This Ain’t Rocket Science…
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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)
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 vs 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 come 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…

• 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…

• 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

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

• 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)

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

• 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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