User Interaction and Product Design

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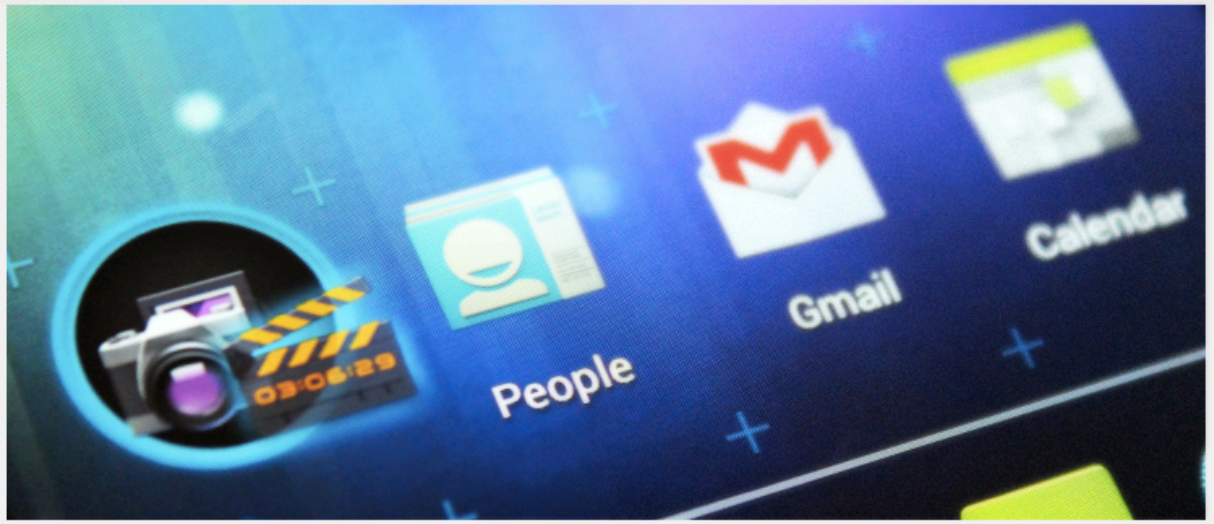
UI guidelines in Android

Android Design

GET STARTED
Creative Vision
Design Principles
UI Overview
STYLE
PATTERNS
BUILDING BLOCKS
DOWNLOADS
DEVELOPERS

Creative Vision PREVIOUS NEXT



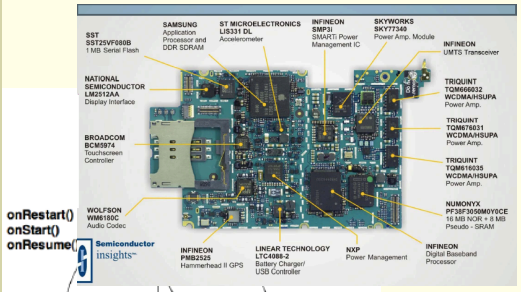
Ice Cream Sandwich (Android 4.0) marks a major milestone for Android design. We touched nearly every pixel of the system as we expanded the new design approaches introduced in Honeycomb tablets to all types of mobile devices. Starting with the most basic elements, we introduced a new font, Roboto, designed for high-resolution displays. Other big changes include framework-level action bars on phones and support for new phones without physical buttons.

We focused the design work with three overarching goals for our core apps and the system at large. As you design apps to work with Android, consider these goals:

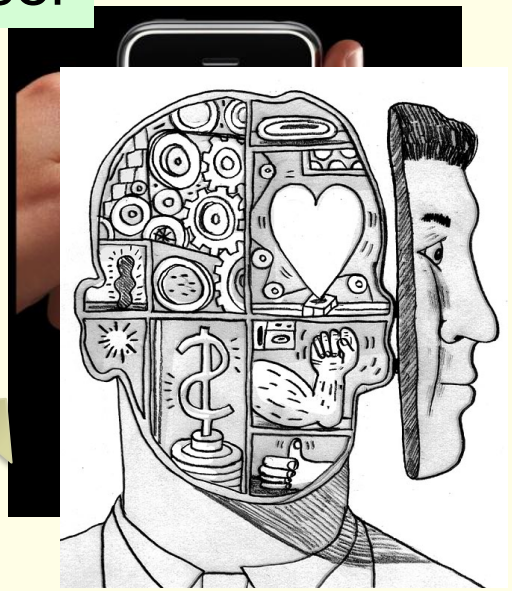
http://developer.android.com/design/

User Interface and Product

Product Design and Development



User



Product

On Terminology

- UI design does not stop at displaying Information via a GUI, MUI or VUI
- That is where it starts!
- That is when the human-machine interaction can be grounded into actions as simple as:
  - Clicks, Taps, Swipes, Gestures, Typing
  - **In order to accomplish a task ("Compose an email")**
- It applies to designing dyadic interactive systems and as well as more complex n-ary systems.

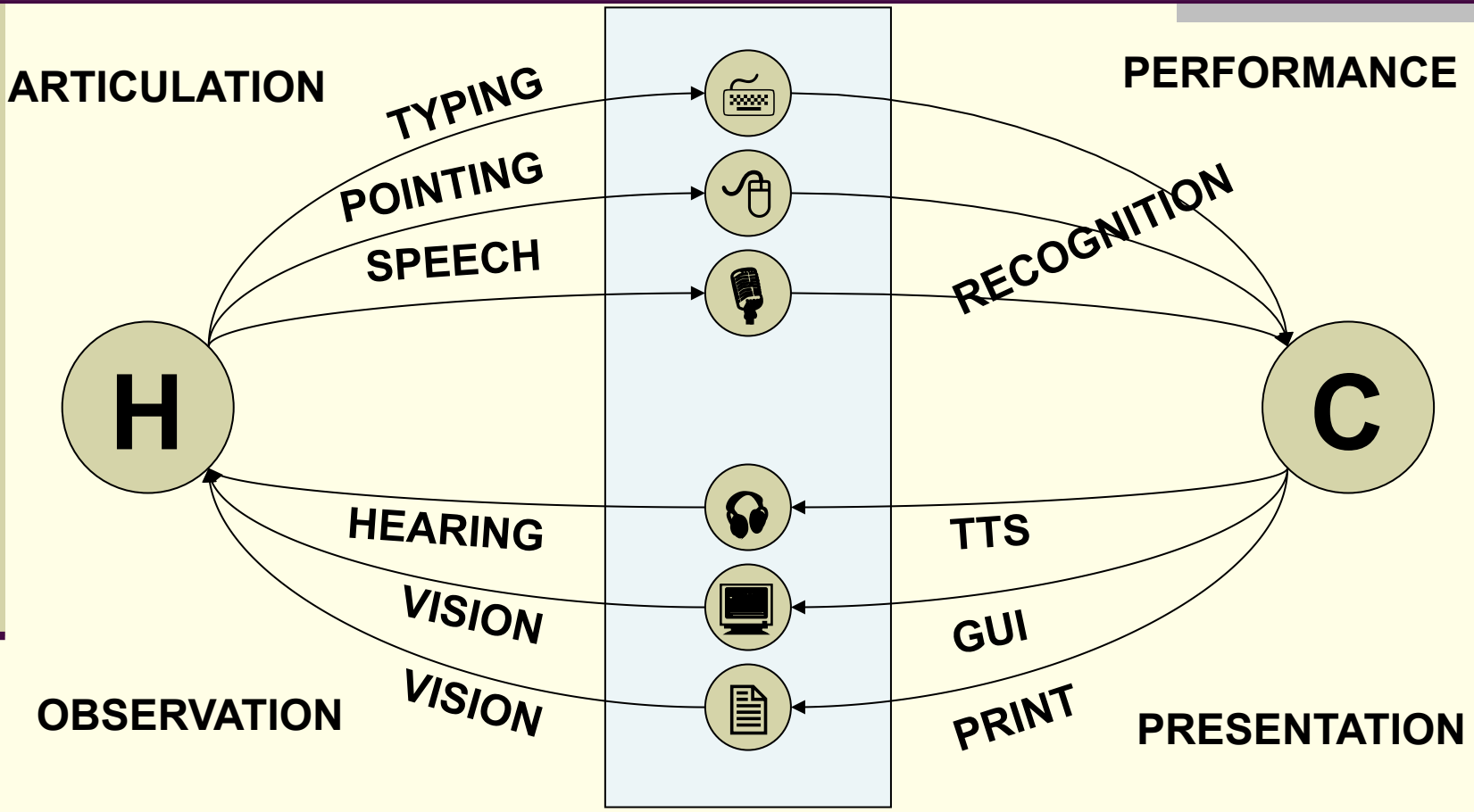
Why User Interface Design

- In a typical mid-large SW project the UI designer function should be present
- In small project teams (people < 2-3) might not be available.
- He/She a minority whereas the team is mostly made of programmers/managers
- It is important that programmers know what UI design is about.
  - Better Communicate SW system development team.
- Programmers might turn into UI designers!

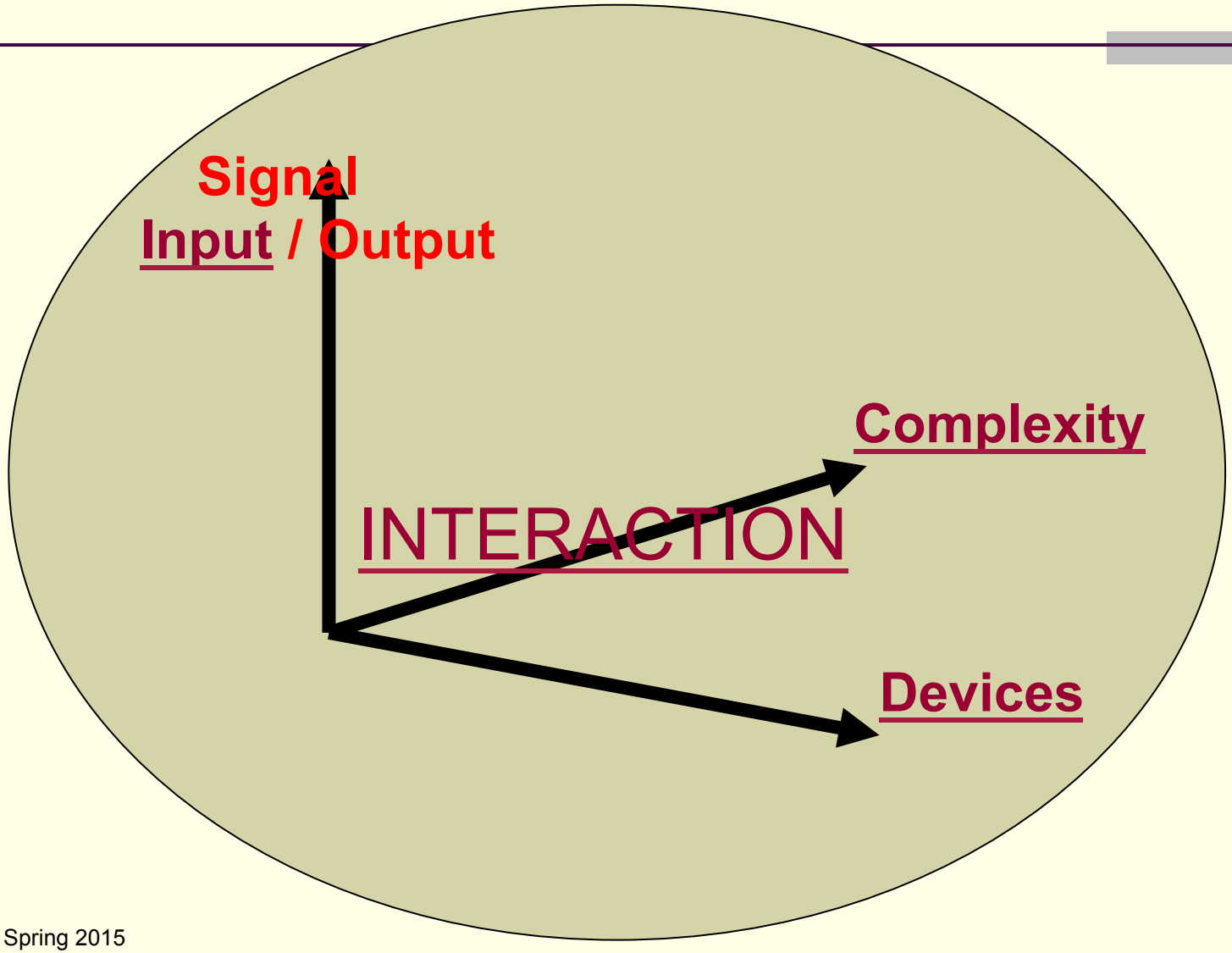
Lecture Plan

- 1st Part
  - User Interface Design
    - Principles (applicable to Human-Machine Interaction Systems)
    - Psychological and Cognitive Motivations
- 2° Part (april)
  - Mobile UI guidelines
  - App Design Process
  - Examples

Human - Computer Interaction



De-Constructing Communication



Human Computer Interaction

The Interface

- Device
  - Input Device: Mouse, Keyboard, Joystick, Audio, ..
  - Output: Screen, Speakers, Virtual Reality goggles
- Interface
  - GUI
  - WIMP (Windows, Icons, Menus & Pointers) [Xerox '70s]
- Human-Machine Interaction
  - Multimodal (Speech, Text, Gestures)
- HCI principles
  - U^3: Useful & Usable & Used

Demo
Mobile Phone 1990

Useful

Usable

Used

Outline

- Intro
- Principles (Design Rules)
- Foundations
  - Perception
  - Vision
  - Attention
  - Memory
  - Task Execution

Reference for the lectures : "**Designing with the mind in mind**", Jeff Johnson

User Interface Design

- Educated ART
  - Human Interaction Understanding
  - Creativity and Expression (different modality)
- Based on
  - Science (Cognitive, Psychology)
  - Engineering
- Goal of Designing interactive systems based on requirements
  - SW, HW
  - Interaction System (User, Machine)

Bridge Design and Engineering (0)

- Many solutions to the problem of

" Design and Build a bridge from point A to B, that can carry car/truck traffic, pedestrians, be stable in super-windy conditions, earthquakes etc.."

Bridge Design and Engineering (1)

Bridge Design and Engineering (2)

House design

- Given a set of requirements
  - Location
  - Real estate space
  - Energy saving materials
  - Project costs
- There are many solutions
  - Different aesthetic appeal
  - Space layouts
  - Expected people behavior

House design: Project 1

House design: Project 2

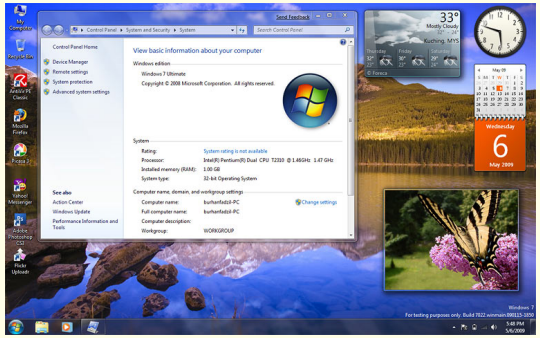
Artifact may require

- Engineering (Technology & Systems)
- Science (Cognitive, Psychology..)
- Aesthetics universals
- User/Social acceptance
- The end-product will **be a mix of all** of the above to reach a **point equilibrium == solution**
- **Not unique!**

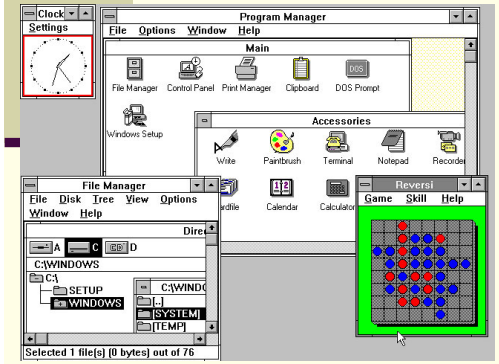
GUI design: Microsoft OS

Windows 95

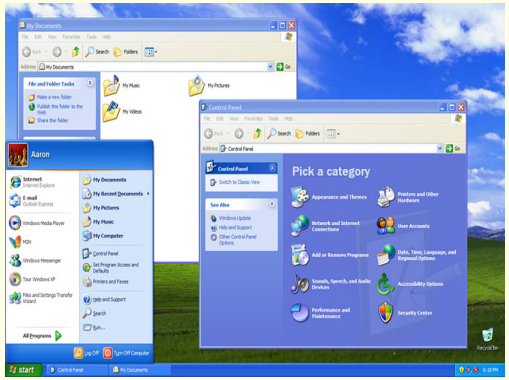
Windows 7



Windows 3.0



Windows XP

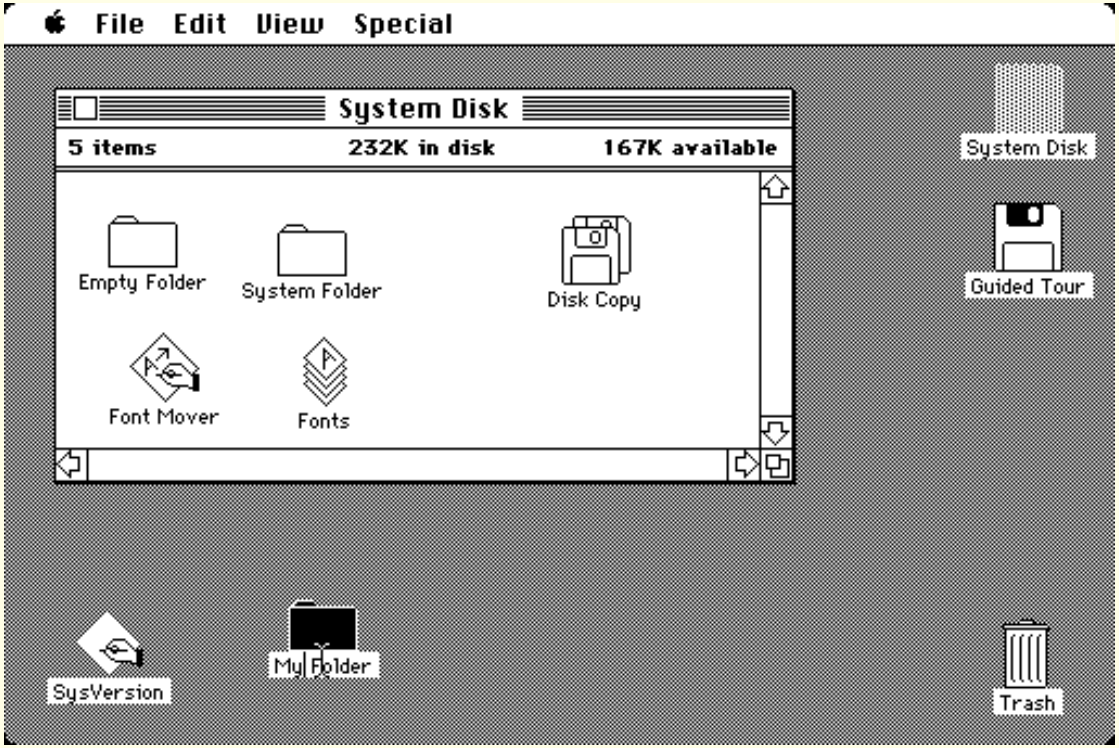


Windows 8

1990 **1995** **2001** **2009** **2012**

GUI design: Apple OS

1984 - 1.0



1984 **1995** **2001** **2009** **2012**

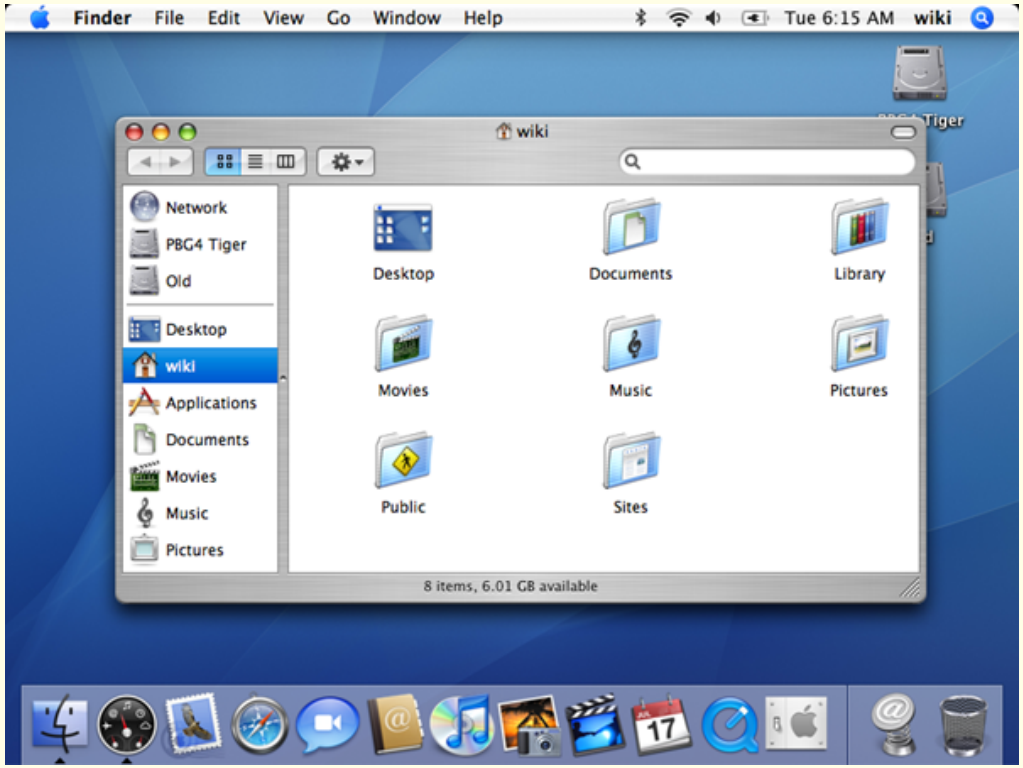
GUI design: Apple OS

1997-8.0

1984 **1995** **2001** **2009** **2012**

GUI design: Apple OS

2005-10.4



1984 **1995** **2001** **2009** **2012**

GUI design: Apple OS

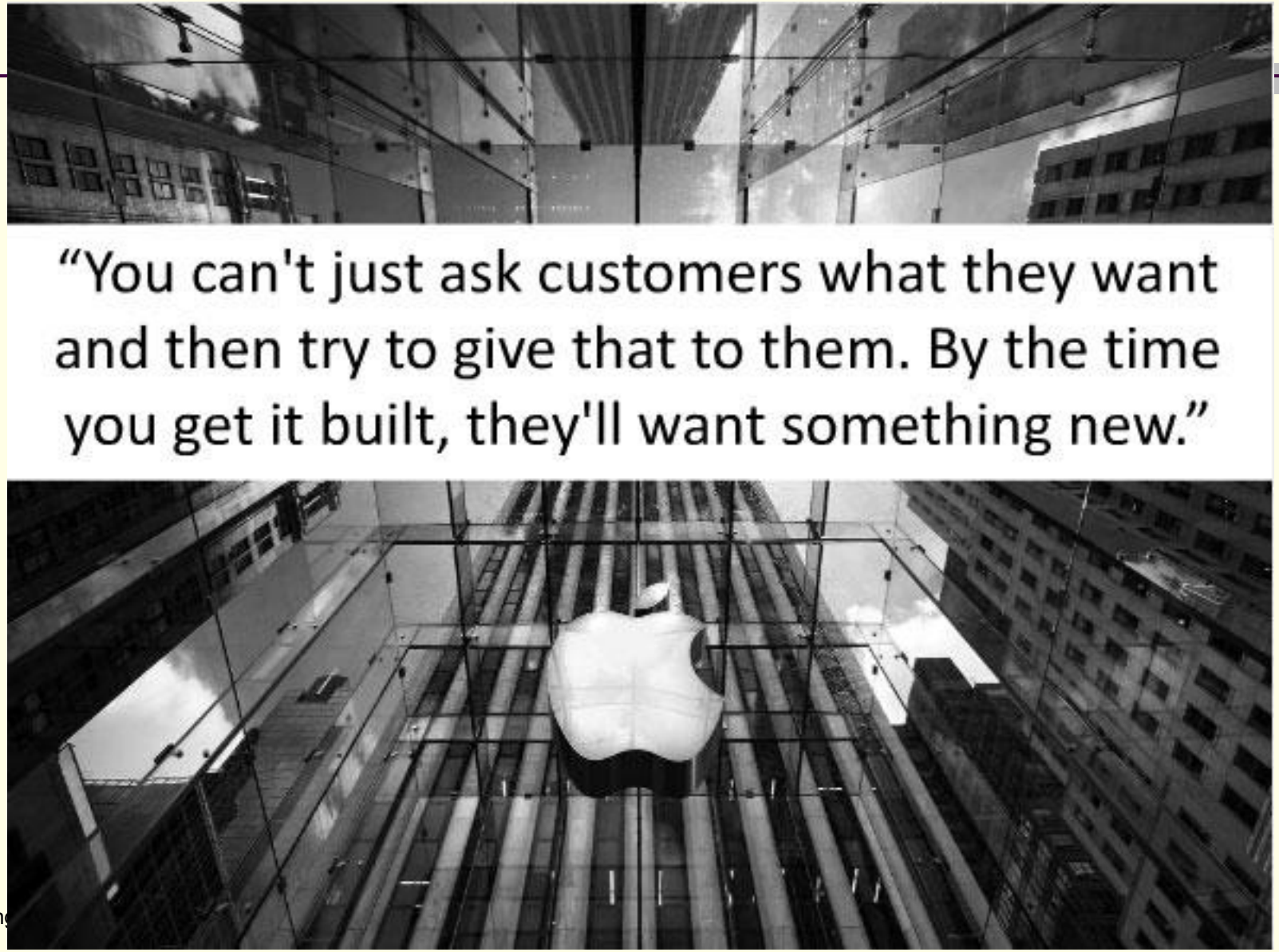
2013 – 10.9

1984 1995 2001 2009 2012

Towards a Science of HCI Systems

- Engineering of Bridge Building
  - DOES not need people to evaluate the solution!
- In HCI systems, users are part of it.
  - They are needed to study and evaluate
- Usability Testing
  - Limited by the number of users and delay btw prototype and final engineered solution

A word of advice from S. Jobs:



UI Design Principles

- They guide towards optimal equilibrium of requirements
- Do not provide analytical solution
- Should allow to avoid errors in early phases
  - System, User Requirements, Prototyping
- And not to rediscover each time dos and donts
  - "color blindness"
- They may be Ambiguous and Contradictory
- Goal to **UNDERSTAND** the motivations of such principles so to **GUIDED in executive decisions.**

Guidelines – A
(Shneiderman 1987)

- Strive for Consistency
- Cater to Universal Usability
- Offer Informative Feedback
- Design Tasks Flows to yield closure
- Prevent Errors
- Permit Easy Reversal of Actions
- Make Users feel They are in Control
- Minimize Short-Term Memory Load

Guidelines – B
(Nielsen and Molich 1990)

- Consistency and Standards
- Visibility of System Status
- Match between System and Real World
- User Control and Freedom
- Error Prevention
- Flexibility and Efficiency of Use
- Aesthetics and Minimalist Design
- Help Users Recognize, Diagnose and Recover from Errors
- Provide Online Documentation and Help