**THE USER ACTION FRAMEWORK**

- All about what users *think, do, and see* while interacting with a computer
  - *THINK* – Cognitive actions
  - *DO* – Physical actions
  - *SEE* – Perceptual actions
THE USER ACTION FRAMEWORK

• **Thinking** applies to two areas:
  * *Planning* of physical actions
  * *Assessment* of outcome via feedback

• **Doing** applies to one area:
  * *Physical actions*

• **Seeing** applies to all areas:
  * Planning/Translation – Seeing visual cues to determine plan for actions
  * *Physical actions* – Seeing objects to manipulate
  * *Assessment* – Seeing feedback representing outcome
THE USER ACTION FRAMEWORK

• All usability concepts can be organized on this framework for
  * Usability inspection
  * Usability problem reporting
  * Usability data management
  * Design guidelines

• Summary of structure for Design Guidelines
  * Planning
    - High-level planning
    - Translation
  * Physical actions
  * Assessment
**HIGH-LEVEL PLANNING**

*High-level planning: User decides what to do, determining intentions*

- User goals, task decomposition
- Overall metaphor, user's model of system
- Examples
Translation

Translation: User plans physical actions to carry out intentions

- Meaning / effectiveness of visual cues
  * Clarity, completeness
  * Error avoidance, consistency

- Presentation of visual cues
  * Legibility, noticeability, complexity
  * Layout, grouping

- Task structure and interaction control
  * Support direct manipulation
  * Support human memory limitations

- Preferences and efficiency
  * Alternatives and shortcuts, efficiency of task structure

- Examples
PHYSICAL ACTIONS

Physical actions: User makes inputs to system

• Perceiving objects
  * Noticeability, legibility, readability
  * Visual disabilities

• Manipulating objects
  * Physical control – manual dexterity
  * Physical layout – distance to move, size of objects
  * Physical complexity of interaction (e.g., device design)
  * Physical disabilities

• Examples
ASSESSMENT

Assessment: User knows what happened

• Existence of feedback (e.g., missing feedback)

• Presentation of feedback
  * Noticeability, legibility, readability
  * Layout, grouping

• Meaning / effectiveness of feedback
  * Ability to know if have error
  * Clarity, completeness
  * Correctness, relevance

• Examples
SELECTED DESIGN GUIDELINES FOR HIGH-LEVEL PLANNING

• Provide clear model of how users view system in terms of tasks
• Make possibilities clear for what users can do at every point
• Decompose tasks logically
• Keep locus of control with users
SELECTED DESIGN GUIDELINES FOR USER TRANSLATION

• Provide effective affordances – visual cues (e.g., in labels, data field formats, icons) that help users get access
  * Help users get started
  * Help users predict outcome of actions (feedforward)
  * Use precise wording in labels for menus, buttons, icons, fields
  * Use consistent wording in labels for menus, buttons, icons, fields
  * Use appropriate layout, grouping by function
  * Support human memory limits with recognition over recall
SELECTED DESIGN GUIDELINES FOR USER TRANSLATION

• Prevent errors: Help users make correct translations and avoid incorrect translations
  * "To err is human; forgive by design"
  * Make inappropriate actions unavailable (e.g., graying out)
  * Guide users with correct data entry (e.g., with data formats, field size, defaults)
  * Be consistent to prevent errors (including across products)
  * Request user confirmation to prevent errors (especially for potentially destructive actions)
    - Give enough alternatives (e.g., not "Deleting your files" with just OK as only possible response)
SELECTED DESIGN GUIDELINES FOR USER TRANSLATION

• Help users recover from errors – provide clear way to undo (multiple levels), reverse actions, offer helpful/constructive error messages

• Keep locus of control with users (e.g., changing folder name "IRS" to "Irs"

• Design for preferences/efficiency

  * Anticipate likely related tasks, support task thread continuity
SELECTED DESIGN GUIDELINES FOR USER PHYSICAL ACTIONS

• Provide effective physical affordances – help in doing actions
  * Size: Support manual dexterity and hand-eye coordination limits by making selectable objects large enough
  * Location/proximity: Place related objects close together

• Design for physical disabilities – limited motion, motor control, vision, hearing

• Avoid user fatigue from too much movement
SELECTED DESIGN GUIDELINES FOR USER ASSESSMENT (OF OUTCOME)

• Provide feedback – no news is no news
• Present feedback, error messages promptly
• Help users recognize errors
• Make system take blame for errors
  * Use helpful, constructive error messages, not "cute" unhelpful messages
  * Be positive to encourage; avoid violent, negative, or demeaning terms
    - Error messages can have great psychological impact on users
• Provide progress report on long operation (e.g., percent-done indicator)
SELECTED DESIGN GUIDELINES FOR USER ASSESSMENT (OF OUTCOME)

• Employ user-centered wording in outcome presentation, messages, and feedback

• Limit density in presentation of results
  * Control local density - imaginary quadrants

• Accommodate different user classes

<table>
<thead>
<tr>
<th>Lead</th>
<th>Novice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow</td>
<td>Intermittent</td>
</tr>
<tr>
<td>Get out of the way</td>
<td>Expert</td>
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</tbody>
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• Avoid anthropomorphism – attributing human characteristics to non-human objects)

• Avoid poor attempts at humor


**DESIGN GUIDELINES: CONCLUSIONS**

- Be cautious; think and interpret guidelines
  * In application, they can conflict and overlap
- Design by guidelines, not by personal opinion