



# Chapter 6

## HCI in the Software Process

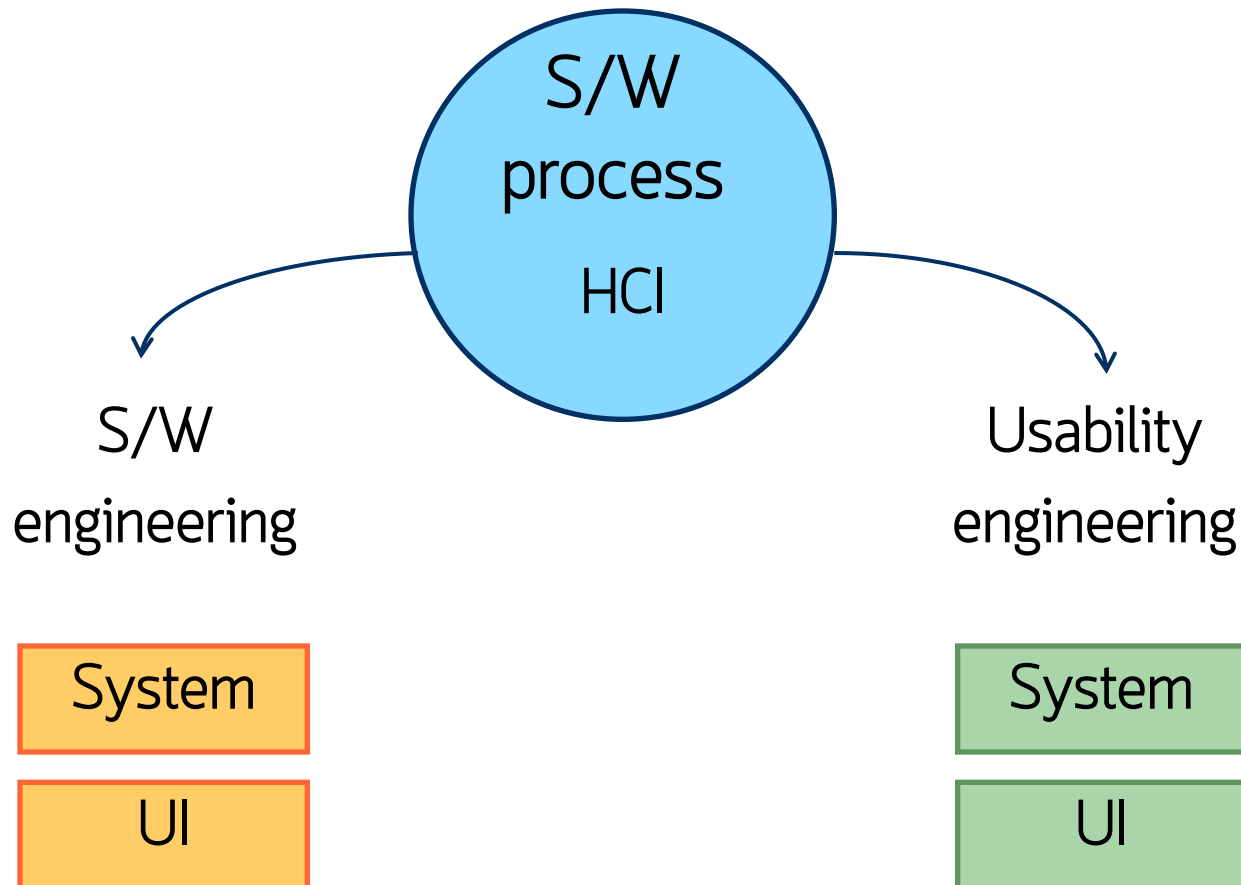
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Reference :

1. Dix, A.J., Finlay, J.E., Abowd, G.D., and Beale, R. 2004.  
Human - Computer Interaction, 3<sup>rd</sup> ed. Prentice Hall Europe.

2. ชุรี เตชะวุฒิ. 2560. การปฏิสัมพันธ์ระหว่างมนุษย์และคอมพิวเตอร์เพื่อการออกแบบ  
ประสบการณ์ในการใช้งานหลายอุปกรณ์. พงษ์สวัสดิ์การพิมพ์.  
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# Overview

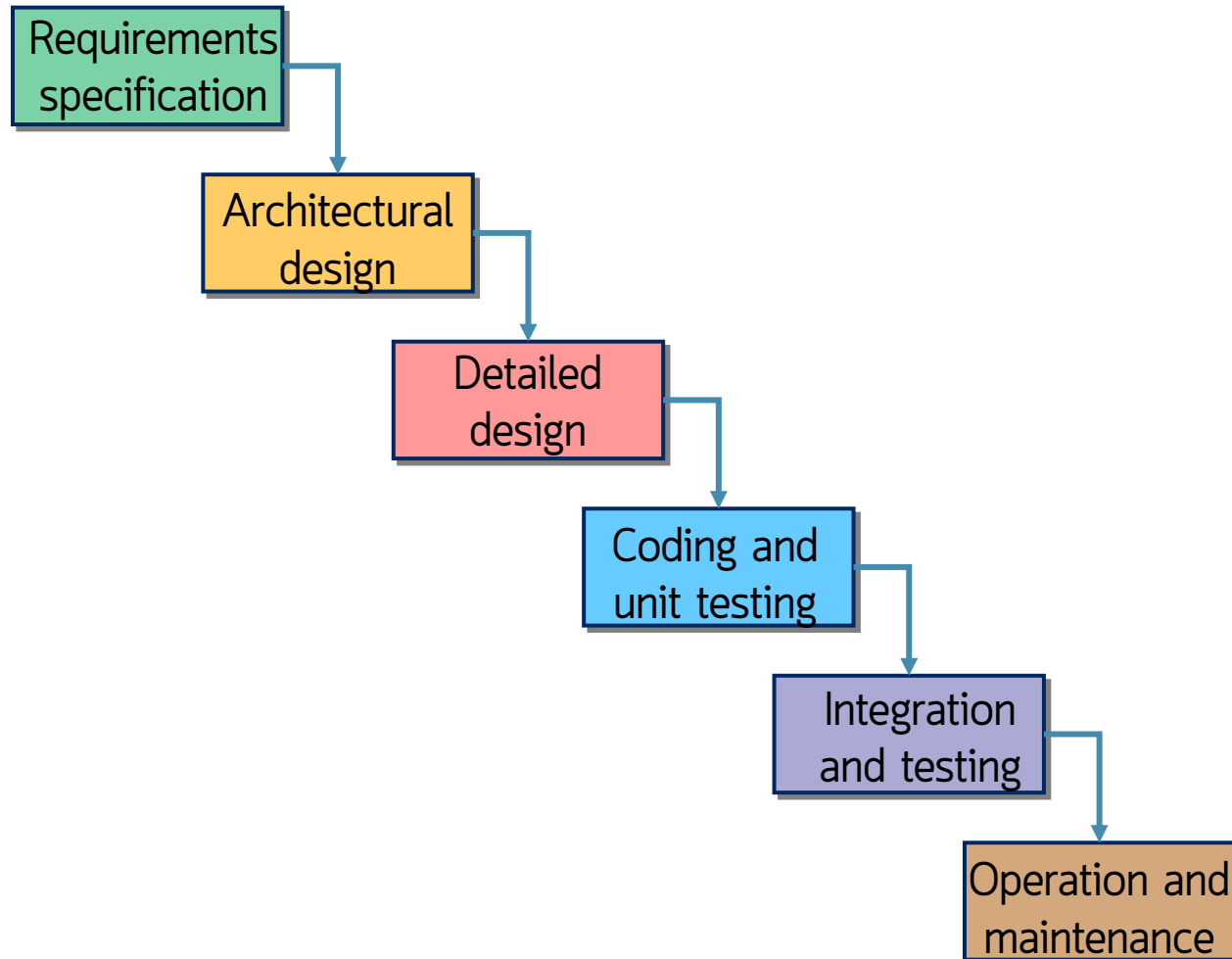


# Outline

- **S/W engineering**
  - Activities in the process
  - Verification and validation
  - The life cycle for interactive systems
- **Usability engineering**
  - ISO usability standard 9241

# S/W design process

- The waterfall model



# Activities in the process

## Requirements specification

Designer and customer try capture what the system is expected to provide  
Can be expressed in natural language or more precise languages, such as a task analysis would provide

## Architectural design

High-level description of how the system will provide the services required  
Factor system into major components of the system and how they are interrelated  
Needs to satisfy both functional and nonfunctional requirements

## Detailed design

Refinement of architectural components and interrelations to identify modules to be implemented separately  
The refinement is governed by the nonfunctional requirements

# Activities in the process

## **Coding and unit testing**

Implementing and testing the individual modules in some executable programming language

## **Integration and testing**

Combining modules to produce components from the architectural description

## **Operation and maintenance**

Product is delivered to customer and any problems/enhancements are provided by designer while product is still live

The largest share of the life cycle

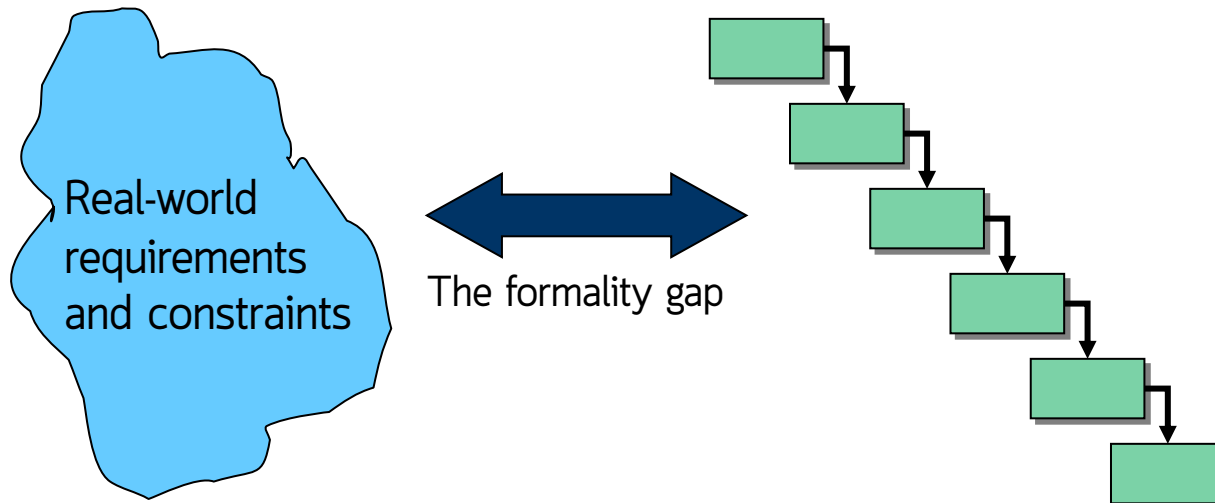
# Verification and validation

**Verification**

- designing the product right

**Validation**

- designing the right product

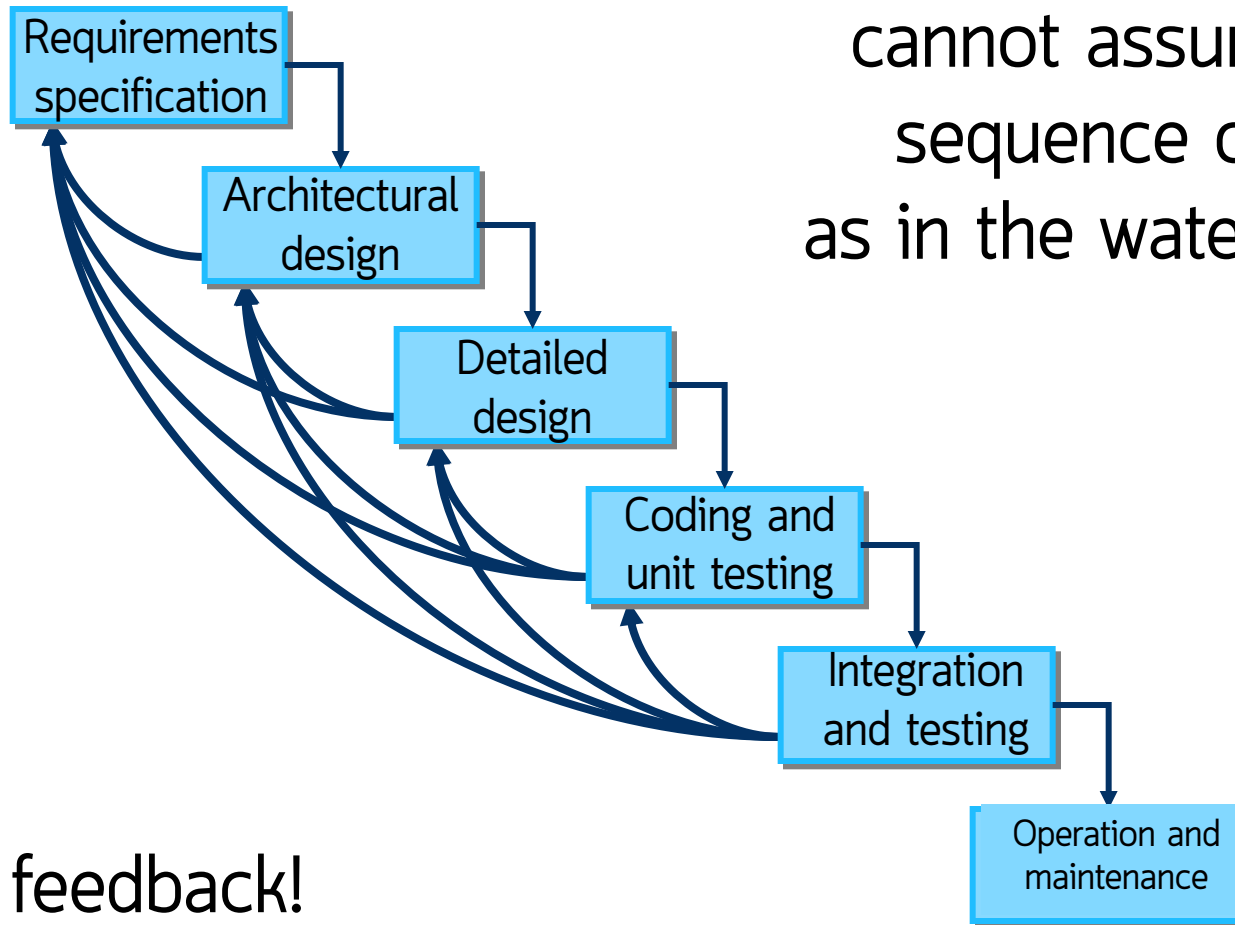


**The formality gap** - validation will always rely to some extent on subjective means of proof

**Management and contractual issues** - design in commercial and legal contexts

# The life cycle for interactive systems

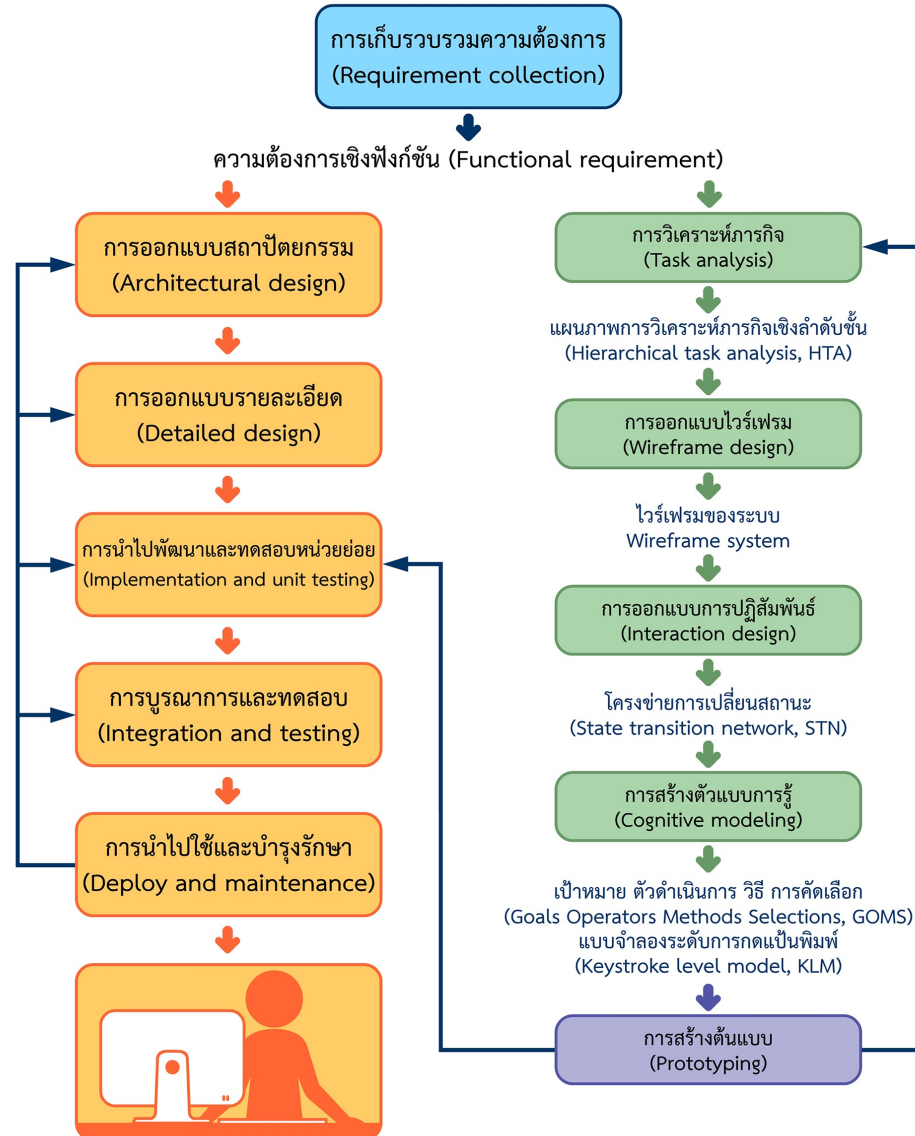
cannot assume a linear sequence of activities as in the waterfall model



lots of feedback!



# วงจรชีวิตการพัฒนาซอฟต์แวร์ และกระบวนการออกแบบการปฏิสัมพันธ์



# Usability engineering

The ultimate test of usability based on measurement of user experience

Usability engineering demands that specific usability measures be made explicit as requirements

## Usability specification

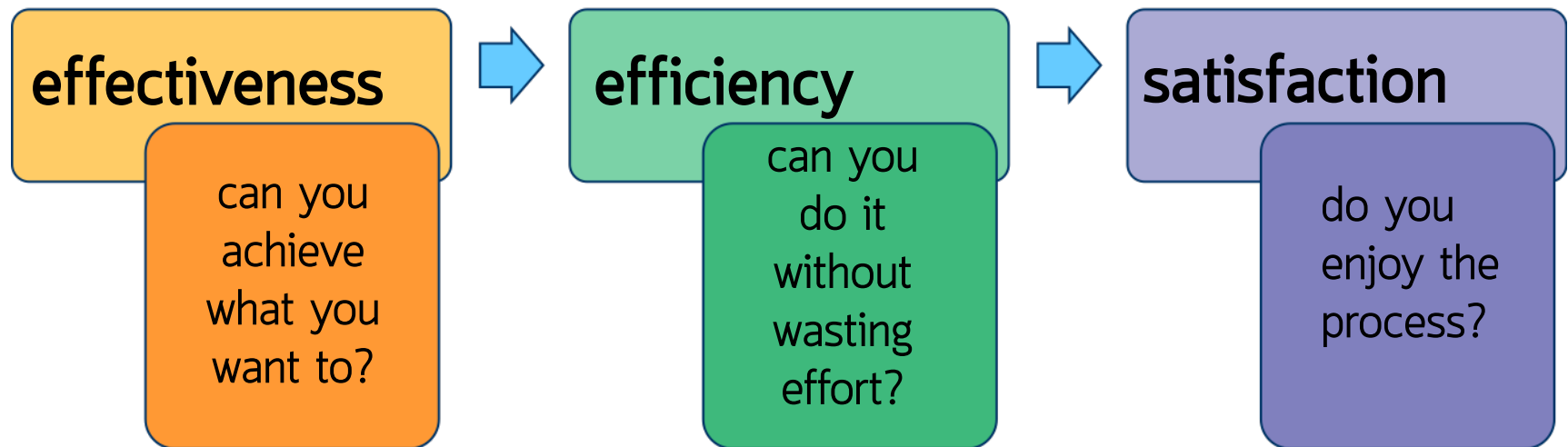
- usability attribute/principle
- measuring concept
- measuring method
- now level/ worst case/ planned level/ best case

## Problems

- usability specification requires level of detail that may not be
- possible early in design satisfying a usability specification
- does not necessarily satisfy usability

# ISO usability standard 9241

adopts traditional usability categories:



# ISO usability standard 9241

Usability objective	Effectiveness measures	Efficiency measures	Satisfaction measures
Suitability for the task	Percentage of goals achieved	Time to complete a task	Rating scale for satisfaction
Appropriate for trained users	Number of power features used	Relative efficiency compared with an expert user	Rating scale for satisfaction with power features
Learnability	Percentage of functions learned	Time to learn criterion	Rating scale for ease of learning
Error tolerance	Percentage of errors corrected successfully	Time spent on correcting errors	Rating scale for error handling

# Summary

- The software engineering life cycle
  - distinct activities and the consequences for interactive system design
- Usability engineering
  - making usability measurements explicit as requirements



# Questions and Answers