Prototyping

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Pertemuan #11
What is a Prototype?

- Concept which reflects the elements of the end state
- Includes critical functionality
  - Partially operational
  - Not necessarily able to implement
- Evolves iteratively
  - “Build a little, test a little...”
- Measures usability
- Reviewed by experts – those in the trenches

Allows the design team to explore working design alternatives
Why Prototype

- Test ideas; engage and involve stakeholders
- Identify and evaluate alternatives
  - Synthesize optimal solution
  - Clarify requirements
  - Validate consistency with overall system direction
Prototype Fidelity

- **Degree of granularity and detail**
  - **Low-fidelity**
    - Simple
    - Inexpensive
    - Easy to produce
    - Easy to modify
  - **High-fidelity**
    - More complex
    - Resembles the final product
      - Functional capabilities
## Effectiveness of Prototypes

<table>
<thead>
<tr>
<th>Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
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</table>
| **Low-fidelity prototype** | ☐ Lower development cost  
☐ Evaluate multiple design concepts  
☐ Useful communication device  
☐ Address screen layout issues  
☐ Useful for identifying market requirements  
☐ Proof-of-concept | ☐ Limited error checking  
☐ Poor detailed specifications for coding  
☐ Facilitator driven  
☐ Limited utility after requirements established  
☐ Navigational and flow limitations |
| **High-fidelity prototype** | ☐ Complete functionality  
☐ Fully interactive  
☐ User driven  
☐ Clearly defined navigational scheme  
☐ Use for exploration and test  
☐ Look and feel of final product  
☐ Serves as living specification marketing and sales tool | ☐ More expensive to develop  
☐ Time consuming to create  
☐ Inefficient for proof of concept designs  
☐ Not effective for requirements |
Paper Prototyping
Example
Prototyping

- Process for demonstrating the feasibility of an approach
  - Based on a hypothesis
    - Validates
    - Invalidates

- Levels of fidelity
  - Low
  - Medium
  - High
Figure 6-1: Example of an early framework sketch. Framework sketches should be simple, starting with rectangles, names, and simple descriptions of relationships between functional areas. Details can be visually hinted at to give an idea of contents, but don’t fall into the trap of designing detail at this stage.

Source: Cooper & Reimann, *About Face 2.0: The Essentials of Interaction Design*, page 86
Developing a Paper Prototype

- Paper prototype represents the first stage of detailed interaction design
  - Follows
    - Concept of operation diagram(s)
    - Conversation diagrams
  - Documents *what* the computer will present to the user

- Address the Purchase Order Scenario
  - Creating a new purchase order
  - Mythical company
Concept of Operations – Purchase Order Process

1. Need for supplies determined
2. Need communicated to purchasing department
3. Purchasing Agent prepares Purchase Order and sends to supplier
4. Supplier processes order and ships to customer
5. Item(s) ordered delivered to requestor
6. Supplier bills customer
7. Customer reviews bill; coordinates with Purchase Order
8. Customer pays bill
Sample Conversation Diagram

- 'START' Signal
- LOGIN Screen
  - Message: "Please enter Entry fields - userid - password - domain"
  - Submit button
- USER ID Screen
  - USERID PASSWORD DOMAIN SUBMIT
- ERROR MESSAGE W/PROMPTS
  - PROGRAM
  - SCREEN OF ALLOWED APPLICATIONS
  - APPLICATION SELECTION (PO ENTRY)
  - SUBMIT

- REQUESTOR INFORMATION SCREEN
  - PROGRAM
  - ERROR MESSAGE W/PROMPTS
  - BILL TO INFORMATION SCREEN
  - PROGRAM
  - BILL TO INFORMATION SCREEN
  - NAME Department Location Phone Fax e-mail

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Sample Conversation Diagram
Conversation Components

- Login
- Application Selection
- Purchase Order
  - Requestor information
  - "Bill to" information
  - "Ship to" information
  - Line item information
  - Approval information
- Information messages
- Computer components
Developing the Prototype

- **Identify the screens**
  - Understand the scenario
  - Use the conversation components
  - Integrate with conversation diagram

- **List screen components**
  - Outputs to user
  - Inputs from user

- **Recommended tools**
  - #2 pencils
  - Quadrille tablet
  - Eraser
Login Screen

Welcome to Conglo, Ltd Applications
Please sign in:

User Name:
Password:
Domain:

Submit

System messages and/or prompts

Error message placement, as required
Application Selection

System messages and/or prompts

User selection mechanism

Focus application

Authorized application choices based on authentication processing

Error message placement, as required

CONGLO LTD APPLICATIONS
PLEASE SELECT CHOICE

PURCHASE ORDER SYSTEM

A1
A2
... 
An
Action Selection

CONGLO LTD PURCHASE ORDER SYSTEM
PLEASE SELECT ACTION

- Create New Purchase Order
- Modify Existing Purchase Order
- Delete Existing Purchase Order
- Review Drafted Purchase Order
- Check Purchase Order Status

Focus action
Specify purchase order of interest
Submit
Error message placement, as required
Purchase Order Creation (1) – Identifying the Requestor

CONGLO LTD PURCHASE ORDER SYSTEM
NEW PURCHASE ORDER

PURCHASE ORDER ID: 43K1mn
CREATE DATE: mm-dd-yyyy
MODIFIED: mm-dd-yyyy

REQUESTOR INFORMATION:

LAST NAME:

FIRST NAME:

DEPARTMENT:

PHONE:

FAX:

LOCATION:

EMAIL: @congloltd.com

System messages and/or prompts

User entries

Error message placement, as required
Purchase Order Creation (2) – Identifying the Ship To

System messages and/or prompts

User entries

Error message placement, as required

System messages and/or prompts

User entries

User entries

User entries

User entries

User entries
Purchase Order Creation (3) – Identifying the Bill To

CONGLO LTD PURCHASE ORDER SYSTEM
NEW PURCHASE ORDER

PURCHASE ORDER ID: yK1mn
CREATE DATE: mm-dd-yyyy
MODIFIED: mm-dd-yyyy

BILL-TO INFORMATION:
LAST NAME: ___________________________
FIRST NAME: ___________________________
DEPARTMENT: __________________________
PHONE: ____________________________-
FAX: ____________________________-

ADDRESS 1: __________________________
ADDRESS 2: __________________________
CITY: __________________________
STATE: __________________________ ZIPCODE: __________________________
EMAIL: __________________________

Error message placement, as required
System messages and/or prompts
User entries
System messages and/or prompts
User entries
Purchase Order Creation (4) – Line Item Entry

CONGLO LTD PURCHASE ORDER SYSTEM
NEW PURCHASE ORDER

PURCHASE ORDER: uklmn
CREATE DATE: mm-dd-yyyy
MODIFIED: mm-dd-yyyy
LINE-ITEM ENTRY: n

CATALOG/SKU NUMBER:

ITEM DESCRIPTION:

QUANTITY:

UNIT PRICE:

UNIT OF MEASURE:

DISCOUNT TERMS:

ADD | LAST

System messages and/or prompts

Error message placement, as required

System messages and/or prompts

User entries
CONGLO LTD PURCHASE ORDER SYSTEM
NEW PURCHASE ORDER

PURCHASE ORDER: 123456789

CREATE DATE: mm-dd-yyyy

MODIFIED: mm-dd-yyyy

YOU HAVE INDICATED THAT THE FINAL LINE ITEM HAS BEEN ENTERED. DO YOU WISH TO:

☐ RESUME LINE ITEM ENTRY
☐ REVIEW AND UPDATE ENTRIES
☐ SAVE FOR LATER PROCESSING
☐ SUBMIT FOR APPROVAL

Error message placement, as required

User selection mechanism

System messages and/or prompts

SUBMIT
CONGLO LTD PURCHASE ORDER SYSTEM CONFIRMATION

PURCHASE ORDER #12345 HAS BEEN SUCCESSFULLY PROCESSED AS YOU DIRECTED.

THANK YOU FOR USING THE CONGLO LTD PURCHASE ORDER SYSTEM. YOU MAY:

- [ ] PROCESS ANOTHER PURCHASE ORDER
- [ ] RETURN TO THE APPLICATION SCREEN
- [ ] END YOUR SESSION

Submit
Question ?