

# Collaboration Rules

Please note that to reduce file size, some non-essential but graphics-intensive elements have been deleted

These materials are based in part on “Collaboration Rules’ by Philip Evans and Bob Wolf  
*Harvard Business Review* July-August 2005 pp 96-104. (This article can be downloaded at  
<http://custom.hbsp.com/b01/en/implicit/p.jhtml?login=EVAN082905&pid=R0507H>)

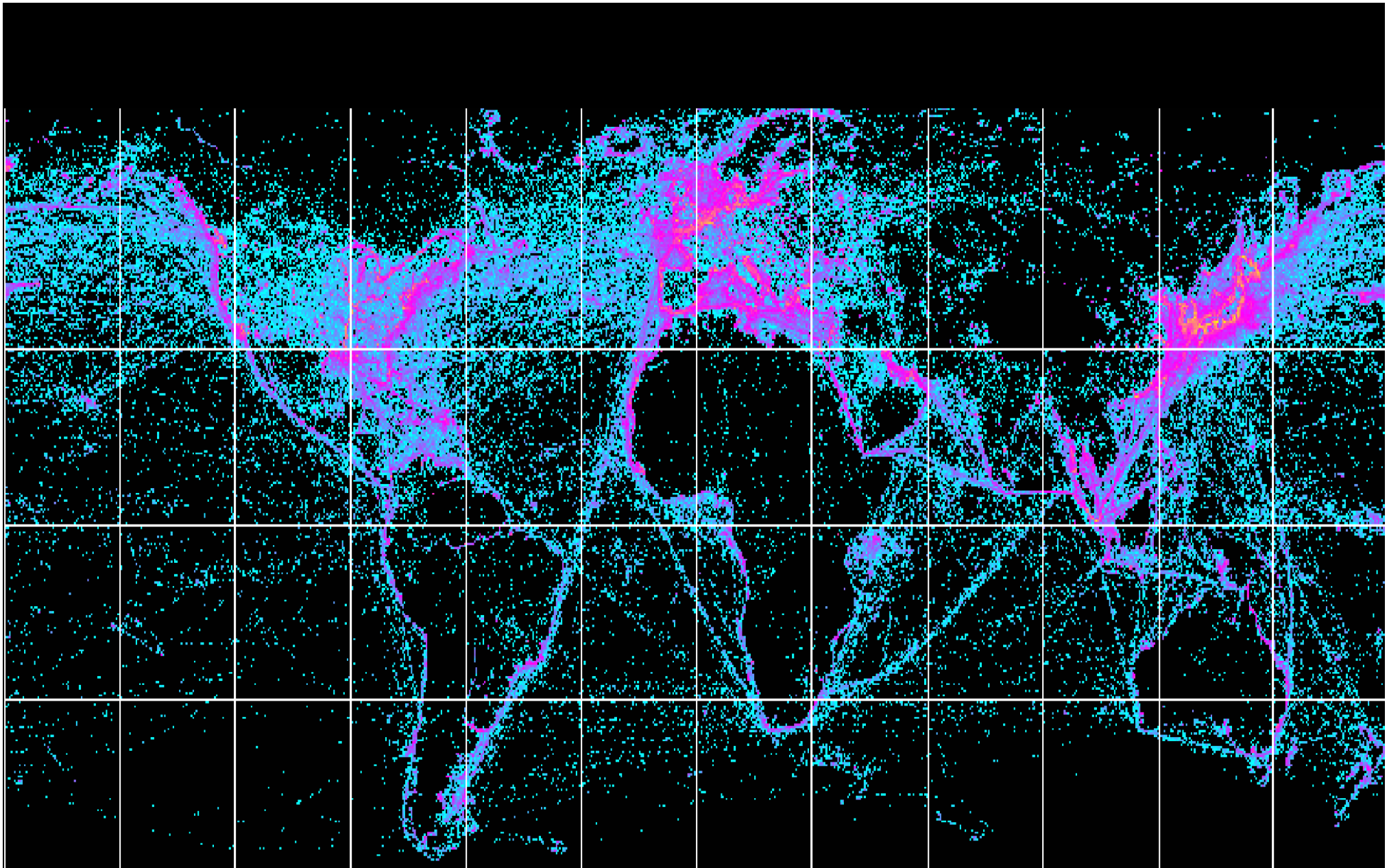
Other content is pre-publication. Therefore please do not redistribute or cite these materials

Copyright © The Boston Consulting Group 2006 All rights reserved


Please direct any comments or enquiries to the author:  
evans.philip@bcg.com  
617 973-1286

**Philip Evans**

**The Boston Consulting Group**



Source: US Department of Defense satellite photographs

Intensity of midnight illumination Low  High

Copyright © The Boston Consulting Group 2006 All rights reserved

# Bio-Tech Alliances

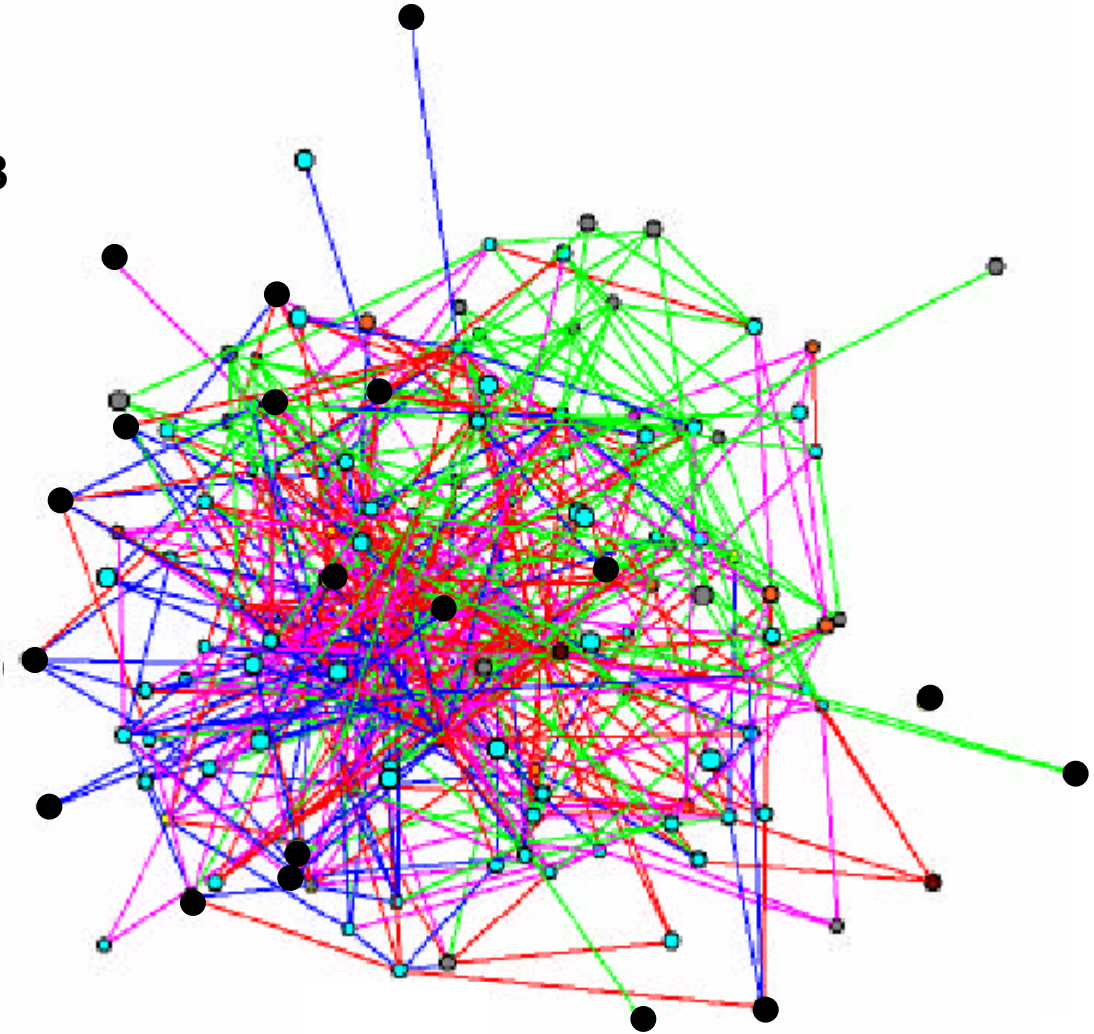
1998

## Links:

- R&D collaborations
- Financial links
- Joint commercialization
- Cross-licensing

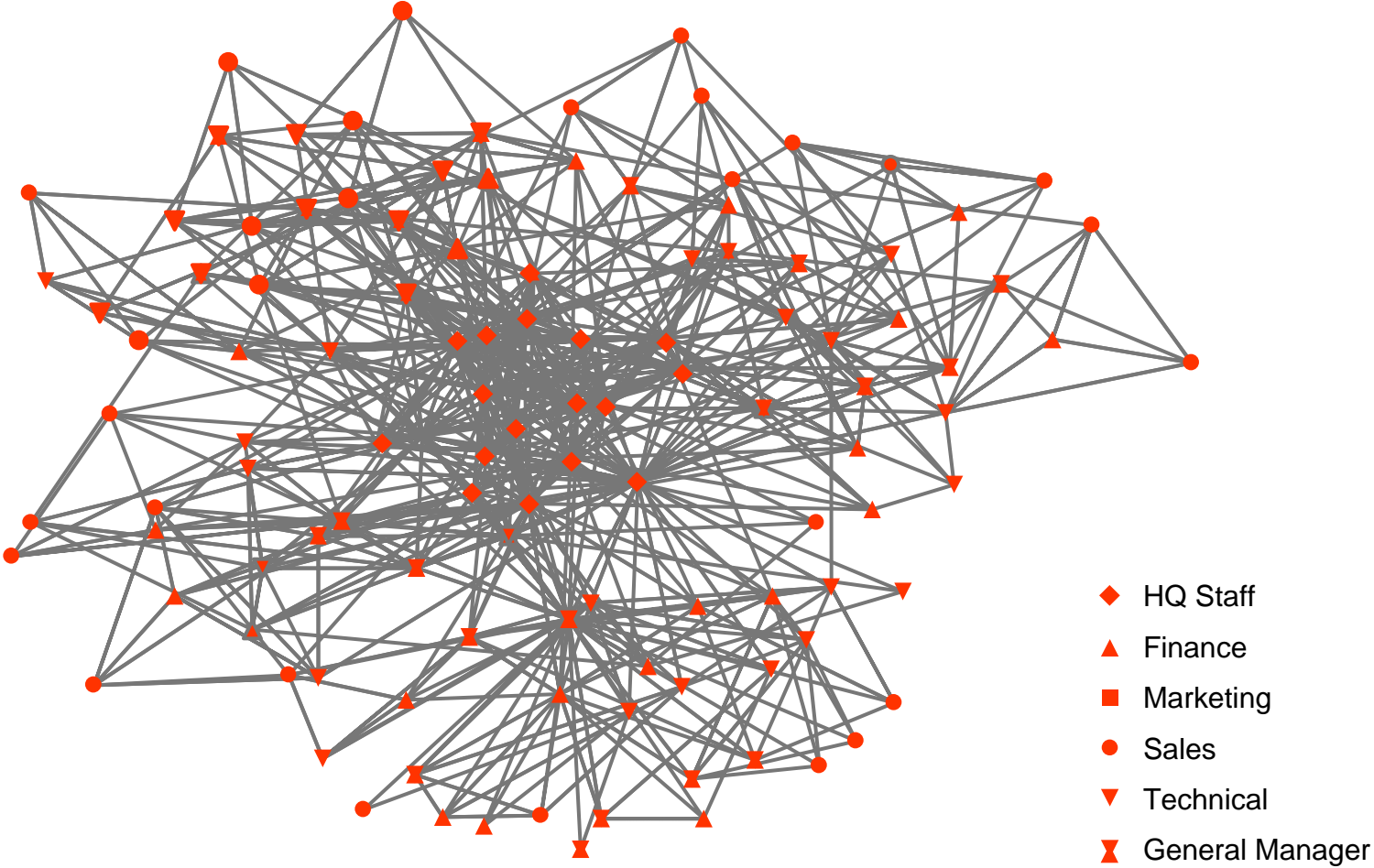
## Nodes:

- Pharmaceutical corporations
- Dedicated bio-tech firms
- Venture capital firms
- Universities, research institutes
- Government institutes



Source: W.W. Powell, D.R. White, K.W. Koput & J. Owen-Smith: 'Evolution of a Science-Based Industry: Dynamic Analysis and Network Visualization of Biotechnology' <http://www.fek.umu.se./dpcc/powell.pdf>

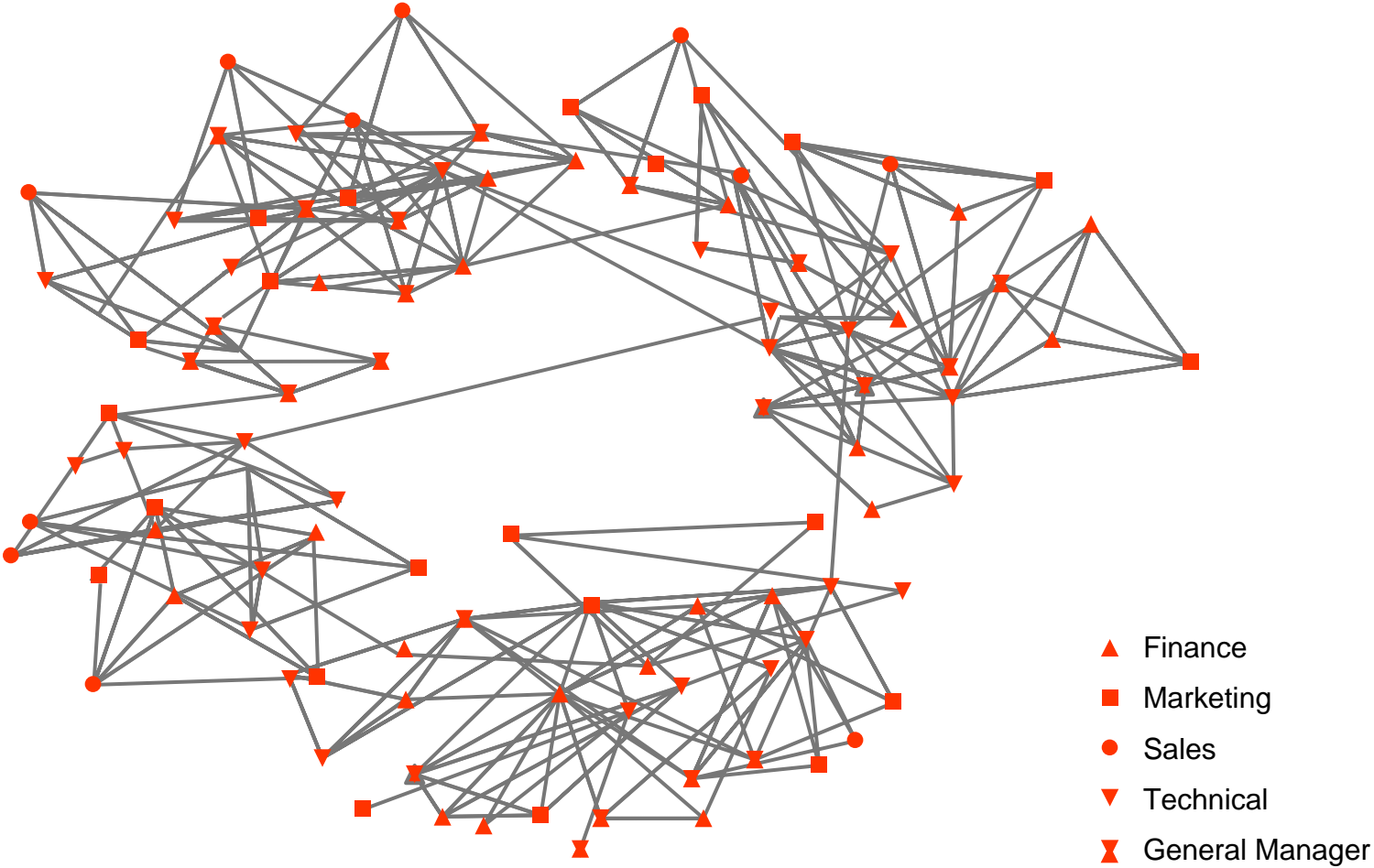
# A Global Sales Organization



Source: BCG Analysis of client network

# A Global Sales Organization

...without Headquarters

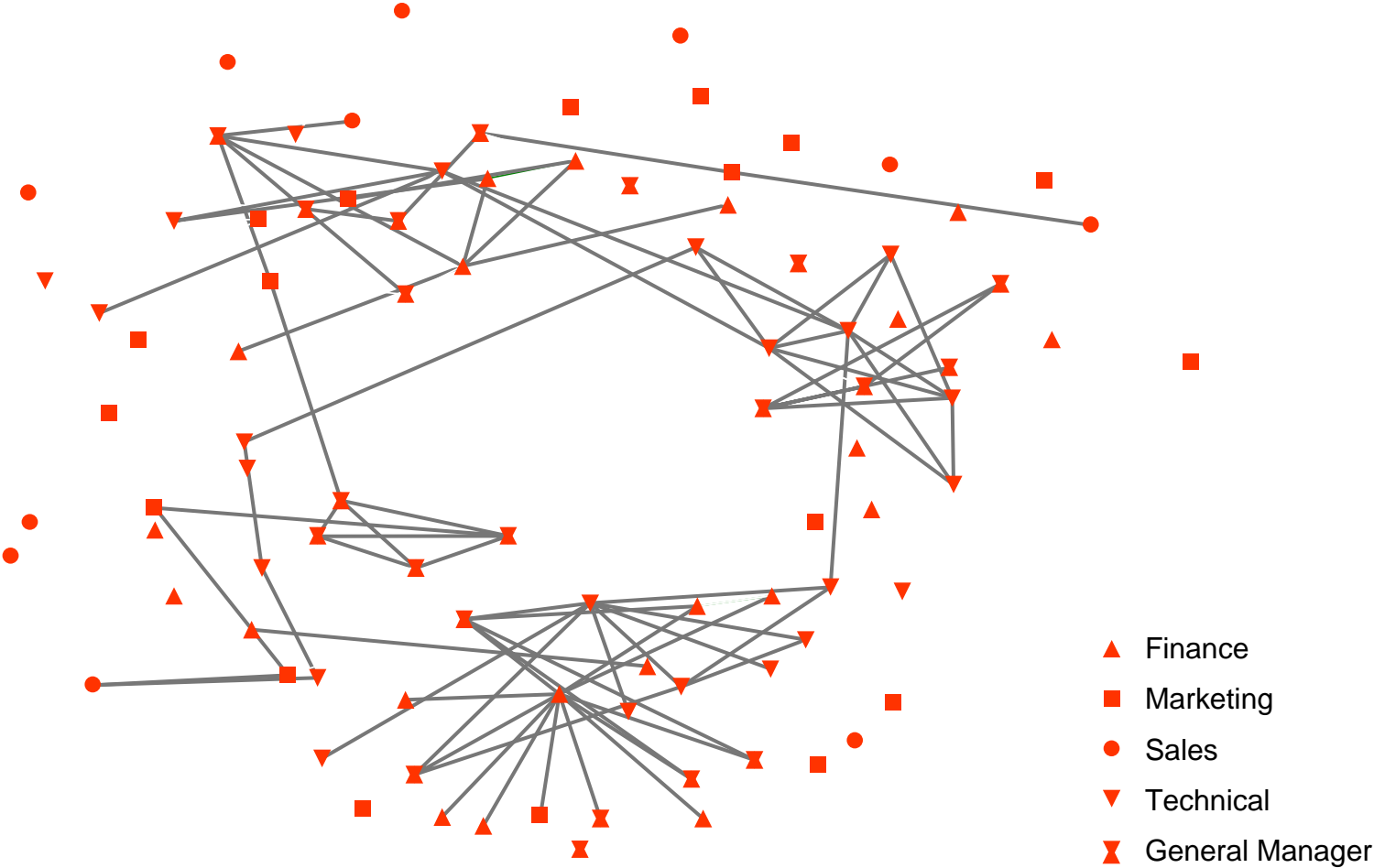


Source: BCG Analysis of client network

# A Global Sales Organization

...without Headquarters

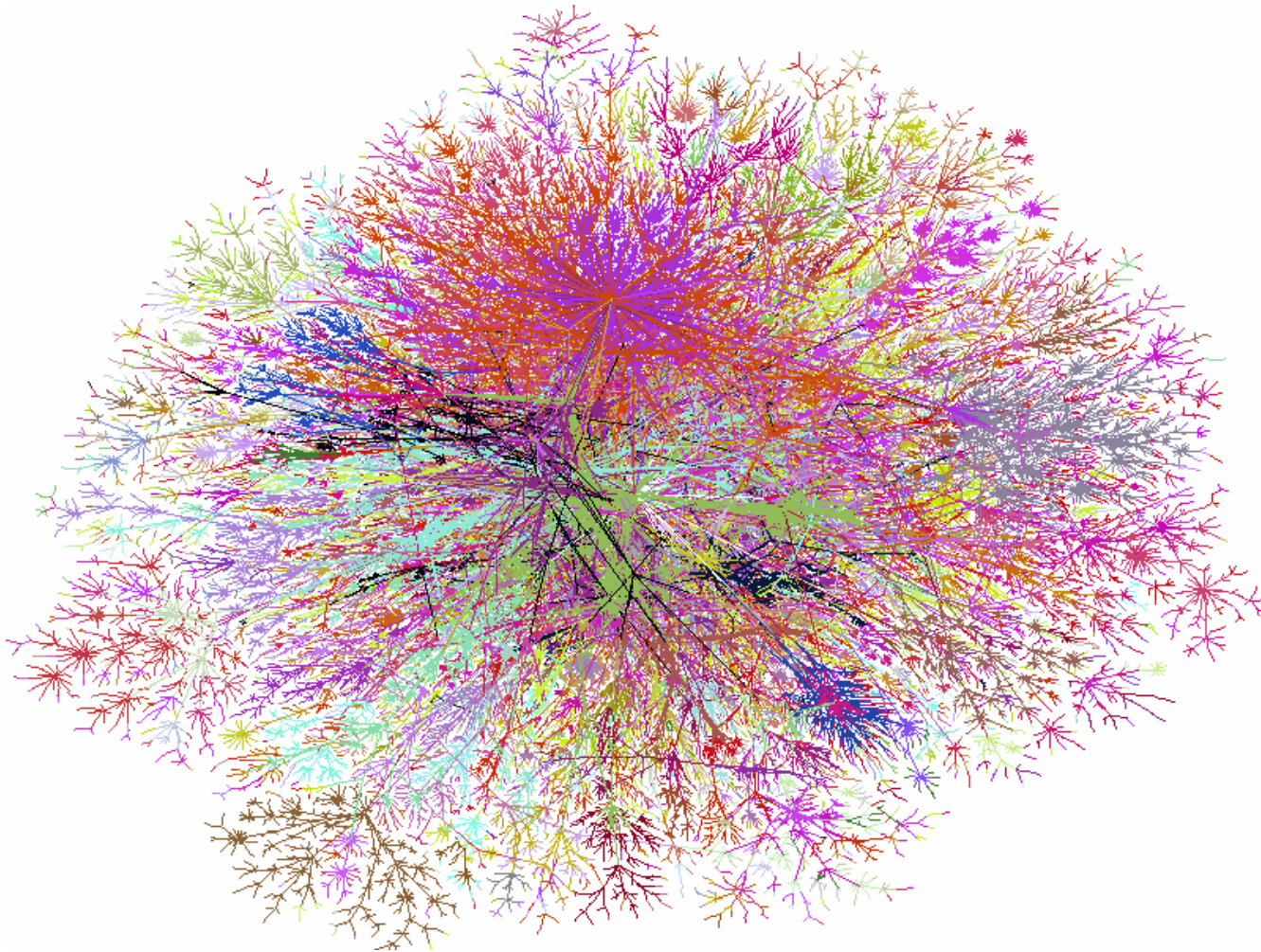
...without domestic links



Source: BCG Analysis of client network



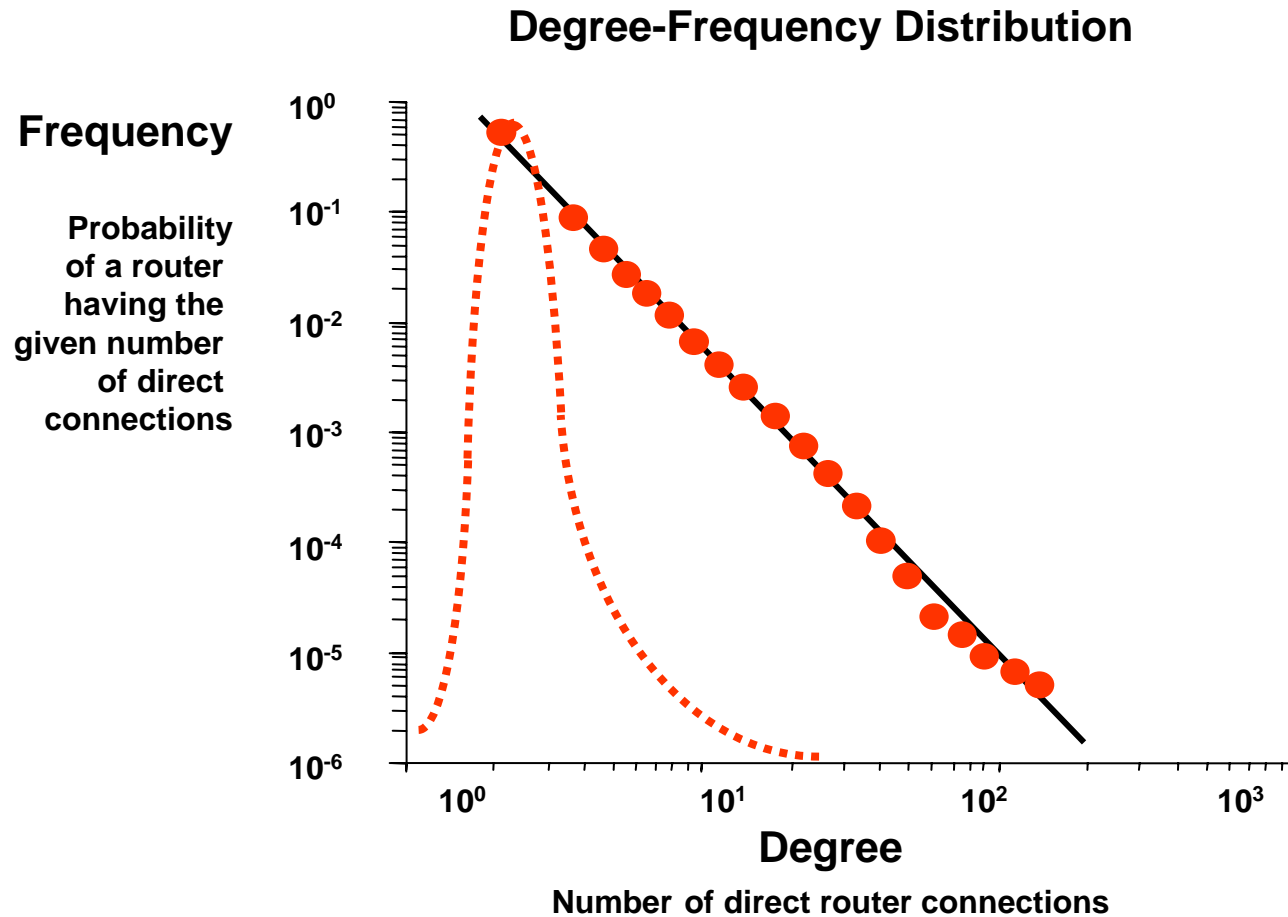
# The Physical Internet



Source: Lumeta Corporation <http://www.lumeta.com/graphics/wired.gif>

**Copyright © The Boston Consulting Group 2006 All rights reserved**

# Self-Organization of the Physical Internet

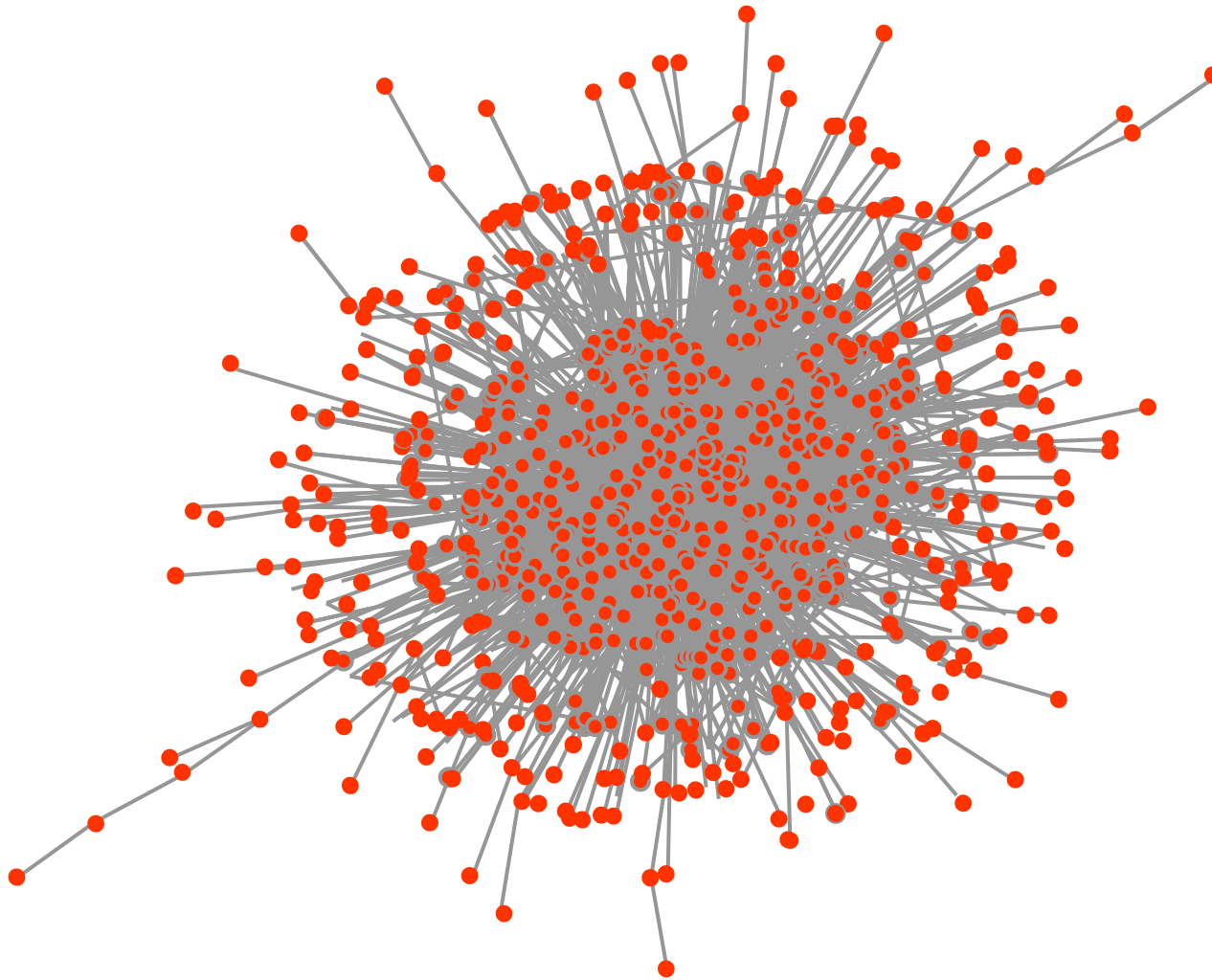
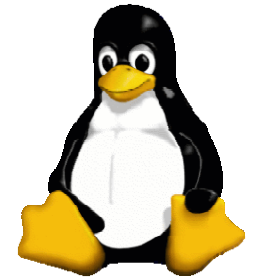


Sample of 150,000 router interfaces and 200,000 adjacencies.

Source: Govindan & Tangmunarunkit, *Proceedings of the IEEE INFOCOM 2000* Vol 3

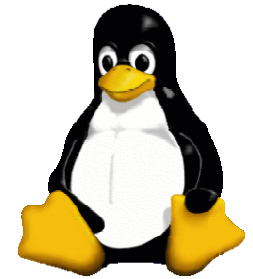


# The Linux Kernel Programming Community

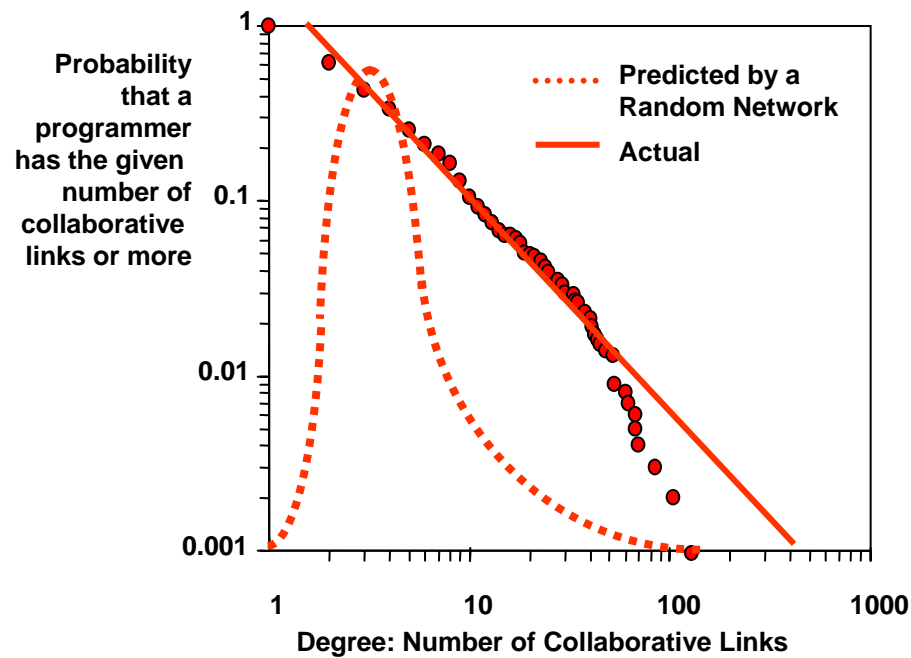


Source: BCG analysis of the Linux Kernel Mailing Listserv <http://www.ussq.iu.edu.hypermail/linux/kernel/>

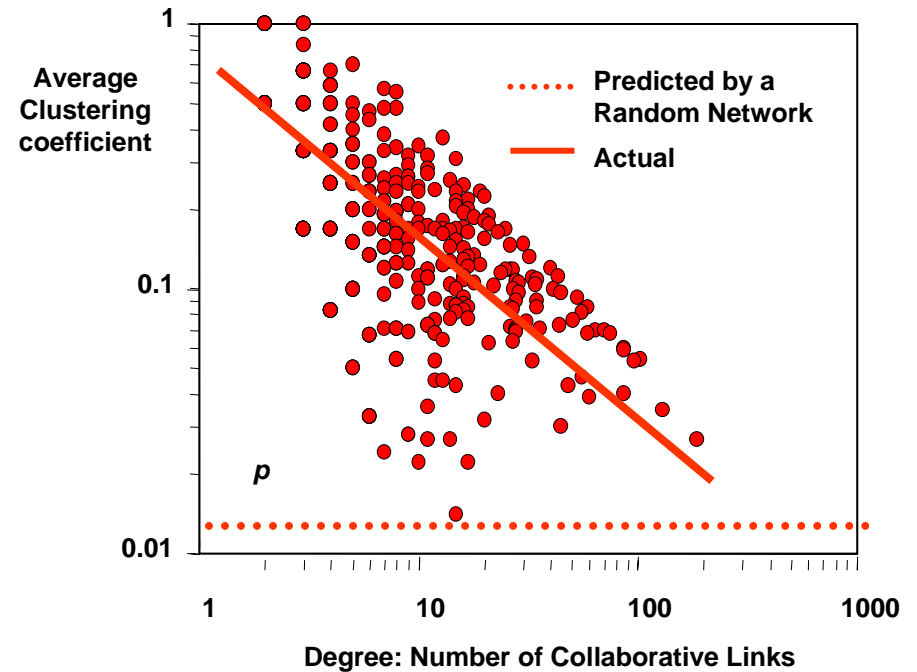
# 'Self-Organization' in the Linux Community



## Degree-Frequency Distribution



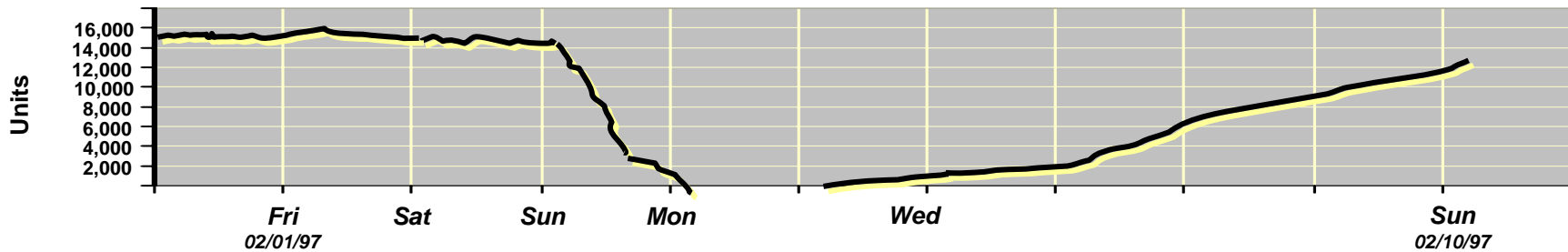
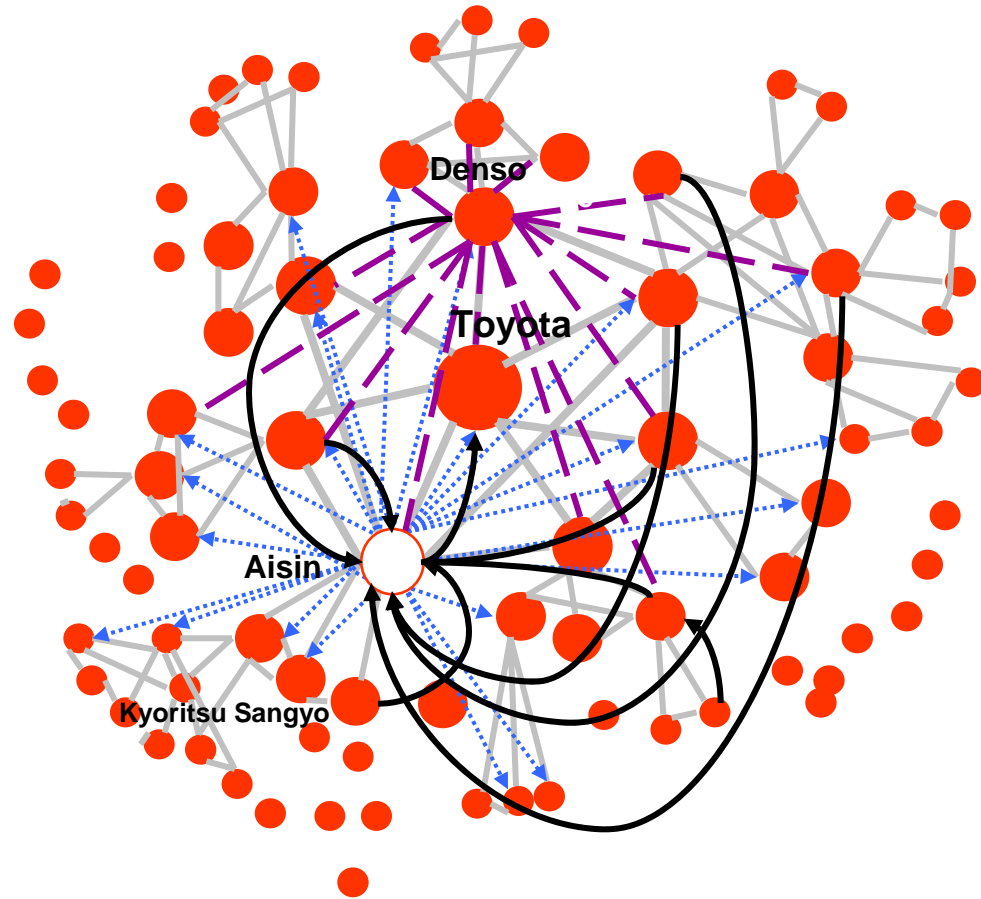
## Degree-Clustering Distribution



The 'clustering coefficient' of a node  $i$  is the probability that any two nodes connected to  $i$ , are connected to each other  
Source: BCG Analysis of the Linux Kernel collaboration patterns

# TOYOTA

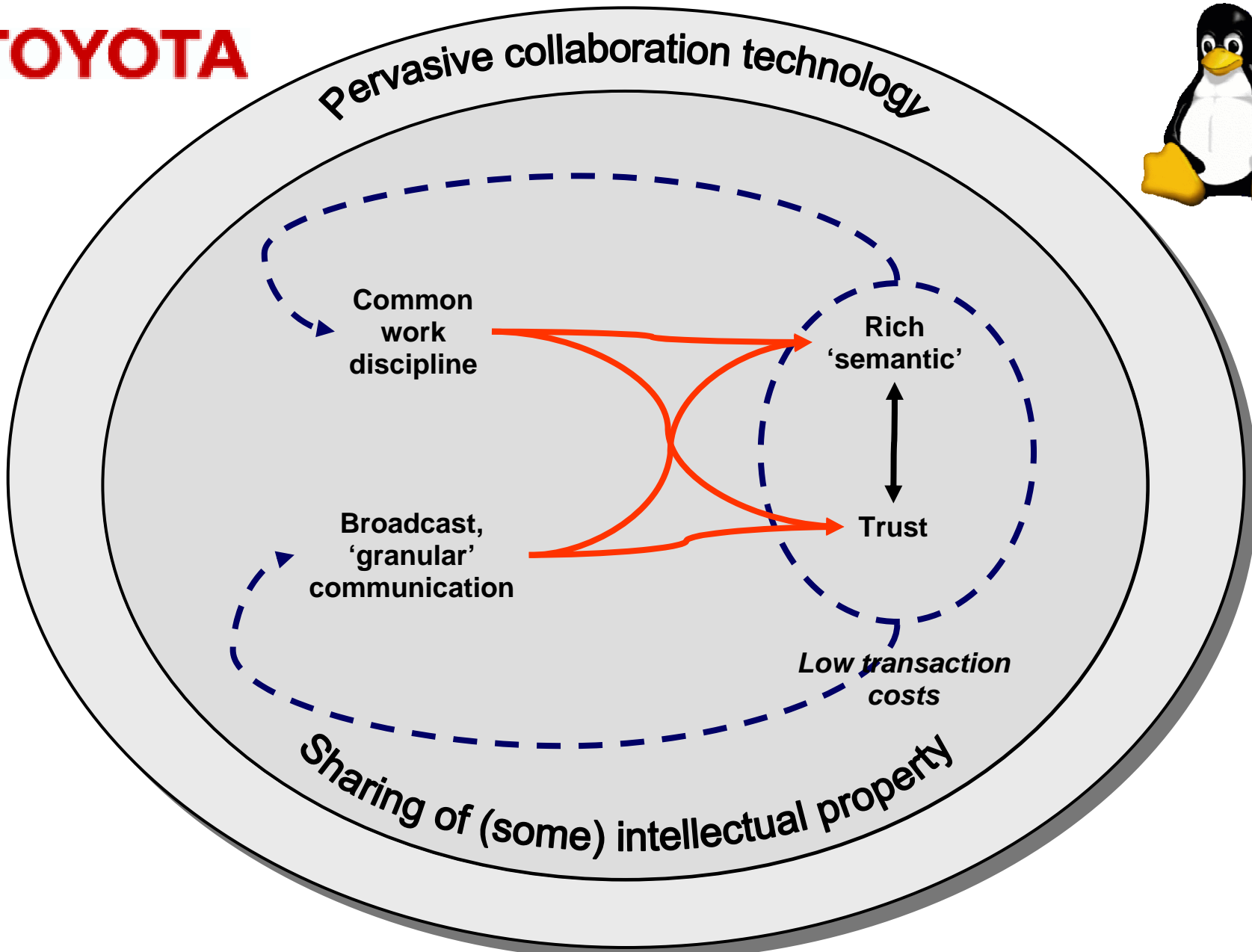
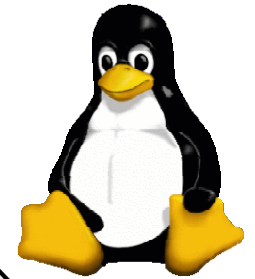
- Normal supply flow
- Emergency teaming
- ⋯ Dispatch of parts, blueprints, workers
- Logistical coordination
- Emergency supply flow



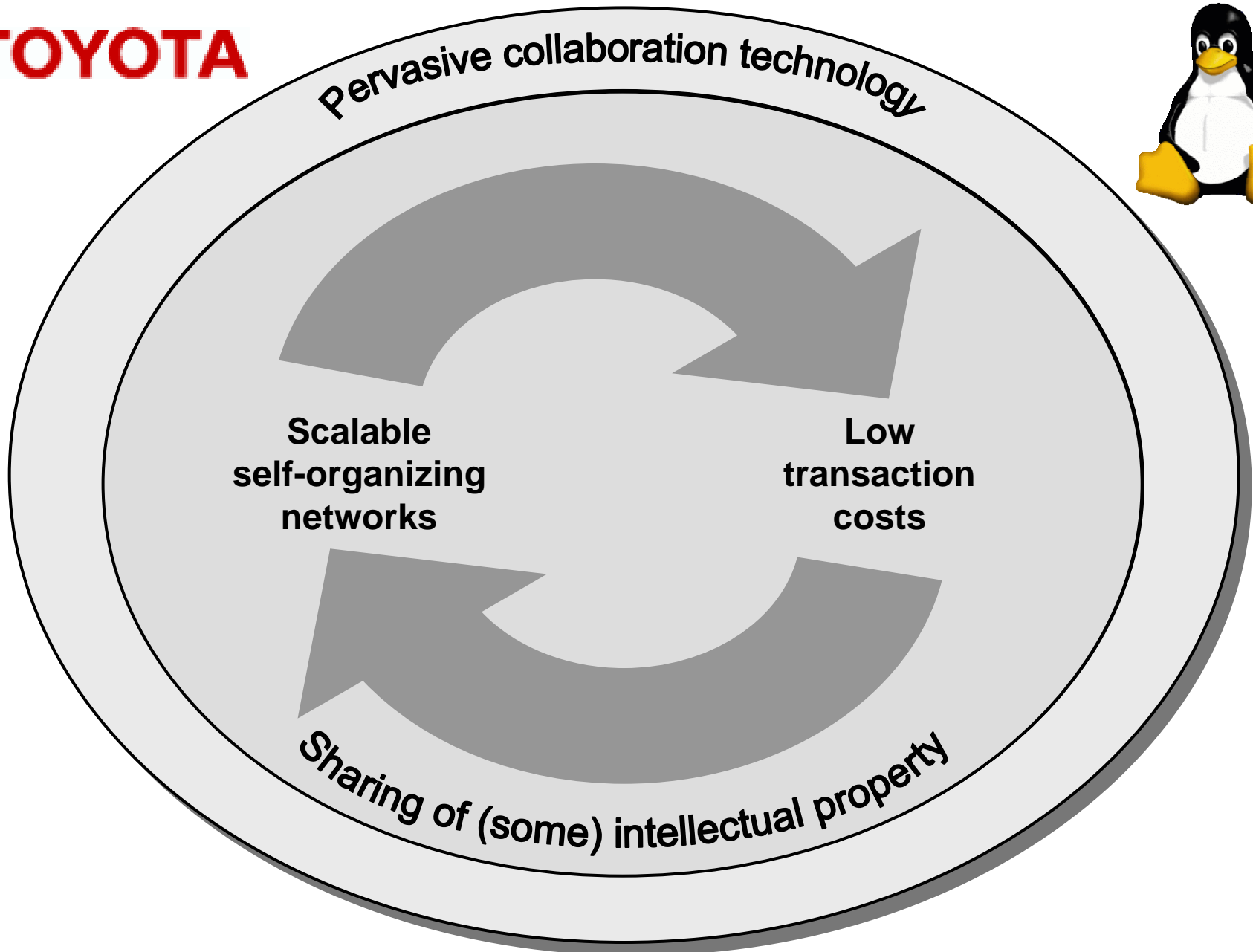
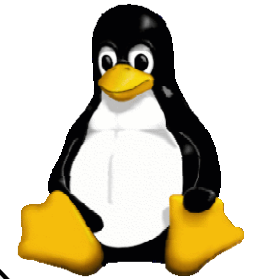
Network map is schematic

Sources: Asahi Shinbun, Aisin Seiki: 緊急生産復旧行動ガイド (Procedural Guide for the Emergency Resumption of Production)

# TOYOTA



**TOYOTA**

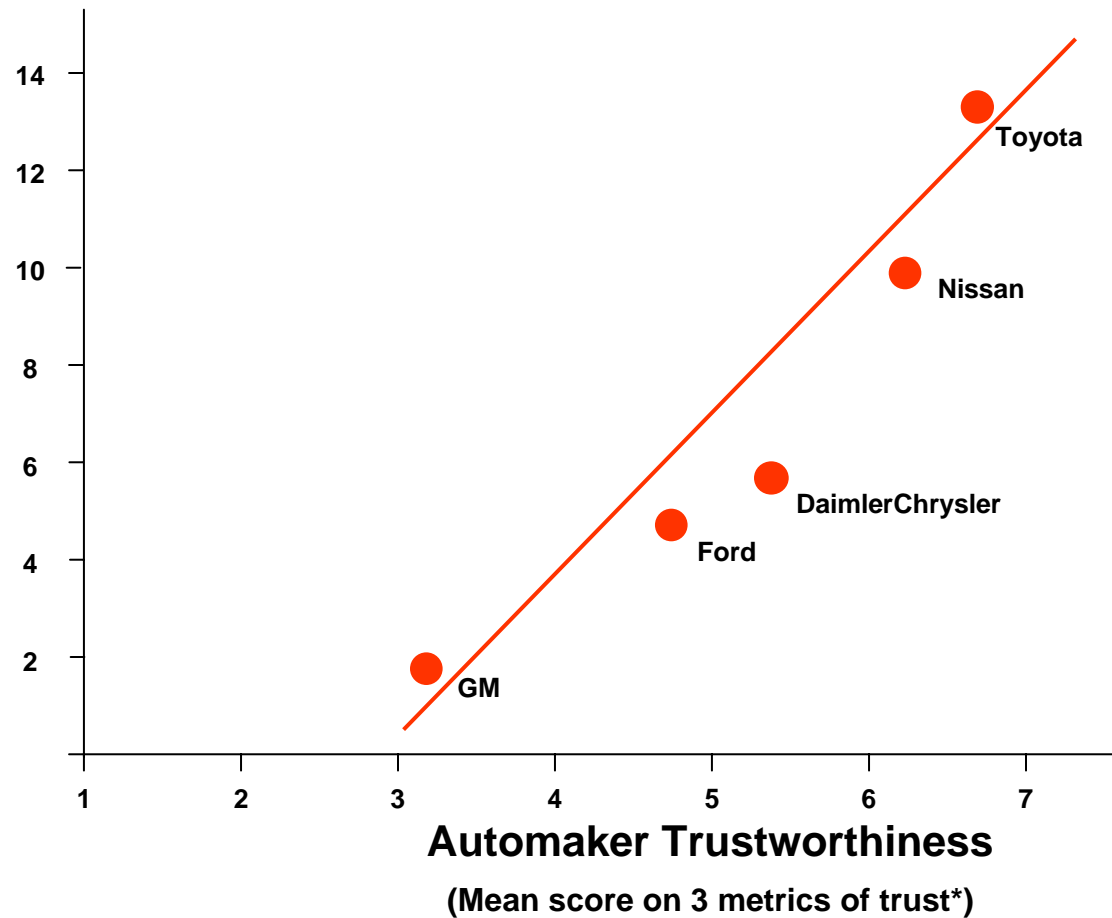




# TOYOTA

Procurement  
productivity  
(Inverse of  
transaction  
costs)

(Dollar volume  
(\$M) of parts  
purchased  
per person in  
procurement)



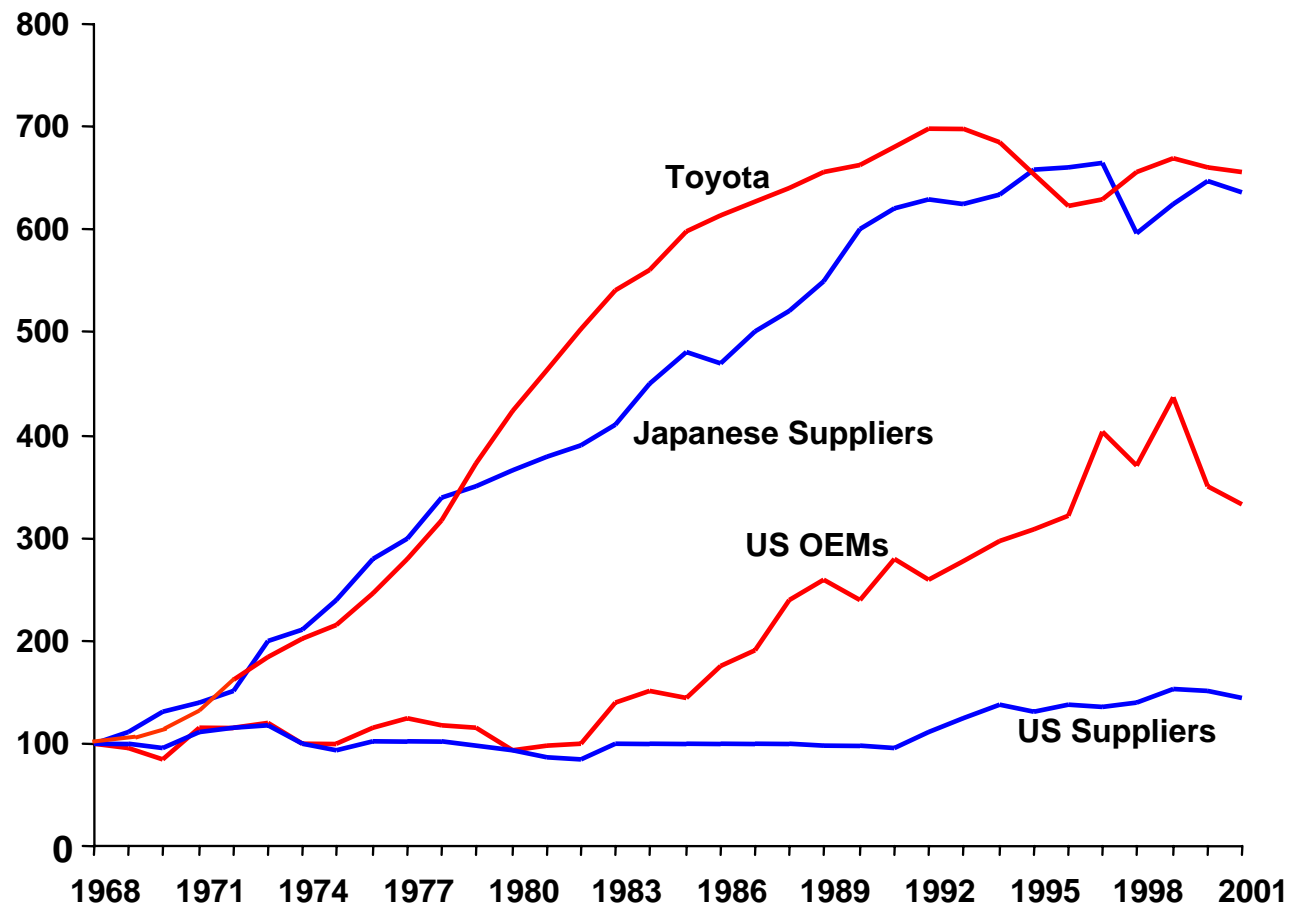
\*Trust metrics: vendor ratings surveyed on a 7-point Likert scale:

- Extent to which the supplier trusts the OEM to treat the supplier fairly
- Extent to which the OEM has a reputation for trustworthiness
- Extent to which the OEM would take unfair advantage of the supplier (reverse scored)

Source: J Dyer: 'The Role of Trustworthiness in Reducing Transaction Costs and Improving Performance'

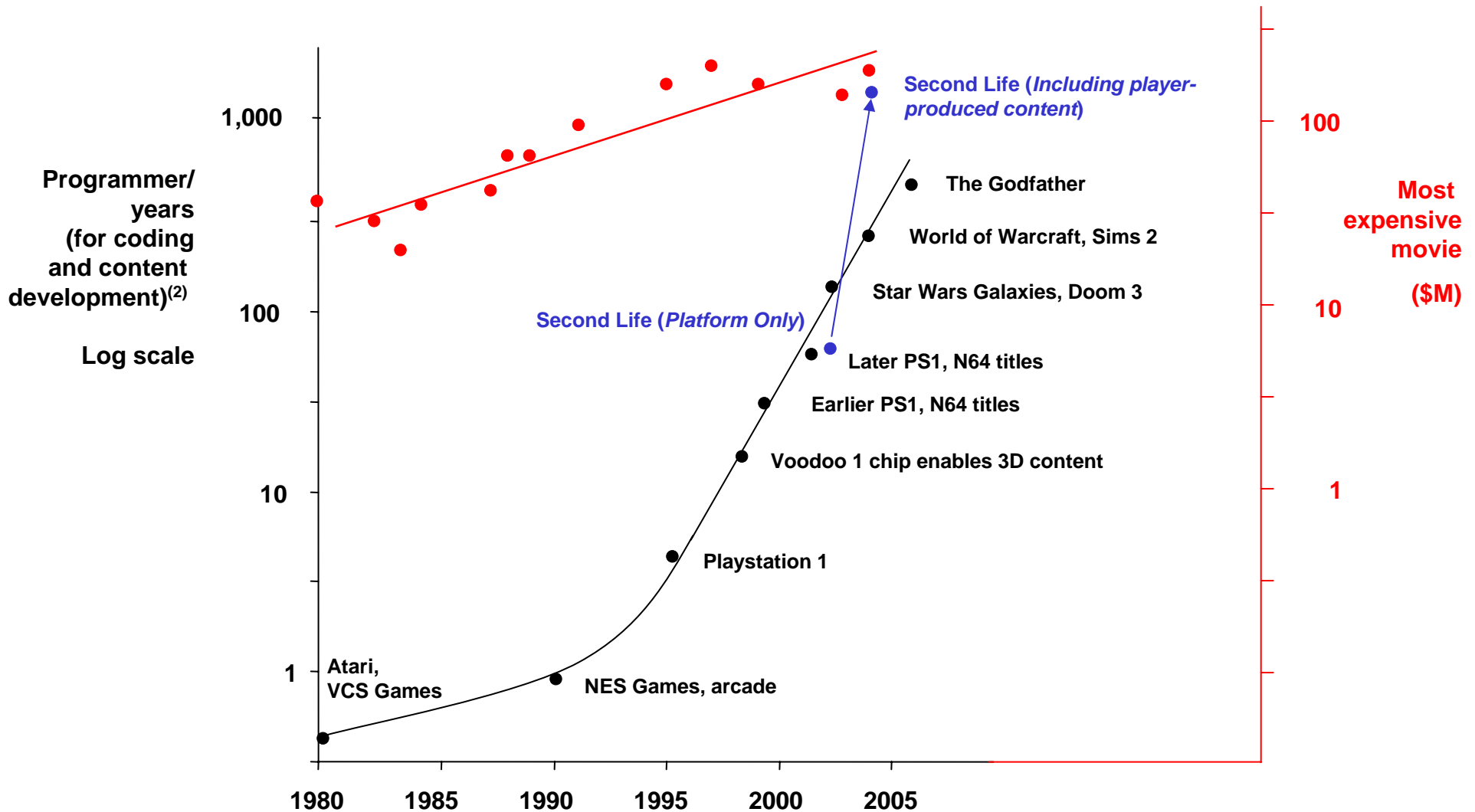
# TOYOTA

Value  
added per  
employee  
Index 1968=100



Source: BCG analysis, updating time series developed by M. Lieberman and S. Asaba: 'Inventory Reduction and Productivity Growth: A Comparison of Japanese and US Automotive Sectors', *Managerial and Decision Economics*, Vol 18, pp 73-85 (1997).

# MMORPGs<sup>1</sup>: The Emergence Of 'Peer Production'

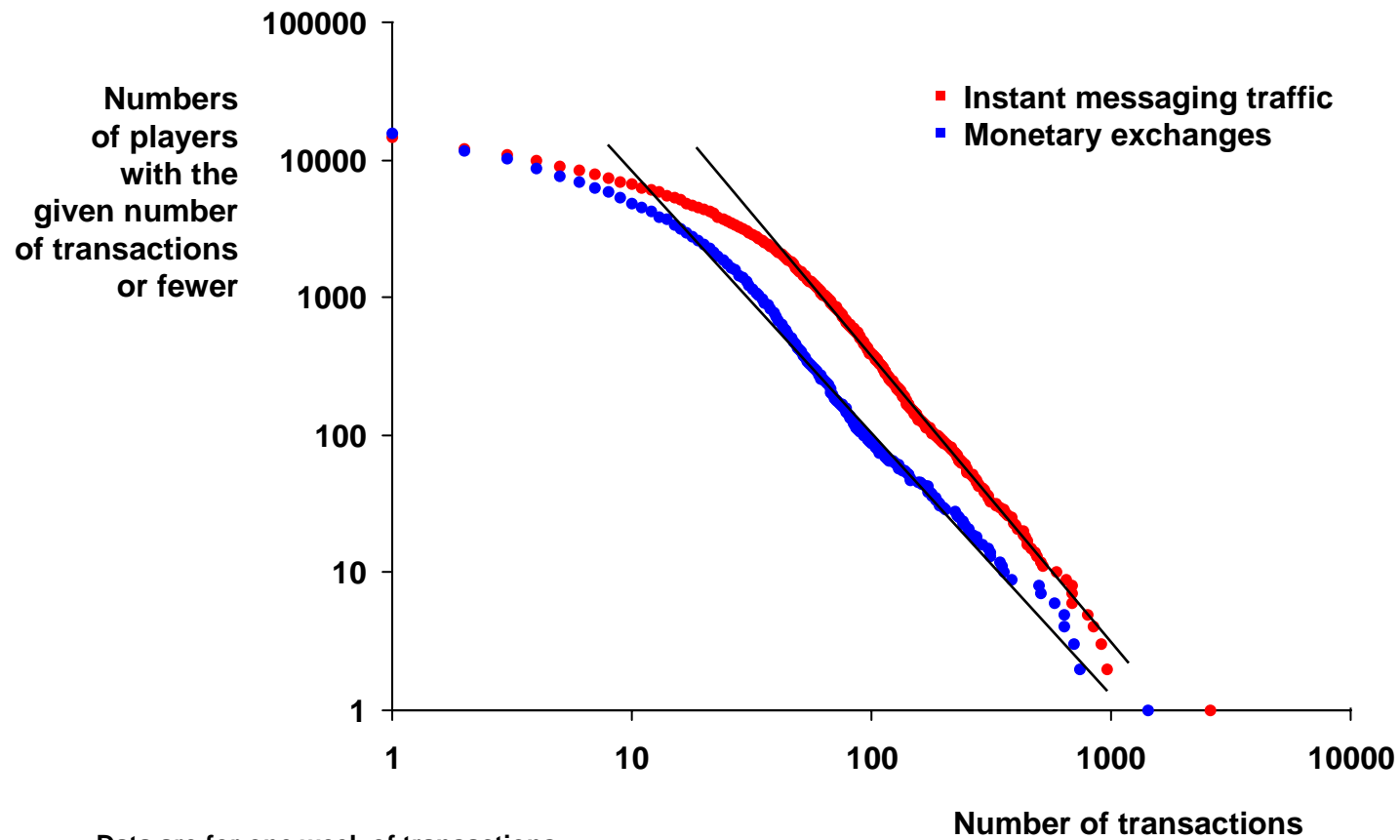


(1) Massively Multiplayer Online Role Playing Games

(2) Implicit translation: one programmer year costs \$100,000

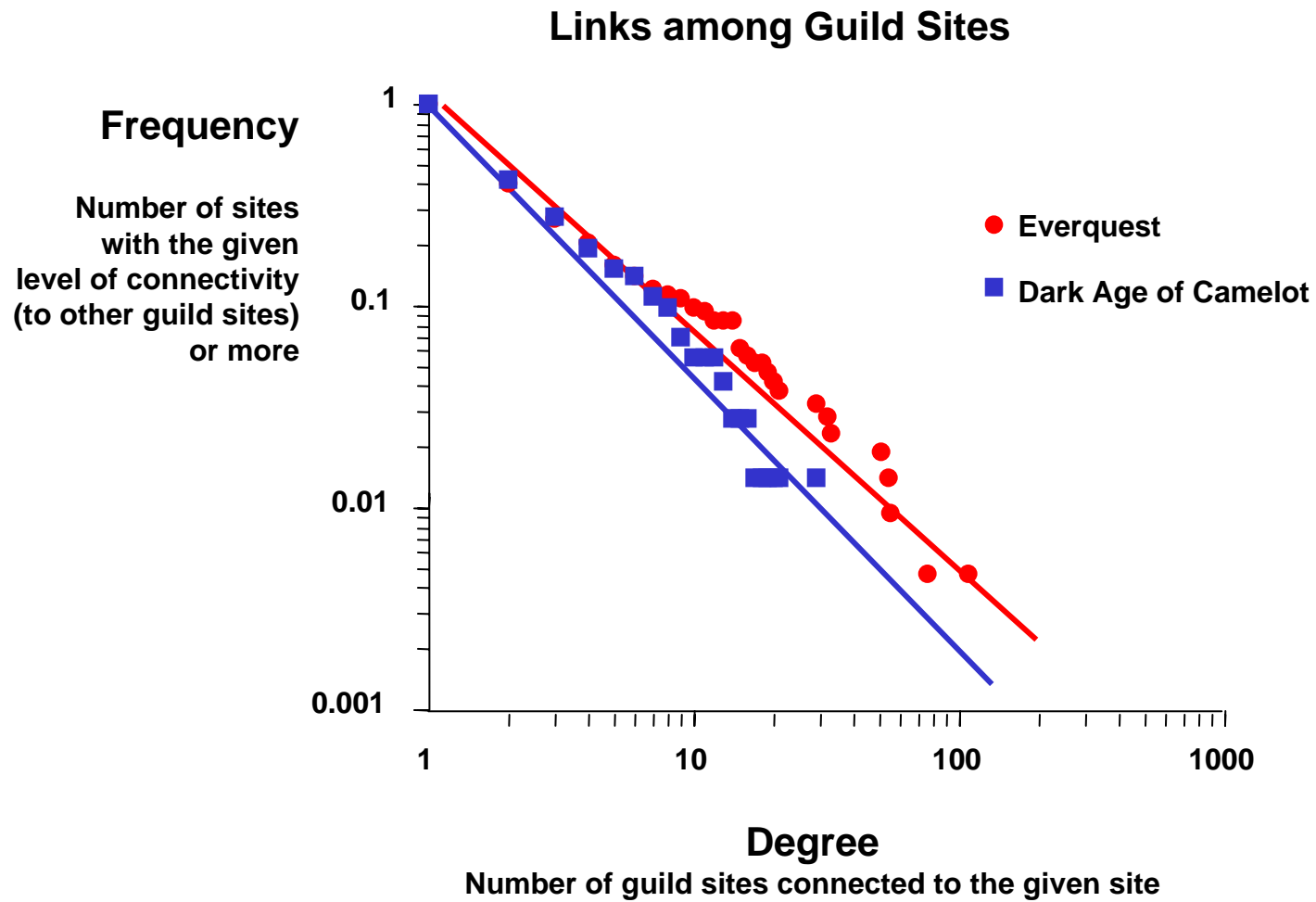
# Self-Organization in MMORPGs...

## Transactions Among Players of *Second Life*



Data are for one week of transactions  
Source: Linden Labs, BCG analysis

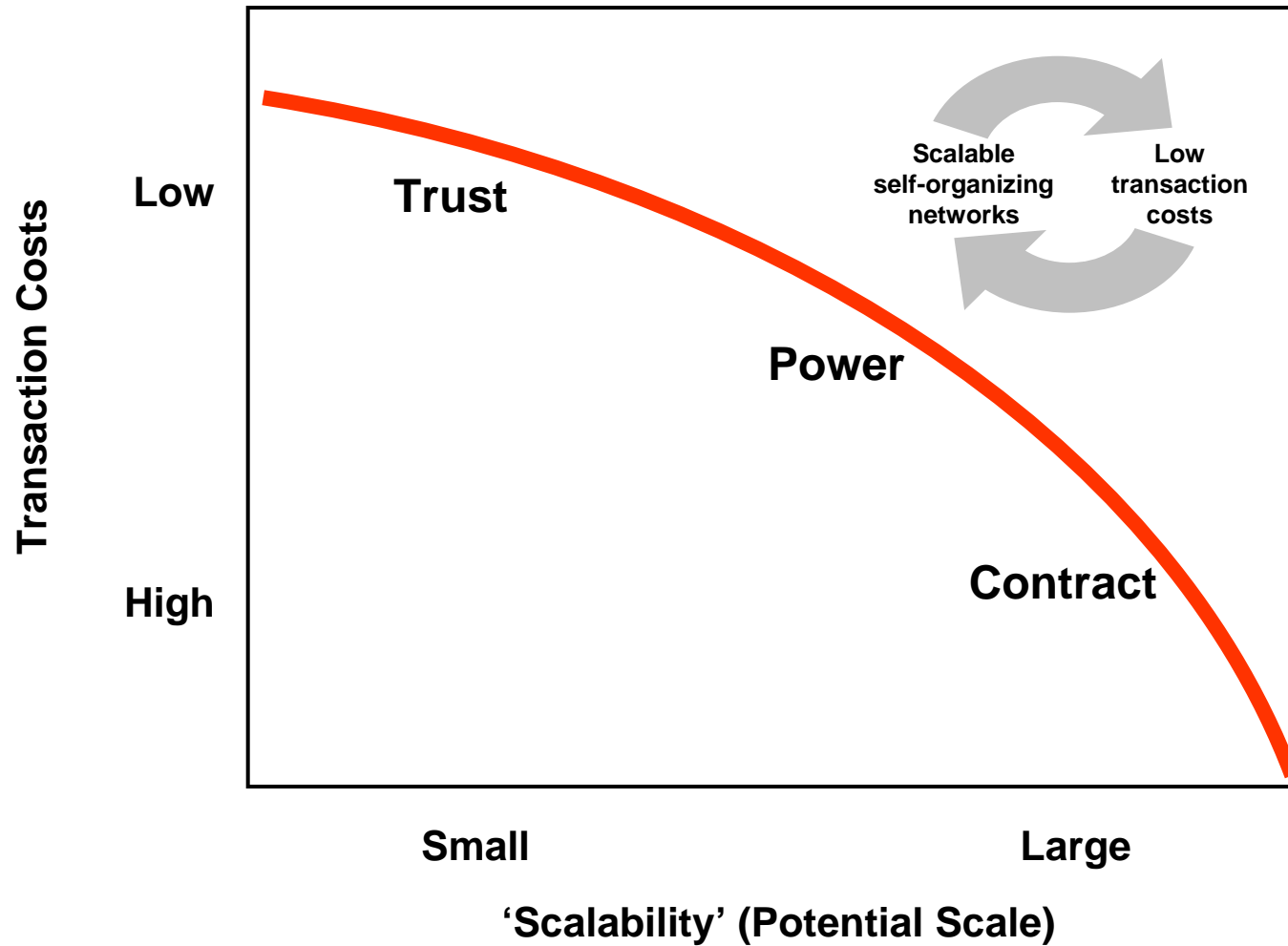
# ...More Self-Organization in MMORPGs



Source: BCG analysis, webcrawl data



# Competing Modes of Co-ordination



**Technology enables large scale, human networks...**

- to be mapped, analyzed and influenced (new managerial tools)
- to emerge (a new phenomenon)

**...within organizations, across organizations, and among customers**

**These networks organize on a mixture of principles:**

	<i>IN:</i>	<i>ALLOCATING RESOURCES VIA:</i>
• <b>Contracts</b>	• <b>Markets</b>	• <b>Supply &amp; Demand</b>
• <b>Power</b>	• <b>Hierarchies</b>	• <b>Rational Planning</b>
• <b>Trust</b>	• <b>Teams or Clans</b>	• <b>Emergent Modularity</b>

**Such networks blur traditional distinctions: producer ↔ consumer, boss ↔ worker, work ↔ play**

**These networks are advantaged in the production of knowledge goods, where very large scale, complexity, innovation and adaptability are the key priorities**

**These networks drive, and are driven by, low transaction costs**



# Six Priorities

**Networks, as a lens and a phenomenon**

**Contracts (markets) *versus* Power (hierarchies) *versus* Trust (teams or clans)**

**Modularity, emergent and engineered**

**Trusting supply chains: upstream and downstream**

**User- or peer-created content**

**Intellectual property: open versus closed**