



# **Select the Proper Interaction Device**

Dosen. Utami Dewi Widiанти



## Interaction Device

adalah suatu mekanisme *input* atau *device* yang digunakan *user* untuk mengomunikasikan keinginan dan kebutuhannya kepada komputer, dan/atau mekanisme *output* atau *device* yang digunakan komputer untuk memberikan respon kepada *user*

**Pemilihan  
Device yang  
tepat adalah  
hal PENTING!**





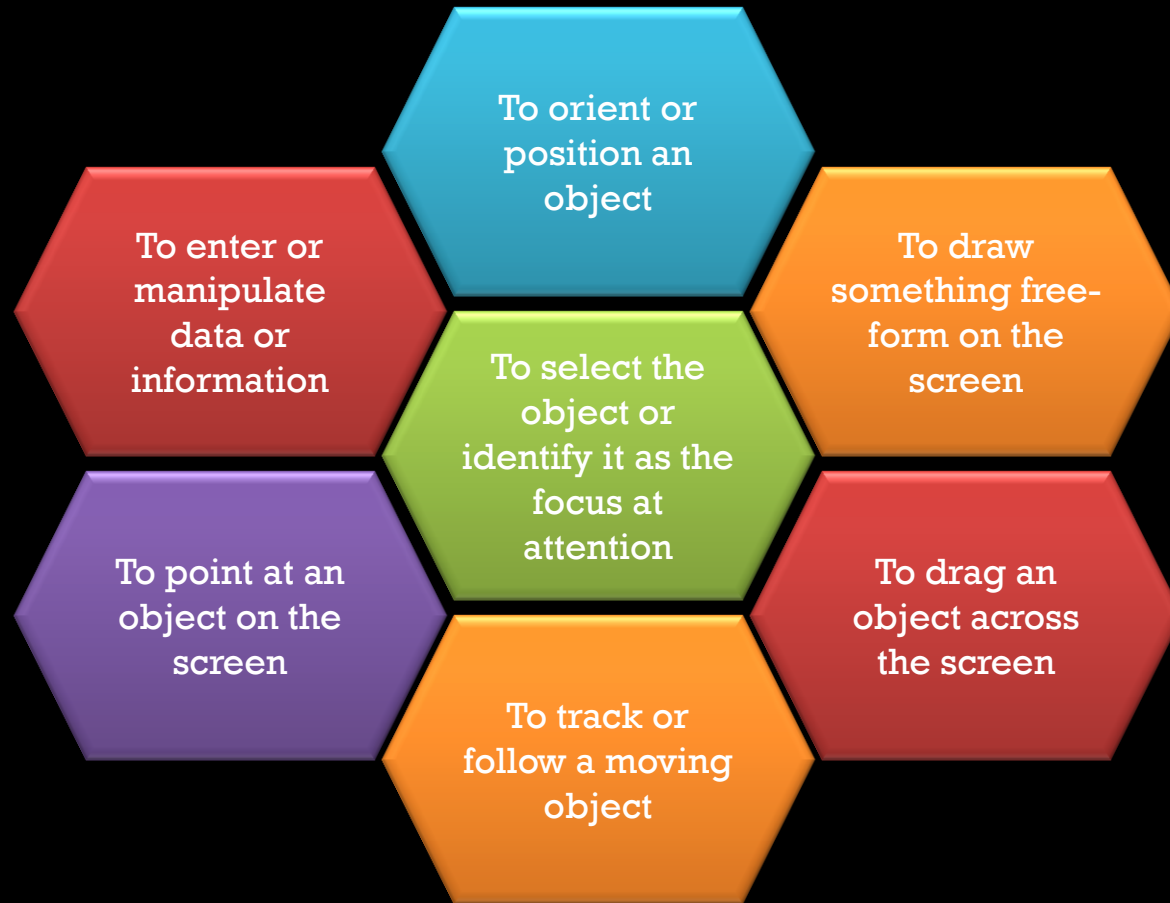
**Jika Tepat maka  
Performansi Cepat  
dan akurat, Jika  
Tidak tepat  
produktifitas turun,  
error naik, STRESS**



# CHARACTERISTICS OF INPUT DEVICE

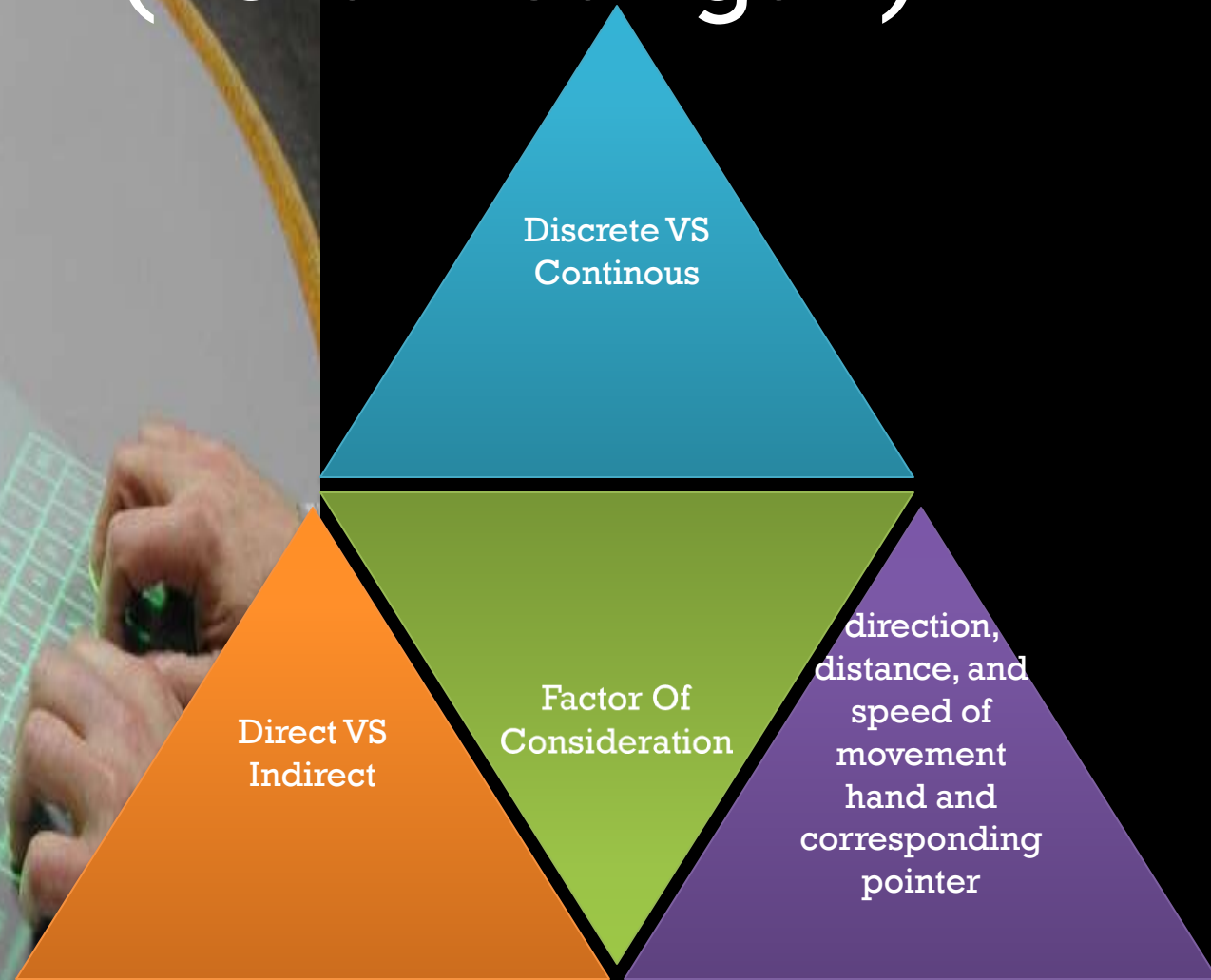


# Task Performed using today system





# Factor of consideration (Pertimbangan)



# Trackball

## Description

- ❑ A spherical object (ball) that rotates freely in all directions in its socket.
- ❑ Direction and speed is tracked and translated into cursor movement.

## Advantages

- ❑ Direct relationship between hand and pointer movement in terms of direction and speed.
- ❑ Does not obscure vision of screen.
- ❑ Does not require additional desk space (if mounted on keyboard)



## Disadvantages

- ❑ Movement is indirect, in a plane different from the screen.
- ❑ No direct relationship exists between hand and pointer movement in terms of distance.
- ❑ Requires a degree of eye-hand coordination.
- ❑ Requires hand to be removed from keyboard keys.
- ❑ Requires different hand movements.
- ❑ Requires hand to be removed from keyboard (if not mounted on keyboard).
- ❑ Requires additional desk space (if not mounted on keyboard).
- ❑ May be difficult to control.
- ❑ May be fatiguing to use over extended time.



# Joystick

## Description

- ❑ A stick or bat-shaped device anchored at the bottom.
- ❑ Variable in size, smaller ones being operated by fingers, larger ones requiring the whole hand.
- ❑ Variable in cursor direction movement method, force joysticks respond to pressure;
- ❑ movable ones respond to movement.
- ❑ Variable in degree of movement allowed, from horizontal-vertical only to continuous.

## Disadvantages

- ❑ Movement indirect, in plane different from screen.
- ❑ Indirect relationship between hand and pointer in terms of speed and distance.
- ❑ Requires a degree of eye-hand coordination.
- ❑ Requires hand to be removed from keyboard keys.
- ❑ Requires different hand movements to use.
- ❑ Requires hand to be removed from keyboard (if not mounted on keyboard).
- ❑ Requires additional desk space (if not mounted on keyboard).
- ❑ May be fatiguing to use over extended time.
- ❑ May be slow and inaccurate.

## Advantages

- ❑ Direct relationship between hand and pointer movement in terms of direction.
- ❑ Does not obscure vision of screen.
- ❑ Does not require additional desk space (if mounted on keyboard).



# Graphic Tablet or Trackpad

## Description

- ❑ Pressure-, heat-, light-, or light-blockage-sensitive horizontal surfaces that lie on the desktop or keyboard.
- ❑ May be operated with fingers, light pen, or objects like a stylus or pencil.
- ❑ Pointer imitates movements on tablet.

## Advantages

- ❑ Direct relationship between touch movements and pointer movements in terms of direction, distance, and speed.
- ❑ More comfortable horizontal operating plane.
- ❑ Does not obscure vision of screen



## Disadvantages

- ❑ Movement is indirect, in a plane different from screen.
- ❑ Requires hand to be removed from keyboard.
- ❑ Requires hand to be removed from keyboard keys.
- ❑ Requires different hand movements to use.
- ❑ Requires additional desk space.
- ❑ Finger may be too large for accuracy with small objects

# Touch Screen

## Description

- ❑ A special surface on the screen sensitive to finger or stylus touch.

## Advantages

- ❑ Direct relationship between hand and pointer location in terms of direction, distance, and speed.
- ❑ Movement is direct, in the same plane as screen.
- ❑ Requires no additional desk space.
- ❑ Stands up well in high-use environments.

## Disadvantages

- ❑ Finger may obscure part of screen.
- ❑ Finger may be too large for accuracy with small objects.
- ❑ Requires moving the hand far from the keyboard to use.
- ❑ Very fatiguing to use for extended period of time.
- ❑ May soil or damage the screen.





# Touch Screen

## Design Guidelines

- ❑ Screen objects should be at least  $\frac{3}{4} \times \frac{3}{4}$  inches in size.
- ❑ Object separation should be at least  $\frac{1}{8}$  inch.
- ❑ Provide visual feedback in response to activation. Auditory feedback may also be appropriate.
- ❑ When the consequences are destructive, require confirmation after selection to eliminate inadvertent selection.
- ❑ Provide an instructional invitation to begin using.



# Light Pen

## Description

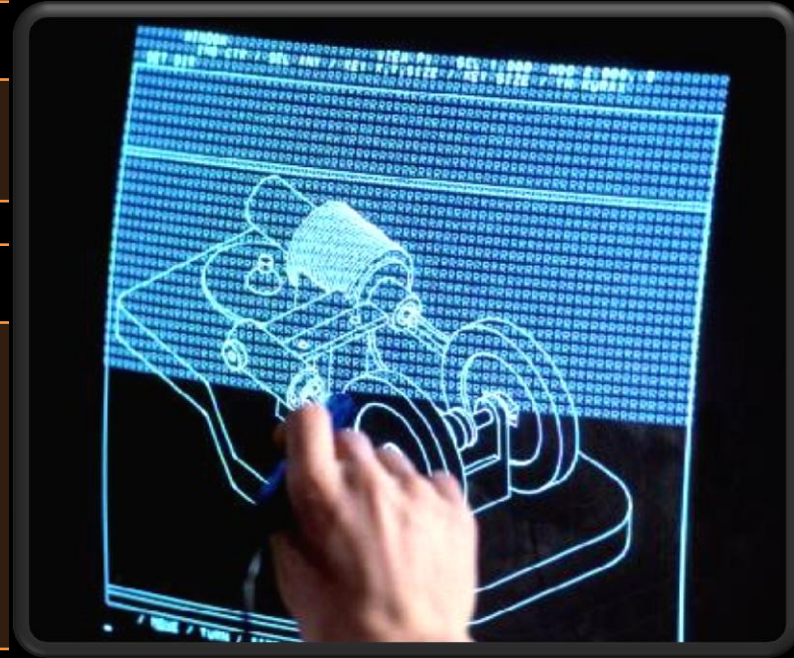
- ❑ A special surface on a screen sensitive to the touch of a special stylus or pen

## Advantages

- ❑ Direct relationship between hand and pointer movement in terms of direction, distance, and speed.
- ❑ Movement is direct, in the same plane as screen.
- ❑ Requires minimal additional desk space.
- ❑ Stands up well in high-use environments.
- ❑ More accurate than finger touching.

## Disadvantages

- ❑ Hand may obscure part of screen.
- ❑ Requires picking it up to use.
- ❑ Requires moving the hand far from the keyboard to use.
- ❑ Very fatiguing to use for extended period of time.



# Voice

## Description

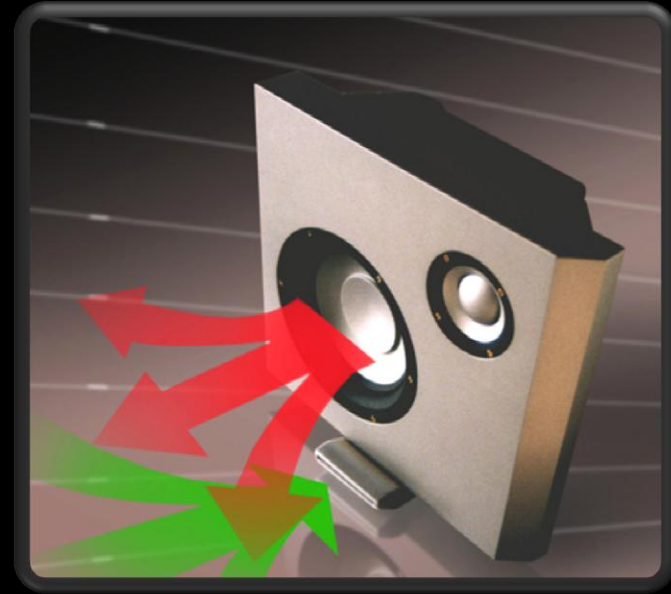
- ❑ Automatic speech recognition by the computer.

## Advantages

- ❑ Simple and direct.
- ❑ Useful for people who cannot use a keyboard.
- ❑ Useful when the user's hands are occupied.

## Disadvantages

- ❑ High error rates because of difficulties in
  - Recognizing boundaries between spoken words.
  - Blurred word boundaries because of normal speech patterns.
- ❑ Slower throughput than with typing.
- ❑ Difficult to use in noisy environments.
- ❑ Impractical to use in quiet environments.





# Mouse

## Description

- ❑ A rectangular or dome-shaped, movable, desktop control containing from one to three buttons used to manipulate objects and information on the screen.
- ❑ Movement of screen pointer mimics the mouse movement.

## Advantages

- ❑ Direct relationship between hand and pointer movement in terms of direction, distance, and speed.
- ❑ Permits a comfortable hand resting position.
- ❑ Selection mechanisms are included on mouse.
- ❑ Does not obscure vision of the screen.

## Disadvantages

- ❑ Movement is indirect, in a plane different from screen.
- ❑ Requires hand to be removed from keyboard.
- ❑ Requires additional desk space.
- ❑ May require long movement distances.
- ❑ Requires a degree of eye-hand coordination.



# Mouse

## Mouse Usage Guidelines

- ☐ Provide a “hot zone” around small or thin objects that might require extremely fine mouse positioning.
- ☐ Never use double-clicks or double-drags as the only means of carrying out essential operations.
- ☐ Do not use mouse plus keystroke combinations.
- ☐ Do not require a person to point at a moving target



# Keyboard

## Description

- ❑ Standard typewriter keyboard and cursor movement keys.

## Advantages

- ❑ Familiar.
- ❑ Accurate.
- ❑ Does not take up additional desk space.
- ❑ Very useful for
  - Entering text and alphanumeric data.
  - Editing text and alphanumeric data.
  - Keyed shortcuts — accelerators.
  - Keyboard mnemonics — equivalents.
- ❑ Advantageous for
  - Performing actions when less than three mouse buttons exist.
  - Use with very large screens.
  - Touch typists.

## Disadvantages

- ❑ Slow for non-touch-typists.
- ❑ Can be over-elaborate.
- ❑ Slower than other devices in pointing.
- ❑ Requires discrete actions to operate.
- ❑ No direct relationship between finger or hand movement on the keys and cursor movement on screen in terms of speed and distance.





# Keyboard

## Keyboard Usage Guidelines

- ☐ Provide keyboard accelerators.
  - ☐ — Assign single keys for frequently performed, small-scale tasks.
  - ☐ — Use standard platform accelerators.
  - ☐ — Assign Shift+key combinations for actions that extend or are complementary to the actions of the key or key combination used without the Shift+key.
- ☐ Assign Ctrl+key combinations for
  - Infrequent actions.
  - Tasks that represent larger-scale versions of the task assigned to the unmodified key.
- ☐ Provide keyboard equivalents.
  - ☐ — Use standard platform equivalents.
  - ☐ — Use the first letter of the item description.
  - ☐ — If first letter conflicts exist, use
    - Another distinctive consonant in the item description.
    - A vowel in the item description.
- ☐ Provide window navigation through use of keyboard keys.



# Other Input Device

- ☐ Gesture Recognition
- ☐ Facial Expression
- ☐ Eye Tracking device
- ☐ Fingerprint
- ☐ Handwriting



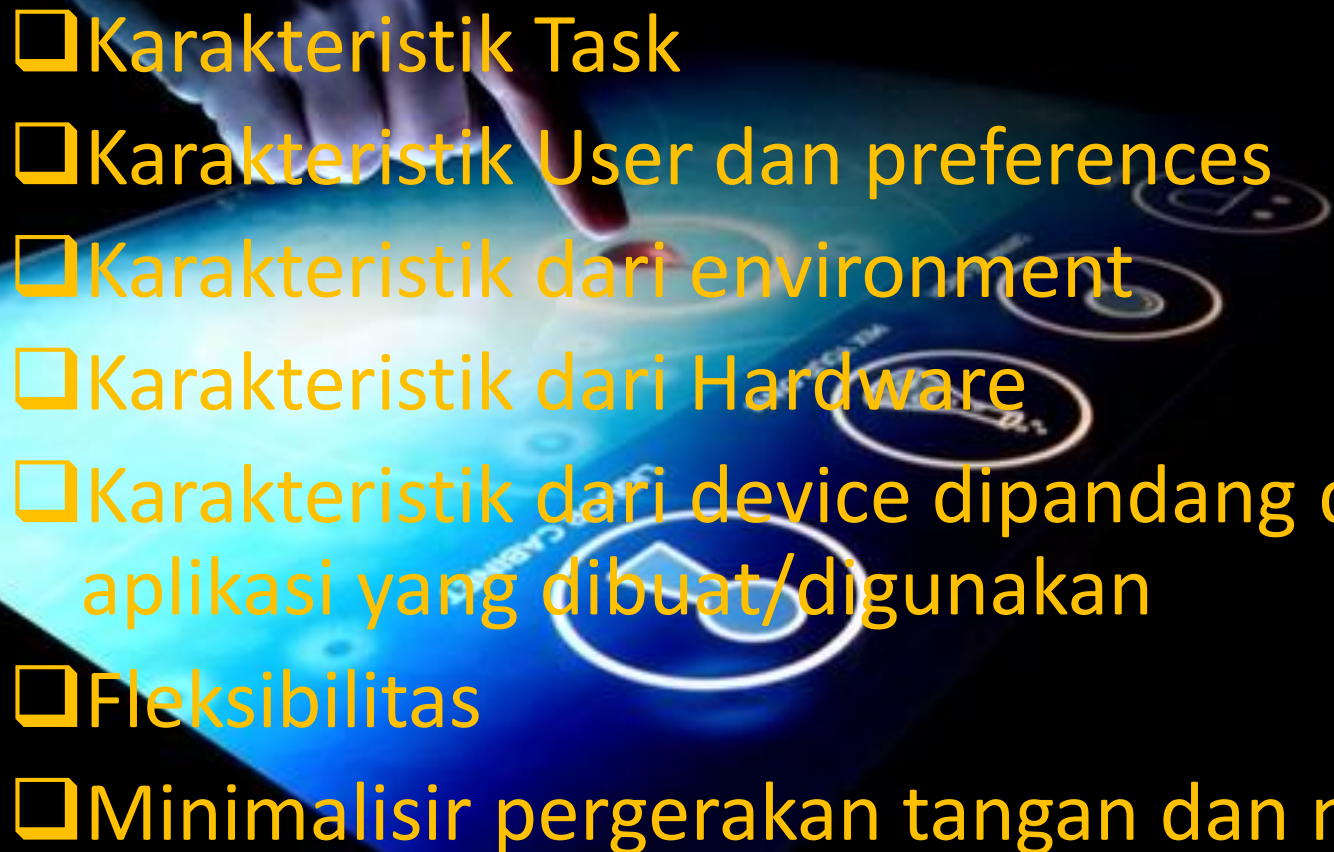


# SELECTING THE PROPER **INPUT DEVICE**

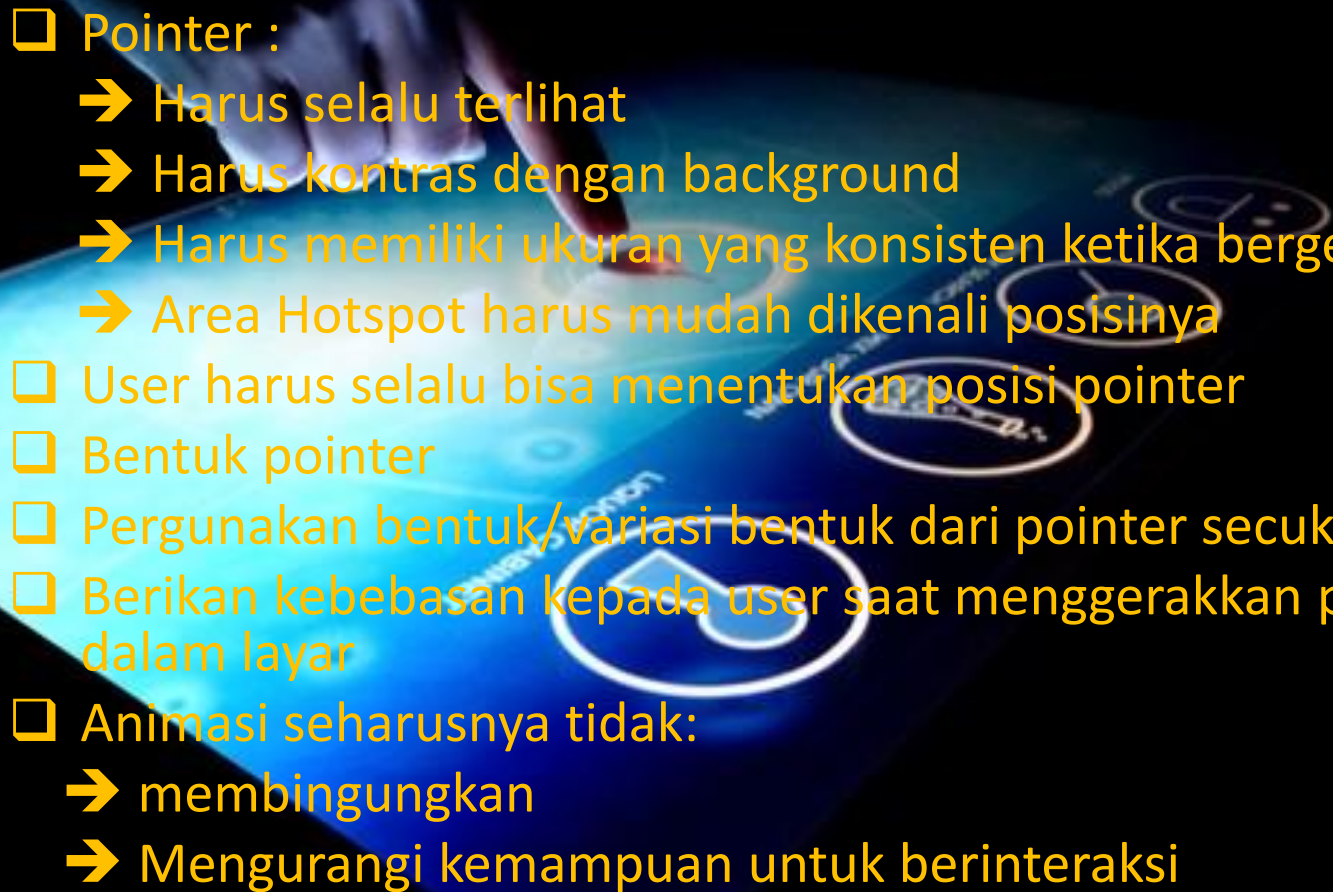




# Panduan dalam memilih Input device yang sesuai

- 
- ☐ Karakteristik Task
  - ☐ Karakteristik User dan preferences
  - ☐ Karakteristik dari environment
  - ☐ Karakteristik dari Hardware
  - ☐ Karakteristik dari device dipandang dari aplikasi yang dibuat/digunakan
  - ☐ Fleksibilitas
  - ☐ Minimalisir pergerakan tangan dan mata

# Pointer Guidelines

- 
- ❑ Pointer :
    - ➔ Harus selalu terlihat
    - ➔ Harus kontras dengan background
    - ➔ Harus memiliki ukuran yang konsisten ketika bergerak
    - ➔ Area Hotspot harus mudah dikenali posisinya
  - ❑ User harus selalu bisa menentukan posisi pointer
  - ❑ Bentuk pointer
  - ❑ Penggunaan bentuk/variasi bentuk dari pointer secukupnya
  - ❑ Berikan kebebasan kepada user saat menggerakkan pointer di dalam layar
  - ❑ Animasi seharusnya tidak:
    - ➔ membingungkan
    - ➔ Mengurangi kemampuan untuk berinteraksi

# Output Device

- Screen

- ➔ Image

- ➔ Color

- ➔ Size

- Speaker

Penggunaan Sound bisa berupa simple beep, speech, music dan sound effect.

