IE 403/476

Human-Computer Interaction

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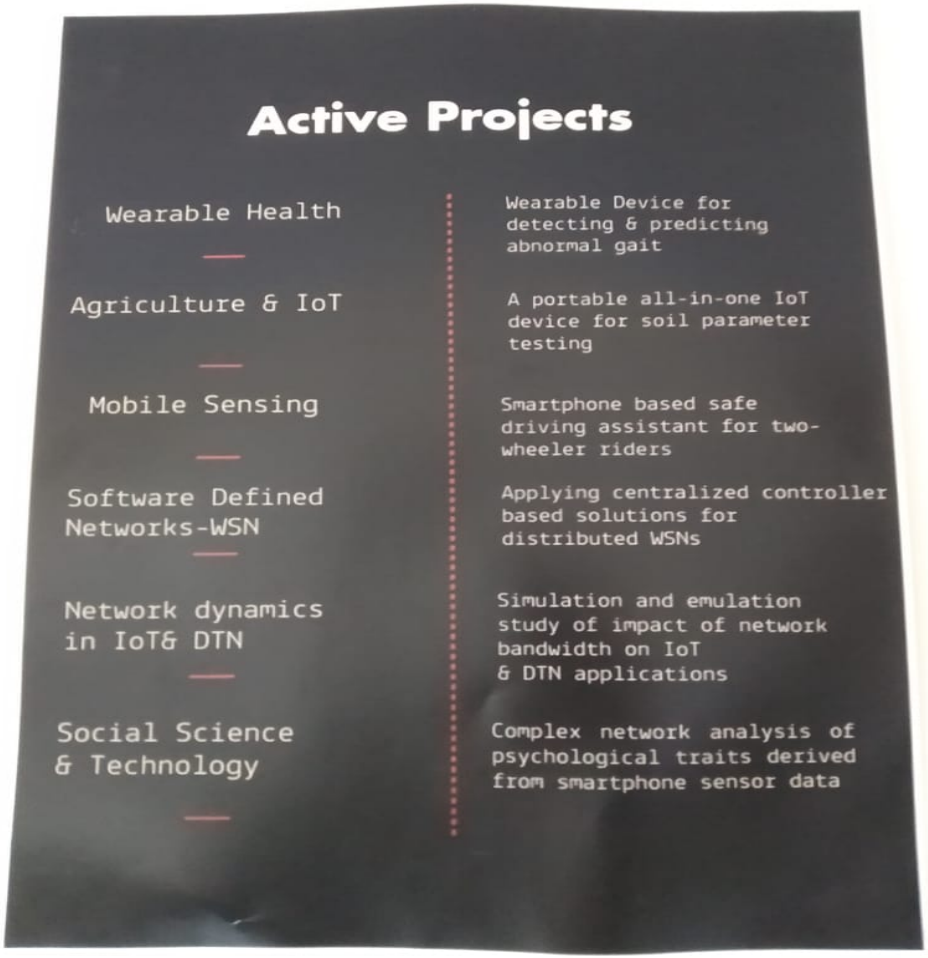


Lab 003
UbiSense lab


HOW GRANDMA SEES THE REMOTE
TV EXPLODES
CAUSE NATIONWIDE BLACKOUT
LOSE SOUND
TIDAL WAVE STARTER
LOSE PICTURE
NO CLUE
NEVER SAW THIS ONE BEFORE
LAUNCH ROCKETSHIP
UTTER MYSTERY
SEXY SINGLES
HOUSE BLOWS UP
OMINOUS SMELL
DROP THE BIG ONE


EMI Calculator
Loan Amount:
1
Calculate
Reset
Interest Rate:
7.3000000000000
5
30
Tenure:
10 Years
1
30
EMI:
Rs. 0.01

What is this class about?

- Why are things so hard to use these days?
- Why doesn’t this thing I just bought work?
- Why is this website so hard to use?
- Why are users not liking my design?
- Why is my app not getting popular?

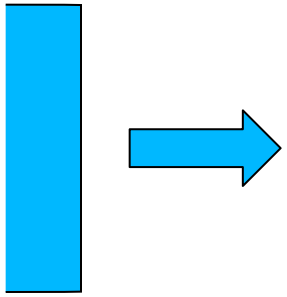
Outcomes

- Understand what makes interfaces more or less usable
- Design and Build usable interfaces
- Scientifically evaluate the usability of those interfaces

*How can we design human-centered Systems that people find **useful and usable**?*

This course introduces

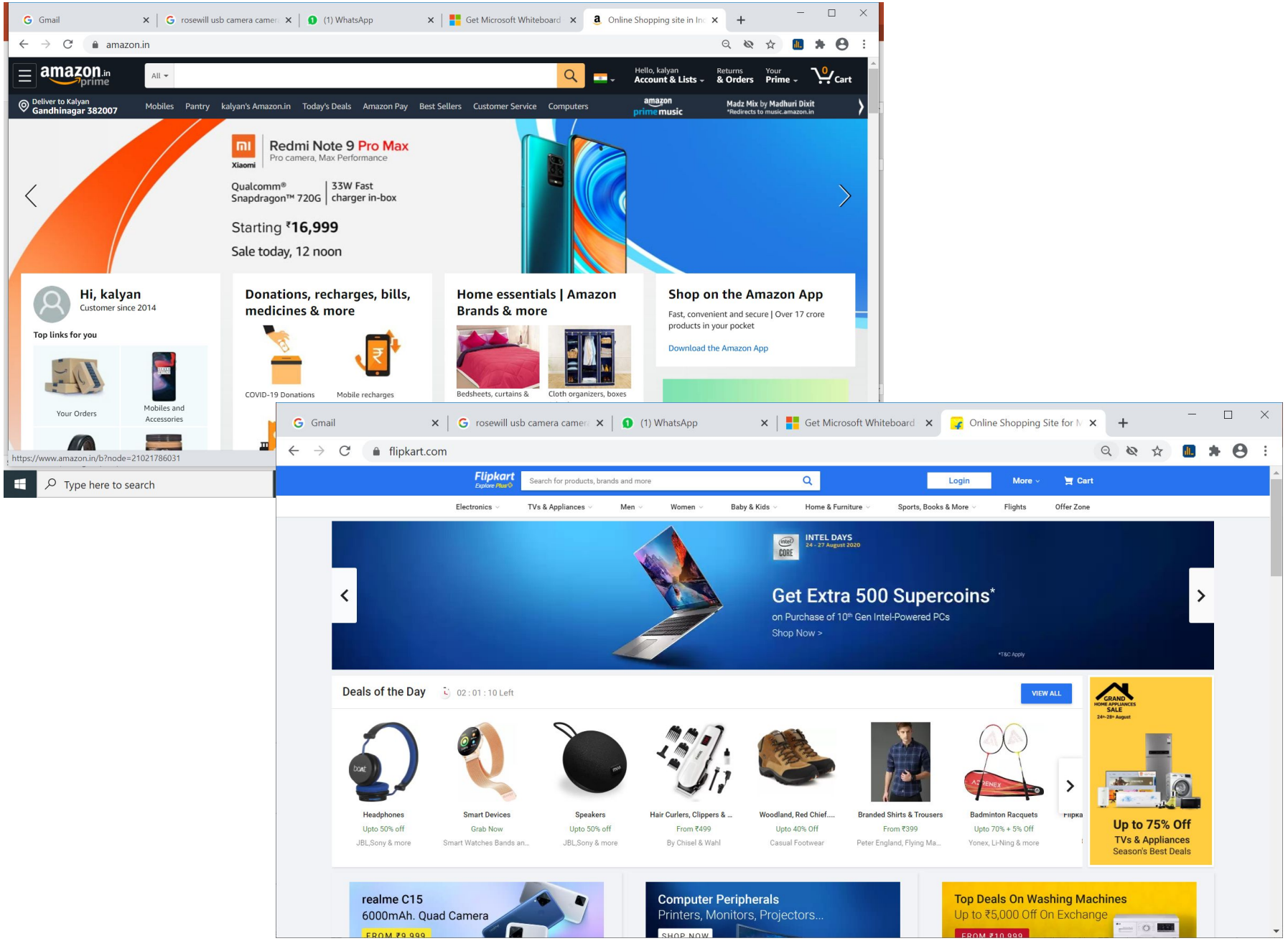
Designing,
Prototyping
Evaluating



user interfaces.

What do these have in common?

What do these have in common?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rosewill usb camera camer
(1) WhatsApp
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Online Shopping site in In
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amazon.in prime
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Account & Lists
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& Orders
Your
Prime
Cart
Deliver to Kalyan
Gandhinagar 382007
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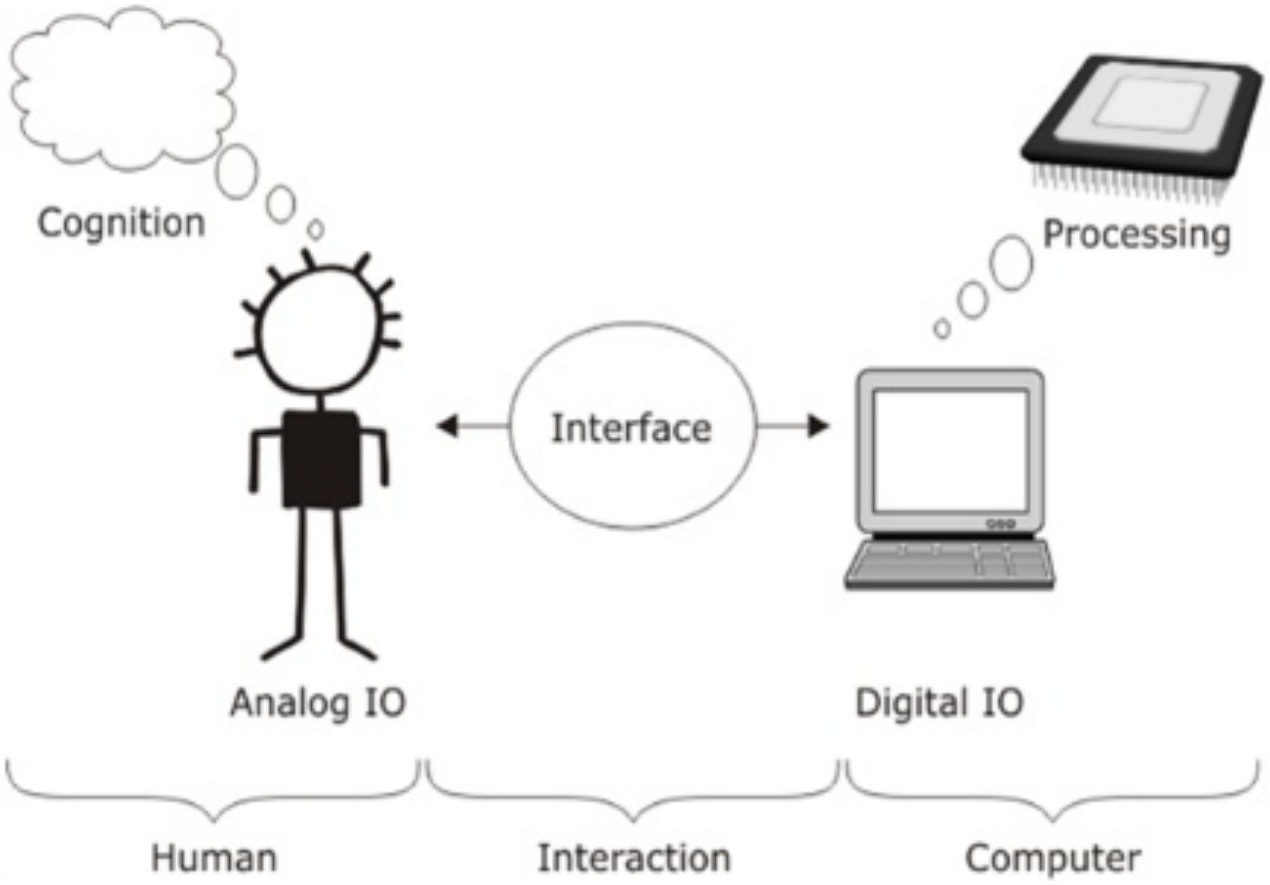
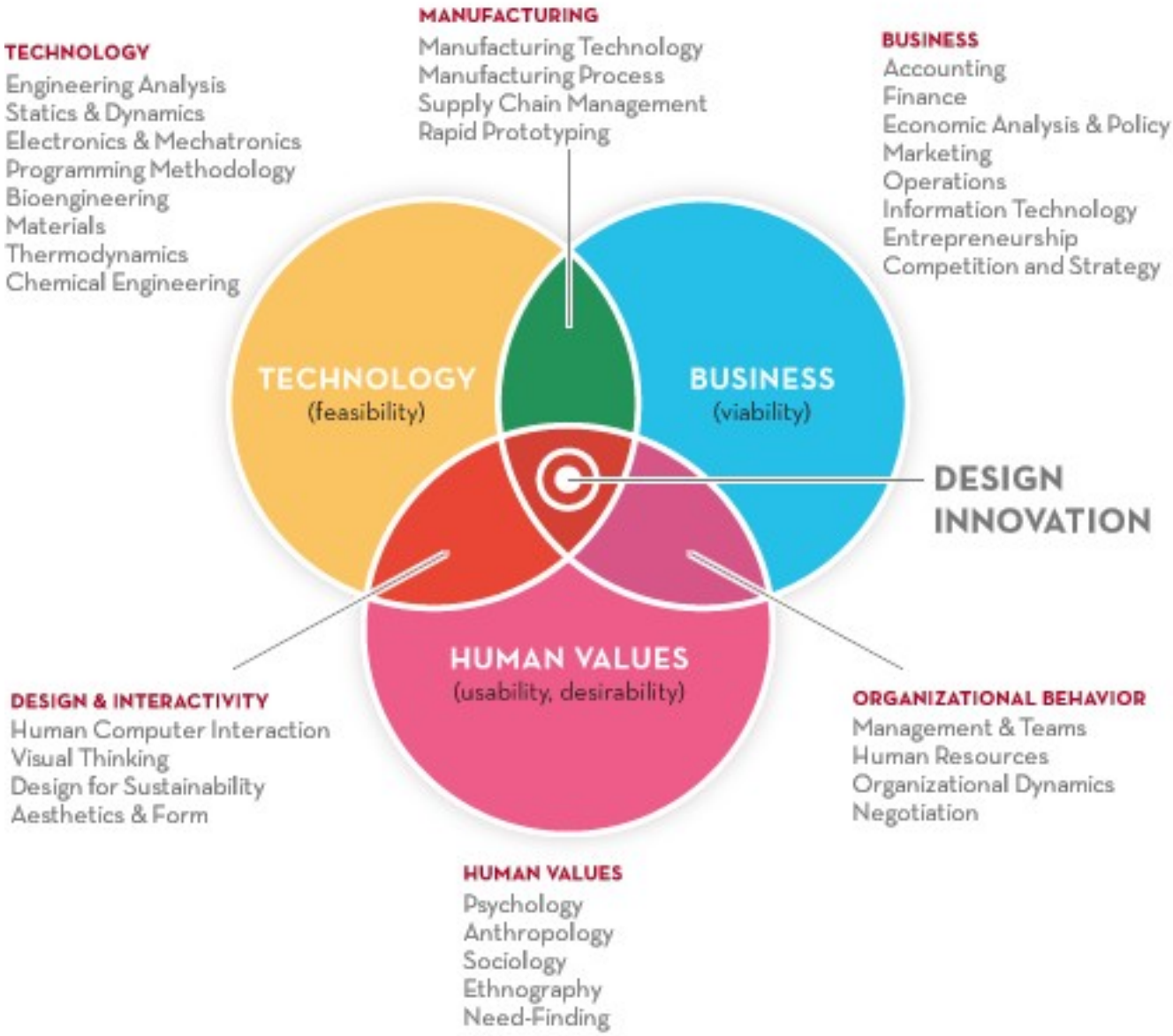
Pantry
kalyan's Amazon.in
Today's Deals
Amazon Pay
Best Sellers
Customer Service
Computers
amazon prime music
Madz Mix by Madhuri Dixit
*Redirects to music.amazon.in
Redmi Note 9 Pro Max
Pro camera, Max Performance
Xiaomi
Qualcomm® Snapdragon™ 720G
33W Fast charger in-box
Starting ₹16,999
Sale today, 12 noon
Hi, kalyan
Customer since 2014
Top links for you
Your Orders
Mobiles and Accessories
Donations, recharges, bills, medicines & more
COVID-19 Donations
Mobile recharges
Home essentials | Amazon Brands & more
Bedsheets, curtains &
Cloth organizers, boxes
Shop on the Amazon App
Fast, convenient and secure | Over 17 crore products in your pocket
Download the Amazon App
https://www.amazon.in/b?node=21021786031
Type here to search
Gmail
rosewill usb camera camer
(1) WhatsApp
Get Microsoft Whiteboard
Online Shopping Site for M
flipkart.com
Flipkart
Explore Plus
Search for products, brands and more
Login
More
Cart
Electronics
TVs & Appliances
Men
Women
Baby & Kids
Home & Furniture
Sports, Books & More
Flights
Offer Zone
INTEL DAYS
24 - 27 August 2020
Get Extra 500 Supercoins*
on Purchase of 10th Gen Intel-Powered PCs
Shop Now >
*T&C Apply
Deals of the Day
02 : 01 : 10 Left
VIEW ALL
Headphones
Upto 50% off
JBL,Sony & more
Smart Devices
Grab Now
Smart Watches Bands an...
Speakers
Upto 50% off
JBL,Sony & more
Hair Curlers, Clippers & ...
From ₹499
By Chisel & Wahl
Woodland, Red Chief....
Upto 40% Off
Casual Footwear
Branded Shirts & Trousers
From ₹399
Peter England, Flying Ma...
Badminton Racquets
Upto 70% + 5% Off
Yonex, Li-Ning & more
GRAND HOME APPLIANCES SALE
24th-28th August
Up to 75% Off
TVs & Appliances
Season's Best Deals
realme C15
6000mAh. Quad Camera
Computer Peripherals
Printers, Monitors, Projectors...
SHOP NOW
Top Deals On Washing Machines
Up to ₹5,000 Off On Exchange

What is HCI?

HCI is the study of interaction between people (users) and computers




TECHNOLOGY
Engineering Analysis
Statics & Dynamics
Electronics & Mechatronics
Programming Methodology
Bioengineering
Materials
Thermodynamics
Chemical Engineering
MANUFACTURING
Manufacturing Technology
Manufacturing Process
Supply Chain Management
Rapid Prototyping
BUSINESS
Accounting
Finance
Economic Analysis & Policy
Marketing
Operations
Information Technology
Entrepreneurship
Competition and Strategy
TECHNOLOGY
(feasibility)
BUSINESS
(viability)
DESIGN
INNOVATION
HUMAN VALUES
(usability, desirability)
DESIGN & INTERACTIVITY
Human Computer Interaction
Visual Thinking
Design for Sustainability
Aesthetics & Form
ORGANIZATIONAL BEHAVIOR
Management & Teams
Human Resources
Organizational Dynamics
Negotiation
HUMAN VALUES
Psychology
Anthropology
Sociology
Ethnography
Need-Finding

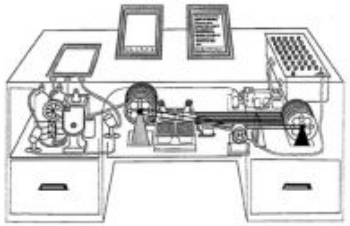
HCI Evolution

- **50s** - Interface at the hardware level for engineers - switch panels
- **60-70s** - interface at the programming level - COBOL, FORTRAN
- **70-90s** - Interface at the terminal level - command languages
- **80s** - Interface at the interaction dialogue level - GUIs, multimedia (http://www.cs.cmu.edu/~amulet/papers/uihistory.tr.html)
- **90s** - Interface at the work setting - networked systems, groupware
- **00s** - Interface becomes pervasive
  - RF tags, Bluetooth, mobile devices, consumer electronics, interactive screens, embedded technology
- 10s -Interface disappears
  - Focus on tasks, experiences, emotions, social connections, beauty

HCI Evolution

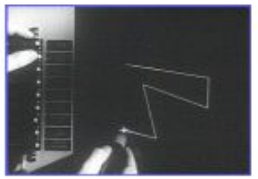
Memex - Vannevar Bush (1945)

Vision for a desktop information management system
Electromechanical system
Seen as the ancestor of the notion of hypertext



Sketchpad - Ivan Sutherland (1963)

Direct manipulation geometric shapes
Geometric constraints, zoom, click-drag


NLS / Augment - Douglas Engelbart (1968)

Inventor of the mouse (1963)

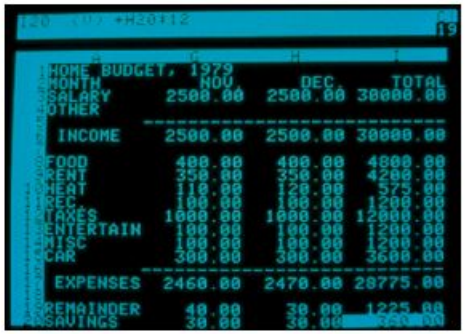
Bimanual interaction

Hypertext, cooperative work,
document sharing, video-conferencing


History

Visicalc - Dan Bricklin (1979)

First spreadsheet (Apple][)



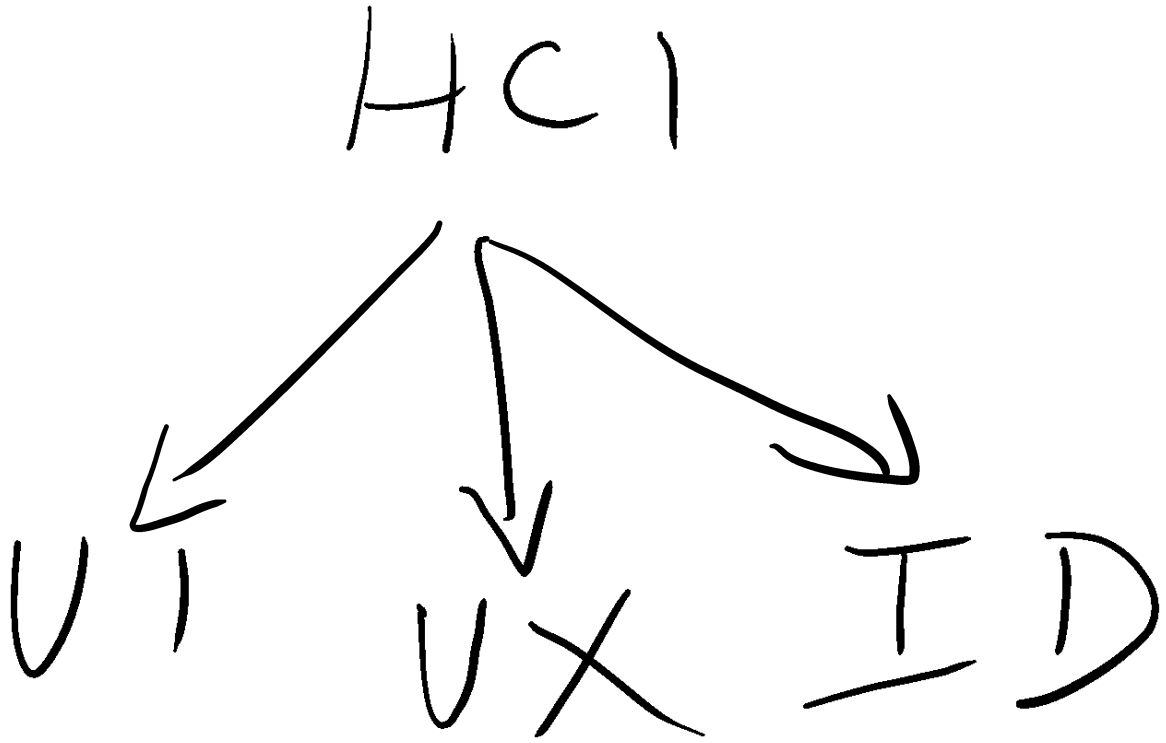
Xerox Star - Xerox PARC (1981)

First commercial graphical workstation
Document-centric approach

Macintosh - Apple (1984)

Graphical personal computer
- Finder
- MacPaint
- MacWrite

Hardware + software design


HCI
UI
UX
ID

HCI

- Human
  - The end-user of a program
  - Other people in the organization
  - The surrounding cultural context
- Computer
  - The hardware and the software
  - Microwaves, mobile phones, cars
- Interaction
  - The user tells the computer what they want
  - The computer communicates results

HCI is made up of..

- Theories – learn and apply
- Models – create and use
- Methods – master and apply
- Guidelines – learn and use
- Principles – understand and apply
- Techniques – master and use

Design Goals of the class

- Everything designed has some explicit criteria
  - Attractive
  - Cost effective to manufacture
  - Durable
  - Water tight
  - Can hold hot water effectively
  - Separate tea leaves from rest

But is it usable?

And is it ~~useful~~ to people?

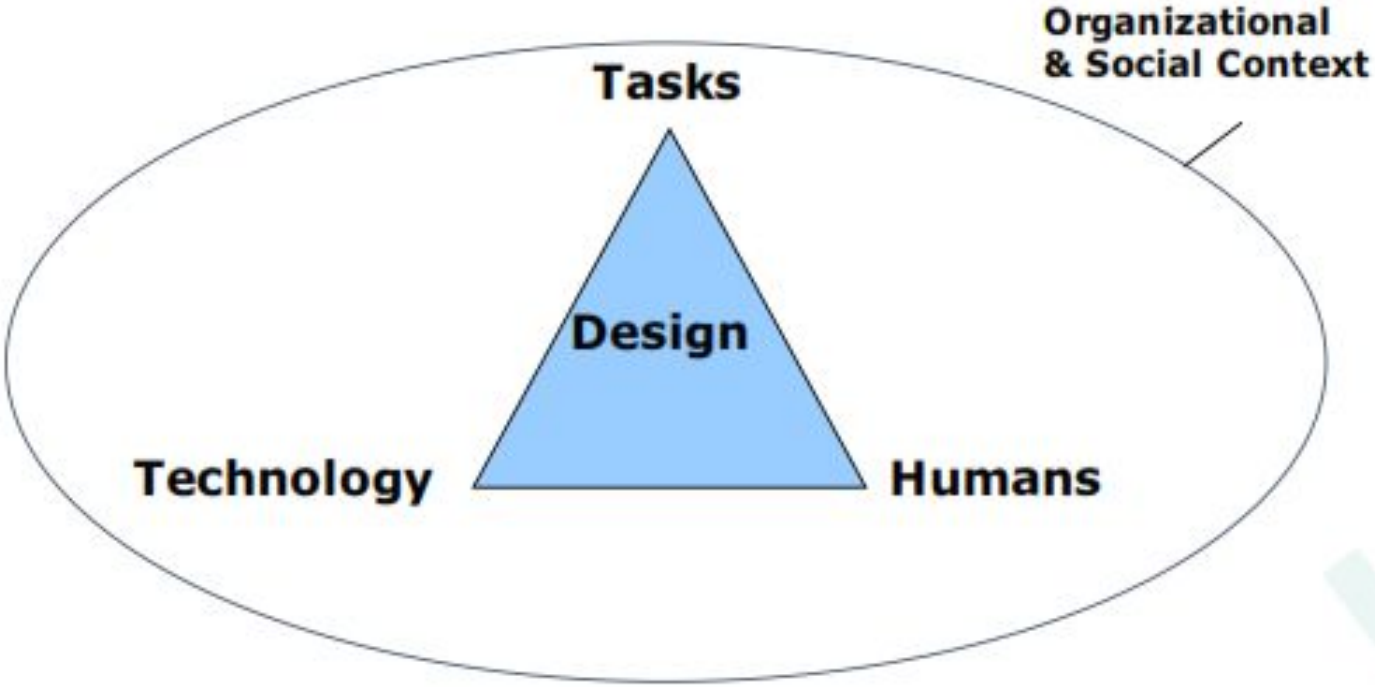
Design and Goals of this class

- Everything designed is done so within a specific context
- Training required
- Conventions
- Laws and regulation
- Competing products
- Human abilities and limitations

Understanding these influencing factors also a key part of this course

Goals of HCI

- Allow users to carry out tasks
  - Safely
  - Effectively
  - Efficiently
  - Enjoyably



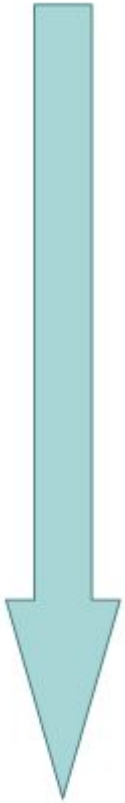
- HCI draws computer science, psychology, and design together
- Main focus is on the people using system

To make better Interactive technology…We need to

- Know about how people **interact with things**
- Know about what people **can and can't do**
- Know about the **situations in which people**
- do things
- Know about the **basics of good design**
- Understand people's **goals**

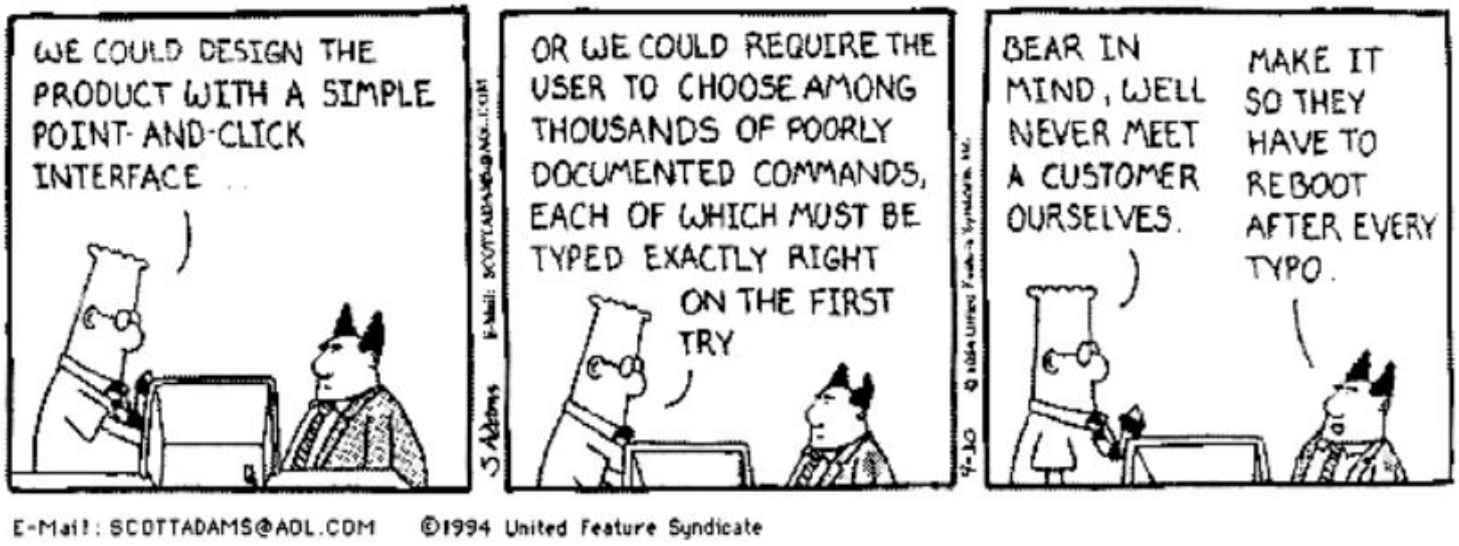
HCI is changing…

- Physical things
- GUI interfaces
- Collaborative interfaces
- Internet technologies
- Social technologies
- Ubiquitous technologies
- What next??



System Centered Design

- What can I easily build on this platform?
- What can I create from the available tools?
- What do I as a programmer find interesting?



User Centered Design

Design is based upon a user's

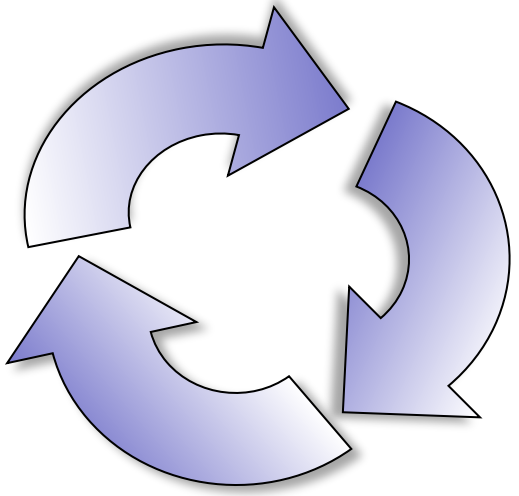
- abilities and real needs
- context
- work
- tasks
- values

User Centered Design

- Focus on the people who will use the system, on their preferences and their requirements
- Building models of the users, tasks and systems
- Iterative process
- Prototyping and Evaluation by users

UI Design/Develop Process

- Analyze user's goals & tasks
- Create design alternatives
- Evaluate options
- Implement prototype
- Test
- Refine



Two Fatal Mistakes

- Assume all users are alike
- Assume all users are like the designer

But Who are the Users?

When you try to teach your parents how to use technology

How do we improve interfaces?

1. Educate software professionals

2. Draw upon fast accumulating body of knowledge regarding H-C interface design
3. Integrate UI design methods & techniques into standard software development methodologies


12:00 PM
Thu
Set At 70
70°F
SYSTEM
Heat
FAN
Auto
Menu
White Rodgers


Honeywell
°C


nest
IN 25 MIN
72

Group Project

Semester-long team effort

Group Project

- Design and evaluate an interface
  - 0 - Team formation & topic choice
  - 1 - Understand the problem space
  - 2 - Exploring the design space
  - 3 - Prototype
  - 4 - Evaluation

- Main 4 parts worth ~10% each
- Presentation, documentation ~ 10%

Group Project Details

- Part 0 - Topic definition
  - Identify team & general topic
  - Create web notebook
  - Suggestion: Pick a population and pick a technology; check out intersection
- Part 1 - Understanding the problem
  - Describe tasks, users, environment, social context
  - What are implications for design?

Group Project Details

- Part 2 - Design alternatives
  - Storyboards, mock-ups for multiple different designs
  - Explore, push boundaries of design space
  - Explain decisions
- Part 3 - System prototype & eval plan
  - More detailed prototype (semi-working ok)
  - Plan for conducting evaluation

Group Project Details

- Part 4 - Evaluation
  - Conduct formal evaluation with example users
  - Use appropriate methods
  - Analyze results of evaluation
  - Characterize what's working and what's not

Project Teams

- K people
  - You decide (or I will!)
  - Diverse is best!
  - Consider schedules
  - Create a web space:
    - Immediately post ideas for general topics, populations, technologies, etc.
- Cool project and team name

Project Topics

Semester theme: “Innovative and Usable Interfaces in Everyday Life”

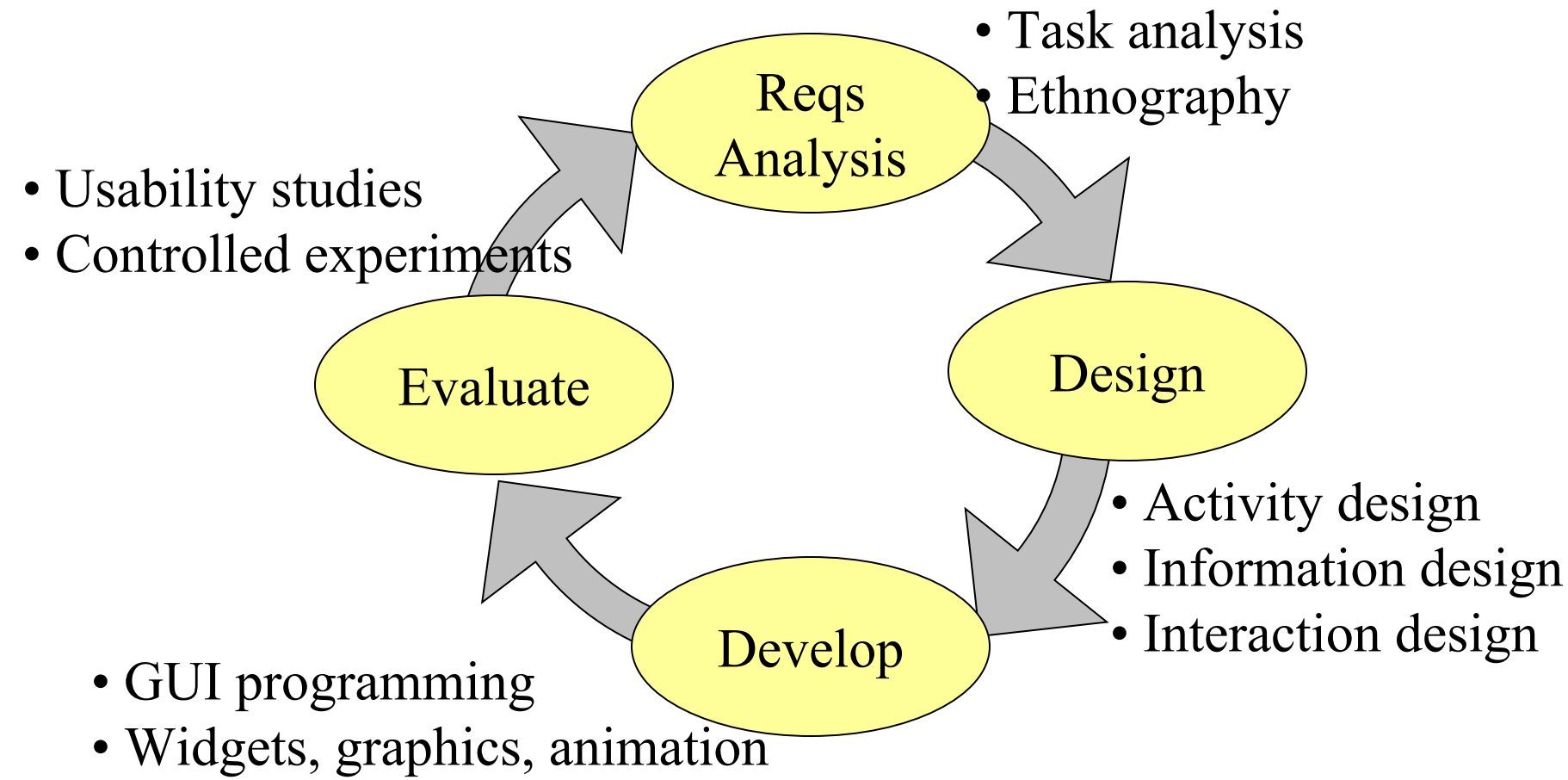
What Makes a Good Project

- Typically:
  - Access to domain experts & users
  - "Real" clients
  - Interesting human issues
  - Rich domain for design

Design Evaluation

- "Looks good to me" isn't good enough!
- Both subjective and objective metrics
- Some things we can measure
  - Time to learn
  - Speed of performance
  - Rate of errors by user
  - Retention over time
  - Subjective satisfaction

The Learning Cycle



Course Evaluation and Grading

Presentation	10%
homework	20%
End term	30%
Design project	40%