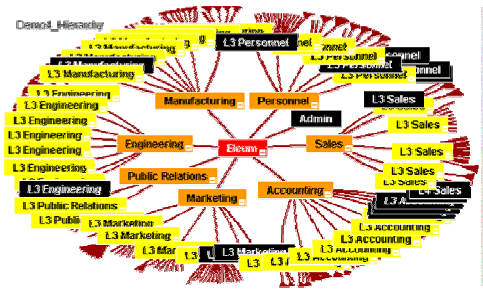
Collaborative Technologies Conference
Boston, USA
June 19-22, 2006

Collaborating in the Networked Organization

Mapping and Measuring Organizations as Networks



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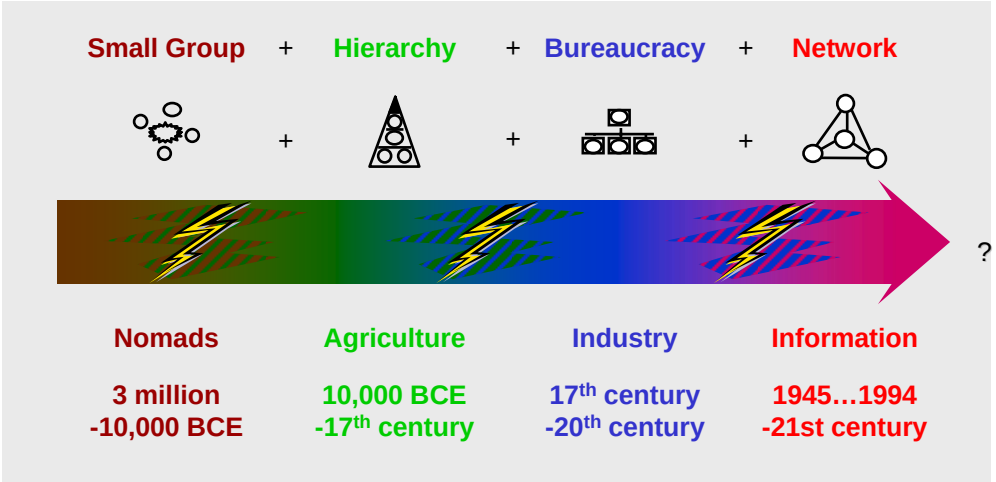
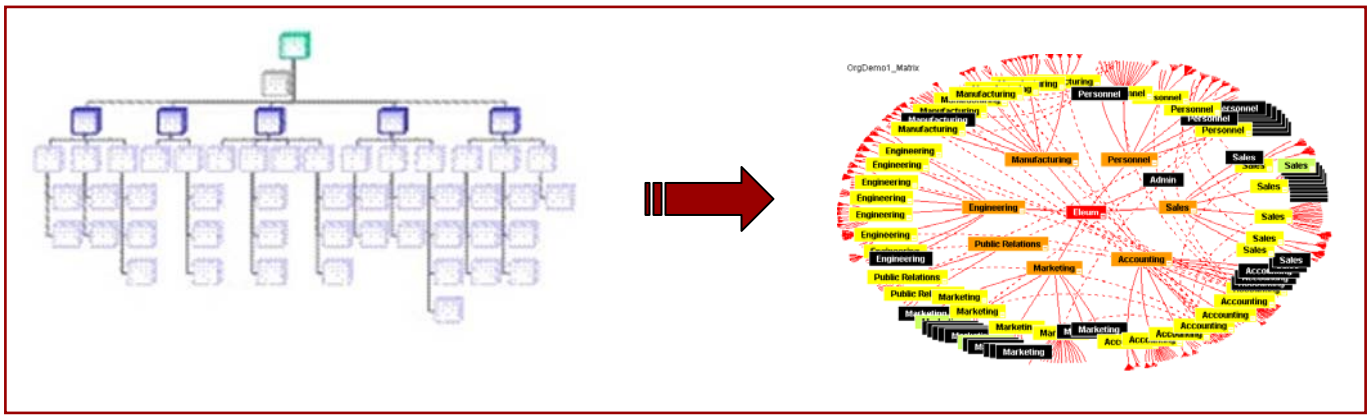
Jeffrey Stamps & Jessica Lipnack
www.netage.com

Our Organizational Predicament

"We can't solve 21st-century problems with 19th-century organizations"



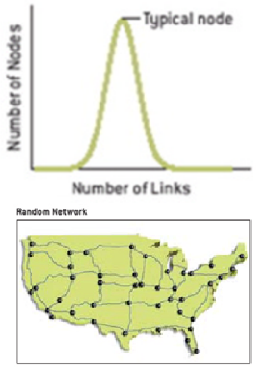
How do we go from hierarchy-bureaucracy to networked organizations?

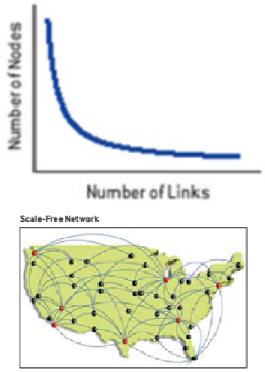


We Wondered About "New Science" of Networks

Do new principles apply to organizations? Are all organizations networks?

For past 50 years, networks regarded as relatively static node structures of uniformly or randomly distributed links with normal averages





In new view, a few highly-linked nodes — **hubs** — form webs with many less-linked nodes. Model is dynamic, growing and changing over time, new nodes attaching preferentially

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

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

? | Hierarchy (organization chart) | Organization | Positions | Reporting relationships | ?

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See "Revolution in Networks" *OrgScope Working Papers*

A Magnifying Glass for Organizations with a Zoom

Fly OrgScope through whole organization

Use **micro-OrgScope** to examine fine detail of each node

Fly t**ele-OrgScope** to span very large-scale enterprises

- OrgScope models organization with data taken directly from **enterprise data system** (e.g., SAP)
- Automatically generates **one-org-chart** map of solid-line reporting relationships, formal network of positions
- Each **position node** can stand for an organisation, a position with a job title, and a location, shown by the text label and the direct **reporting link** to a superior position
- Scales to **very large organizations** and networks of organizations
- Maps **simplify organizational complexity** and offer people new mental models based on shared enterprise data

Background, theory, and initial results can be found at [OrgScope Working Papers]

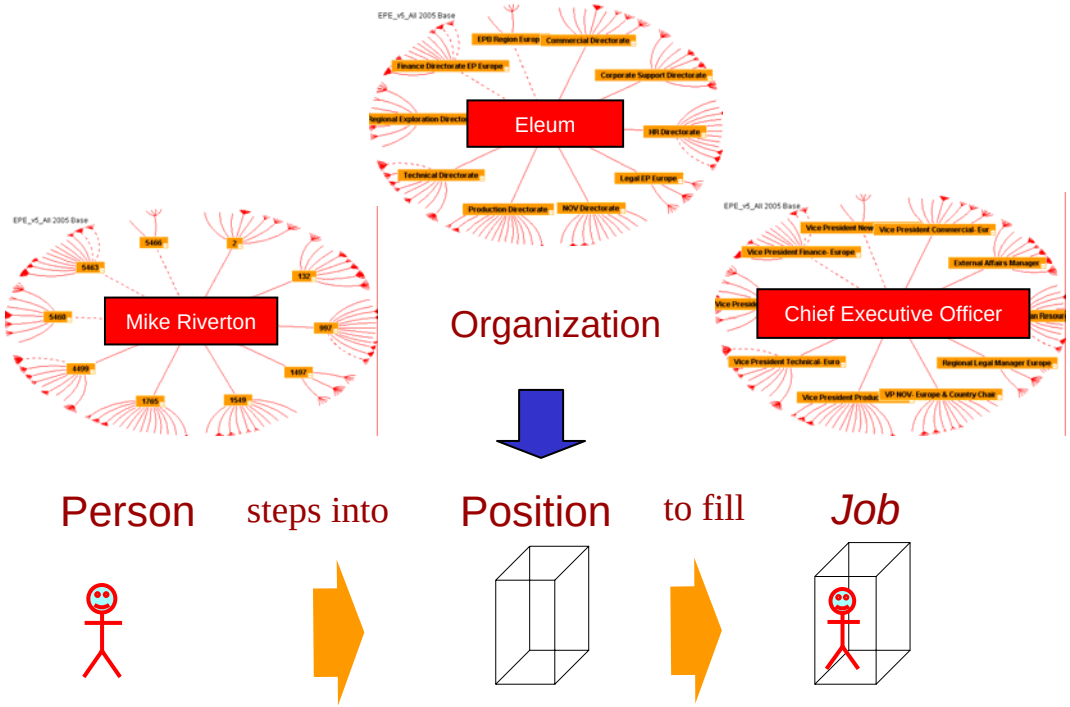
- Allows you to model many jobs and roles in relationship to one another and **display them as a network**
- Generates **network metrics** like level in organization, size of organization, manager span, and virtual team distribution that can be immediately applied to business issues
- Further network science analysis brings power of **cross-domain network principles** to organizations at every scale, from small groups to largest human collaborations

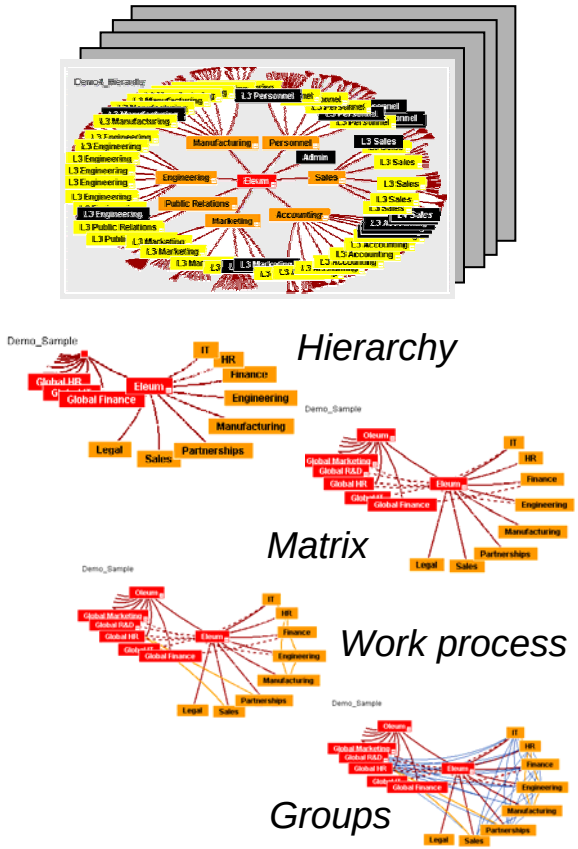
OrgScope based on “hyperbolic viewer” technology, first developed at Xerox PARC. Thank you, John Seely Brown and Ramana Rao

Organizations Are Natural Networks: Nodes Connected with Rich Webs of Links

To map hierarchy as a network, treat positions as **nodes** and reporting relationships as **links.** People play organizational roles.

Many types of **links** layer on top of formal hierarchy,including matrix reports, work process flows, group memberships, information exchanges, social influences …





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See "Hubs in the Diamond" [OrgScope Working Papers]

Introducing Eleum: Our Sample Data Set

Note: OrgScope display data is sample set; results based on real data

- 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 data needed for complete, very large org chart, which we then analyze as a network. Simple measures offer surprising, and useful, results

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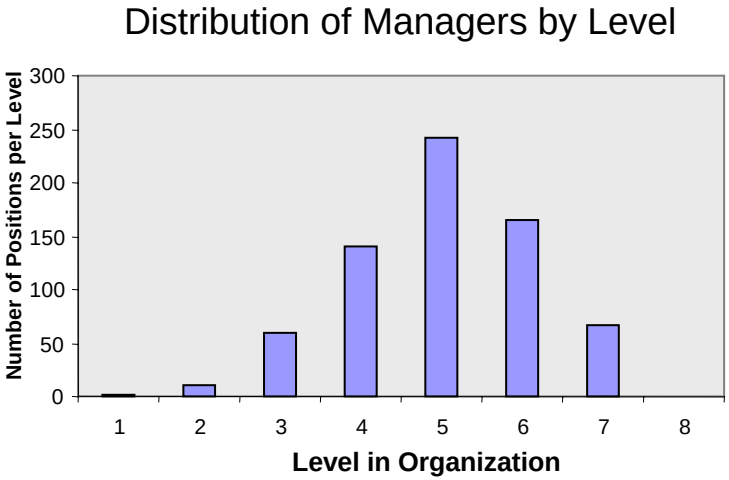
See "Deep in the Heart of Hierarchy" *OrgScope Working Papers*

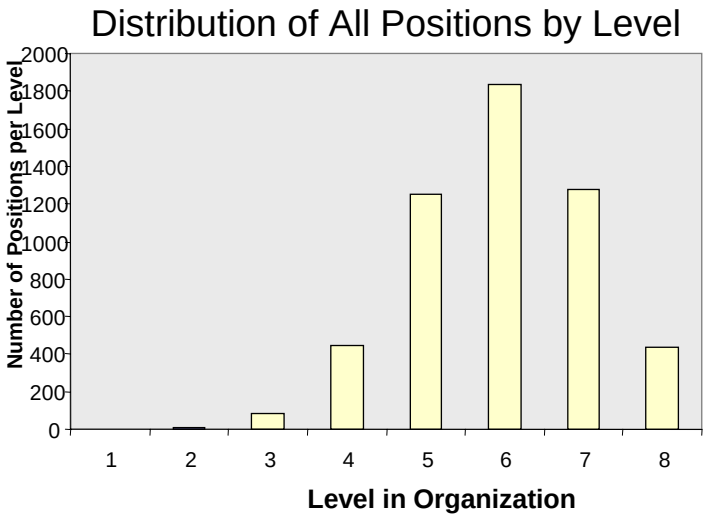
What OrgScope Found at Eleum

- Organization is a diamond, not a pyramid, 9 levels, not 5, deep
- Communication by cascade cannot reach whole organization quickly, but a ‘sideways’ strategy can
- A third of executive and line management teams are virtual, and can be pinpointed
- Most managers supervise small groups: a few manage very large staff—15 or more; these hubs hold the whole together
- Majority of sub-organizations are very small; some large organizations are quite deep in hierarchy (levels 5-7)
- Some functions over-represented, others underrepresented in formal leadership groups
- Some positions—about 20%—inherently **more complex** than others, the organizational ‘hotspots’

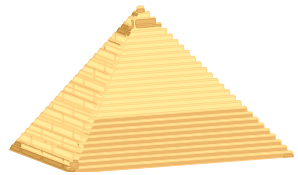
Eleum immediately using OrgScope results to address business challenges

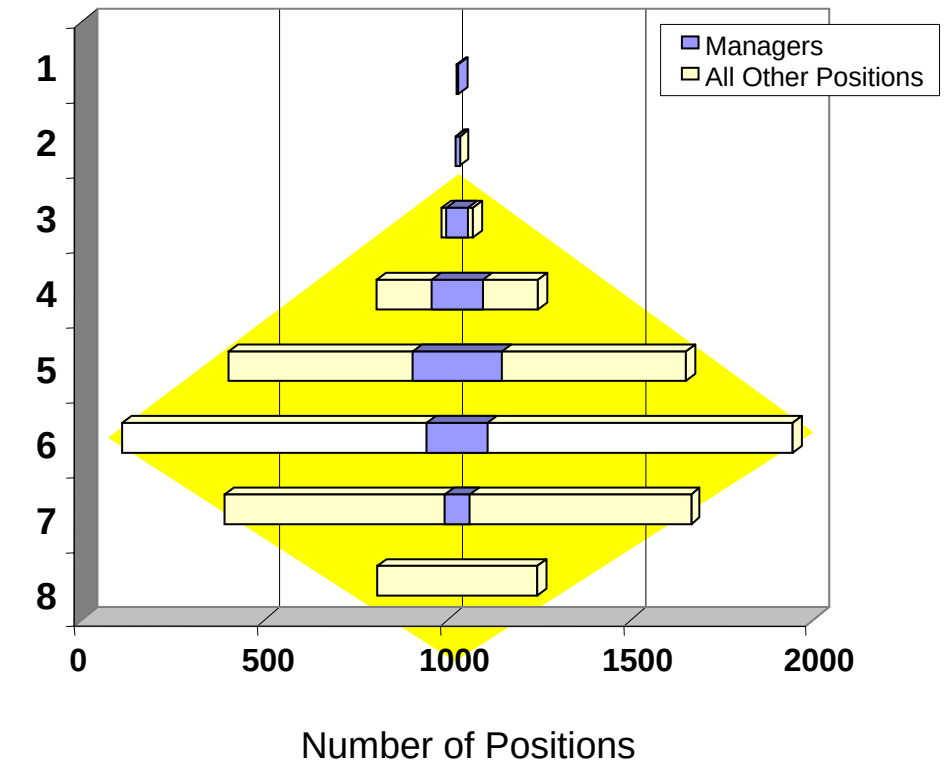
Eleum's Shape Is a Diamond, Not a Pyramid: Turns Communication Strategy on Its Side





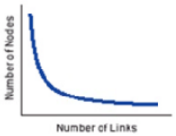
Expected slope, classic shape of organization



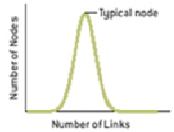


See "Hubs in the Diamond" [OrgScope Working Papers]

Eleum's Span? 80% Manage Small Staff, 20% Are Hubs: Identifies Manager "Hotspots" for Greater Support

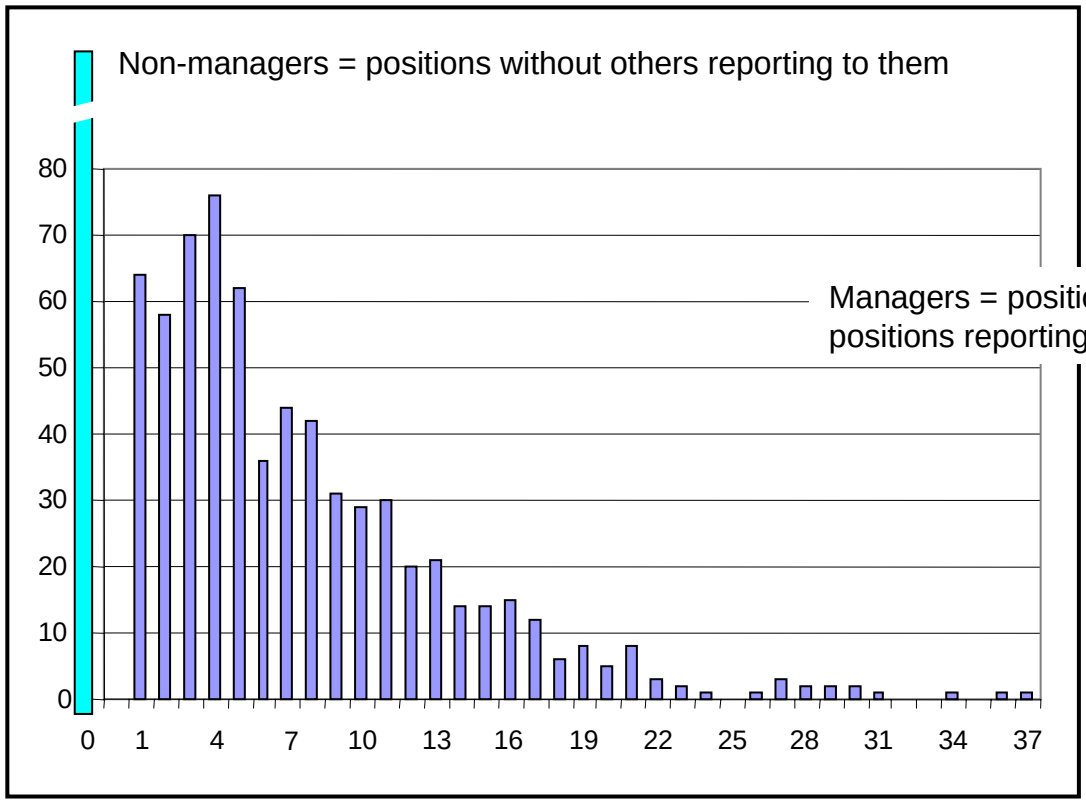


Hub
view of span



Expected normal
view of span

Many nodes,
few links



# of Managers

# of Reporting Links (k)

Few nodes, many links

# of People Reporting to Manager = Span

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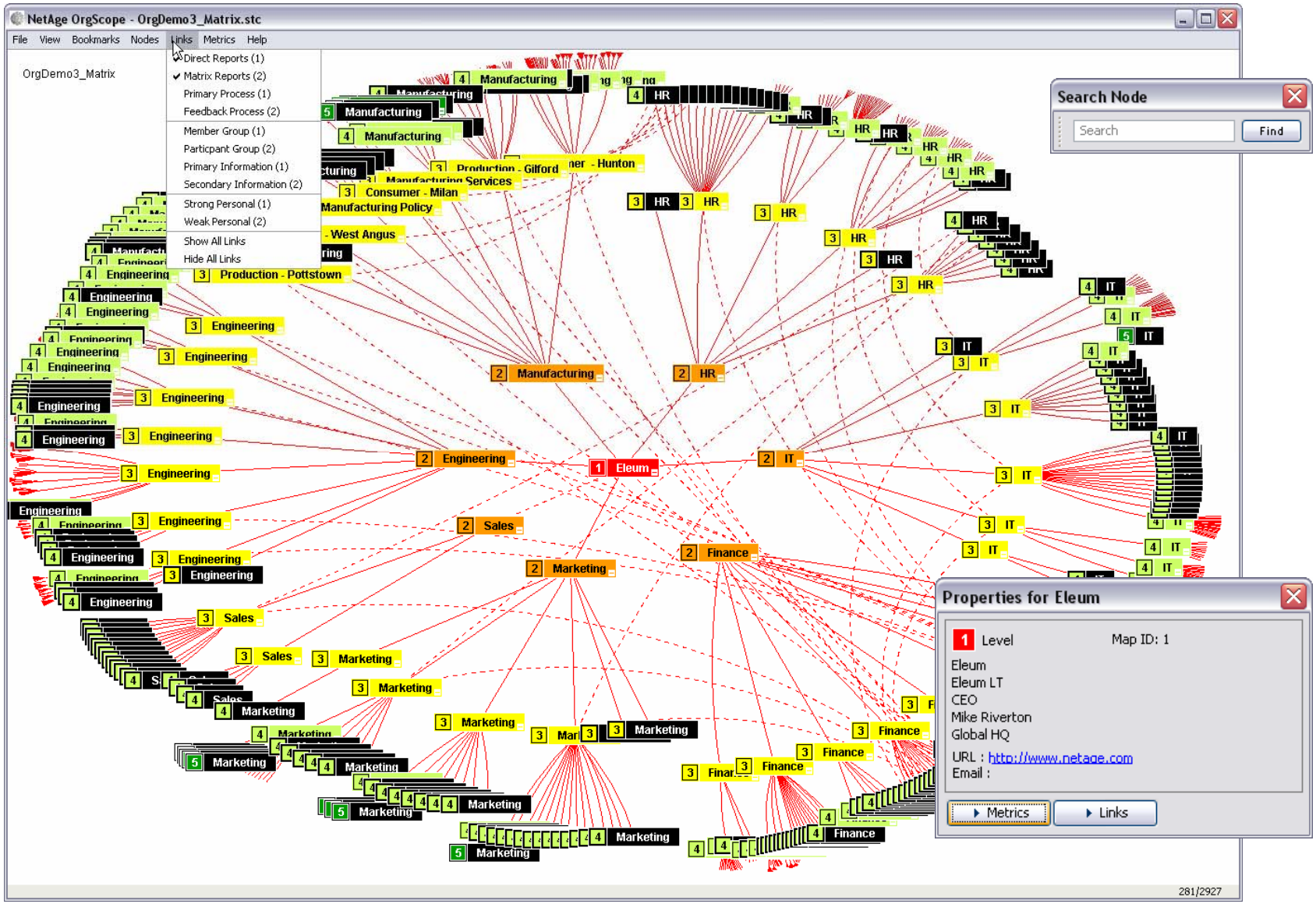
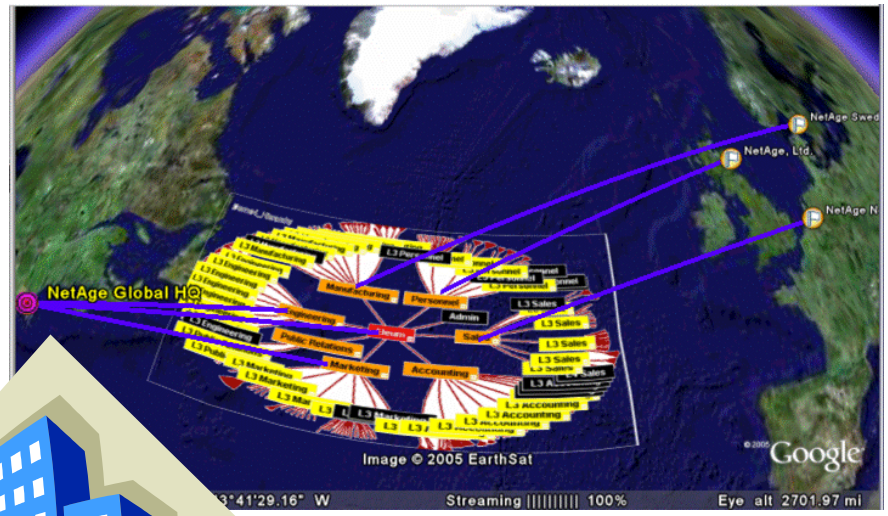
See "Hubs in the Diamond" *OrgScope Working Papers*

NetAge OrgScope Demo



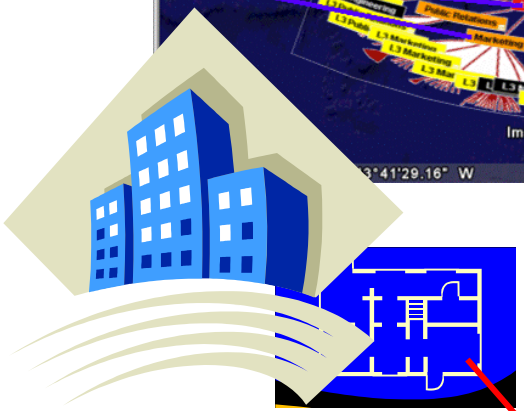
Positions in Virtual Organization Connect to Physically-Real Sites



When occupied, all positions represent real people, who are always in some particular place

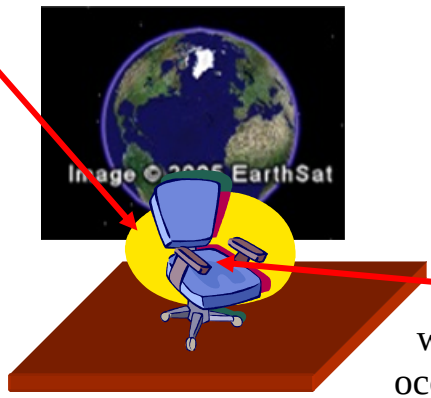
The world of the virtual organization is spread out over one real world, Earth

Traditional positions have desks or stations assigned to facilities with particular addresses and geo-points



On this street, 505 Waltham

Sits at this desk, WN 3-3

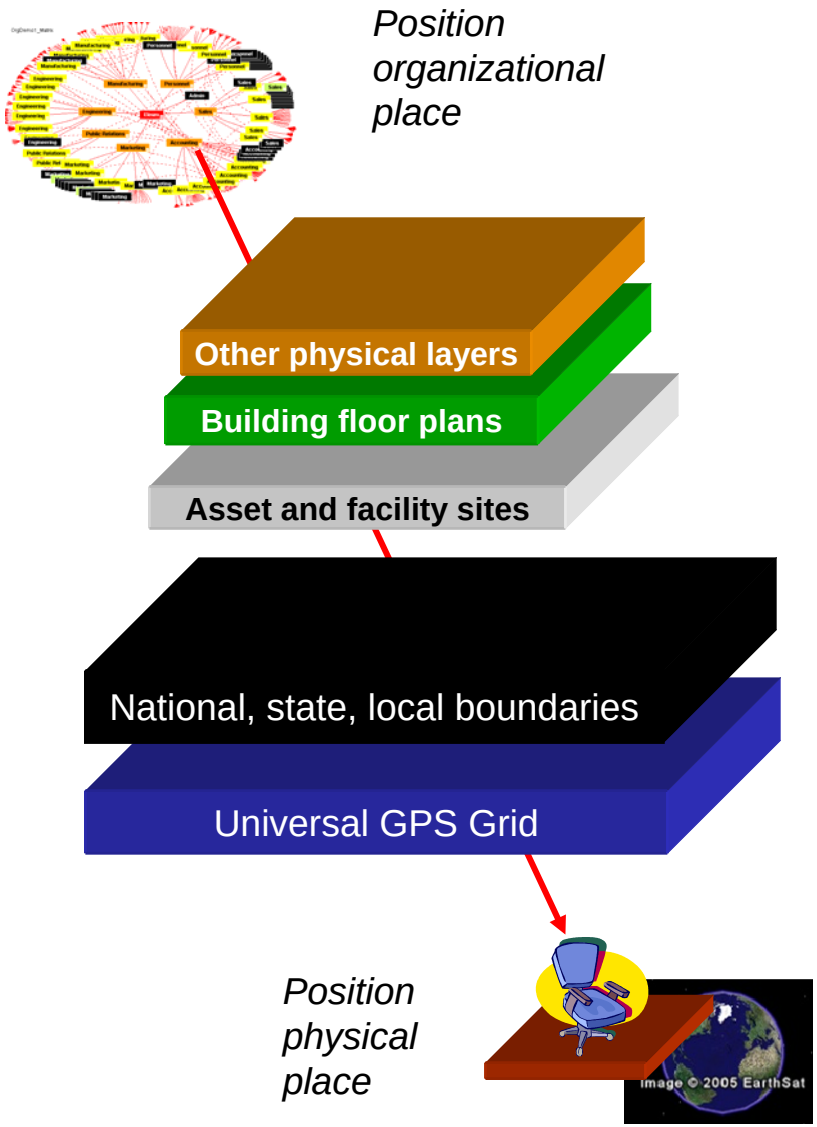


Positions can be anywhere, but they are always *some*where

when a person occupies position

because real people are always somewhere

Abstract Positions Connected to Concrete Places Located in Many Layers



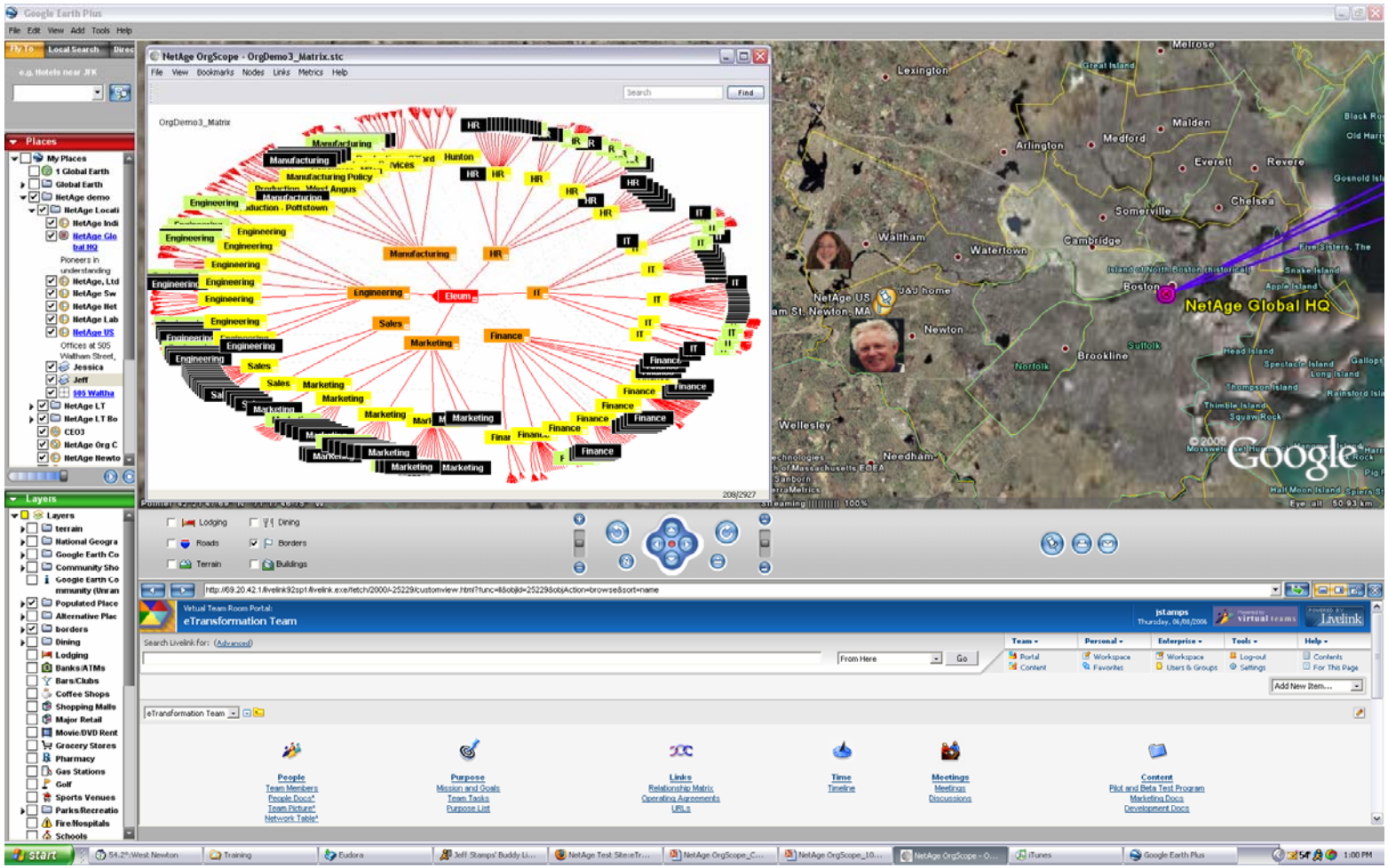
- Position "places," anchored to points on the earth, "pass through" multiple layers based on physical things on the earth's surface
  - All entities can have both GPS and jurisdictional place addresses
  - National boundary layer is near-universal global-local pattern of mutually-exclusive, whole-part hierarchies comprising one world
  - GPS coordinate system is universal global virtual layer on real earth

Global Leadership Dashboard: OrgScope-Earth for Large-Scale Collaboration

Organization Layers

NetAge OrgScope

Google Earth



Place Layers

NetAge's Livelink virtualteams: Collaboration Platform

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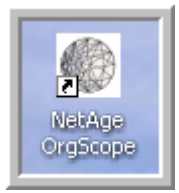
Background, theory, and initial results:
OrgScope Working Papers

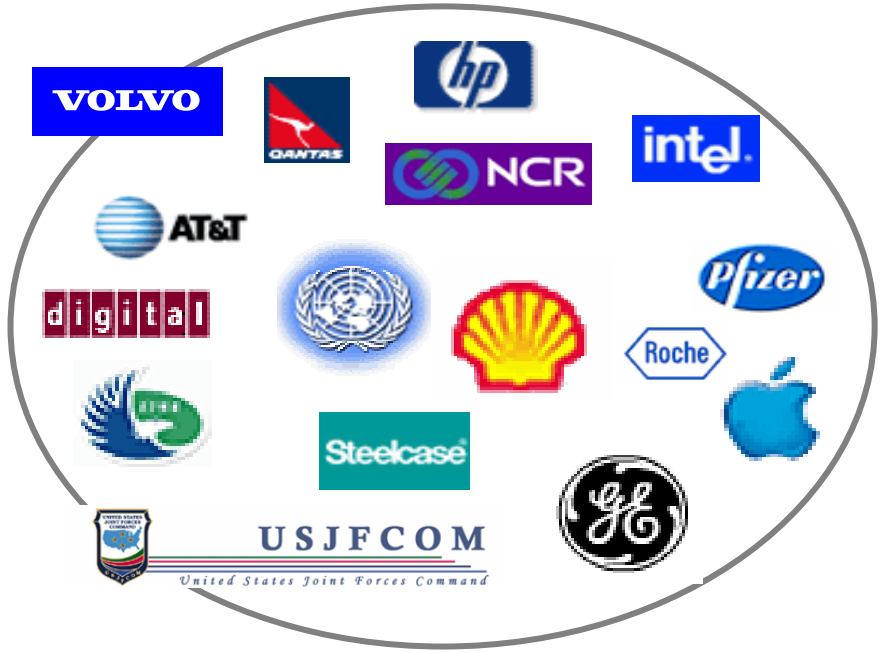
Background on NetAge and OrgScope



OrgScope:
Build 10

NetAge Principals: 25-Year Focus on Networks

Books, articles, methods, theory



Consulting and projects

Jessica Lipnack

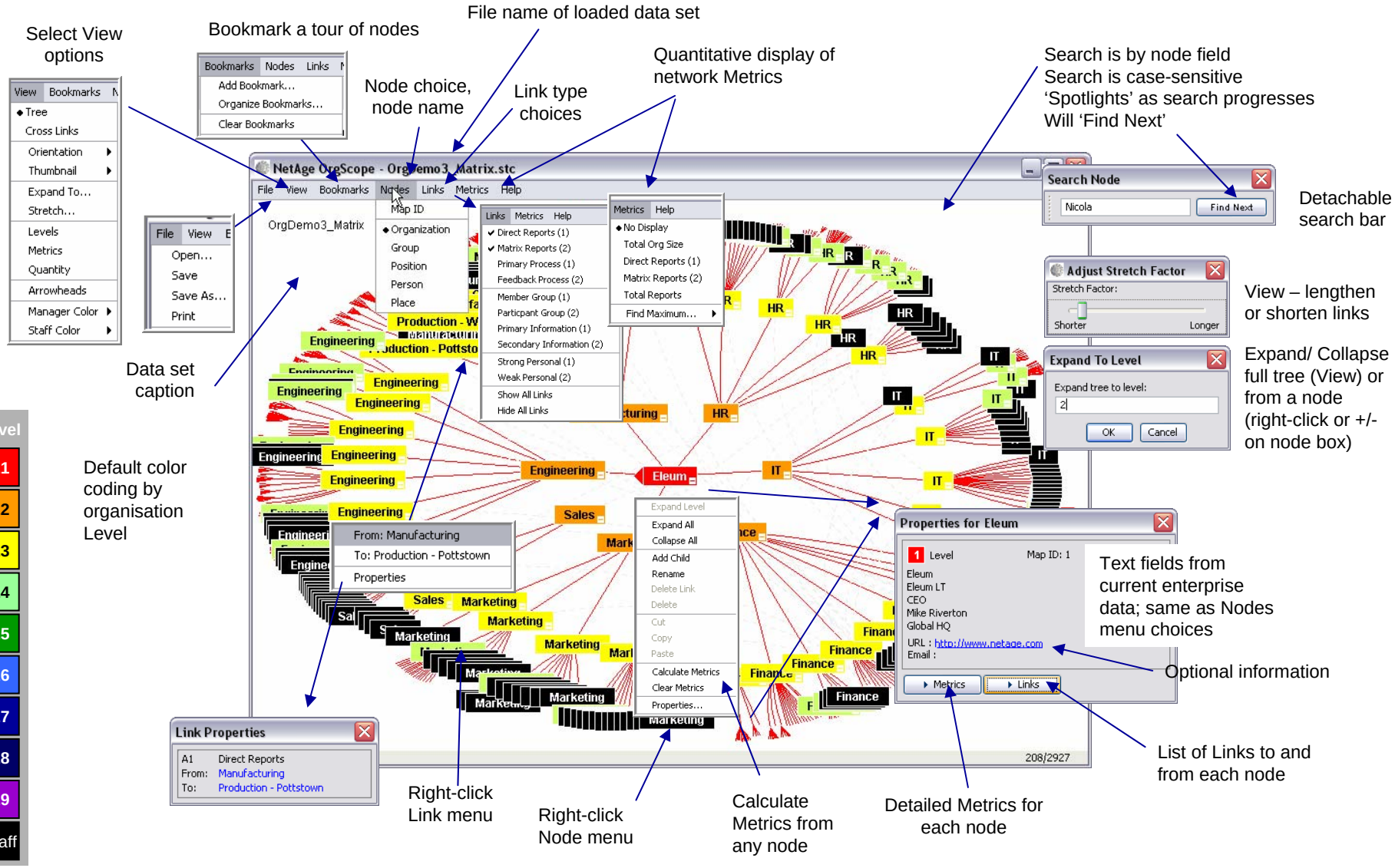
Livelink virtualteams

NetAge OrgScope

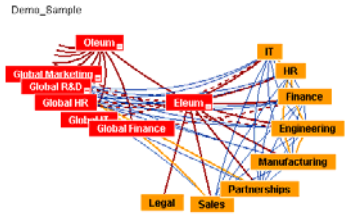
Training and software

Jeff Stamps

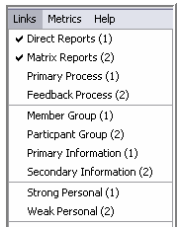
NetAge OrgScope Viewer (Alpha)
Build 10 Features



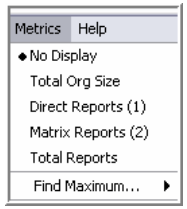
OrgScope Maps Many Links and Generates Many Metrics

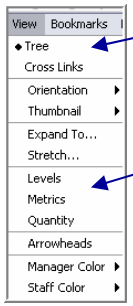


Cross Links of multiple types
Cross-links connect positions directly where more familiar Tree option 'duplicates' matrix-ed nodes



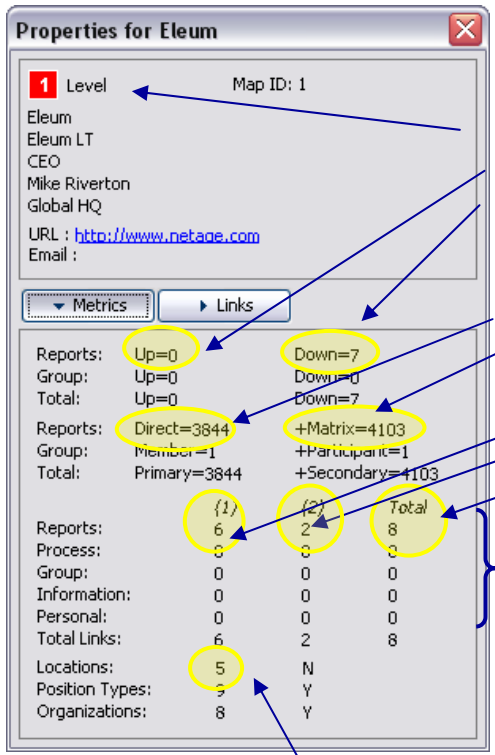
Link type selections define how size, and span display metrics are calculated





Tree and Cross Links
are mutually-exclusive View options

Levels, Metrics, Quantity
are mutually-exclusive View options



Node **level**
- Links up
- Links down

Organisation **size**
- Direct reports only
- Including matrix

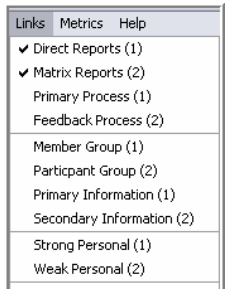
Manager **span**
- Direct reports
- Matrix reports
- All reports

Team **locations**

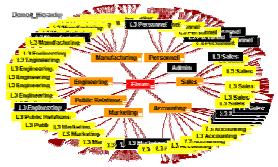
Link type

Link direction

Link list changes with Node menu selection



Link types (5x2)



Metrics relative to specific data set being modeled

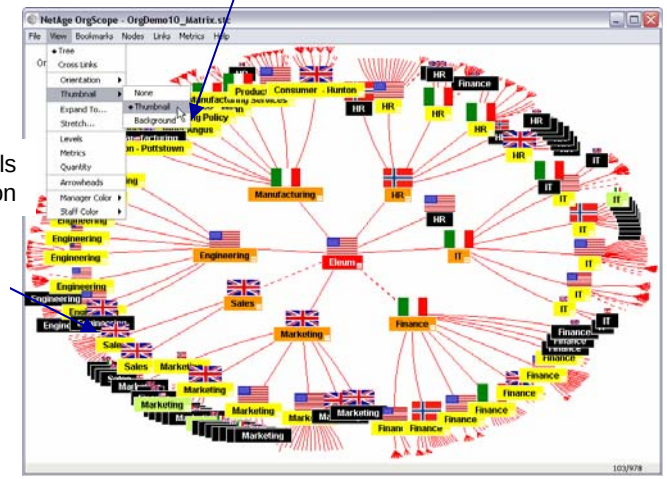
OrgDemo 10 – June 2006

Customize with Thumbnails, Colors, Quantities, and URLs

Thumbnails turned on

Levels on

Tags each node with its level



Thumbnails are small JPEG files that may be associated with each node type

Icon denotes network membership

Node Type	Thumbnail
Map ID	Net
Org	Flag
Group	Leader
Position	Net
Person	Picture
Place	Flag

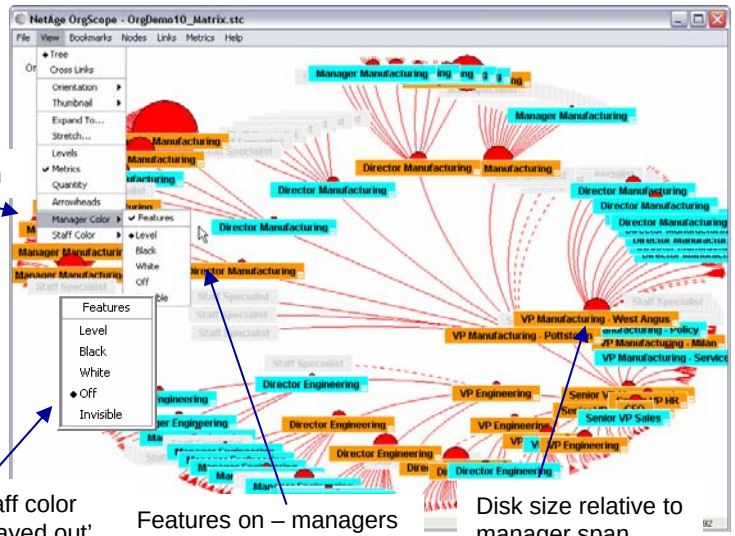
Flags of position (not person) location coded by Country field in data

Leadership networks coded from position-based list

Eleum LT
VPnet
Key Lead

Any image can be associated with any node selection

Metrics on



Staff color 'grayed out'

Features on – managers color coded by "hotspot" – big size and/or span

Disk size relative to manager span

Node Type	Feature Color	Quantity Value	URL or email
Map ID			
Org			
Group			
Position	Hot		
Person			
Place			

Separate URLs may be associated with each node type

Nodes may be custom-color coded for specialized views; e.g.,

Hub: Hot orange
Not hub: Cool blue

Budget numbers or any other quantity can be associated with any node by type

Thumbnails and features are associated with specific data set

OrgDemo 10 – June 2006