Interaction Design

Andrew Kusiak
The University of Iowa
andrew-kusiak@uiowa.edu


Basis of Innovation

- Interaction design
- Data mining
- Evolutionary computation

What is Interaction Design? (1)

- Not well defined
- Interdisciplinary roots in: industrial and communication design, human factors, and human-computer interaction

Interaction Design

- Much of interaction is not visible
- E.g., Though Windows and Mac operating systems may have almost the same functionality and look, yet, they feel differently
- Interaction is about behavior and behavior is difficult to observe and understand

What is Interaction Design? (2)

Design is to design a design to produce a design

John Heskett
Interaction Design Perspectives

- Technology centered
  - E.g., use of digital technology
- Behaviorist
  - Study product behavior and users’ feedback
- Social interaction design
  - Facilitating interaction among products and people

Focus of Interaction Design (1)

- Focusing on users
  - Designers should advocate users’ expectations
- Finding alternatives
  - Designing is not choosing among multiple options,
  - It is about creating options (Genetic programming link)
- Using ideation and prototyping
  - Many prototypes, e.g., Jeff Hawkins – designer of the original PalmPilot carried around wooden blocks and wrote on them
- Collaborating and addressing constraints
  - Designers deal with teammates, money, materials; and address business goals, deadlines, etc.

Focus of Interaction Design (2)

- Creating appropriate solutions
  - Appropriate to the situation (Evolutionary computation and evolving landscape link)
- Drawing on a wide range of influences
  - E.g., engineering, ergonomics, psychology, economics, arts
- Incorporating emotion
  - Product without emotional component does not connect to people

History of Interaction Design (1)

- Likely begun with Native Americans and other tribes used smoke and other signals to communicate over long distances
- 1930s – 40s
  - In mid 1930s Samuel Morse created a system to convert electromagnetic pulses into a language (system = everything from electrical system to mechanism of tapping out the code, to training operators)
  - Other mass communication technologies required systems solutions
History of Interaction Design (2)

✓ 1940s – 60s
  The first computer - ENIAC was engineered, not designed. Humans had to adapt to the computer, speak its language not the natural one, and it was poorly usable
  1. In 1945 Vannevar Bush introduced Memorex (augmenting a human memory) - a microfilm device for storing books, records, and communications
  2. Memorex was the first concept of hypertext followed by Douglas Engelbart

History of Interaction Design (3)

✓ 1960s – 70s
  2. 1963 – Graphical user interface – Ivan Sutherland
  3. 1962 – ARPANET
  4. 1965 – Email
  5. 1968 – Douglas Engelbart – Mouse demo and interactive design presentation
  6. 1970 – Gaming industry, e.g., ATARI in 1977
  7. 1973 – Ethernet and beginning of Apple’s era (Steve Jobs)

History of Interaction Design (4)

✓ 1980s
  1. Apple Computer (Lisa and Macintosh)
  2. Era of personal computers
  3. Portable computers, Osborne 1
  4. Concept of ubiquitous computers at Xerox PARC

✓ 1990s
  1. The era of networked computers

✓ 2000s
  1. Era of social software and ubiquitous computing
  2. Era of products and services

Case Study 1

Microsoft Office 2007
Microsoft Office 2007 (1)

Microsoft: The world's largest software company

The Problem

- In early 2000, a decision was made to redesign Microsoft Office
- A decade old interface did not scale well
- E.g., 50 menu items and 2 toolbars from MS Word 1.0 had ballooned to 260 menu items and over 30 toolbars in MS Word 2003

Microsoft Office 2007 (2)

The Process

- Microsoft analyzed data created by anonymous users on the use of Office 2003
- They looked at desirable (low frequency) features that users could not find, and
- Frequently used features that were difficult to find (users badly wanted them)

Microsoft Office 2007 (3)

The Solution

- Microsoft Office 2007 has been enhanced with 1000 improvements taking less screen space than the previous versions
- Minibar introduced
- Ribbon introduced (with some controversy)