Visualization, Knowledge Management and CSCW

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Outline

- General background on CSCW
- How can visualization enable CSCW?
- How can CSCW enable Knowledge management?
- Selected topics:
  – Social proxies
  – Visualizing large discussions
  – Beyond email

- Segueway to Workshop Topics
  – Collaborative support for Version Control Systems (Marcus)
  – Shared information workspaces (James)

CSCW Definitions

- CSCW – Computer Supported Cooperative (or Collaborative) Work
- Groupware:
  - Computer based systems that support groups of people engaged in a common task (or goal) and that provide an interface to a shared environment
- Groupware reflects a change in emphasis from using the computer to solve problems to using the computer to facilitate human-human interaction
- While *Groupware* refers to the real computer-based systems, the notion *CSCW* means the study of tools and techniques of *Groupware* as well as their psychological, social and organizational effects

CSCW Background

- Group activities supported by groupware are:
  - communication,
  - collaboration and
  - coordination

Classification of CSCW systems

A four-category classification system for CSCW systems

	Same time	Different times
Same place	Face-to-face (classrooms, Meeting rooms)	Asynchronous interaction (project scheduling, coordination tools)
Different places	Synchronous distributed (shared editors, video windows)	Asynchronous distributed (email, bulletin boards, conferences)

Classification cont.

	TIME		
PLACE	Same	Different but predictable	Different and unpredictable
Same	Meeting facilitation	Work shifts	Team rooms
Different but predictable	Teleconferencing Videoconferencing Desktop conferencing	Electronic mail	Collaborative writing
Different and unpredictable	Interactive multicast seminars	Computer bboards	Workflow

Example systems

- Message systems
- Multi-user editors
- Group Decision Support Systems
- Computer Conferencing
- Coordination systems

Groupware Concepts

- Shared information spaces
- Shared context
- Group windows
- Views
- Telepointer
- Session
- Role

Issues

- Group protocols
- Concentration issues, lack of social contact – but may be more efficient
- Awareness
- Group interfaces
  - WYSIWIS
  - Screen real estate management
- Technical aspects

Selected Tools

- Tango: http://www.collabworx.com/legacy/tango/
- Groove: http://www.groove.net/

Discussion

How can information visualization enable CSCW?

KM and Collaborative Work

- How can CSCW enable Knowledge management?
- Some are concerned that *"the codification of knowledge management is proceeding a little too rapidly, and that we may end up with a conception of knowledge management that is too neat and too simple to survive in the wilds of the workplace"*
- Missing pieces in the knowledge management puzzle – cognitive and social research and techniques
- Notions of a document as a "conduit"
- Knowledge work is not a solitary occupation but involves communication among loosely structured networks and communities of people
- Shared background and awareness of a coworker's activities help establish the common ground needed for knowledge sharing

Socially translucent systems

- Systems that provide perceptually based information about the presence and activity of users
- Provides social resources for the group and individuals to structure and enhance their online interactions
- Visibility yields awareness yields accountability
- *"Social translucent systems make it easier for people to interact in purposeful ways, to observe and imitate others, to engage in peer pressure, to create, notice and conform to social conventions"*
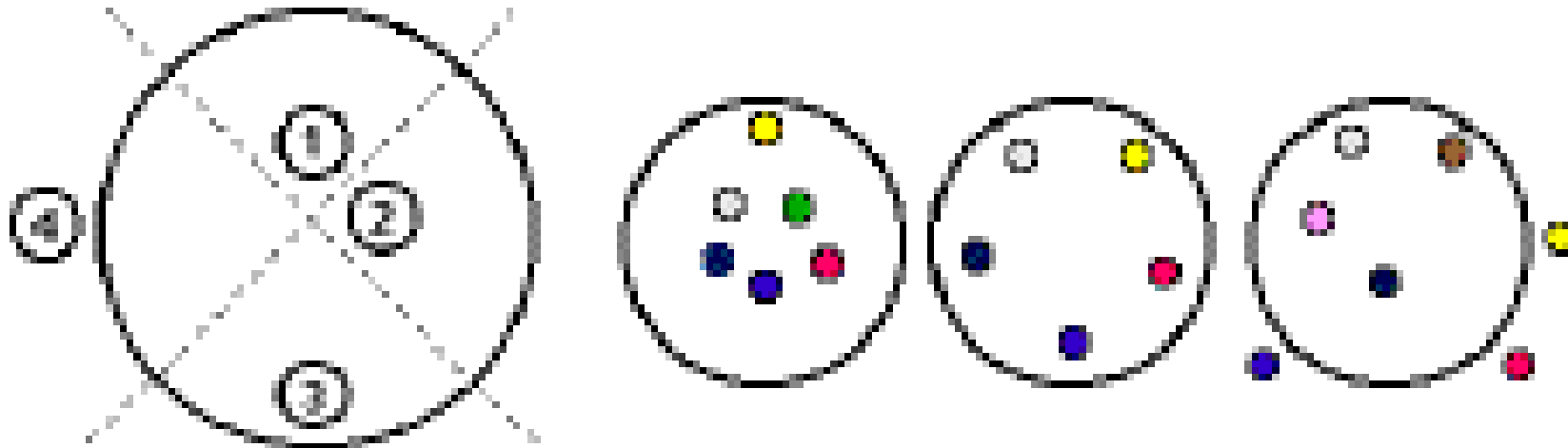
Babble

- Babble is an infrastructure for a knowledge community
- It is an online, digital space in which knowledge can be created, discovered, shared and reused
- Provides support for expressive communication through informal conversation

Babble -- 2

- Babble is a multichannel, text-based chat system to which many users can connect, and either select from a list of conversations to participate in, or create their own.

- Differs from conventional chat in two ways:
  - Conversation is persistent
  - Presence and activity of the participants visible through a variety of means, but principally through what we call a **social proxy**

Social proxy

Babble's user interface
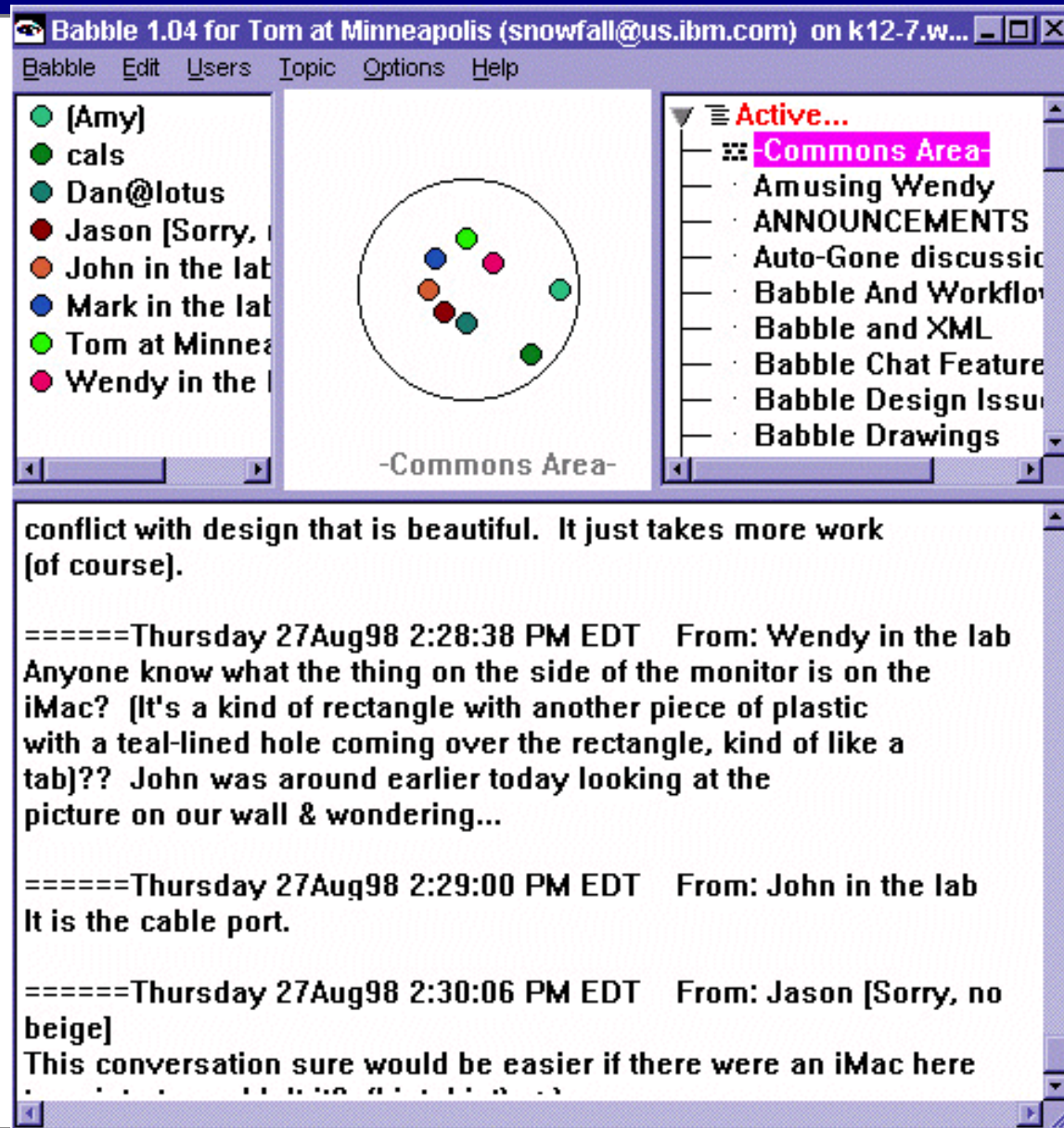
The Timeline in Babble
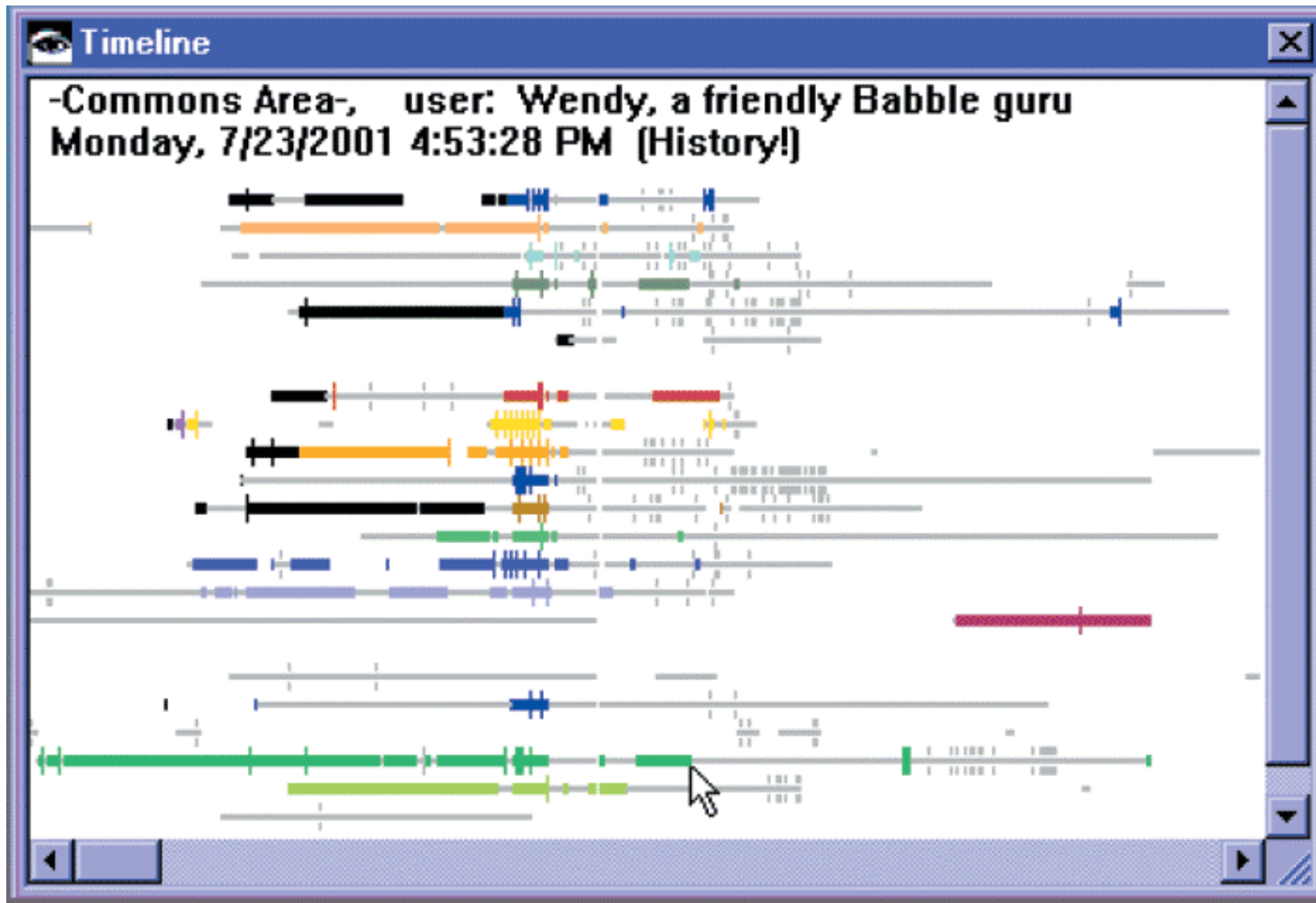
User experiences with Babble

- Experimented it with approx. 15 groups at IBM over several years
- Mixed experiences with adoption
- "Waylaying"
- Awareness – through persistent conversations

"In today's world … you'd want threaded discussions … and also have a chat space that would provide for real-time dialog, not necessarily staying on a particular topic, but a way to build trust, establish deeper relationships, a way to complement what you're trying to address over in the threaded dialog space. It's needed in the widely distributed, no-travel, matrix managed environment that we have today."

Visualizing Large-scale Discussions
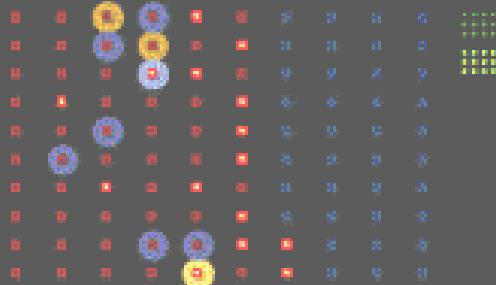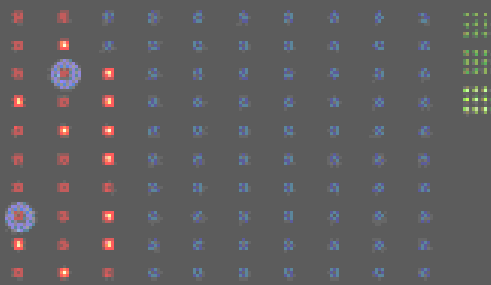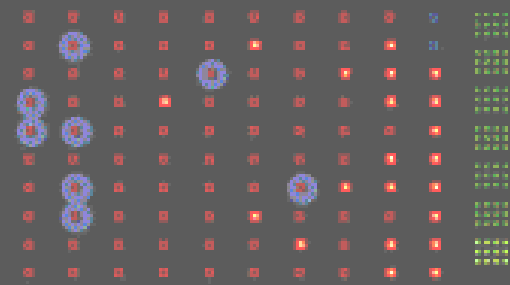
Zooming into the next level
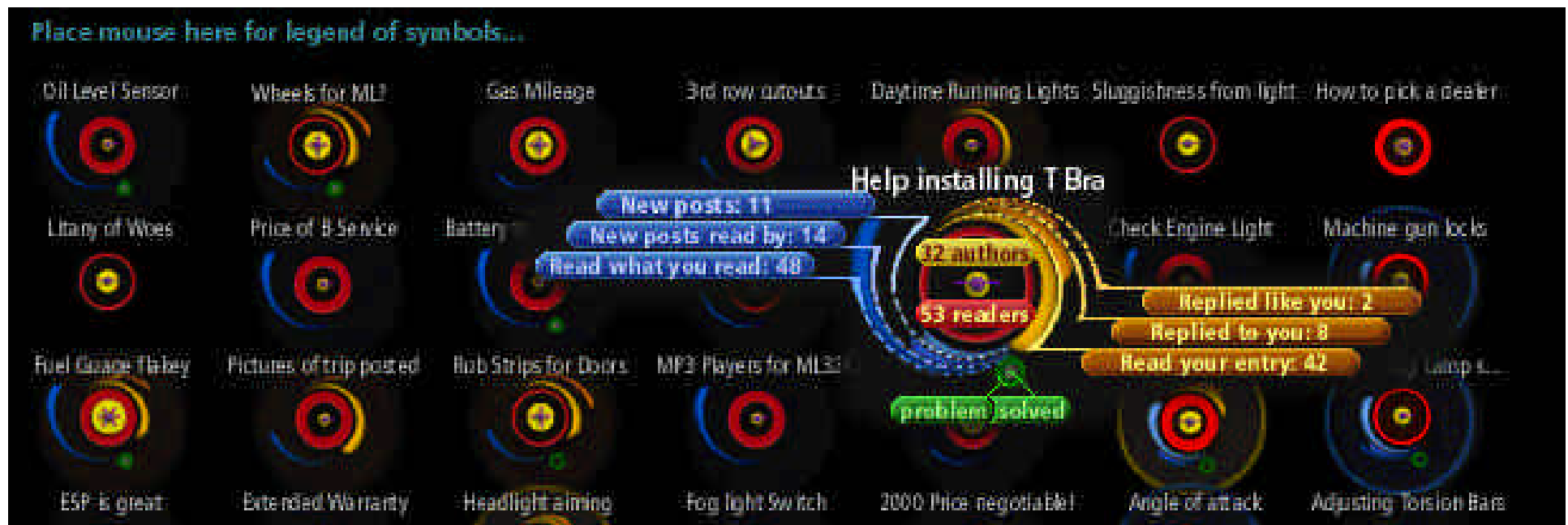
Zooming into the 3rd level
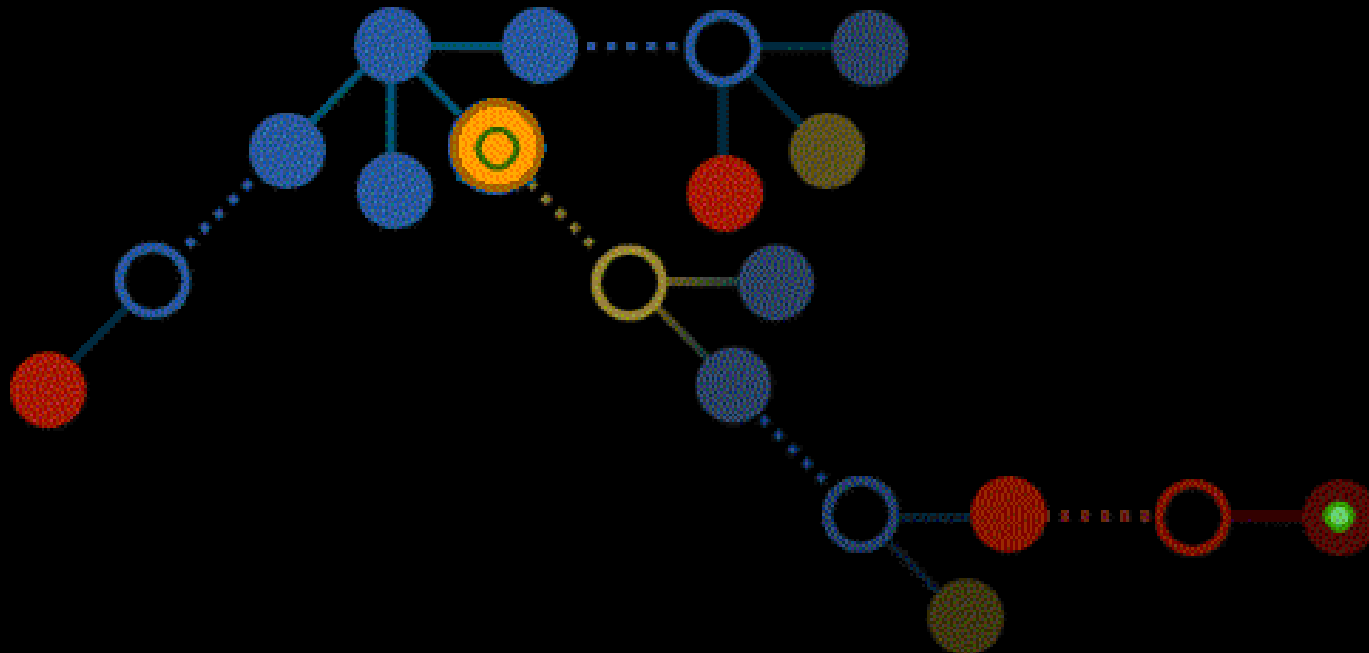
Beyond Email

- Electronic mail is the most widely used business productivity application
- Exchange of many kinds of content
- Many people use email to structure their work
- But users are often overwhelmed by volume, lose important items, and feel pressure to respond quickly
- Email clients generally have not kept pace

Redesigning Email

- Can visualizations help improve understanding and navigation?

- Would the use of synchronous communication and the ability to annotate messages be helpful?

- Can the structure of information within emails be exploited to provide better automatic summarizations?

Visualization of Emails

- Message threads
- Time
- Content of documents
  - Automatic classification tends to be error prone

Message Threads

- A conversation represents a series of replies to a message and replies to those replies

- This tool provides a visualization of the thread tree when any message is selected
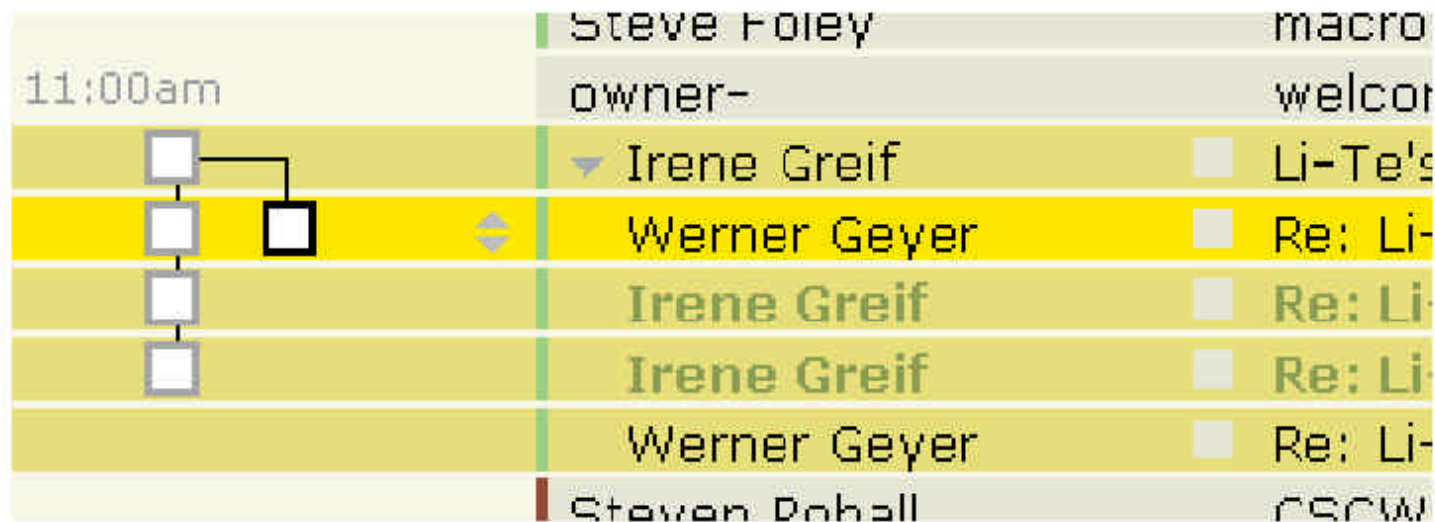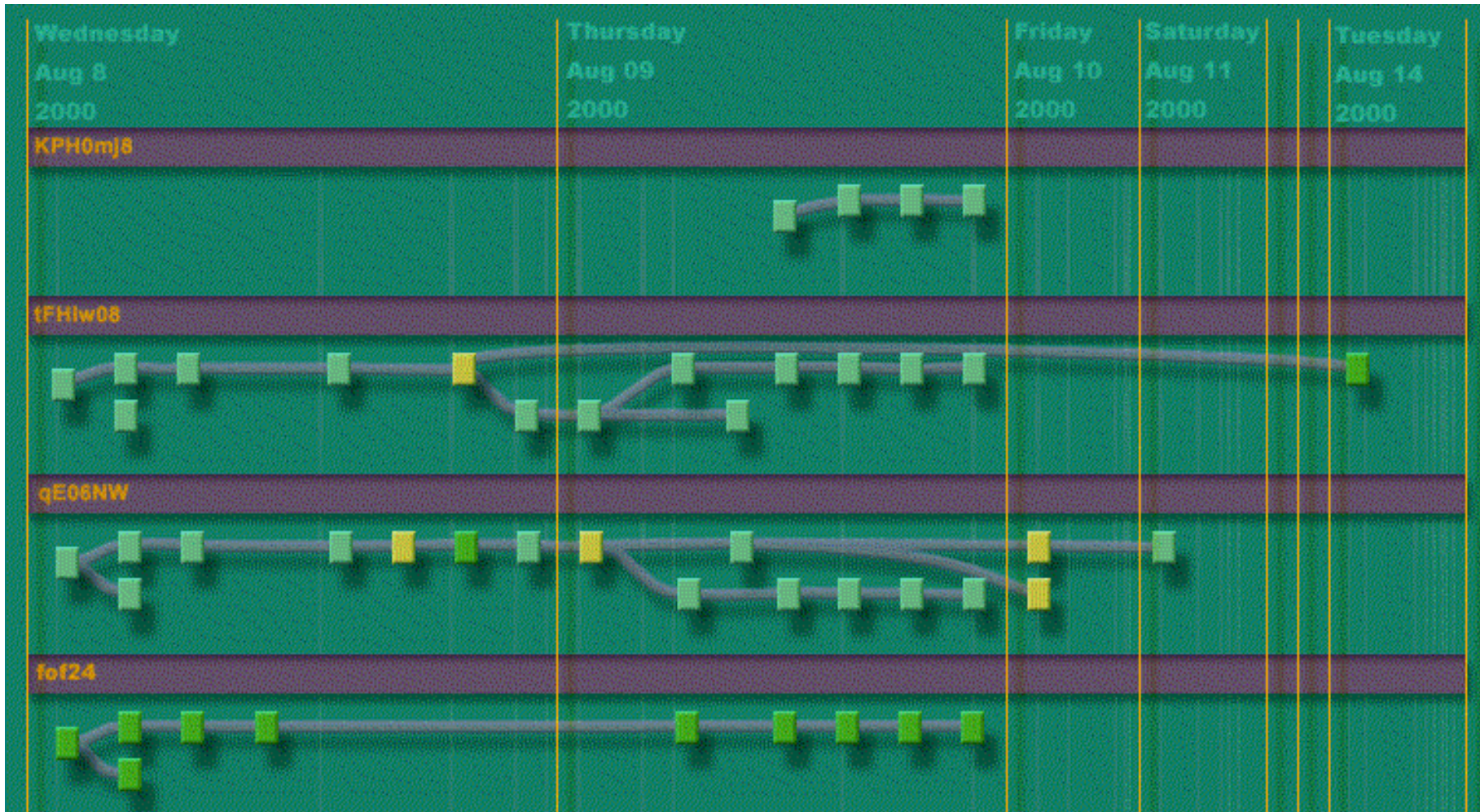

Figure 2. A gathered thread.

Times and Timelines

Awareness and messaging

- "Live names"
- Chat then saved as part of thread discussion
- Annotations

Redesigned System

List of sent and received messages.

A *gathered* and *collapsed* thread represented by a single entry.

An annotation attached to a message.

A *gathered* thread.

Secondary highlights indicating other messages in a thread.

Thread map.

A saved chat.

A chat started as a response to an email message.

An open message.

Automatic classification of emails

- Much work on document summarization but tend not to be suitable for the shorter, informally written emails

- But emails do have some structure

- Still an open problem

Discussion

- Risks:
  - Too many features – leads to poor usability

- Other ideas/thoughts?

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- Knowledge management puzzle:
  http://www.research.ibm.com/journal/sj/404/thomas.html

- Knowledge communities:
  http://www.research.ibm.com/SocialComputing/Papers/KnowCommunities.pdf

- Knowledge depot paper (mention some stuff):
  http://www.ics.uci.edu/~mkantor/flier/flier.html

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