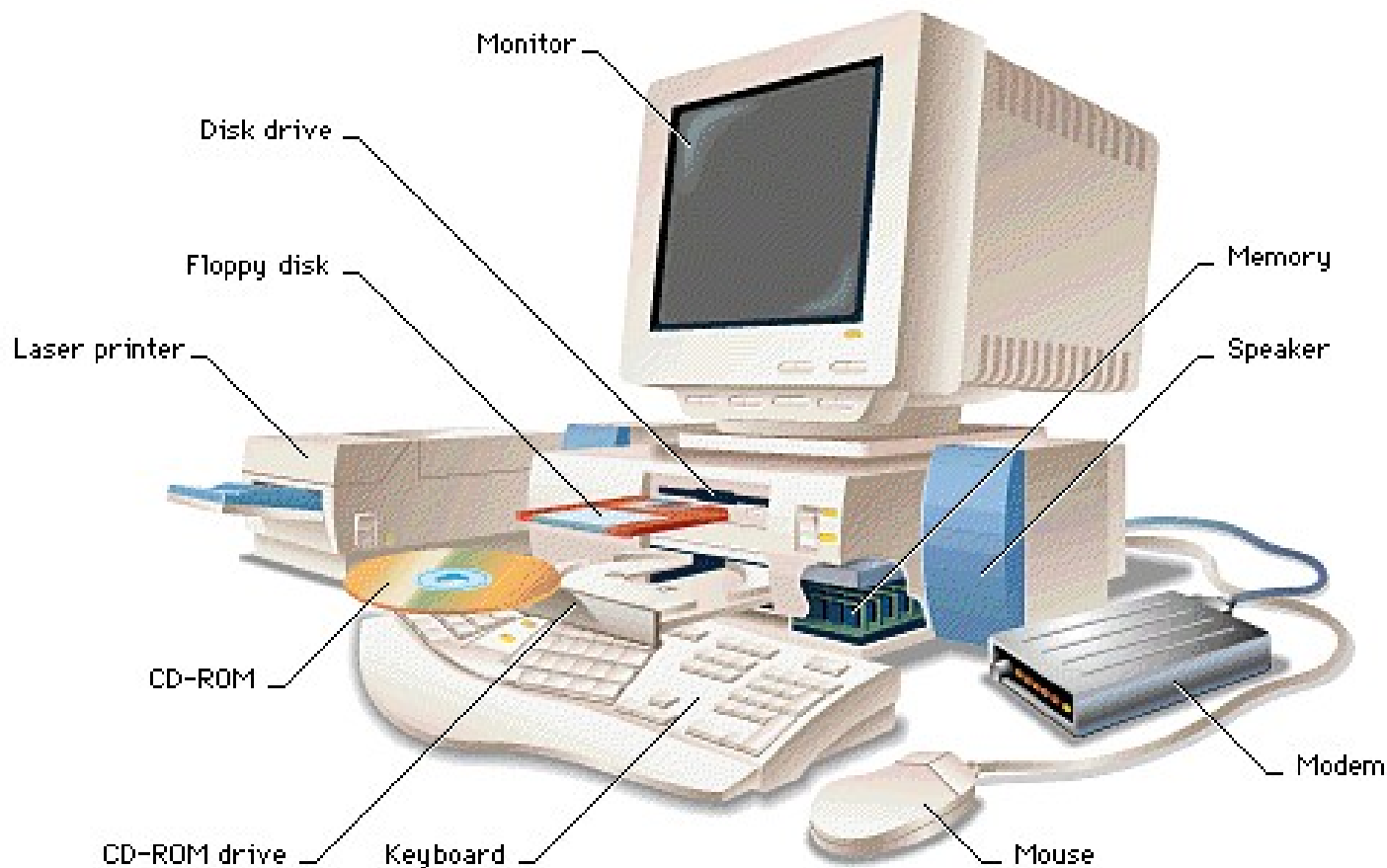


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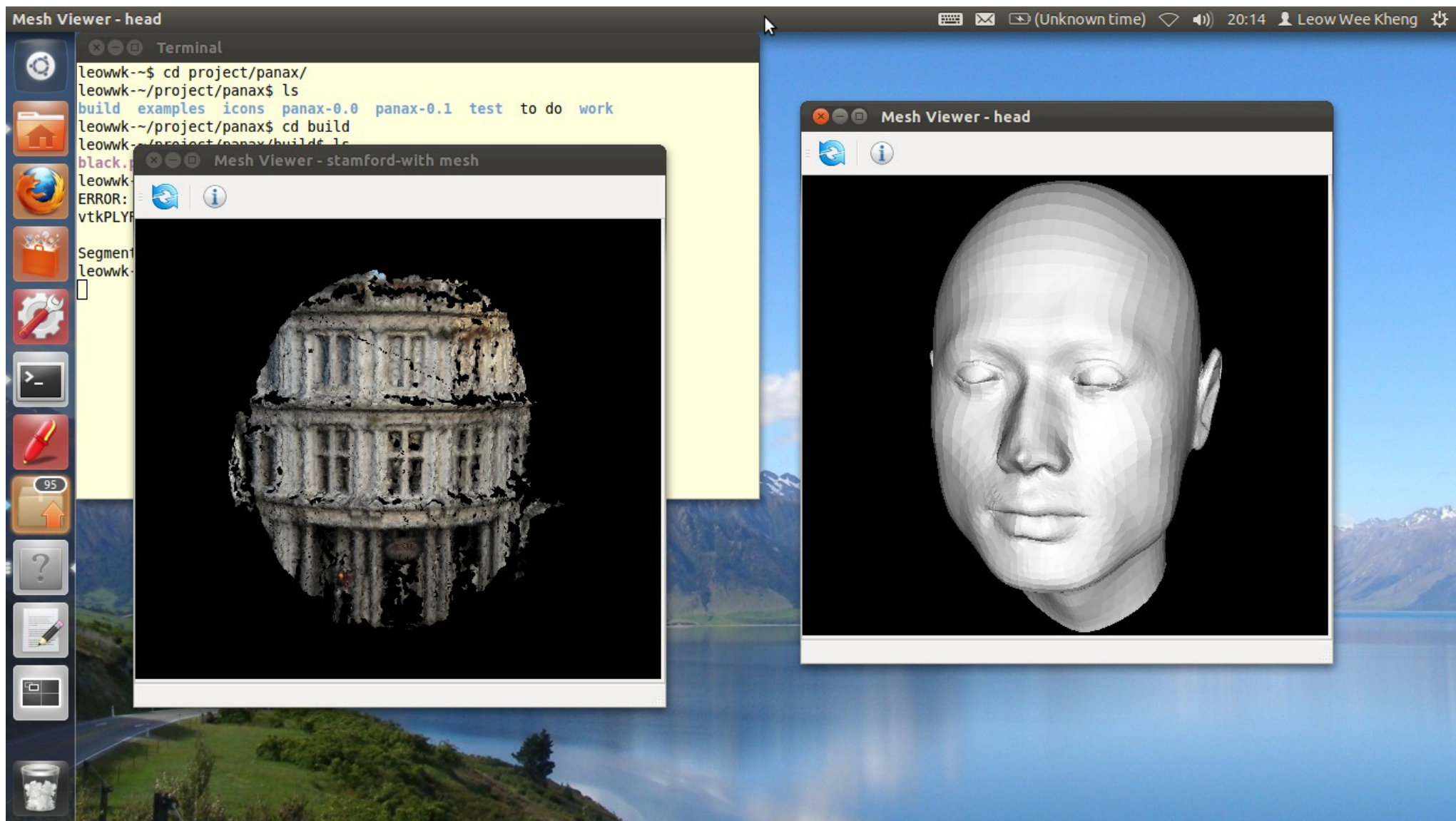
# User Interface Development

# User Interface

- ⦿ Hardware + software that let user interact with system.
- ⦿ Different systems have different requirements.



# User interface can be graphical



# User interface can be non-graphical





Futurístic  
UI



Developing good user interface is not easy...





How the customer explained it



How the Project Leader understood it



How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



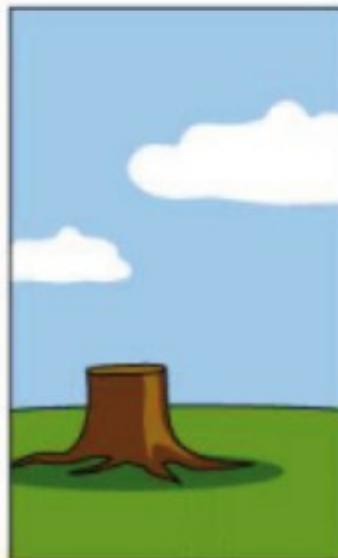
How the project was documented



What operations installed



How the customer was billed



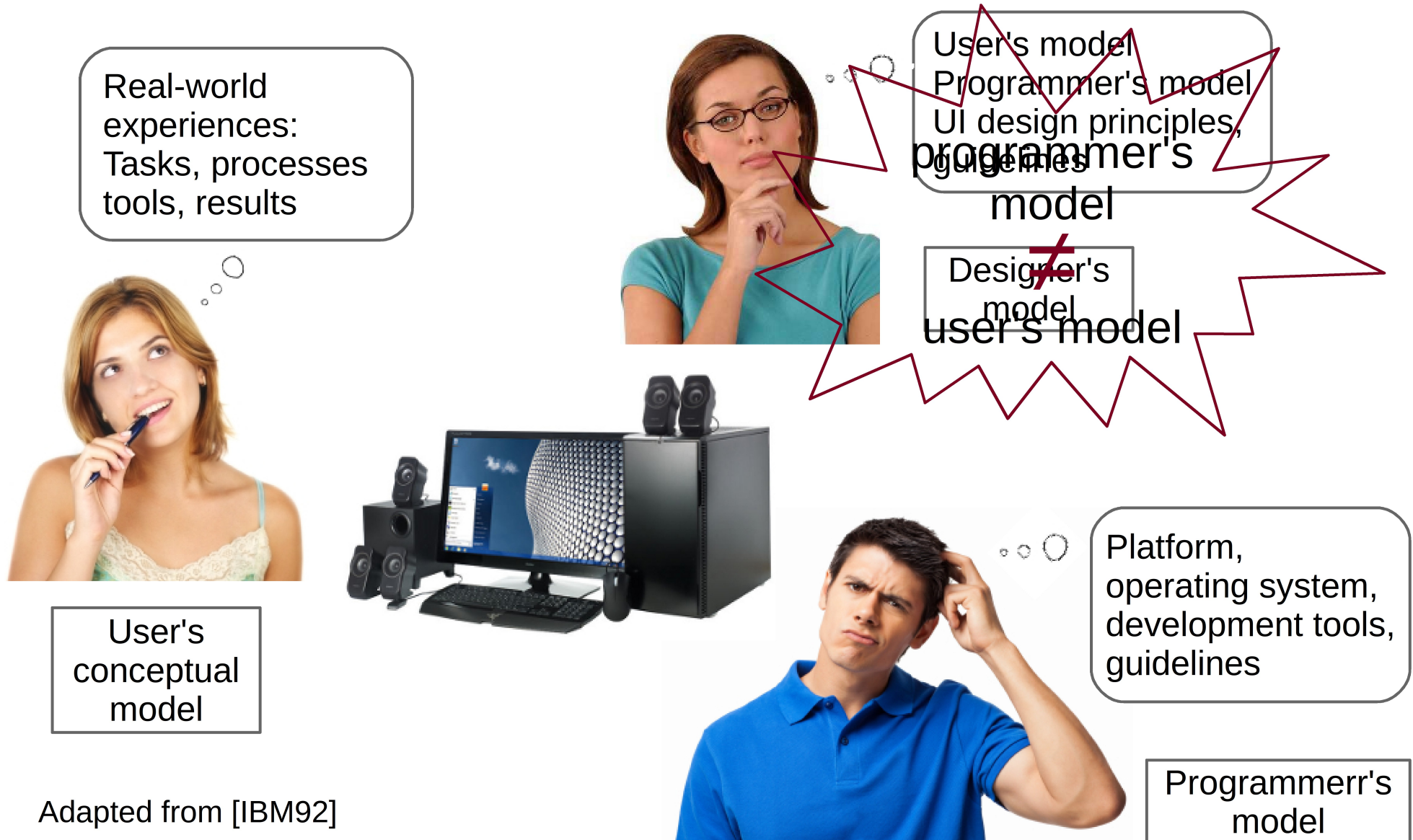
How it was supported



What the customer really needed

As user interface design should not end up (enabled.com)

# User Interface Models



Adapted from [IBM92]

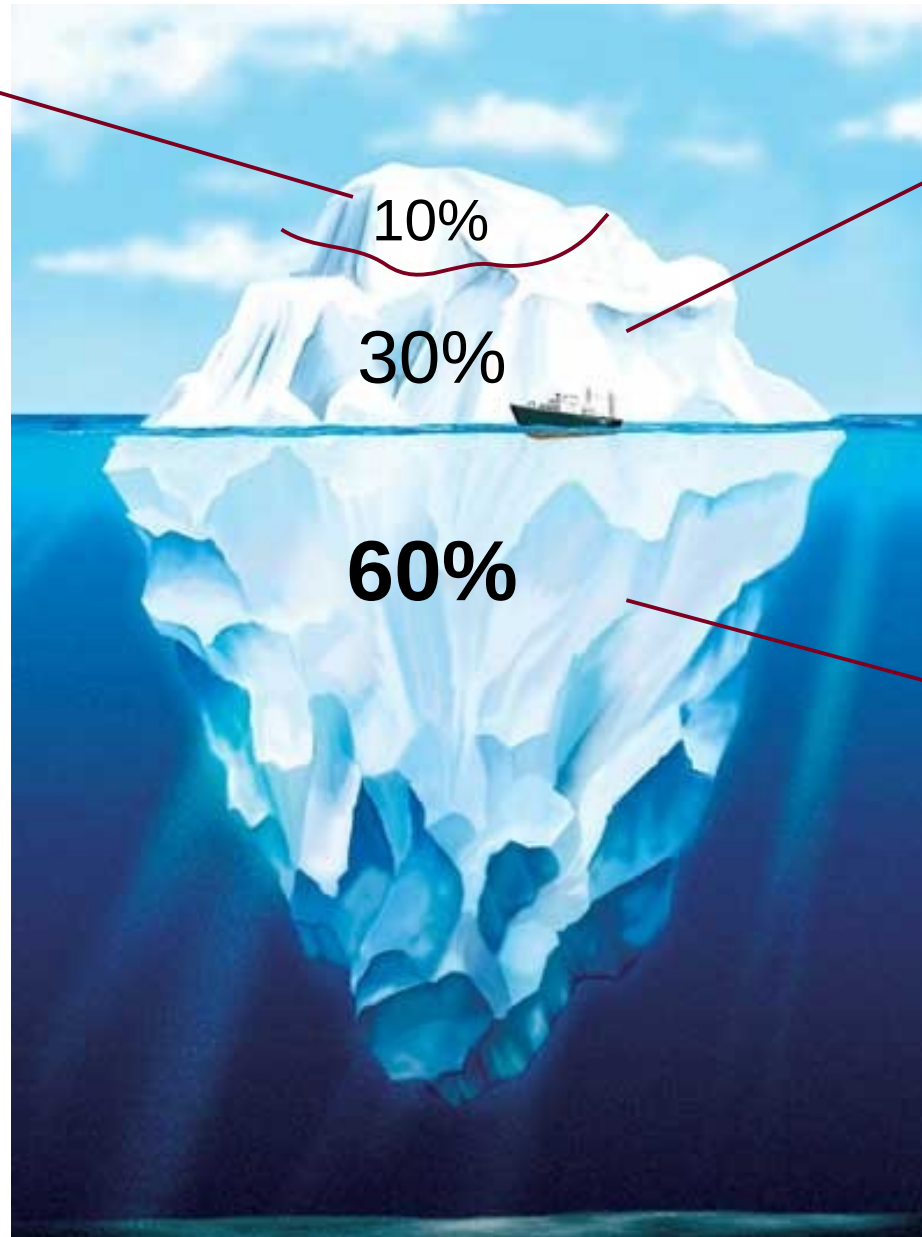


# Look-and-Feel Iceberg

adapted from [IBM92]

## Presentation (Look)

- visual representations
- aesthetics



## Interaction (Feel)

- techniques
- style

## Architecture (Behaviour)

- organisation
- properties
- algorithms

# Good Looking is Not Enough!



# To begin...

## Understand your users

### ⦿ User Goals

- What are they trying to accomplish?

Reduce manual labour? Reduce human errors?

Increase productivity? Enhance customers' experience?

### ⦿ User Requirements

- What do they need to accomplish their goals?

Simpler UI? Smarter system? Better functionality?



Next, design...

## Golden Rule of Design

Don't do to others what you don't wish.

- ⦿ Golden Rule #1: Place Users in Control
  - Use modes judiciously.
  - Allow users to use either keyboard or mouse.
  - Allow users to change focus.
  - Display descriptive messages and text.
  - Provide immediate and reversible actions and feedback.
  - Provide meaningful paths and exits.
  - Accommodate users with different skill levels.
  - Make the user interface transparent.
  - Allow users to customise the interface.
  - Allow users to directly manipulate interface objects.

## ⦿ Golden Rule #2: Reduce Users' Memory Load

- Relieve short-term memory.
- Rely on recognition, not recall.
- Provide visual cues.
- Provide defaults, undo and redo.
- Provide interface shortcuts.
- Promote an object-action syntax.
- Use real-world metaphors.
- Use progressive disclosure.
- Promote visual clarity.



## ⦿ Golden Rule #3: Make the Interface Consistent

- Sustain the context of users' tasks.
- Maintain consistency within and across products.
- Keep interaction results the same.
- Provide aesthetic appeal and integrity.
- Encourage exploration.

# Not only UI...

- ⦿ UI development is not only UI programming!
- ⦿ UI has to work seamlessly with back end.
  - System design involves both UI and back end.
- ⦿ Most people know only one thing...
  - Conventional software engineer doesn't know enough of UI.
  - UI / UX designer doesn't know enough of SE.
  - Game developer doesn't know enough of software design.
  - ...
  - Whoever can integrate takes the crown!

# Summary

- ⦿ Good UI makes a system usable.
- ⦿ Understand users' goals and requirements.
- ⦿ Apply appropriate UI design principles & guidelines.
- ⦿ Design good system architecture.
- ⦿ Develop well-tested UI programs.



# Further Reading

- ⦿ User interface models: [Mend97] chap. 3.
- ⦿ UI design principles: [Mend97] chap 5.

# References

- ⦿ IBM Corporation, *Object-Oriented Interface Design: IBM Common User Access Guidelines*, QUE, 1992.
- ⦿ T. Mandel, *The Elements of User Interface Design*, Wiley, 1997.