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The Reality of Knowledge Sharing & Collaboration: Web-based Workspaces

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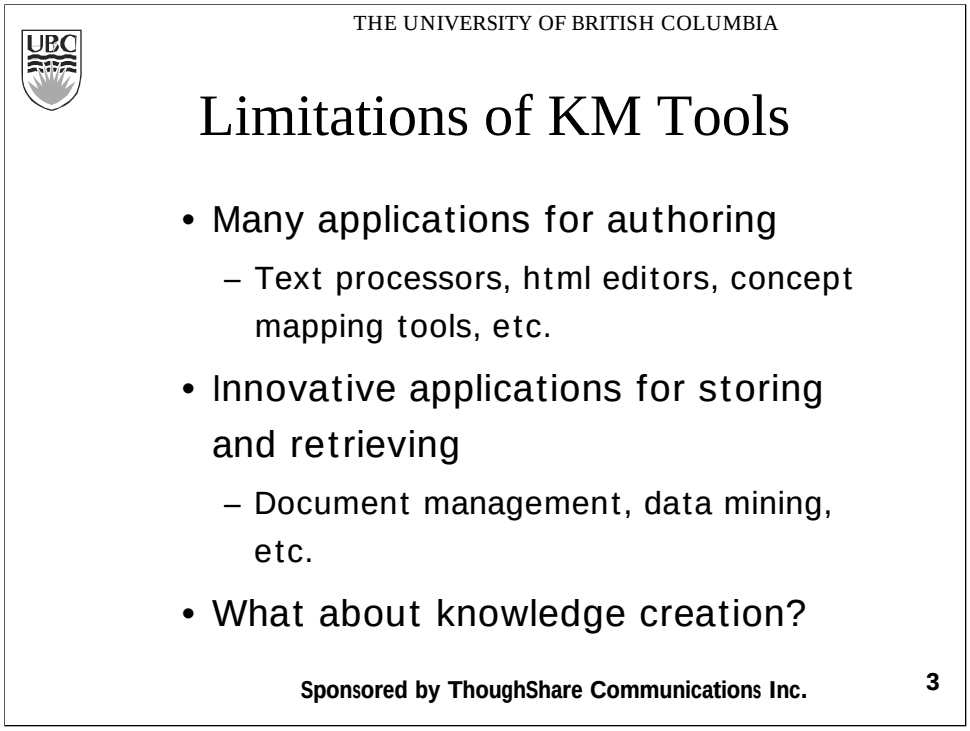
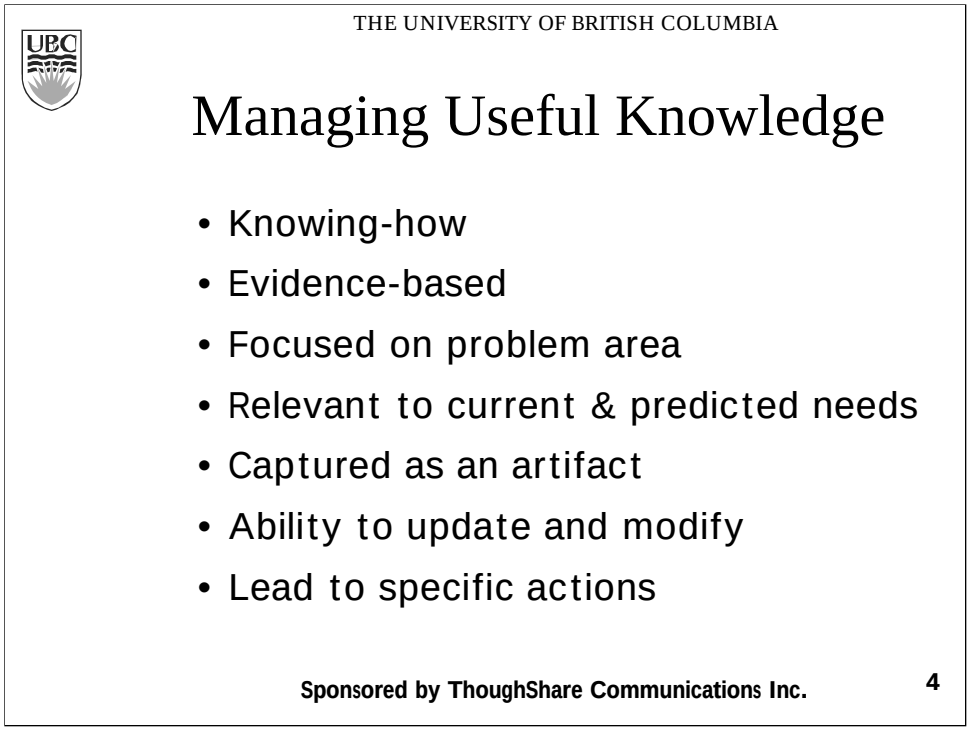
I'm not a ThoughtShare employee, rather I work at UBC MAGIC. MAGIC collaborates with a number of private sector and academic institutions on development projects.

The research I will describe here was done at Simon Fraser university in a group headed by John Dill. I participated in this project as an SFU employee and later at MAGIC

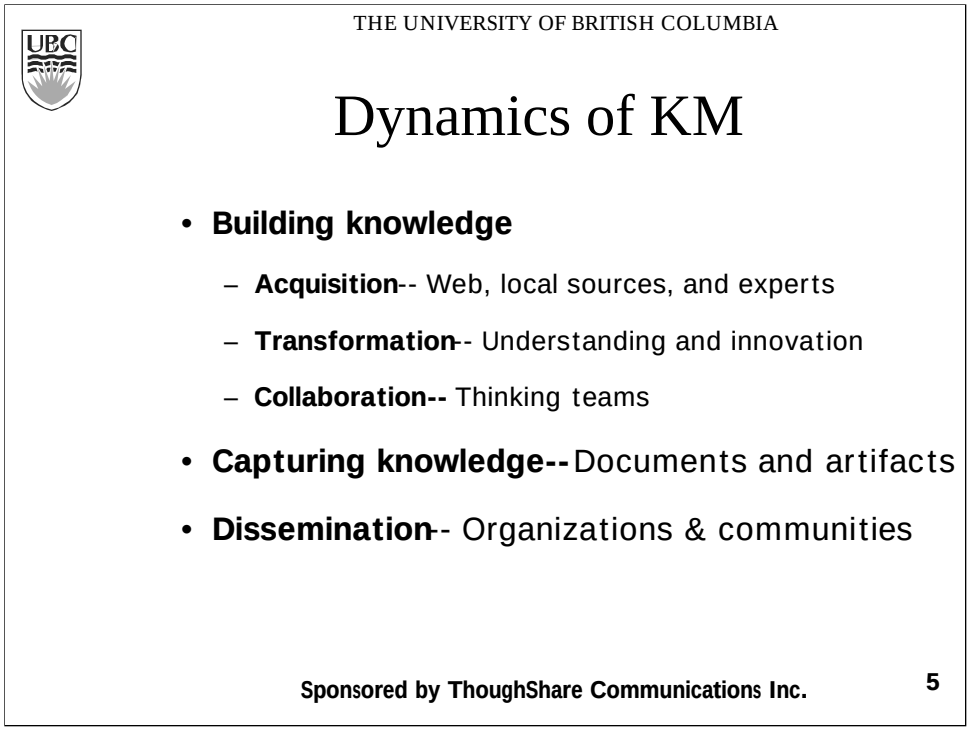


Current software is limited by its emphasis on the end product--the document or service. It does not support the process of creative thought and collaboration.

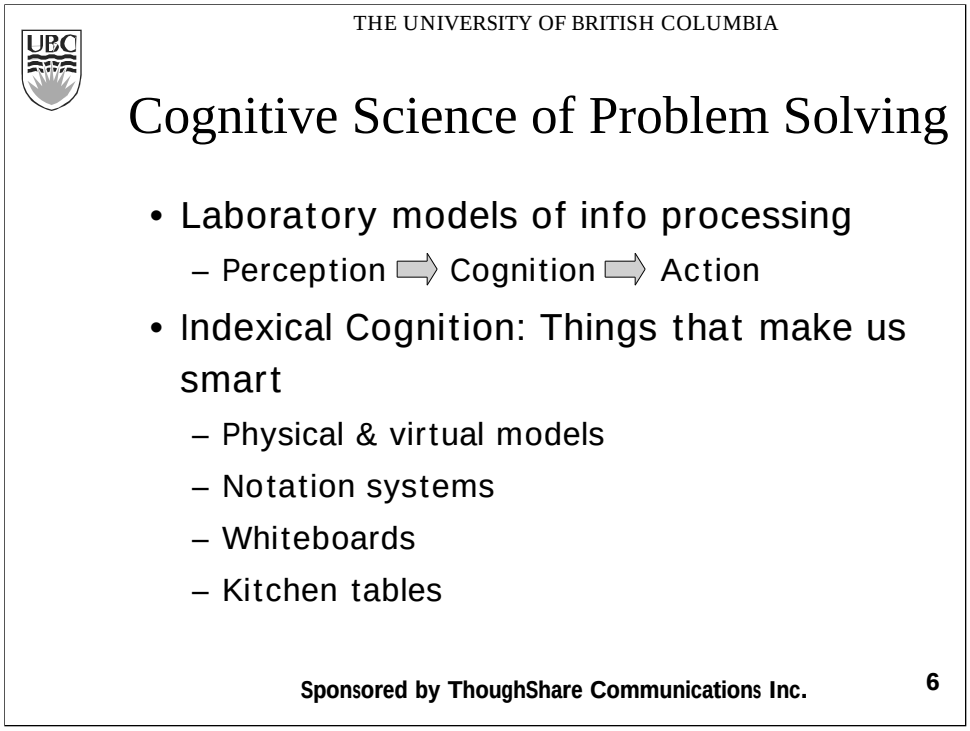
KM products have made excellent progress towards document management solutions, but have neglected the basic process of knowledge creation



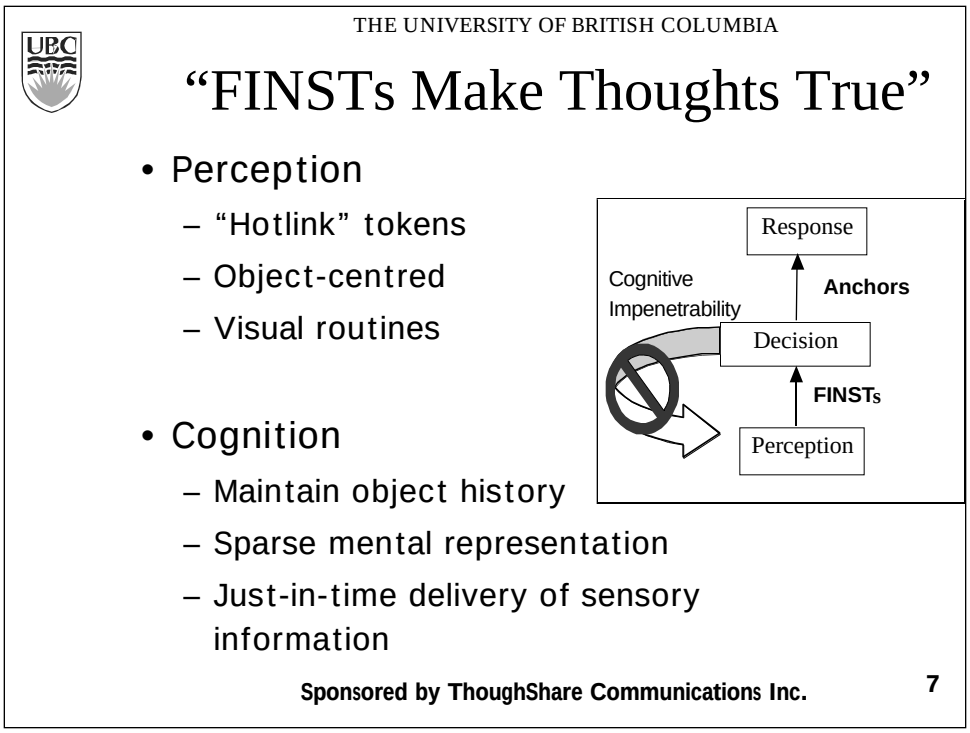
The type of knowledge that is captured should include tacit knowledge, not simply theoretical knowledge.



Here is one version of the cycle of knowledge work. While most KM concentrates on the last two stages we will examine the initial creative process by which knowledge is produced and captured in an artifact.



Much of the research draws upon models of human Cognitive Science. In particular a new set of theories developed by Zenon Pylyshyn and colleagues.



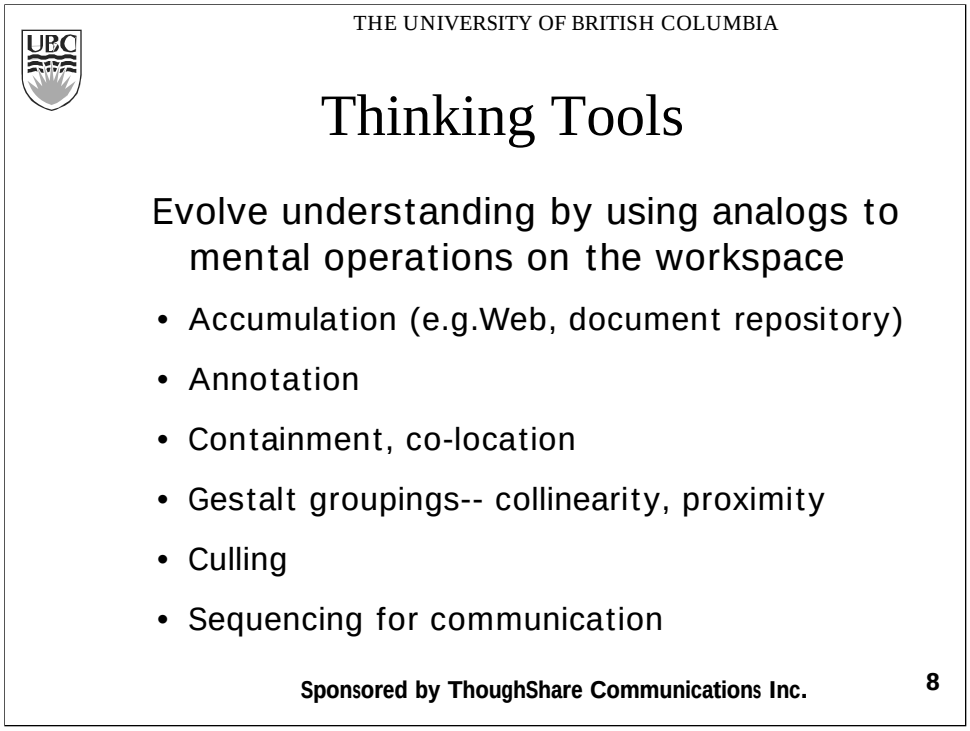
In recent years there has been a great deal of interest in Indexical, situated, embodied, deictic cognition: Minimal mental model. Leave as much of the representation in the world as possible, retrieve information as needed

Pylyshyn's FINST hypothesis describes a minimal mechanism that can support this high level of interaction of perception and cognition. At the perceptual level, there is evidence for a small number (~4) of attentional tokens that index perceptual primitives as originating from a given object or event in the world. When information about aspects of an object are needed, they are recalled by reference to the token.

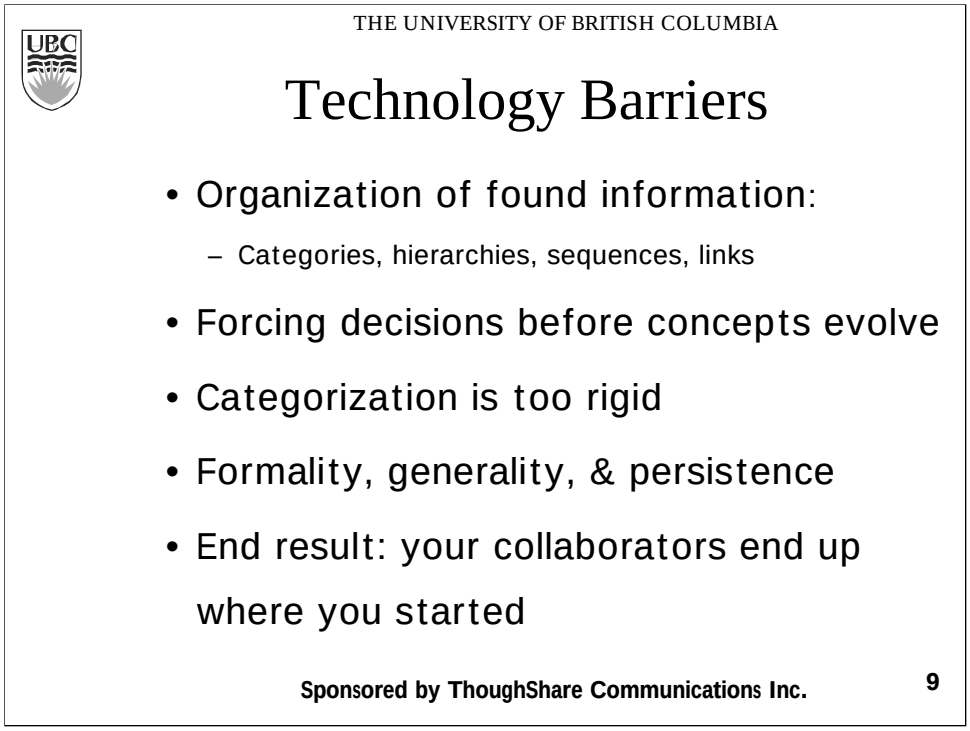
Among other things, FINSTs enable you to track a subset of identical moving targets, subitize a small number of items and perform simple visual routines such a collinearity quickly. They are drawn by new display items and provide potentially parallel access to a small number of them.

At the cognitive level, FINSTs provides the underlying atom of semantics-- the token that enables you to believe something about a specific object or event

Philosopher Jerry Fodor says FINSTs are the things that "make thoughts true"



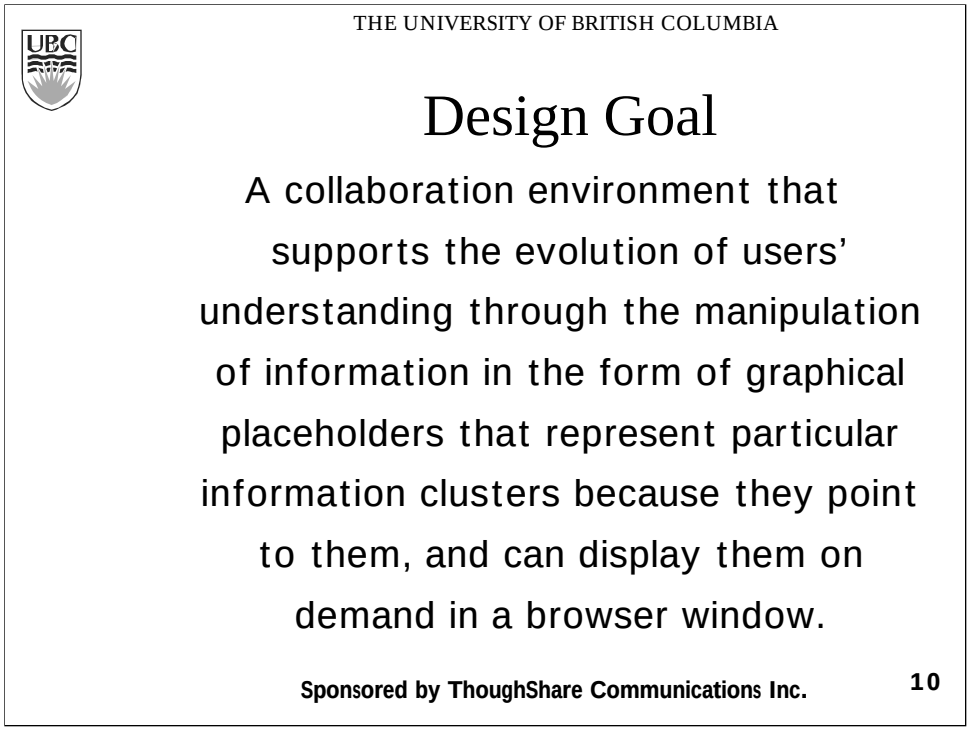
Indexical cognition models help us to develop tools that facilitate creative intelligence, collaboration, and the capture of tacit as well as explicit knowledge.



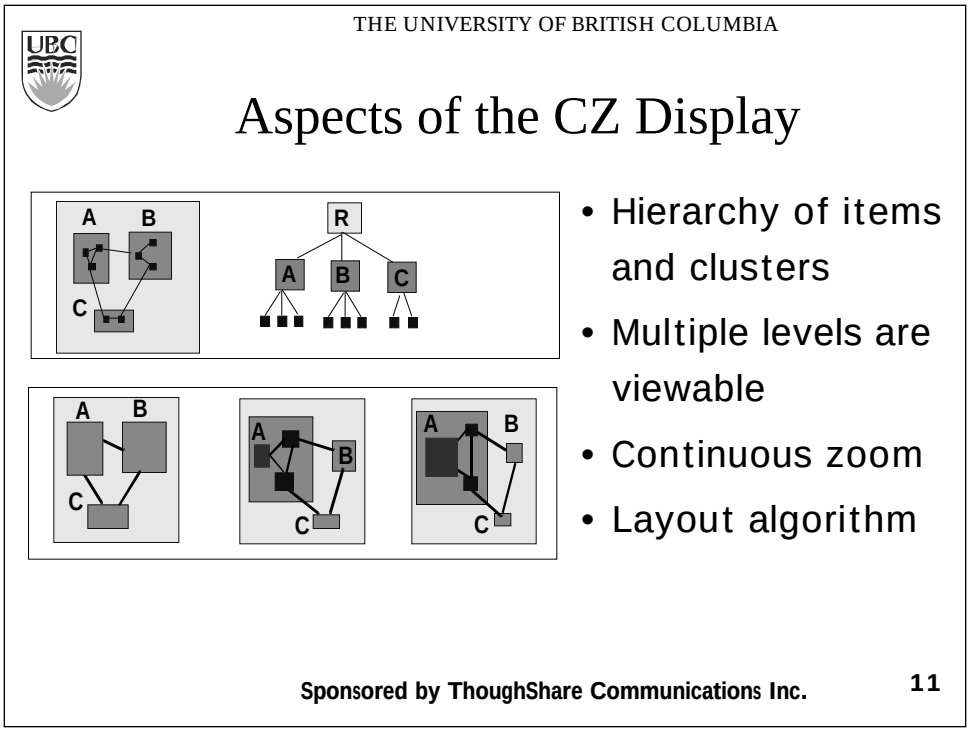
In order to create a new solution, a user must be able to understand information in a new way. This requires them to restructure the information in a fluid way, overcoming the information structure that they find in Web and intranet systems. This structure was based on and supports old ways of thinking about the information.

By forcing users to think about the format and structure of the final document at early stages of the creative process, document-based KM software packages do not allow users the flexibility that they need to think on the screen.

Even if users are successful, the document that they produce is hard to change, and so they unintentionally force their collaborators to overcome that organization in order to add their knowledge and insight.



The CZWeb project at SFU was part of a comprehensive research effort to understand and manage large information spaces. This began with the PRECARN IGI project, begun by John Dill and headed by Tom Calvert , and continued as CZWeb



CZWeb uses a hierarchical graph representation and a continuous zoom to use screen real estate efficiently.

The inset zoom technique maintains the visibility of the base page while allowing simultaneous views of multiple levels of the hierarchy

Layout algorithm responds to new items or removal of items by re-arranging the display for optimal visibility.

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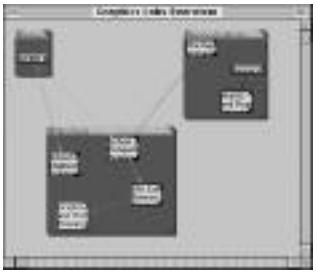
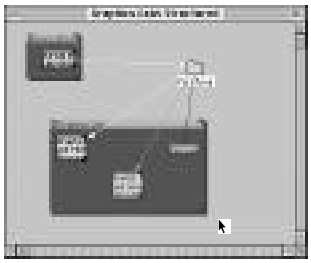
CZWeb Prototype





CZWeb creates a clickable index for each Web page visited at an open location.

If space is at a premium, CZWeb allows items to change size and location to make room for new or expanded items.

The result is an environment for decision evolution through flexible, spatial organization of information.

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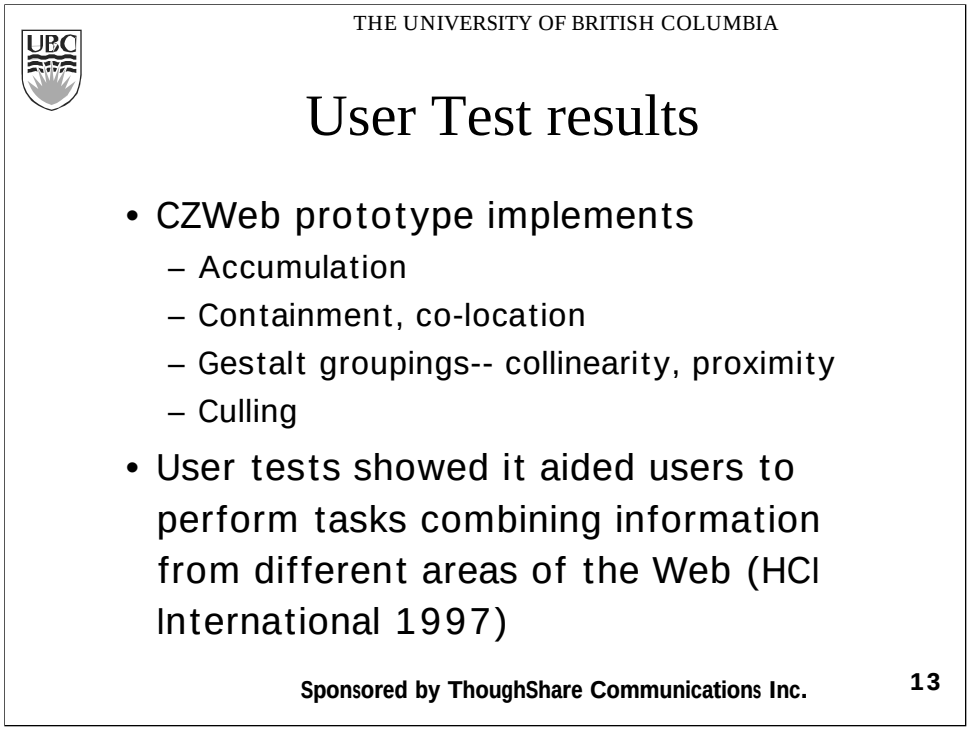
Web exploration is a dynamic and evolving process. It is impossible to predict how many pages will be visited in a session. No static layout would be optimal for all sessions.

As the user visits sites, CZWeb watches browser events and displays new Web locations in open spaces, with a visible link to the previously visited page. These links are springs that can reposition the nodes they connect so as to keep the spring length short.

If space is at a premium, CZWeb allows items to change size and location to make room for new or expanded items

CZWeb's communication with the browser is 2-way. Clicking on a node opens the Web page it points to in the browser window

Question: How will users respond to the display transformations?



User results were positive, and supported our claims that this approach was more effective than browser-based interaction alone.

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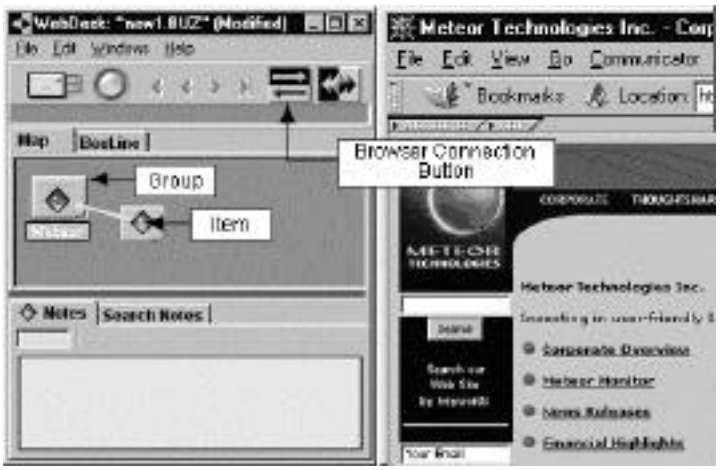
Plan Bee Freeware



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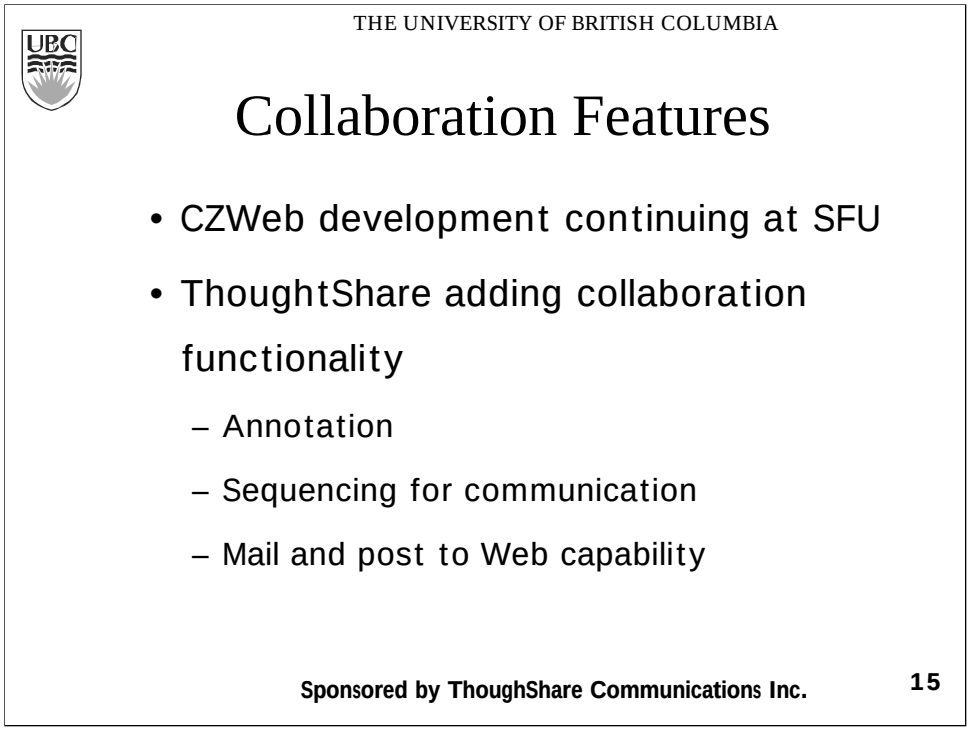
1n 1998 CZWeb technology was licensed to ThoughShare communications for commercial development. John Dill and myself worked with the ThoughtShare team on the design of an industrial-strength KM application based on that technology.



CZWeb development is a continuing effort at SFU. New features and functions will continue to emerge from this project.

ThoughtShare added collaborative functions to round out the product design and make it more applicable to collaborative uses. We will examine a few of the ways in which the product line is being developed in those areas

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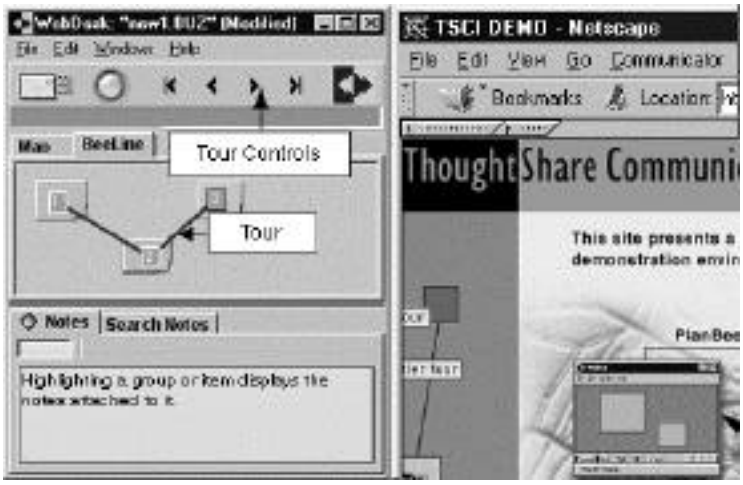
Sequencing for collaboration



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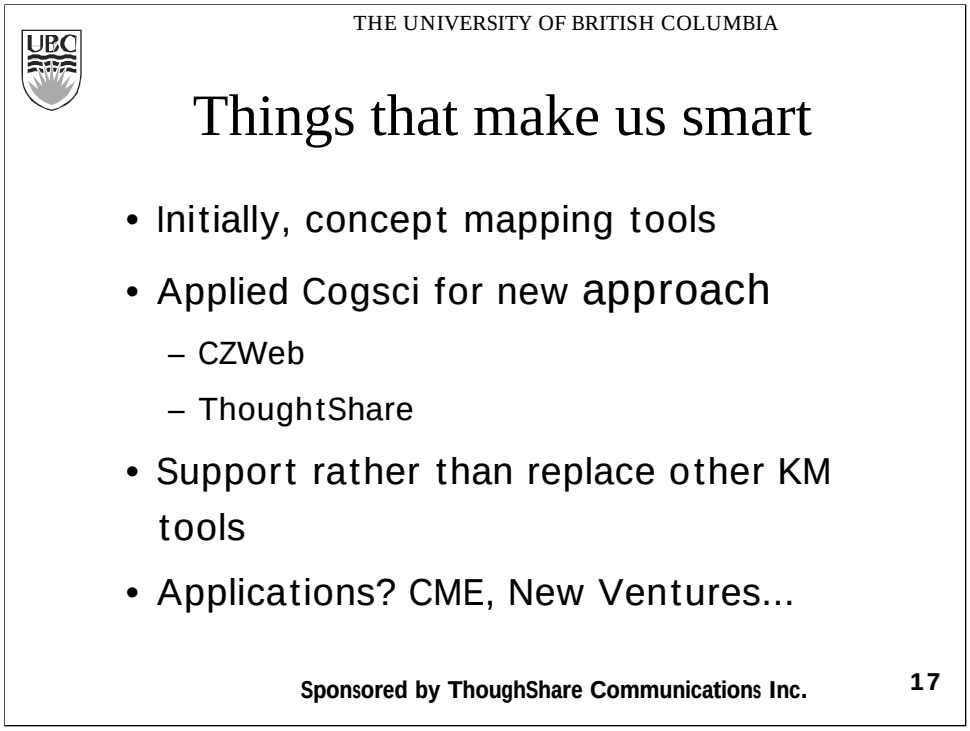
The Web tour is a particularly useful function. This enables someone receiving a BuzzPack, as the documents are called, to follow the creator's sequence of thought.



If we look at the tools that are out there, with the exception of concept mapping tools there has been little effort placed on supporting the key processes of knowledge creation and capture.

CZWeb was the first application to do so, and ThoughtShare continues the effort. ThoughtShare can be thought of an application that does not replace KM products, but rather complements them with added functionality.

Information & Downloads

- CZWeb prototype information
  - www.cs.ubc.ca/~fisher
- PlanBee Freeware
  - www.thoughtshare.com
- ThoughtShare Server Suite for KM
  - Exhibit hall, booth 1228

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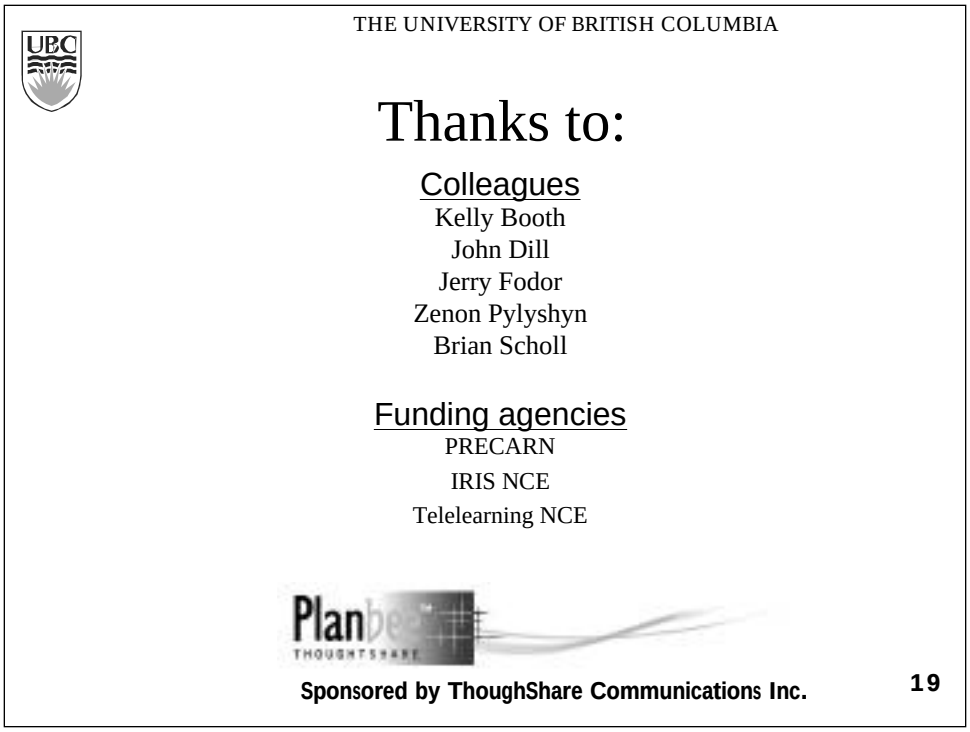

The research I describe here has been developed in a wide ranging collaboration between researchers across Canada and in the US. In addition to John Dill and Zenon Pylyshyn who I mentioned earlier, I would like to acknowledge the contribution of MAGIC Director Kelly Booth and FINST researchers Jerry Fodor and Brian Scholl and our funding agencies PRECARN, IRIS, and Telelearning.