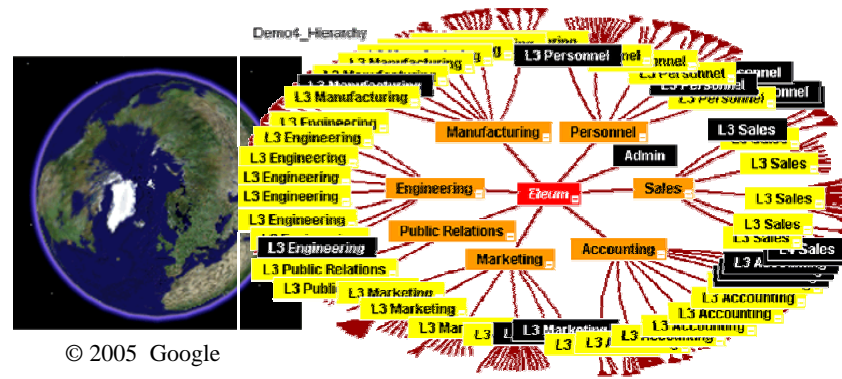**Designing Information and Organizations with a Positive Lens**

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

Earth-OrgScope:

Applying a Science of Organization Networks

© 2005 Google

© 2005 NetAge

Jeffrey Stamps & Jessica Lipnack

www.netage.com

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Who Are We? 25-Year Focus on Networks

Books, articles, methods, theory
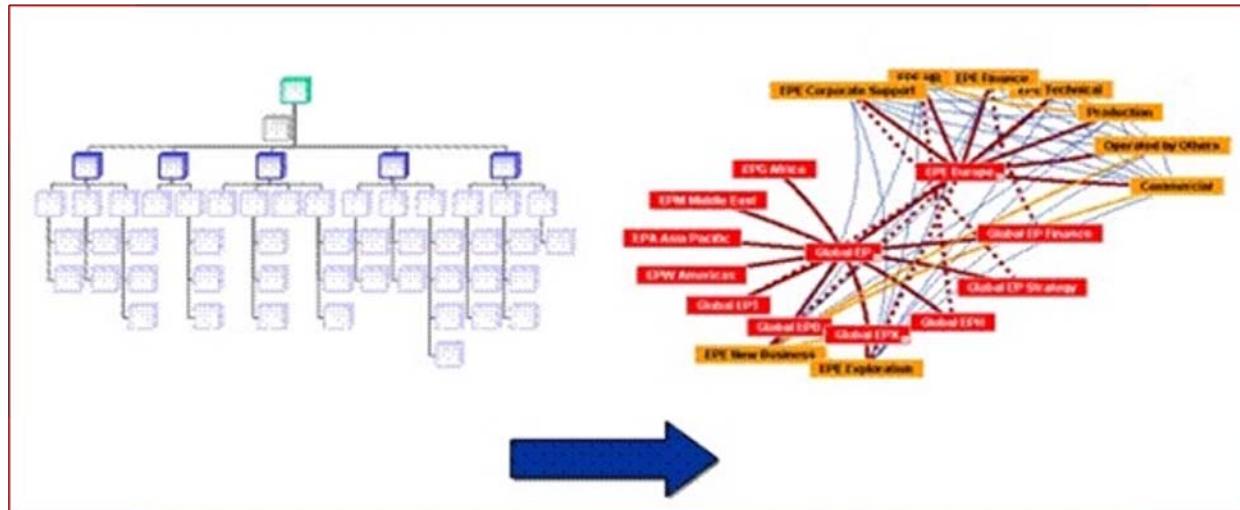
Consulting and projects
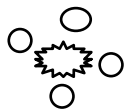
Training and software

Jessica

Jeff

Our Organizational Predicament

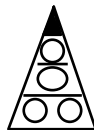*"We can't solve 21st-century problems*
with 19th-century organizations"
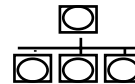
Our Networks Stand on Giant, Old Shoulders

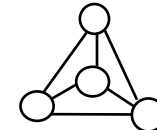**Small Group** + **Hierarchy** + **Bureaucracy** + **Network**

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
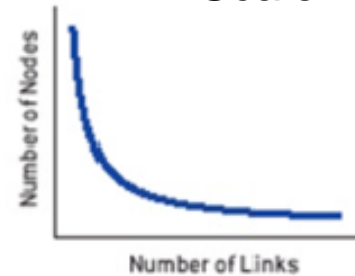
Random

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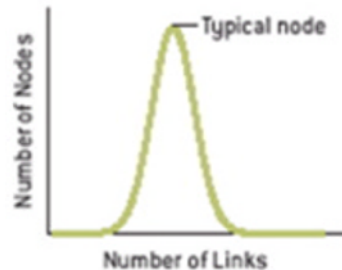
- Nodes have average number of links; no extremes
- Random distribution prevails
  - *Fixed inventory of nodes*
  - *Random attachment of links*

Road system:
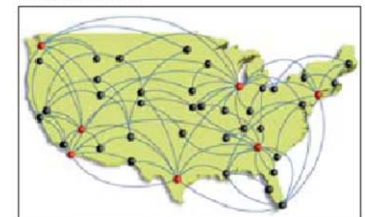*Random network*

Scale-Free

Power-law Distribution

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

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

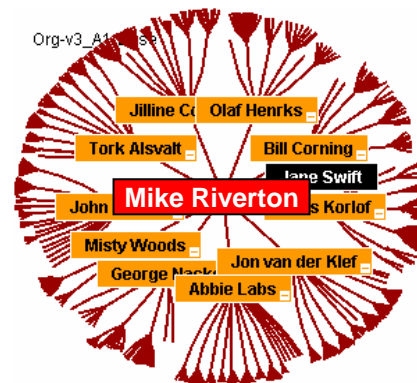"**Scale-Free Networks**" by Albert-László Barabási and Eric Bonabeau, Scientific American, May, 2003

?			?
Hierarchy (org chart)	Organization	Positions	Reporting relationships

See "Revolution in Networks" *white paper*

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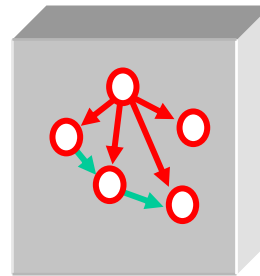

Position

Job
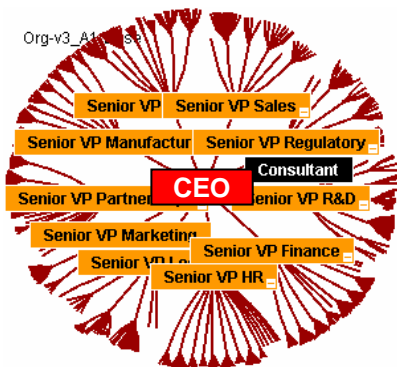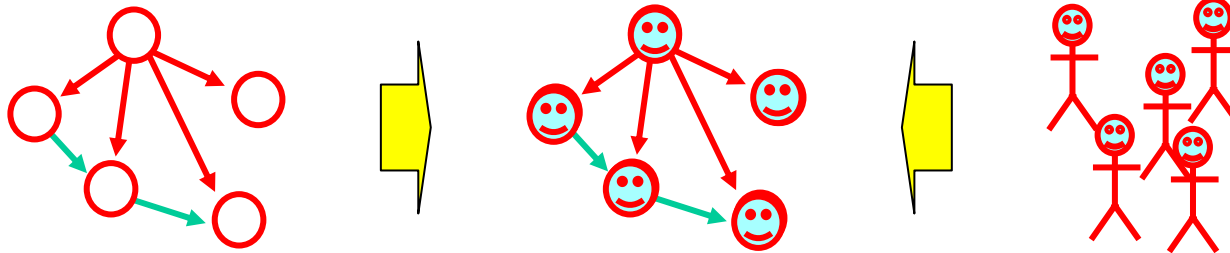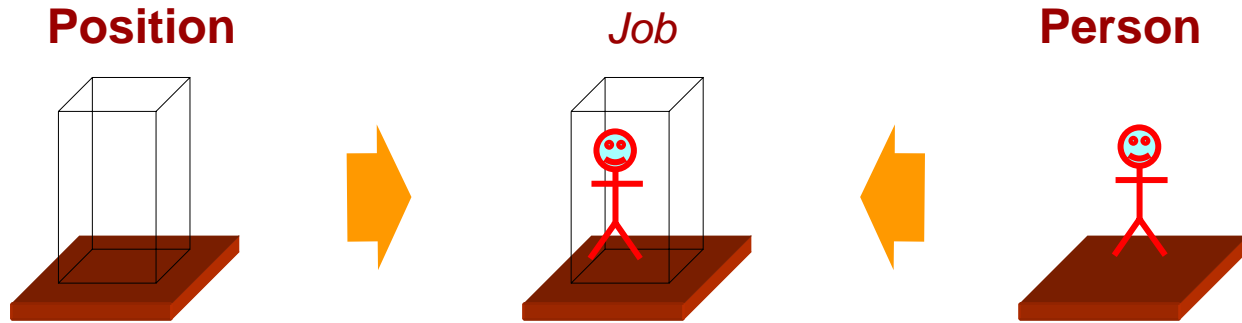
Person

Map of positions as nodes

Map of people as nodes

Leadership Positions Stand for their Organizations
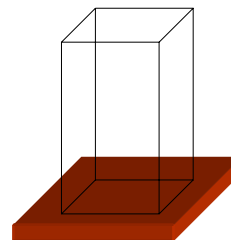
Org nodes

Organization

Position nodes
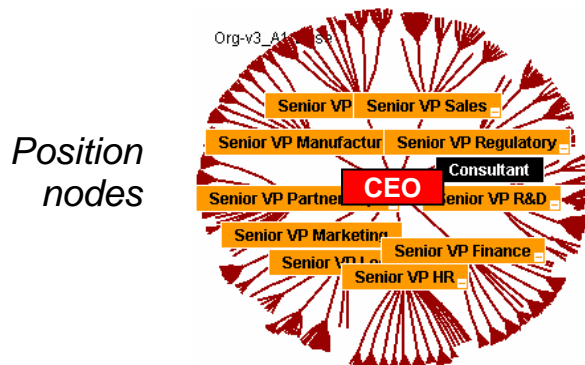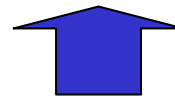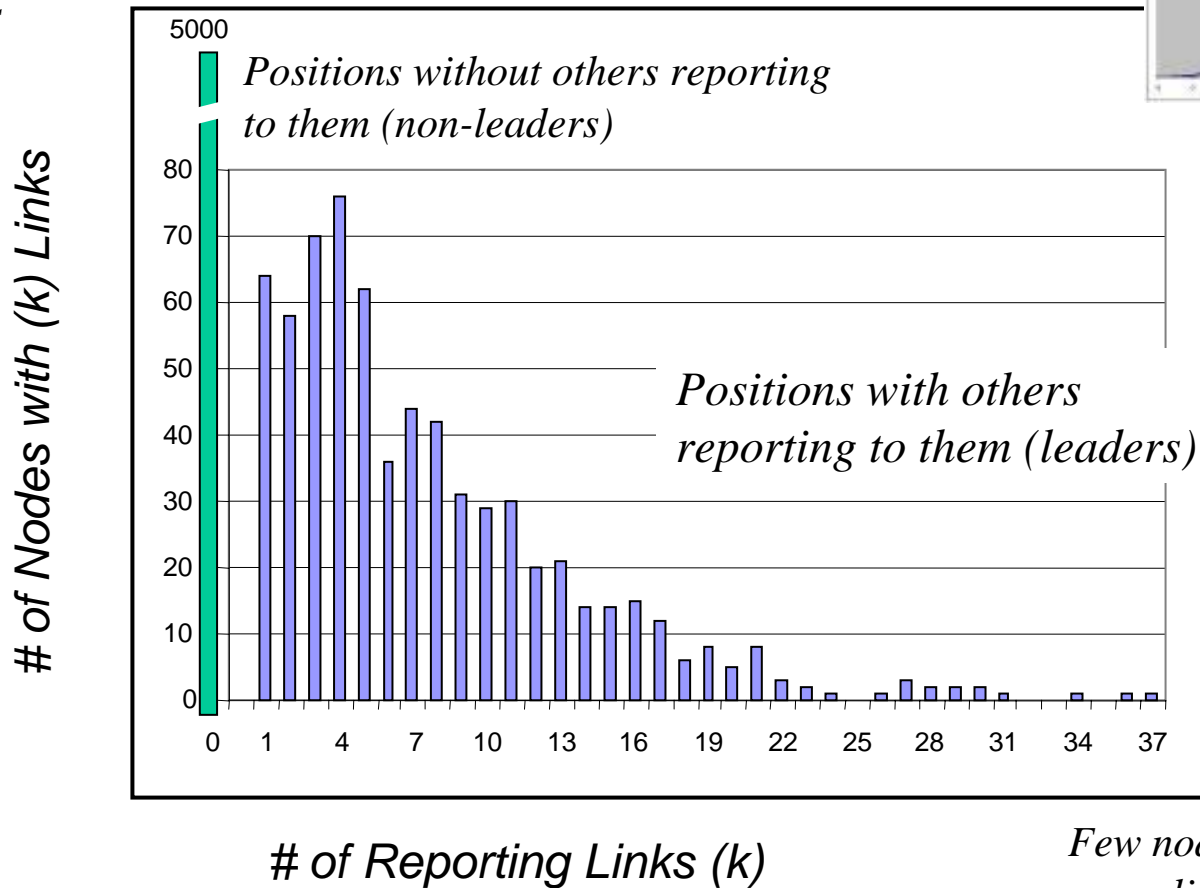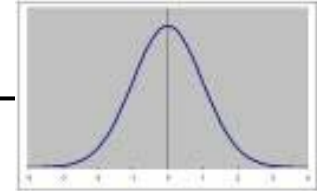
Position

Job

Person
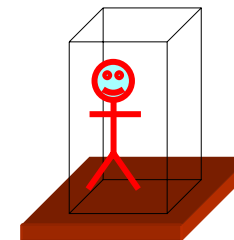
Introducing Eleum: Our Sample Data Set

- 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

# of Nodes with (k) Links

*Positions without others reporting
to them (non-leaders)*

*Positions with others
reporting to them (leaders)*

5000

80
70
60
50
40
30
20
10
0

0 1 4 7 10 13 16 19 22 25 28 31 34 37

# of Reporting Links (k)

*Few nodes,
many links*

Leadership Span
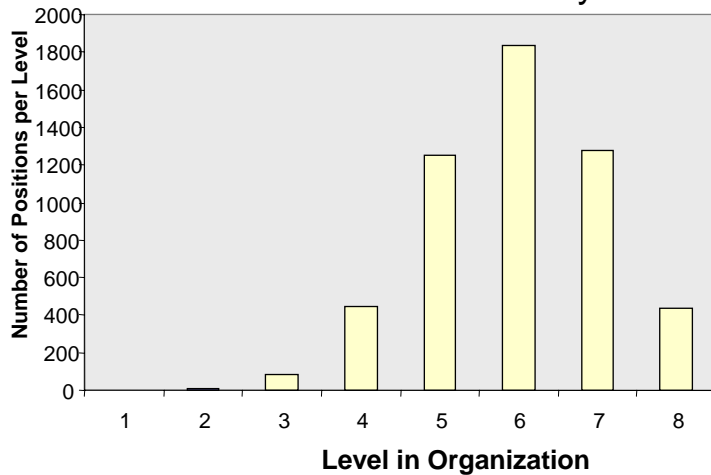
See "Hubs in the Diamond"
NetAge White Paper

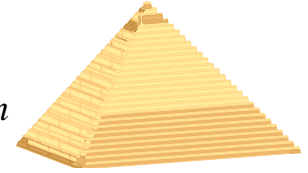**NetAge**

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

Distribution of Leaders by Level
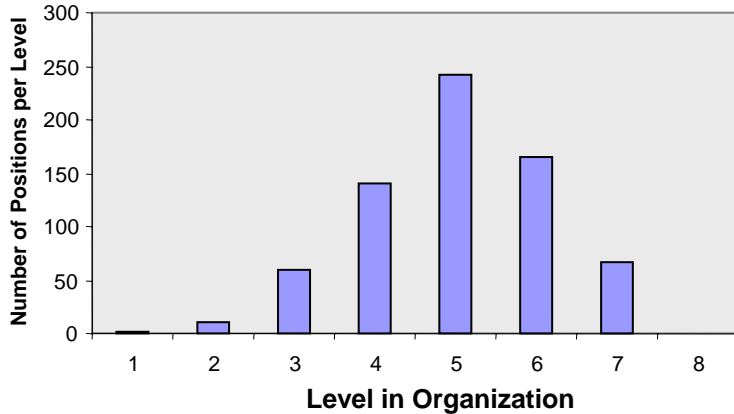
Distribution of All Positions by Level

*Classic shape of organization*

Level in Organization

Number of Positions

Legend: Leaders / All Other Positions
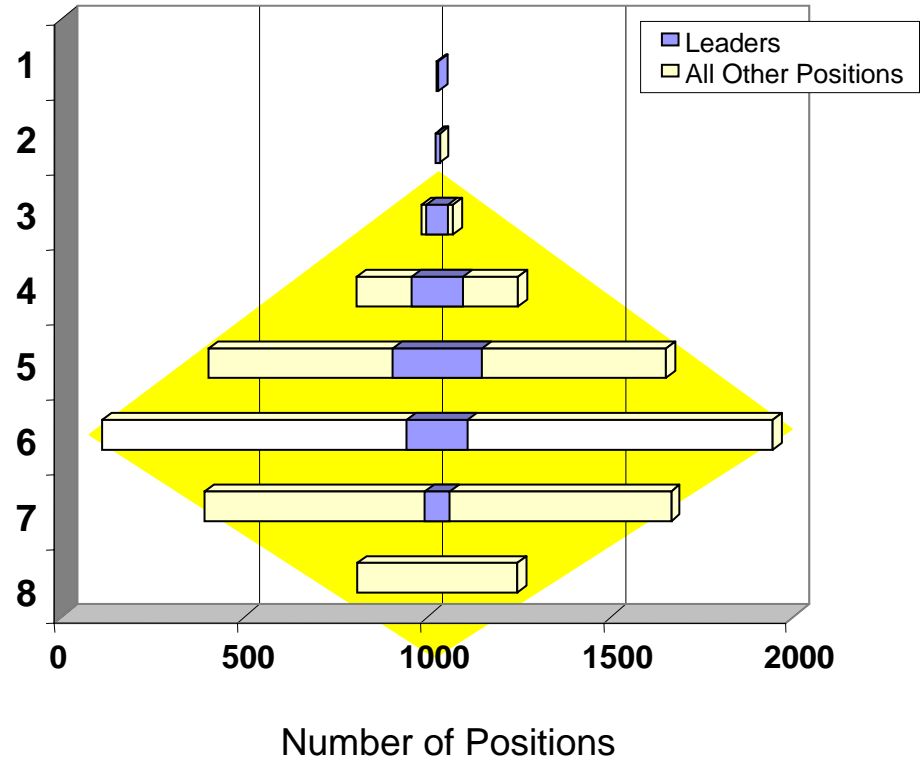
See "Hubs in the Diamond" white paper

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

Earth-OrgScope @ www.netage.com

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*

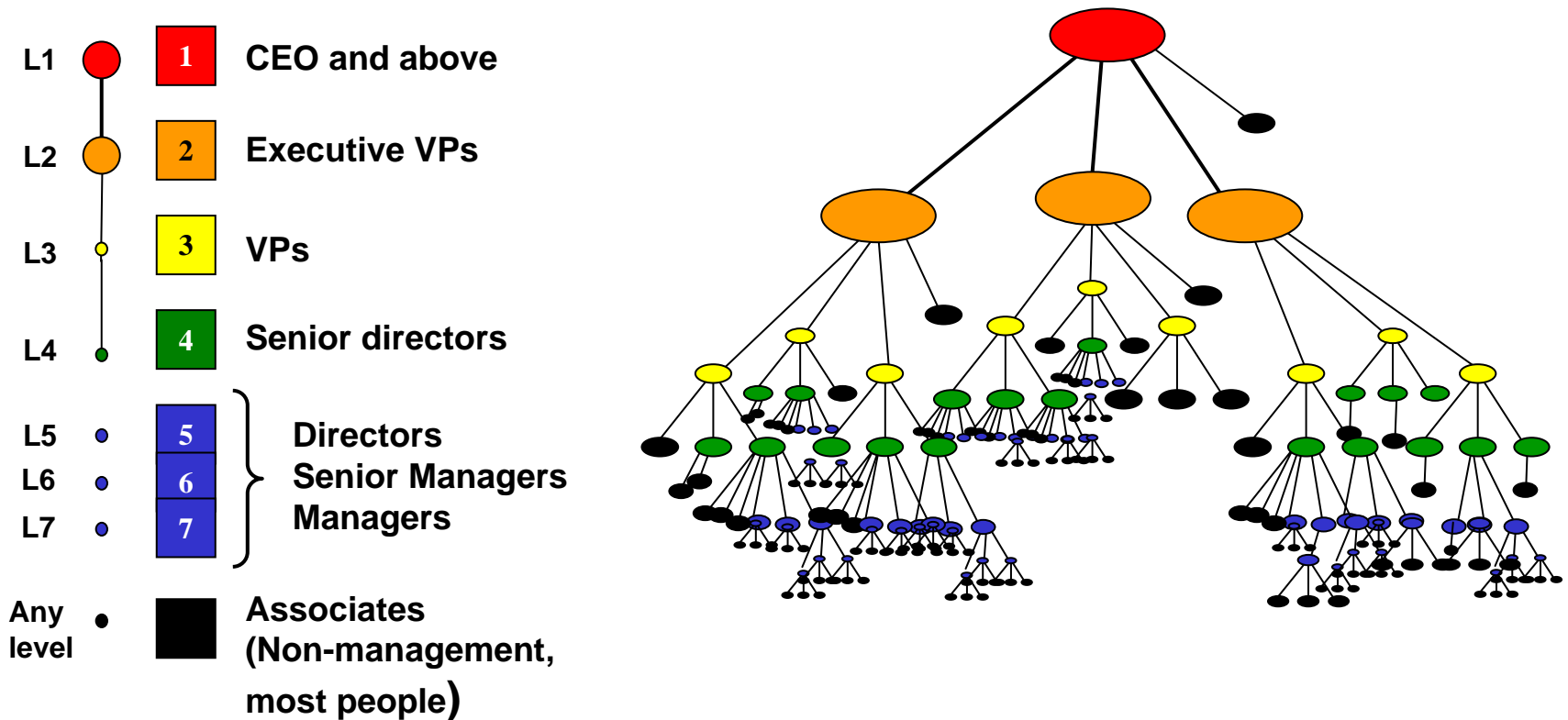- OrgScope models hierarchy from position-based enterprise data system
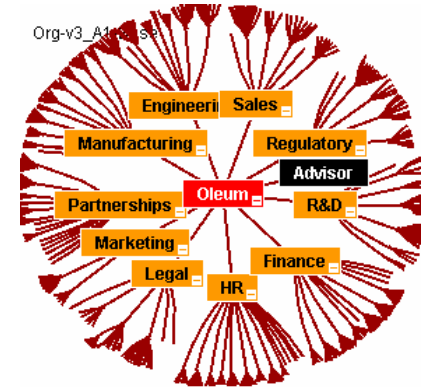
See six <u>*NetAge White Papers*</u> *on* Us: A Theory *for more theory foundation*
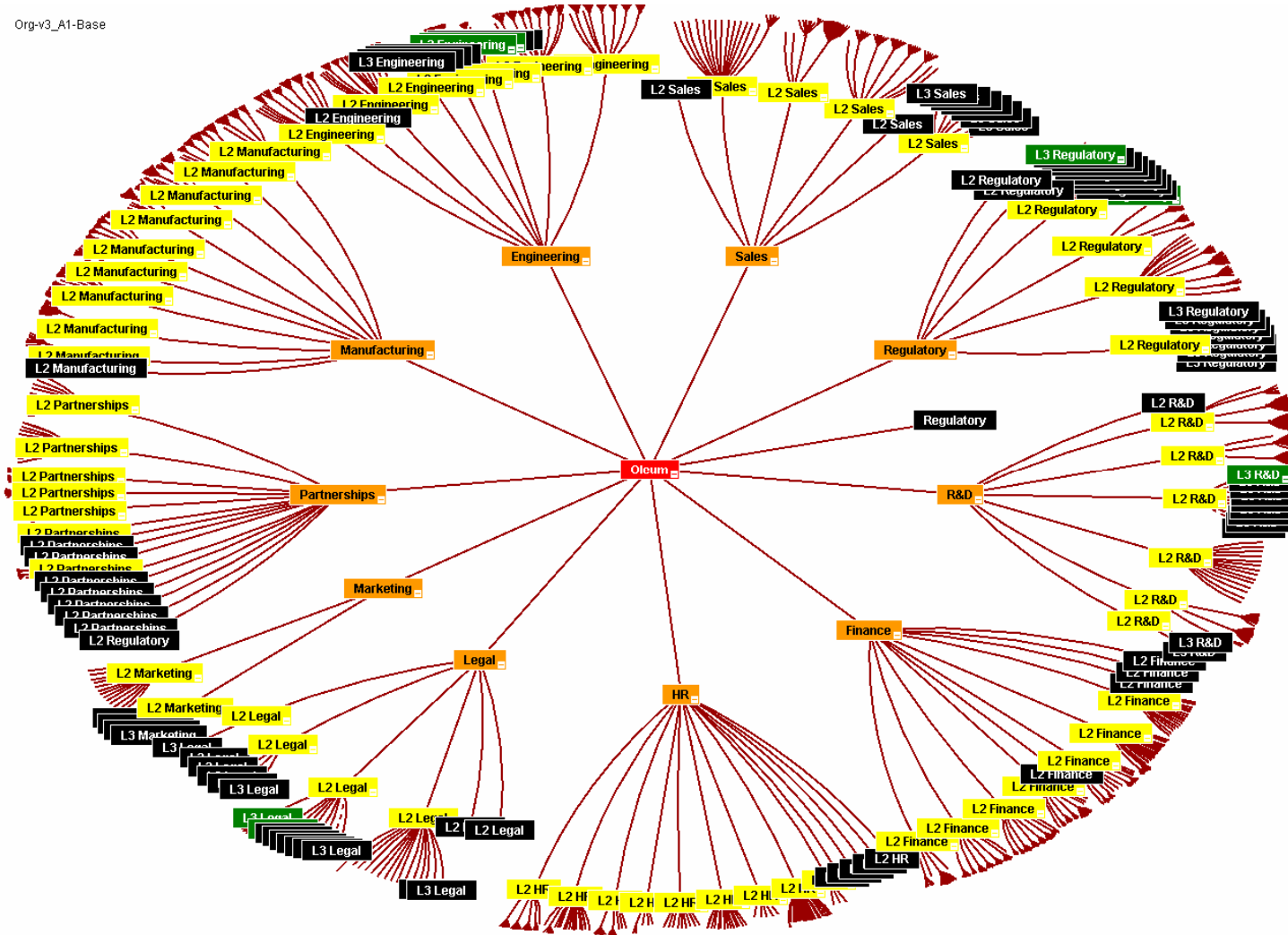
OrgScope Is Representational Technology

- 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

- Scaleable from small to very large organizations

NetAge

We Code Leadership Levels by Color

L1 — **1** CEO and above

L2 — **2** Executive VPs

L3 — **3** VPs

L4 — **4** Senior directors

L5 — **5**
L6 — **6** } Directors
L7 — **7** Senior Managers
Managers

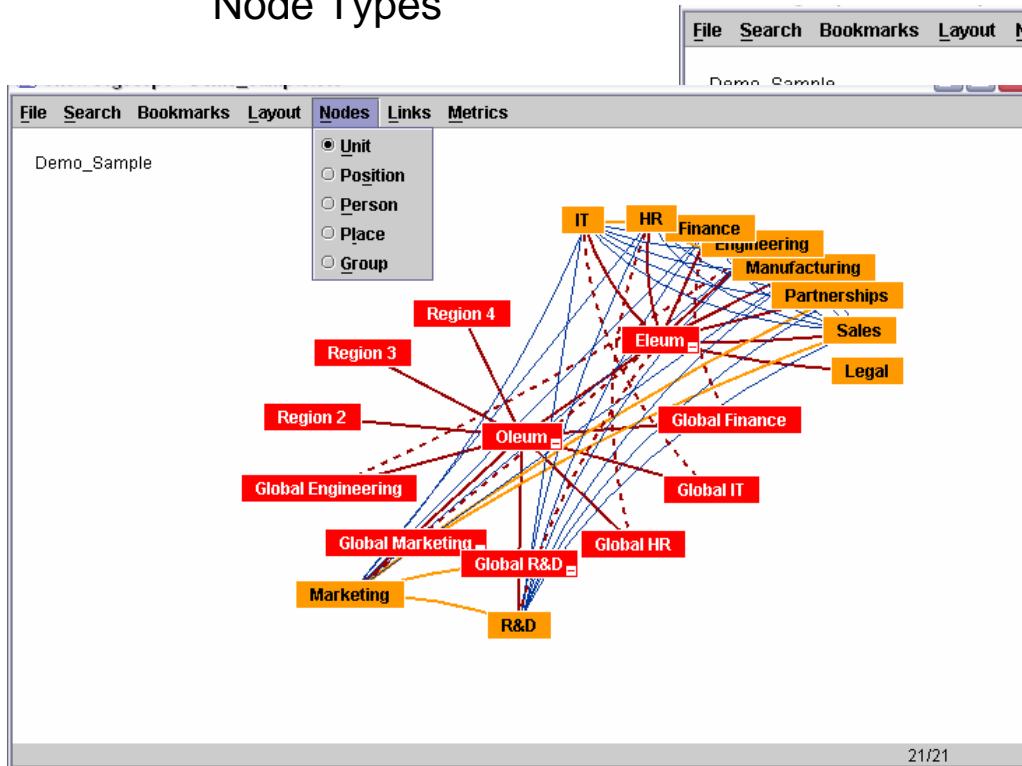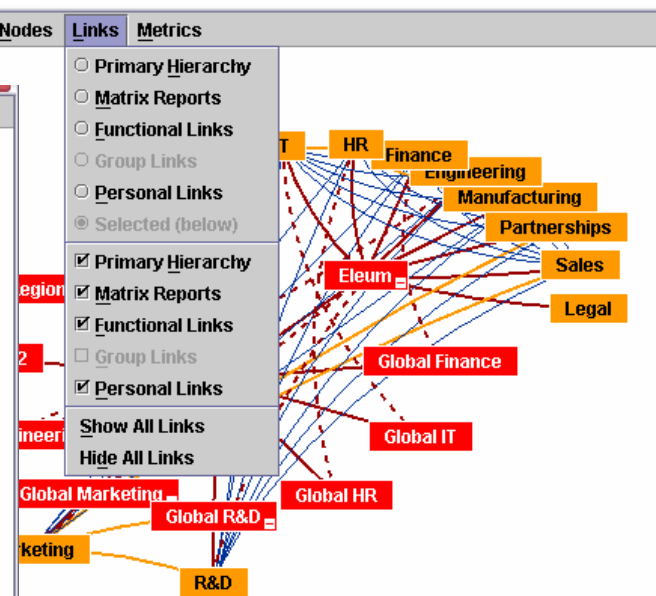**Any level** — ■ Associates (Non-management, most people)

OrgScope Demo

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

Link Types

Node Types

Many Types of Links Overlay Formal Hierarchy

Other links

Team links

Work process links

Matrix reporting links

Direct reporting links

Demo_Sample

Demo_Hierarchy
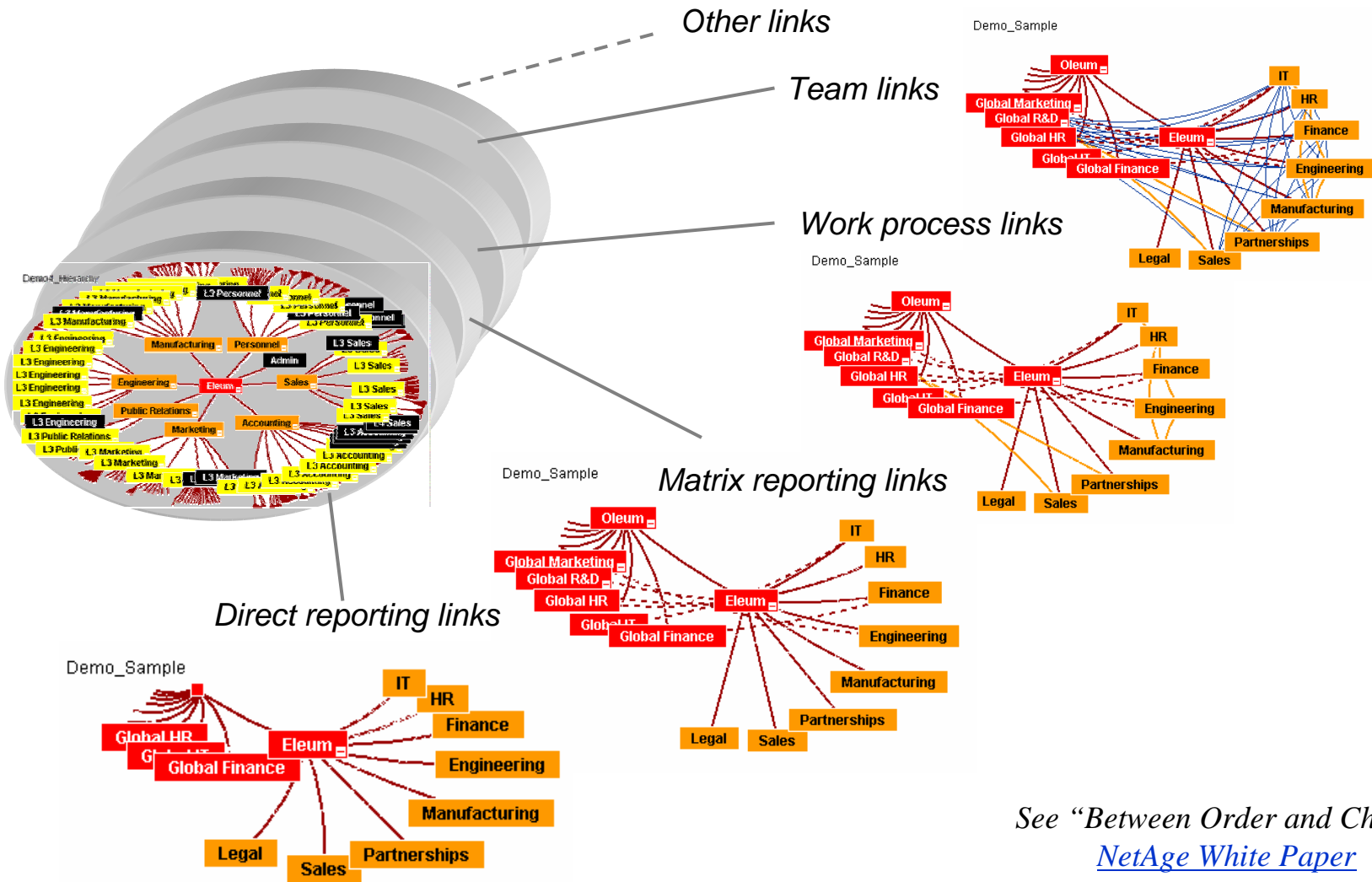
See "Between Order and Chaos"
NetAge White Paper

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

NetAge

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
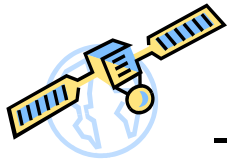
GPS coordinates

Every place has GPS address, geo-point

Every place has point-of-view, eye altitude

30,301 km

Every place has legal address
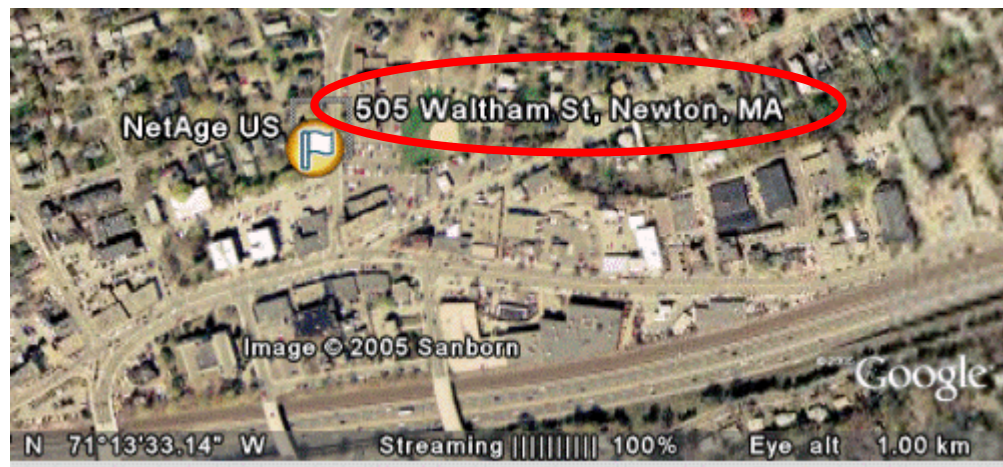
1.0 km

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
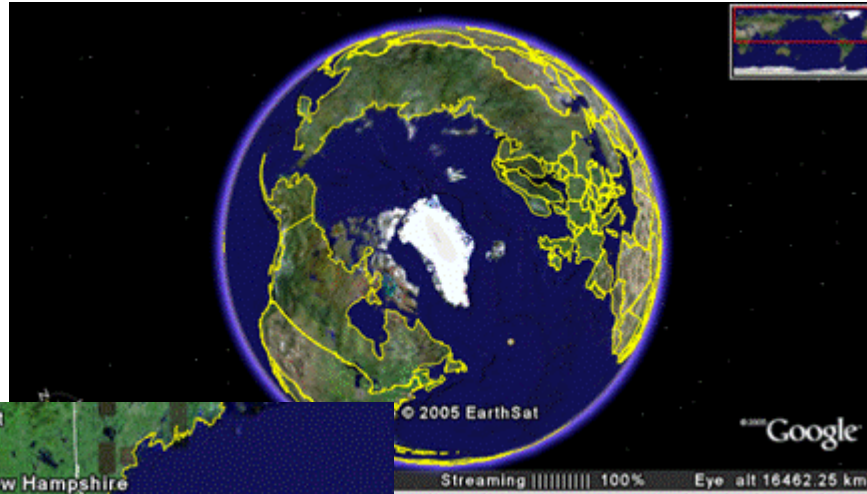
Provinces/States

Localities

16,462 km

780 km

17 km

Organization Network Connects Physical Places
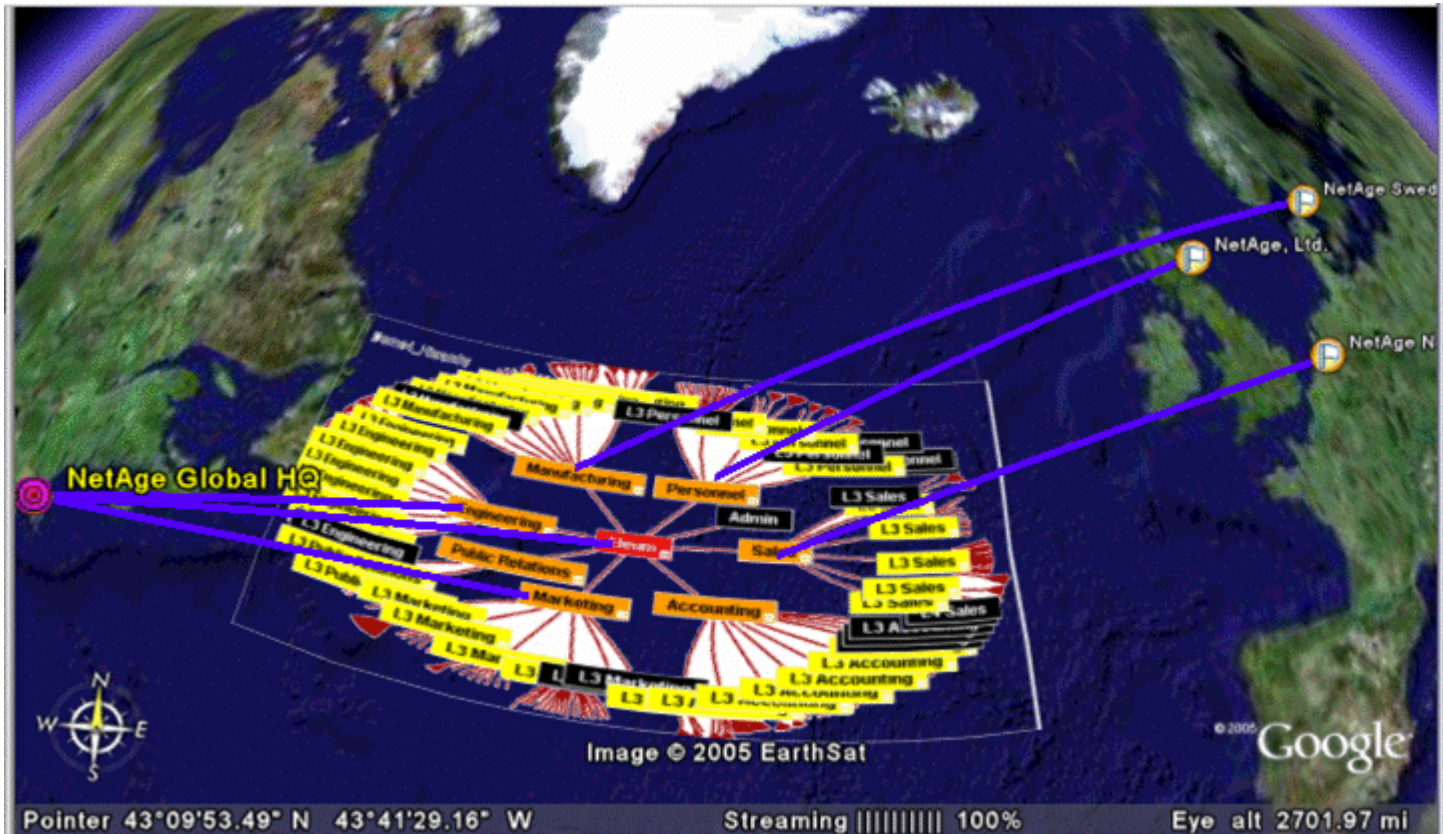
2701 km

Positions in Organizations
Also Can Be Physically Located and Addressed
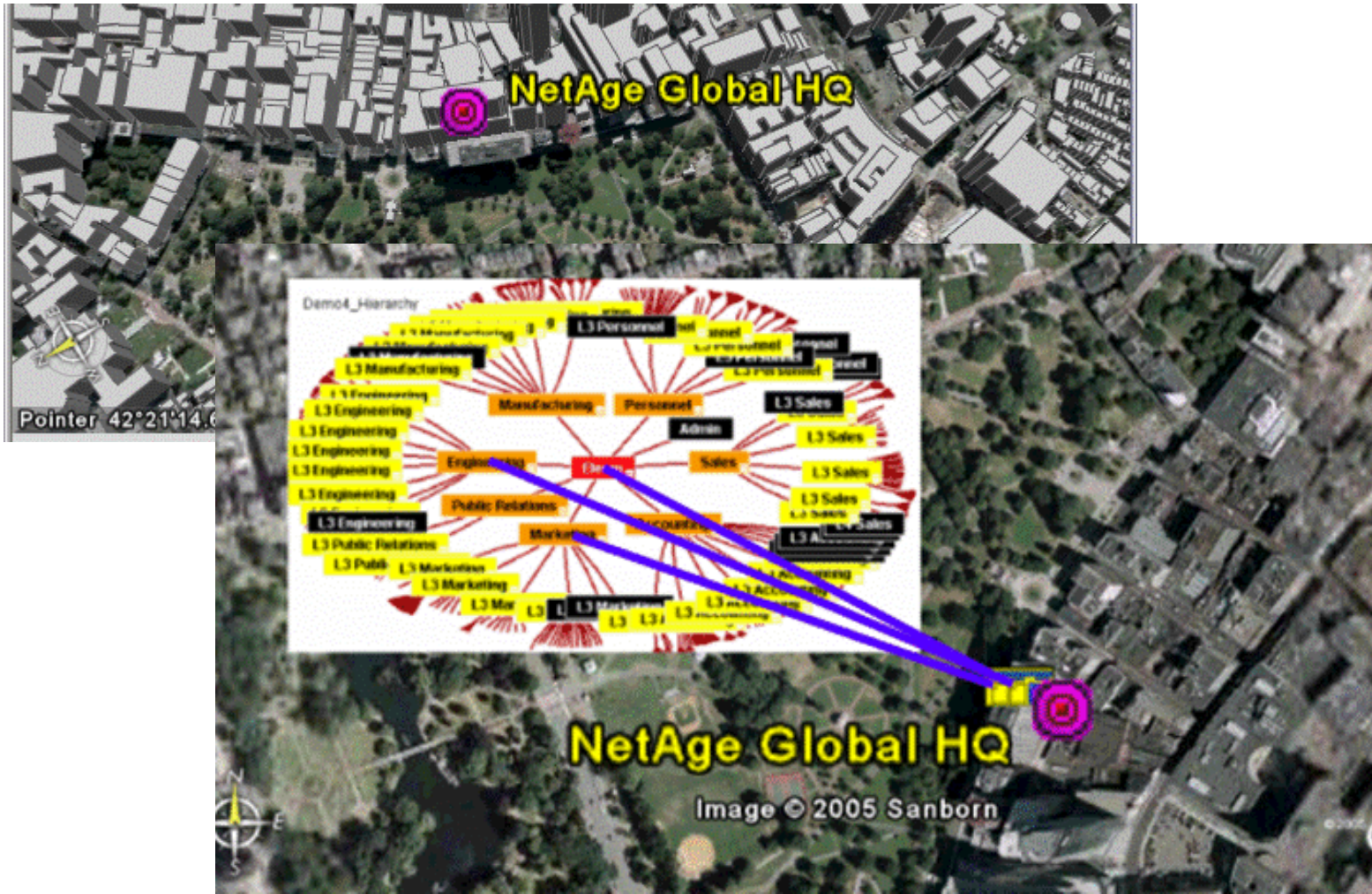
1 km

Executive Floor Plan: Virtual and Physical
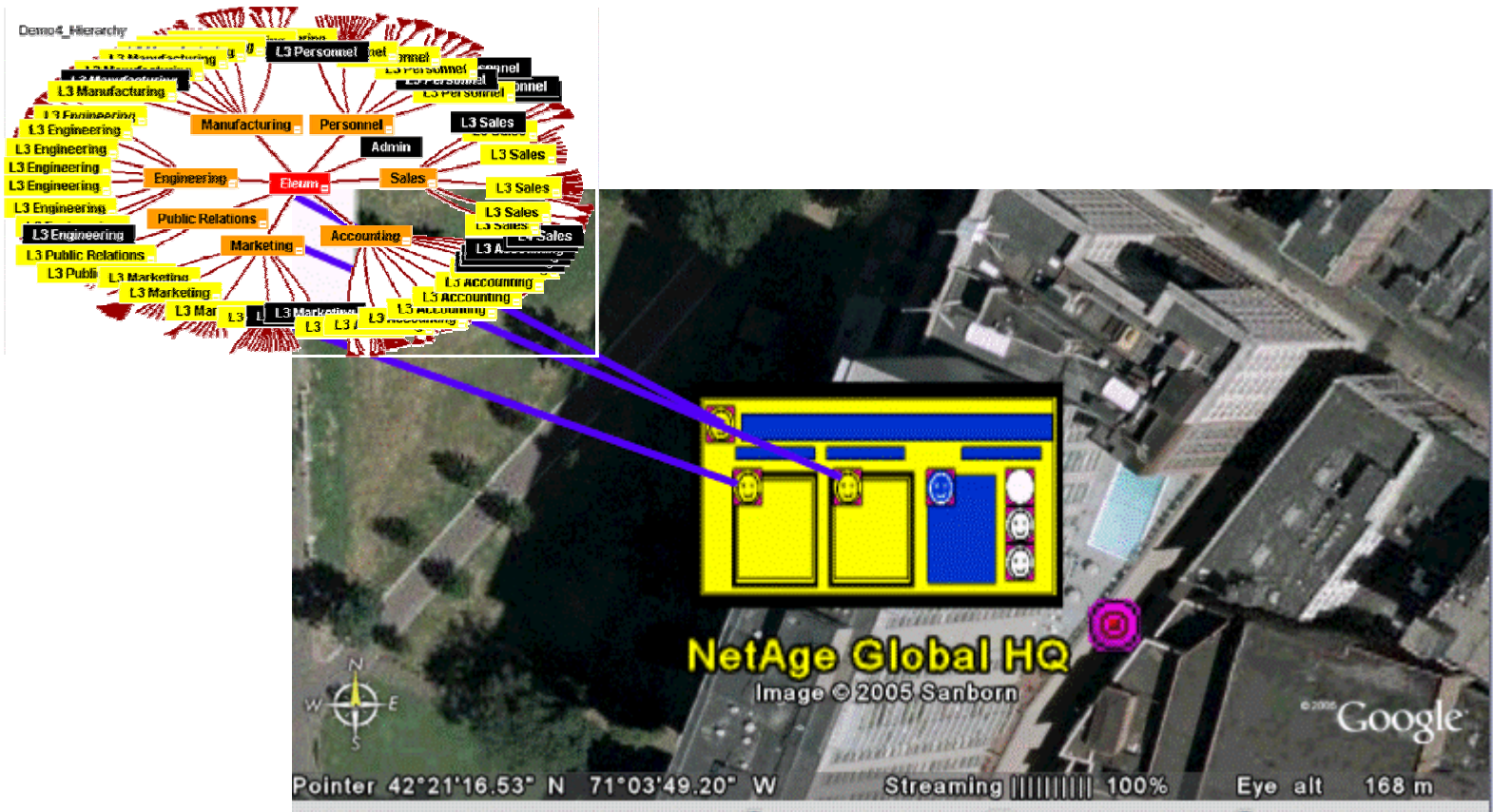
168 meters

Making Positions Concrete with Place

A seat of power

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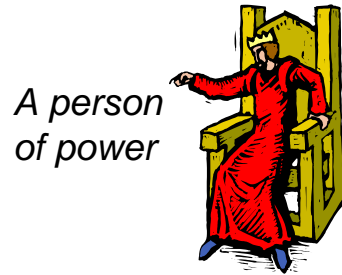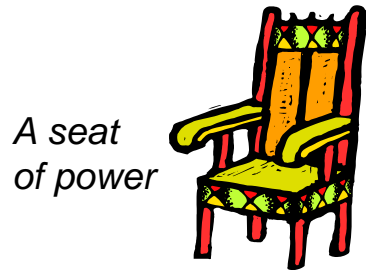
- Chair represents a position
- Person sits in chair doing a job
- Person standing or sitting takes up about 1 square meter
- Positions, jobs, and people measure roughly 1 sq. meter
- All three can be linked to physical places, whether fixed or mobile

1 sq. meter
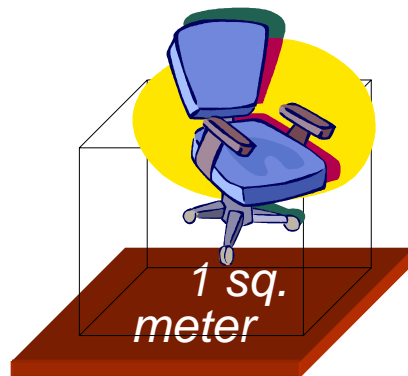
Place

Position

Job
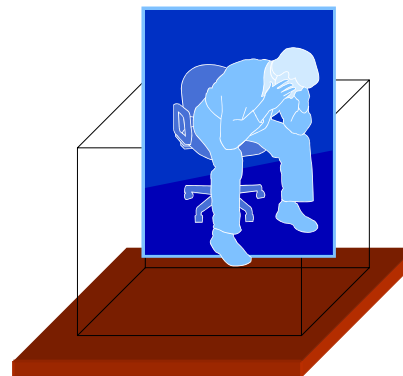
Person

Positions Have Formal Places, People Are Always Some Place

Demo4_Hierarchy

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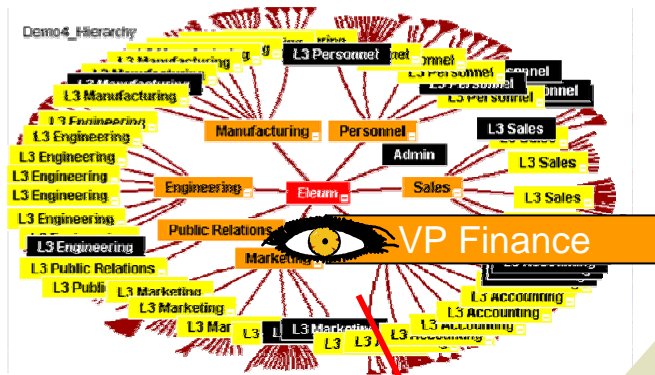
- Traditionally, desk assigned to precise facility with particular address and geo-point

Sits at this desk, HQ 2-14
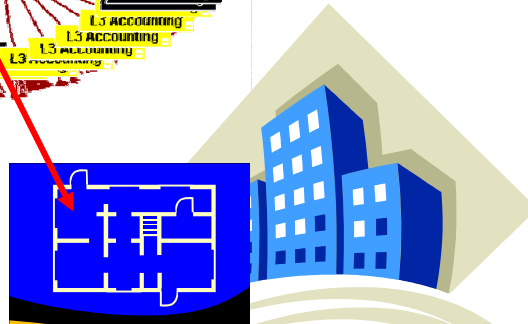
On this street, 505 Waltham

Every position located somewhere

Person occupies position

Person always somewhere on planet

Image © 2005 EarthSat

Position Places Located on Many Overlays

Other Overlays

Asset Locations

Facilities & Floor plans

Political Boundaries

GPS Grid
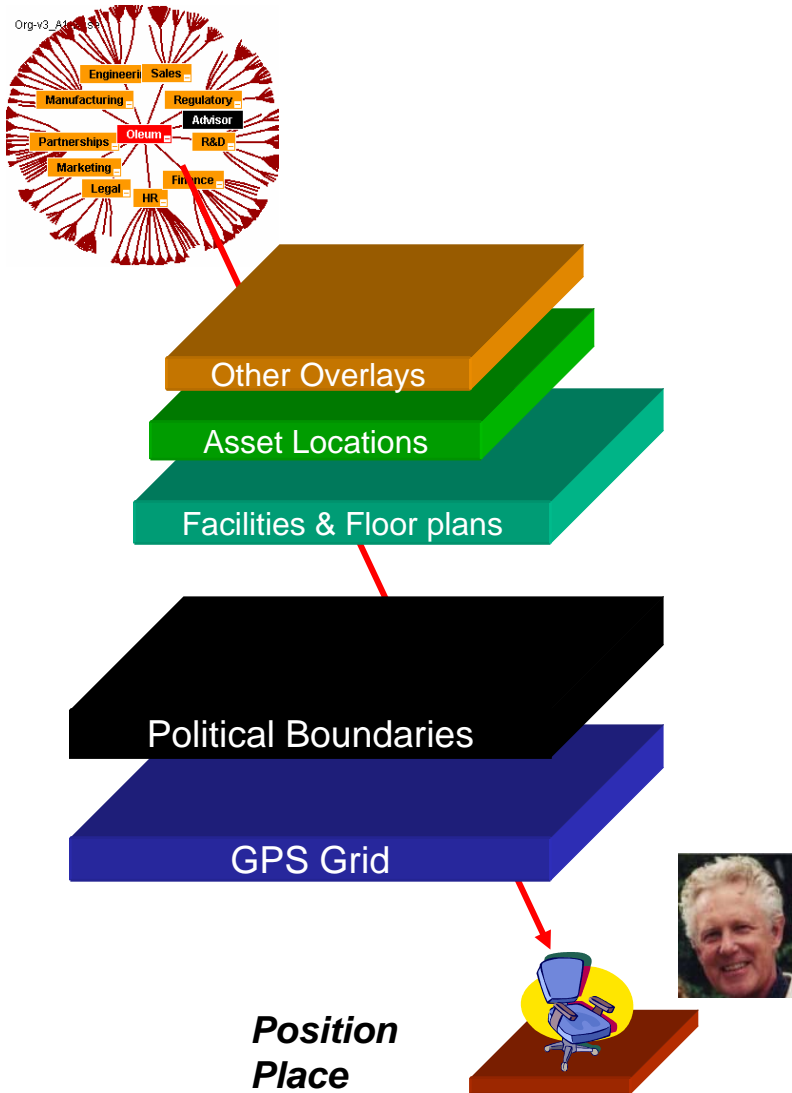
Position Place

- 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

Google Earth

Online Workplace (Livelink)

From Concrete to Abstract and Back

Image © 2005 EarthSat
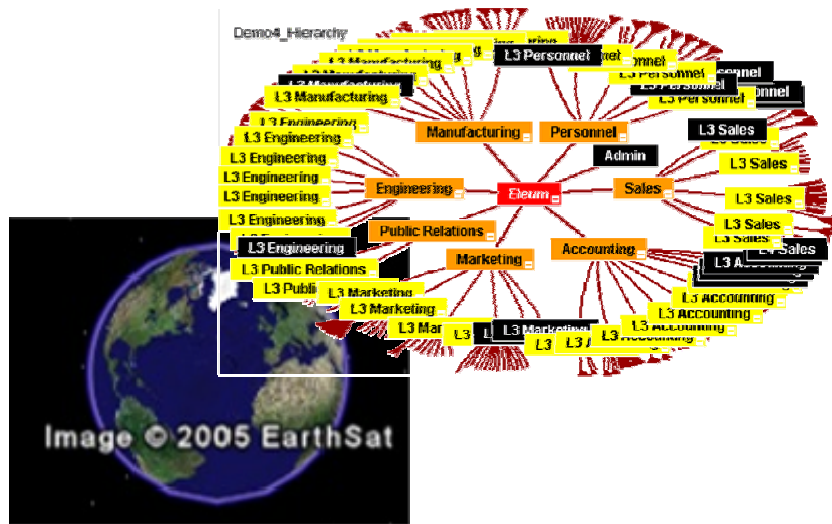
- **Global mindset**
  - *Global perspective*
  - *Country consciousness*
  - *Local knowledge*
  - *Personal perspective*

- **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

Papers on Organisations as Networks

Decide to Network

By Robert Muller

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.

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*.

Decide to Network

Visit us at
www.netage.com