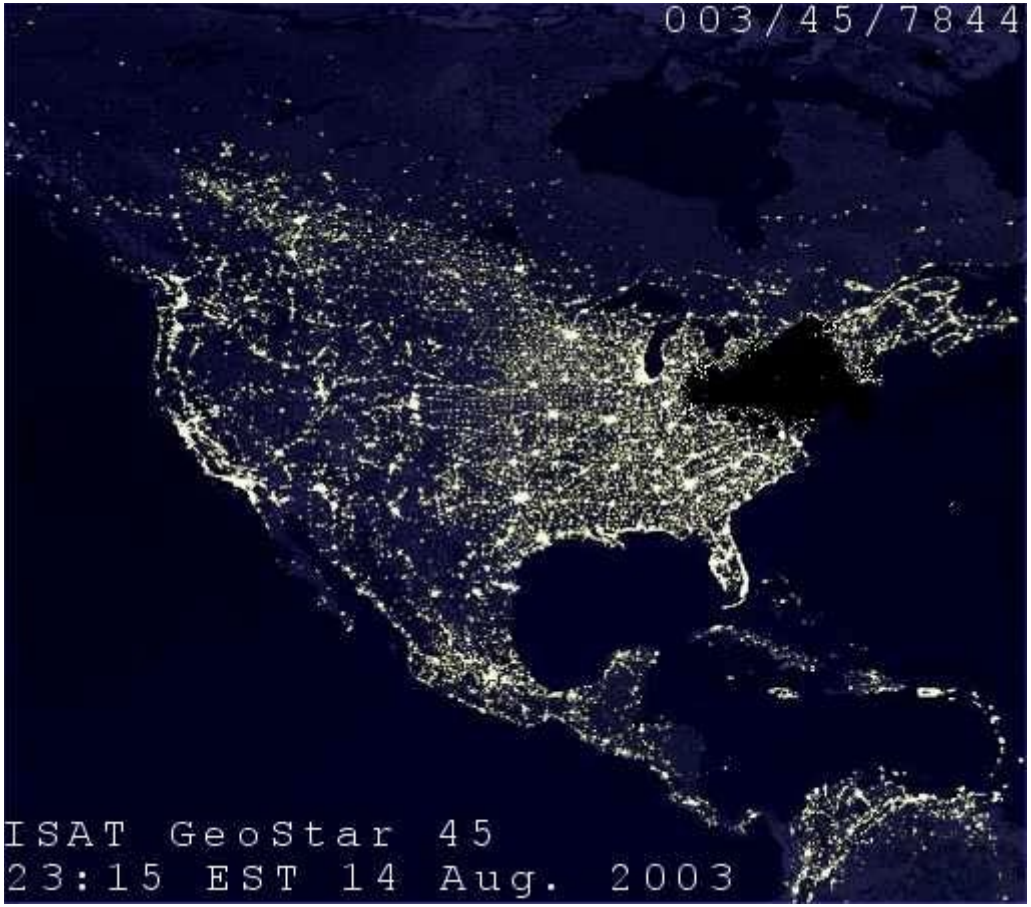
- **1:58 p.m.** The Eastlake, Ohio, First Energy generating plant shuts down (maintenance problems).
- **3:06 p.m.** A First Energy 345-kV transmission line fails south of Cleveland, Ohio.
- **3:17 p.m**. Voltage dips temporarily on the Ohio portion of the grid. Controllers take no action, but power shifted by the first failure onto another power line causes it to sag into a tree at 3:32 p.m., bringing it offline as well. While Mid West ISO and First Energy controllers try to understand the failures, they fail to inform system controllers in nearby states.
- **3:41 and 3:46 p.m.** Two breakers connecting First Energy's grid with American Electric Power are tripped.
- **4:05 p.m.** A sustained power surge on some Ohio lines signals more trouble building.
- **4:09:02 p.m.** Voltage sags deeply as Ohio draws 2 GW of power from Michigan.
- **4:10:34 p.m.** Many transmission lines trip out, first in Michigan and then in Ohio, blocking the eastward flow of power. Generators go down, creating a huge power deficit. In seconds, power surges out of the East, tripping East coast generators to protect them.

Source: Eric J. Lerner, "What's wrong with the electric grid?" http://www.aip.org/tip/INPHFA/vol-9/iss-5/p8.html

(dis) information cascades

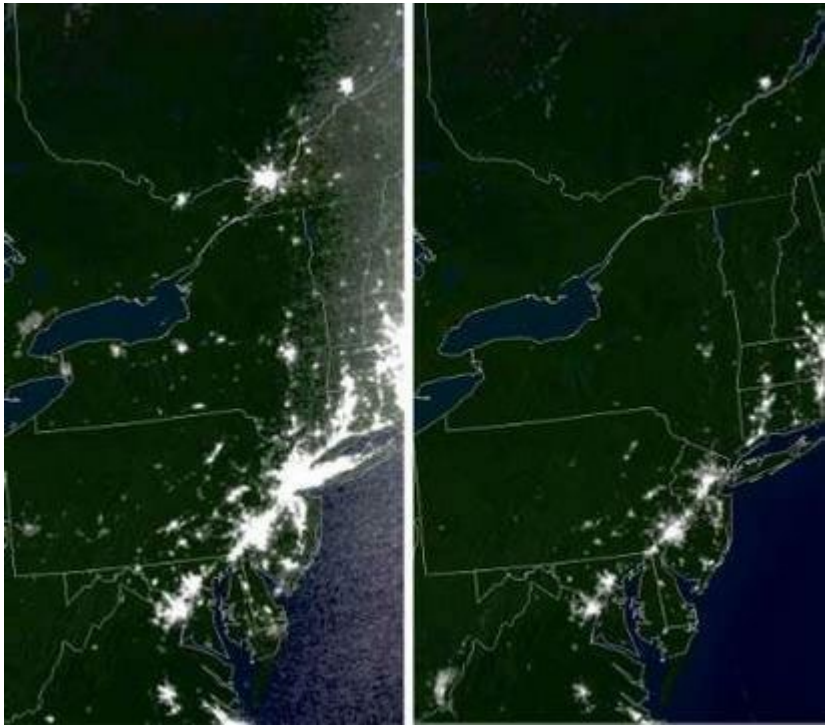
- Rumor spreading
- Urban legends
- Word of mouth (movies, products)

- Web is self-correcting:
  - Satellite image hoax is first passed around, then exposed, hoax fact is blogged about, then written up on urbanlegends.about.com



Source: undetermined

Actual satellite images of the effect of the blackout



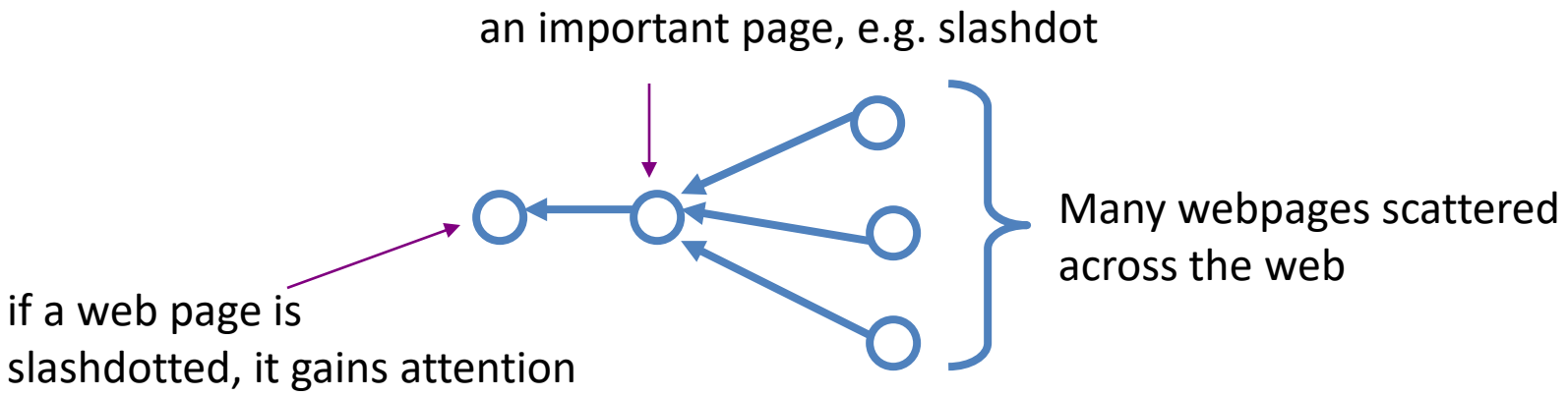
20 hours prior to blackout

7 hours after blackout

Source: NOAA, U.S. Government

IR applications: online info retrieval

- It's in the links:
  - links to URLs can be interpreted as endorsements or recommendations
  - the more links a URL receives, the more likely it is to be a good/entertaining/provocative/authoritative/interesting information source
  - but not all link sources are created equal
    - a link from a respected information source
    - a link from a page created by a spammer



Four Struggles

- The Four Struggles are:
  - Human vs Wild (Survival)
  - Human vs Human (Geopolitics)
  - Past vs Future (Change)
  - Rich vs Poor (Justice)

Human vs Wild

- Tribes – Lions and Tigers and Bears
- Institutions – Health, Sanitation
- Markets – Natural Disasters and Disease
- Networks – Environment and Ecology

Human vs Human

- Tribe: Tribal Warfare
- Institution: clash of religions, clash of peoples, nationalism
- Markets: economic system, trading blocks, politics and elections
- Networks: information warfare, propaganda, marketing

Past vs Future

- Tribal: settled agricultural (cities and towns) vs hunters and gatherers (nomads, barbarians)
- Institutions: nations vs city-states and tribes
- Markets: market economics, democracy, rights vs. Controlled and planned economies
- Networks: activism, NGOs, networks vs. established structures

Rich vs Poor

- Tribe: tribal leader & medicine man
- Institutions: papal authority, divine right of kind, entrenched nobility
- Markets: industrial leaders and capitalists, political leaders, rock stars
- Privileged networks, cartels, WTO, supply chains

Shifting Loyalties

- People in one battle will take sides in another battle to entrench their position
- Eg, nobility preserved power by siding with merchants and industrialists vs the poor
- Eg. Political leaders and industrialists preserve power by siding with environment against humans

Outsourcing

- In the future – will be a network phenomenon
- Will therefore not be managed by “industrial leaders and capitalists, political leaders, rock stars” but rather will be, as they say, ‘bottom up’
- Projects like Kiva more typical than call centres
- Greater need to build network capacity than to attract influential partners

- Stephen Downes
- http://www.downes.ca