

# HCI:THEORIES

HCI COMP341

Theories, Principles & Guidelines



Happy New Year  
2069





# REVIEW

- Goals of System Engineering
- Goals of UI Design
- Motivating Factor and Application Area
- Diversity Issues
- Major Goals of UI Engineering

# OVERVIEW

- High Level theories (GOMS, Stage of actions etc.)
- Object Action Interface Model
- Principles
- Balance Automation and Human Control.



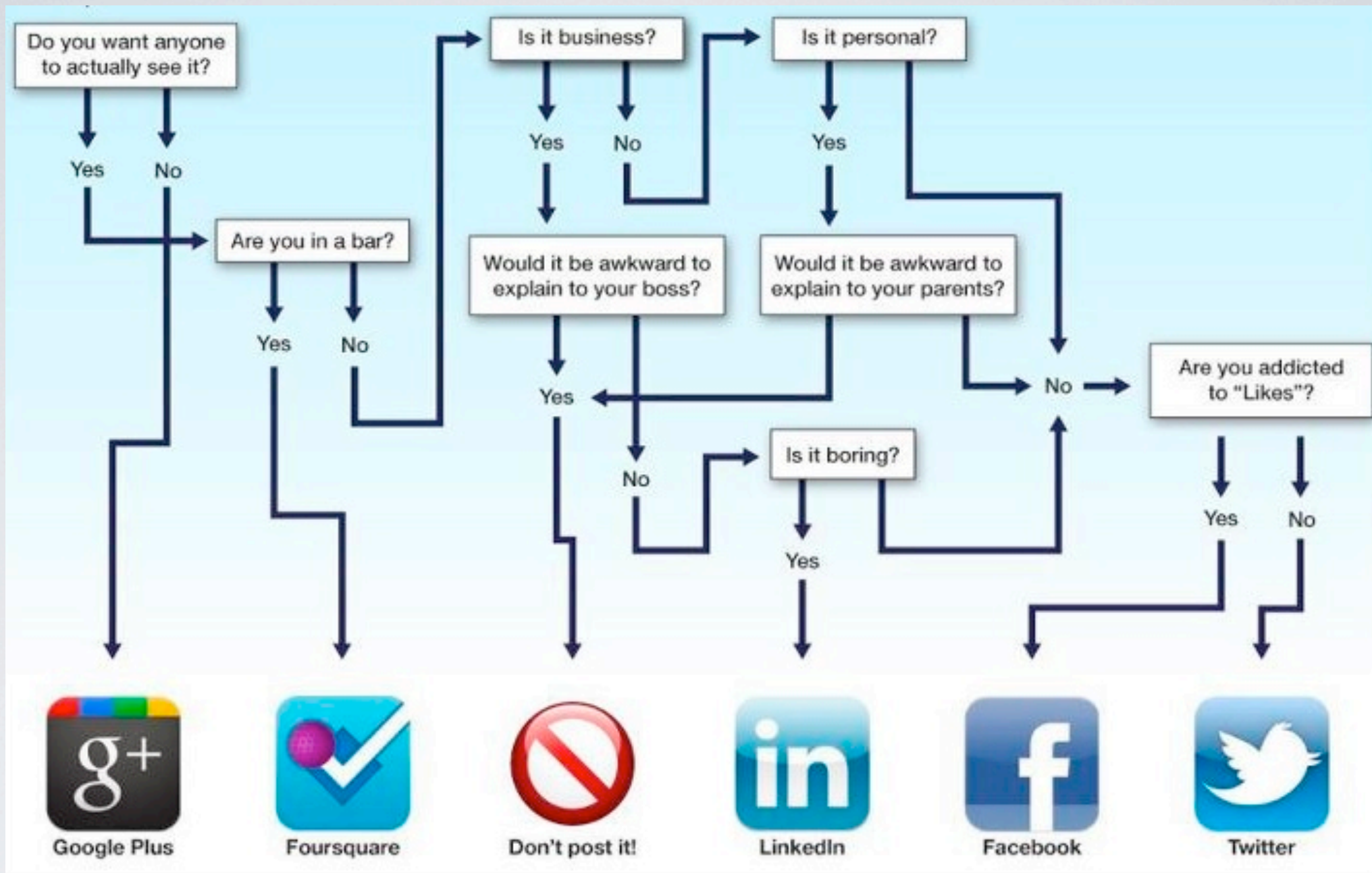
# ASSIGNMENT



# BOOKS

do they have to be boring?





# INTRODUCTION

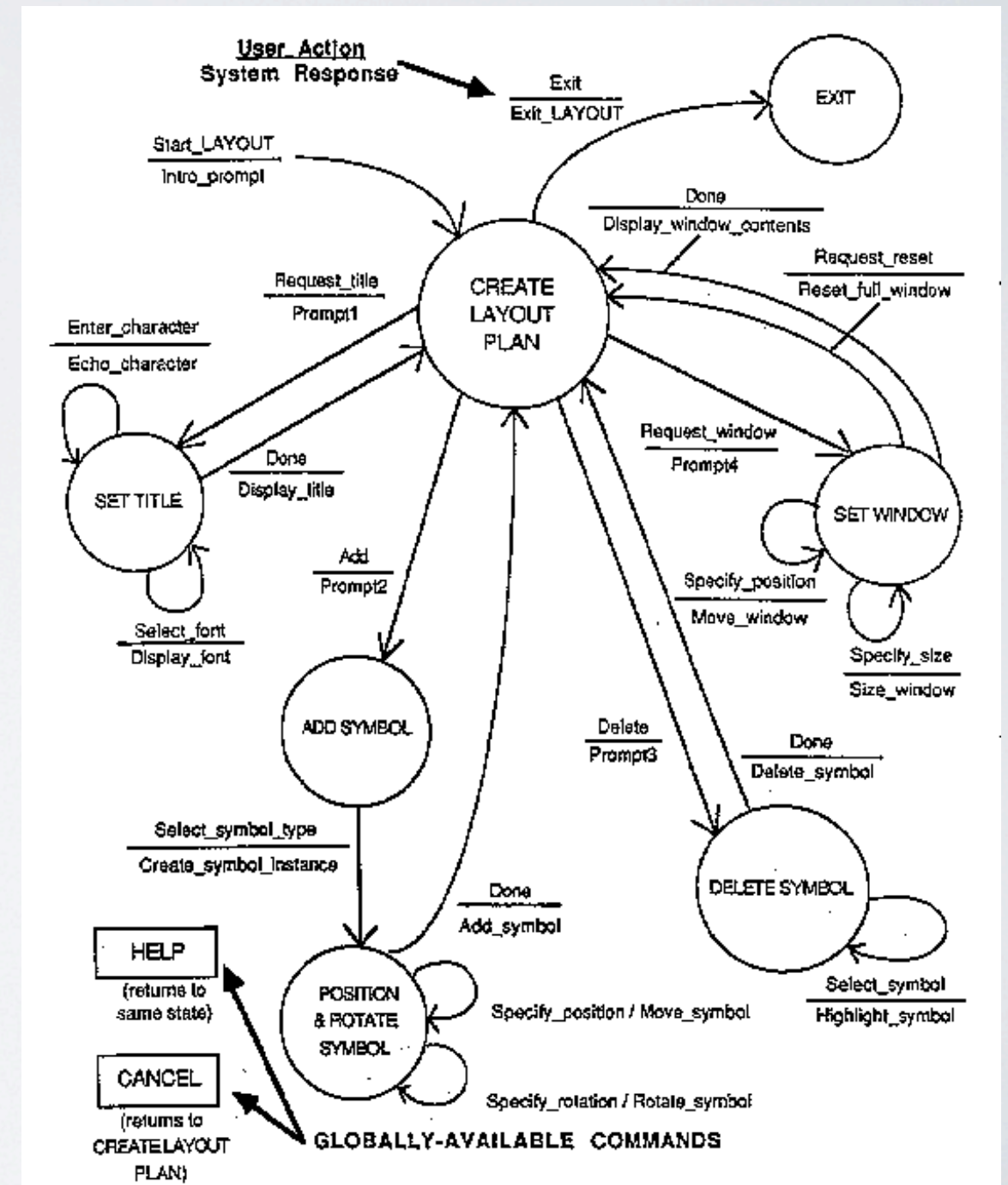
Think, Plan and Work

# HIGH LEVEL THEORIES



# CONCEPTUAL - LEXICAL

- Conceptual Level
- Semantic Level
- Syntactic Level
- Lexical Level





# GOMS & KEYSTROKE

- Goals
- Operators
- Methods
- Selection Rules
- Keystroke level model

Method for goal: Cut text

Step 1. Accomplish goal: Highlight text.

Step 2. Return that the command is CUT, and  
accomplish goal: Issue a command.

Step 3. Return with goal accomplished.

...

Selection rule set for goal: Highlight text

If text-is word, then accomplish goal: Highlight word.

If text-is arbitrary, then accomplish goal: Highlight  
arbitrary text.

Return with goal accomplished.

...

Method for goal: Highlight arbitrary text

Step 1. Determine position of beginning of text (1.20 sec)

Step 2. Move cursor to beginning of text (1.10 sec)

Step 3. Click mouse button. (0.20 sec)

Step 4. Move cursor to end of text. (1.10 sec)

Step 5. Shift-click mouse button. (0.48 sec)

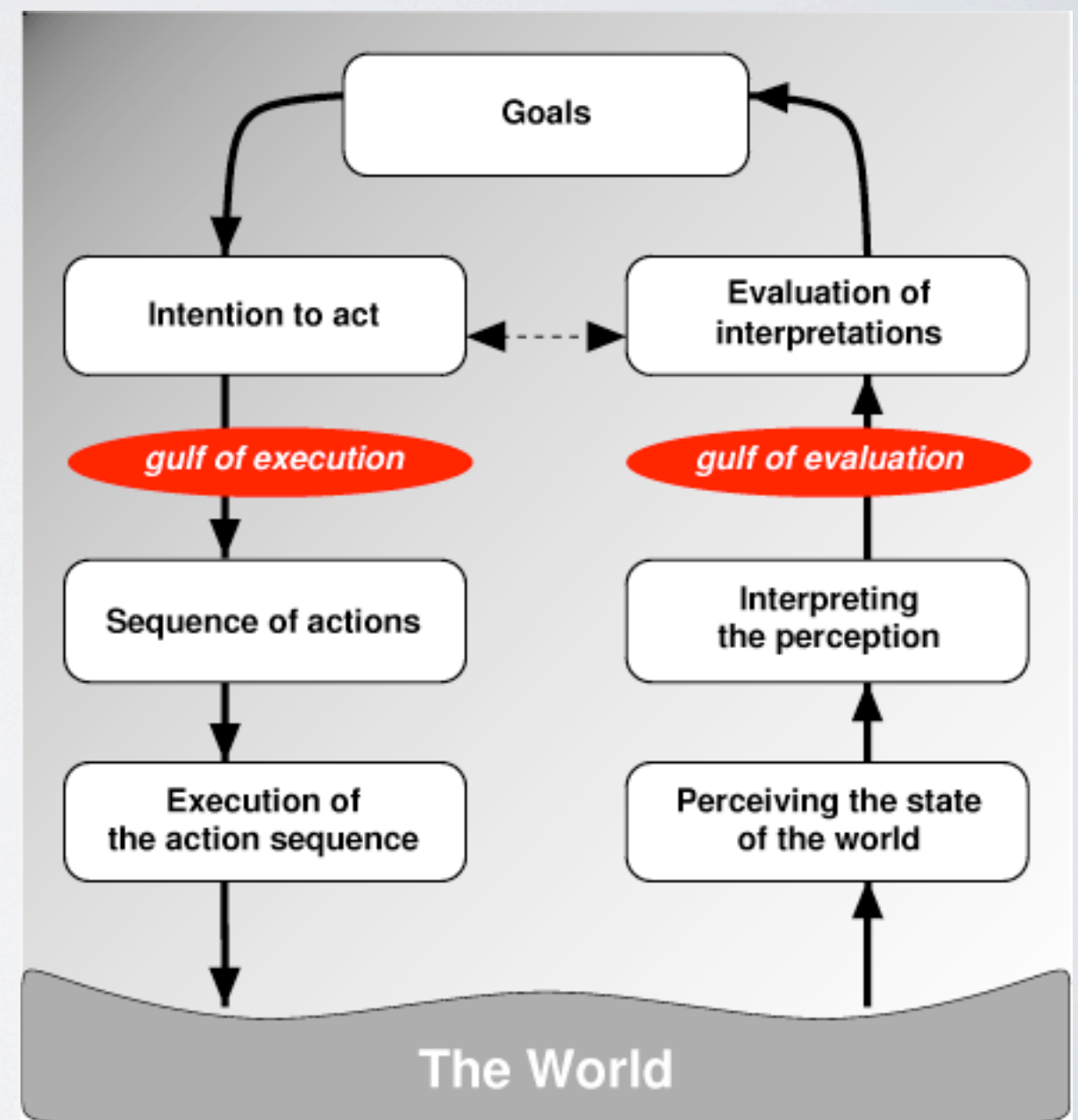
Step 6. Verify that correct text is highlighted (1.20 sec)

Step 7. Return with goal accomplished.



# STAGES OF ACTION

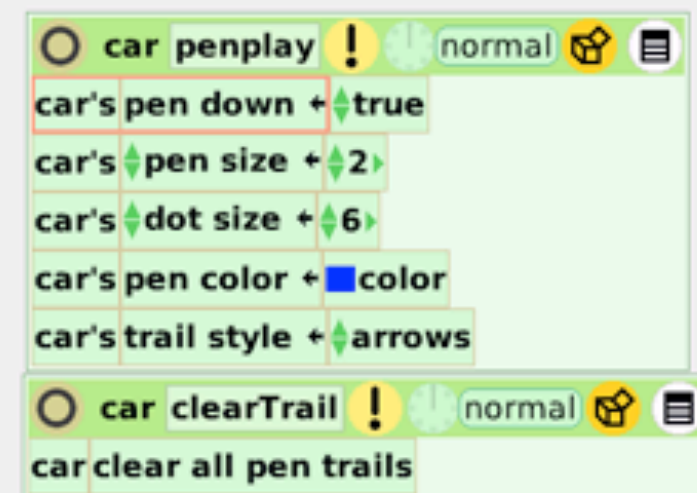
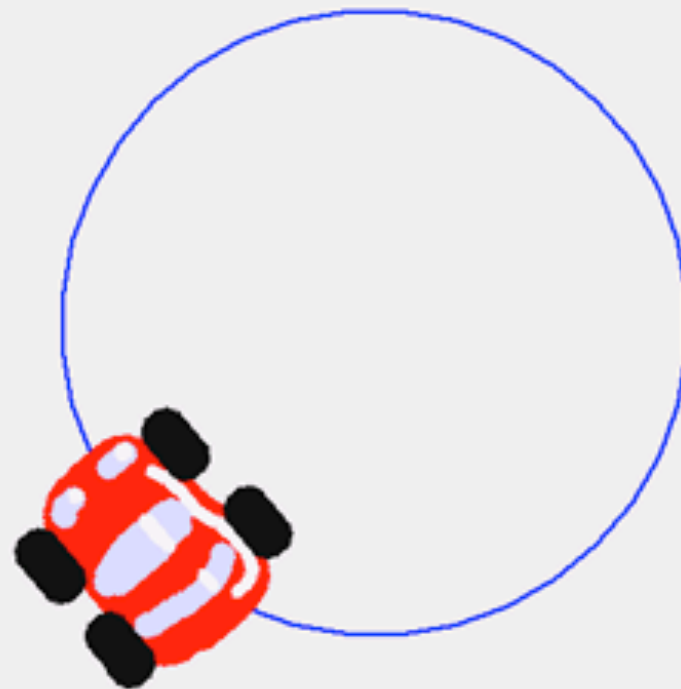
- Forming the Goal
- Forming the Intention
- Specifying the Action
- Executing the Action
- Perceiving System state
- Interpreting System State
- Evaluating the Outcome





# OBJECT-ACTION INTERFACE





# OBJECT AND ACTIONS

Task and Interface of Object and Action, disappearing syntax



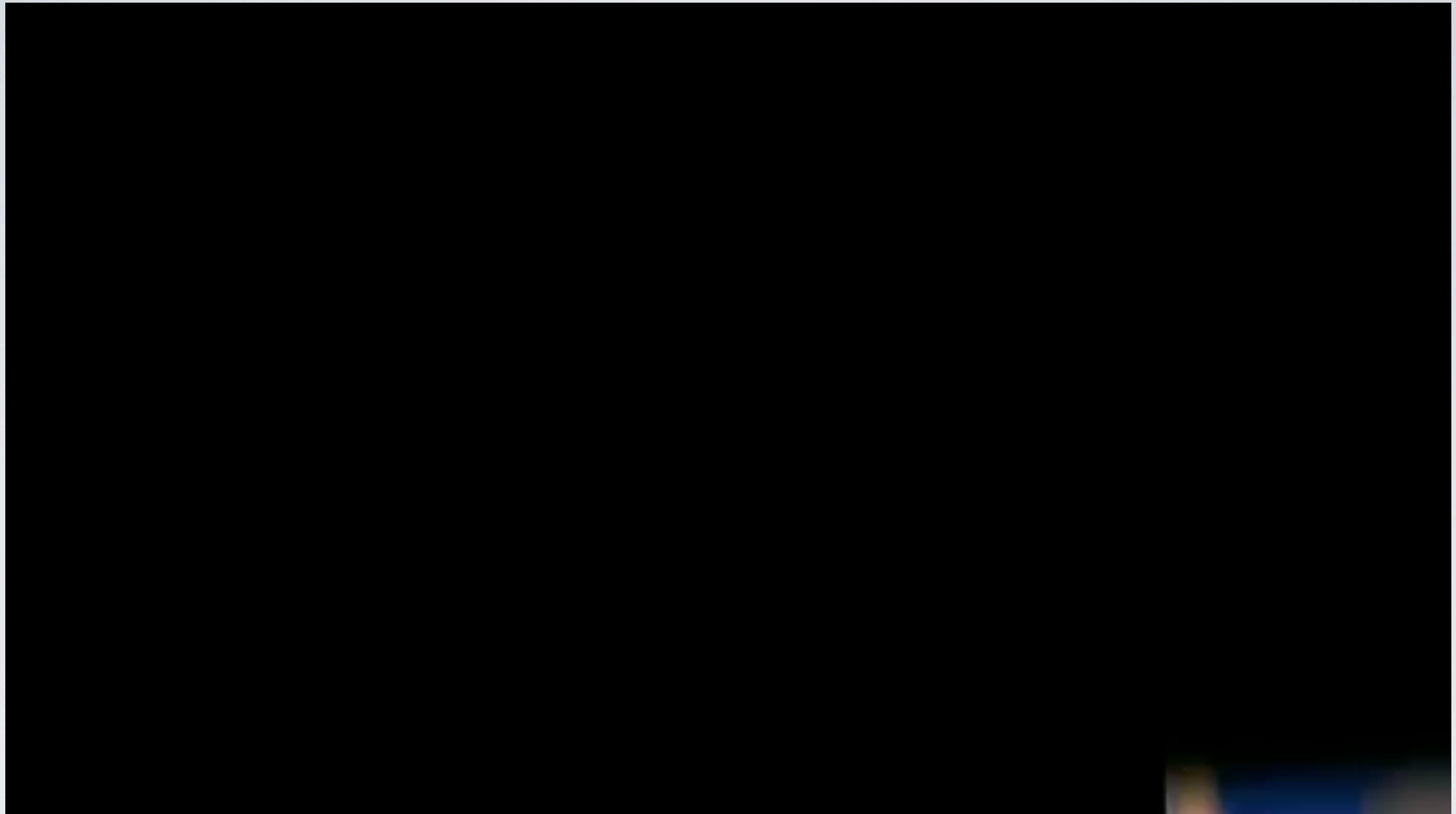
# PRINCIPLES



# PRINCIPLE I: RECOGNIZE THE DIVERSITY

- Usage Profiles
  - Novice
  - Knowledgeable
  - Expert
- Task Profiles
  - Frequent
  - Intermediate and Infrequent
- Interaction Styles
  - Direct Manipulation
  - Form Filling
  - Command Line





# DIRECT MANIPULATION

example of surgical table

# PRINCIPLE II: 8 GOLDEN RULES

- Strive for Consistency
- Enable frequent users to use shortcuts
- Offer informative feedback
- Design dialogues to yield closure
- Offer error prevention and simple error handling
- Permit easy reversal of action
- Support internal locus of control
- Reduce short term memory load



# **Shneiderman's Eight Golden Rules of Interface Design**

8RULES

A showcase of Ben's 8 rule

# PRINCIPLE III: PREVENT ERRORS

- Correct Matching Pairs
- Complete Sequences
- Correct Commands





# INTERACTIVE BOOKS

The Fantastic Flying Books of Mr Morris Lessmore

MANY THANKS