INTERACTION DESIGN

ROGERS • SHARP • PREECE

beyond human-computer interaction

6th Edition

Chapter 4

COGNITIVE ASPECTS

Overview

- What is cognition?

- Why it is important to understand in HCI

- Describe how cognition has been applied to interaction design

- Explain what are mental models and how to elicit them

- Cover relevant theories of cognition

What is cognition?

- Thinking, remembering, learning, daydreaming, decision-making, seeing, reading, talking, writing…

- Ways of classifying cognition at a higher level:
  - Experiential vs. reflective cognition (Norman, 1993)
  - Fast vs slow thinking (Kahneman, 2011)

Which involves fast vs slow thinking?

- 2 + 2 =

- 21 × 29 =

- What color eyes do you have?

- How many colors are there in the rainbow?

- How many months in the year have 31 days?

- What is the name of the first school you attended?

How can understanding cognition help HCI?

- Provides knowledge about what people can and cannot be expected to do

- Identifies and explains the nature and causes of problems that people encounter when using technology

- Provides theories, modeling tools, guidance, and methods that can lead to the design of better interactive products

Cognitive processes

- Attention

- Perception

- Memory

- Learning

- Reading, speaking and listening

- Problem-solving, planning, reasoning and decision-making

Attention

- Selecting things on which to concentrate at a point in time from the mass of stimuli around us

- Allows us to focus on information that is relevant to what we are doing

- Involves audio and/or visual senses

- Focused and divided attention
  - Enables us to be selective in terms of the mass of competing stimuli, but limits our ability to keep track of all events

- Design recommendation
  - Information at the interface should be structured to capture peoples' attention, for example, use perceptual boundaries (windows), color, reverse video, sound, and flashing lights

Activity: Find the price for a double room at the Quality Inn in Pennsylvania

Pennsylvania
Bedford Motel/Hotel: Crinaline Courts
  (814) 623-9511   S: $118 D: $120
Bedford Motel/Hotel: Holiday Inn
  (814) 623-9006 S: $129 D: $136
Bedford Motel/Hotel: Midway
  (814) 623-8107 S: $121 D: $126
Bedford Motel/Hotel: Penn Manor
  (814) 623-8177 S: $119 D: $125
Bedford Motel/Hotel: Quality Inn
  (814) 623-5189 S: $123 D: $128
Bedford Motel/Hotel: Terrace
  (814) 623-5111 S: $122 D: $124
Bradley Motel/Hotel: De Soto
  (814) 362-3567 S: $120 D: $124
Bradley Motel/Hotel: Holiday House
  (814) 362-4511 S: $122 D: $125
Bradley Motel/Hotel: Holiday Inn
  (814) 362-4501 S: $132 D: $140
Breezewood Motel/Hotel: Best Western Plaza
  (814) 735-4352 S: $120 D: $127
Breezewood Motel/Hotel: Motel 70
  (814) 735-4385 S: $116 D: $118

Activity: Find the price of a double room at the Holiday Inn in Columbia

South Carolina

City	Motel/Hotel	Area code	Phone	Rates Single	Rates Double
Charleston	Best Western	803	747-0961	$126	$130
Charleston	Days Inn	803	881-1000	$118	$124
Charleston	Holiday Inn N	803	744-1621	$136	$146
Charleston	Holiday Inn SW	803	556-7100	$133	$147
Charleston	Howard Johnsons	803	524-4148	$131	$136
Charleston	Ramada Inn	803	774-8281	$133	$140
Charleston	Sheraton Inn	803	744-2401	$134	$142
Columbia	Best Western	803	796-9400	$129	$134
Columbia	Carolina Inn	803	799-8200	$142	$148
Columbia	Days Inn	803	736-0000	$123	$127
Columbia	Holiday Inn NW	803	794-9440	$132	$139
Columbia	Howard Johnsons	803	772-7200	$125	$127
Columbia	Quality Inn	803	772-0270	$134	$141
Columbia	Ramada Inn	803	796-2700	$136	$144
Columbia	Vagabond Inn	803	796-6240	$127	$130

Findings based on activity

- Tullis (1987) found that the two screens produced quite different results
  - 1st screen: Took an average of 5.5 seconds to search
  - 2nd screen: Took 3.2 seconds to search

- Why, since both displays have the same density of information (31percent)?

- Spacing
  - In the 1st screen, the information is bunched up together, making it hard to search
  - In the 2nd screen, the characters are grouped into vertical categories of information making it easier