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Analisis dan Desain Sistem Informasi

UI Design

Team Teaching ADSI

Tujuan perkuliahan

- Memahami pengertian UI
- Memahami faktor manusia dalam perancangan UI
- Memahami prinsip-prinsip dan proses perancangan UI
- Memahami konsep penyajian informasi, pewarnaan dan pesan dalam UI

Contents

- UI Analysis and Design Concept
- UI Analysis and Design Workflow
  - Analysis and Modelling
  - Design
  - Development and Testing
  - Validate
- Error Messages and Design Factors

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Concept of UI Analysis and Design

User Interface Design Principles

- Put the user in control
- Keep the user's memory load controlled
  - Minimizing the requirements of user to remember something while using the system
- Consider issues of consistency

User Quote

“What I really would like is a system that reads my mind."

"*It knows what I want to do before I need to do it and makes it very easy for me to get it done.*"

"That’s all, just that."

Control: Who's in Control?

- Does ***user adapt to computer's*** model of task?
- Does ***computer adapt to user's*** model of task?
  - Consider the novice user
  - Consider the knowledgeable, intermittent user
  - Consider the knowledgeable, frequent user

User Maintains Control (and Happier) of Using The System When They…

- Interaksi yang fleksibel
- Allowed for interaction to be interrupted and undoable
- Allowed for interface to be customized to user's skill level
- Terhindar dari masalah yang terlalu teknis
  - no OS commands or technical code needed
- Don't forced into unnecessary actions
- Designed for direct interaction with objects on the screen

Human factors in interface design

- **Ingatan jangka pendek yang terbatas**
  - People can instantaneously remember about 7 items of information. If you present more than this, they are more liable to make mistakes.
- **Manusia membuat kesalahan**
  - When people make mistakes and systems go wrong, ***inappropriate*** alarms and messages ***can increase stress and hence the likelihood of more mistakes***

Human factors in interface design (2)

- Orang memiliki kemampuan berbeda-beda
  - People have a wide range of physical capabilities. Designers should not just design for their own capabilities.
- Setiap orang memiliki preferensi cara interaksi masing-masing
  - Some people like pictures, some others like text

User's memory load

- Make UI show state with visual cues
- Use meaningful defaults that can be reset/set
- Provide meaningful shortcuts
  - icons that reflects proper action or category
- Make visual layout reflect real world task
  - mimic real world layout as close as possible

Consistency

- Use the same design standard throughout all screens
- Use the same input techniques throughout all screens

Use UI Design Theme or Scheme

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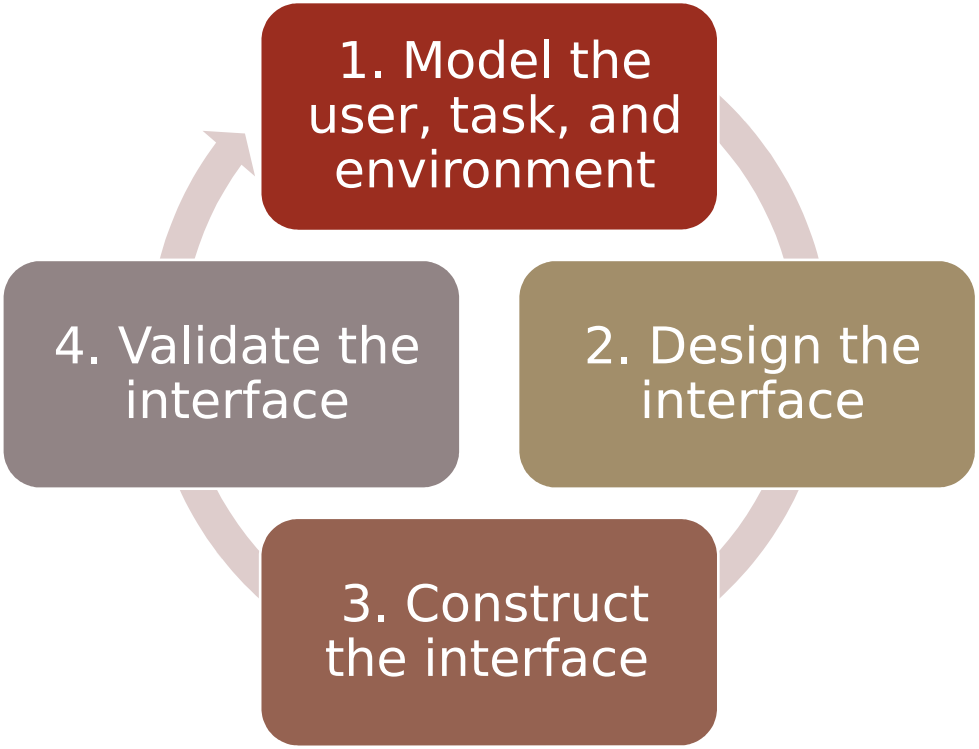
UI Analysis and Design

UI analysis and design



- Iterate through these, with each pass elaborate additional requirements and resulting design

Analysis

User analysis

- Interview the users or representatives of the users
  - Level of education
  - Learn from written materials or is a tutorial class needed for users to understand?
  - Expert typists or phobic
  - Age range
  - One gender predominates?

Ask Questions *to understand the users more...*

- Compensation for users for their work is how?
- Use during normal work hours or until job is done?
- Integral part of job or infrequent use?
- What is primary language of users?
- What are consequences of mistakes?
- Are users subject matter experts?
- Knowledge about underlying technology needed?

Environment analysis

- What will be the physical location of the software?
- Will user be sitting, standing, walking?
- Will user be dedicated to this task/multi-users required for this task?
- Will there be noise, light, or space impairments?

Task Analysis

- What tasks will be done while user is working?
- What work is performed in special circumstances?
- What special domains are used during work?
- What is the sequence of workflow?

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Analysis Modelling

Deriving UI Objects From Use Cases

- Pilih objek-objek dari narasi use case
- Kelompokkan class-class
- Definisikan detail attribut setiap class
- Tentukan operasi/method setiap objek/class
  - Gunakan Class-Responsibility-Collaboration (CRC) Cards

Task Workflow Analysis and Modelling

- When different ***user groups*** and ***user roles*** are to use software
- Use flow diagram called ***swimlane/activity diagram***
- Column for each role
- Bubbles for processes, flows for data
- Flows between columns represent interactions between processes of different roles
- Look and feel of UI for different roles may be different

Analysis for Presentation of Content

- Content sources may be from:
  - Other parts of the application
  - Database accessible from application
  - External to application
- Format of content:
  - Consistent location for same types?
  - Customizable location?
  - Identification of content?
  - Handling of large datasets? Summary available?
  - Color?
  - Error handling?

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UI Design

Steps for UI design

1. Parse use cases - objects (nouns) and operations (verbs)
2. Sketch set of screens
3. Test UI
4. Iterate last 2 steps

Common design issues

- Response time
- Help
- Error handling and messages
- Command and menu labeling
- Color
- Analog vs Digital

Responsiveness

- Length of response time
  - 1 sec acceptable, but no longer than 3 secs
  - More than that - use ***progress bar*** and "***busy icon***"
- Variability
  - 1 sec ***is better*** than from 0.2 sec to 3.0 sec

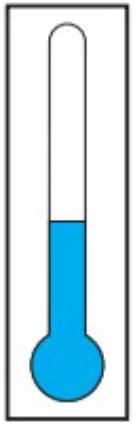
Analogue or Digital?

- Digital presentation
  - Compact – takes up little screen space
  - Precise values can be communicated
- Analogue presentation
  - Easier to get an 'at a glance' impression of a value
  - Possible to show relative values
  - Easier to see exceptional data values

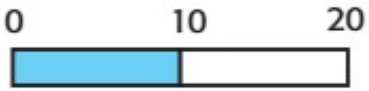
Analogue or Digital?

Dial with needle

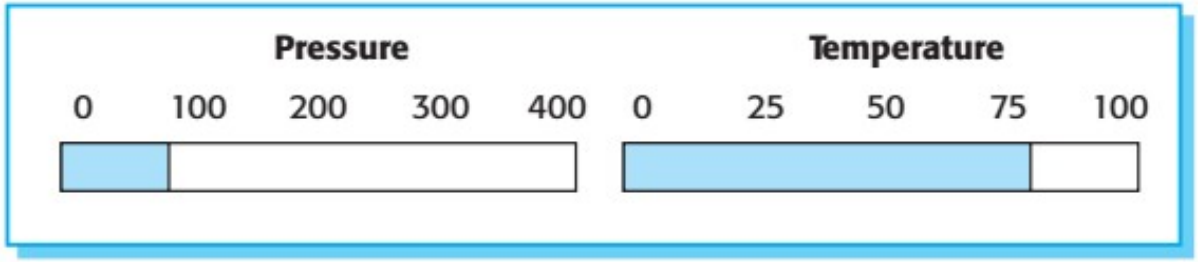
Pie chart



Thermometer



Horizontal bar



Design of help features

- Provided for all features or just subset?
- Available at all times?
- How to request?
- How presented?
  - Window, printed documents, 2-lines
- How to return to normal operations?
- How is help info structured?
  - Flat, hierarchical, hypertext

Command and menu labels

- Easy to remember labels? How to remind?
- What is form of commands? Control seq or typed word?
- Will all menu items have commands?
- Customizable and shortcuts available?
- Self-explanatory labels
- Do submenu items fit logically under menu items?

Colour

- Colour adds an extra dimension to an interface and can help the user understand complex information structures.
- Colour can be used to highlight exceptional events.
- Common mistakes in the use of colour in interface design include:
  - The use of colour to communicate meaning;
  - The over-use of colour in the display.

Colour use guidelines

- ***Limit*** the number of colours used and be conservative in their use.
- Use colour change to show a change in system status.
- Use colour coding to support the task that users are trying to perform.
- Use colour coding in a thoughtful and consistent way.
- Be careful about colour pairings.

Error Messages

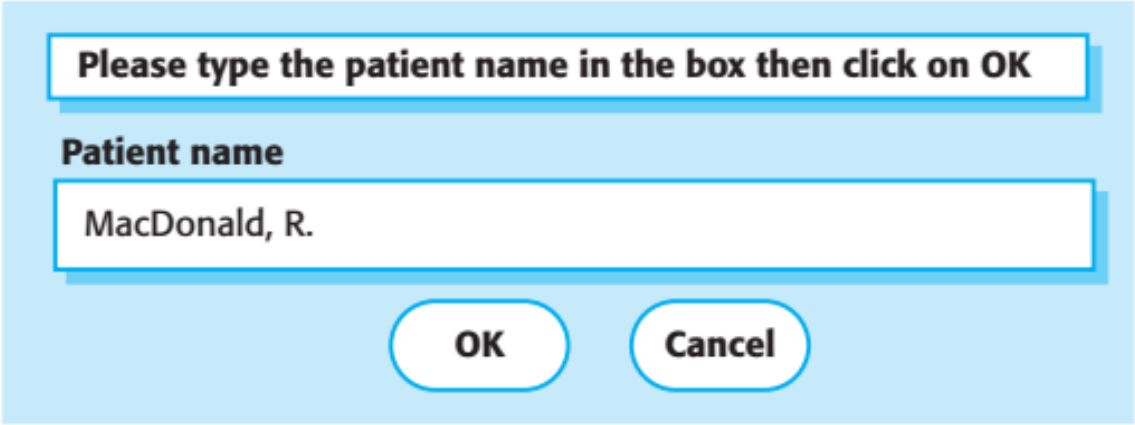
- Error message design is critically important. Poor error messages can mean that a user rejects rather than accepts a system.
- Messages should be polite, concise, consistent and constructive.
- The background and experience of users should be the determining factor in message design.

Design Factors in Message Wording

Factor	Description
Context	Wherever possible, the messages generated by the system should reflect the current user context. As far as is possible, the system should be aware of what the user is doing and should generate messages that are relevant to their current activity.
Experience	As users become familiar with a system they become irritated by long, 'meaningful' messages. However, beginners find it difficult to understand short, terse statements of a problem. You should provide both types of message and allow the user to control message conciseness.
Skill level	Messages should be tailored to the users' skills as well as their experience. Messages for the different classes of users may be expressed in different ways depending on the terminology that is familiar to the reader.
Style	Messages should be positive rather than negative. They should use the active rather than the passive mode of address. They should never be insulting or try to be funny.
Culture	Wherever possible, the designer of messages should be familiar with the culture of the country where the system is sold. There are distinct cultural differences between Europe, Asia and America. A suitable message for one culture might be unacceptable in another.

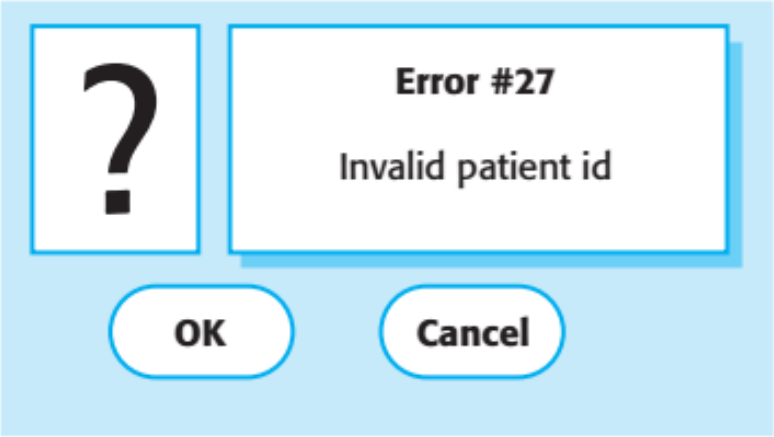
User Error

- Assume that a nurse misspells the name of a patient whose records he is trying to retrieve.

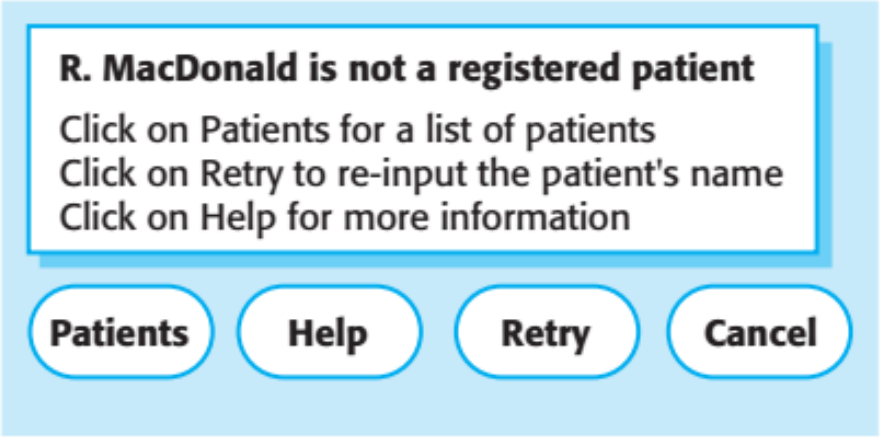


Good and Bad Message Design

System-oriented error message



User-oriented error message



Good for developers for debugging system during development phase

Good for end users in production phase

Which one is good and which one is bad?
Are both design good or bad?

Good or bad is subject to users who use it.

So ask users!

Test the UI

- Check Screen Validations
- Verify All Navigations
- Check usability Conditions
- Verify Data Integrity
- Verify the object states
- Verify the date Field and Numeric Field Formats

“I have always wished that my computer would be as easy to use as my telephone.
My wish has come true. I no longer know how to use my telephone.”

Bjarne Stronstrup
(designer and implementor of C++)

Summary

- Weak UI may cause failure of acceptance of system
- Follow 3 principles of UI design
  - User in control
  - Reduce user's memory load
  - Consistency
- Development involves
  - Analysis (user, task, environment)
  - Design (use cases drive sketches)
  - Evaluate and iterate

Questions?