

## The Xerox Star: A retrospective

J. Johnson, T. L. Roberts, ...

The best interface design work in the world may be wasted if it is not tightly coupled with a timely product that offers significant functionality at a reasonable price, skillfully marketed to appropriate customers.

## 8010 Star Information System

- conceived in 1975 and released in 1981
- new personal workstations designed for offices ... intended for business professionals who handle information
- Xerox Palo Alto Research Center (PARC)
- System Development Division (SDD) at Xerox

## 8010 Star Information System

- What distinguished the Xerox Star from other computer systems?
- changed the notion of how interactive systems should be designed
- many of the design aspects were done right

## Xerox Star - user interface features

- desktop metaphor
- direct manipulation
- property or option sheet
- WYSIWYG (what you see is what you get)

## Xerox Star - user interface features

- generic commands
  - Each type of data object interprets a generic command in an appropriate way
- high degree of consistency
- few modes
  - A system has modes if user actions are interpreted differently in different situations.
- icons and iconic file management
- progressive disclosure

## Emphasis on good graphic and screen design

- Appearance and placement of screen objects
- illusion of manipulable objects
- visual order and user focus

## Emphasis on good graphic and screen design

- revealed structure
  - A good graphical interface can make the connections between intention and effect apparent to the user
- consistent and appropriate graphic vocabulary
- match the medium

## Xerox Star - features

- bitmapped display
- windows
- integrated applications

## Xerox Star - features

- Mouse
- Distributed computing
  - connect personal workstations with a local area network and attach shared resources to the network

## Xerox Star - Why wasn't it successful?

- Market not available?
- cost?
- limited functionality
- lacked an open architecture
- *perceived* as slow

## The Apple Lisa

- 1983
- a product with a similar interface to the Star
  - it is said that Steven Jobs, Apple's founder and chairman, visited Xerox PARC in 1979
- the Star was more ambitious than the Lisa in networking and distributed computing
- less expensive (\$10,000)
- Lisa was positioned between an office system and a personal productivity tool
- withdrawn from the market after three years
  - cost
  - confused product positioning
  - inadequate application base

## The Apple Macintosh

- January 1984
- approximately \$2,500
- SUCCESSFUL!
  - Did not need to trailblaze
  - a second-general Lisa and could learn from previous experience
  - aggressively priced
  - partially open architecture and a powerful developer's toolkit
    - lead to widespread availability of software applications
  - desktop publishing market
    - excellent graphics and reasonably priced laser printers
  - marketing experience and experience in sales and support

## A Case Study in Interface Design

The CHI '89 Information Kiosk

Gitta Salomon

### Project Goals

- to explore the interface design process
- make use of multimedia
- expand the team's understanding of what constitutes a successful interface design

## An overview of the system

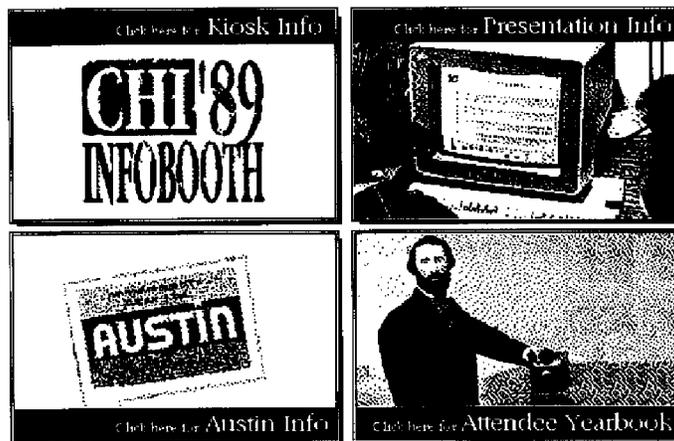
### InfoBooth

Provided multimedia data about the conference program, the people in attendance, and the city of Austin, Texas.

### PhotoBooth

Offered conference attendees a way to input information about themselves that was then included in the InfoBooth.

## InfoBooth Intro Screen



## Design Methodology

Iterative design process, based on successively enhanced prototypes

- initial design specification phase
- storytelling prototype phase
- functional prototype phase

## Initial design specification phase

- early designs were based on the team's perspective
- Used visual specifications as opposed to textual
- Design sessions around the computer

## Storytelling prototype phase

- Prototypes from the initial phase were expanded on to create sets of screens showing interaction sequences
- The enhanced designs were then presented to colleagues and friends (outside of the project)

## Functional prototype phase

- semi-functional prototypes were informally tested with users and quickly reworked based on feedback
- discount usability testing
- most of the problems uncovered were related to misinterpreted functionality and were relatively easy to correct through visual representation

## Design Evolution: Figure 4(e)

SESSION: New Directions in Theory for HCI

**Paper**

**"Generalization, Consistency, and Control"**

by Clayton Lewis, D. Charles Hair & Victor Schoenber

**Clayton Lewis**

Date: Tuesday, May 2  
Time: 8:30 - 10:00 AM  
Place:

Summary  
Location  
Yearbook...  
Print Screen

Timetable Presenters Session Types Themes

Detailed description: This screenshot shows a software interface for a 'Paper' session. At the top left, it says 'SESSION: New Directions in Theory for HCI'. The main title is 'Paper' in a large font. Below that is the paper title '"Generalization, Consistency, and Control"' and the authors 'by Clayton Lewis, D. Charles Hair & Victor Schoenber'. A portrait of Clayton Lewis is shown on the left. Below the portrait is his name 'Clayton Lewis'. To the right of the portrait, the date and time are listed as 'Date: Tuesday, May 2' and 'Time: 8:30 - 10:00 AM', with 'Place:' below. On the far right, there is a vertical column of four buttons: 'Summary' (with a filmstrip icon), 'Location' (with a location pin icon), 'Yearbook...' (with a book icon), and 'Print Screen' (with a printer icon). At the bottom, there is a horizontal row of five buttons: 'Timetable' (with a clock icon), 'Presenters' (with a person icon), a star icon, 'Session Types' (with a folder icon), and 'Themes' (with a lightbulb icon). There are also small navigation arrows on the left and right sides of the main content area.

## Design Evolution: Figure 4(f)

**Lab Review**

**Rank Xerox Cambridge EuroPARC**

by Thomas P. Moran

**Thomas P. Moran**

Date: Tuesday, May 2  
Time: 10:30 - 12:00 noon  
Place: Ballroom A

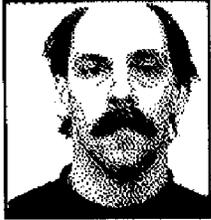
Mini Presentation  
Author Info...  
Print Screen

Panel of the same topic Flenary of the same topic

View By: Times Authors Titles Intro Screen '89

Detailed description: This screenshot shows a software interface for a 'Lab Review' session. At the top right, it says 'Lab Review' in a large font. Below that is the session title 'Rank Xerox Cambridge EuroPARC' and the author 'by Thomas P. Moran'. A portrait of Thomas P. Moran is shown on the left. Below the portrait is his name 'Thomas P. Moran'. To the right of the portrait, the date and time are listed as 'Date: Tuesday, May 2' and 'Time: 10:30 - 12:00 noon', with 'Place: Ballroom A' below. On the far right, there is a vertical column of three buttons: 'Mini Presentation' (with a filmstrip icon), 'Author Info...' (with a person icon), and 'Print Screen' (with a printer icon). Below the main content area, there are two buttons: 'Panel of the same topic' (with a left arrow icon) and 'Flenary of the same topic' (with a right arrow icon). At the bottom, there is a horizontal row of buttons: 'View By:' (with a dropdown arrow), 'Times' (with a clock icon), 'Authors' (with a person icon), 'Titles' (with a book icon), and 'Intro Screen' (with a screen icon). To the right of the 'Intro Screen' button is the text ''89'.

## Yearbook Navigation: Figure 7



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 CHI Hotel: Stouffer's Arboretum

**My interest in human computer interface began...**

When I bought an early Apple II and decided there must be a better way to interact with it besides through programming and typing.

◀ Previous

CHI '89  
Intro Screen

Print Screen

Next ▶

CHI '89  
Presenter of...

Arrange by:  
 First Name  
 Last Name

	N
B	O
C	P
D	Q
E	R
F	S
G	T
H	U
I	V
J	W
K	X
L	Y
M	Z
Index	

## Yearbook Navigation: Figure 8



**Allan MacLean**

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 maclean.europarc@xerox.com  
 CHI Hotel: Stouffer's Arboretum

**My question is:**

Q. 42 CHI is about (a) People (b) People and computers (c) User Interfaces (d) Designing User Interfaces (e) Designing Computer Systems. (Choose one)

◀ Previous

CHI '89  
Intro Screen

Print Screen

Next ▶

CHI '89  
Author of...

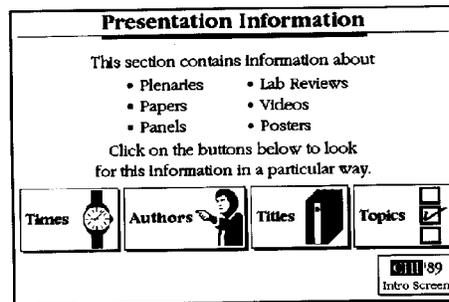
Arrange by:  
 First Name  
 Last Name

Index	
A	N
B	O
C	P
D	Q
E	R
F	S
G	T
H	U
I	V
J	W
K	X
L	Y
	Z

## Use of trace data

- To explore usage patterns to uncover where, in practice, the interface design was successful and where it was flawed

- Design of selectable items:



## Use of trace data (continued)

- Intelligent defaults
- Index button not used
- Improving trace data

## Principles used in this case study:

- user-center design
- progressively more refined designs and prototypes
  - benefits of low-level, medium-level and high-level prototypes
- early and frequent user testing
- three design stages
  - initial design specification
  - storytelling prototype phase
  - functional prototype phase
- system logging

## Getting to know users and their tasks

**Who?**

**What?**

**How?**

## Getting in touch with real users



- find real people who will be potential users
- spend time with them discussing how the system might fit in
- “many ideas that are supposed to be good for everybody aren’t good for anybody”
- “never work on something if you ought to be a user for it but you aren’t”

## Learning about the users’ tasks



- Develop CONCRETE DETAILED EXAMPLES of tasks they perform or want to perform
- choose tasks that represent complete jobs not parts of jobs
- users are not always right

## Using the tasks in design



- Write up descriptions of all the tasks
- produce SCENARIOS for each sample task
  - scenario: design specific
  - task: design independent
- represent the scenarios with STORYBOARDS
  - sequences of sketches showing what the screen would show, and what actions the user would take, at key points in the task
- Remember: they are ONLY EXAMPLES

## Developing good task examples

- Says what the user wants to do but doesn't say how they would do it
- Are very specific
- Describes a complete job

## Developing good task examples (continued)

- Says who the users are
  
- Evaluate

## Task scenarios

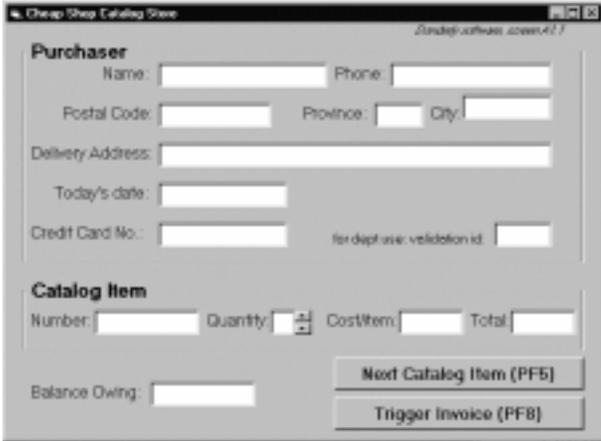
- With the design, create a scenario for each task
  
- Forces us to

## Walk-throughs

- Good for developing an interface
- Process:
  1. Select one of the scenarios
  2. For each user's step/action in the scenario:
    - can you build a believable story that motivates the user's actions?
    - Can you rely on user's expected knowledge and training about a system?

### **The Prototype**

The system below is used by the Cheap Shop Department Store, a catalog-based store similar to Consumer's Distributors. Shoppers in the store decide on the item they want by browsing a paper catalog, and can then purchase items by entering the relevant information into the following screens.



The screenshot shows a window titled "Cheap Shop Catalog Store" with a version number "2.0 (Setup Software version 4.2)". The form is divided into two main sections: "Purchaser" and "Catalog Item".

**Purchaser**

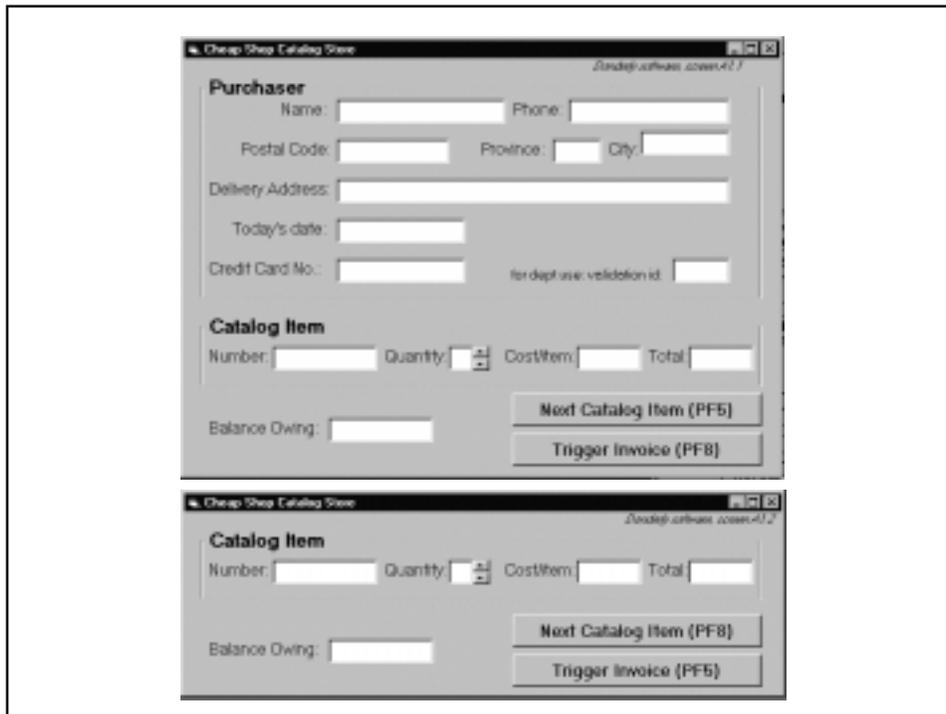
Name:  Phone:   
Postal Code:  Province:  City:   
Delivery Address:   
Today's date:   
Credit Card No.:  for dept use: validation id:

**Catalog Item**

Number:  Quantity:  Cost/Item:  Total:

Balance Owing:

Next Catalog Item (PF5)  
Trigger Invoice (PF8)



## Specifications

### To create an order

- On screen 1, shoppers enter their personal information and their first order
- text is entered via keyboard
- the tab or mouse is used to go between fields.

### Further orders

- shoppers go to the 2nd screen by pressing the Next Catalog Item button

### Order completion

- shoppers select 'Trigger Invoice'.
- the system automatically tells shipping and billing about the order
- the system returns to a blank screen #1

### To cancel order

- Shoppers do not enter input for 30 seconds (as if they walk away)
- The system will then clear all screens and return to the main screen

### Input checking

- all input fields checked when either button is pressed.
- erroneous fields will blink for 3 seconds, and will then be cleared.
- the shopper can then re-enter the correct values in those fields.

## Example Task Descriptions for "Cheap Shop"

- A man carrying for a demanding toddler buys an umbrella stroller (red is preferred, but blue is acceptable), pays for it in cash, and uses it immediately.
- An elderly arthritic woman is price-comparing the costs of a child's bedroom set, consisting of a wooden desk, a chair, a single bed, a mattress, a bedspread, and a pillow. She takes the description and total cost away with her, to check against other stores. Two hours later, she returns and decides to buy everything but the chair.

## Example Task Descriptions for "Cheap Shop"

- A "Cheap Shop" clerk, who is the sole salesperson in the store, is given a lengthy list of 10 items to order by a customer who does not want to use the computer.
- The items are:
  - 3 pine chairs, 1 pine table, 6 blue place mats, 6 "lor" forks, 6 "lor" table spoons, 6 "lor" teaspoons, 6 "lor" knives, 1 "tot" tricycle, 1 red ball, 1 "silva croquet set
- After seeing the total, the customer decides to take all but the 4th and 6th item, and adds a new one to the list afterwards.
- The customer then changes their mind about paying by credit card, and decides to pay cash. The customer wants the items delivered to his home the day after tomorrow.
- While this is occurring, 6 other customers are waiting for the salesperson.

## Readings for Wednesday, May. 19th

- Article 4: How to Design Usable Systems (excerpt) by John D. Gould
- Article 5: Learning from Notes: Organizational Issues in Groupware Implementation by Wanda J. Orlikowski
- Article 6: Scandinavian Design: Users in Product Development by Morten Kyng