

HOW THE NETWORK WINS....

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Agenda

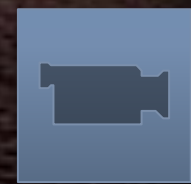


- networks
- not chains
- the network challenge





PROJECT X

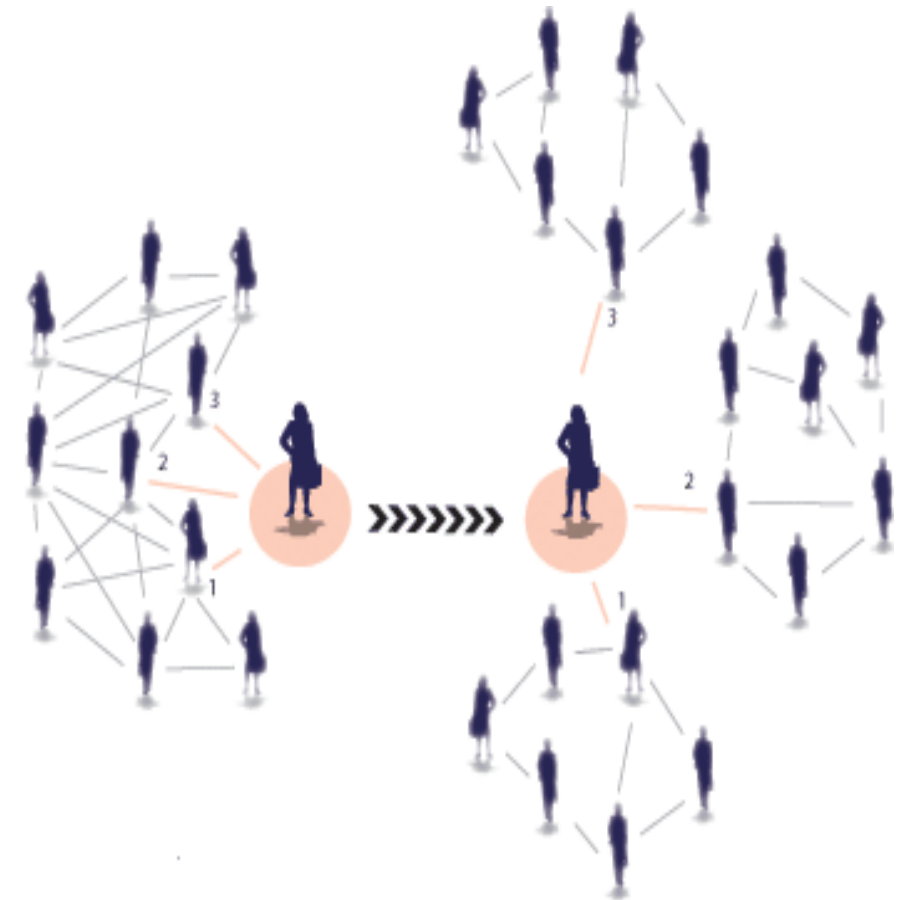




Core concepts



- A network consists of **actors** (or **nodes** or **vertices**); e.g.
 - People
 - Companies
- and **relationships** (or **links** or **ties** or **edges**); e.g.:
 - Colleagues
 - Friends
 - Buyers / sellers
 - Strategic partners
- **Actors and relationships** together form the **network structure**

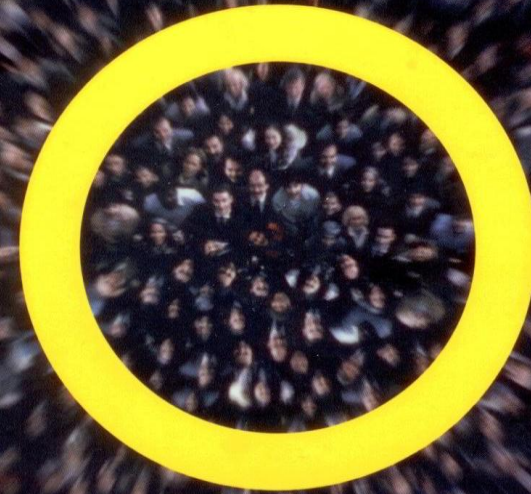


Your social network



- school
- club
- LinkedIn
- Facebook
- Twitter
- Flickr, Jabber, ...

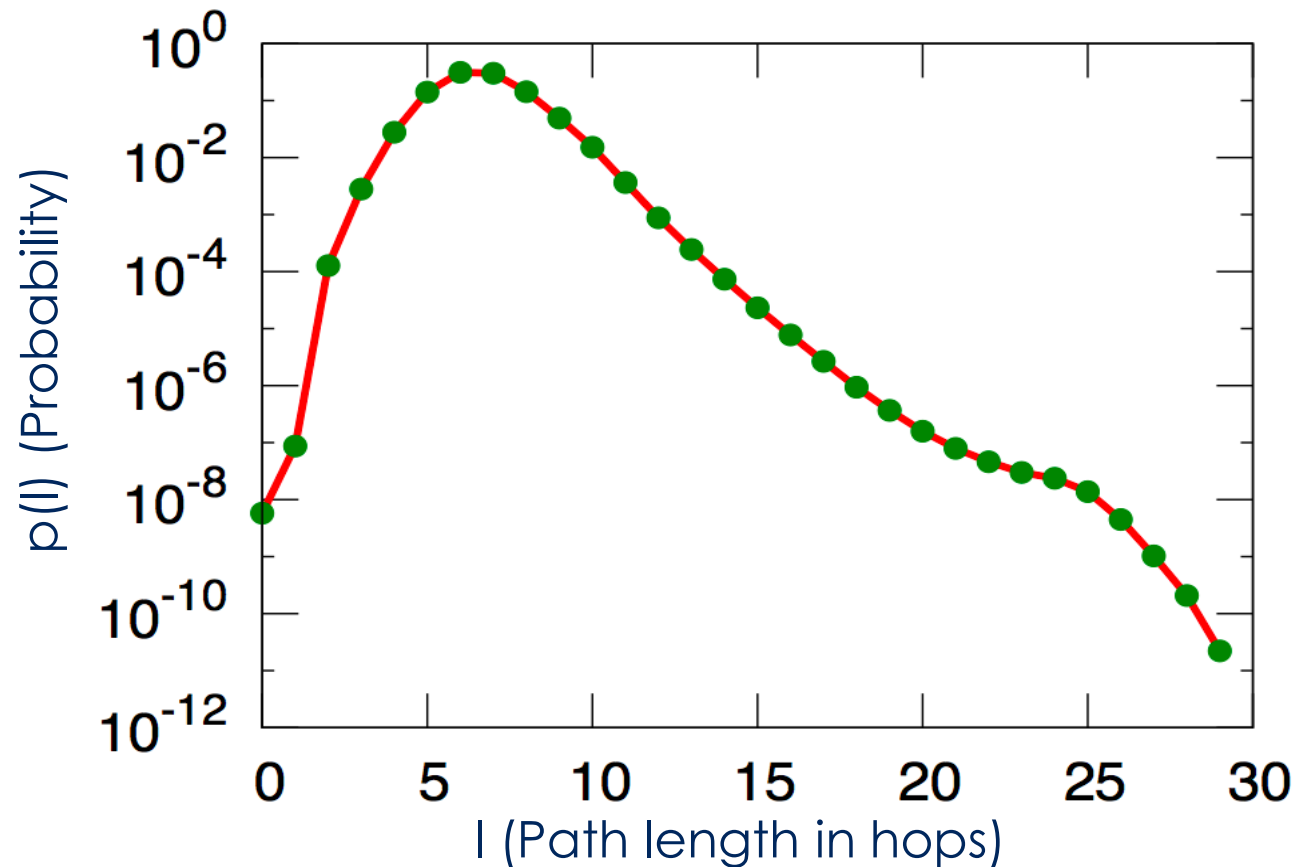
SIX DEGREES



THE SCIENCE OF
A CONNECTED AGE

Jure Leskowitz, Eric Horvitz (2008)

average path length of 240 million active user accounts on Microsoft Instant Messenger is 6.6



a link between two users of IM is defined as
“a two-way conversation at any point in time
during a month-long observation period”

Network analysis



The Hidden Pattern Behind
Everything We Do



Albert-László Barabási
Author of *LINKED*

- path / path length
- strong and weak ties
- density
- degree distribution
- clustering/
betweenness
- homophily/ affiliation
- structural balance
- traffic

Barabási (in: Linked, 2003)

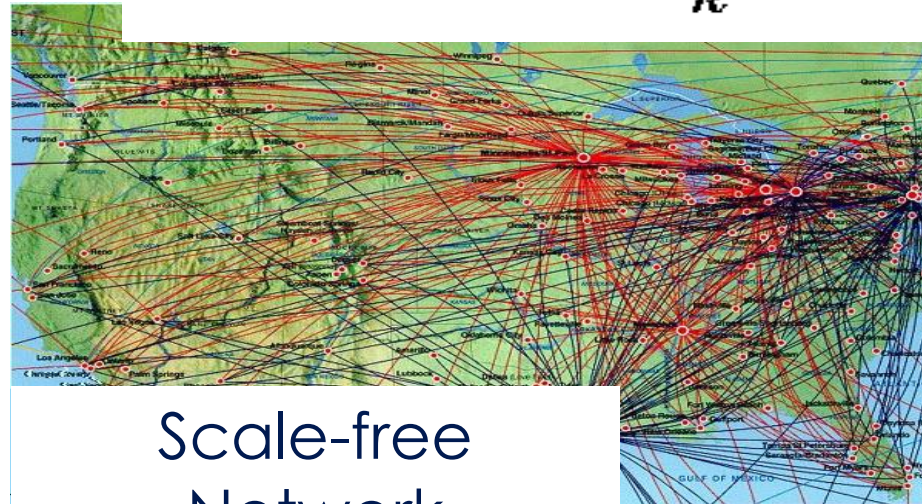
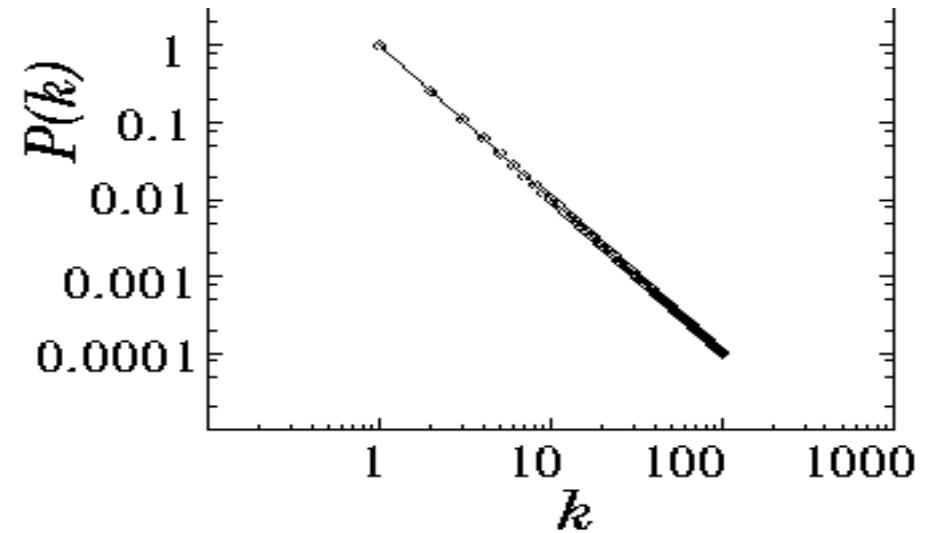


Internet is **scale-free**:

$$P(k) \approx k^\alpha$$

through **growth**
and **preferential attachment**

Power-law distribution



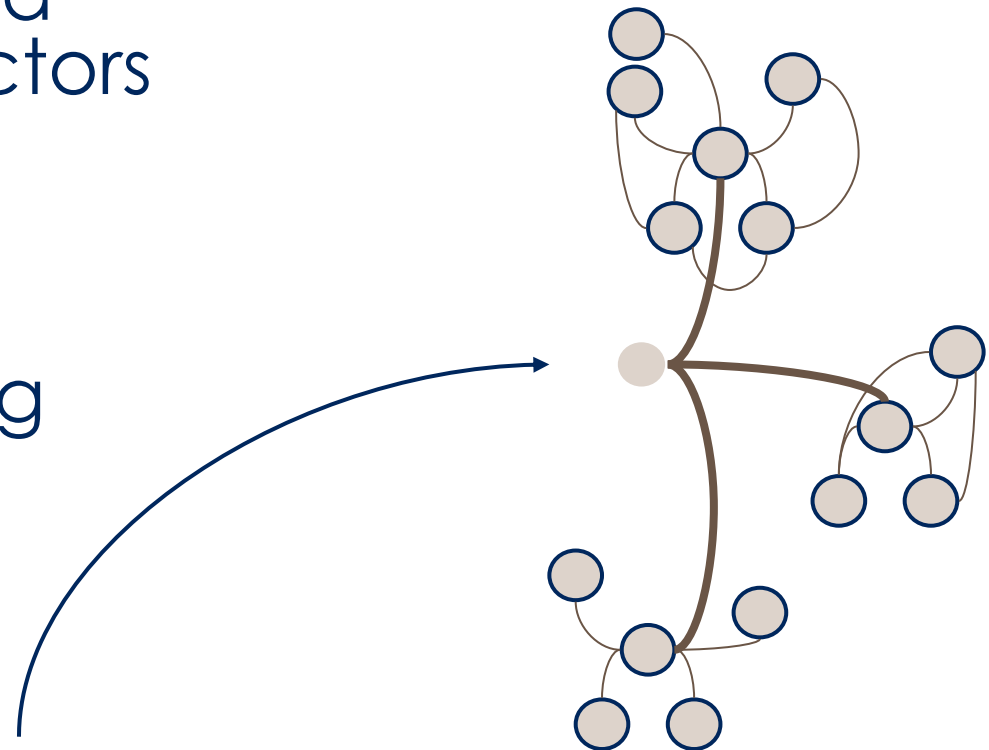
Scale-free
Network



Network structure and position

Does network position determine actor performance?

- Bridging positions in a network connect actors that do not have a direct tie
- Benefits of a bridging position:
 - **Control**
 - **Information**

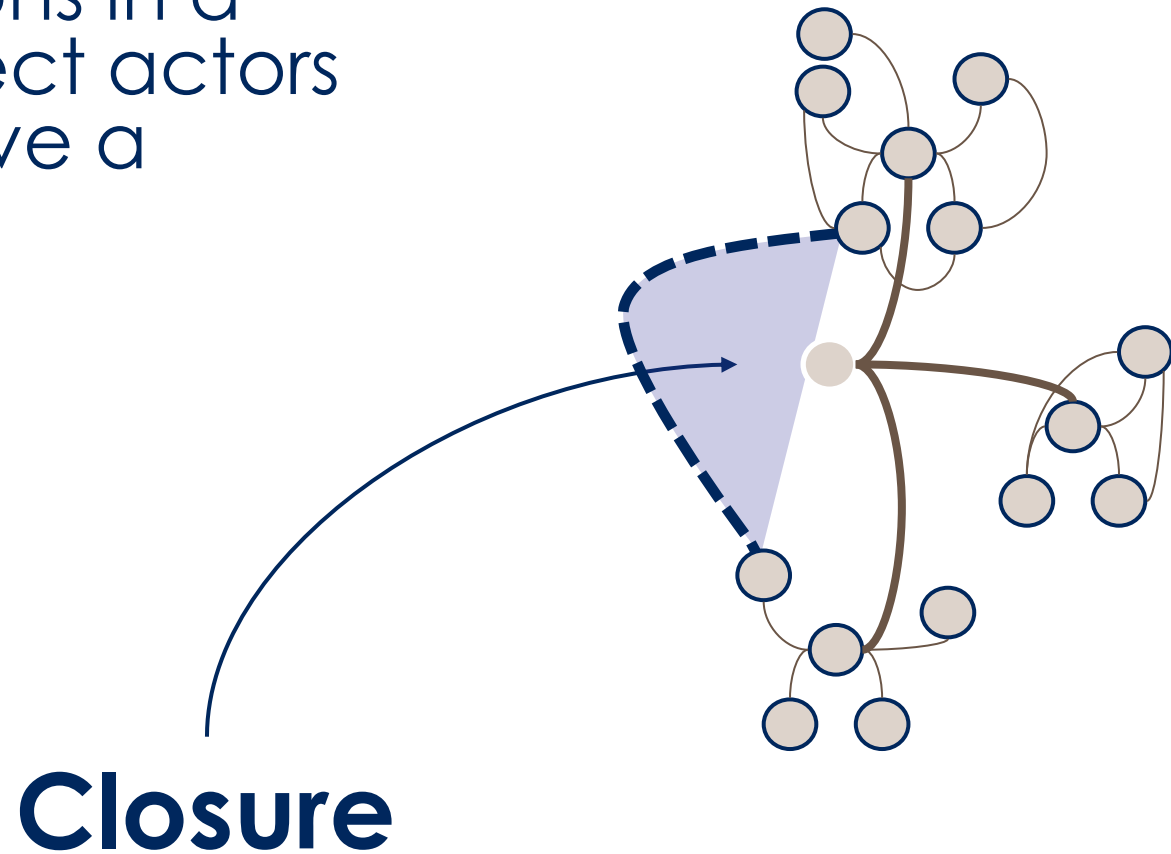


Bridging position
(in-between the structural hole)

Dynamics of networks



- Bridging positions in a network connect actors that do not have a direct tie



Mapping and horizon



senseable city lab:::



The real-time city is now real! The increasing deployment of sensors and hand-held electronics in recent years is allowing a new approach to the study of the built environment. The way we describe and understand cities is being radically transformed - alongside the tools we use to design them and impact on their physical structure.

Studying these changes from a critical point of view and anticipating them is the goal of the SENSEable City Laboratory, a new research initiative at the Massachusetts Institute of Technology.

projects

/2010 Urban Internet of Things Workshop	/2010 Seaswarm	/2010 LIVE Singapore!	/2010 Network & Society	/2010 Urban Revolutions	/2010 Future ENEL	/2010 Flyfire	/2009 the CLOUD	/2009 Affective Intelligent Driving Agent	/2009 Engaging Data Forum	/2009 The Copenhagen Wheel	/2009 Trash Track	/2009 NSA Domesticity Workshop	/2009 PiNK!

contacts

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F++ 1-617-258-8081
W senseable.mit.edu



papers

Calabrese F., Kloeckl K., Ratti C., 2007, "Wikicity: Real-Time Urban Environments", IEEE Pervasive Computing, special issue on Urban Computing >> [more](#)

news

SENSEable city lab is chairing workshops at UCMedia 2010

"NYC Waterfalls," New York Times, 8 June 2009

"Emotional Connections," (New York Talk Exchange featured in Newsweek) 10 March 2008 >> [more](#)

research opportunities

SENSEable City Lab has funded positions for PhD, Master students, and post-doctoral fellowships. We also host visiting scholars and PhD students >> [more](#)

people

Researchers: Carlo Ratti (Director), Assaf Biderman (Associate Director), Clio Andris, German W Aparicio Jr., Rex Britter, Francesco Calabrese, Xiaojie Chen, Camaven Chiu, Alyx Daly, Jennifer Dunnam, Luigi Farrauto, Filippo dal Fiore, Robert Johnson, E Roon Kang, Kristian Kloeckl, Aaron Koblin, David Lee, Eugene Lee, Giusy Di Lorenzo, Mauro Martino, Vincenzo Manzoni, Stephen Miles, Mahsan Mohsenin, Sey Min, Nashid Nabian, Walter Nicolino, Dietmar Offenhuber, Christine Outram, Francisco Camara Pereira, Santi Phithakkitnukoon, Adam Pruden, Francisca Rojas, Basant Sagar, Christian Somner, Angela Wang, Malima Wolf

visual explorations of urban mobility
part of the LIVE Singapore initiative

SPRING SPREE
spending patterns in spain during easter 2011

The problem with supply chains

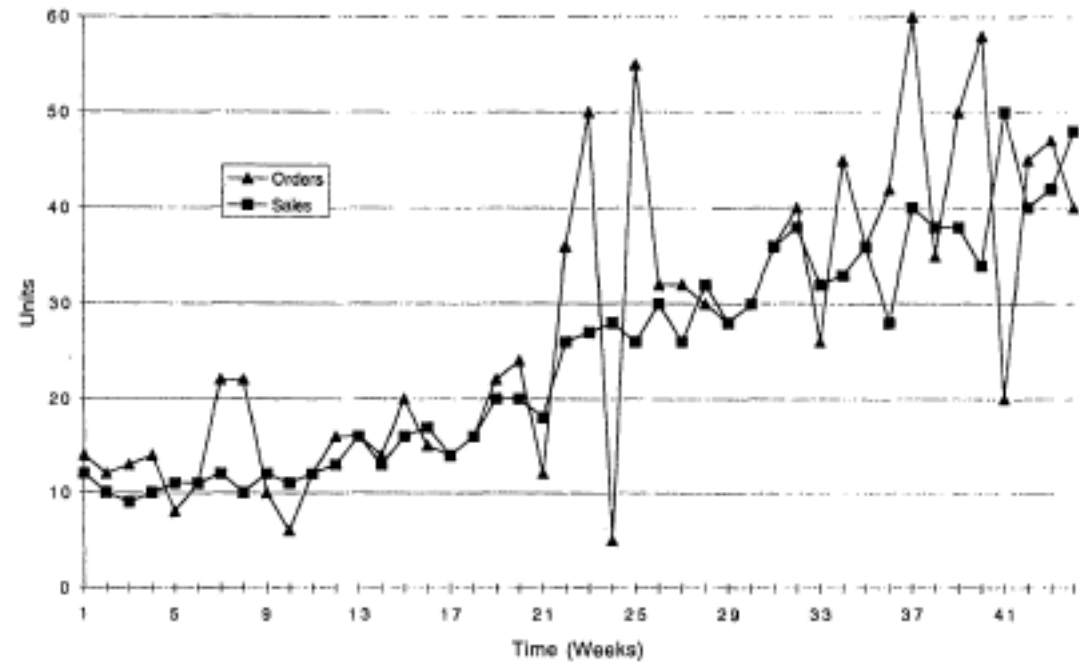


Propagation in supply chains



Information Distortion in a Supply Chain: The Bullwhip Effect

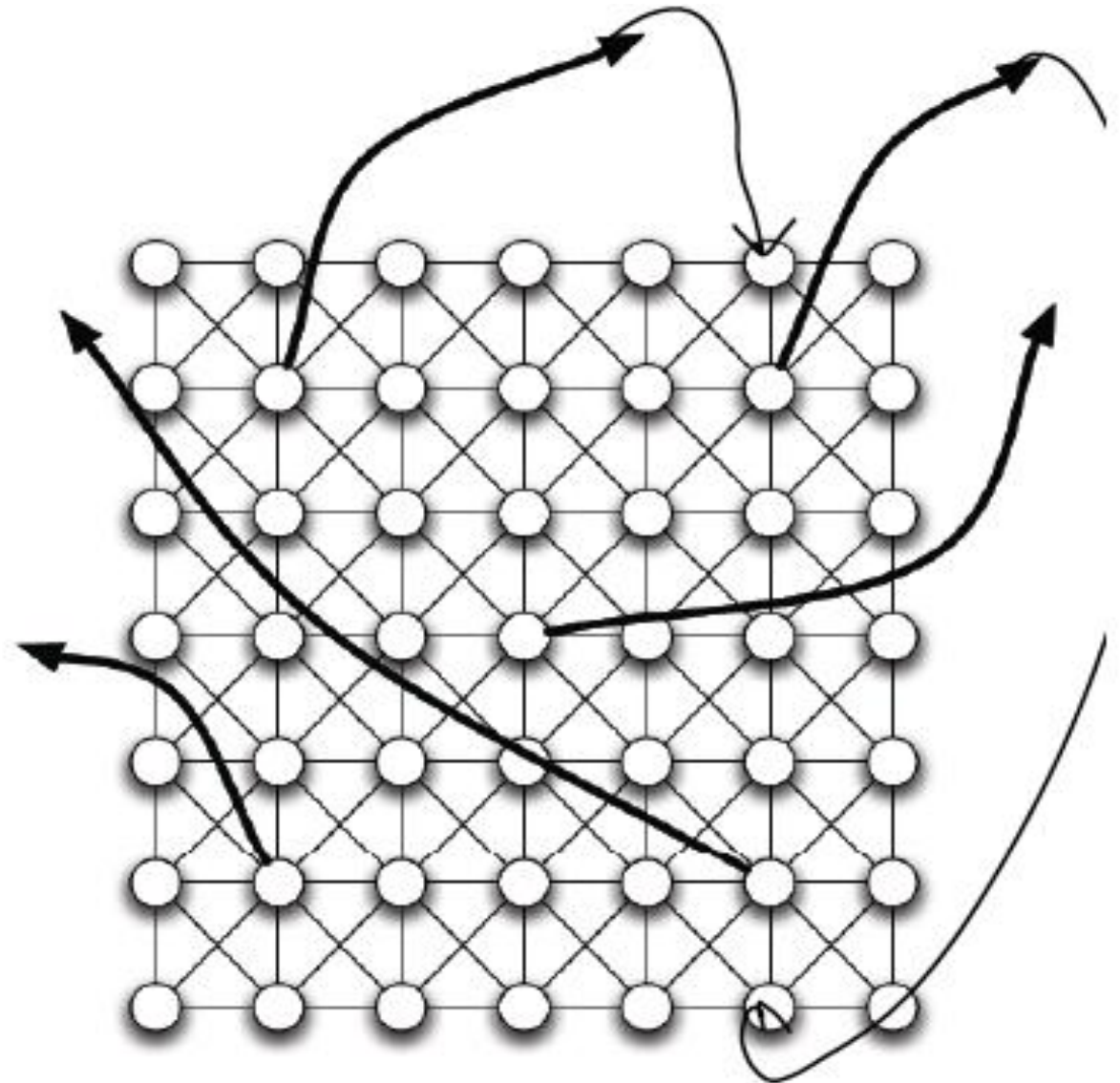
Hau L. Lee • V. Padmanabhan • Seungjin Whang



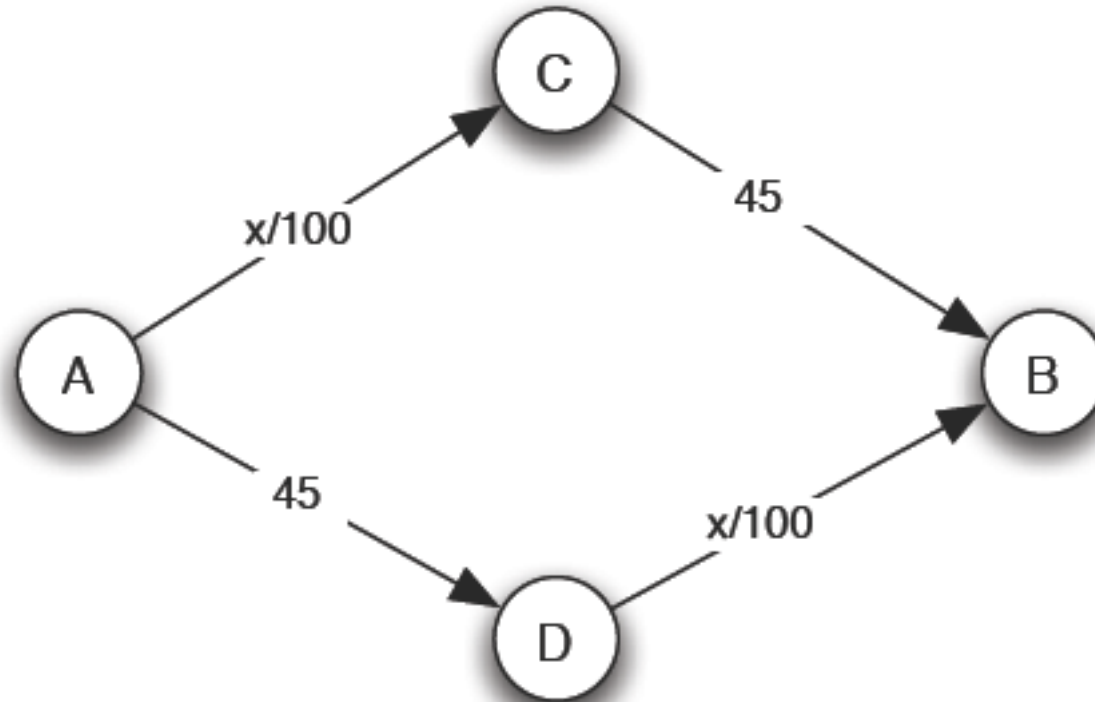
Propagation in business networks



- multiple pathways
- alternative routing
- load balancing



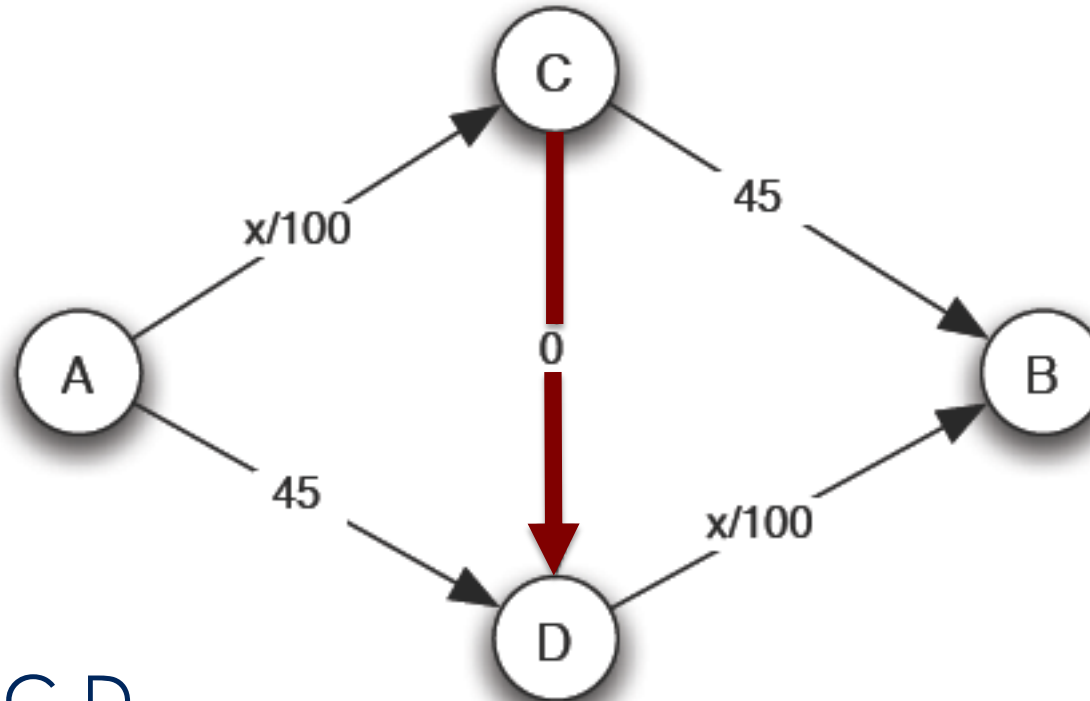
Braess's paradox



example:

- x = number of cars
- time to travel from A to B = $x/100+45$
- assume 4000 cars: travel time in equilibrium = **65** minutes

Braess's paradox



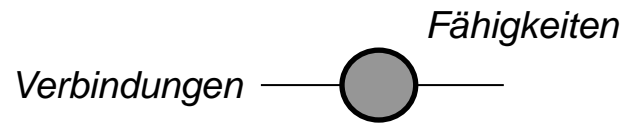
- new link C-D
- new Nash equilibrium = **80** minutes
- dominating strategy at A is to go to C
[$x/4000$] = 40 minutes [A→D = 40]

The business challenge

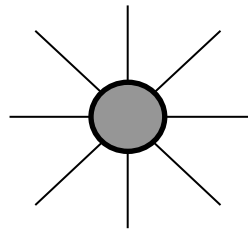


Innerhalb eines Smart Business Networks sind verschiedenen Strategien möglich. Eine Brückenposition und ein weiter Geschäftshorizont bringen Positionierungsvorteile.

Netzwerk-Strategien



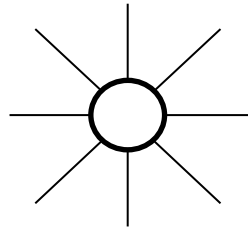
- **Plattform-Provider:**
Fähigkeiten und Verbindungen



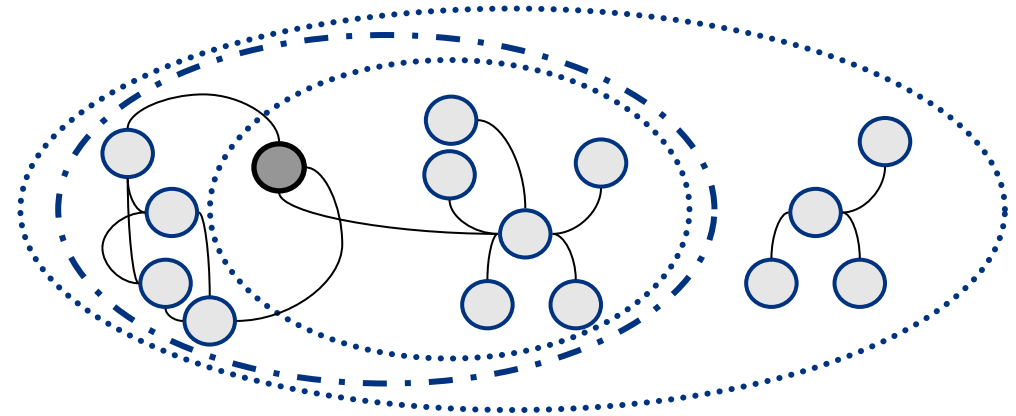
- **Capability-Hub:**
Fähigkeiten



- **Netzwerk-Orchestrierer:**
Verbindungen



Geschäftshorizont



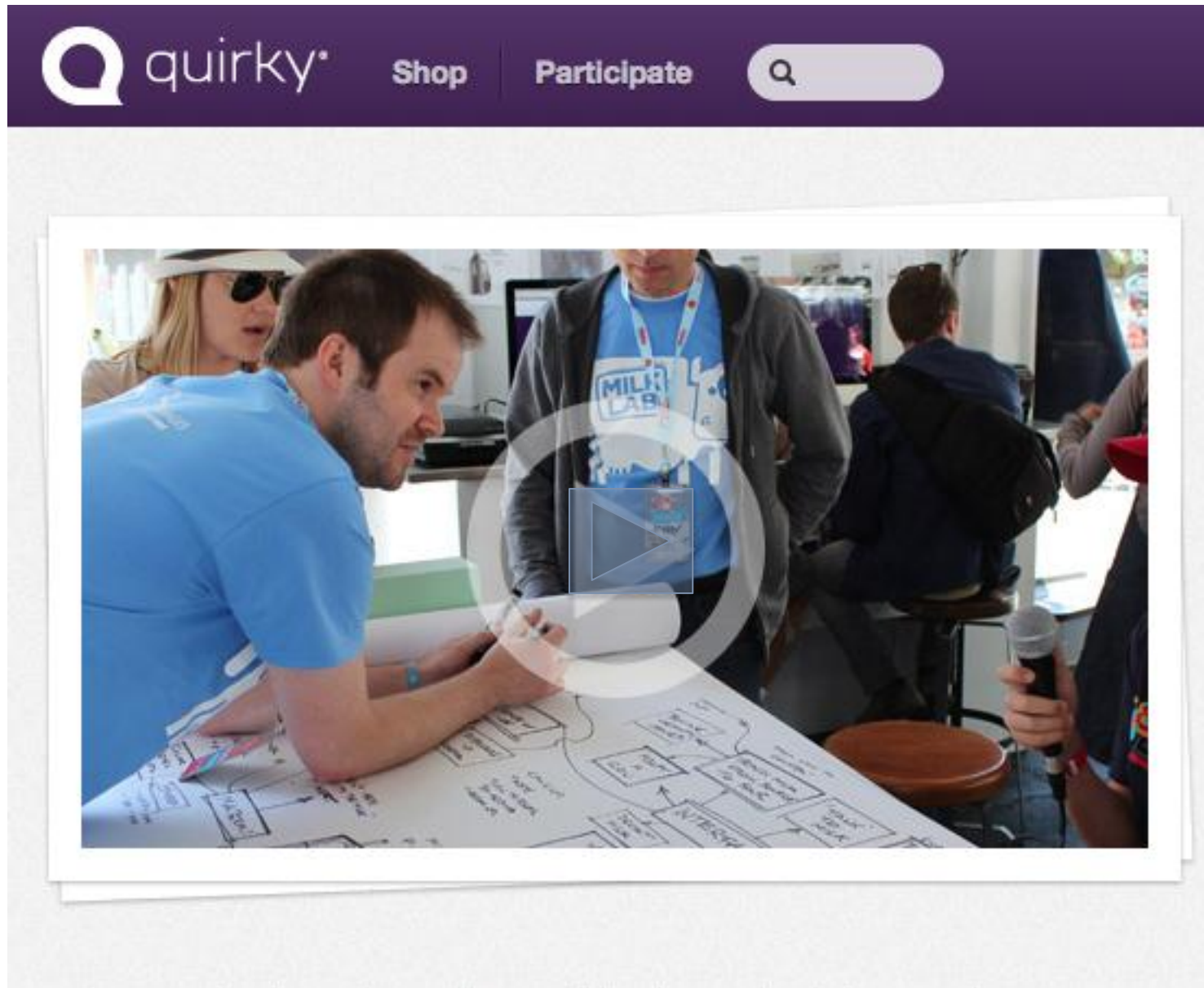
- Um eine vorteilhafte Position im Netzwerk zu erlangen oder zu behalten - um vorteilhafte Entscheidungen treffen zu können -, muss ein Unternehmen Informationen über sein Netzwerk haben
- Der **Geschäftshorizont**: Der Grad der Vollständigkeit der Informationen, die ein Unternehmen über sein geschäftliches Netzwerk hat

nach Prof. Dr. P. Vervest, Rotterdam School of Management

The real thing?



The real thing?



quirky.com – product development



Filter Upcoming Products by Category

- Kitchen
- Housewares
- Bed & Bath
- Organization
- Electronics
- Kids
- Pets
- Outdoors
- Travel
- Other

Only Show Products In Production

WE'RE MAKING THIS



Shift
Stand Out



Script
Take Note



Pickup Power
Energize Anywhere



Twisted Sifter
Flour Sifting Rolling Pin



Core
Touch Base



Loft
Elevate Your Dishes



Stow
Flip, Charge, Go



Katch
Hangs and Holds



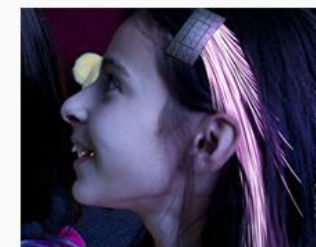
Helix
Wrap around sound



Buffer
Divert the Dirt

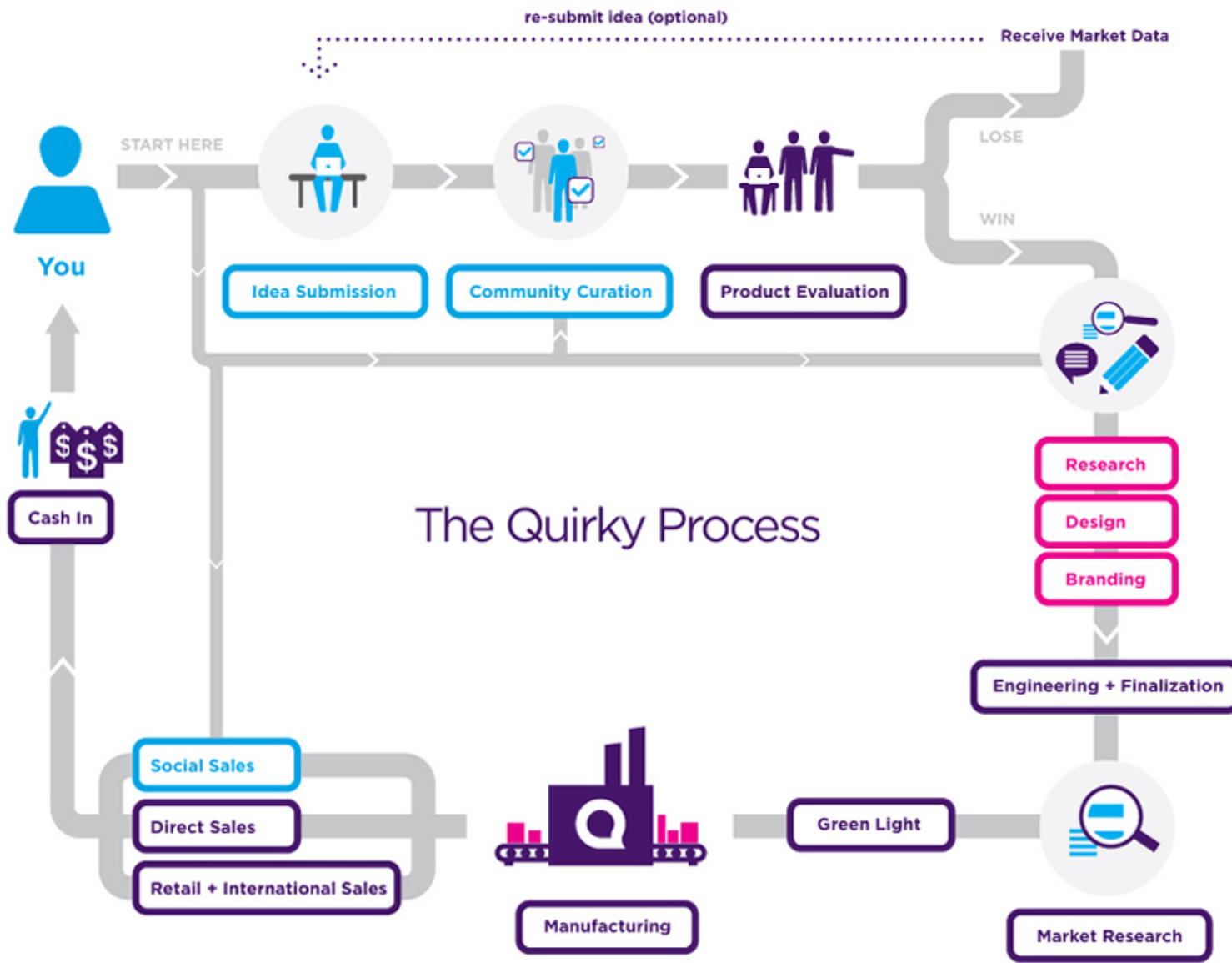


Stylus
Protection and Precision




Spectra
Go with the glow

a socially developed product?



make it at Techshop?





what do YOU want to make?

Choose your store...

UPCOMING EVENTS

San Jose, CA

Arduino Show & Tell
Sun Nov 18, 6:30PM


San Francisco, CA

College of Lockpicking Workshop
Sat Nov 24, 4PM


Menlo Park, CA

College of Lockpicking Workshop
Tue Nov 27, 7PM

Raleigh-Durham, NC



TechShop Member Stories Part 1



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stay in touch



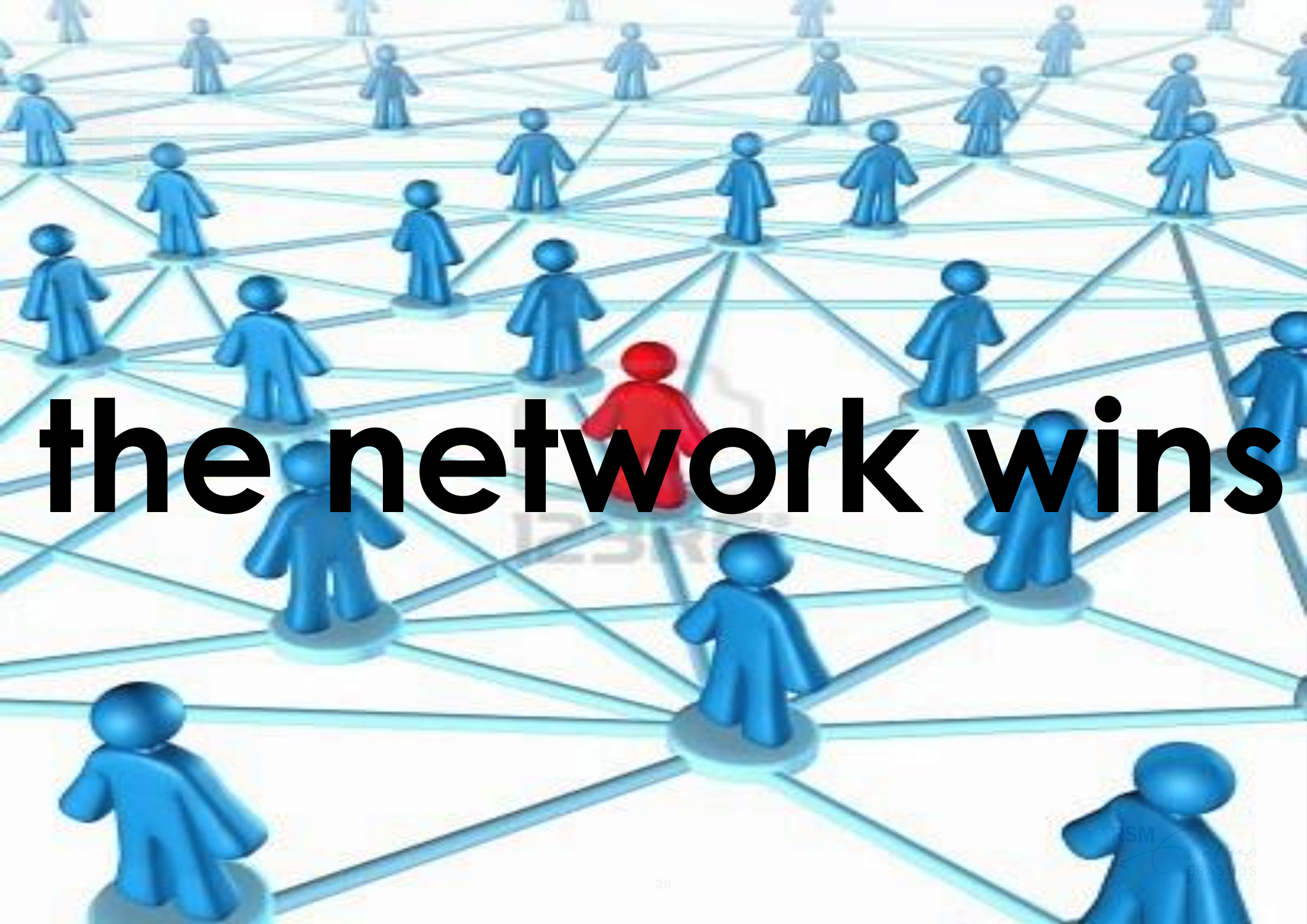
Promo Code?



TECHSHOP

San Francisco, CA





the network wins