



Web Characterization (online)

Web Design

Week 3

LBSC 690

Information Technology



Today's Goals

- Be able to discuss what the Web “is”
- Understand human-computer interaction principles
 - What makes something well or poorly designed?
- Connect that knowledge to good Web site design
- Begin to think about evaluation



*Review

- FTP
- URLs

G1: What the Web 'is'

Web Characterization



Let's reflect

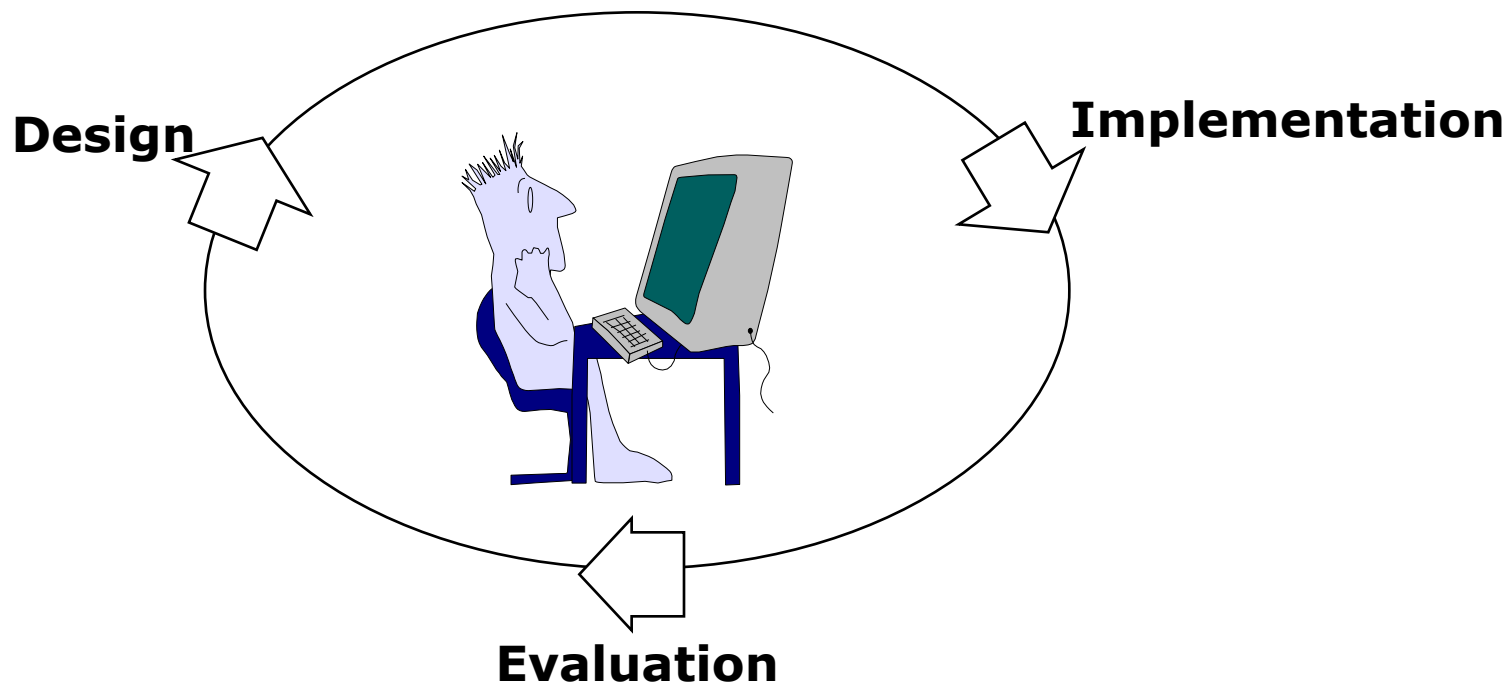
G2: Understand HCI

Human-computer interaction



Human Computer Interaction

- A discipline concerned with the



of interactive computing systems for human use.



What are Computers Good At?

- Sense stimuli outside human's range
- Calculate quickly and accurately
- Store large quantities and recall accurately
- Respond rapidly and consistently
- Perform repetitive actions reliably
- Work under heavy load for an extended period



What are Humans Good At?

- Sense low level stimuli
- Recognize patterns
- Reason inductively
- Communicate with multiple channels
- Apply multiple strategies
- Adapt to changes or unexpected events

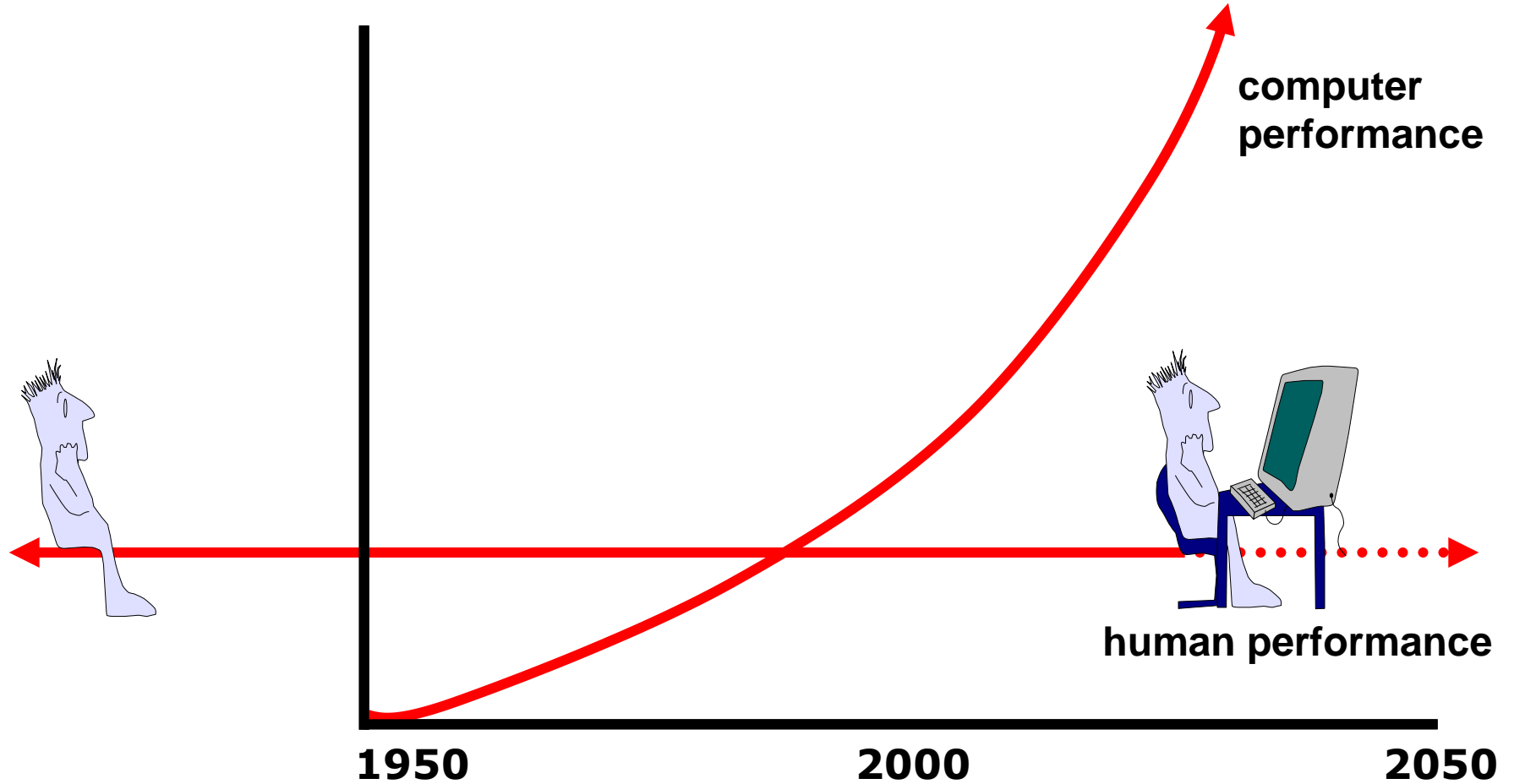


Individual Differences

- Physical
 - Anthropomorphic (height, left handed, etc.)
 - Age (mobility, dexterity, etc.)
- Cognitive
- Perceptual
 - Sight, hearing, etc.
- Personality
- Cultural factors



Where is the bottleneck?





Synergy

- Humans do what they are good at
- Computers do what they are good at
- Strengths of one cover weakness of the other

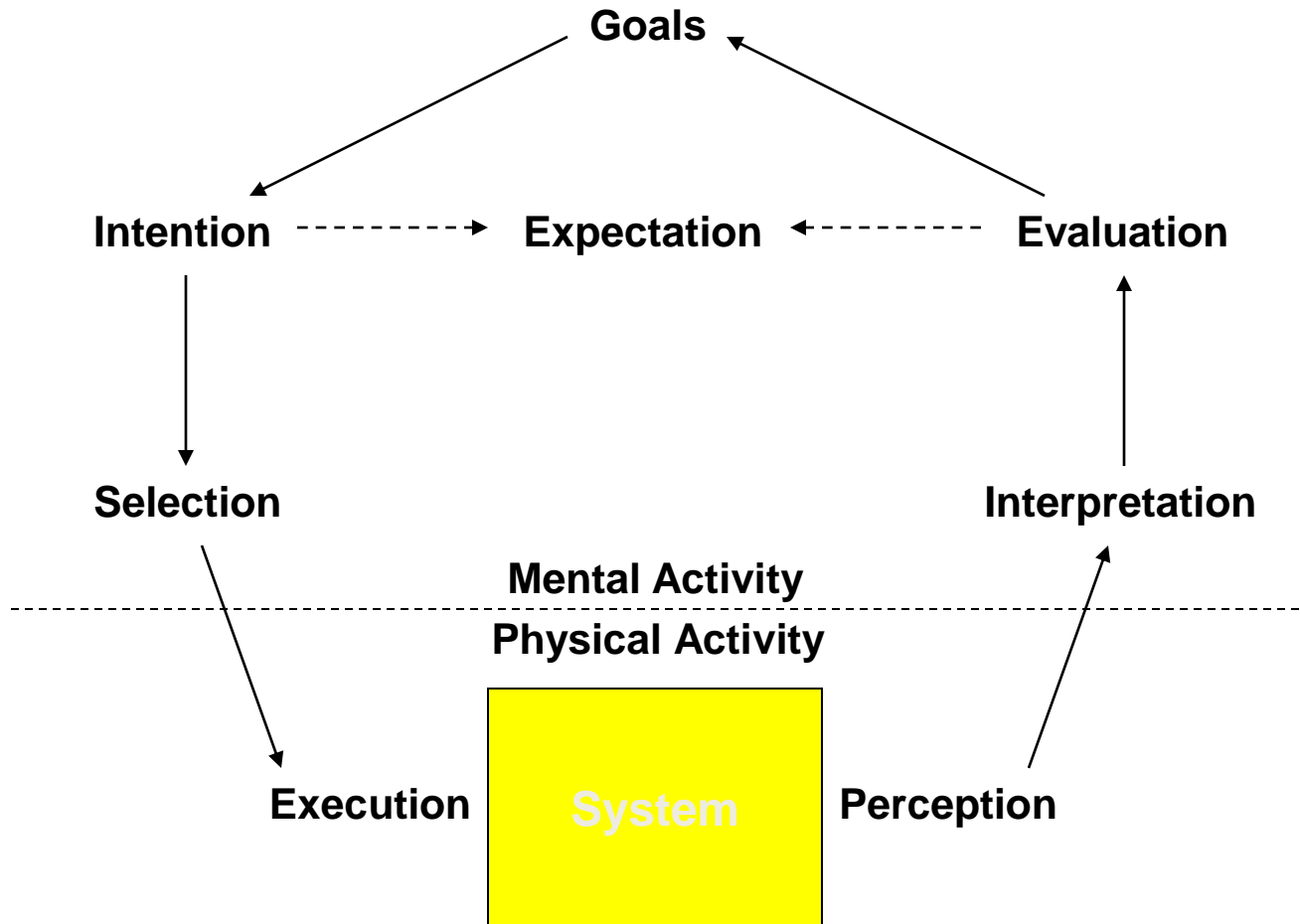


Interaction

- Forming an intention
 - Internal mental characterization of a goal
- Selection of an action
 - Review possible actions, select most appropriate
- Execution of the action
 - Carry out appropriate actions with the system
- Evaluation of the outcome
 - Compare results with expectations



Stages of Interaction





Mental Models

- How the user thinks the machine works
 - What actions can be taken?
 - What results are expected from an action?
 - How should system output be interpreted?
- Mental models exist at many levels
 - Hardware, operating system, and network
 - Application programs
 - Information resources



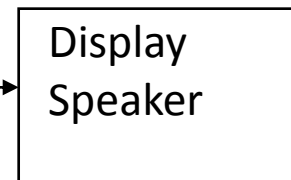
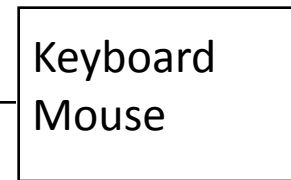
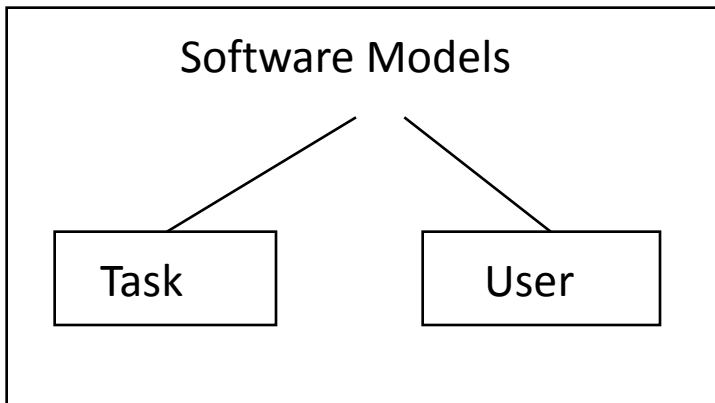
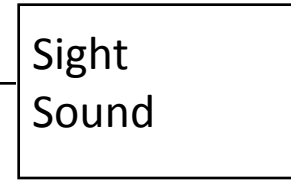
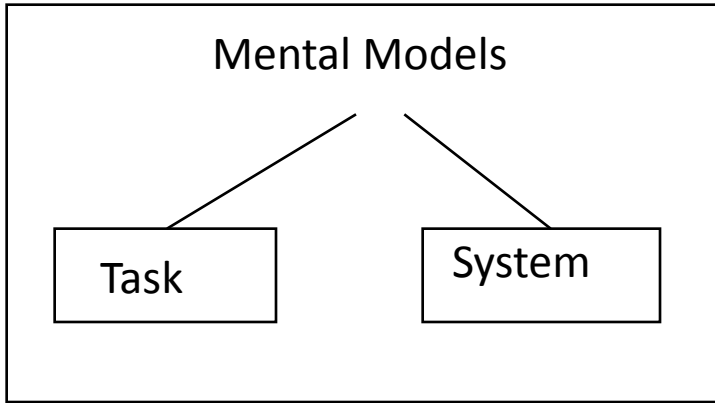
Mental Models

- Built from:
 - Affordances, causality, constraints, mapping
 - Positive transfer, stereotypes / cultural transfer
 - Instructions
 - Interactions
- Allow people to mentally simulate use of a system
 - Thus developing expectations for how the system will work & respond
- Can be wrong
 - Especially if any of the above are misleading: Direct link between system features and user's state of mind.

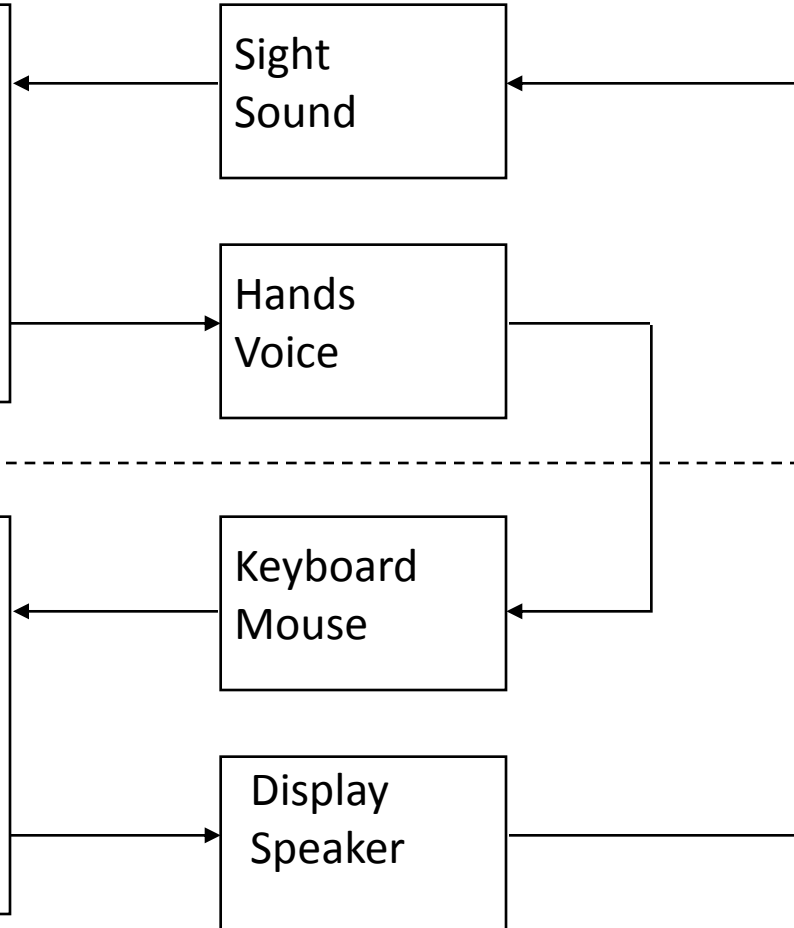


Modeling Interaction: Computer Peripherals & Human Sensory Perception

Human



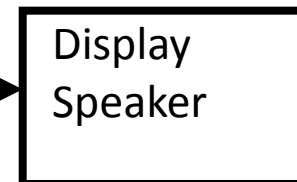
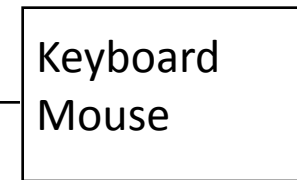
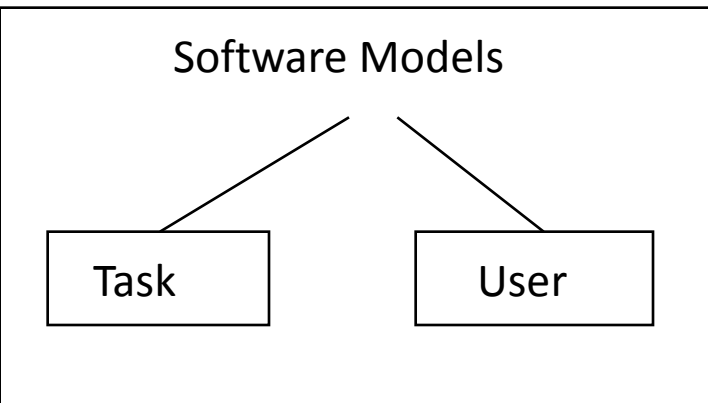
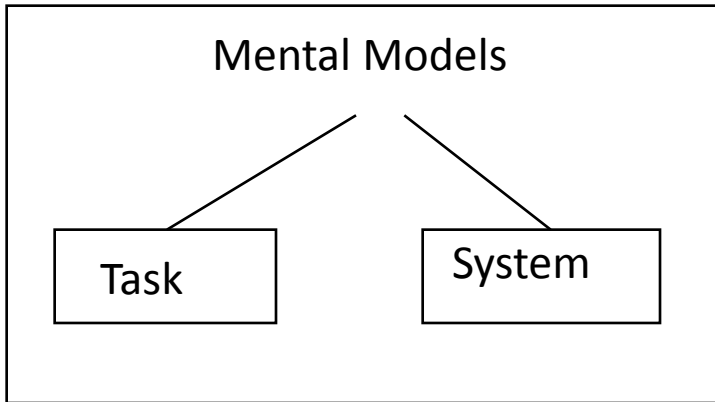
Computer





Modeling Interaction

Human



Computer



Human Senses

- Visual
 - Position/motion, color/contrast, symbols
- Auditory
 - Position/motion, tones/volume, speech
- Haptic
 - Mechanical, thermal, electrical, kinesthetic
- Olfactory
 - Smell, taste
- Vestibular



Human-computer communication

- Human-to-computer
 - Input devices
 - Keyboard, mouse, touchscreen, microphone, etc.
 - Hardware mechanisms that receive the kind of data that can be processed by software processes
- Computer-to-human
 - Output devices
 - Screen, speaker, device vibration, etc.
 - Hardware mechanisms that can send the kind of data that can be processed by human senses

G3: Connect HCI principles with good Web site design

Human-computer interaction +
Human-information interaction



Objects & Design: Lessons from Donald Norman

- Objects have natural actions that go with them
 - Chairs are for sitting
 - Knobs are for turning
 - Buttons are for pushing ...
- Vandalizing a train
 - Example from *The Psychology of Everyday Things* by Donald Norman.
- The perceived and actual fundamental properties of an object determine how it will be used.



Bridging Users & Systems: Affordances

- Real or perceived action possibilities of an object
 - A knob can be twisted or pushed
 - A cord can be pulled, twisted, wrapped
 - A link can be read, clicked, copied
 - A box can be typed into
- Complex things may need explaining, but simple things should not



Affordances Gone Wrong

Sliders for sliding

Dials for turning



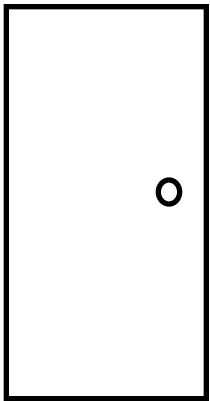
Are these buttons?

What does this button do?

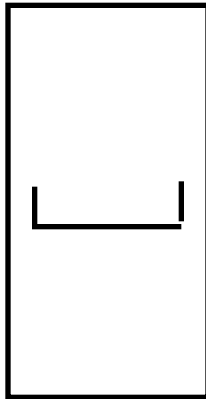


Bridging Users & Systems: Visible Constraints

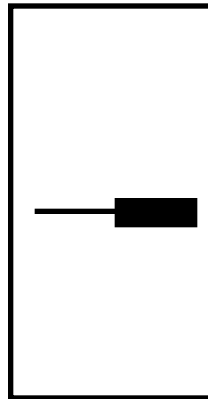
- Visible limitations on affordances
 - Limitations in a good way: Reduces complexity, uncertainty of objects with many possible affordances



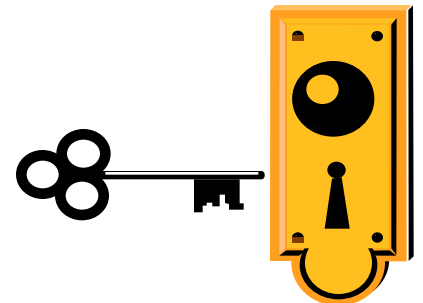
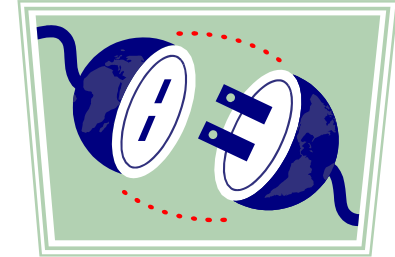
Push or pull?



Which side?



Can only push,
side to push clearly visible





Users play a role too!

- Not all visual constraints are seen, perceived, followed!





Visible Constraints: Date Entry

Form1

Date:

Month Day Year

Month Day Year

Month Day Year

Appointment

General Attendees Notes Planner

When

Start:

End:

All day

Description:

Smart Technology Sem

Where:

May 1997						
S	M	T	W	T	F	S
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7



BRISBANE MID



OFF

OFF

OFF

OFF

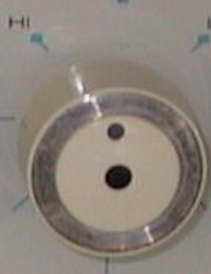
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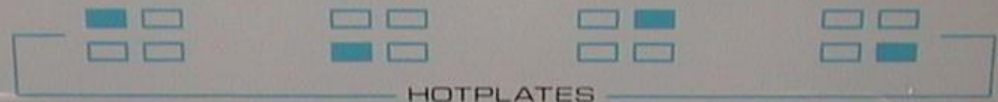


ON



200 230 260
400 450 500

OVEN



HOTPLATES

GRILL

Centenary



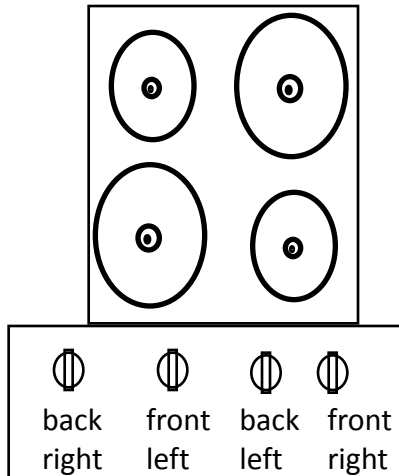
Bridging Users & Systems: Mapping

- Design concept
- Draw clear relationships between objects and the things or behaviors they control
- Should help users develop reasonable expectations of cause and effect
 - What will probably happen if I click here?



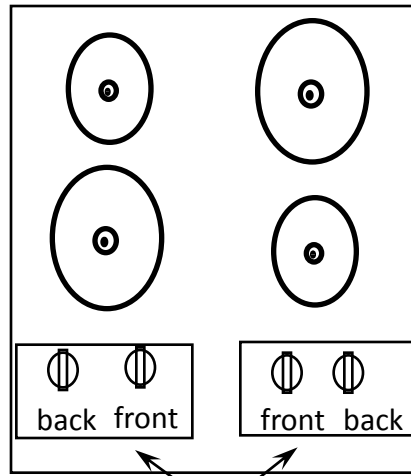
Possible Mappings

arbitrary



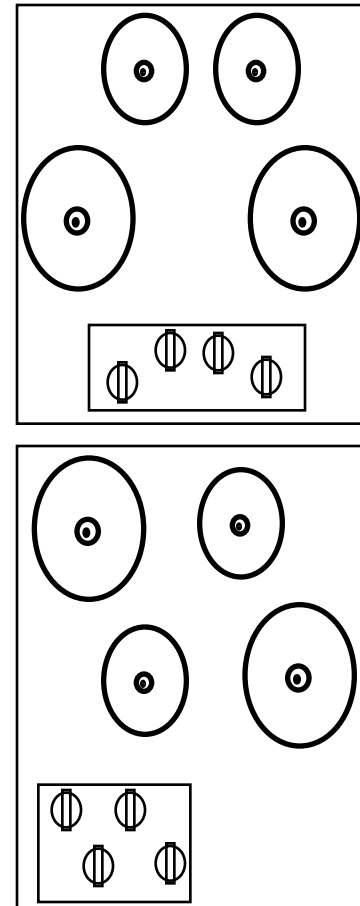
24 possibilities, requires:
-visible labels + memory

paired



2 possibilities per side
= 4 total possibilities

full mapping





Bridging Users & Systems: Causality

- More specifically, perceived causality
 - What happens immediately after an action is feedback about the consequences of the action
- False causality
 - Post hoc ergo propter hoc.
 - Incorrect effect
 - E.g., invoking unfamiliar function, then computer freezes
 - Can cause ‘superstitious’ behaviors
 - Invisible effect
 - Command with no apparent result often re-entered repeatedly
- Causality and design
 - Maintain awareness that humans naturally and unavoidably ascribe causality
 - Design for consequences of this kind of reasoning



Bridging Users & Systems: Transfer Effects

- People transfer their learning/expectations of similar objects to current objects
 - Positive transfer: Previous learning applies well to new situation
 - Negative transfer: Previous learning conflicts with new situation



Bridging Users & Systems: Population Stereotypes/Idioms

- People learn idioms and symbols differently in different cultures:
 - Red means stop or danger
 - Green means go or safe
 - Light switch in America versus Great Britain
 - Faucets in America versus Great Britain
 - Thai trash can icon
 - American trash can icon





Lessons from Architecture: Patterns

- “[A] pattern describes a problem that occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.”
 - Christopher Alexander, *A Pattern Language*. 1977.
- A design concept that can apply to anything that gets ‘built.’
 - Buildings, landscapes, software, Web sites, collections



Pattern Examples

- **251: Different Chairs**

Conflict: People are different sizes; they sit in different ways. And yet there is a tendency in modern times to make all chairs alike.

Resolution: Never furnish any place with chairs that are identically the same. Choose a variety of different chairs, some big, some small, some softer than others, some with rockers, some very old, some with arms, some wicker, some wood, some cloth.





Pattern Examples

- **112: "Entrance Transition"**

Conflict: Buildings, especially houses, with a graceful transition between the street and the inside, are more tranquil than those which open directly off the street.

Resolution: Make a transition space between the street and from front door. Bring the path which connects street and entrance through this transition space, and mark it with a change of surface, a change of level, perhaps by gateways which make a change of enclosure, and above all with a change of view.



"All the News That's Fit to Print"

The New York Times

THE METROPOLITAN MUSEUM OF ART

TOTAL SURVEY NOW SHIPPED

Various small news snippets and advertisements on the left side of the page.

Various small news snippets and advertisements on the left side of the page.

WILSON SWORN IN AS PRESIDENT; PLEDGES HIMSELF TO JUSTICE; BIGGEST INAUGURAL THROG

WASHINGTON — President Obama made addressing climate change the most prominent policy of his second inaugural Address, setting in motion what Democrats say will be a deliberately paced but aggressive campaign that around the use of his executive powers to sidestep Congressional opposition.

"We will respond to the threat of climate change, knowing that failure to do so would harm our children and future generations," Mr. Obama said on Monday at the start of eight ceremonies on the subject, more than he devoted to any other specific area. "Some may still deny the overwhelming judgment of science, but none can avoid the devastating impact of raging fires and crippling drought, and more powerful storms."

The central place he gave to the subject seemed to answer the question of whether he had crossed it in a realistic second term priority. He devoted scant attention to it in the campaign and had delivered a mixed message about its importance since the election.

Mr. Obama is heading into the effort having extensively studied the lessons from his first term, when he failed to win passage of comprehensive legislation to reduce emissions of the gases that cause global warming. This time the White House plans to avoid such a fight and instead focus on what it can do administratively to reduce emissions from power plants, increase the efficiency of home appliances and have the federal government produce less carbon pollution.

Mr. Obama's path on global warming is a case study in making sure his approach is vetted politically, economically and technologically so as not to risk missing what many environmental advocates say could be the last best chance for years to address the problem.

The controversy will be acted by the Environmental Protection Agency on Page A13

Continued on Page A13



Coming of Wilson and Tilt. The Obama inauguration ceremony.

OBAMA OFFERS LIBERAL VISION: 'WE MUST ACT'

Speech Gives Climate Goals Center Stage

By RICHARD W. STEVENSON and JOHN H. BRODER

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Continued on Page A13



Feeling a Sense of Urgency To Leave His Mark. He did not say the work, but President Obama followed his address with the spirit of a favorite phrase: the Rev. Dr. Martin Luther King Jr.'s call to heed "the force urgency of now." This was a man contrasted of his time left in effort.

By RICHARD W. STEVENSON, PAGE A8

Inaugural Stresses Theme of Civil and Gay Rights — Safety Net Praised

By PETER BAKER

WASHINGTON — Barack Obama's inauguration ceremony opened his second term on Monday with an executive Inaugural Address that offered a robust articulation of modern liberalism in America, arguing that "preserving our individual freedoms ultimately requires collective action."

On a day that echoed the optimism from the civil rights era and tributes to the Rev. Dr. Martin Luther King Jr., Mr. Obama dispensed with the traditional appeals of four years ago but set a bold vision of advancing gay rights, showing more tolerance toward illegal immigrants, preserving the social welfare safety net and acting to stop climate change.

At times he used his speech, delivered from the West Front of the Capitol, to reprise arguments from the full campaign, rebuking the notion expressed by conservative opponents that America risks becoming "a nation of solipsists" and exhorting the value of progressive government in society, instead of declaring the end of "party government" and that taking the oath as the 44th president in 2009, he challenged Republicans to step back from their staunch opposition to his agenda.

"Progress does not come from us to settle centuries-old debates about the role of government for all time — but it does require us to act in our time," he said in the 18-minute address. "But now decisions are upon us, and we cannot afford delay. We cannot make a mistake about the principle or substance of progress for policy or treat name-calling as a reason to back down."

Mr. Obama used Abraham Lincoln's 1866, as he did four years ago, but this time added Dr. King's 1963 as well to mark the holiday honoring the civil rights leader. He became the first president ever to mention the word "gay" in an Inaugural Address as he repeated the drive for same-sex marriage in the quest for racial and gender equality.

The festivities at the Capitol came a day after Mr. Obama officially took the oath in a quiet ceremony with his family at the White House on the day set by the Constitution. With Inauguration Day falling on a Sunday, the ceremony was then repeated for an energized mass audience a day later, accompanied by the pomp and parade that typically surround the quadrennial tradition.

Hundreds of thousands of people gathered on a brisk but bright day, a huge crowd by any measure, though far less than the record turnout four years ago. If the day did feel somewhat dampened by the historic mood the last time, it reflected a more restrained mission in the life of the country. The hopes and expectations that seemed so large with Mr. Obama's taking the office in 2009, even amid economic crisis, have long since faded into a starker sense of the limits of his presidency.

Now 73 and notably grayer, Mr. Obama appeared alternately upbeat and reflective. When he reentered the Capitol at the conclusion of the ceremony, he tipped his entourage to turn back toward the "cherry crows" in the National Mall.

"I want to see this again," he said. "I want to see this again."

Continued on Page A12

A Diverse Crowd Celebrates A Moment in History

From the musicians who marched with a pipe and fife to the American flag, the parade featured performers from Texas to streets of elegant African American women, the faces of those once left behind.

A First Lady Unfraid To Look Like a Million Bucks

Fashion is no longer the headline subject it once was in American politics. Embracing expensive designer clothes has not been a problem for Michelle Obama in the way that earlier parades boasted Nancy Reagan, or even Jacqueline Kennedy.

Even if It Enrages Your Boss, Social Net Speech Is Protected

By STEVEN GREENHOUSE

As Facebook and Twitter become as central to workplace conversation as the company cafeteria, federal regulators are advising employers to scale back policies that limit what workers can say online.

Employees often seek to discuss comments that paint them in a negative light. Don't discuss company matters publicly, a typical social media policy will say, and don't disparage managers, co-workers or the company itself. Violations can be a firing offense.

But as a series of recent rulings and advisory, labor regulators have declared many such blanket restrictions illegal. The National Labor Relations Board says workers have a right to discuss work conditions freely and without fear of retribution, whether

the discussion takes place at the office or on Facebook. In addition to enforcing the reinstatement of various workers fired for their posts on social networks, the agency has pushed companies nationwide, including giants like General Motors, Target and Costco, to rewrite their social-media rules.

"Many view social media as the new water cooler," said Mark G. Platero, the board's chairman, noting that federal law has long protected the right of employees to discuss work-related matters. "All we're doing is applying traditional rules to a new technology."

The decisions come amid a heated debate over what constitutes appropriate disclosure on Facebook and other social networks. Schools and universities

Algeria Defends Tough Response to Hostage Crisis as Toll Rises

By ADAM NOSSETER and ERIC SCHMITZ

ALGERIA — The prime minister of Algeria offered an unapologetic defense on Monday of the country's tough actions to end the Sahara hostage crisis, saying that the militants who had not tried to kill all their captives and that the army saved many from death by attacking.

But the American case at the death toll of foreign hostages rose sharply to 22, and an American official said they had defied sophisticated intelligence help that could have averted the crisis.

At a news conference in Algiers, the prime minister, Abdelmalik Sellal, portrayed the military's deadly assaults on the Islamists militants who had stormed and occupied an international airport, gas-propelled complex last Wednesday as necessary to end Algeria as a nation of national shame and despair.

American counterterrorism officials and experts said they would have taken a more cautious approach, using detailed surveillance to gain an information advantage and helpfully maneuver the militants. But the Algerians decided to second guess the

hostage-taking episodes in recent memory reflects conflicting ideas over how to manage such mass abductions in an age of suicidal terrorist acts in a post-9/11 world.

The Algerians — and some Western supporters — argue that the loss of innocent lives is unavoidable, when confronting fanatics who will kill their captives anyway, while others say modern technology provides some means of minimizing the deaths.

Continued on Page A8



Rescue workers with the coffin of one of the slain hostages.

French Air Strikes Successful

French and Italian troops pushed to locate militants out of important towns in central Mali that they had held for a week. Above, the towns of Dadi, where the troops were pressed with

Continued on Page A13

Coup Is Said to Fail in Eritrea

Government troops quashed a rebellion after minutes soldiers turned the information Ministry, people with contacts in the African nation said.

Continued on Page A13

Cardinal Tied to Cover-Up

The ex-archbishop of Los Angeles and other officials worked to keep evidence of child-molestering hidden, church records filed in a lawsuit, it says.

Training on Religious Liberty

Standard Law School has opened the nation's only clinic devoted to cases involving religious freedom.

Continued on Page A8

Super Bowl Cold Shoulder

New Orleans may not welcome Roger Goodell, the man who presided over the Super Bowl.

Redthinking a Tax Edge

The private equity industry hopes to hold down higher federal taxes.

Continued on Page A13

Storm's Punch, 3 Months Later

A look at how several communities are

Continued on Page A13

Arts & Culture

Of Adultery and Apathetic "The Sun" a satirical play set in South Africa in the post-apartheid era.

Country Soul in Brooklyn Soil

The Lone Bowler, a Brooklyn band with a rock edge and Southern roots, is preparing to first album.

Continued on Page A8

David Brooks

Editorial, OP-ED A14-25



Layers of Patterns for Web Design

- Posture – genre, type, purpose
 - Commercial, informative, social, creative, combo
 - The *posture* of the site it becomes clearer what kinds of experiences to design
- Experience
 - User tasks and goals within the realm of the posture
 - High-level tasks & goals
 - Primary & secondary level experiences
- Task
 - Specific solutions and strategies for creating experiences
 - Can be drawn as wireframes or sketches
- Action
 - Low-level widgets & features that contribute to task performance

Affordances & Constraints
go here

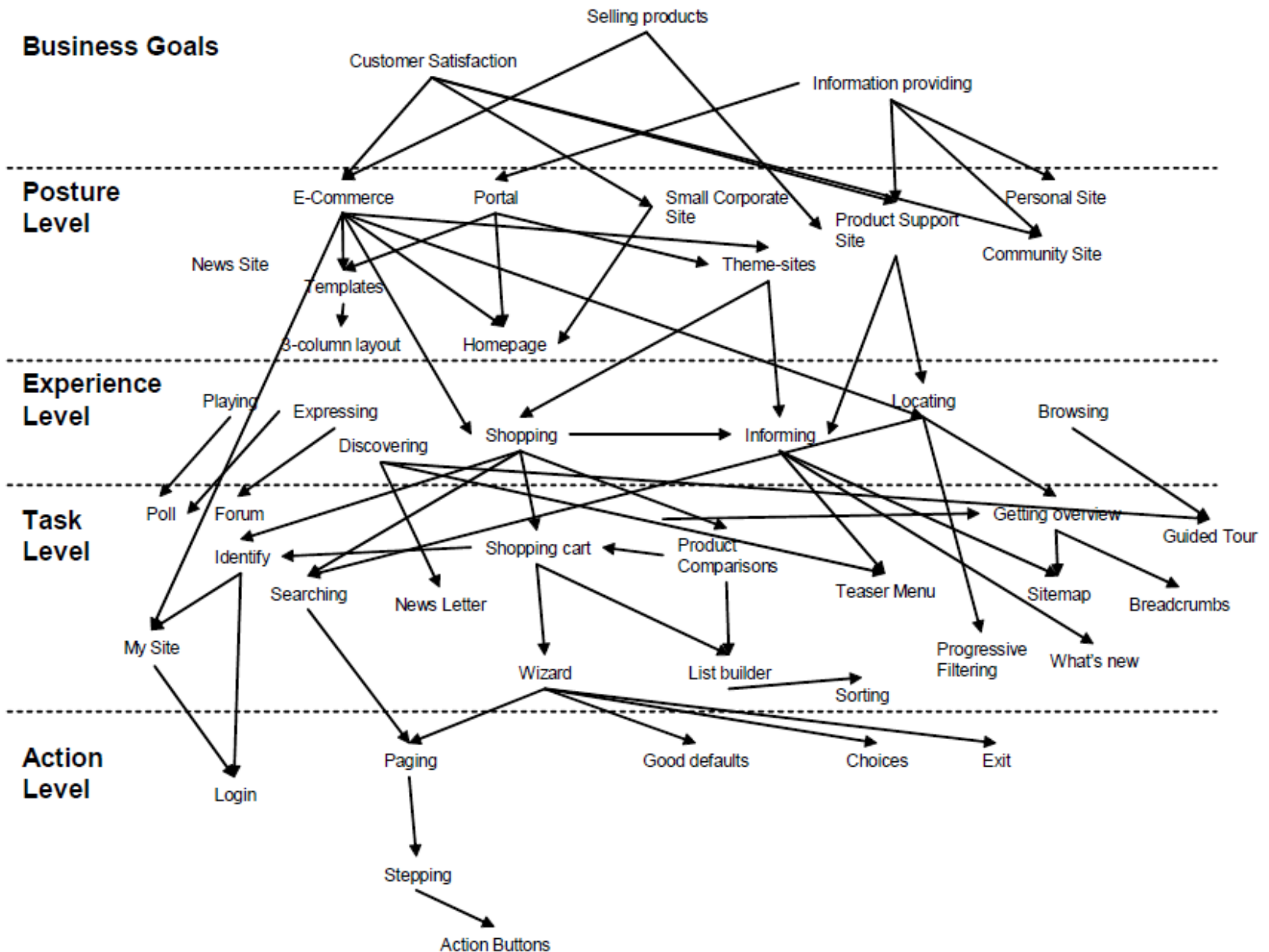


Figure 2: A partial pattern language for web design (centred around “shopping”)



Wire Framing

- Design, brainstorming technique
 - Highly conceptual
 - Low-fi
 - Low risk, low cost
 - Rapid
- Incorporates three elements of Web design:
 - Information design. *Which information will go where?*
 - Navigation design. *How will users get around?*
 - Interface design. *What kinds of elements convey functionality?*

GORMLESS THE FIRST



INTRO TEXT

more...



ME AT THE LOCAL SWIMMING POOL



LATEST VIDEO

more...

CALL TO ACTION



FOOTER

INTERIOR: PRODUCT DETAIL PAGE v1

SAME WIDTH AS COLUMN

data TECHNOLOGIES INC.

00000000000000000000

600 NUMBER

CHAT BOX

SEARCH

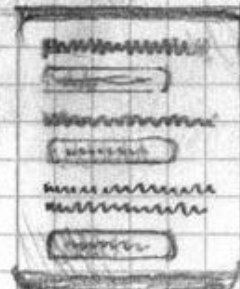
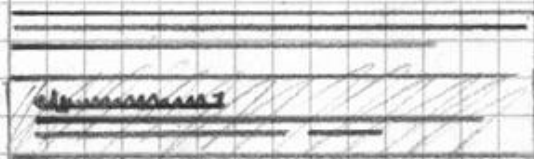
INTRO BLOCK ON PRODUCT WITH TITLE TYPE + LOGO GRAPHICS

INTRO TO BULLET ITEMS

BULLET FEATURES

CLOSING

CROSS-SELL FOR IMAGE OR FOR BOARDS?



BUY MIDDLE - WHAT IF MOST EXPENSIVE IS @ THE TA?

HELP + SUPPORT MIDDLE

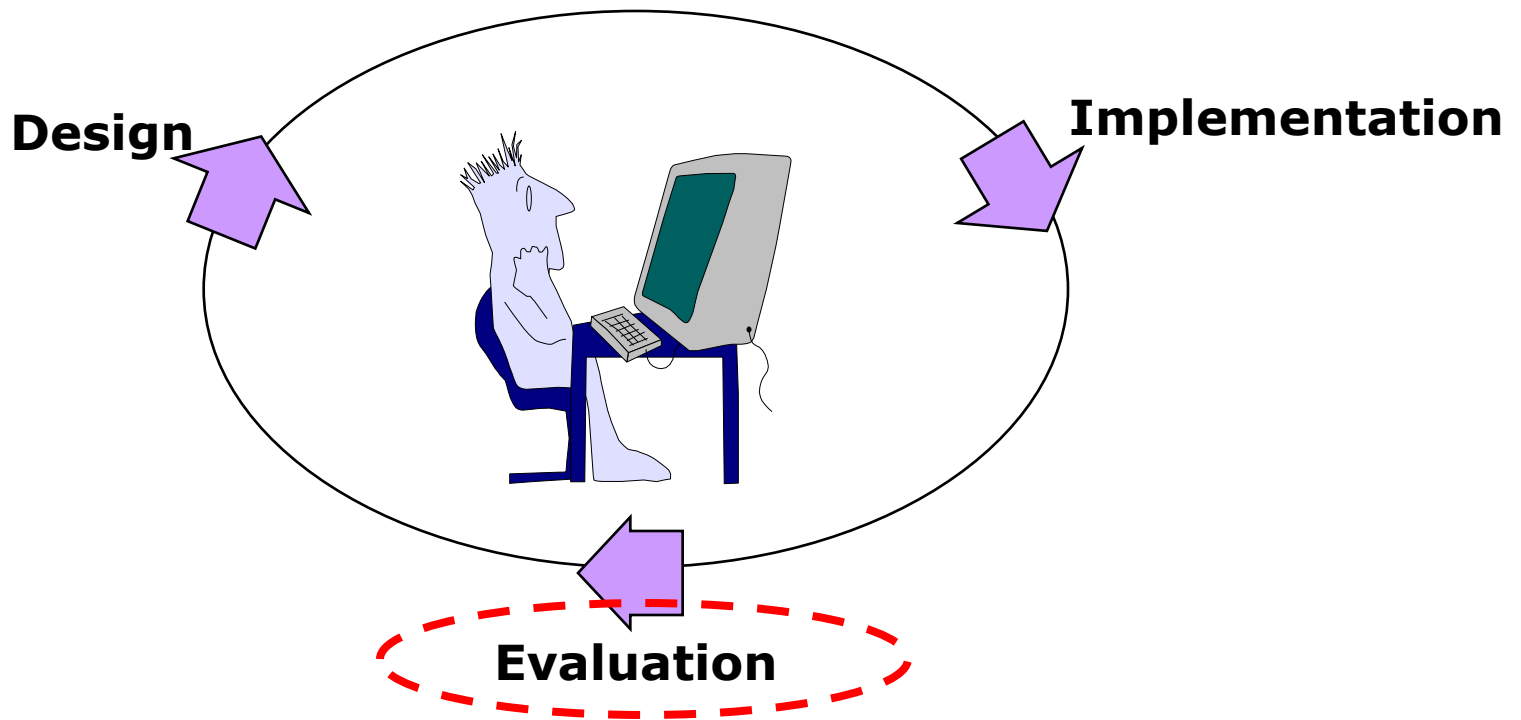
LOGOS FOR APPROVAL - OR LOGOS OF COMPANIES WHO USE IT (CASE STUDIES)

G4: Begin to think about evaluation

Timing, methods, and outcomes of
usability evaluation



Human-Computer Interaction



of interactive computing systems for human use



Usability Evaluation Methods

- Quantitative
 - Numeric data
 - Usually objective
- Qualitative
 - Narrative data
 - Usually subjective
- Mixed Methods
 - Combine both kinds of data



Objective Data: Quantitative Analysis

- Response/task times
 - Captured via transaction logs
 - System can capture time & place of mouse clicks, text entries, etc.
 - Screen capture can record any on-screen activity (movement of mouse, typing, screen loads)
- Reading time/locus of attention
 - Eye trackers can record a “movie” of where a person looks and for how long
- Response/task accuracy
 - Types of responses can be tracked and categorized, then compared with accuracy benchmarks



Subjective Data: Quantitative Analysis

- Numeric user survey responses
 - Likert scale
 - Odd (neutrality allowed) or even (forced choice) number of choices allowed
- Statistics calculated for each question
 - Mean, standard deviation, N-per-answer



Objective Data: Qualitative Analysis

- Content analysis of user's text entries
 - E.g., Query logs
- Qualitative evaluation of transaction logs, screen captures, eye-trackers
 - Requires some inferences, conjecture on researcher's part, unless user corroboration is built into evaluation method
- Heuristic evaluation
 - Applying established design guidelines to the analysis of a site
 - E.g., Homework 3 using HHS Usability Guidelines



Subjective Data for Qualitative Analysis

- Interviews: Researcher & One Participant
 - Structured: The same pre-planned list of questions is asked of every participant, with no going off-script
 - Semi-structured: The same pre-planned list of questions or talking points are touched on with every participant, although some follow-up questions or tangential discussions are expected
 - Unstructured: No structured plan going in; a free form conversation between researcher and participant



Subjective Data for Qualitative Analysis

- Focus groups: Group of users and observation by a (perhaps invisible) researcher
 - Small groups are asked to collaborate on a task, OR
 - Work independently on a task, then discuss, OR
 - Discuss their wants, needs, reactions to a real or proposed product
 - Sometimes facilitated by researcher, sometimes the researcher stays out of the room



Subjective Data for Qualitative Analysis

- User reactions to system
 - Think-aloud: User is asked to think out loud while using the system
 - Often requires prompt from the researcher, like “What are you trying to do right now?” or “Tell me what you’re thinking about the system while you do this.”
 - Stimulated recall: User is shown a transaction log, screen capture, etc. and asked to recall what was going on at the time



Processing Qualitative Data

- Transcripts are often made of narrative data (interviews, focus groups, etc.)
- Researcher uses software (e.g., Nvivo, Atlas.ti) to highlight interesting passages and code them according to evaluation benchmarks or research topics
 - E.g., Researcher might highlight all passages where an interviewee discusses the menu structure, or all passages where interviewee expresses dissatisfaction.