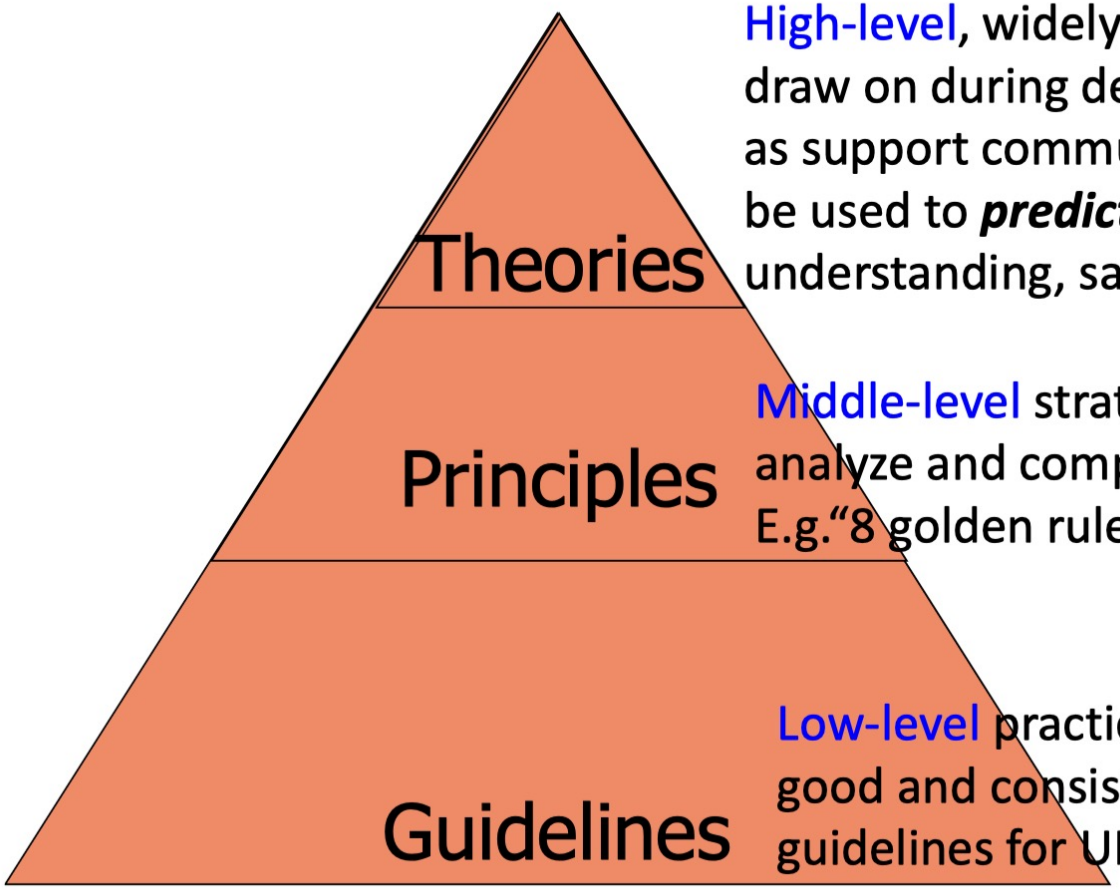
Lingwei Meng

Review of Basic Concepts in Human Computer Interface

Theory, principle and guideline



High-level, widely applicable frameworks to draw on during design and evaluation, as well as support communication and teaching. Can be used to ***predict*** performance, errors, understanding, satisfaction of user.

Middle-level strategies or rules used to analyze and compare design alternatives. E.g."8 golden rules of UI design", etc.

Low-level practices and rules that make for good and consistent design, e.g. Apple's guidelines for UIs

Guidelines

- Guidelines were developed in the "early stage"
- Best Practices
  - For example, Windows and Apple UI guidelines
- From experience (empirical evidence)
- Good starting point for all projects that involve a UI

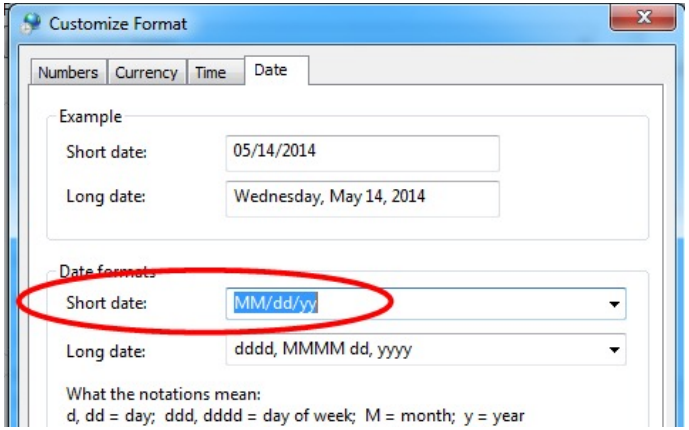
- Developed a "shared language"
  - Widget names, functionality name, etc.
- Gives developers a (shared) language to discuss the UI efficiently

The guidelines in different aspects

- Navigating the Interface
- Guidelines for Disabled
- Organizing the Display
- Get the user's attention
- Facilitate Data Entry

1.Guidelines of Display Organization

- Consistency of data display
  - Terminology, abbreviation, formats, colors, grammar, capitalization should be consistent!
    - E.g., DD/MM/YY *vs* MM/DD/YY *vs* YY/MM/DD …
    - (20)20/02/20

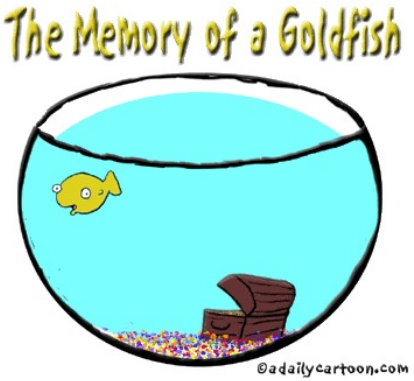


Consistency of data display

- Efficient information that can be assimilated by the user
  - Format for presentation *should be familiar* to the operator/user
  - No park! But…
  - Similar but different UI
  - Related to tasks at hand
    - E.g., justification, spacing, formatting, labels, units/measurements, numbers of decimal points, etc.

Consistency of data display

- Minimal memory load on the user
  - Minimize carry information over from one screen to another
  - Short-term memory.
    - capacity of 7+-2; decay of 30 sec. to 2 min



  - Labels and common formats should be provided for novice
    - **E.g. Give a guidebook for beginners**
  - Require fewer actions (for both expert and novice users)
    - Tab key to move to next entry field vs. needing the mouse

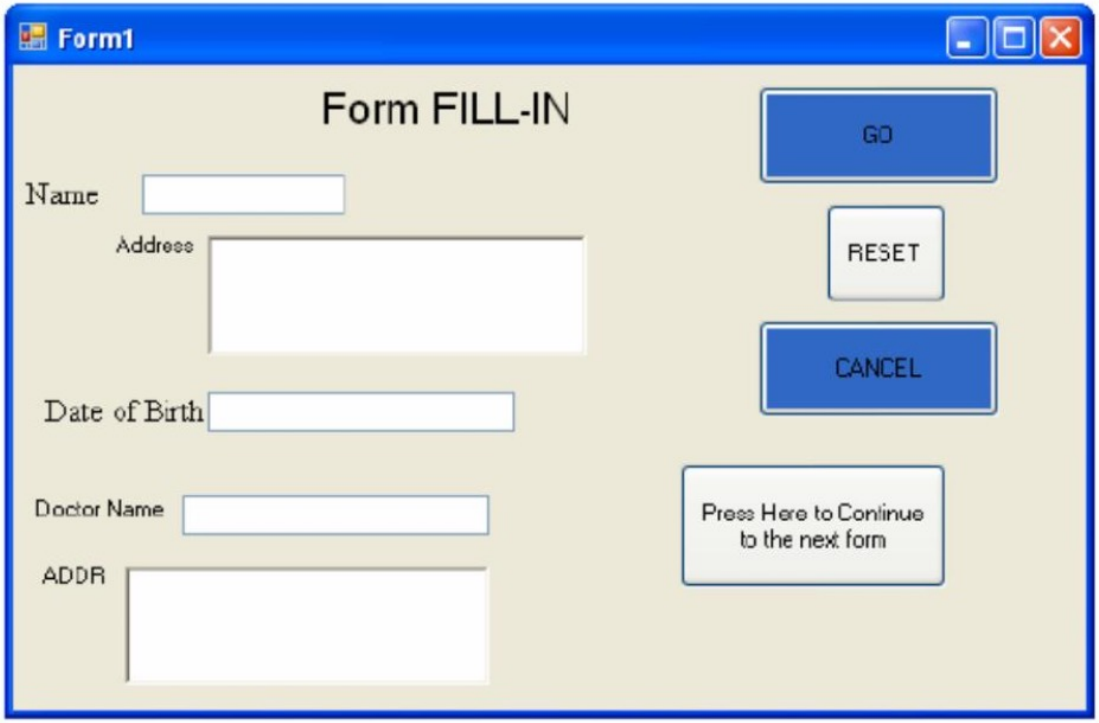
Guidelines of Display Organization (cont.)

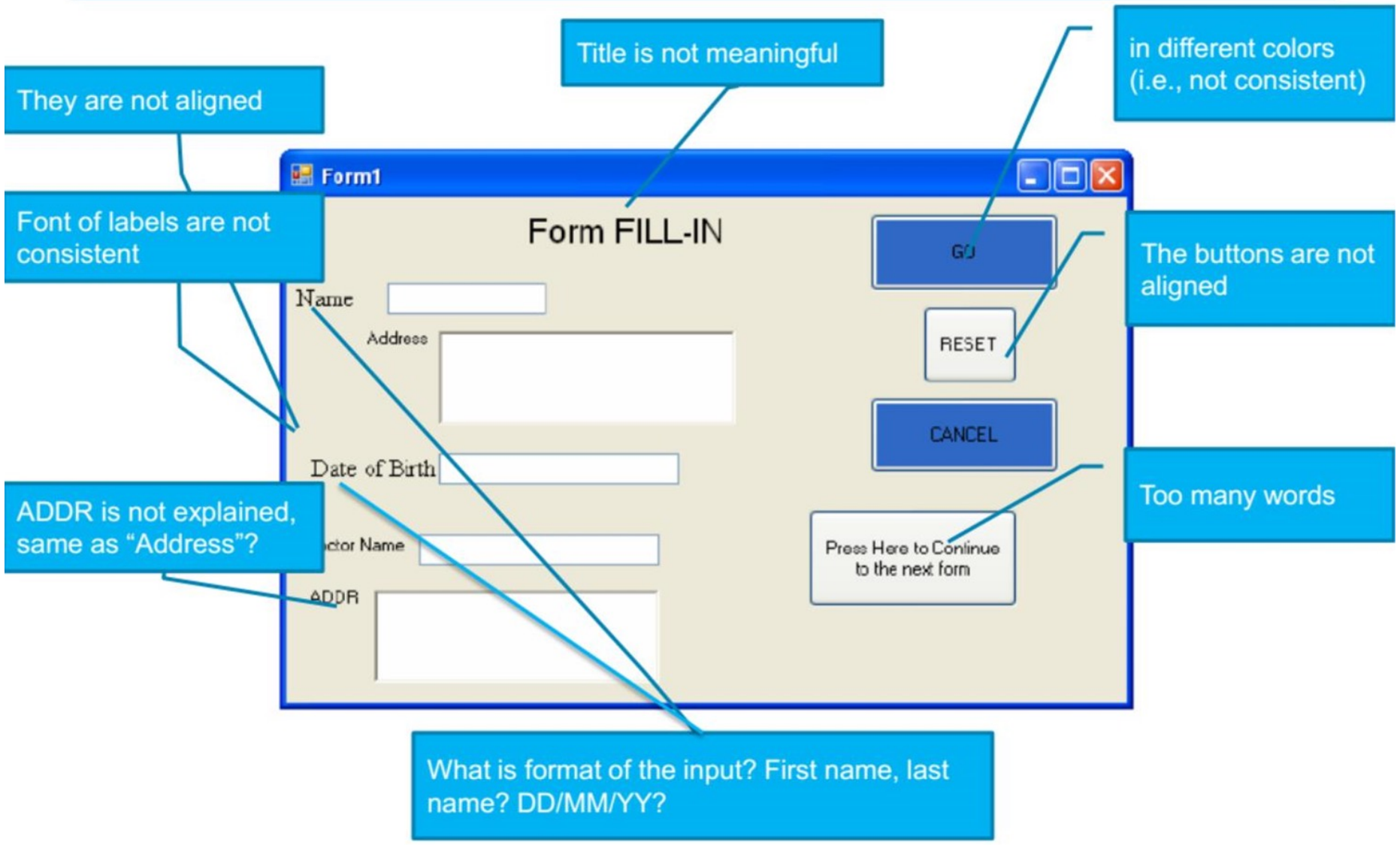
- Compatibility of data display with data entry
  - Entering data should look like the eventual viewing of the data
  - If possible, displayed fields should be editable (as input)

- Flexibility for user control of data display
  - For task convenience, user *can control how information is displayed* (e.g., sorting, ordering of columns and rows)
  - [diff. tasks may require viewing the same data in diff. ways]

specific problems with the interface

- Tools to design an interface, like MFC using C++ or Java

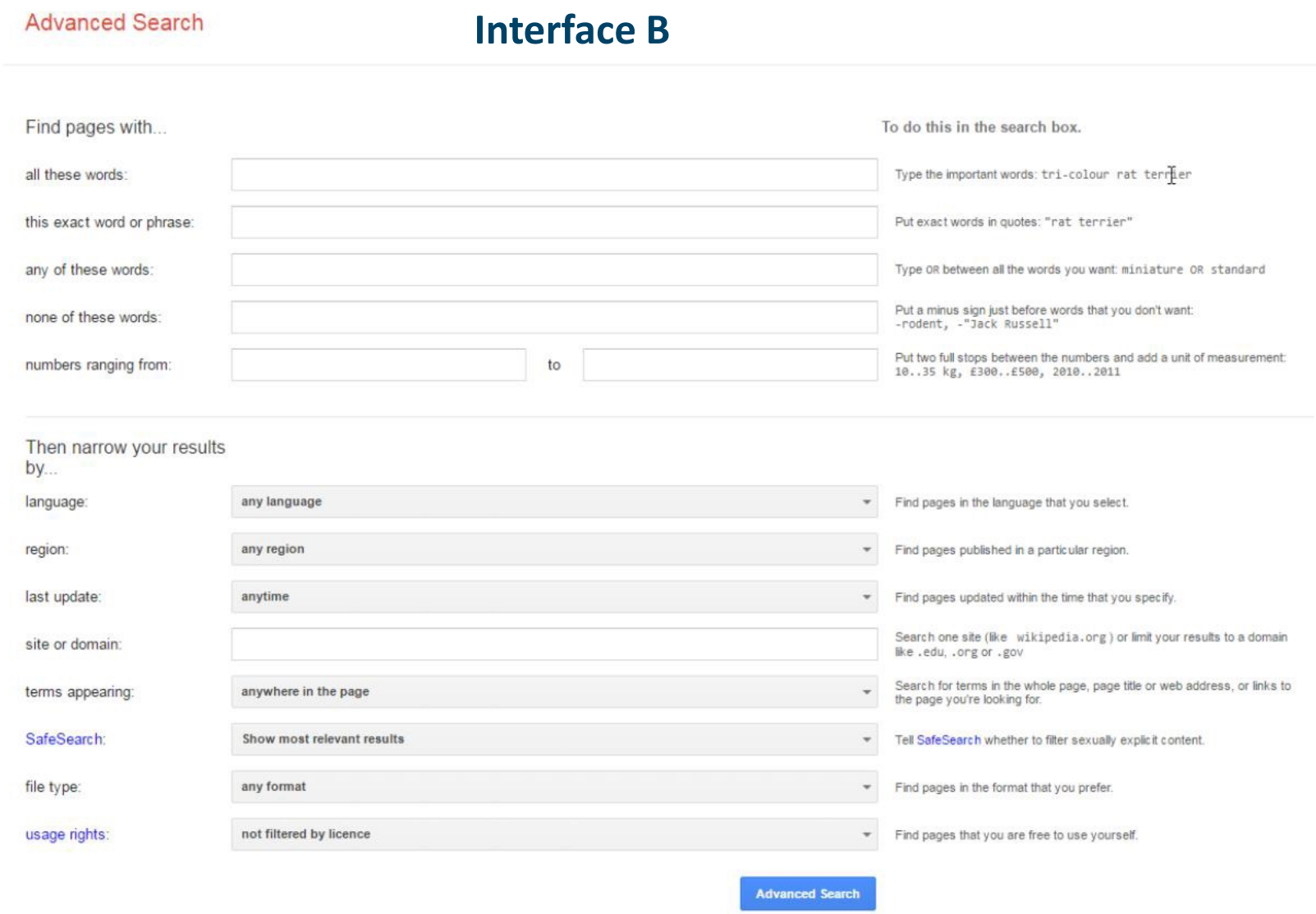



Title is not meaningful
in different colors (i.e., not consistent)
They are not aligned
Font of labels are not consistent
Form1
Form FILL-IN
GO
RESET
CANCEL
Name
Address
Date of Birth
ADDR
Press Here to Continue to the next form
The buttons are not aligned
Too many words
ADDR is not explained, same as "Address"?
What is format of the input? First name, last name? DD/MM/YY?

Two Google interfaces (A) and (B) for searching

Interface A

Two Google interfaces (A) and (B) for searching



Question 1

- For interface (A) and (B), which user skill level is the respective interface targeting?

- **Solution:**
  - The interface (A) is aimed for novice (or intermittent) users, while the interface (B) is for expert users.

Question 2

- By providing both interfaces (A) and (B), which one within the 8 golden rules is Google supporting?
  - Strive for consistency
  - Cater to universal usability
  - Offer informative feedback
  - Design dialogs to yield closure
  - Prevent errors
  - Permit easy reversal of actions
  - Keep users in control
  - Reduce short-term memory load

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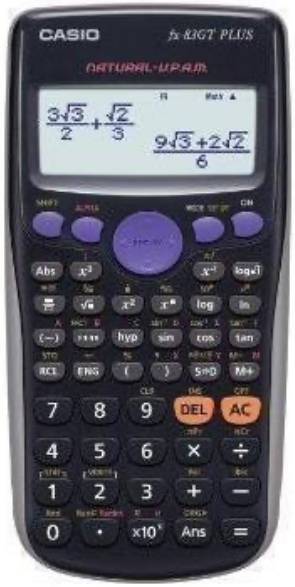
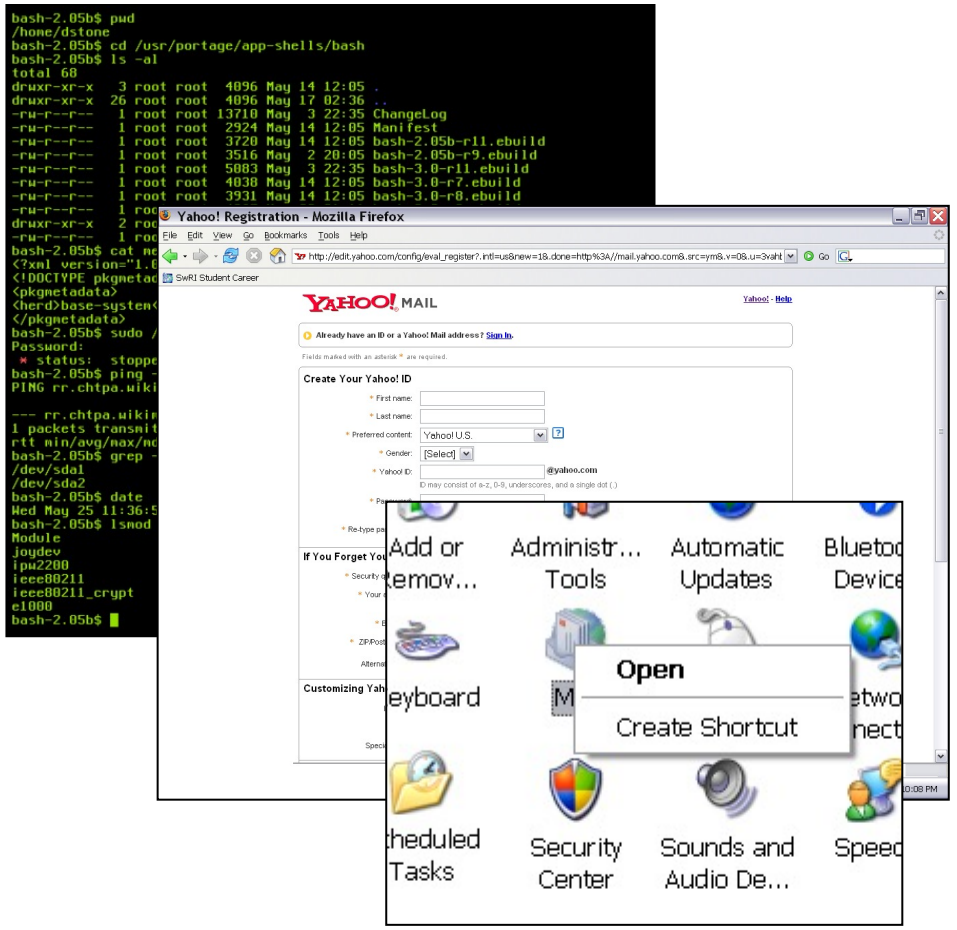


2.Five main types of interaction style

- **Command – Line.**
- Form-Fill.
- Menu Selection.
- Direct Manipulation.
- Anthropomorphic
  - Nature language



Pros and Cons of interaction style 'Command Language'

- Features:
  - Means of directly instructing the system using function keys, commands or abbreviations.
    - Action objects interface (AOI), e.g., cp test.txt test_copy.txt
  - Provide access to the system functionality.
  - Commands often have a number of options that vary its behavior and can be applied to many objects at once.
  - Suitable for expert users, since it provides a sense of being in control.
- Limitations:
  - Commands and command sequences need to be remembered.
  - Low tolerance of errors typing
  - Error messages and online assistance are hard to provide due to diverse possibilities.

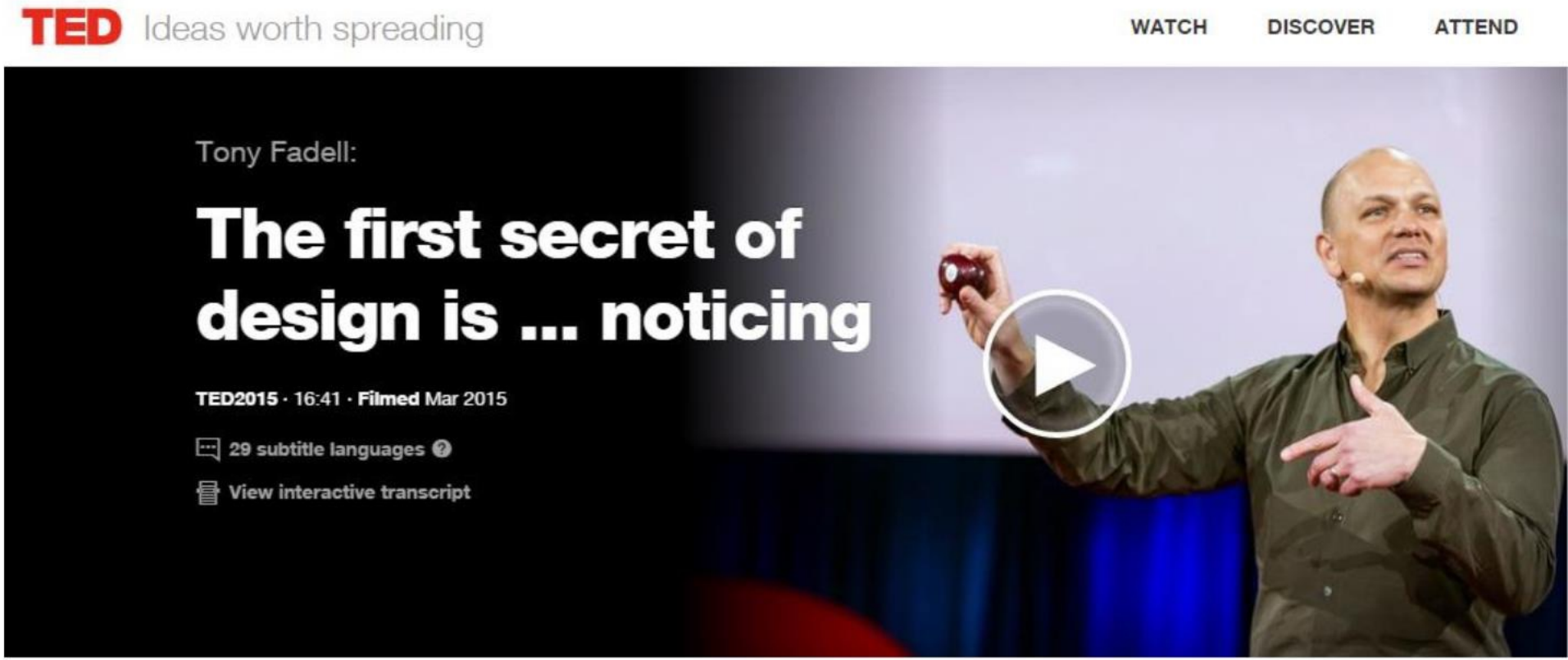
3.Stages-of-action theory

- Seven stages of action theory by Donald Norman:
  - Forming the goal (e.g. cook a nice meal)
  - Forming the intention (e.g. cook chicken with hoisin sauce)
  - Specifying the action (e.g. prepare chicken, prepare sauce…)
  - Executing the action
  - Perceiving the system state (e.g. smell, look, taste of dish)
  - Interpreting the system state (e.g. evaluate chicken dish)
  - Evaluating the outcome (e.g. evaluate chicken dish as a nice meal)

https://www.youtube.com/watch?v=n4fCHYbRcKw

TED: Tony Fadell

https://www.ted.com/talks/tony_fadell_the_first_secret_of_design_is_noticing
https://www.youtube.com/watch?v=9uOMectkCCs



TED: Donald Norman

https://www.ted.com/talks/don_norman_on_design_and_emotion?language=en
https://www.youtube.com/watch?v=RlQEoJaLQRA