

# Usability

Professor Sylvan

IS4300

# This week

## Today:

Usability principles

HW 2

Team project brainstorming

## Thursday:

Usability methods

Observational methods

Rapid prototyping tools

# Usability principles, not laws

- No “cookbooks”
- No simple, universal checklists
- There are many concepts, principles, and guidelines
- Understand the higher level principles that apply across situations, display types, etc.
- Implement the standards and guidelines

# Nielsen's Model of the Attributes of System Acceptability

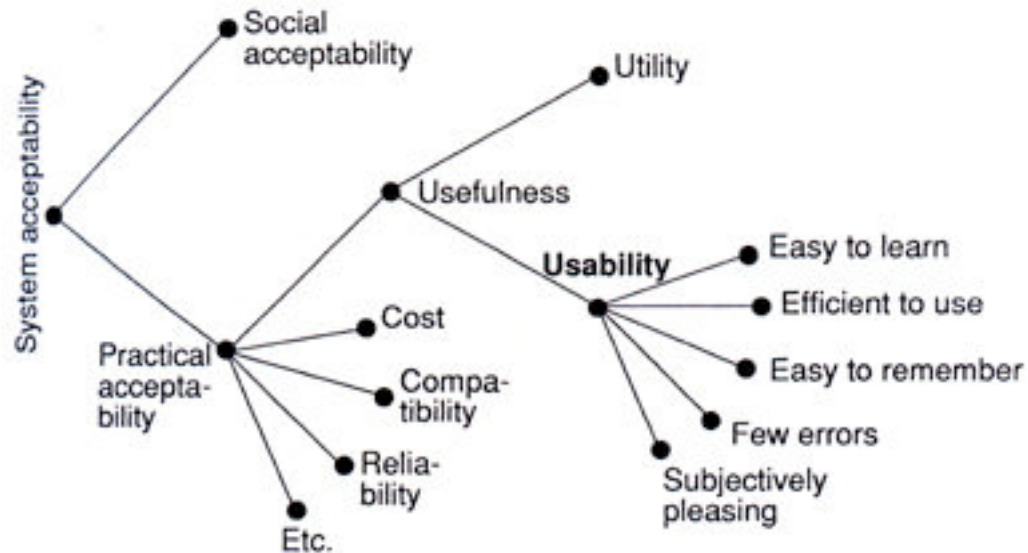


Figure 1 A model of the attributes of system acceptability.

# 3 Principles

1. Learnability
2. Flexibility
3. Robustness

# 1. Learnability Principles

# What is learnability?

- Ease with which new users can begin effective interaction and achieve maximal performance
  - Predictability
  - Synthesizability
  - Familiarity
  - Generalizability
  - Consistency

# Predictability

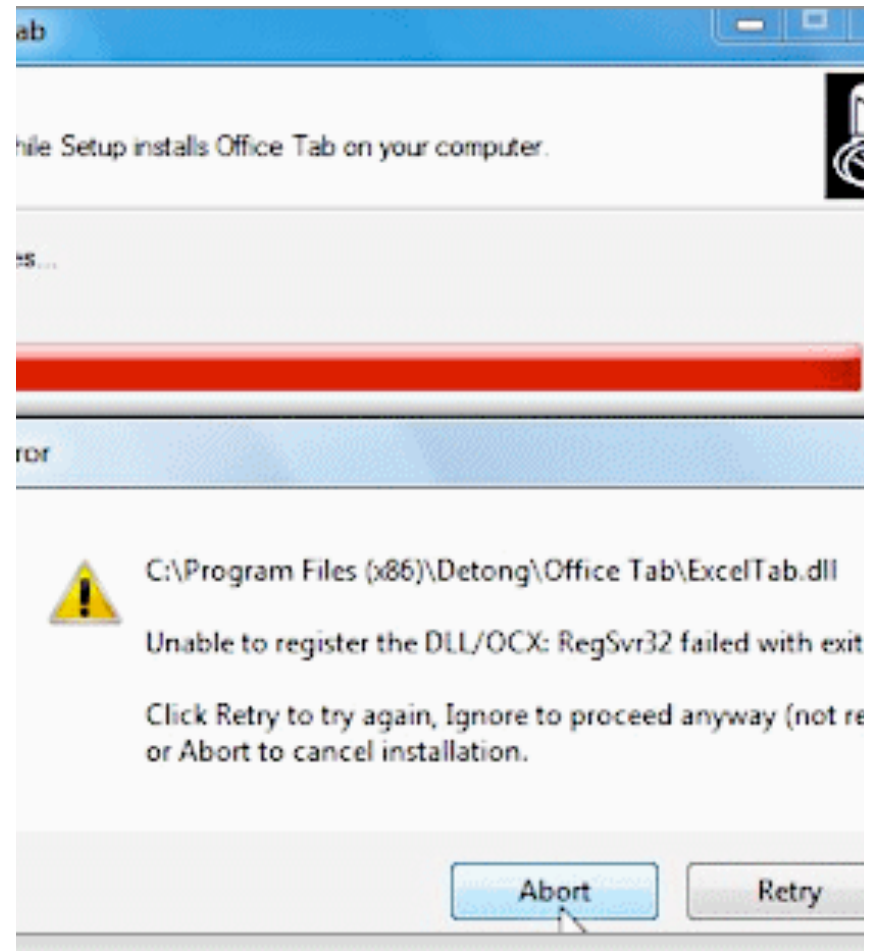


- What will this action do?....



# Synthesizability

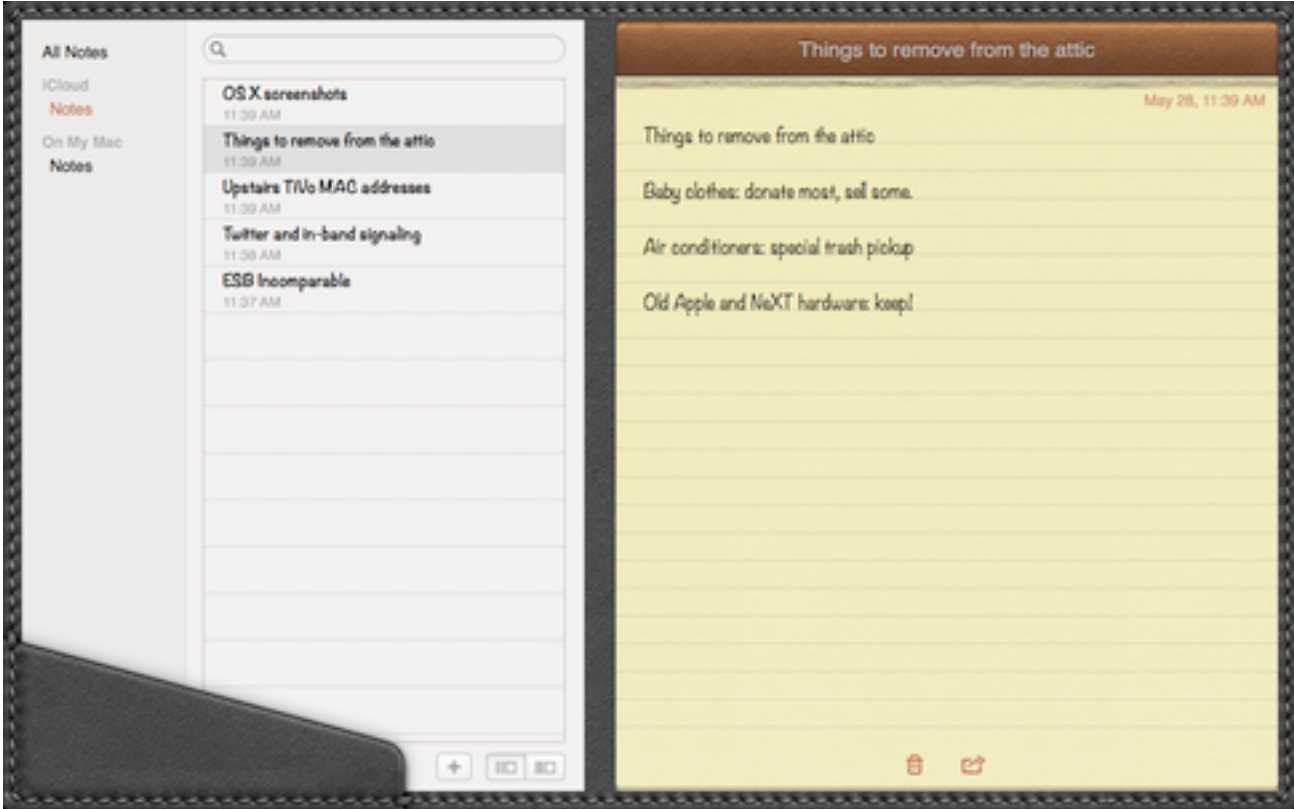
- Support for user in assessing the effect of past operations on current system state



# Familiarity














- Does UI task leverage existing real-world or domain knowledge?
- Really relevant to first impressions
- Use of metaphors
- Are there limitations on familiarity? (e.g. parking lot colors and traffic light)



















create, new	
save	
cut	
copy	
paste	
add	
remove	
delete	
erase, clear	
search	
find	
help	
edit	
_____	

compare	
debug	
run, execute	
import	
export	
play, resume	
suspend	
terminate	
stop	
undo	
redo	
refresh	
filter	
_____	

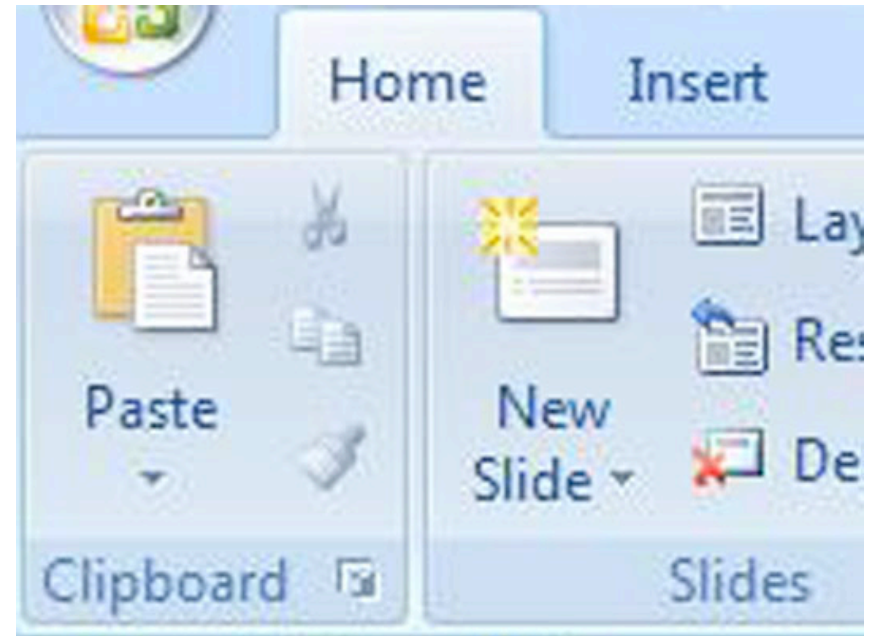
forward	
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project	
open project	
folder	
open folder	
file	
library	
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jar	
WAR	
EAR	
window	
perspective	
property sheet	
table	
database	
repository	
class	
interface	
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plugin	
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error	
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alert	
conflict	
public	
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private	
default	

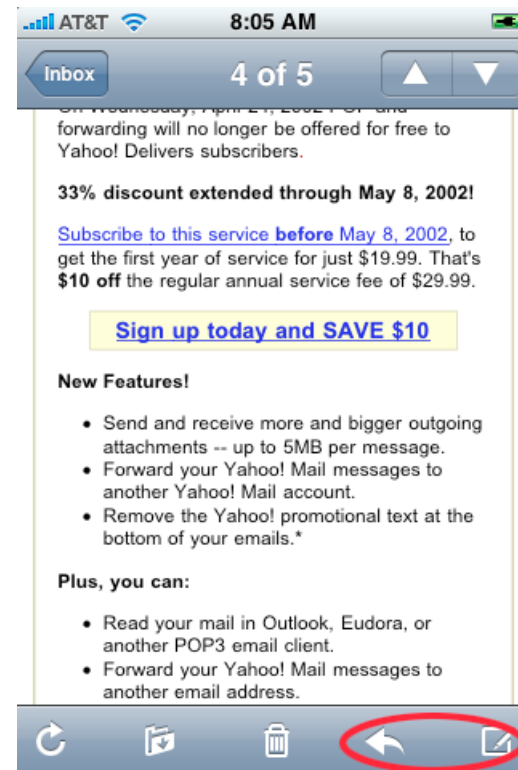
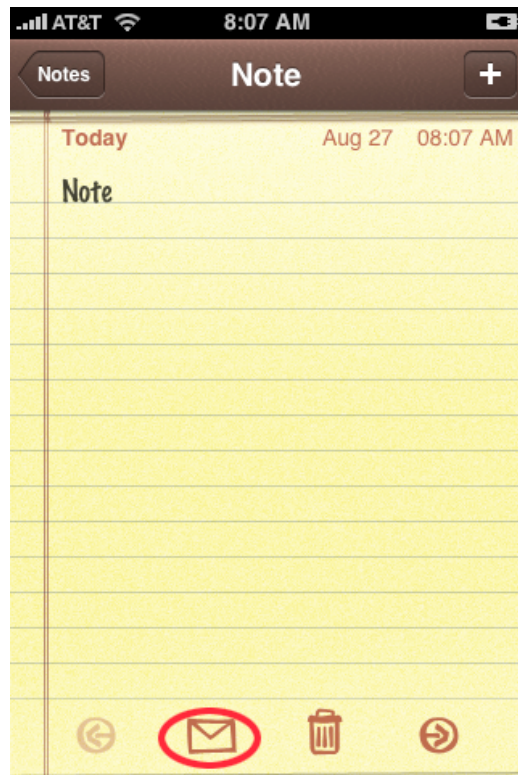
# Generalizability

- Can knowledge of one system/UI be extended to other similar ones?
- Does knowledge of one aspect of a UI apply to rest of the UI?
- e.g. file browser in OS, file locator in MS-Word
- UI Developers guidelines help



# Consistency

- Likeness in behavior between similar tasks/operations/situations



## 2. Flexibility Principles

# What is flexibility?

- Multiplicity of ways that users and system exchange information
  - Dialog Initiative
  - Multithreading
  - Task migratability
  - Substitutivity
  - Customizability



# Dialog Initiative

Not hampering the user by placing constraints on how dialog is done

- User pre-emptive
  - User initiates actions
  - More flexible, generally more desirable
- System pre-emptive
  - System does all prompts, user responds
  - Sometimes necessary

# Multithreading

Allowing user to perform more than one task at a time

- Two types
  - Concurrent
    - Input to multiple tasks simultaneously
  - Interleaved
    - Many tasks, but input to one at a time

# Task migratability

Ability to move performance of task to entity (user or system) who can do it better

- Auto-pilot/FMC in planes
- Spell-checking
- Safety controls in plant

# Substitutivity

## Flexibility in details of operations

- Allow user to choose interaction methods
- Allow different ways to
  - perform actions
  - specify data
  - Configure
- Allow different ways of presenting output
  - to suit task, user

# Customizability

Ability of user to modify interface

- By user – adaptability
  - Is this a good thing?
- By system – adaptivity
  - Is this a good thing?

# 3. Robustness Principles

# What is robustness?

- Supporting user in determining successful achievement and assessment of goals
  - Observability
  - Recoverability
  - Responsiveness
  - Task Conformance

# Observability

Can user determine internal state of system from what she perceives?

- **Browsability**
  - Explore current state (without changing it)

## Reachability

- Navigate through observable states
- **Persistence**
  - How long does observable state persist?



# Recoverability

Ability to take corrective action upon recognizing error

- “UNDO”
- Difficulty of recovery procedure should relate to difficulty of original task
- Forward recovery
  - Ability to fix when we can't undo
- Backward recovery
  - Undo previous error(s)

# Responsiveness

Users perception of rate of communication with system

- Response time
  - Time for system to respond in some way to user action(s)
- Consistency important
- Response OK if matches user expectations

# Task Conformance

Does system support all tasks user wishes to perform in expected ways?

- Task completeness
  - Can system do all tasks of interest?
- Task adequacy
  - Can user understand how to do tasks?
  - Does it allow user to define new tasks?