Modeling Interaction / Techniques for Design: Personas

Human Computer Interaction
CSCI 4620U| SOFE 4850U | CSCI 5540G
Dr. Christopher Collins

Acknowledgement: Parts of these lectures are based on material prepared by Ron Baecker, Ravin Balakrishnan, John Chattoe, Ilona Posner, Scott Klemmer, and Jeremy Bradbury.

Neilson's Usability Heuristics

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and Standards
- Help users recognize, diagnose, and recover from errors
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help and documentation

Auto-Selected Paper Size

Universal Print Driver defaults

How does the Universal Print Driver determine the default paper size?

The default paper size is based on the operating system locale rather than the print driver language. The print driver retrieves the locale information and sets the default paper size appropriately (A4 or letter).

SNMP

Does Universal Pri

No. The Universal Print Dr upported.

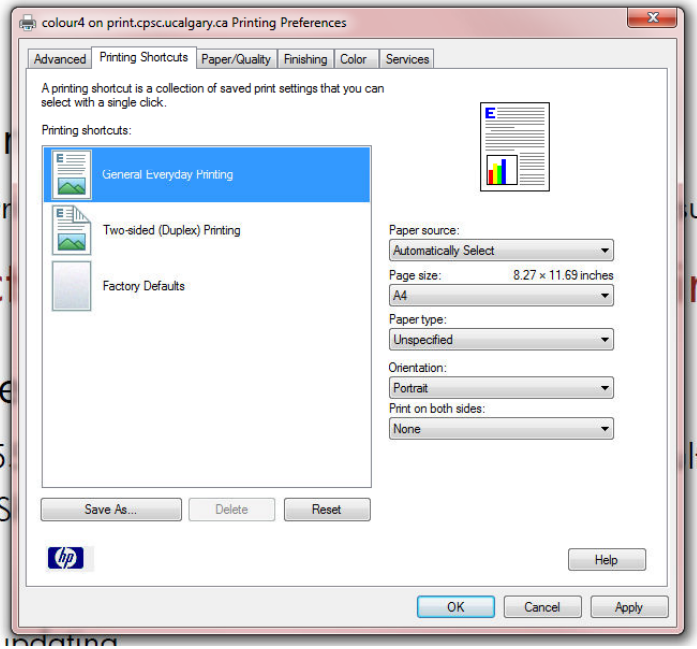
Reported defec nt Driver 4.4.2

Job storage/secure

- The HP Color LaserJet 5 lt.
- Navigating to Printing S

Installation issues

- Errors when installing/updating

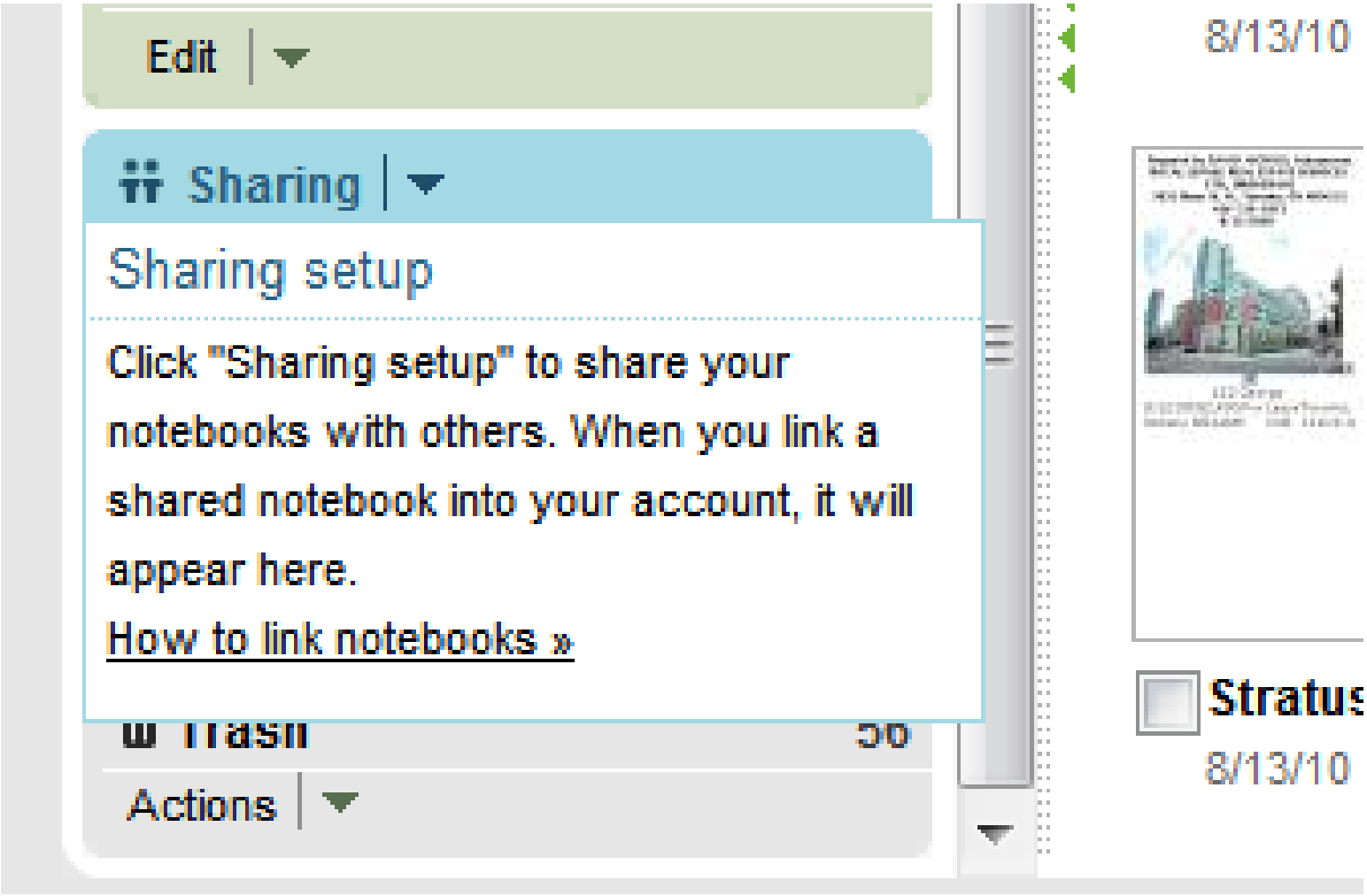


Key Card Design

TANFORD
UEST HOUSE

STANFO

Evernote Sharing



Today

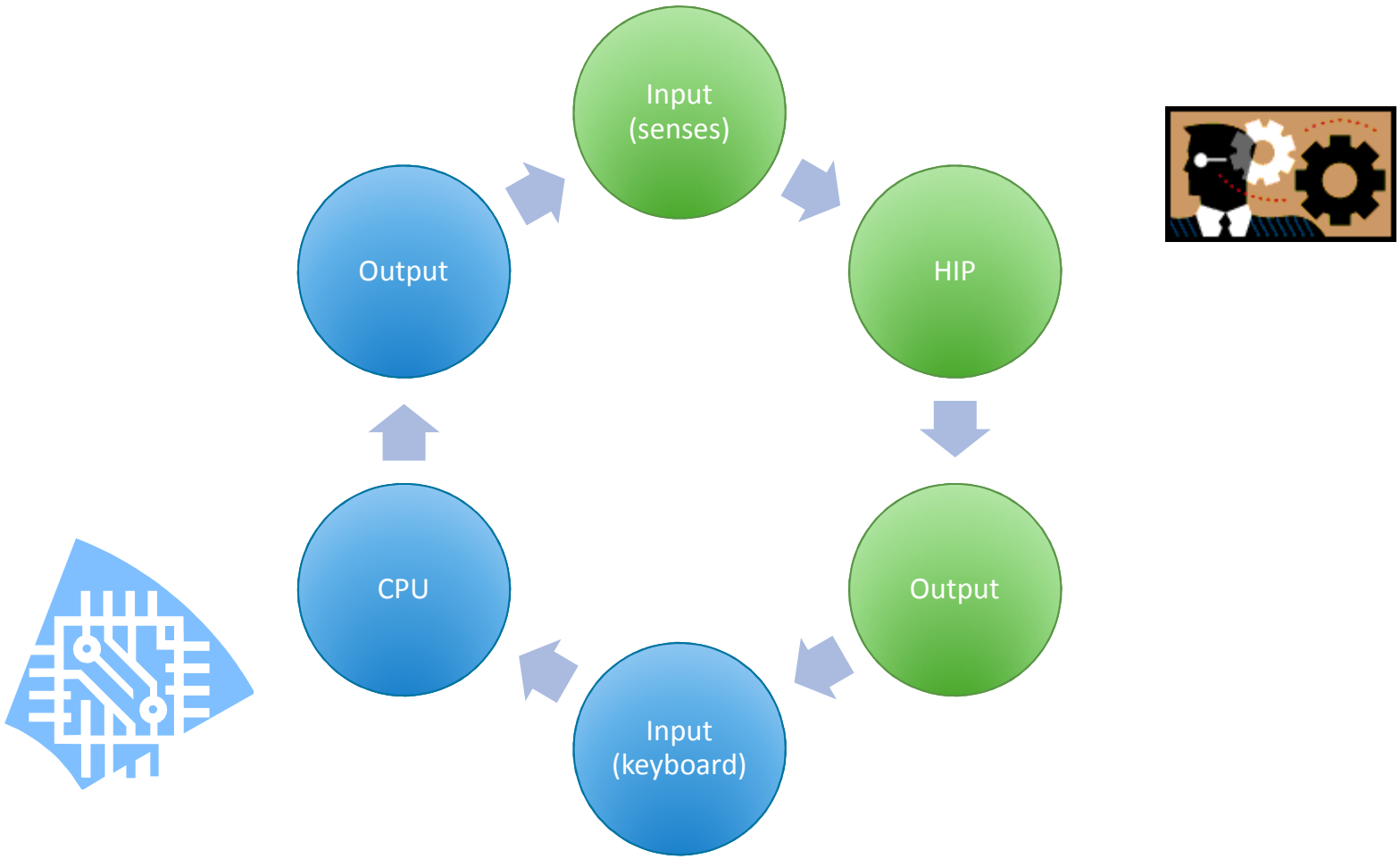
- In today's lesson we will introduce formalisms for modeling human computer interaction processes:
  - Human Information Processing
  - Norman's Seven Stage Model
- Using these models, we can discover problems with current systems and with designs
- We will also start to examine techniques for motivating design:
  - Personas (today), scenarios and requirements (Friday)

Benyon text 23.1-23.2

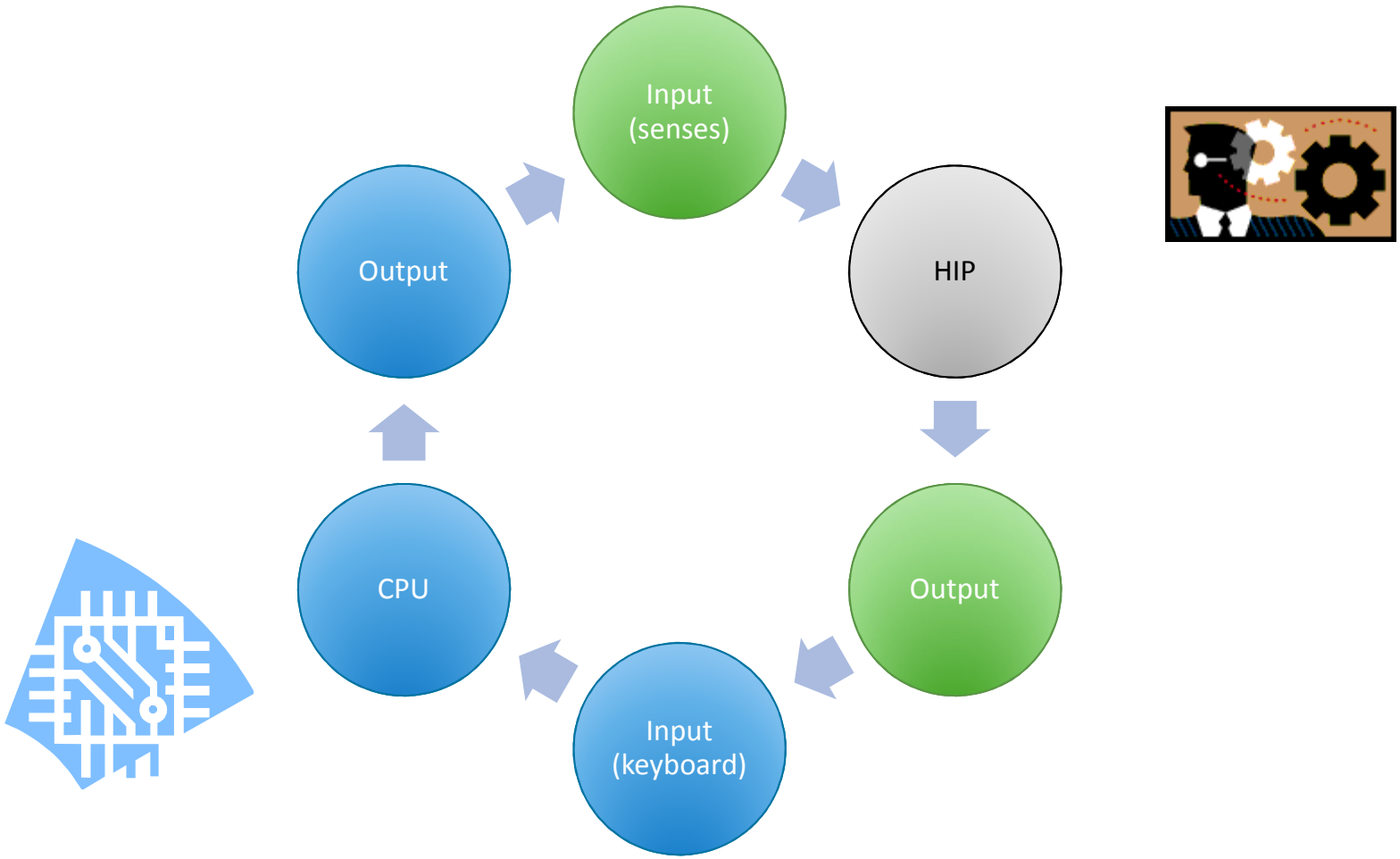
HCI Theory

MODELING INTERACTION

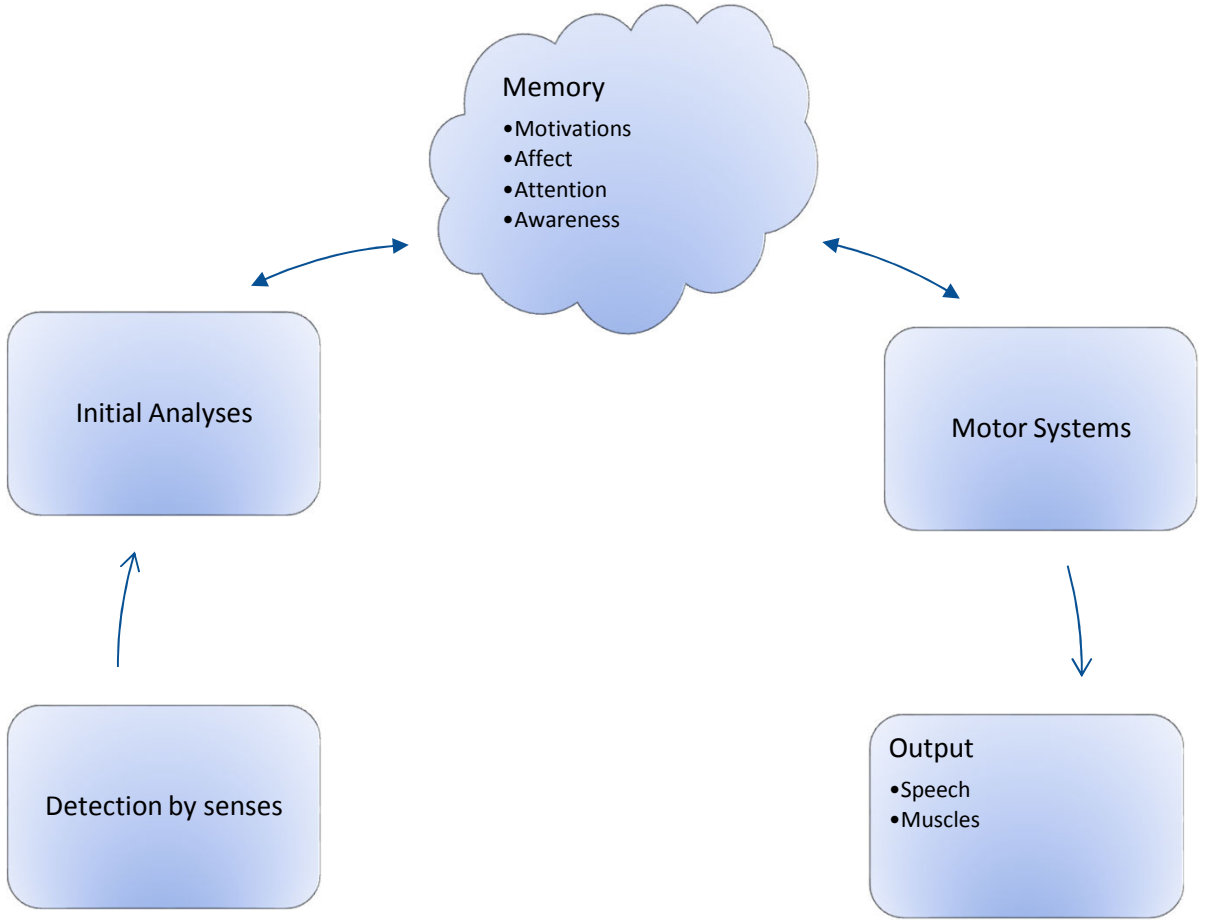
Human Information Processing



Human Information Processing



Details of HIP



HIP Model Problems

- Oversimplifies Humans
  - e.g., memory is not SQL, visual perception is not a pair of cameras
- Decontextualization (outside world reduced to stimuli)
  - Models are based on controlled lab studies
- Output characterized on low level (subtle complexities, world knowledge ignored)
  - Human behaviour (worl, travel, games, writing) is social, but model does not include other people

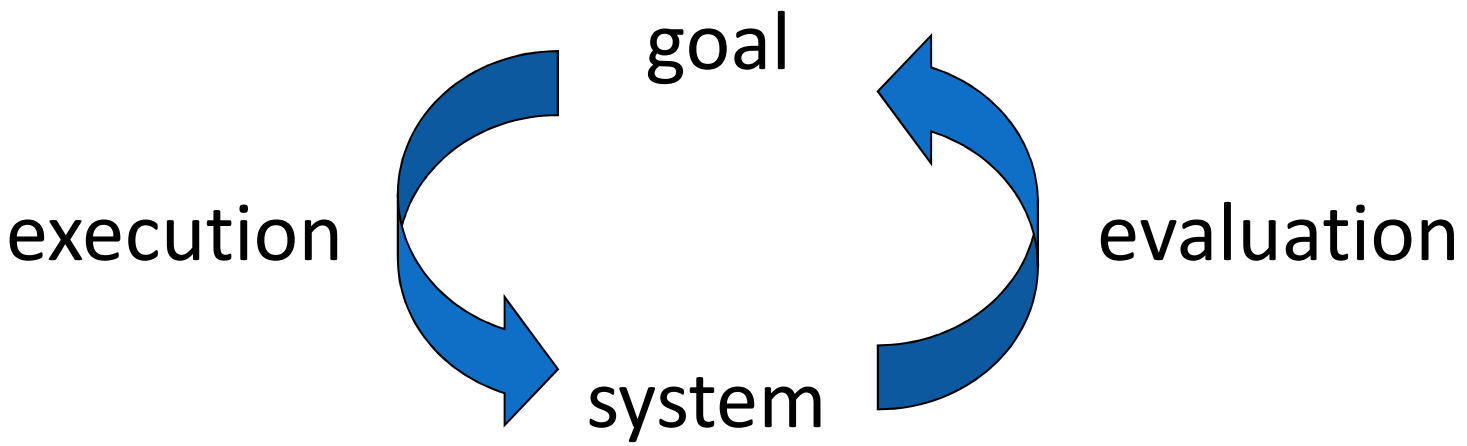
- Why use it? The best we have. Norman's Model is an example of an HIP-inspired model

Norman's Model of Interaction

- A 7 stage model of the execution-evaluation cycle:
  1. Goal is established
  2. Intention is formed
  3. The action sequence is specified
  4. The action is executed
  5. The system state after the action is perceived
  6. The perceived system state is interpreted
  7. The system state is evaluated based on the original goals and intentions (see stages 1 & 2)

Modeling interaction

Norman's Model of Interaction



(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction")*

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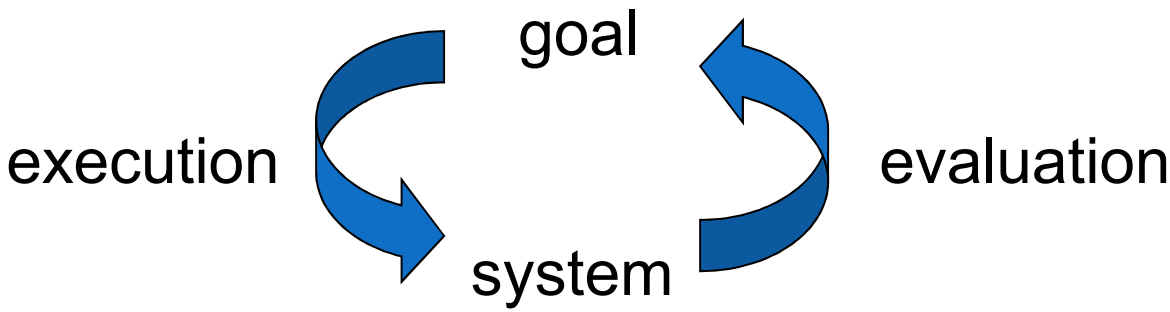
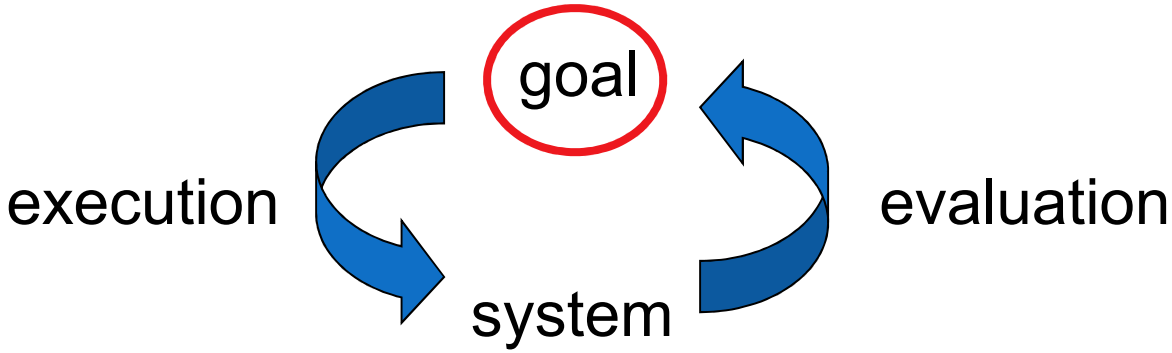
execution/evaluation loop



- user establishes the goal
- formulates intention
- specifies actions at interface
- executes action
- perceives system state
- interprets system state
- evaluates system state with respect to goal

execution/evaluation loop



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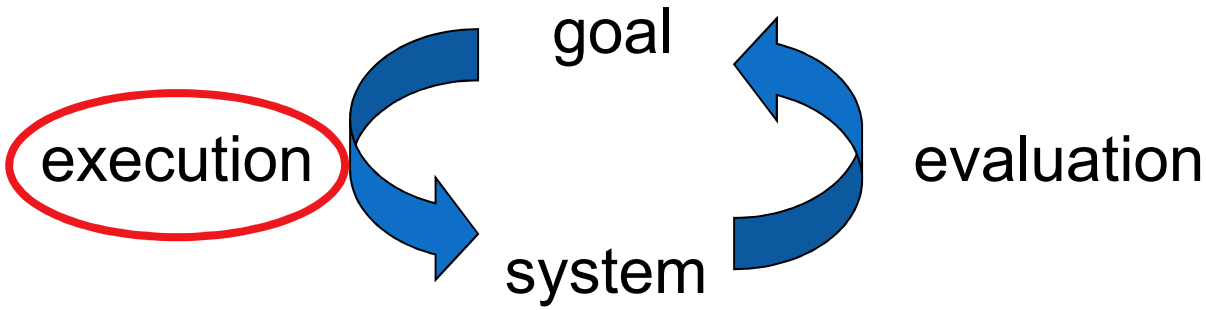

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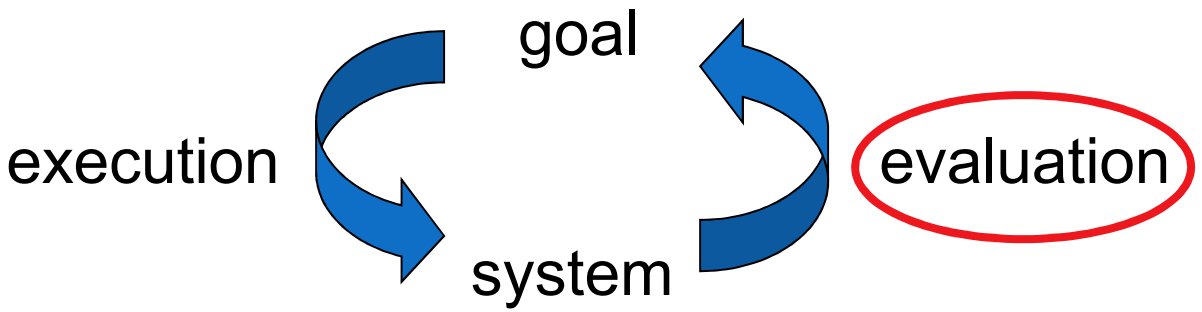

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Modeling Interaction

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At what points can a person make a mistake?

Mistakes

Norman's Model of Interaction

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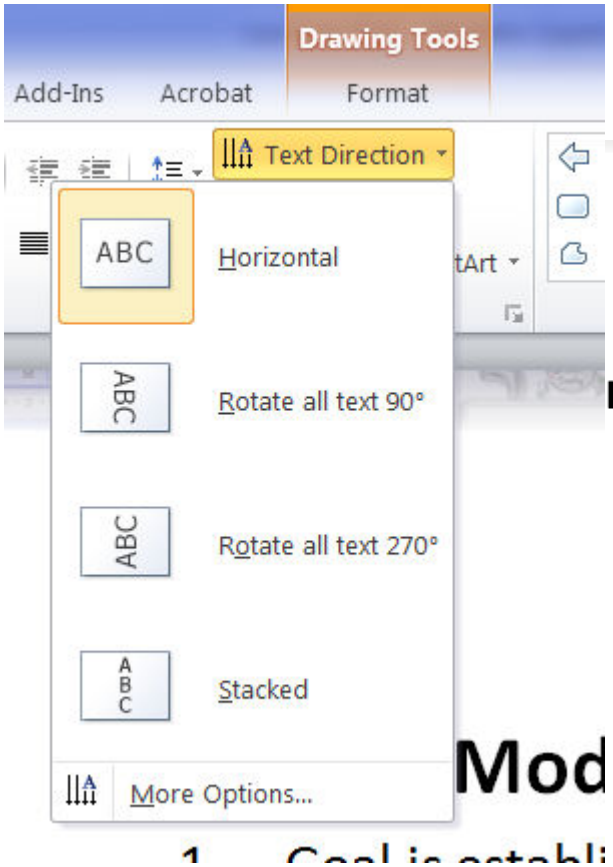
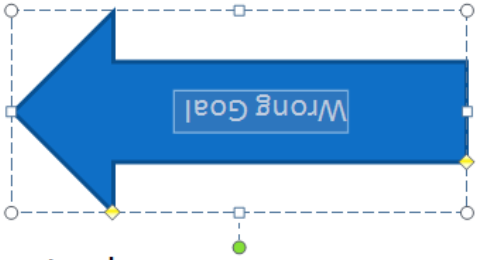
A Reflective Example



Mistakes

man's Model of Interaction



Goal is established

Intention is formed

The action sequence is specified

The action is executed

The system state after the action is perceived

The perceived system state is interpreted

The system state is evaluated based on the original goals and intentions (see stages 1 & 2)

Slip

Norman's Model of Interaction

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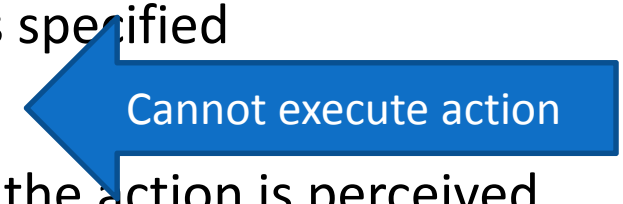

Mistakes

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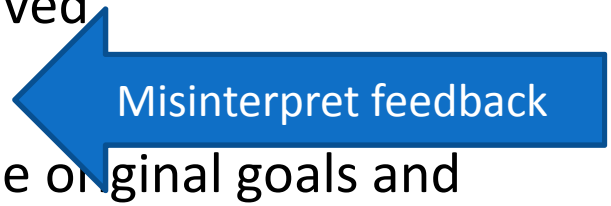


Slips & Mistakes

- Slip: Right goal, right action plan, incorrect action execution
  - Example: try to press F1, and accidentally press F2
- Mistake: Incorrect goal or incorrect action plan
  - Example: you think magnifying glass is for "search" but it's really for "magnify"
  - Action plan can be executed correctly, but if goal is wrong, or plan doesn't serve the goal, then it is a *mistake*

Modeling Interaction

Norman's Model of Interaction

- Gulfs of execution
  - The difference between:
    - The actions the person needs to do
    - The actions the system allows
- Gulfs of evaluation
  - The difference between:
    - The actual system state
    - The person's expectations of system state

Modeling Interaction

Norman's Model of Interaction

- Gulfs of execution
  - "The problem of translating human intention into action" (Benyon, p. 510)
- Gulfs of evaluation
  - "The problem of how an individual understands, of evaluates, the effects of actions and knows when his or her goals are satisfied."

Advanced Models (readings)

- Situated Action Model (sec. 23.2)
  - Considers collaboration and context
  - Plans and scripts make people central
- Distributed Cognition (sec. 23.3)
  - Cognitive process and knowledge used are distributed across people and computers
  - Internal and external representations
  - Examples? More later…
- Embodied Cognition (sec. 23.4)
  - Affordances embody how something is to be used

Affordance: physical properties which lead to actions; 'perceived behaviour'

TECHNIQUES FOR DESIGN

Techniques for Design

- Formal methods:
  - Stakeholders
  - Personas
  - Scenarios
    - Stories, conceptual scenarios, concrete scenarios, use cases
  - Task Analysis
- For describing:
  - *the current situation* (to motivate design)
  - *the proposed design solution* (to drive implementation of prototypes, and test for errors)

Analysis

- Stakeholders & Personas analysis
  - Describing users and other key groups
- Scenarios
  - Tell the story of solving a problem or accomplishing a task
  - Intention/action, and system responsibility
- Task analysis
  - Describing work people do and how they do it

Techniques for Design

STAKEHOLDERS

Stakeholder Analysis

- Primary stakeholders
  - The “users” of the system!
- Secondary stakeholders
  - Other people who are not users but are involved with input/output
- Tertiary stakeholders
  - Other people (not in the above categories) who are affected by the success/failure of the system
- Facilitating stakeholders
  - Software engineers, IT, HCI – people who create and maintain the system

Stakeholders

Example: Classifying stakeholders – an airline booking system

An international airline is considering introducing a new booking system for use by associated travel agents to sell flights directly to the public.

Primary stakeholders: travel agency staff, airline booking staff

Secondary stakeholders: customers, airline management

Tertiary stakeholders: competitors, civil aviation authorities, customers' travelling companions, airline shareholders

Facilitating stakeholders: design team, IT department staff

(Source: Dix, Finley, Abowd, Beale, *"Human-Computer Interaction")*

Stakeholders

- As many stakeholders as possible need to be taken into account when gathering requirements and designing a system
- What happens when stakeholders needs conflict?
  - We have to make hard decisions
  - In general primary stakeholders needs are more important than secondary stakeholders which are more important than tertiary, which are more important than facilitating stakeholders…

Stakeholders

- Recall IDEO's shopping cart stakeholders
  - Shoppers
  - Store owners
  - Checkout clerks
  - Shopping cart retrievers?
- Give examples of stakeholders in
  - Electronic classrooms

From Your Studies

- From interviews, questionnaires, and other research methods, we gain insight into attributes, skills, needs, etc. of stakeholders.

Benyon text
Chapter 3

Techniques for Design

PERSONAS

Personas

- Personas give a rich picture of an imaginary person who represents your primary stakeholder group
- Personas allow you to imagine what the person would do – this is much better than asking yourself what you would do!
- Used in product design, software design, interface design…

Personas

- Persona is a hypothetical stakeholder archetype used throughout design process
- Where from: Compiled from ethnographic interviews with real people
- How: Defined by goals, motivations, behaviors, of real primary stakeholders
- Why: Helps focus on people & context, assist in decision-making & communication
- Tool: Designing for archetype can satisfy bigger group

Primary Persona

- Demonstrates key goals & behaviour patterns
- If the design fails for the primary persona the product is a failure
- Each primary persona may require a different interface
- Secondary Personas (secondary stakeholders) and Anti-Personas (non-users) can be useful too

Persona Examples

- Family Electronic Calendar persona category examples:
  - Career mom
  - Stay-at-home-mom
  - Career dad
  - Teenager
- Select to cover a broad range of primary stakeholder possibilities

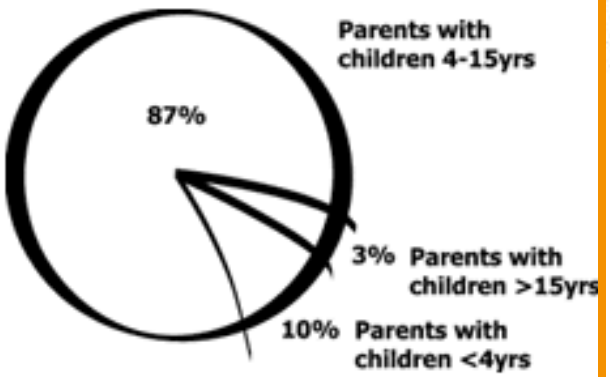
Personas are your Friends

- “When presenting, talking about your personas, or referring to them in writing, communicate as though they are real people, people that you know. Express it like you are talking about a friend.”

Source: www.boxesandarrows.com/archives/002343.php

Market Segmentation & Personas

In a survey of 150 people, participants were asked about Rear Seat Entertainment (RSE) systems. It was found that most respondents believed it was a "lifestyle" purchase for parents trying to entertain or distract their kids while driving. Most felt that the system was appropriate for children between the ages of 4-15yrs, as children needed to be old enough to use headsets as well as some form of remote control. Among the high quality brand names mentioned were Sony, Hitachi, Magnavox and Nintendo. High system prices were cited as a barrier to purchase in the next two years. However, many expected prices to fall significantly over the next five years.



Example survey chart

Personas, on the other hand, reveal motivations and potential usage patterns. A consumer's motivation is what gets them interested in using a product. For example:

Kathleen is 33yrs old and lives in Seattle. She's a stay-at-home mom with two children: Katie, 7, and Andrew, 4. She drives the kids to school (usually carpooling with 2-3 other kids) in her Volvo wagon. Kathleen is thinking about buying the Sony rear-seat entertainment system she saw last weekend at Best Buy to keep the children occupied on the upcoming trip to see family in Canada.

She doesn't want to be distracted by the noise from the videos or games so wants to make sure she can set the sound to be heard only in the back seat. Kathleen also wants to make sure her kids are watching appropriate programs; therefore she wants some channel controls close at hand, but she thinks Katie should be able to control the system most of the time so she won't be distracted.

From this example, the designers can ascertain that Kathleen does not necessarily want her kids to be wearing headphones for an entire journey, as she likes to talk with them on their trips, and that she may want Katie to have some control of the entertainment system from the back seat.

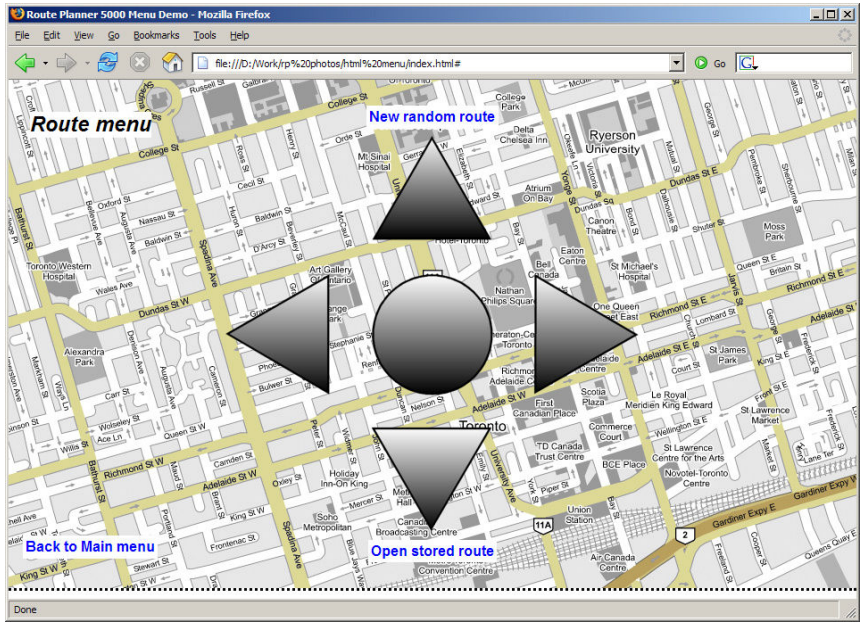
Source: www.cooper.com/newsletters/2002_02

Personas and Scenarios

- Personas and scenarios go together
- Personas become the characters in scenarios which describe the current situation or your proposed solution
- (We will discuss scenarios next time)

RoutePlanner

- Technology solution to assist in planning jogs and tracking progress



Lucas

- Age 42
- Recently divorced and moved to a new city
- Works for the federal government 9-5 with occasional overtime
- Likes classic rock music to keep him moving
- Blood pressure high range of normal
- Knee injury healed, but finds downhill running challenging
- Eats poorly and watches TV 2-3 hours per day
- Only exercise is jogging, usually in the evening, alone
- Owns an iPhone with an armband to hold it

Required Reading: Explore Personas

- http://www.aegis-project.eu/index.php?option=com_content&view=article&id=63&Itemid=53
- Or http://bit.ly/dvxsr7

Summary

- Today we introduced:
  - Models of interaction
  - Personas

Post-Lecture Quiz

- Two “gulfs” in Norman’s model?

Your Action Items

- Group project part 2b is posted: review it before Tuesday
- Keep up with required readings (new – Benyon text, Chapter 3)
- Graduate students: send your topic for A1 ASAP

Ongoing Course Evaluation

- Please complete the Lecture 8 daily feedback form!