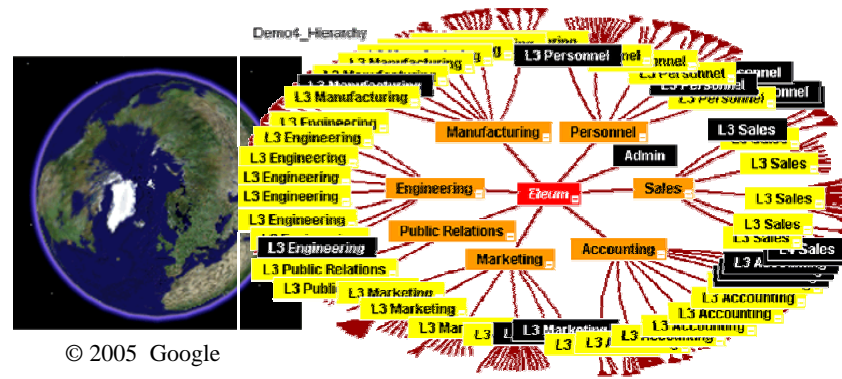


Designing Information and Organizations with a Positive Lens

Case Western Reserve University
Weatherhead School of Management
November 10-12, 2005

Earth-OrgScope:

Applying a Science of Organization Networks



© 2005 Google

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Jeffrey Stamps & Jessica Lipnack

www.netage.com



Who Are We? 25-Year Focus on Networks



Books, articles, methods, theory



Jessica



Consulting and projects



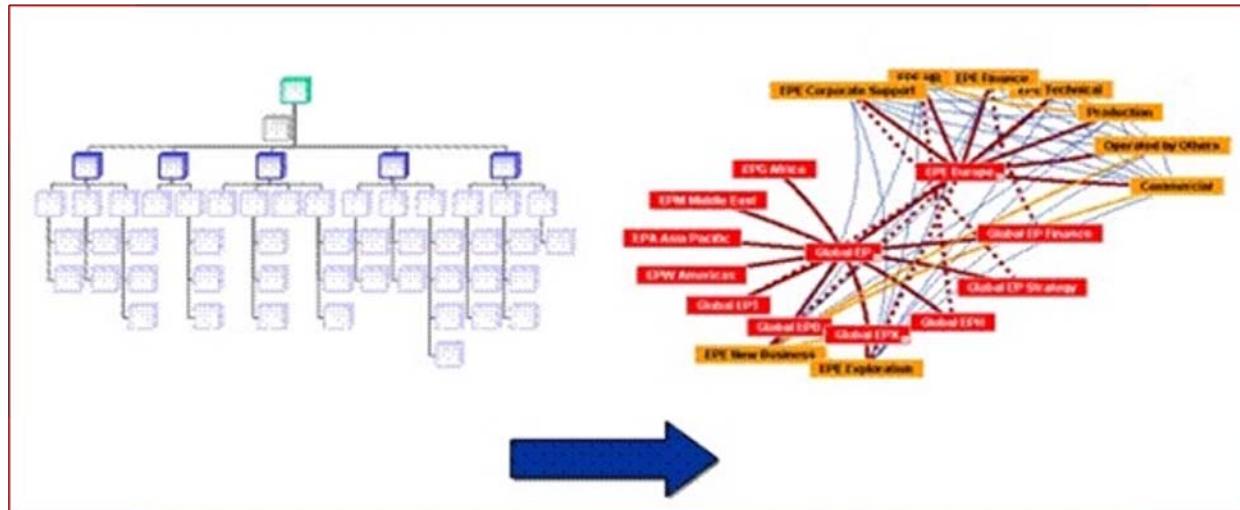
Training and software



Jeff

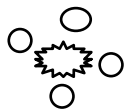
Our Organizational Predicament

*“We can’t solve 21st-century problems
with 19th-century organizations”*

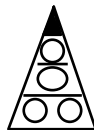


Our Networks Stand on Giant, Old Shoulders

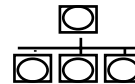
Small Group + Hierarchy + Bureaucracy + Network



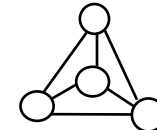
+



+



+



Nomadic

Agricultural

Industrial

Information

3 million
-10,000 B.C.E.

10,000 B.C.E
-17th century

17th century
-20th century

1945...1994
21st century

What We're Going to Talk about Today

- What Is an *Organization* Network Science?
- How Do You Map, Analyze, and Design for a Networked Organization?
- When NetAge OrgScope Meets Google Earth

What Is *An Organization* Network Science?

Networks Are Organizations, Organizations Are Networks

Vision: A radical step change in organizational capability

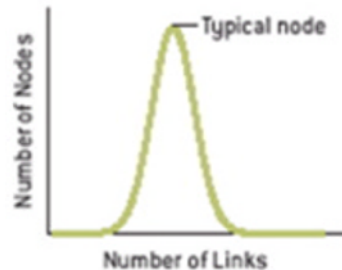
- The network is an evolving human organization
 - *Nomadic Age: small groups*
 - *Agricultural Age: hierarchy*
 - *Industrial Age: bureaucracy*
 - *Information Age: networks*
- The organization is a kind of network
 - *A natural configuration of nodes and links with cross-domain properties (scale-free and small-world characteristics)*
 - *Formal configuration of hierarchy comprises positions connected by primary (direct) reporting relationships*
 - *People show up in their positions*



Typically, Networks Are Random or Scale-Free

Random

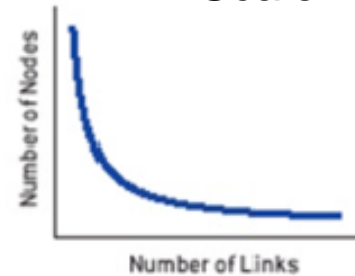
Bell-curve Distribution



- Nodes have average number of links; no extremes
- Random distribution prevails
 - *Fixed inventory of nodes*
 - *Random attachment of links*

Scale-Free

Power-law Distribution



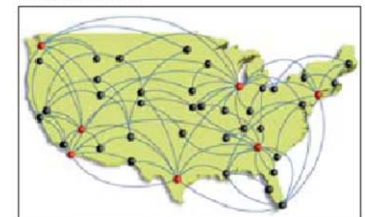
- A few highly-linked hubs and many nodes
- Power Law prevails
 - *Growth over time*
 - *Preferential attachment of links*

Random Network



Road system:
Random network

Scale-Free Network



Airline system:
Scale-free network

From “**Scale-Free Networks**” by Albert-László Barabási and Eric Bonabeau, *Scientific American*, May, 2003.

Are Scale-Free Networks Everywhere? Even in Organizations?

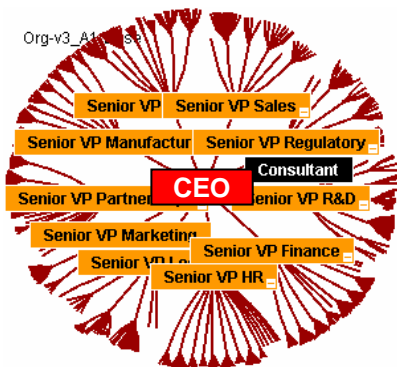
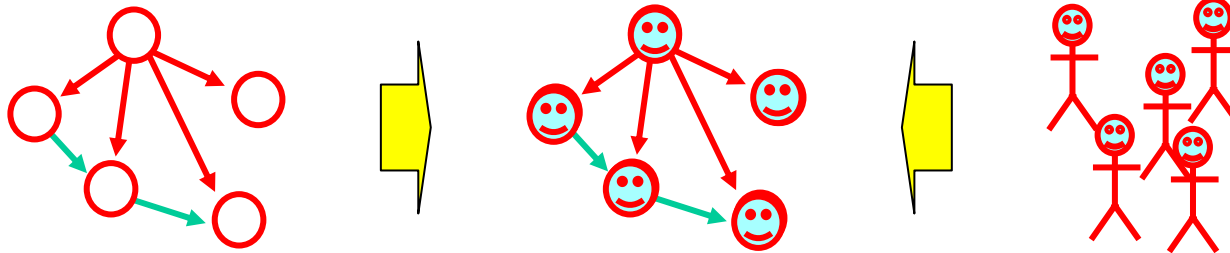
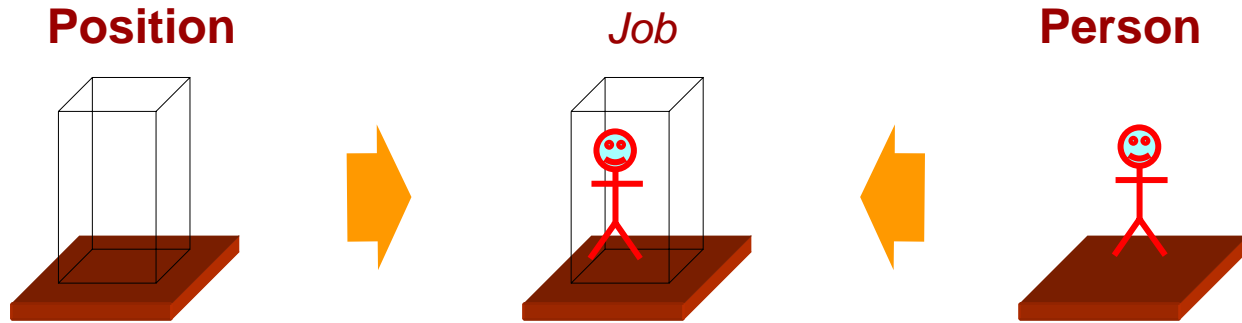
Network	Type	Nodes	Links
Cellular metabolism	Biology	Molecules involved in burning food for energy	Participation in same biochemical reaction
Protein regulatory network	Biology	Proteins that help to regulate a cell's activities	Interactions among proteins
Sexual relationships	People	People	Sexual contact
Hollywood	People	Actors	Appearance in same movie
Research collaborations	People	Scientists	Co-authorship of papers
Internet infrastructure	Technology	Routers	Optical and other physical connections
World Wide Web	Knowledge	Web pages	URLs

“Scale-Free Networks” by Albert-László Barabási and Eric Bonabeau, Scientific American, May, 2003

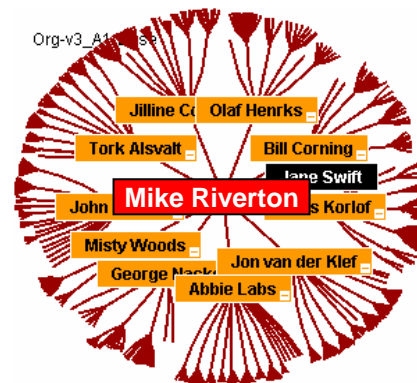
?	Hierarchy (org chart)	Organization	Positions	Reporting relationships	?
---	-----------------------	--------------	-----------	-------------------------	---

See “*Revolution in Networks*” [white paper](#)

Our Initial Focus Is the Position, Key Node in Formal Organization



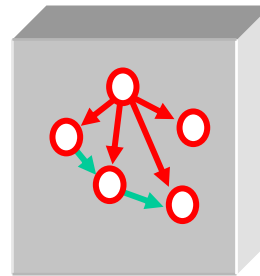
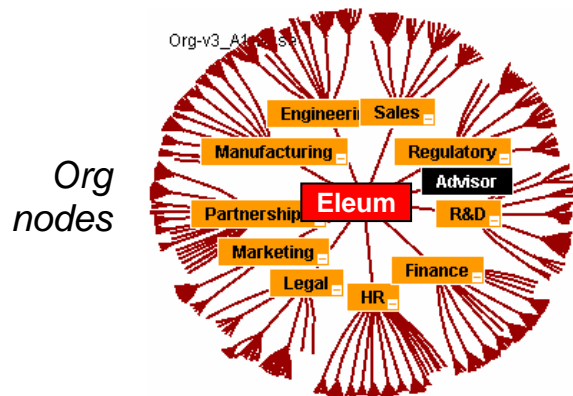
Map of positions as nodes



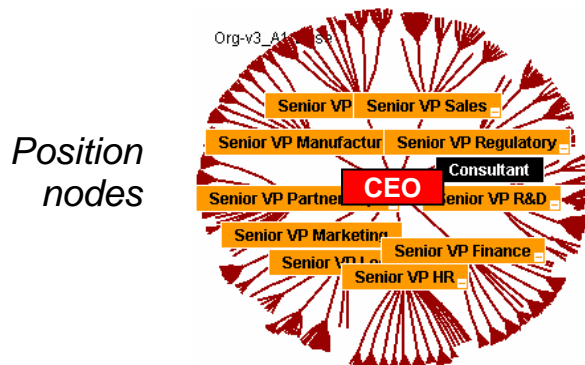
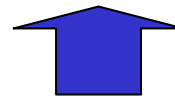
Map of people as nodes

Leadership Positions Stand for their Organizations

See "Nodes Are Us" [white paper](#)



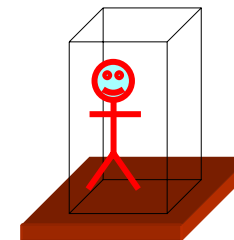
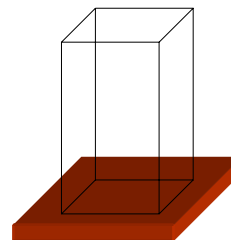
Organization



Position

Job

Person



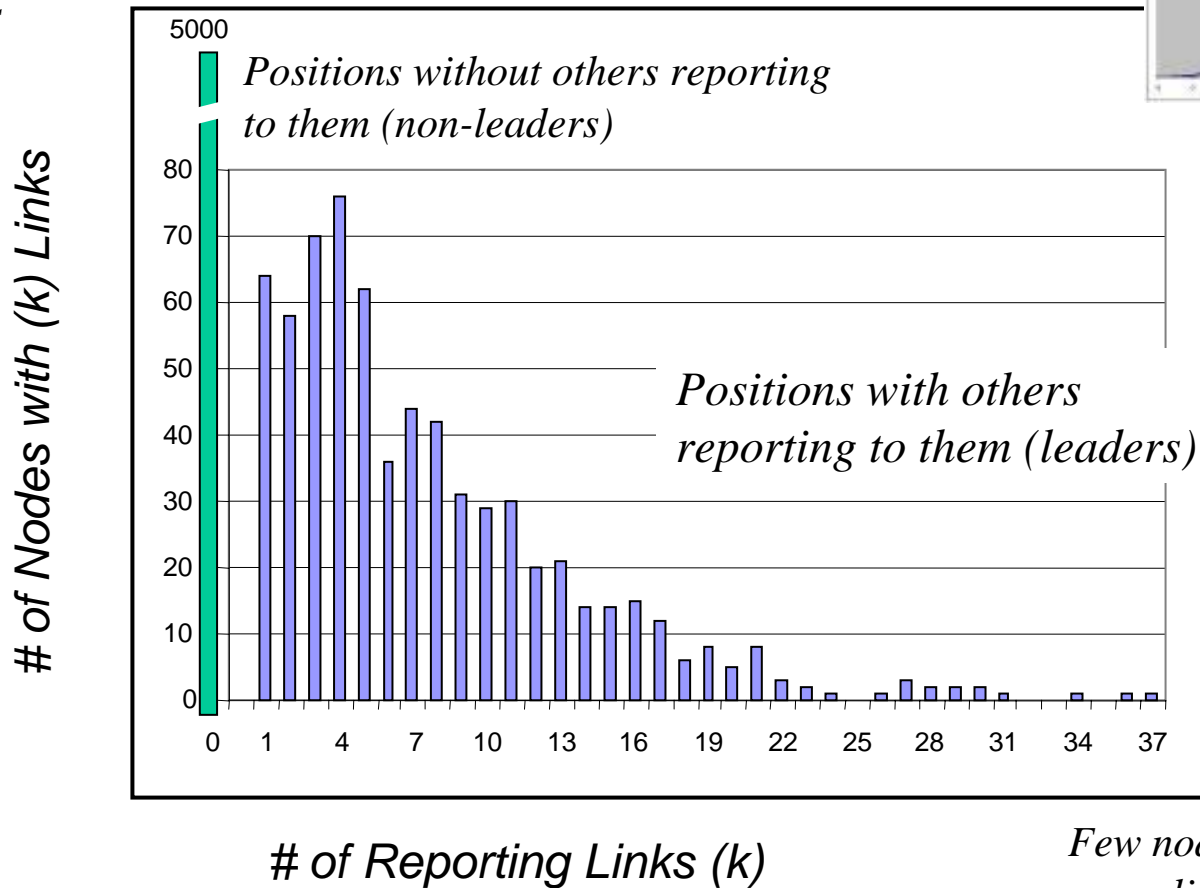
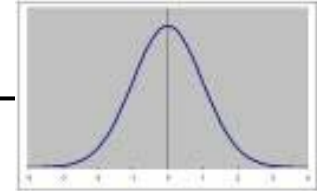
Introducing Eleum: Our Sample Data Set

- New 5000-position regional business unit within 100,000-position global company
- Complex company in complex industry
- Highly experienced and thoughtful senior executives
- Data from enterprise HR system
 - *Each position reports to another position*
 - Marks each position's level, its "degree of separation" from CEO
 - *Each position associated with a specific organization*
 - *Most positions associated with named people (some open)*
 - *Each position is situated in a physical location*
- *Provides all the data needed for a really big org chart*

Eleum's Leadership Distribution: Power-law Curve of Scale-free Network?

Many nodes,
few links

Normal view of span



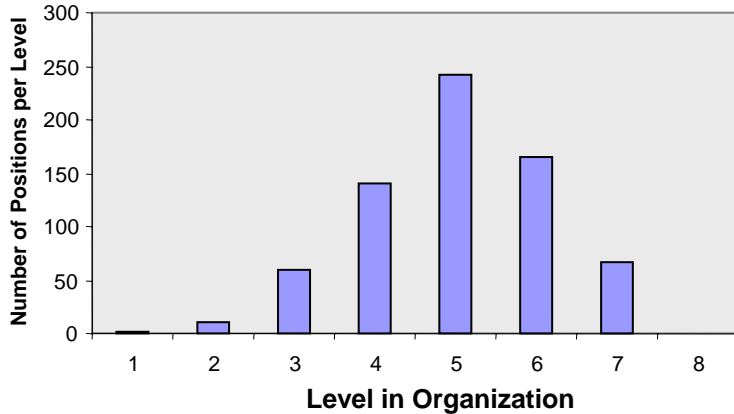
See "Hubs in the Diamond"
[NetAge White Paper](#)

Leadership Span

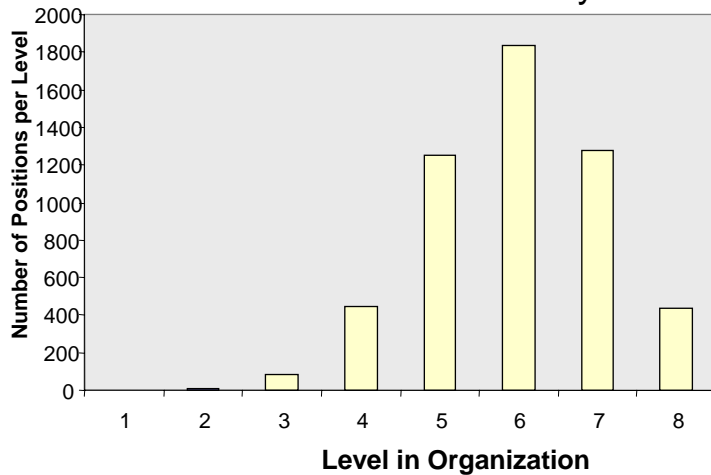
Few nodes,
many links

Eleum's Shape? It's a Diamond, Not a Pyramid

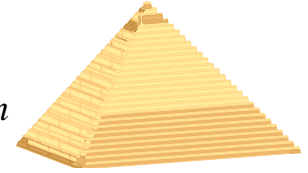
Distribution of Leaders by Level



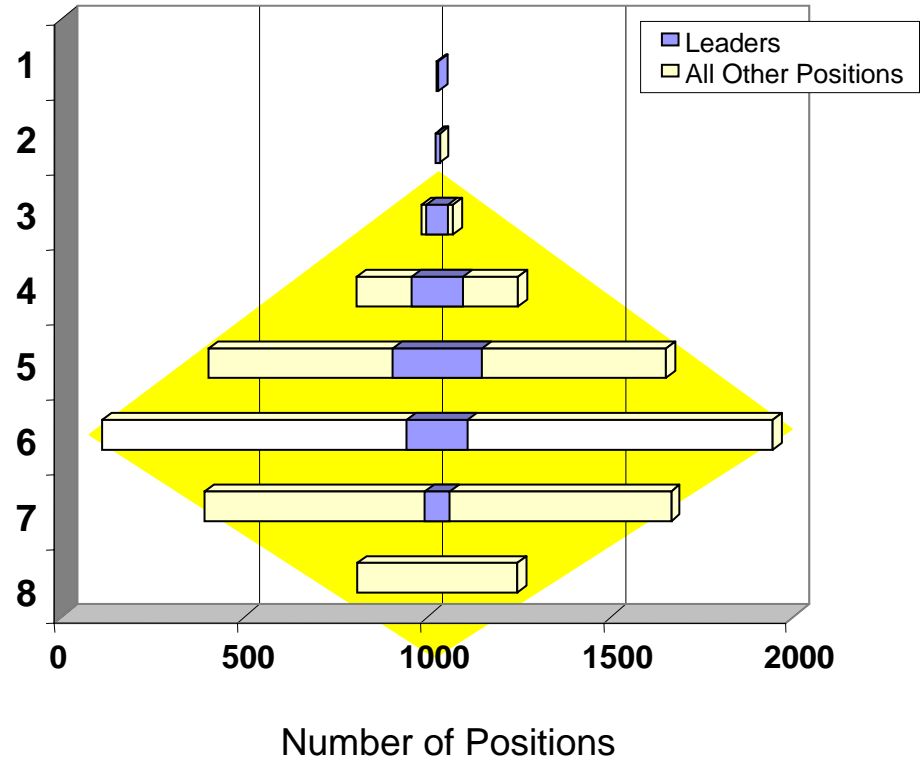
Distribution of All Positions by Level



Classic shape
of organization



Level in
Organization

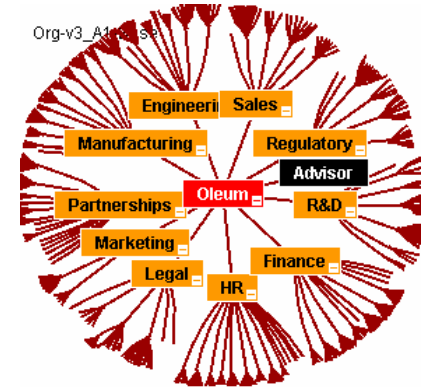


See "Hubs in the Diamond" [white paper](#)

How Do You Map, Analyze, and Design for a Networked Organization?

A Tool to See Organizations as Natural Networks

- OrgScope models organization as symbolic network of nodes and links
 - *For example, as formal network of positions connected by solid-line reporting relationships*
- Multiple types of links can connect multiple types of nodes
- Position is key type of node
 - *Can represent itself, organizations, teams, people*
- Primary reporting relationship is key type of link
 - *Defines formal organization boundary*
- OrgScope models hierarchy from position-based enterprise data system

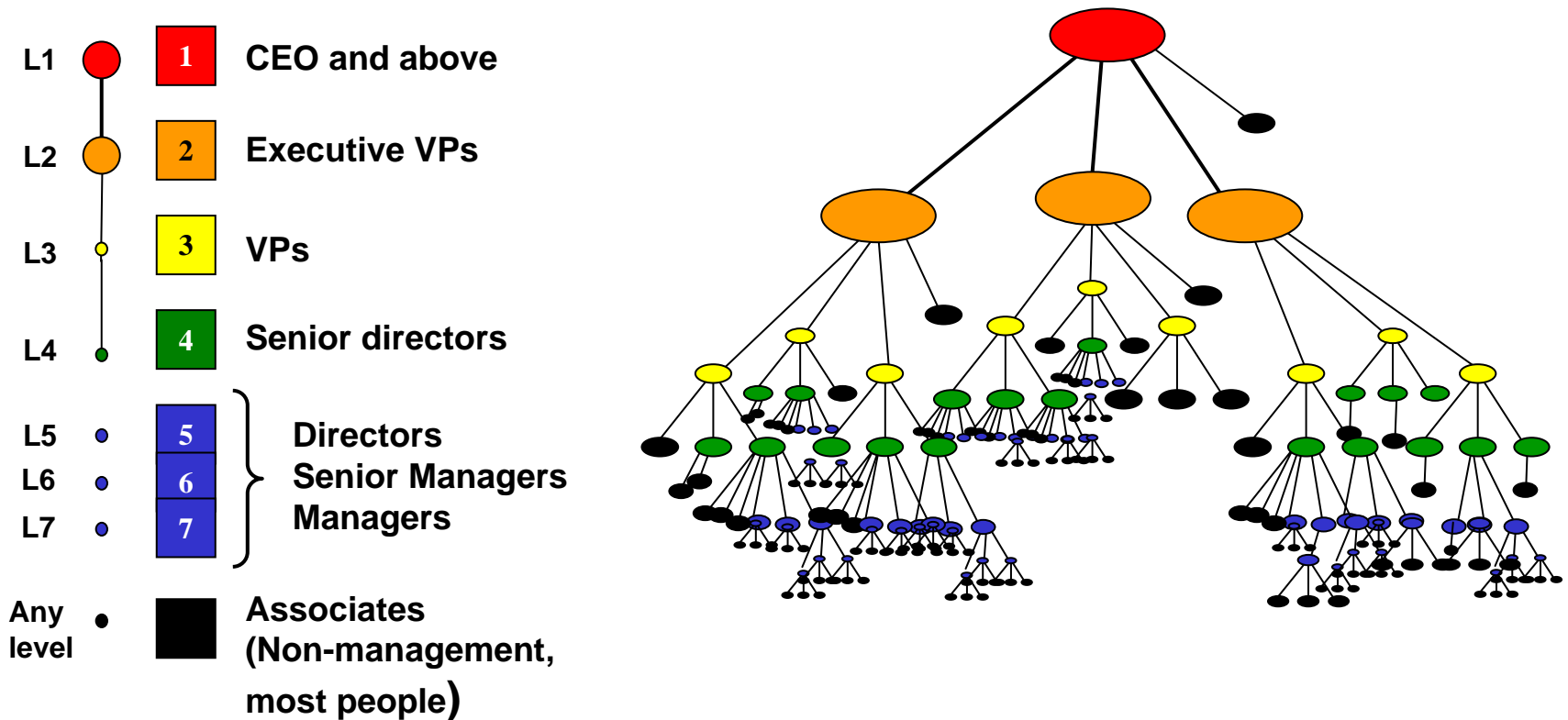


See six [NetAge White Papers](#) on Us: A Theory for more theory foundation

OrgScope Is Representational Technology

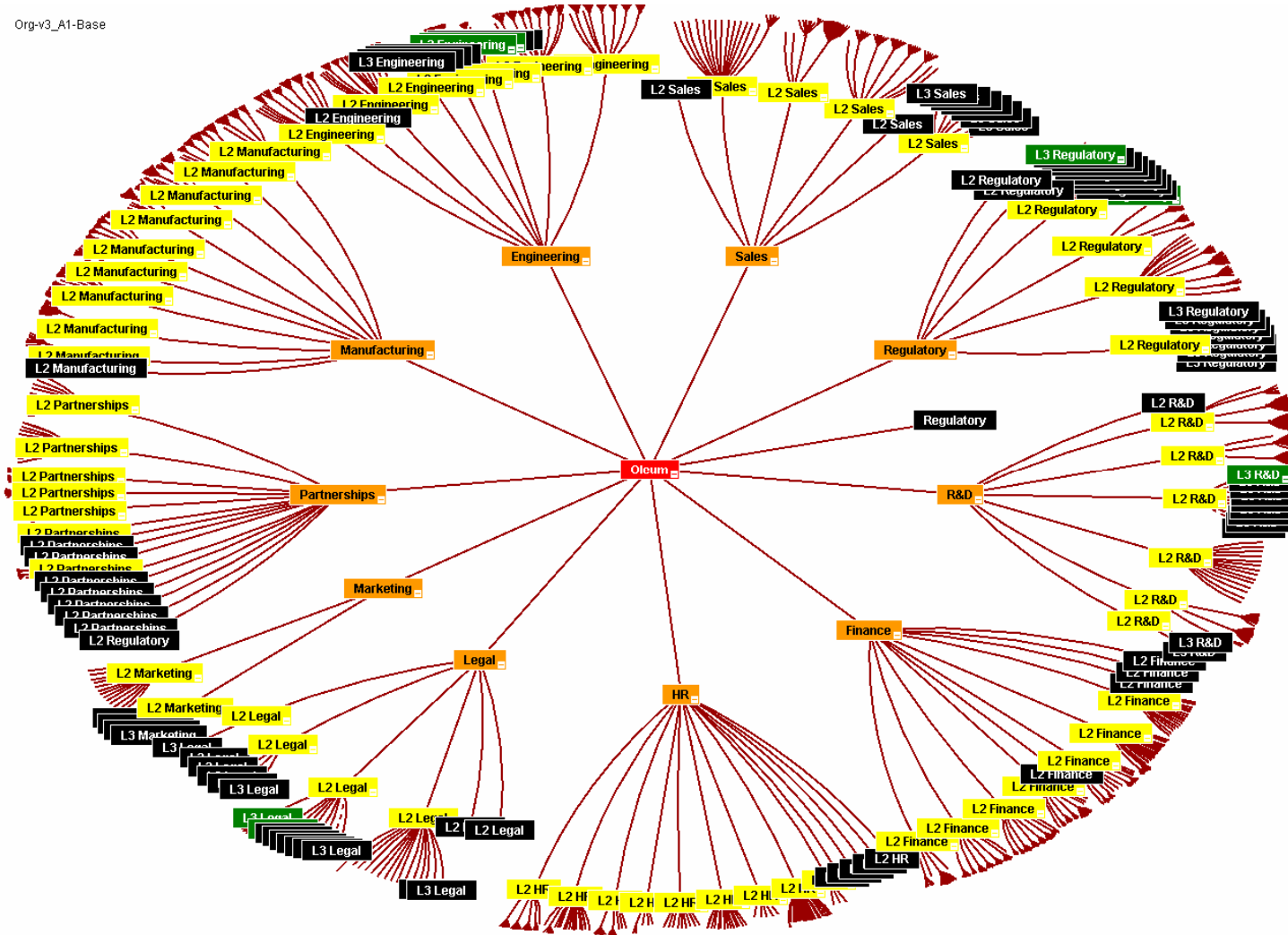
- Maps organization territory (landscape, terrain)
- Comes to life by adding layers of networks based on different configurations and types of nodes and links
- Labels landscape, giving context to key words of local organization language
 - *Includes organization names, team and other group names, position titles, people's names, and names of places*
- Engages both major symbolic systems—logic and language—in single visual-spatial network model of numbers and names
- Scalable from small to very large organizations

We Code Leadership Levels by Color



OrgScope Demo

Org-v3_A1-Base

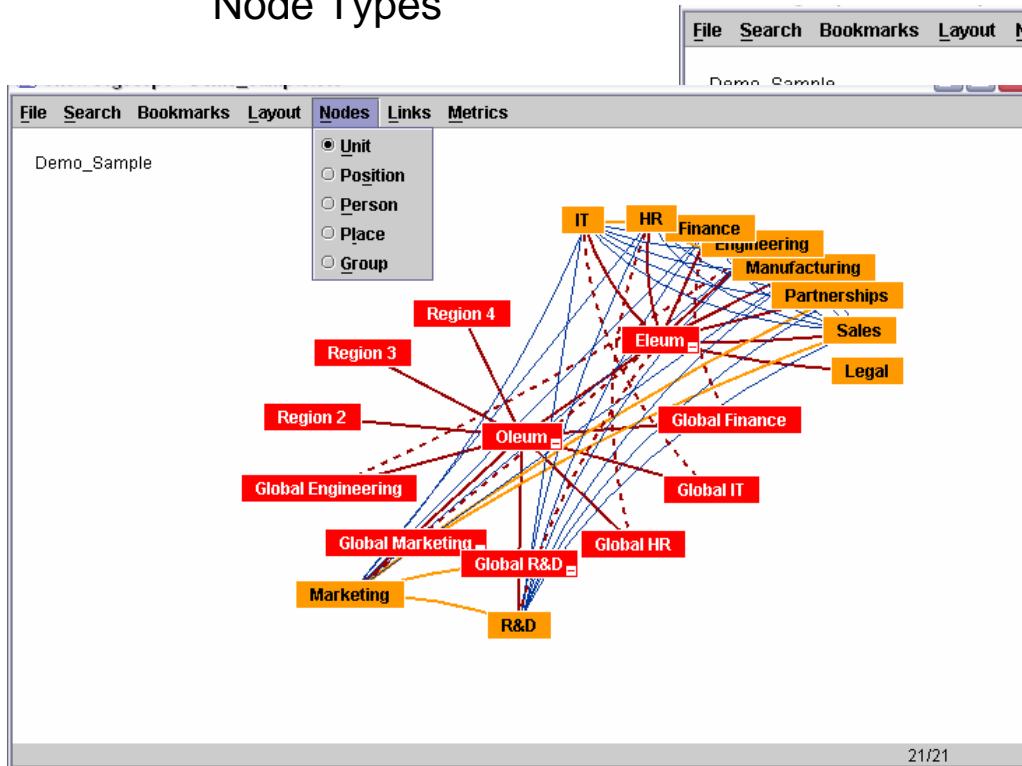


OrgScope Demo Script

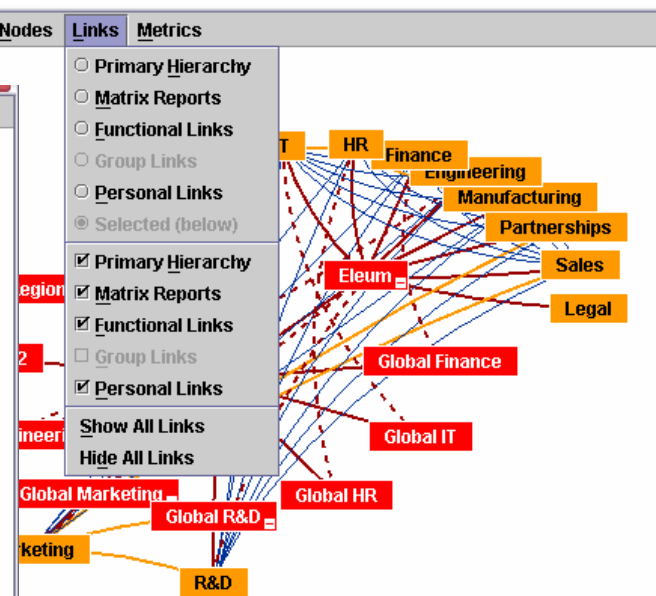
- Open on wheel of base hierarchy – logic of org chart
- Show motion, mobile point of reference, orientation, return to center
- Show node labels: organization, title, person, place – detail of org chart
- Go down Engineering thread and note topography in levels, hubs
- Open on matrix, change orientation, go down Accounting thread
- Center near top, turn off matrix, and show link types on menu
- Turn on quantity, calculate CEO, show size, metrics menu
- Show span, hubs, as quantities
- Return to program

OrgScope Maps Multiple Types of Nodes and Links

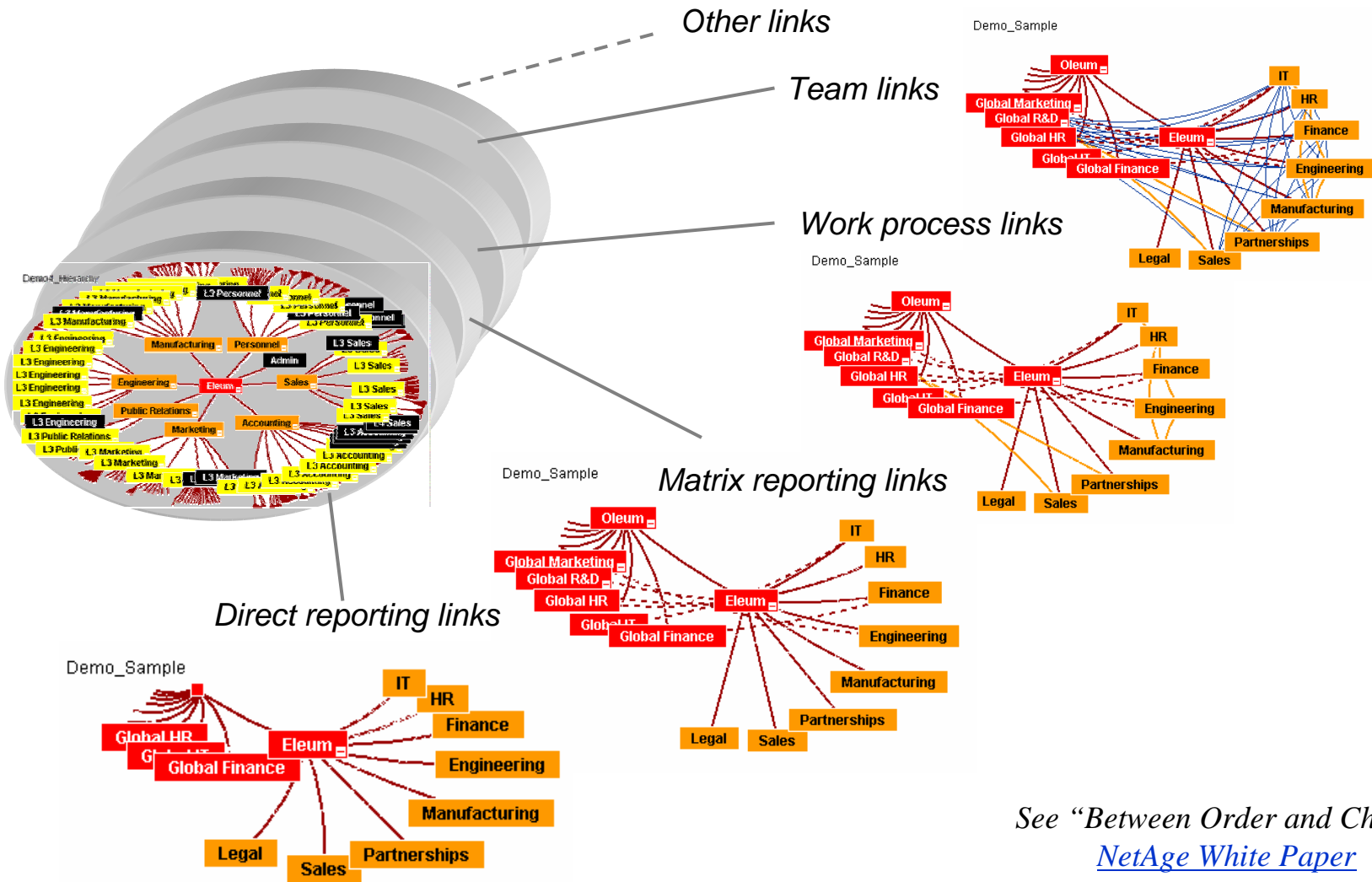
Node Types



Link Types



Many Types of Links Overlay Formal Hierarchy



See *“Between Order and Chaos”*
[NetAge White Paper](#)

Eleum's Executives Asked Questions Based on Initial Results

- Do we have right people in our leadership groups?
- Do we have the communication strategy we need to reach everyone?
- Who are the “hubs” in organization? At what levels do they appear?
- Do hubs differ from formal leaders?
- How many people do we really have on the line?
- What does picture look like when we add matrix reports? Contractors?
The global organization we're part of?
- Is there a compelling leadership story in these pictures?
- What is the leadership profile at each level?
- Where is our organizational center of gravity?
- What importance do levels have as organizing principle?

Management By *Clicking* Around

- Very difficult to adopt HP's "management by walking around" in virtual world
 - *Leaders cannot be everywhere the organization is*
 - *More globally distributed organization means less face-to-face contact*
 - *Travel is increasing hassle*
- The higher your position and the larger the organization, the greater the difficulty of "grasping the whole" and "keeping in touch"
- Virtual organization tools enable you to be in many places at once without moving—or even while moving

Two Ways to Make Virtual Places Solid Online

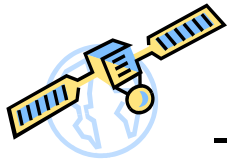
- Possible to construct data-driven virtual enterprise architecture from organization network model
 1. Architecture provides physical metaphor of organization that changes as data changes
 - *Can create and map organizationally continuous virtual structures that connect to non-contiguous physical spaces*
 2. Architecture can generate adaptive framework for online virtual collaborative work structures
 - *Use network and/or physical models to navigate complex structures*
 - *Data in collaboration system can flow back to source and update enterprise model*

When NetAge OrgScope Meets Google Earth

Earth-OrgScope: Whole Planet, Whole Organization

- NetAge OrgScope brings whole organization into single accessible, navigable organization-chart, network view
- Google Earth brings whole planet into single accessible, navigable physical-picture view
- Both use “hyperbolic viewer” technology
 - *View surface of sphere from any chosen point of reference*
 - *Can “see” at different levels of resolution*
 - *Sensation of “flying” in 3D space*
- Both offer overlays of associated information
 - *Physical overlays for planet, relationship overlays for organization*
- Earth-OrgScope connects all levels of representations
 - *Abstract symbolic model is connected through*
 - *...Organization and place category overlays to*
 - *... Representations of concrete physical systems of people, places, and things*

Our Planet Is Public: Every Place Has GPS and Legal Addresses



GPS coordinates

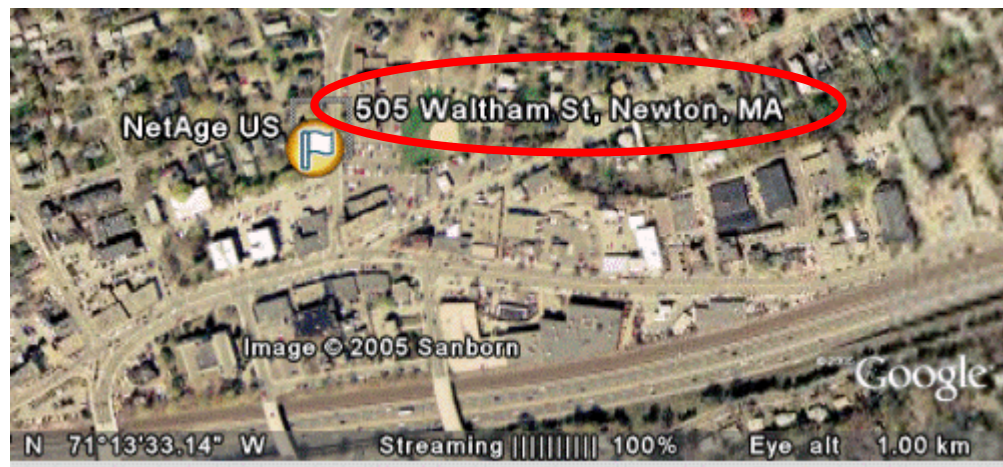
*Every place
has GPS
address, geo-
point*




*Every place
has point-of-
view, eye
altitude*

30,301 km 

*Every place has
legal address*



1.0 km 

Points of View, Levels of Resolution

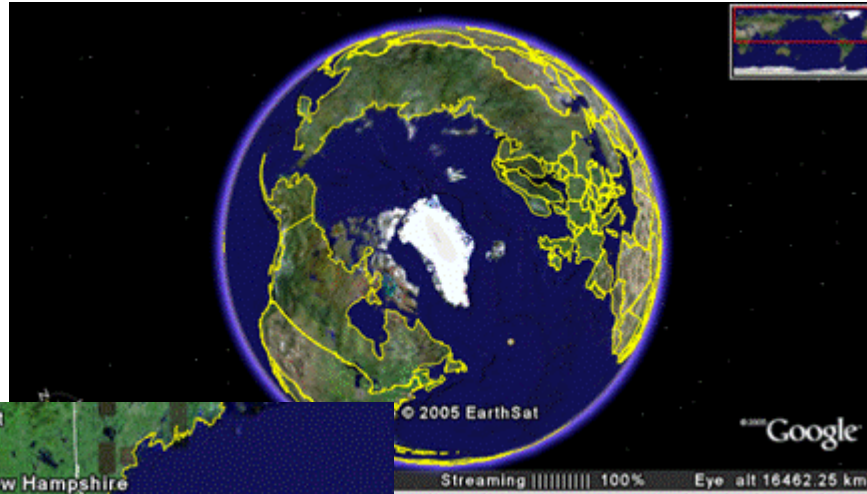
The lower the “eye altitude,” the higher the resolution
The higher the eye, the lower the detail




Location	Eye Altitude
Earth	30K km
Country	16K km
Province-State	600 km
Locale	25 km
Building	480 m
Floor plan	268 m
Seat/station	47 m

Political Jurisdictions Overlay Place

Nations



16,462 km 

Provinces/States



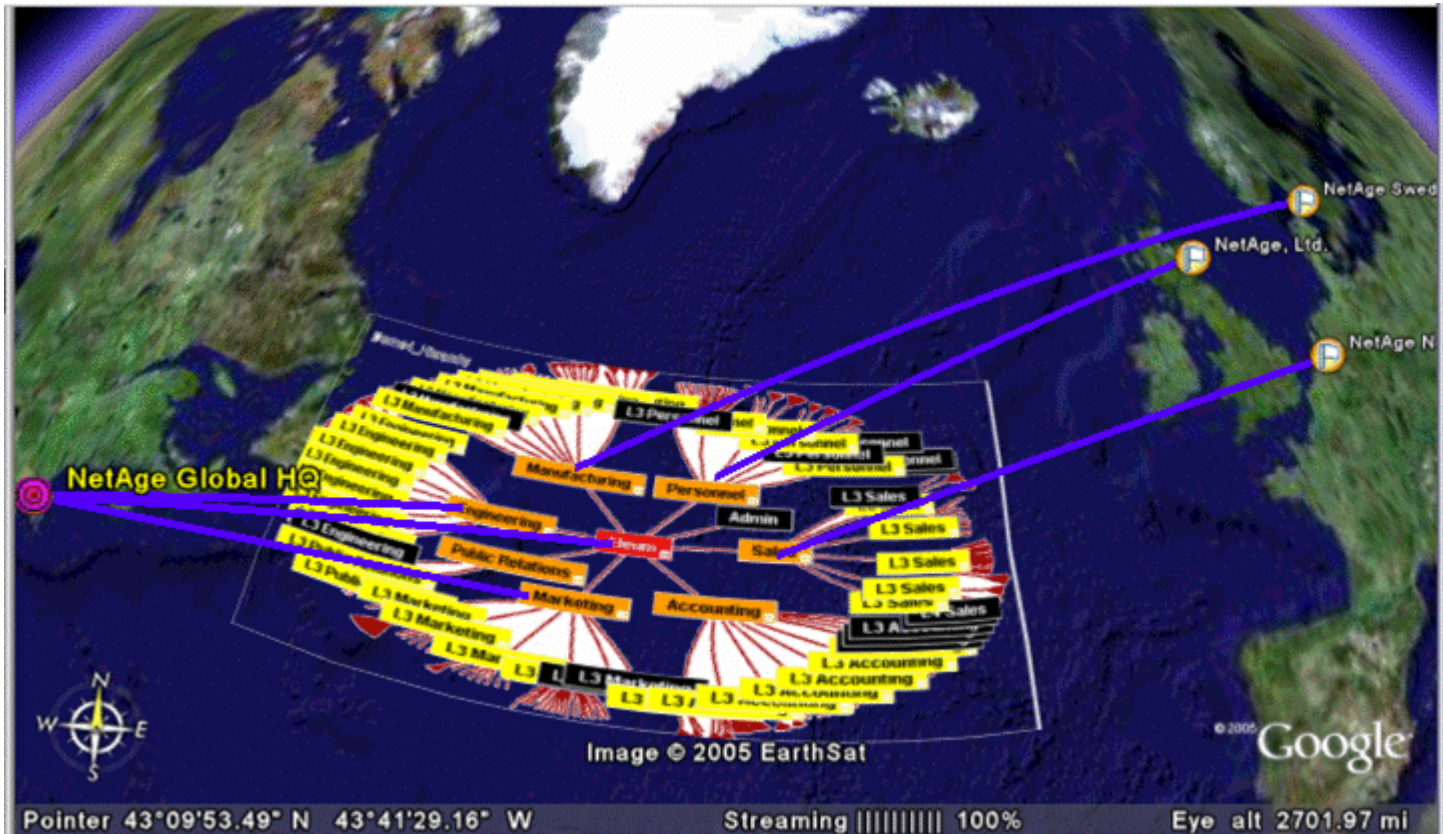
 780 km

Localities



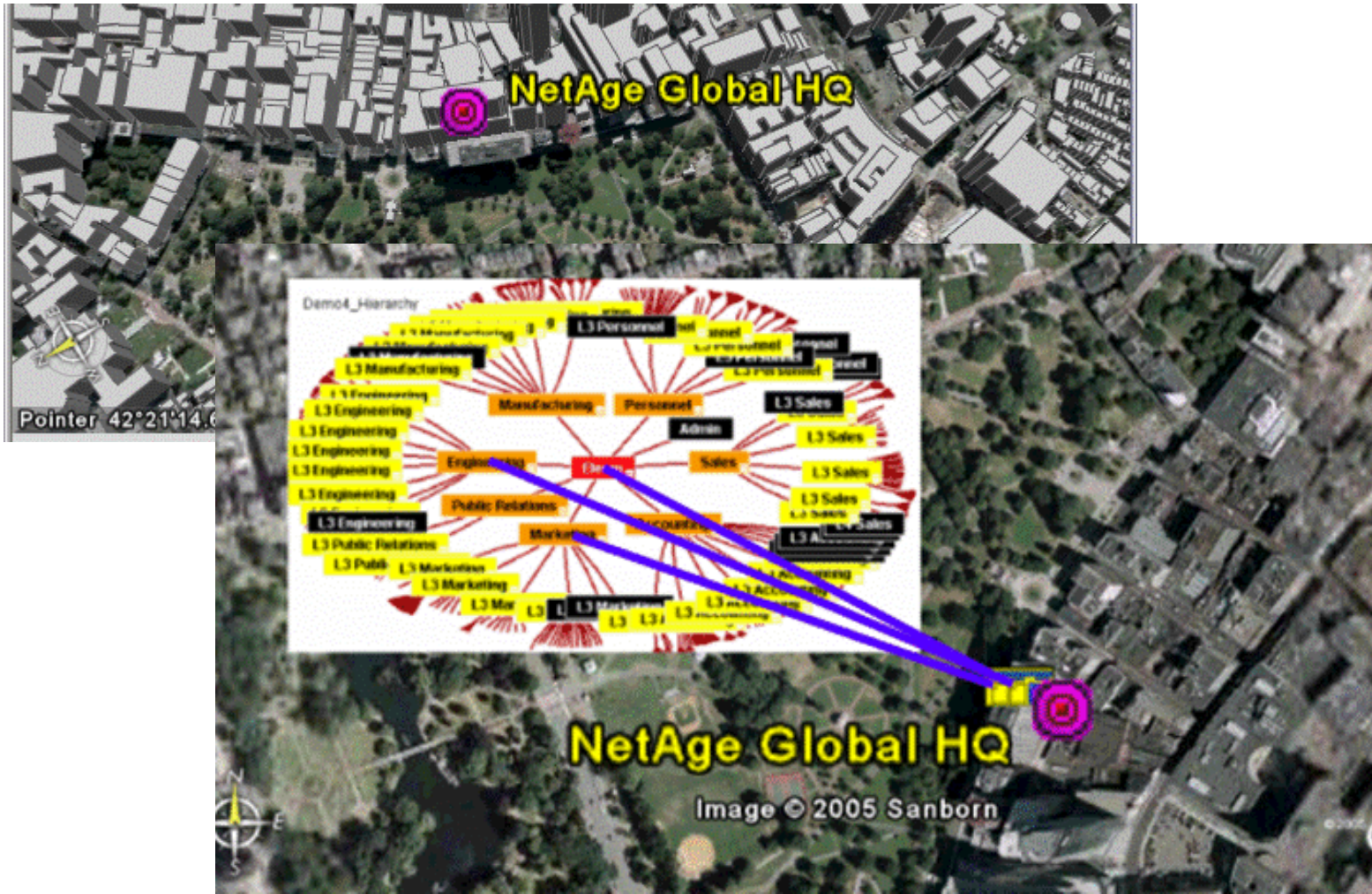
 17 km

Organization Network Connects Physical Places



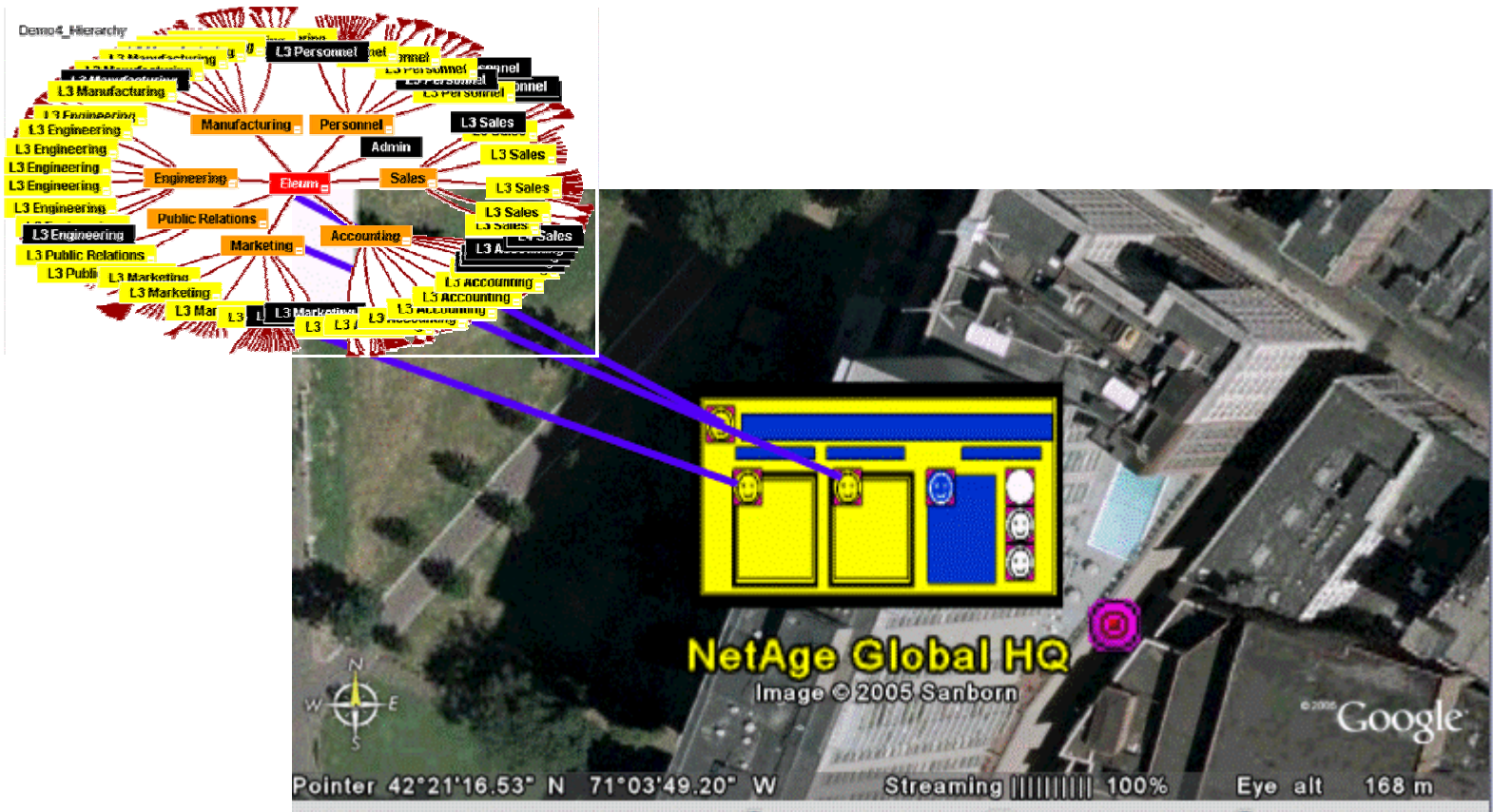
 2701 km

Positions in Organizations Also Can Be Physically Located and Addressed



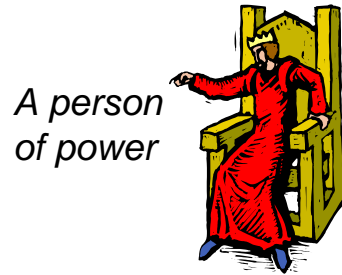
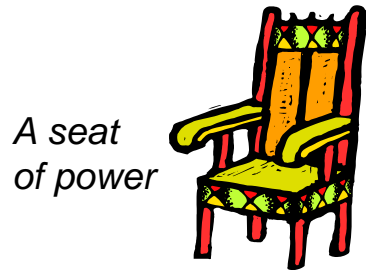
1 km

Executive Floor Plan: Virtual and Physical

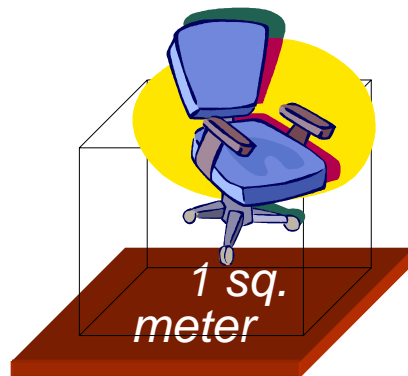


 168 meters

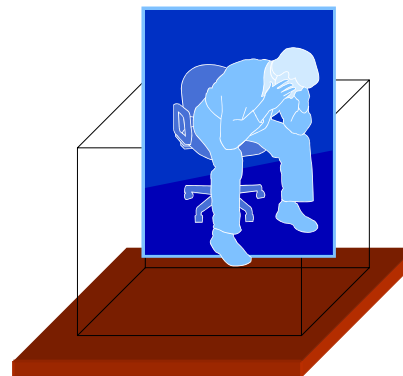
Making Positions Concrete with Place



- Chair represents a position
- Person sits in chair doing a job
- Person standing or sitting takes up about 1 square meter
- Positions, jobs, and people measure roughly 1 sq. meter
- All three can be linked to physical places, whether fixed or mobile



Position



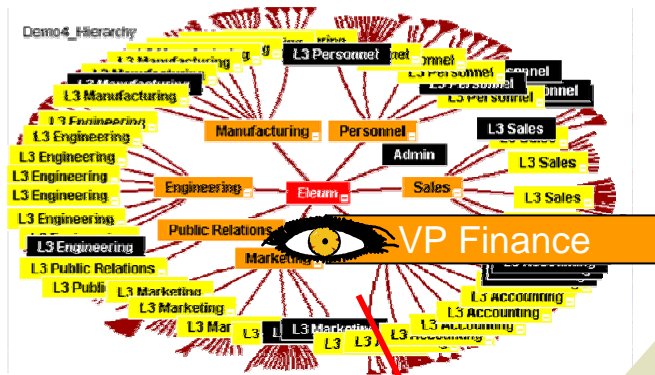
Job



Person

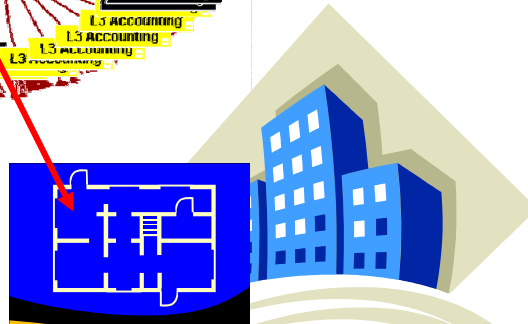
Place

Positions Have Formal Places, People Are Always Some Place



- Traditionally, desk assigned to precise facility with particular address and geo-point

Sits at this desk, HQ 2-14



On this street, 505 Waltham



Every position located somewhere

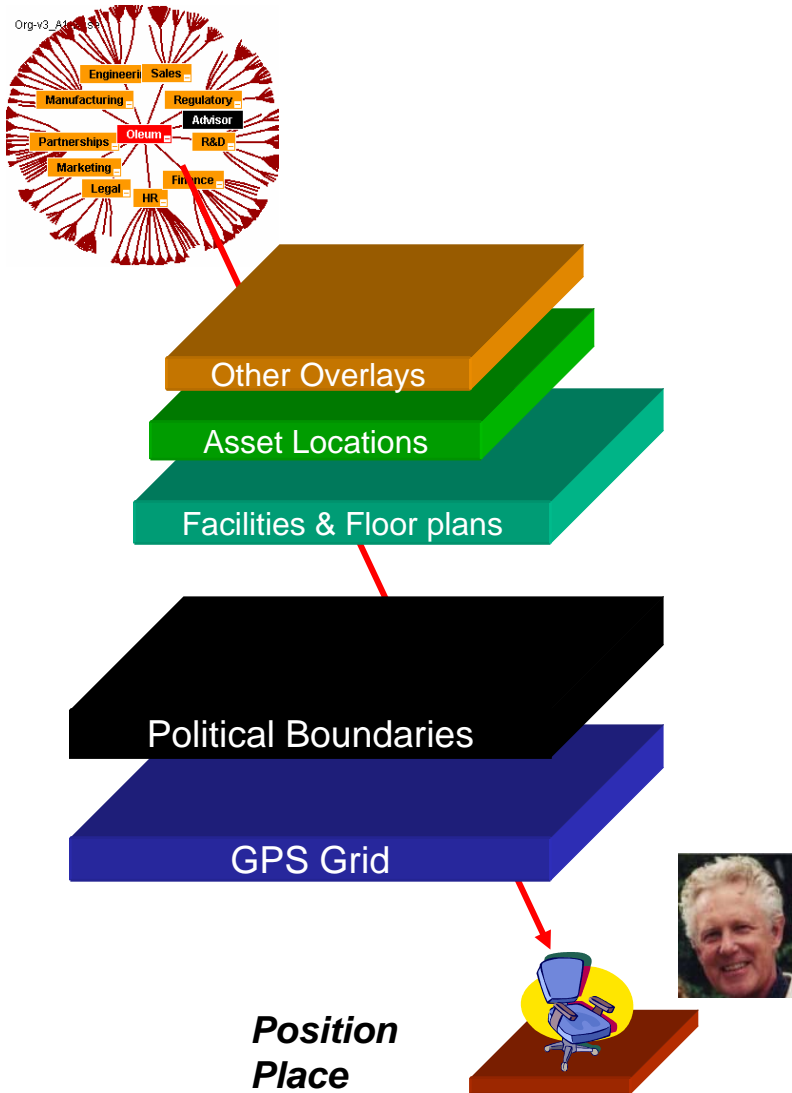


Person occupies position



Person always somewhere on planet

Position Places Located on Many Overlays



- Position places, anchored to earth, can be located in multiple category overlays
 - *All points in arbitrarily large number of categories of things can be given both GPS and political coordinates*
 - *National boundary overlay is near-universal global overlay*
 - *GPS coordinate system is universal global overlay*

Political Overlay of Great Importance to Global Organizations

- Global companies must operate both as integrated global entity and as network of national companies
- Facilities and assets are located in particular countries, provinces-states, and locales
- People are citizens of countries, and they are residents (permanent or temporary) of countries
- Place where positions situated always carry a political context

Earth-OrgScope: Global Leadership Dashboard

NetAge OrgScope

Organization
Overlays

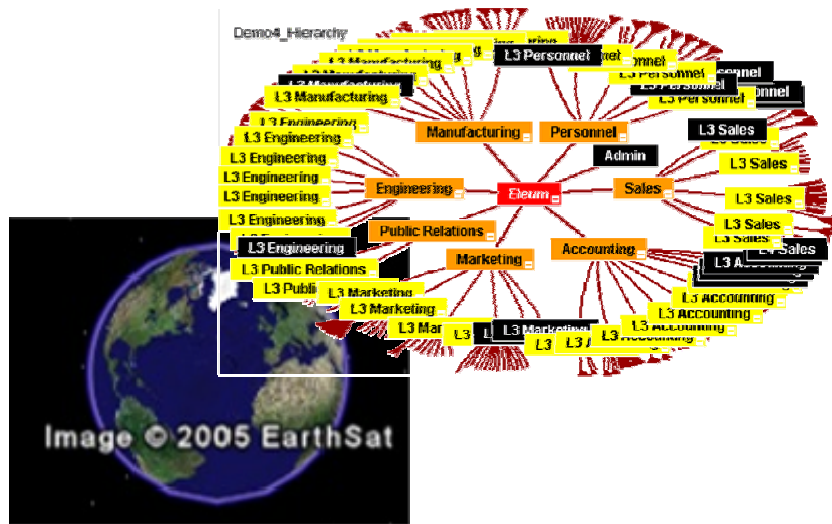
Place
Overlays

The screenshot displays the Earth-OrgScope application running on a desktop. The main window is a Google Earth interface showing an aerial view of a city. A central window titled 'OrgScope - Demo_Hierarchy.stc' displays a complex organizational chart with nodes for various departments like Manufacturing, Personnel, Admin, Sales, Engineering, Marketing, and Accounting. The chart is overlaid on the map, with a red dot marking the 'NetAge Global HQ' location. The left sidebar shows a 'Places' list with various organizational units and a 'Layers' list with geographical overlays like 'National Geographic Maps' and 'Keyhole Community BBS'. The bottom of the screen shows a browser window with the URL 'http://69.20.42.18/NetAge/Start/Bwlink.exe?func=480&id=48113&obj=4&mode=browse' and a taskbar with several open applications.

Google
Earth

Online
Workplace
(Livelihood)

From Concrete to Abstract and Back



- Global mindset
 - *Global perspective*
 - *Country consciousness*
 - *Local knowledge*
 - *Personal perspective*

- Multi-level perspective, global to specific
 - *Levels of resolution “eye altitude” and “org altitude”*
- Situational awareness of physical context
 - *Always have context of real pictures of planet’s surface*
- Situational awareness of organizational context
 - *People-in-positions always in network of organizations and people*

In Summary: Use the OrgScope Lens Positively

- Anchor positive lens in ground-level reality of organizational logic, a.k.a., the hierarchy
- Design layers of matrix, process, group, information, and social links between people-in-positions to bring working networks to life
- Expand the self-centered view by mapping key connections one, two, more links away from core organization
- Use logical language to structure visual display architectures and online virtual workspaces
- Anchor positions-in-places to associate physical location with virtual relationships, i.e., connect earth to organization
- Map existing, newly designed, proposed, and envisioned organizations
- Design communication, engagement, and professional development strategies based on organization's true architecture

White Papers at www.netage.com



collaborating in the networked organization

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Suffering on Telecons?
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Great articles

Virtual Workspace
Future Is Now
Coolest Collaboration
Working at a Distance
Coach Universe

Company

About Us
Contact Us
Safe Harbor Policy

Katrina: Help kids directly with child care
See AGN's response



>> Details
>> Download
>> Mini-book

Decide to Network
by Robert Muller



Collaborate or Disappear

Interview with Jessica Lipnack in Volvo's USE IT

>> See USE IT Fall, 2005, "No Success Without Collaboration"
>> See Jessica's interview by Tobias Hammar
>> See editorial by Ulf Nilsson, president of Volvo IT

As globalization and the web speed up work, NetAge helps develop more networked and collaborative organizations. We advise on strategy, propose and support projects, offer education and training, and introduce innovative methods and tools.

Engagement and Projects

World-class collaboration for networked organizations
>> Learn more

Enterprise collaboration requires executives to set strategy and staff to commit to virtual working. NetAge works on complex projects where people have to collaborate in distributed teams.

Education and Training

Workshops, seminars, and licensed programs: Principles, practices, and tools for virtual work.
>> Learn more



Jessica Lipnack, The Hague, 2005
See her blog, *Endless Knots*

Software for Collaboration

Livelihood virtualteams:
An enterprise solution for virtual organizations and teams. Based on NetAge methodology, developed with Open Text.
>> Screen / Data Sheet / Product Details



Jeff Stamps, Bear Island, 2003
See his thinking, *Us: A Theory*

NetAge Orgscope:

Under development with Inxight. Enables visualization and analysis

Think you understand your org chart? Take another look.

Us: A Theory

Series of six white papers

We wrote the book:

virtual teams:
people working across boundaries with technology



Best-selling second edition from NetAge's founders.
>> Details and Buy at Amazon
>> Read Chapter 1

"the definitive book on managing successful virtual companies" - Walmart

And the article:

"Can Absence Make a Team Grow Stronger?"

Far-flung teams can be remarkably productive, even outperforming groups whose members work side by side. New rules about how to manage them. >> More

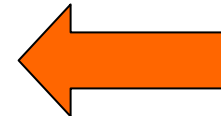


Buy from HBR


Inside Social Networks

Jessica Lipnack observes a conference on the hot topic of social networks. >> Read

>> See her blog, *Endless Knots*



Papers on Organisations as Networks



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Us: A Theory

Papers on a new organization network science

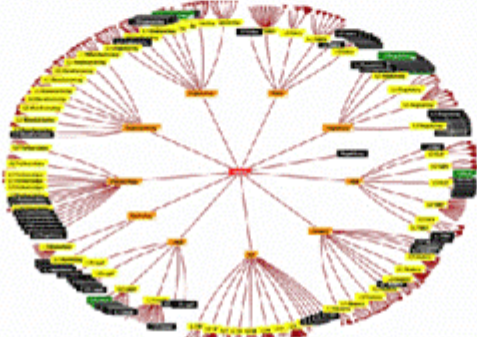
For 25 years we have been giving voice to the idea that "the network is a form of organization," the evolutionary successor to hierarchy-bureaucracy. Now we have come full circle to the idea that "the organization is a form of network," a naturally-linked configuration of people-in-positions.

Introduction

To further our mission—to help people work together better through networks—we have developed new theory about human organization and drawn some broad implications from early testing of several central network hypotheses. There is some validation of core organization network ideas from practical application in the field, so that is where we begin the *Us: A Theory* white paper series.

Paper Summaries

We live in a new era of stunning connectivity, creating in a few years vast new webs of knowledge and people grown in a digital culture. At the same time, webs of terror and counter-terrorism are transforming our civic culture before our eyes. Knowing ourselves as networks is essential to our survival and creative adaptation to an increasingly complex world.



- Introduction Summaries
- 1. Hubs in the Diamond
- 2. Deep in the Heart of Hierarchy
- 3. Revolution in Networks
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**Decide to network
Use every letter you write
Every conversation you have
Every meeting you attend
To express your fundamental beliefs and dreams
Affirm to others the vision of the world you want
Network through thought
Network through action
Network through love
Network through the spirit
You are the center of the world
You are a free, immensely powerful source
of life and goodness
Affirm it
Spread it
Radiate it
Think day and night about it
And you will see a miracle happen:
the greatness of your own life.
In a world of big powers, media, and monopolies
But of six-and-a-half billion individuals
Networking is the new freedom
the new democracy
a new form of happiness.**

Decide to Network

By Robert Muller

Robert Muller is former Assistant Secretary-General of the United Nations and now Chancellor, UN University for Peace, Costa Rica. He wrote the poem for Jessica Lipnack and Jeffrey Stamps for their first book, *Networking: The First Report and Directory*.

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