Visualization System Design

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User Interfaces

- Data visualization systems are graphical user interfaces
- User interface design
  - System, User
  - Tasks, goals
  - Dialog, interaction

System Design

- **Requirements Specification** – What specific problems will the system solve? Who will the system serve? How will a user use the system to make a decision?
- **Architectural Design** – Decompose the problem and the system into components, e.g. elements of a dashboard
- **Component Design** – Select the best tools, visualizations, interactions for each component
- **Implementation** – Actual coding or setup
- **Component Testing** – debugging
- **User Evaluation** – user testing, statistics
- **Maintenance** – documentation, fixes

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Don't wait until the end to test. Test after each step and iterate as necessary.

User Modeling

- Focus on user requirements, not capabilities of the computer system
- Try to “get into the head” of the user
- Know the user: familiarity, role, knowledge, motivation
- Cognitive walkthrough

Goals – What the user will hope to achieve, e.g. an informed decision

Operators – Basic user actions or thought process steps

Methods – sequences of operators used to achieve a goal

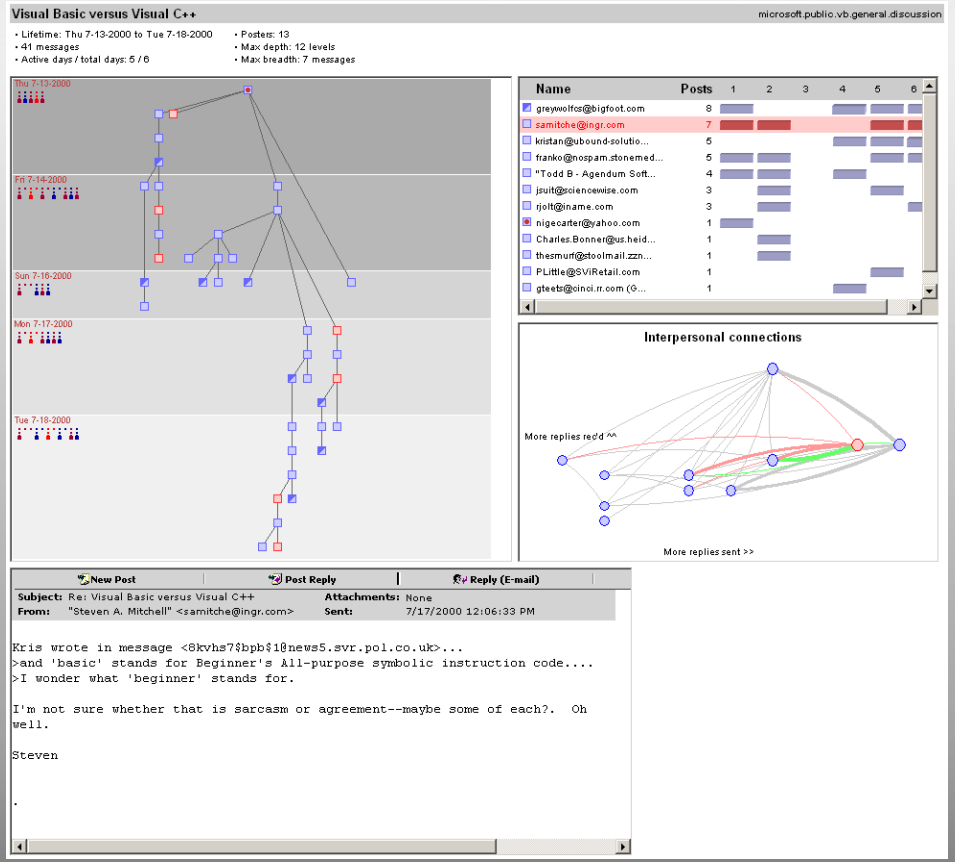
Selections – How the user decides to use one method over another

Task Analysis

- Connect system tasks to user goals (synthesizability)
- Decompose tasks hierarchically into subtasks
- Create plans out of task sequences
- Examine triggers for conditional tasks
- Also consider waiting, cycles and multitasking
- Use results for dashboard layout, organization of screens

Netscan Dashboard

THREADTREE DISPLAY OF SELECTED THREAD, ORGANIZED CHRONOLOGICALLY AND BY THREAD HIERARCHY



DETAIL OF SELECTED MESSAGE FROM THREADTREE

PIANO ROLL (GANTT CHART) OF USERS COMMENTING IN THREAD. ORDERED VERTICALLY BY NUMBER OF POSTS. SELECTED USER HIGHLIGHTED IN THREADTREE.

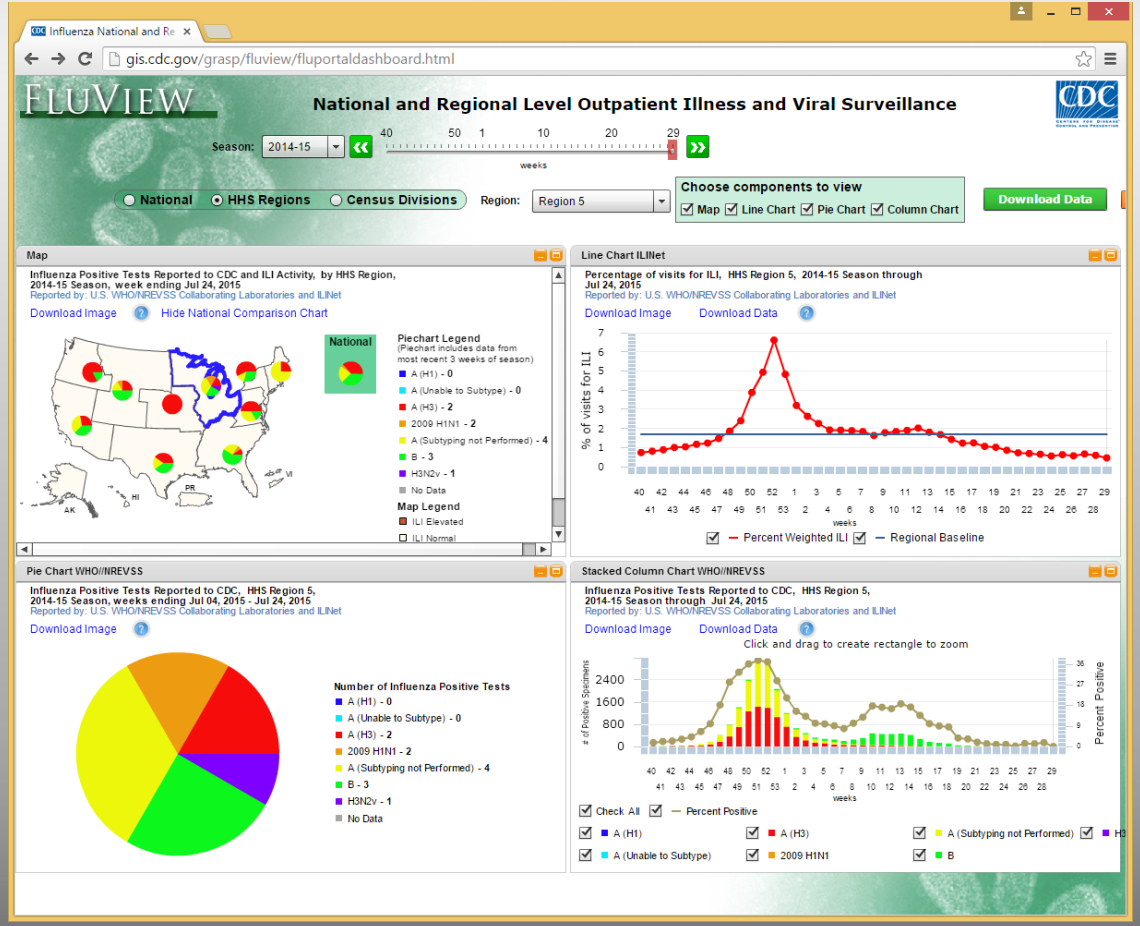
SOCIOGRAM INDICATING WHO USERS REPLY TO AND WHO REPLIES TO THEM.
X = # OF RESPONSES THEY SEND
Y = # OF RESPONSES THEY GET

Smith & Fiore, Visualization Components for Persistent Conversations, Proc. SIGCHI 2001

CDC FluView

Flu strain distribution by region

Flu strain distribution in selected region



Flu visits for selected region

Flu cases by type for selected region

UIUC Strategic Plan Dashboard

STRATEGIC PLAN ELEMENTS

GOALS

PERFORMANCE DATA