



# Knowledge Transfer

## WK-5

**“Finding effective ways to let people talk and listen to one another.”**

**KT is embedded in spontaneous ‘conversations’**

**“Successful knowledge transfer involves neither computers nor documents but rather interactions between people.”**



**“When Good Enough is Not Good Enough.”**

**“Knowing What You Know... Challenge”**

**“Can You Know What You Know...?”**



**“The best information environments will take advantage of the ability of IT to overcome geography but will also acknowledge that the highest bandwidth network of all is found between the water fountain and the coffee machine.”**



**“We have documents, document databases, an Intranet Web, groupware, ... But the assignees and the F2F meeting are by far the most important channels for transferring knowledge to the member firms.”**

# The Three Components of Knowledge Management:

- **Knowledge generation.**

Includes all activities, which brings to light knowledge that is "new" to the individual, to the group, and to the organization.

- **Knowledge codification.**

Representation of knowledge so that it can be "reused" either by an individual or an organization.

- **Knowledge transfer.**

“Movement of knowledge from one location to another”.





## Means of Knowledge Transfer

- **Knowledge Fairs** – E&Y, CSIRO
  - **Unstructured, Ad Hoc**
  - **versus Structured, Micro-Planned Conferences**
- **Japanese Talk Rooms**
- **Knowledge Markets** – Any organization that exchanges for other things of value – money, respect, promotions, or knowledge
- **Communities of Practice** – knowledge flows best through networks of people with similar interest



**Tacit:** Knowledge not easy to visualize and express. Highly personal and hard to formalize.

**Explicit:** Can be expressed in words and numbers and can easily be communicated and shared in the form of hard data.

**Knowledge conversion:** Tacit and Explicit knowledge interact and interchange into each other in the creative activities of human beings. Knowledge is created through social interaction of the two types of knowledge!

# Tacit and Explicit Knowledge

## Tacit Knowledge

- Embedded in the human brain
- Cannot be expressed easily
- Requires extensive personal contact
- Mentorship networks
- Knowledge Maps, Video conferencing

## Explicit Knowledge

- Can be easily codified,
- Embedded in procedures,
- Represented in documents,
- Transferred with reasonable accuracy



## Cultures of Knowledge Transfer

- Lack of trust
- Different, cultures, language, mental models
- Lack of time and meeting places
- Status and rewards issues
- Lack of absorptive capacity
- Not-invented-here syndrome
- Intolerance for errors and mistakes



Transfer = Transmission + Absorption (and Use)

No Action => Useless Knowledge [Transfer]



"the movement of knowledge within the organization is a distinct experience, not a gradual process of dissemination, and depends on the characteristics of everyone involved"

**Transfer of knowledge does not denote a full replication of the knowledge in the receiving unit. Indeed, knowledge is often modified in the receiving unit. The key element in knowledge transfer is not the underlying (original) knowledge, but rather the extent to which the receiving subsidiary receives potentially useful knowledge and utilizes this knowledge in its own operations.**

# Knowledge Transfer

- Four different modes of knowledge conversion
  - Socialization
  - Externalization
  - Combination
  - Internalization

# Nonaka and Takeuchi (1995)

Tacit to Tacit – Socialization - P2P

Tacit to Explicit – Externalization – P2T

Explicit to Explicit – Combination – T2T

Explicit to Tacit – Internalization – T2P

Tacit **TO** Explicit


Tacit

**FROM**

Explicit


|                      |                    |
|----------------------|--------------------|
| <b>Socialization</b> | Externalization    |
| Internalization      | <b>Combination</b> |

## P2P



**Socialization**: “The process of sharing experiences and thereby creating tacit knowledge, such as shared mental models and technical skills. The key to acquire tacit knowledge is experience. Without some shared experience, it is extremely difficult for one person to project her/himself into another individual’s thinking process.”

# P2T



**Externalization**: “The process of **articulating tacit knowledge** into **explicit concepts**. It may however be difficult to find an adequate verbal expression for a mental image through use of **analytical methods** alone.

Externalization is therefore often driven by **metaphor and/or analogy**.”

# T2T

**Combination**: “The process of systematizing concepts into a knowledge system, i.e. combining different bodies of explicit knowledge. This entails reconfiguration of existing information, where sorting, adding, combining and categorizing of explicit knowledge can lead to new knowledge.”



# T2P

**Internalization**: “This process is closely related to **'learning by doing'**. When **tacit knowledge** is **incorporated** and **applied** in a person's or an organization's tasks. In this conversion mode it helps if **knowledge** is **verbalized** or **diagrammed** into **documents** or **oral presentations**.”



## **Accelerate the Knowledge Spirals**

**Socialization-Externalization-  
-Combination-Internalization-**

**Application – Understanding  
- Application – Understanding**

**Knowledge in Action - Motors for change**



**“Stickiness” of knowledge** – how it tends to stay in one place... The CEO of Chapparral Steel firm said that he had no problem with competitors touring their plant. Chapparral, he said, is willing to show just about everything "and we will be giving away nothing because they can't take it home with them.”

**“Leakiness” of knowledge** – Knowledge leaks out of organizations like a sieve perhaps because people are closer to their external communities than to the rest of their organization's.



Another downside of hiring third-party service vendors and consultants is knowledge transfer-or, more accurately, the lack thereof. When third parties come in, "they know how to get work done quickly-and then they leave..."

Cisco - Knowledge Transfer and Mentoring Datasheet - Netscape

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## Fact Sheet

### Solution Overview Cisco Systems Customer Advocacy Knowledge Transfer and Mentoring

Today's leading companies make ongoing education a business imperative because it helps employees keep up with the fast pace of technology evolution. In all industries, IT leaders and engineers must focus attention each day on learning the technologies, protocols, products, and solutions that could benefit their company's Internet business strategies. Maintaining network uptime, implementing improved network security solutions to protect company data, and adding new network applications that will decrease costs and increase productivity are all dependent on engineer knowledge and skills.

Companies that establish a process for capturing, filtering, and disseminating knowledge within their organizations are more likely to recruit and retain top performers and to differentiate themselves from their competitors, two significant factors for business success.

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Knowledge Transfer through the National Science Foundation's Science and Technology Centers - Netscape

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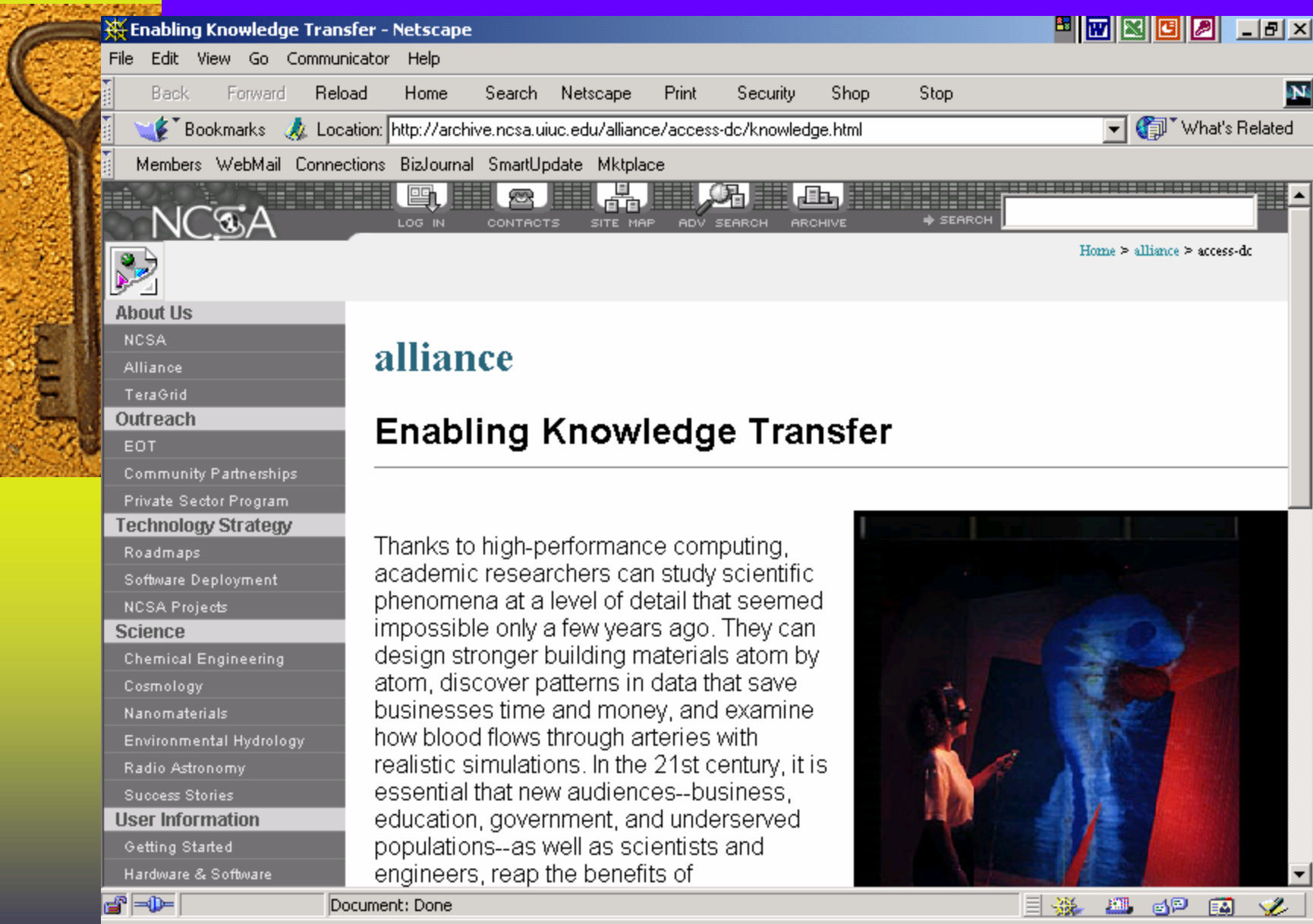
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# Knowledge Transfer through the National Science Foundation's Science and Technology Centers

## Table of Contents

- [Introduction](#)
- [Research Collaboration in Leading-Edge Technologies](#)
  - Electronics
  - High-performance Computing
  - Materials
  - Optics and Imaging
  - Biotechnology and Biomedical Imaging
  - Superconductors
  - Environmental Management
  - Natural Disaster Prediction
- [Knowledge Transfer Activities to Foster Research Collaboration](#)
  - Workshops and Symposia
    - Disseminating Information
    - Building Collaborations
    - Introducing New Technologies
    - Providing Training
  - Industrial Participation in STC Activities

Document: Done

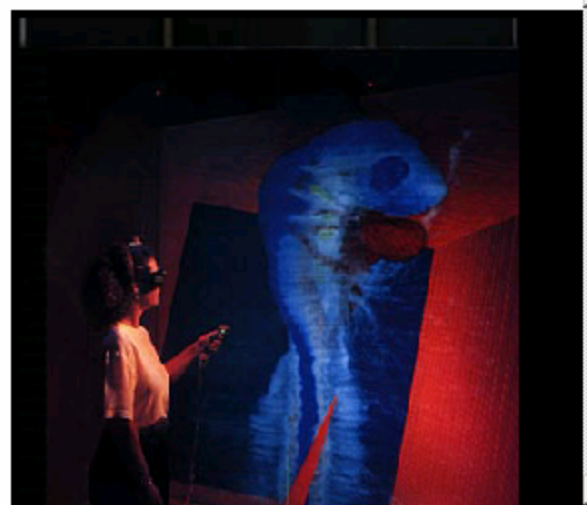


- About Us**
  - NCSA
  - Alliance
  - TeraGrid
- Outreach**
  - EOT
  - Community Partnerships
  - Private Sector Program
- Technology Strategy**
  - Roadmaps
  - Software Deployment
  - NCSA Projects
- Science**
  - Chemical Engineering
  - Cosmology
  - Nanomaterials
  - Environmental Hydrology
  - Radio Astronomy
  - Success Stories
- User Information**
  - Getting Started
  - Hardware & Software

## alliance

# Enabling Knowledge Transfer

Thanks to high-performance computing, academic researchers can study scientific phenomena at a level of detail that seemed impossible only a few years ago. They can design stronger building materials atom by atom, discover patterns in data that save businesses time and money, and examine how blood flows through arteries with realistic simulations. In the 21st century, it is essential that new audiences--business, education, government, and underserved populations--as well as scientists and engineers, reap the benefits of



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# CLIPCODE™

## Welcome to Clipcode.net

### Knowledge Transfer Portal For Software Engineers

*Strategy: Consider Clipcode.net as an extension to your company's advanced technology group - we are continuously exploring the very latest software engineering technologies and providing our subscribers with timely in-depth research on their use.*

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**What's New:**

- [W3C Standards - XML Technologies](#)
- [W3C Standards - XPath](#)
- [Design Patterns - implementations in C#](#)

Document: Done



## Tools of Knowledge Transfer

- Knowledge generation
- Knowledge codification
- Knowledge transfer - spirals
- Tools
  - **Data management tools- data warehouses, data search engines, data modeling, visualization**
  - **Information management tools - automated information search and retrieval agents, decision support technologies, executive information systems, document management technologies**
  - **Knowledge management**

# Humans in Knowledge Dissemination, Transfer

## – Transmission and absorption

- [www.lotus.com](http://www.lotus.com)
- [www.microsoft.com](http://www.microsoft.com)
- [www.rootlearning.com](http://www.rootlearning.com)
- Groupware

## – Wholistic applications

- [www.inference.com](http://www.inference.com)
- [www.primus.com](http://www.primus.com)
- [www.knowlix.com](http://www.knowlix.com)
- [www.kanisa.com](http://www.kanisa.com)

# Knowledge Transfer and Sharing

- Survey of over 400 U.S. & European firms (Ruggles 1998) concerning activities needed for knowledge sharing within organizations:
  - 50% oriented to people
    - establishing new roles to leverage knowledge
    - enabling knowledge (training and education)
    - making knowledge visible to the organization
  - 25% oriented to process
    - mapping sources of internal expertise
    - creating networks of knowledge workers
  - 25% oriented to systems
    - implementing intranets & collaborative systems
    - data warehousing
    - developing expert systems
    - refining organizational routines



# Analyzing Existing IT Infrastructure

**Step 1**

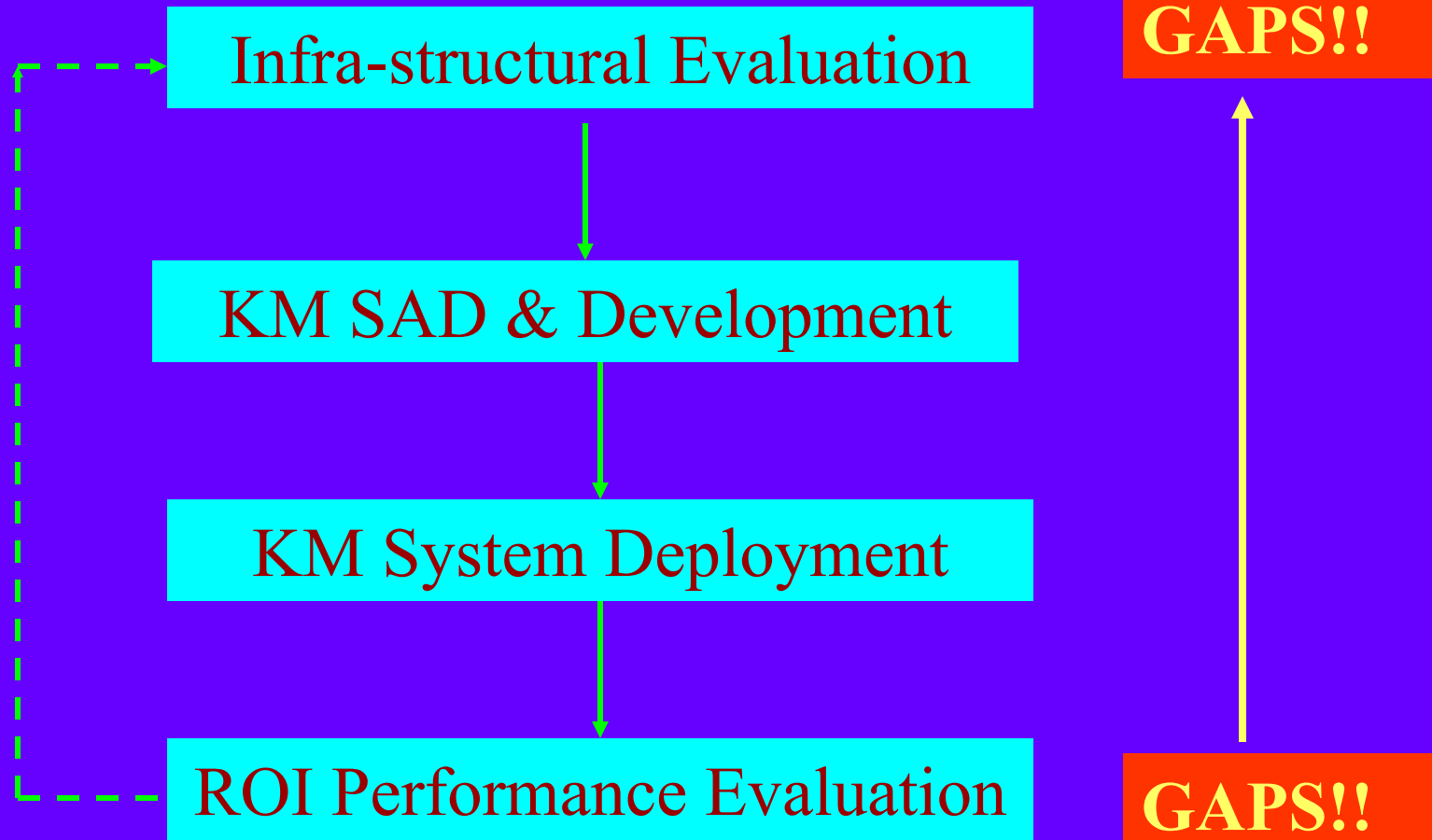
**KMT-5**



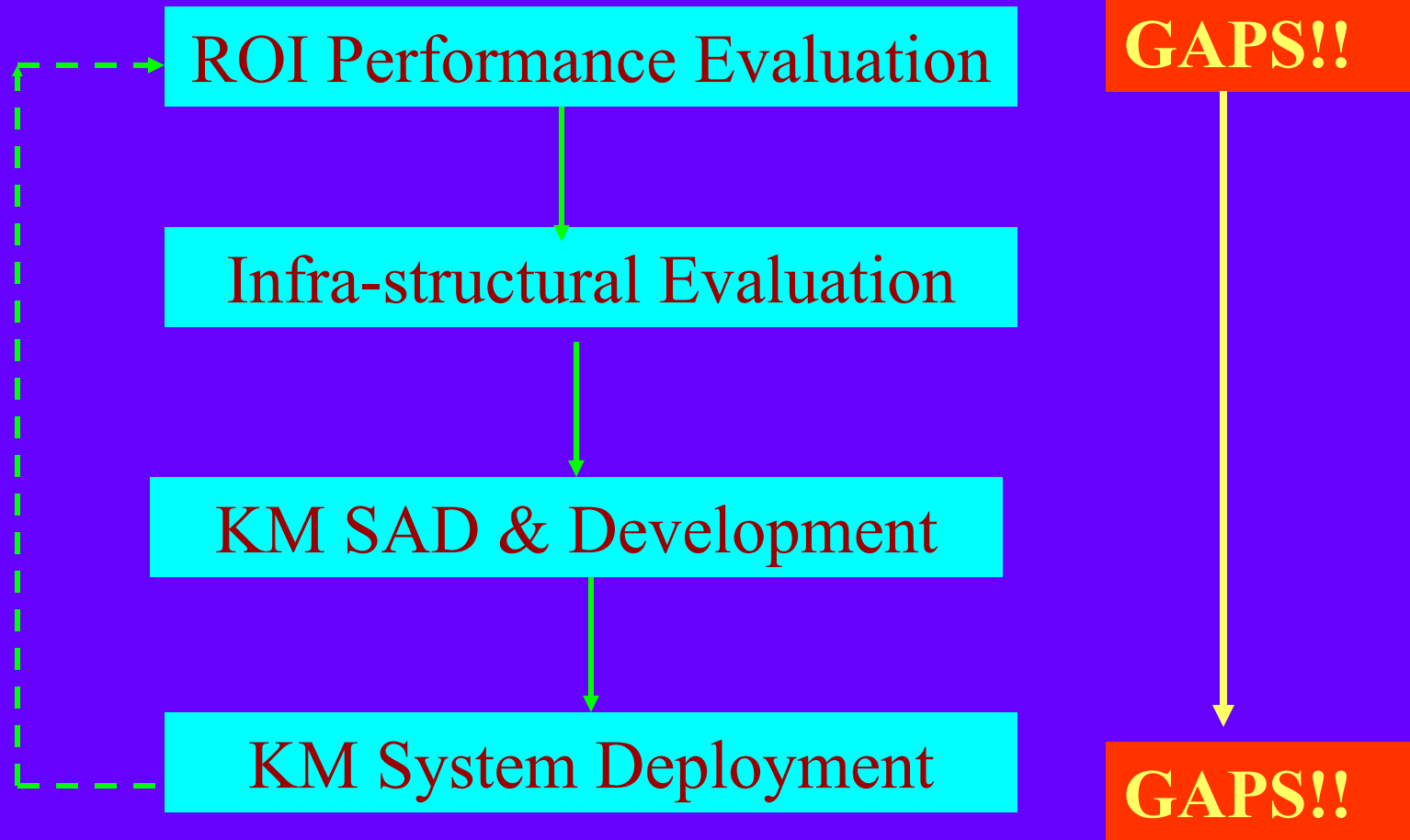
## 10-Step KM Roadmap

- Roadmap, not a methodology, **you apply...**
- **Four phases** constituting **10 steps**
- Link between KM and **business strategy**
- Prioritize KM Support for Processes **to maximize business impact - 'Value'**
- Key steps involved in K auditing, K mapping, strategic grounding, deployment methodology, teaming, change management, ROI metrics

# Four Phases for 10 Steps – Inputs Driven



# Four Phases for 10 Steps – Outputs Driven



# LEVERAGING THE GAPS

- GAP 1 – OUTCOMES - VALUE
- GAP 2 – KNOWLEDGE
- GAP 3 – INPUTS – IT SYSTEMS

**IT  $\Rightarrow$  KNOWLEDGE  $\Rightarrow$  VALUE**



## 1. Analyze Existing Infrastructure

- Various components of KM strategy and technology
- What's available, what are the 'gaps'?
- 'Clean Slate' versus 'Growing systems'
- Networks, intranet, extranets, data mining, data warehousing, DSS, groupware, etc.
- Knowledge servers – current limitations



## Analyze Existing Infrastructure - Overview

- Understand the role of your company's existing networks, Intranet and extranets in knowledge management.
- Understand the knowledge management technology framework and its components.
- Analyze, leverage and build upon data mining, data warehousing, project management and DSS tools that are already in place.
- Understand how knowledge servers work and help in enterprise integration.



## Analyze Existing Infrastructure - Overview

- Integrate existing Intranets, extranets and GroupWare into your knowledge management system.
- Perform a preliminary analysis of business needs that match up with relevant knowledge server choices.
- Understand the limitations of implemented tools and identify gaps in your the existing infrastructure.
- Take concrete steps to leverage and build upon existing infrastructural investments.

## The Leveraged Infrastructure (T)

- Hype of the ‘ultimate KM tool’
- Need to leverage *existing* infrastructure
- IT’s role in KM – broaden the reach and enhance the ‘velocity’
- Computing resources, processing power – storage and communications

## What to Look For?

- Innovation, generation of new ideas, ...
- Collaboration, K sharing, learning and continuous improvement
- Real knowledge, not *artificial intelligence* (?)
- Conversation as medium of thought
- Sources and originators – ‘K maps’
- Golden rule – KMS for the people
- DSS, quality, scalability, pragmatism...
- User is the King (??)

# Leveraging the 'binding glue' of Internet

- Global reach
  - Cost-effective (?)
  - Anyplace, anywhere
  - Distributed connectivity
  - Robust global data path
- Platform Independence (??)
  - Different data formats – still different (?)
  - Paper documents abound
  - Disparate information sources



# Enabling Technologies for KM 5 Components

## 5 Meta Components

- Knowledge Flow – facilitate K flow
- Information Mapping – link and map I flow
- Information sources – ‘data sources’
- Information and Knowledge exchange
  - Tools and non-technological facilitators
  - Enable exchange across tacit and explicit sources
  - Help create and share context, facilitate sense-making ?
- Intelligent agent and network mining

# Enabling Technologies for KM

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# 1. Knowledge Flow Meta Component

- Facilitate K Flows
- Intranets, extranets – paths for explicated K
- GSS and CSCW – paths for explicated content and tacit context
- K Pointers – direction to location of tacit K
- Goupware – document repository, remote integration and a base for collaborative work
- Intranets & Extranets – secure, cost-effective, unrestricted communication (?)



## Knowledge Flow Meta Component

- Groupware – for collaboration, transparent capture, document exchange, conversation / email
- Collaborative filtering tools – e.g GrapeVine
- Pointers to Expertise – Electronic Yellow Pages – limit to ‘explication’

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## 2. Information Mapping Meta Component

- Maps paths for both sources and destinations influencing I
- Document management systems, repositories with context, information distribution channels, meta-data, data about informal conversations, paths of external networks



## Information Mapping Meta Component

- Intranets – Collaboration / Connectivity, Information distribution, Publish / Push feed, Yellow Pages / Directory
- Tools – Web publishing tools, WWW servers, App servers, Dynamic web page generators
- Document management – creation of documents, tools supporting versioning
- E.g. *Vignette Story server (Cnet)*

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### 3. Information Source Meta Component

- Provide I feeds to KMS
- Distributed search and retrieval, multimedia content for ‘thick’ interactions, electronic bulletin boards, OLTP summaries
- Project Management Tools – allow to trace back documents and artifacts resulted in formal workflows
- Need better WWW-integration, developing...



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## 4. Information and K Exchange Meta component

- CB Tools and non-technological facilitators
- Allow people and systems to exchange, contextually share, transfer explicit and tacit forms of K
- Include collaborative annotation tools, messaging integration, conversation threading, information beading (E)
- Context addition, rich-media Internet conferencing, video conferencing, community building networks, mind maps, white boards, etc.


## Information and K Exchange Meta component

- Transparent capture enablers
- White boards and legal pads – capture of independent thoughts, discarded solutions
- Crosspads, electronic whiteboards
- Web conferencing, water coolers, and telephones: virtual meetings, document collaboration, informal communication (?)
- Mind maps, concept maps, thought maps,...
- Smile, you are on ‘K capture camera’!
- E.g. Caucus, Web Crossing, O'Reilly WebBoard, etc.



# Enabling Technologies for KM 5 Components

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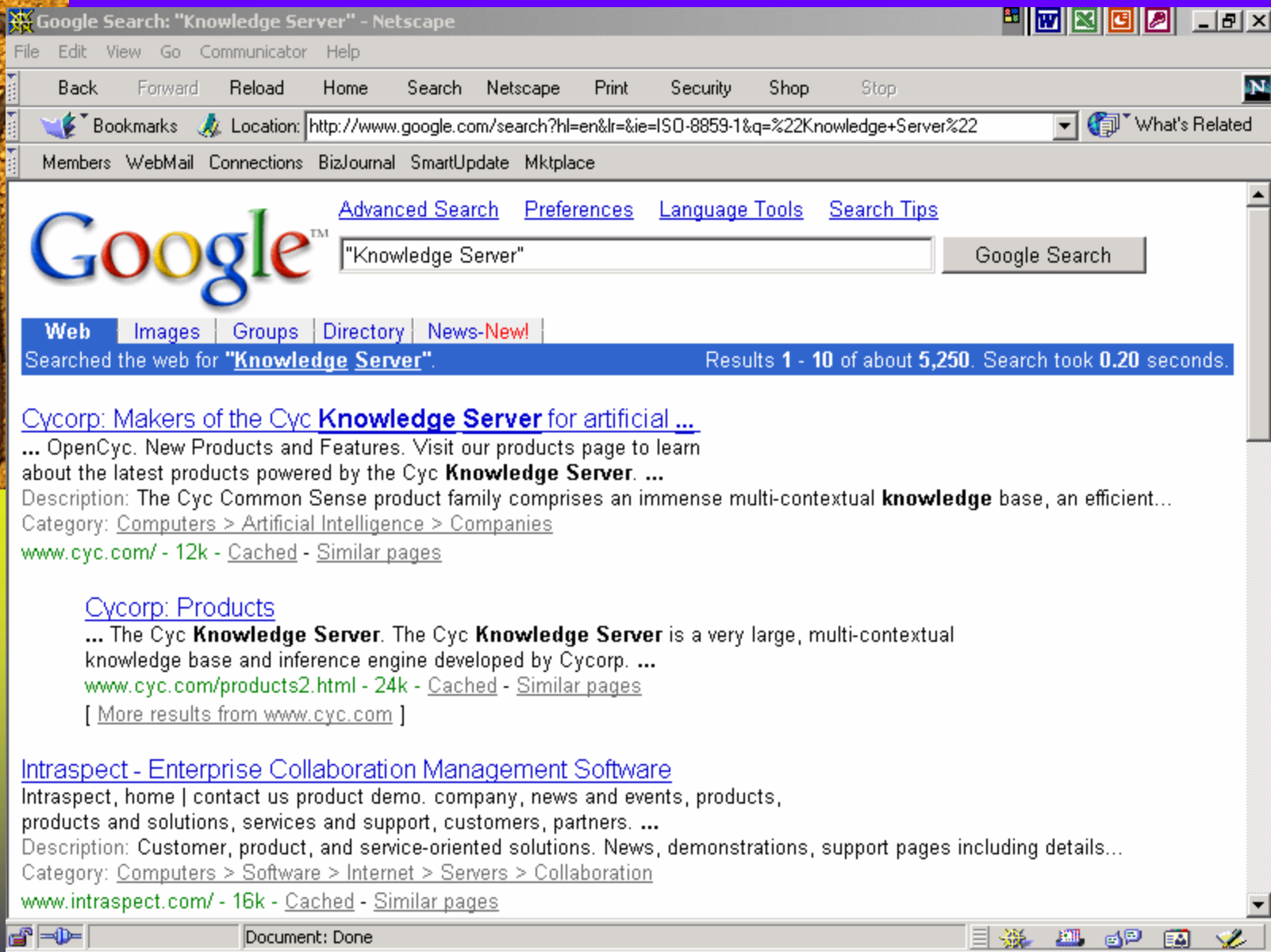
## 5. AI Agent / Network Mining Meta component

- Intelligent DSS, search engines, content aggregation, push- and pull-, content mining, web farming, clustering, automatic indexing, tag-based (XML) classification...
- Intelligent DSS – CBR, contextual I retrieval, data mining tools
- AI Agents – filtering, editing, searching and organizing overcome limitations of ‘conventional’ tools – excessive hits, breadth tradeoffs, meaning...
- Thunderstone, Verity, Fulcrum, Excalibur, Autonomy,...



## Where do we go from here?

- “Key driver for KMS – proper leverage and tight integration of existing technology tools and information sources”
- ... using K servers
  - allow for seamless integration across multiple enterprises that use the same K server
  - Provide extensible architecture for unifying and organizing access to disparate corporate repositories and Internet data sources
- E.g. Plumtree – other EIP plays in recent years...



The screenshot shows a Netscape browser window with the title "Google Search: 'Knowledge Server' - Netscape". The address bar contains the URL "http://www.google.com/search?hl=en&lr=&ie=ISO-8859-1&q=%22Knowledge+Server%22". The search results page displays the Google logo, a search bar with "Knowledge Server" entered, and a "Google Search" button. Below the search bar, there are navigation links for "Web", "Images", "Groups", "Directory", and "News-New!". The search results show "Searched the web for 'Knowledge Server'". Results 1 - 10 of about 5,250. Search took 0.20 seconds.

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