INTERAKSI MANUSIA DAN KOMPUTER

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3 KAIDAH PROSES DESAIN

CAPAIAN PEMBELAJARAN

Mahasiswa mampu memahami kaidah-kaidah yang perlu dipatuhi dalam proses desain antarmuka interaktif.

AGENDA

- Introduction
- Principle To Support Usability
- Standards
- Guidelines
- Golden Rules and Design
- HCI Patterns

INTRODUCTION

- ***Bagaimana menyiapkan perancang yang memiliki kemampuan (ability) untuk menentukan (determine) konsekuensi dari kemudahan penggunaan (usability consequences) dari penetapan desain antarmuka?***
- Dibutuhkan sebuah aturan dalam perancangan (*design*) antarmuka.
- ***Untuk apa aturan tersebut dibuat?***

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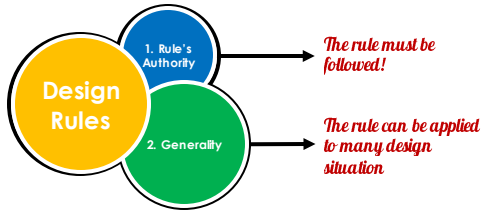
INTRODUCTION



- 2 Dimensions of Rule Clasification -

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INTRODUCTION

PRINCIPLES

STANDARDS

GUIDELINES

ABSRACT DESIGN RULES:
high generality - low authority

SPECIFIC DESIGN RULES:
high in authority - limited in application

LOWER *in authority* - **MORE GENERAL** *in application*

- Different Type of Design Rules -

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PRINCIPLES TO SUPPORT USABILITY

- **Principles,** dikatakan sebagai aturan umum proses desain antarmuka yang bersifat abstrak.
- Dapat diterapkan pada desain sistem interaktif dalam hal untuk menggambarkan kemudahan penggunaan dari rancangan antarmuka sistem interaktif.
- **Principles** dibagi ke dalam 3 kategori utama: (1) ***learnability***; (2) ***flexibility***; dan (3) ***robustness***.

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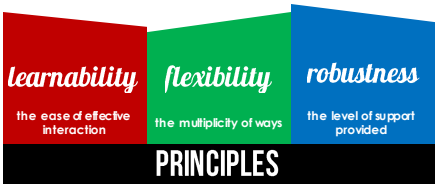
PRINCIPLES TO SUPPORT USABILITY



- Three Main Categories of PRINCIPLES -

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PRINCIPLES TO SUPPORT USABILITY

Summary of Principles Affecting Learnability

Principle	Definition	Related principles
Predictability	Support for the user to determine the effect of future action based on past interaction history	Operation visibility
Synthesizability	Support for the user to assess the effect of past operations on the current state	Immediate/eventual honesty
Familiarity	The extent to which a user's knowledge and experience in other real-world or computer-based domains can be applied when interacting with a new system	Guessability, affordance
Generalizability	Support for the user to extend knowledge of specific interaction within and across applications to other similar situations	–
Consistency	Likeness in input–output behavior arising from similar situations or similar task objectives	–

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PRINCIPLES TO SUPPORT USABILITY

Summary of Principles Affecting Flexibility

Principle	Definition	Related principles
Dialog initiative	Allowing the user freedom from artificial constraints on the input dialog imposed by the system	System/user pre-emptiveness
Multi-threading	Ability of the system to support user interaction pertaining to more than one task at a time	Concurrent vs. interleaving, multi-modality
Task migratability	The ability to pass control for the execution of a given task so that it becomes either internalized by the user or the system or shared between them	–
Substitutivity	Allowing equivalent values of input and output to be arbitrarily substituted for each other	Representation multiplicity, equal opportunity
Customizability	Modifiability of the user interface by the user or the system	Adaptivity, adaptability

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PRINCIPLES TO SUPPORT USABILITY

Summary of Principles Affecting Robustness

Principle	Definition	Related principles
Observability	Ability of the user to evaluate the internal state of the system from its perceivable representation	Browsability, static/dynamic defaults, reachability, persistence, operation visibility
Recoverability	Ability of the user to take corrective action once an error has been recognized	Reachability, forward/ backward recovery, commensurate effort
Responsiveness	How the user perceives the rate of communication with the system	Stability
Task conformance	The degree to which the system services support all of the tasks the user wishes to perform and in the way that the user understands them	Task completeness, task adequacy

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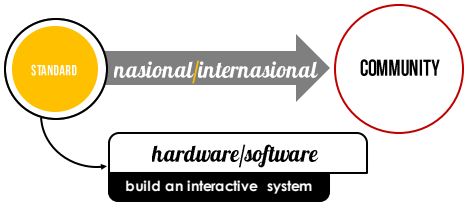
STANDARDS



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STANDARDS

hardware	STANDAR	*software*
Underlying Theory • based on an understanding of physiology or ergonomics/human factors • fixed and readily adaptable to design of the hardware		**Underlying Theory** • based on theories from psychology or cognitive science • still evolving and not very easy to interpret in the language of software design
Change • more difficult and expensive to change • requirements changes less frequently		**Change** • usually designed to be very flexible • requirements changes frequently

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STANDARD

Usability
effectiveness, **efficiency** and **satisfaction**

Effectiveness
accuracy and **completeness**

Efficiency
resources expended related to **accuracy** and **completeness**

Satisfaction
comfort and **acceptability**

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GUIDELINES

"Incompleteness of theories underlying the design of interactive software makes it difficult to produce authoritative and specific standards." [dix, 2004]

The more abstract the guideline, the more it resembles the principles, and the more specific the guideline, the more suited it is to detailed design. [dix, 2004]

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GUIDELINES

- Kategori dasar panduan perancangan sistem interaktif yang dikemukakan oleh Smith dan Mosier: [smith, mosier, 1986]
  1. Data Entry
  2. Data Display
  3. Sequence Control
  4. User Guidance
  5. Data Transmission
  6. Data Protection

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1. **Data Entry**

1.1 *Position Designation*

1.1–1 **Distinctive Cursor**

For position designation on an electronic display, provide a movable cursor with distinctive visual features (shape, blink, etc.).

Exception When position designation involves only selection among displayed alternatives, highlighting selected items might be used instead of a separately displayed cursor.

Comment When choosing a cursor shape, consider the general content of the display. For instance, an underscore cursor would be difficult to see on a display of underscored text, or on a graphical display containing many other lines.

Comment If the cursor is changed to denote different functions (e.g. to signal deletion rather than entry), then each different cursor should be distinguishable from the others.

Comment If multiple cursors are used on the same display (e.g. one for alphanumeric entry and one for line drawing), then each cursor should be distinguishable from the others.

Reference Whitfield, Ball and Bird, 1983

See also 1.1–17 Distinctive multiple cursors
4.0–9 Distinctive cursor

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GUIDELINES

- Fokus utama panduan (*guidelines*) → *dialogue style*. ***Mengapa demikian?***

Smith and Mosier [325]	Mayhew [230]
Question and answer	Question and answer
Form filling	Fill-in forms
Menu selection	Menus
Function keys	Function keys
Command language	Command language
Query language	–
Natural language	Natural language
Graphic selection	Direct manipulation

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GOLDEN RULES AND HEURISTICS

Shneiderman's Eight Golden Rules of Interface Design.

1. *Strive for consistency.*
2. *Enable frequent users to use shortcuts.*
3. *Offer informative feedback.*
4. *Design dialogs to yield closure.*

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GOLDEN RULES AND HEURISTICS

Shneiderman's Eight Golden Rules of Interface Design. (cont...)

5. *Offer error prevention and simple error handling.*
6. *Permit easy reversal of actions.*
7. *Support internal locus of control.*
8. *Reduce short-term memory load.*

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GOLDEN RULES AND HEURISTICS

Norman's Seven Principles for Transforming Difficult Tasks into Simple Ones.

1. *Use both knowledge in the world and knowledge in the head.*
2. *Simplify the structure of tasks.*
3. *Make things visible.*
4. *Get the mappings right.*

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GOLDEN RULES AND HEURISTICS

Norman's Seven Principles for Transforming Difficult Tasks into Simple Ones. (Cont...)

5. *Exploit the power of constraints, both natural and artificial.*
6. *Design for error.*
7. *When all else fails, standardize.*

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HCI PATTERNS

- *"one way to approach design is to learn from examples that have proven to be successful in the past: to reuse the knowledge of what made a system - or paradigm - successful."* [dix, 2004]
- Pola (*pattern*) adalah sebuah pendekatan untuk menangkap (*capturing*) dan penggunaan ulang (*reuse*) pengetahuan mengenai hal-hal yang membuat sistem berjalan sesuai harapan.

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ATURAN
PROSES
DESAIN
TERIMA KASIH