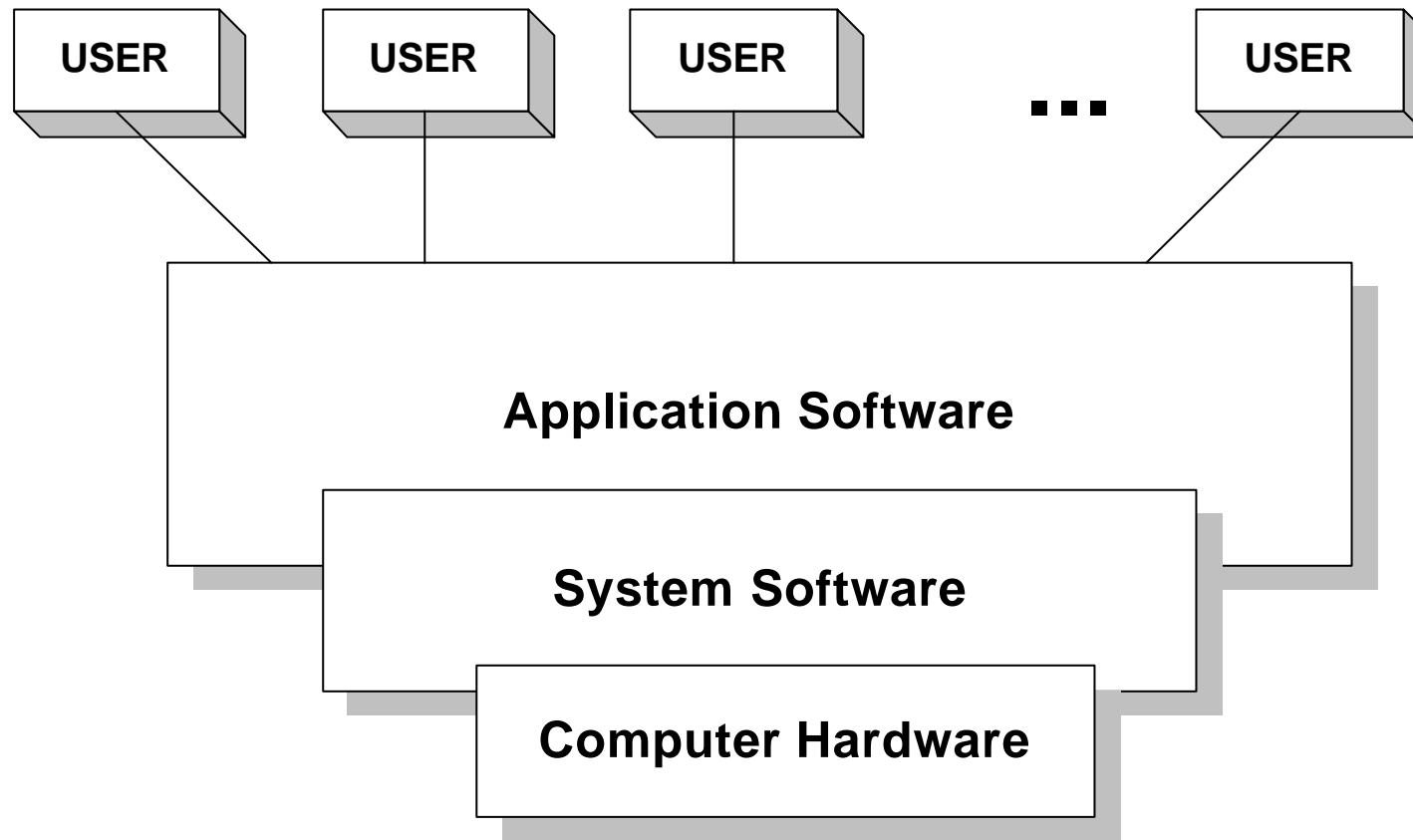# Pengantar Teknologi Informasi

# RPL

Santika WP

Departemen Teknik Informatika

Institut Teknologi Bandung

# Pengertian Dasar

- Abstraksi (*review*)



USER        USER        USER        ...        USER

**Application Software**

**System Software**

**Computer Hardware**

# Pendahuluan

- *Software* [ingat lagi !]
  - Aplikasi yang harus dikerjakan komputer, 2 jenis.

- *Software Engineering* (SE)
  - *The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software* **[IEEE Standard 610.12].**

- *Business software definition*
  - *Software for business is a huge industry. Software can make a business more efficient and improve the bottom line. Business software packages exist for many key functions of businesses. Business software can be off the shelf, or specially configured for the specific application.* [www.commerce-database.com/businesssoftware.htm]

# Pendahuluan

- Evolusi SW
  - Era-1
    - berorientasi *batch*, distribusi terbatas, *custom SW.*
  - Era-2
    - *multiuser, real time, database, product SW.*
  - Era-3
    - *distributed systems, embedded intelligence, low-cost HW, consumer impact.*
  - Era-4
    - *desk top systems, OO technologies, ES's, artificial neural networks, parallel computing.*

# Pendahuluan

- Karakteristik SW
  - *Developed / engineered* [*not manufactured*]
  - *Doesn't "wear out"*
  - *Custom-built* [*not assembled*]

- Aplikasi potensial
  - [*Computer*] *system* [*compiler, editor, ... *]
  - *Real-time*
  - *Business* [*discrete systems: payroll, inventory, ... *]
  - *Engineering & scientific*
  - *Embedded* [*microwave, fuel control, brake system, .. *]
  - *PC* [*wordpro, spreadsheets, ...... *]
  - *AI* [*ES, KBS, pattern recognition, ....... *]

# Pendahuluan

- Paradigma
  - *Waterfall model (classic life cycle)*
    - *system engineering, analysis, design, coding, testing, maintenance.*
  - *Prototyping (circle model)*
    - *requirements&refinements, quick design, prototyping, evaluation of prototype, refining prototype, engineer product.*
  - *Spiral model*
    - *planning, risk analysis, engineering, customer evaluation.*
  - *Fourth-Generation Techniques*
    - *requirements, design strategy, impl. using 4GL, testing.*
  - Kombinasi

# Manajemen Proyek

- Metrik
  - Proses: *objective&scope, measures&metrics, estimation, risk analysis, scheduling, tracking&control.*
  - Cara pengukuran: *size-oriented, function-oriented.*
  - Kualitas
    - faktor-faktor yang mempengaruhi: *operation, revision, transition.*
    - Pengukuran: *correctness, maintainability, integrity, usability.*
  - Faktor-faktor yang mempengaruhi produktifitas
    - manusia [struktur organisasi & keahlian]
    - tingkat kesulitan masalah
    - proses: teknik-teknik analisis & desain, bahasa & *CASE tools, review*
    - produk: *reliability & performance*
    - keberadaan sumber: *tools, HW, SW.*

# Manajemen Proyek

- Estimasi
  - Observasi [3D]: *complexity based on past efforts, size of effort, degree of structure, definition, variabolity.*
  - Objektif perencanaan proyek
  - Lingkup: fungsi [*cost&schedule*], kinerja [*processing & response time*], kendala [*SW vs HW available*], antarmuka [*HW, SW, BW, procedures*], kehandalan.
  - Sumberdaya: manusia [*skills, availability, tasks duration*], *HW, SW* [*tools: BSP, PM, support, A&D, programming, integration&testing, prototyping&simulation, maintenance, framework*],*reusability.*
  - Teknik dekomposisi
  - Model estimasi empirikal: *COCOMO, Putnam, Function-point.*
  - Automated: *BYL, WICOMO, DECplan,* .....

# Manajemen Proyek

- Perencanaan
  - *Risk analysis*: *identification, projection, assessment, management & monitoring.*
  - *Project scheduling*: *people-work relationships, task definition & parallelism, effort distribution, scheduling methods & example, project tracking & control.*
  - *Software acquisition*
  - *Software re-engineering*
  - *Organizational planning*
  - *Software project plan*

# Analisis Kebutuhan Sistem & SW

- *Computer-based Systems*
  - *HW, SW, BW, IW [DB & doc., procedures]*
- *Computer Systems Engineering*
  - *HW, SW, DB*
- *System Analysis*
  - *Need identification, feasibility study, economic analysis, technical analysis, trade-offs.*
- *System Architecture Modeling*
  - *Diagram, specification*
- *Modeling & Simulation*
- *System Specification*

# Analisis Kebutuhan Sistem & SW

- ## Analisis Kebutuhan
  - *Analysis tasks: problem recognition, evaluation & synthesis, modeling, review.*
  - *Analyst*

- ## Lingkup Masalah

- ## Teknik Komunikasi
  - *Process initiating*
  - *Facilitated Application Specification Techniques* (FAST).

- ## Prinsip-prinsip analisis
  - *Information domain, modeling, partitioning, essential & implementation views.*

# Analisis Kebutuhan Sistem & SW

- *Software Prototyping*
  - *Scenario [6 steps]*
  - *Methods & tools*
- *Specification*
  - *8 Principles*
  - *Representation*
  - *SW requirements specification*
- *Basic Notation [of structured analysis]*
  - *DFD & other structured methods*
- *Mechanics [of structured analysis]*
- *Requirements Dictionary*
- *Structured Analysis & Case*

# Analisis Kebutuhan Sistem & SW

- *Object-oriented*
  - *Concept*
  - *Analysis Modeling*
  - *Data Modeling*
- *Alternative analysis techniques & formal methods*
  - *Requirement analysis*
  - *Data structured-oriented*
  - *System development*
  - *Formal specification techniques*
  - *Automated techniques*

# Desain & Implementasi

- *Design Fundamentals*
- *Data-flow oriented design*
- *Object-oriented design*
- *Data-oriented design*
- *User interface design*
- *Real-time design*
- *Programming languages & coding*

# Desain & Implementasi

- *Integrity*
  - *Quality Assurance*
  - *Testing Techniques*
  - *Testing Strategies*
  - *Maintenance*
  - *Configuration Management*
- *Role of Automation*
  - *CASE*
  - *Integrated case envoronment*
  - *Road head*