# CS5540 HCI

*This Ain't Rocket Science…*

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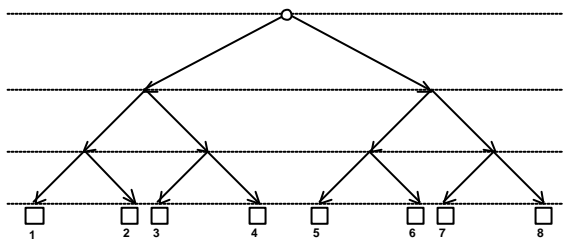27 November 2002

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## 2 Click Rule

- Any item should be accessible in "2 clicks"
- Problems
  - If there are many items, then the menu list gets VERY long!
  - If the tree is more structured, some items will get buried deeper
  - Can us dynamic structure (a la MS)

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## 2 Click Rule

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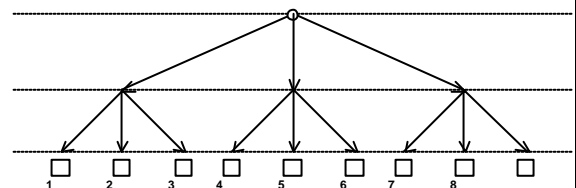## 2 Click Rule

## Modes

- *Modes* – the same action means some different depending on the "mode"
  – Many examples abound
- *Modes* are likely to be confusing

## Modes

- Digital alarm clock:   Time v Alarm
- Car stereo: Treble-Bass, Lt-Rt, Fr-Back
- Emacs
- Various finite state machines
- Computers
- Automobile controls
- Remote for TV-CD-VCR

## Modes

- What *mode* am I in?
  – Should always be able to answer
- Maintain analogies (parallelisms)
  – Similar actions produce analogous functions in various modes
    – Examples ??
    – This is a kind of consistency, really

## Smart (non-dumb!) Interfaces

- Who is the user?
  – Does the interface behave differently depending on the user?
  – Is it customizable?
  – Does it remember things?
- Does it comes up in unexpected modes?

## Smart (non-dumb!) Interfaces

- Recall context from previous sessions?
  - Restore windows and pgms?
  - Allow easy return to "state" ?
- Tactfully, alert against and resist nonsense inputs
  - Not allowed to do that … *maybe you want to do this…*

## Smart (non-dumb!) Interfaces

- Does it prompt?  Anticipate?
- Does it annoy, get in the way, give unhelpful, distracting msg's? (paperclip)
- The user's efforts should be *respected* !
  - Offer typical choices?
  - Do a GOOD MS Paperclip!

## Smart (non-dumb!) Interfaces

- Does it sense and react to the environment?
  - Dim lights when light is low?
  - "Talk" louder when environment is noisy.
  - Fast and slow digital counters, etc.
  - Generate resistance to mistakes
    - Avoiding multiple clicks… (my office phone)
    - Stuff like that…

## Smart (non-dumb!) Interfaces

- Be responsive to inputs!
  - Departure date is AFTER arrv date, so advance it on input
  - Present a good choice for first guess. Today's date, not 1 Jan, etc..
  - Other examples??

## Smart (non-dumb!) Interfaces

- Good defaults
  - Nonsmoking hotel room
  - Aisle seat, when available
  - Table apart from noisy group
- Profiles, histories, data gathering
- "Having your usual, madam?"
  - Quick select, speed dialing,
  - Don't require repeated input of same info

## Smart (non-dumb!) Interfaces

- Assist with available "knowledge"
  - Spell checker, style checker
  - Color choices
  - Formats, templates, etc
  - Style critique
- Don't be lazy; pamper the user.

## Smart (non-dumb!) Interfaces

- Assist with "knowledge"
  - Pharmacy: patient drug interactions
  - Automobile guides: Neverlost
    - "Hey, my map says that this is a *one-way*. Achtung!" – Why doesn't it do this?
  - Cannot lock key in ignition, etc.
  - Cannot leave car in *Drive*
- Others?

## Smart (non-dumb!) Interfaces

- Narrow choices: Car Radio, eg
  - Scan for next
    - *Jazz, Country, News, Sports, Spanish*
  - Restaurants by *locale, type, cost*, etc
  - Movies by genre, and the like
    - *Action, Drama, Documentary, Foreign*, etc

## Smart (non-dumb!) Interfaces

- UI should TRY to figure out problem, and try to *solve* it
  - Too easy to just complain, then
    - Core dump
    - Bail
    - Force user to start process over

## Smart (non-dumb!) Interfaces

- UI should TRY to figure out problem, and try to solve it
  - It may know the problem, and be able to fix it, or guide the user to easily fix it
    - Matching parens, eg
    - It looks as though… May I fix this?
    - Use "back pointers" to maintain correctness. Filters and mailboxes in Eudora. Hey!

## Smart (non-dumb!) Interfaces

- Guide user through tasks
  - What next?
  - Where am I in the grand scheme?
    - Does questionnaire tell you how much left?
    - Should I quickly finish, or break here?
  - Offer good defaults
  - Give stats on choices
    - 90% of users do this ->

## Smart (non-dumb!) Interfaces

- Example – 4 wheel steering
  - Slow behavior (radical turns)
  - Fast behavior (gentle turns)
  - Forward v. Backward ??
- Automatic trans, another example
  - Using context for smart, autonomous behavior
- Anti-skid, anti-lock, etc.
  - Takes control, and does what is needed

## 4 wheel steering

- 2-wheel steering
- 4-wheel
  - Low speed
- 4-wheel
  - High speed

## Smart (non-dumb!) Interfaces

- Security
  - When to help with password?
  - Providing info to wrong user?
- How prudent, how circumspect is appropriate?
  - Video game, medical records, replace passport, info on grades, etc.

## Smart (non-dumb!) Interfaces

- UI should act as an assistant, or even an *associate*
  - Know the user: I like coffee in the morning
  - Watch activities, learn, remember
  - Help out: special terms, abbrev's, etc
  - Guard against mistakes: *force feed-back*
  - Offer comfortable advice and assistance
    - "Think along. Know the art of helping!

## Smart (non-dumb!) Interfaces

- UI should act as an assistant
  - Think along, understand what is going on
  - Be friendly, not demeaning
  - Communicate in effective, straightforward terms, not "geekspeak"
  - Unobtrusively refer to explanations (clickable, etc) for technical items, background

## Smart (non-dumb!) Interfaces

- Beaucoup sensors
  - Temp, pressure, cameras, gaze, etc., etc.,
- Beaucoup processors
  - Ids, DBs, agents, …

- Continuous, immersive involvement

## Smart (non-dumb!) Interfaces

- Speech input
  - Talk to UI
  - UI talks to User
  - Shneiderman doubts its potential, however
- Gestures

## Gestures Studies

Following *Gesture* material from:

**Hand Centered Studies of Human Movement Project, *School of Kinesiology, Simon Fraser University,* February 1996**

## Gestures-1

- Praying (two flat hands up together)
- Begging (flat hand)
- Expressing anger (raising a fist)
- Derogation (middle finger up)
- Accusation (index pointing)
- Live or die decisions in the Roman amphitheater (thumb up/down)

## Gestures-2

- Hitch hiking (thumb up, hand moving sideways)
- Legal and business transactions (handshake, judge hammering)
- Waving and saluting
- Counting (fingers and/or hand)
- Pointing to real and abstract objects and concepts (index, hand)

## Gestures-3

- Conducting of an orchestra (variety of both gestures with arms and body)
- Traffic control of cars and airplanes (hands flat pointing or moving)
- Shaping of imagined objects (hands tracing out curves and shapes)
- Martial arts, fighting (variety of movements of arms and body)

## Gestures-4

- Dance (Balinese dancing)
- Gesturing by singers (hand and body movements)
- Stock exchange operations (various hand shapes)
- Affective gestures (hand touching)
- Rejective (index up moving left & right) / appreciative (hand clapping) gestures

## Gestures-5

- Game playing (hand signs to communicate with partner in card games)
- Game scoring (cricket, basketball, soccer, rugby, football)
- Dinnertable actions (commanding waiter to refill wine glass)
- Positioning of real (remote or close Control panel operations (mousing, steering a vehicle)

## Gestures-6

- Moving, touching and interacting with objects
- Silent and non-verbal communication (shrugging, holding one's own earlobe, scratching)
- "Italianate" gestures (two hands open shaking)

## Gestures-7

- Mimicry and pantomime (actions and objects are depicted with hand/body movements)
- sign language (a complete linguistic communication system)
- Mimicry and pantomime (actions and objects are depicted with hand/body movements)

## Gestures-7

- Sign language (a complete linguistic communication system)
- Aircraft carrier landings
- Dog training

## Smart (non-dumb!) Interfaces

- Eliminate the 3-handed interface
  - Keyboard + mouse (impossible situation, really)
  - 2 hands plus voice?
- Another kind of input?

## Topics for Future

- Ergonomics
- Psychological aspect,
- Smart interfaces / AI
- Building interfaces
  - Designing interfaces
  - Testing
  - Throwing out inadequate ones

## Conclusions

- This ain't so hard to figure out
- This IS hard to do
  - Take much work, actually
  - UI is expensive, labor intensive
- Have not begun to talk about real AI, just "HI"!

# End

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