Visualizing Non-Functional Traces in Student Projects in Information Systems and Service Design

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CS 294-10, Spring 2011

The "Traceability Onion" below is a modified graph-based representation of traces throughout the student project design process. It is meant to:

• Encourage more systematic design decisions
• Provide a better understanding the system that is being designed
• Indicate the adequacy of artifacts (including prototypes, etc.)
• Facilitate audits of the design process by the teaching team
• Inform the prioritization of requirements, "scoping"
• Facilitate change impact estimation and improving changeability

General Layout
• 1 ring = 1 design artifact
• rings move through time as they diverge from the center
• node = trace,
• lines between nodes = parent-child relationship
• multiple parents and multiple children
• graph layout optimization (modified Reingold & Tilford, 1981)

Color
Trace-type is indicated using a specific color:
• beginning (white), continuation (white), fulfillment (green), termination (light green), forgotten (red)
• Colors were determined for maximum distinctiveness using Color Brewer 2 (© Cynthia Brewer, Mark Harrower and The Pennsylvania State University)

Hovering over a node
• highlights the path between parents and children in yellow
• highlights the ring (design artifact) on which that trace exists in yellow

Clicking on a node
• node is selected
• detailed information about that node is displayed (upper right)
• path between the node and the node's parents and children is highlighted in black
• "selected" node is fixed in the diagram until another node is selected

Tag Cloud
• shows relative frequency of tags used in a collection of traces
• clicking on a tag highlights (nodes) tagged with that term

" Traceability was just sort of ad-hoc before. This will really improve things." - Student 2010

What is Traceability?
One key concept students must master as part of courses at the School of Information is "traceability," however, the concept of traceability in this context is different from previously studied traceability in the software development process. Traceability in this context is a software design tool, rather than a software development tool. It is the way in which a design group identifies and keeps track of the relationships between important observations and key insights from early to later design activities. It is a tool for making more objective decisions about system and service design.

Traces for "Park My Ride"
Click a node for more information; double-click a node to edit.

Sensors

Artifact
Technology Review

Trace Title "Public Transportation"
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean at diam quam. Nullam eget tempo...more

Trace Type: Termination
Tags: public transportation, parking, sensors

stakeholder   analysis
parking   cost
sensors   public
transportation   SFMTA
parking enforcement
government regulations weather

Click tags to see associated nodes.