An Introduction to The Bridge

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The Problem:

- Bridging the gap between user requirements and GUI design
  - How do we turn our understanding of users into successful systems?
A Solution: The Bridge

- A comprehensive methodology for
  - understanding user needs
  - identifying users’ conceptual building blocks for their tasks
  - building GUI prototypes from the building blocks
  - testing the results with actual users
- Originally developed at Bellcore
A Solution: The Bridge

- It’s fast
  - You can create and test a prototype in as little as three days
The Bridge Is

- A participatory design method
  - Users, designers, and implementers are equal partners
  - Continuous communication among stakeholders accelerates design
  - Users and other stakeholders contribute their unique expertise
  - Stakeholders gain a shared understanding of design goals, opportunities, and constraints
The Bridge Is

- An object-oriented design method
  - Derives *task objects* – objects that support user tasks and make sense to users – from user tasks and uses them as building blocks
  - Task objects have attributes, actions, and containment relationships, as in object-oriented programming
Deriving Task Objects from Tasks

Tasks

Write grocery list
Bring list to store
Buy items on list

Task Objects

Grocery List
- Grocery items
- Create
- Edit
- I’m in | In Me
grocery items

Grocery Store
- Name Location
- Grocery items
- Pay
- I’m in | In Me
- Grocery items

Grocery Item
- Name Number
- Max price
- Add
- Delete
- Check off
- I’m in | In Me
- Grocery store

Identity
Attributes
Actions
Containment
Relations
The Bridge Is

- An object-oriented design method
  - To build a prototype, task objects are mapped directly to corresponding GUI objects using an object-oriented GUI style guide. This is the bridge between requirements and implementation.
Mapping Task Objects to GUI Objects

**Task Objects**

- Grocery List
  - Grocery items
  - Create
  - Edit
  - I'm in | In Me
    - Grocery items

- Grocery Item
  - Name
  - Number
  - Max price
  - Add
  - Delete
  - Check off
  - I'm in | In Me
    - Grocery items
    - Grocery store

**GUI Objects**

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
<th>Max Price</th>
<th>Purchased?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oranges</td>
<td>12</td>
<td>$.99/lb.</td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td>6</td>
<td>$.79/lb.</td>
<td></td>
</tr>
</tbody>
</table>
The Bridge Is

- Multiplatform
  - Task flows and task objects are defined independently of their implementation on a particular platform
  - Task objects can be mapped to GUI objects on any platform for which there are suitable GUI style rules
Mapping Task Objects for Multiple Platforms

Microsoft Windows

<table>
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Web

<table>
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<th>Delete</th>
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Parts of The Bridge

- Part 1: Task analysis – understand user needs
  - Describe current tasks as task flows
  - Begin with high-level Current Big Picture task flow
  - Identify trigger and result of task flow
Example: Current Big Picture
Task Flow

Trigger: Out of grocery item

Process:
- Write grocery list
- Bring list to store
- Buy items on list

Result: Have groceries
Parts of The Bridge

- Part 1: Task analysis (continued)
  - Identify problems associated with tasks
  - Scoping: Agree on what parts to address in this design session
Example: Scoped Big Picture Task Flow

Trigger: Out of grocery item

Process:
- Write grocery list
- Bring list to store
- Buy items on list
- Bad traffic
- Long checkout lines

In Scope

Result: Have groceries
Parts of The Bridge

- Part 1: Task analysis (continued)
  - Next, describe current task flows in moderate detail
  - Identify problems associated with tasks
  - For each problem, agree on priority (high, medium, or low) for solving it
  - Scoping: Agree on what parts to address in this design session
Parts of The Bridge

- Part 1: Task analysis (continued)
  - Brainstorm “blue sky” ideal task flow that addresses the problems of current tasks
  - No criticism during brainstorming
  - Consider radical solutions without regard for feasibility
  - After brainstorming, agree on the desirability and feasibility (high, medium, or low) of each part
Example: Blue Sky Task Flow

Trigger
Out of grocery item

Process
Write grocery list
Send list to store
Eliminates Driving
High desirability High feasibility
Wait for delivery
Medium desirability Medium feasibility

In Scope

Result
Have groceries

An Introduction to The Bridge
Parts of The Bridge

- Part 1: Task analysis (continued)
  - Construct realistic task flows for the new system with as many desirable features of the ideal tasks as possible
  - After creating each task flow, agree on what is in scope for this design session
Parts of The Bridge

- Part 2: Task object design – identify users’ conceptual building blocks
  - Write down all nouns that appear in the realistic task flows
  - For each noun, write down its attributes: properties, such as its name, and any objects it contains
  - Some nouns will emerge as task objects users need to work with, others as properties of objects
Identifying Attributes of Task Objects

Task Objects

- Grocery List
  - Grocery items

- Grocery Store
  - Name
  - Location
  - Grocery items

- Grocery Item
  - Name
  - Number
  - Max price

Identity

Attributes
Parts of The Bridge

- Part 2: Task object design (continued)
  - For each object, identify actions that users (not the computer) perform on the object, such as copy, print, or delete
Identifying Actions Performed on Task Objects

Task Objects

**Grocery List**
- Grocery items
- Create
- Edit

**Grocery Store**
- Name
- Location
- Grocery items
- Pay

**Grocery Item**
- Name
- Number
- Max price
- Add
- Delete
- Check off

Identity
Attributes
Actions
Parts of The Bridge

Part 2: Task object design (continued)

- For each object, identify any other objects it’s contained in (parent objects) and any objects it contains (child objects)
Identifying Parent and Child Objects of Task Objects
Parts of The Bridge

- Part 2: Task object design (continued)
  - Usability test the objects by using them to perform the tasks in the realistic task flow
Parts of The Bridge

- Part 3: Mapping task objects to GUI objects – build a prototype
  - Use style rules for the mapping, such as
    - A task object is a conceptual unit, so put it in its own window
    - Put the object’s actions in the window’s menu bar and tool bars
    - Put the object’s attributes in the client area of the window
Parts of The Bridge

- Part 3: Mapping task objects to GUI objects (continued)
  - Usability test the prototype by using it to perform the tasks in the realistic task flow
For More Information

  - The most complete description of The Bridge

  - A list of 61 PANDA (participatory analysis, design, and assessment) methods. The Bridge is listed as “Workshop for O-O GUI Designing from User Needs”

  - An object-oriented GUI style guide for Microsoft Windows, CUA, CDE, and Motif

  - Describes object oriented GUI design methods for web commerce

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