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UNIVERSITY OF SCIENCE AND TECHNOLOGY OF SOUTHERN PHILIPPINES

COLLEGE OF INFORMATION TECHNOLOGY AND COMPUTING

ELECTIVE 4 (IT 415)

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If you have a positive attitude and constantly strive to give your best effort, eventually you will overcome your immediate problems and find you are ready for greater challenges.

Pat Riley

Topic 1: Introduction to Information Systems Development and Management

Objectives

By the end of this topic, students will be able to:

- Understand the concept of information systems analysis and design, and systems development life cycle (SDLC).
- Explain the importance of software engineering and its techniques.
- Describe the concept of outsourcing, different source of software and evaluate off-the-shelf software.

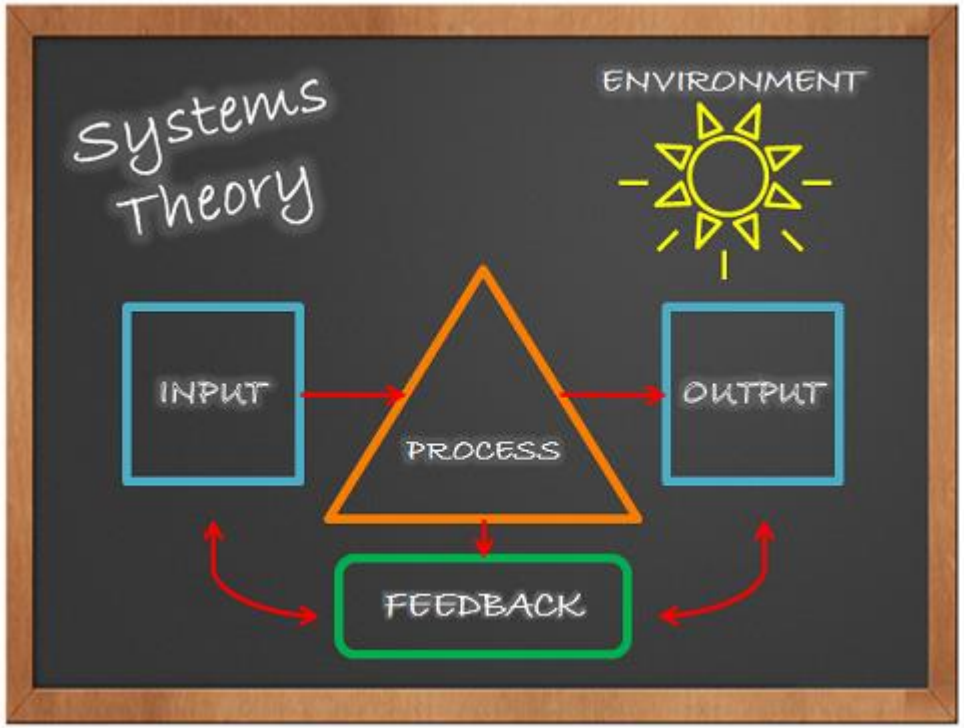
Overview

1. Roles and Importance of Information Systems
2. Introduction to Software Engineering
3. Origins of Software

What is a System?

General System Theory

Definition: A system is a set of components that interact with one another and serve for a common purpose or goal



What is an Information System?

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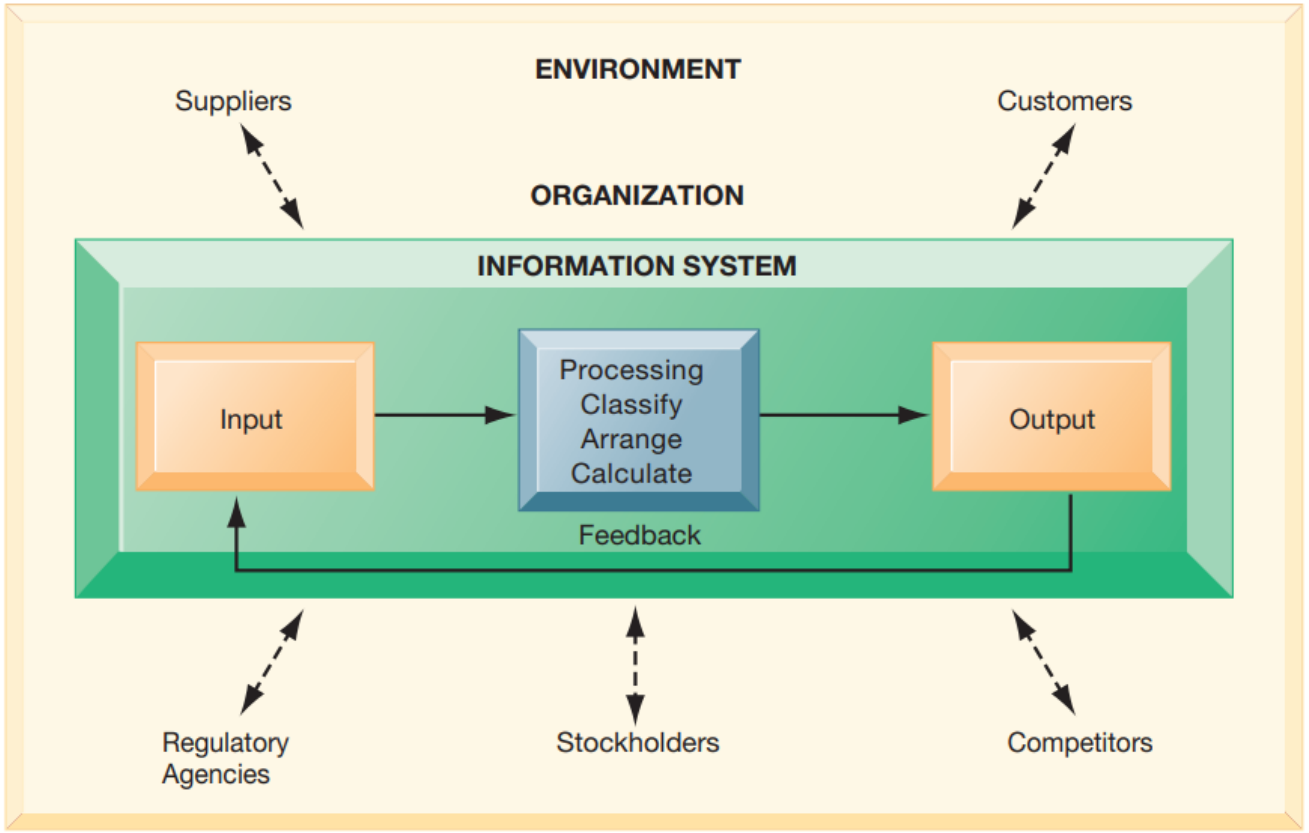
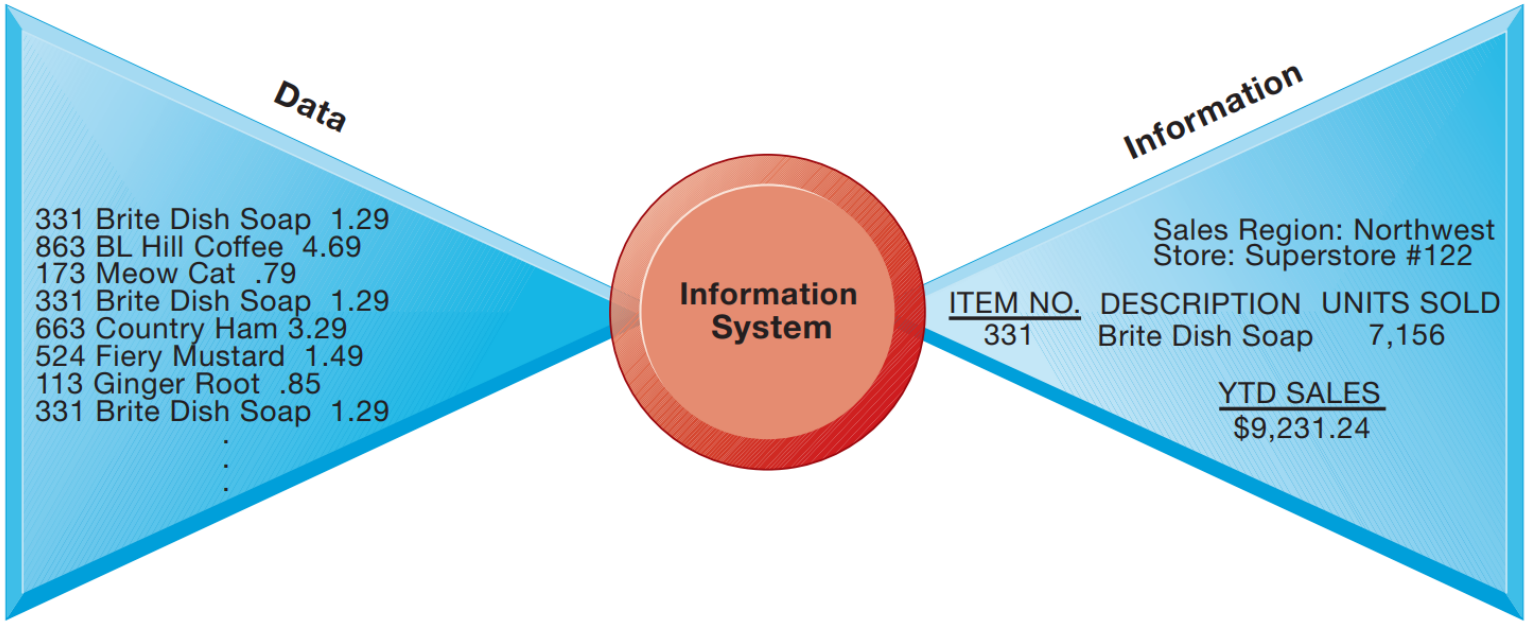


An information System is...

- A set of interrelated components
- Collect, process, store, and distribute information
  - By computers and software as a tool
- Support decision making, coordination, control, problem analysis and create new product
- Provide solutions to challenges in business environment.

Information vs. Data

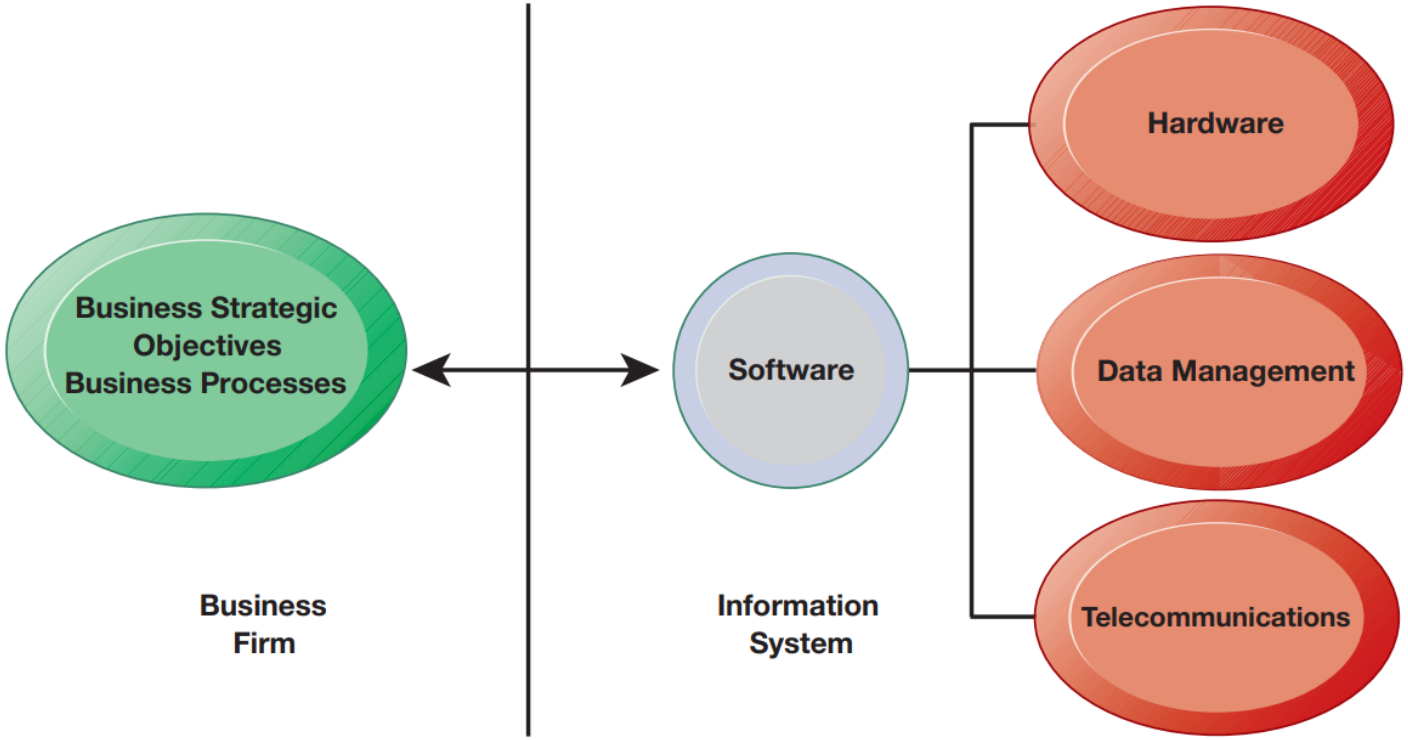
- Data are streams of raw facts.
- Information is data shaped into meaningful form.



Source: K.C. Laudon and J.P. Laudon: Management Information Systems: Managing the Digital Firm (15th Edition), Pearson

Importance of Information System in Organizations and Business

The Role of Information System in Business Today



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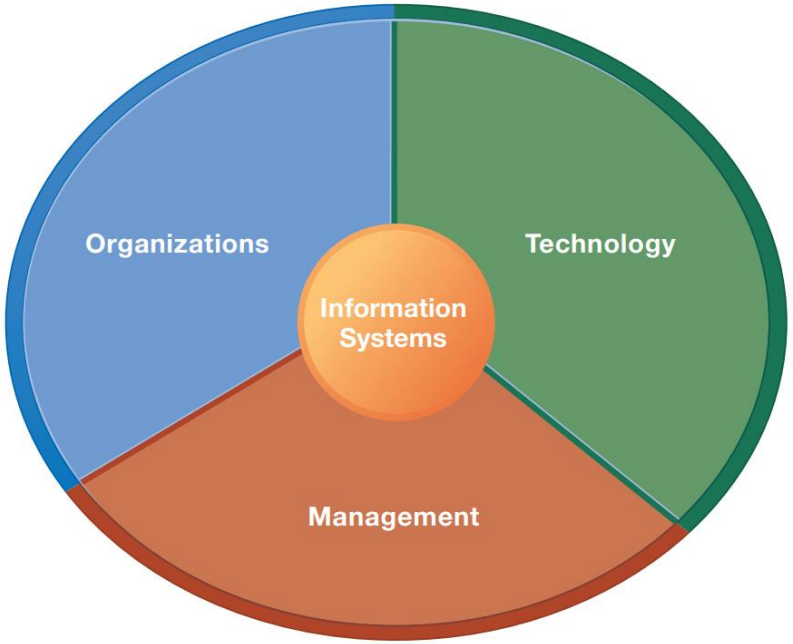
The Role of Information System in Business Today



Information Systems Are More Than Computers

Using information systems effectively requires an understanding of the organization, management, and information technology shaping the systems.

An information system creates value for the firm as an organizational and management solution to challenges posed by the environment.

Source: K.C. Laudon and J.P. Laudon: Management Information Systems: Managing the Digital Firm (15th Edition), Pearson

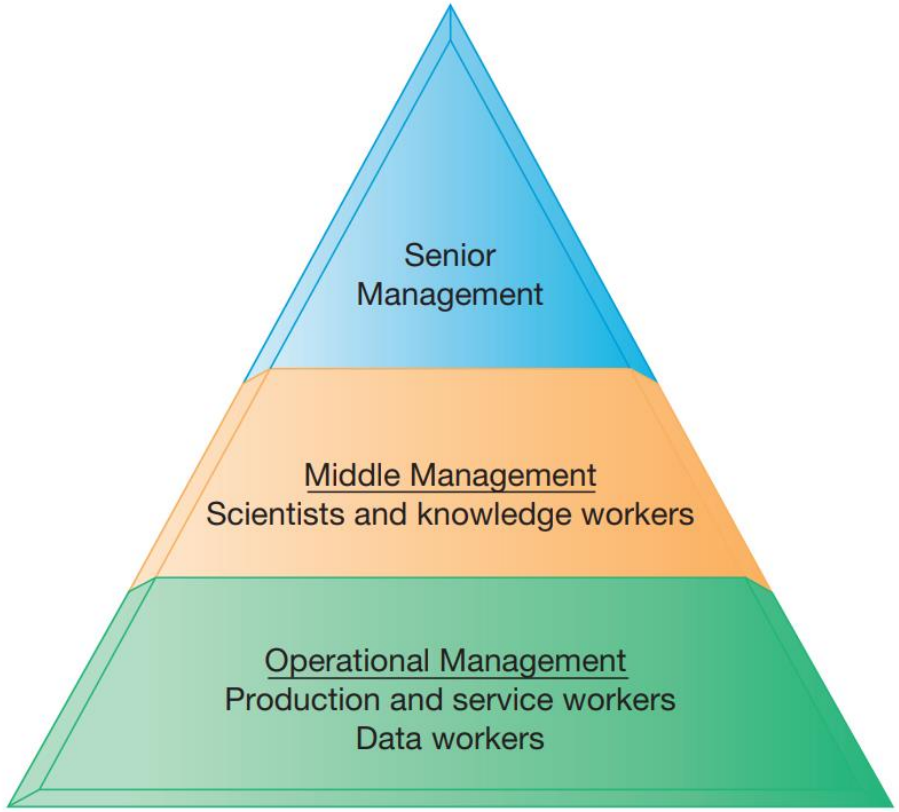
Perspective on Information System

Levels in a Firm

Business organizations are hierarchies consisting of three principal levels:

- senior management
- middle management, and
- operational management

Information systems serve each of these levels. Scientists and knowledge workers often work with middle management.



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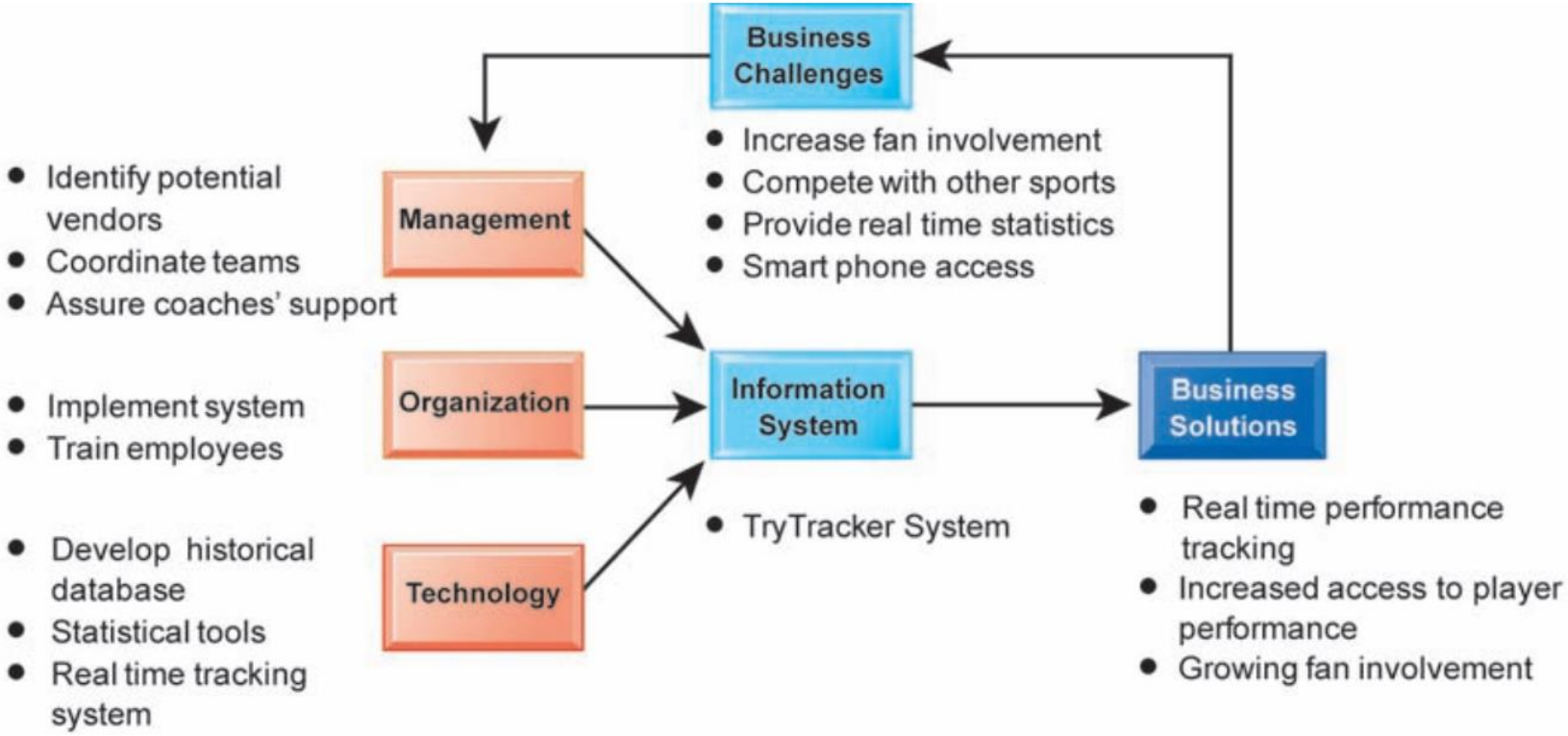
Perspective on Information System



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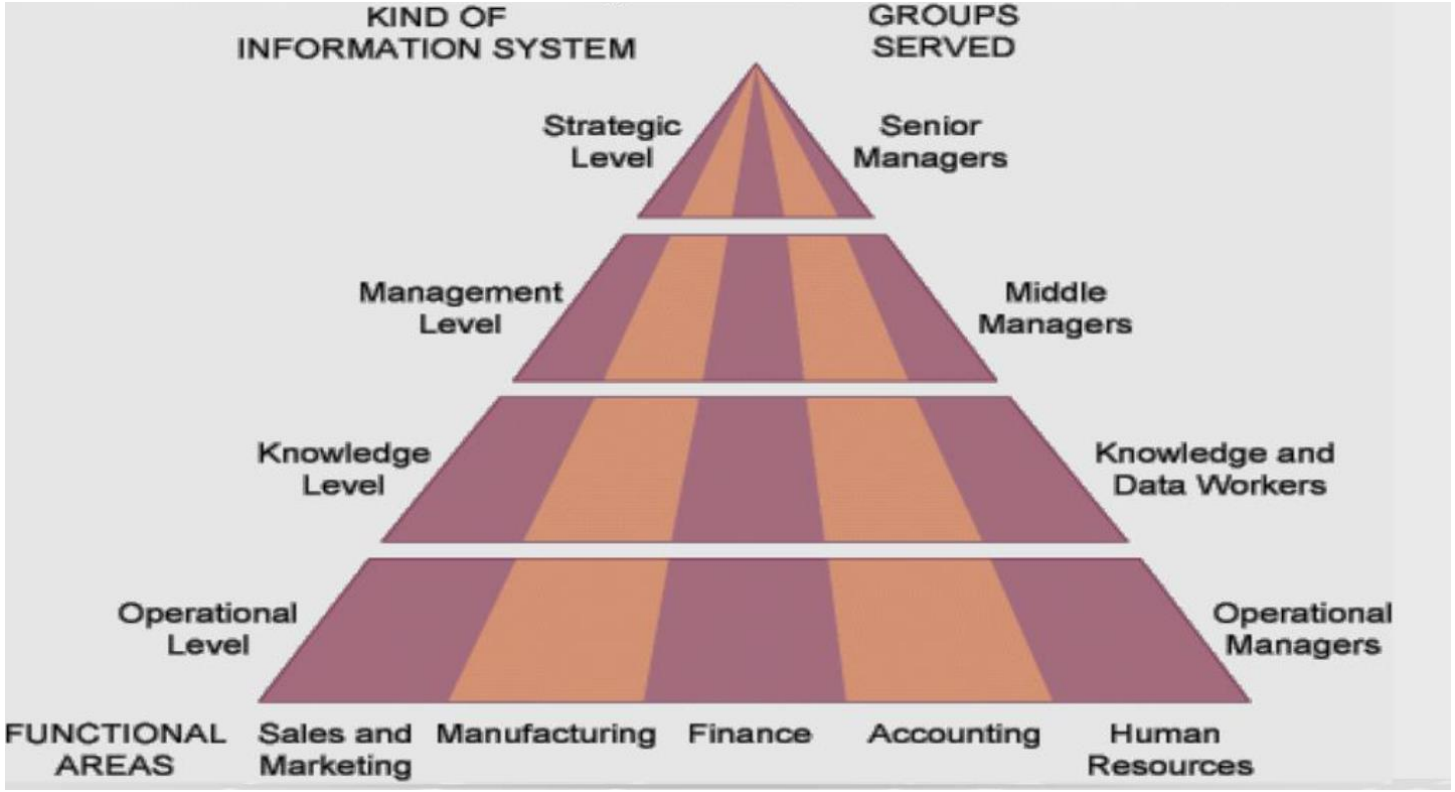
Types of Information System



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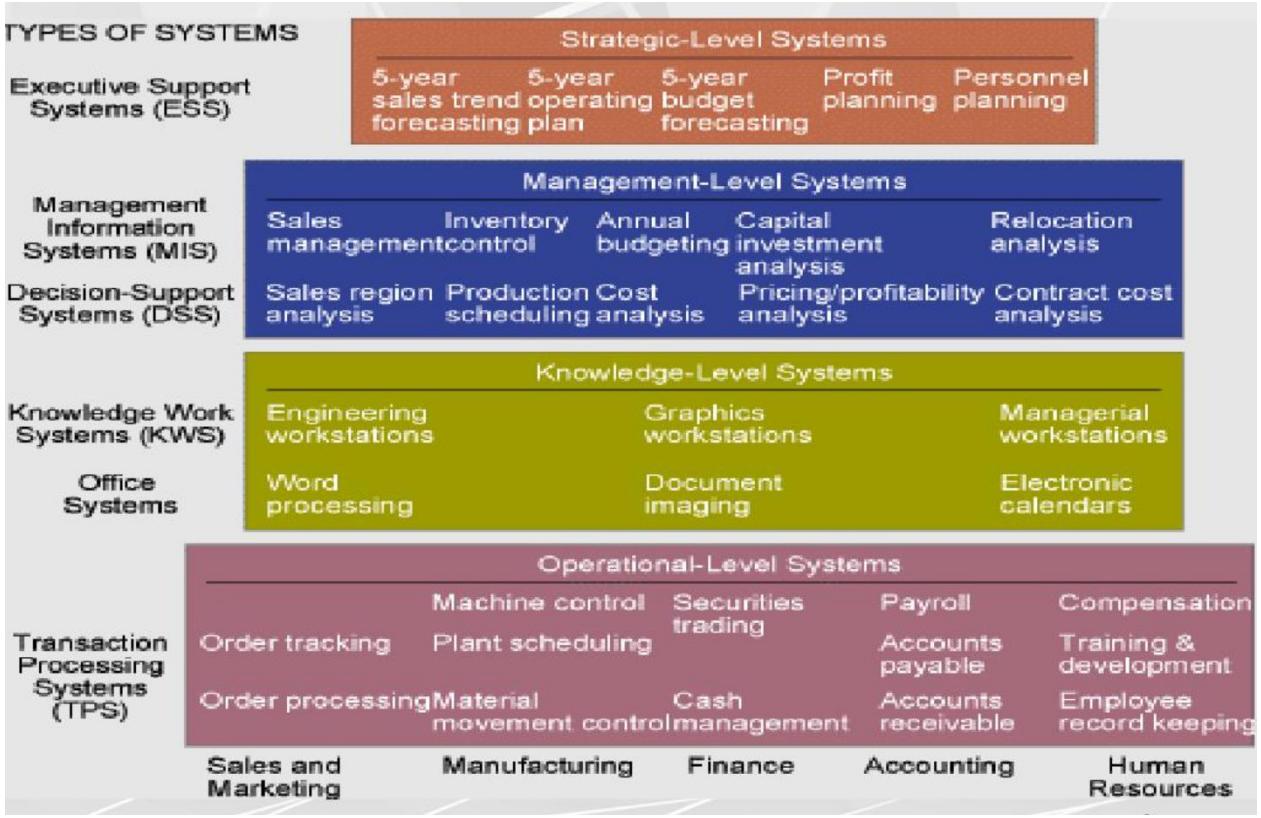

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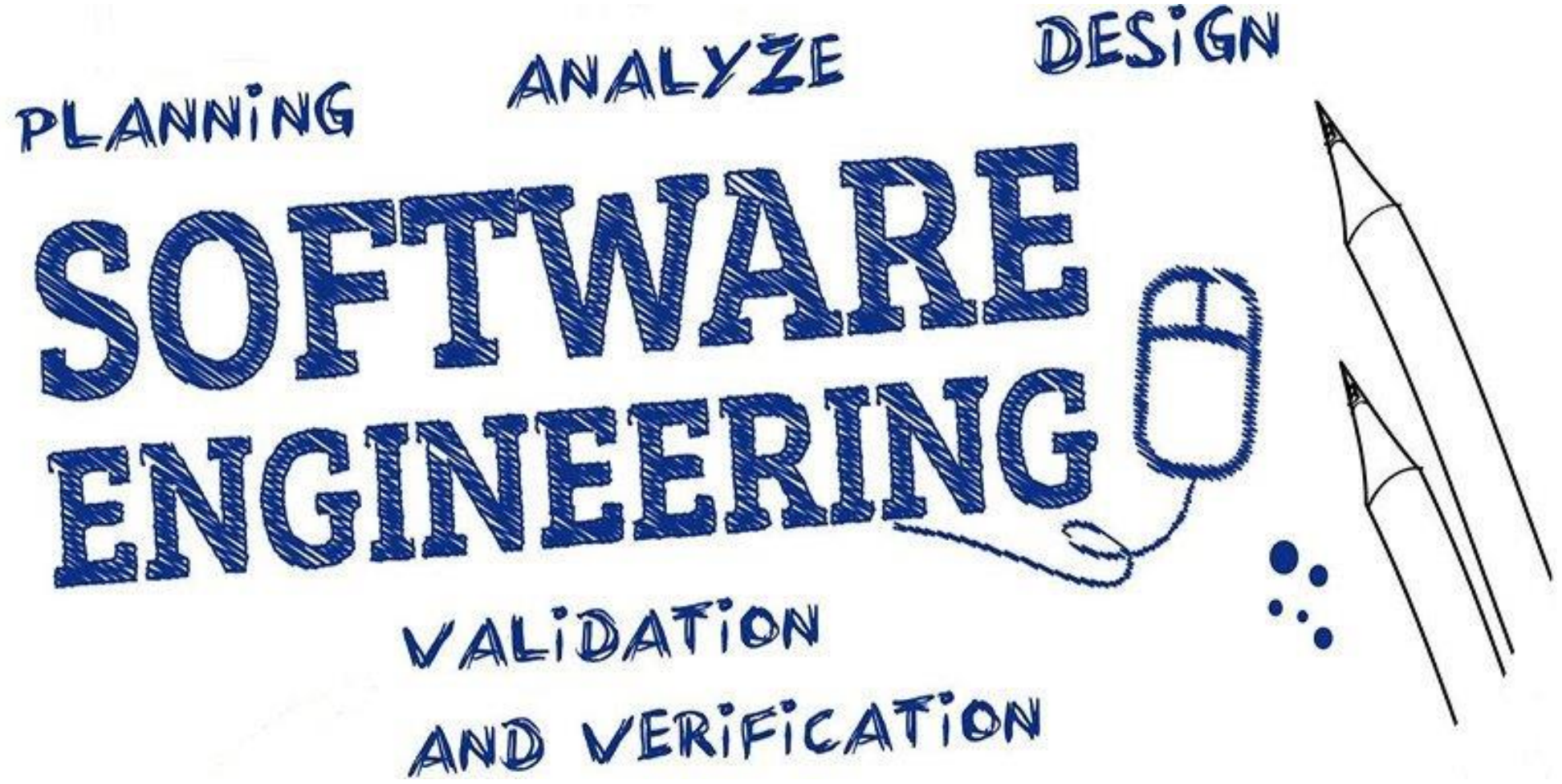
Software Engineering



FAQ: Software Engineering

Question
1. What is software?
2. What are the attributes of good software?
3. What is software engineering?
4. What are the fundamental software engineering activities?
5. What are the key challenges facing software engineering?
6. What are the costs of software engineering?
7. What are the best software engineering techniques and methods?

Source: I. Sommerville: Software Engineering (10th Edition), Addison Wesley

FAQ: Software Engineering

Question	Answer
1. What is software?	Computer programs and associated documentation. Software products may be developed for a particular customer or may be developed for a general market.
2. What are the attributes of good software?	Good software should deliver the required functionality and performance to the user and should be maintainable, dependable and usable.
3. What is software engineering?	Software engineering is an engineering discipline that is concerned with all aspects of software production.
4. What are the fundamental software engineering activities?	Software specification, software development, software validation and software evolution.

Source: I. Sommerville: Software Engineering (10th Edition), Addison Wesley

FAQ: Software Engineering

Question	Answer
5. What are the key challenges facing software engineering?	Coping with increasing diversity, demands for reduced delivery times and developing trustworthy software.
6. What are the costs of software engineering?	Roughly 60% of software costs are development costs, 40% are testing costs. For custom software, evolution costs often exceed development costs.
7. What are the best software engineering techniques and methods?	While all software projects have to be professionally managed and developed, different techniques are appropriate for different types of system. For example, games should always be developed using a series of prototypes whereas safety critical control systems require a complete and analyzable specification to be developed. You can't, therefore, say that one method is better than another.

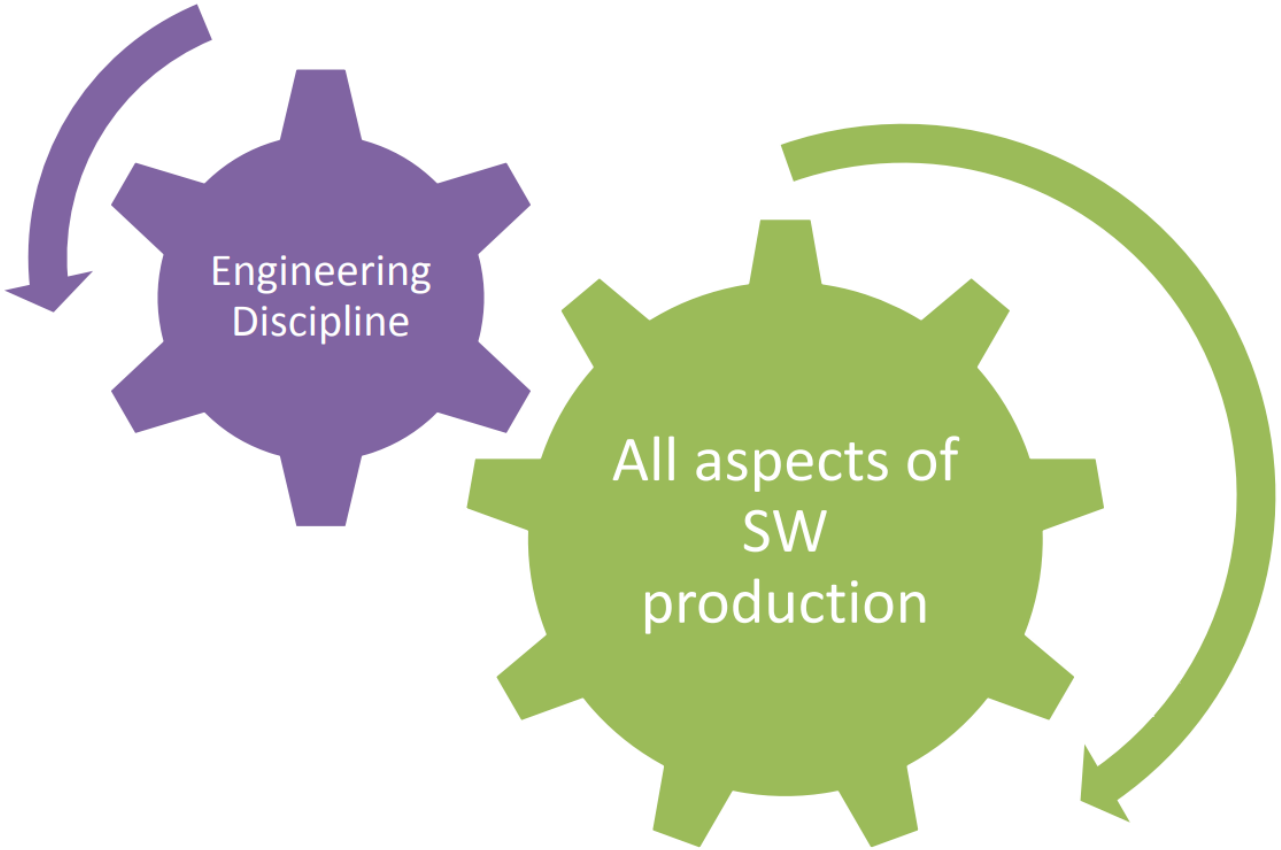
Source: I. Sommerville: Software Engineering (10th Edition), Addison Wesley

Essential attributes of good software

Maintainability	• Software should be written in such a way so that it can evolve to meet the changing needs of customers. This is a critical attribute because software change is an inevitable requirement of a changing business environment.
Dependability and security	• Software dependability includes a range of characteristics including reliability, security and safety. Dependable software should not cause physical or economic damage in the event of system failure. Malicious users should not be able to access or damage the system.
Efficiency	• Software should not make wasteful use of system resources such as memory and processor cycles. Efficiency therefore includes responsiveness, processing time, memory utilisation, etc.
Acceptability	• Software must be acceptable to the type of users for which it is designed. This means that it must be understandable, usable and compatible with other systems that they use.

Source: I. Sommerville: Software Engineering (10th Edition), Addison Wesley

Software Engineering



Importance of Software Engineering

Software Process Activities

Software Specification	Customers and engineers define the software that is to be produced and the constraints on its operation.
Software Development	The software is designed and programmed.
Software Validation	The software is checked to ensure that it is what the customer requires.
Software Evolution	The software is modified to reflect changing customer and market requirements.

Software Project Failure

Application Types

- Stand-alone
- Interactive transaction-based
- Embedded control systems
- Batch processing systems
- Entertainment systems
- Modeling and simulation

Sources of Software

Sources of Software

Sources of Software

TABLE 2-1 Leading Software Firms and Their Development Specializations

Specialization	Example Firms or Websites
IT Services	Accenture Computer Sciences Corporation (CSC) IBM HP
Packaged Software Providers	Intuit Microsoft Oracle SAP AG Symantec
Enterprise Software Solutions	Oracle SAP AG
Cloud Computing	Amazon.com Google IBM Microsoft Salesforce.com
Open Source	SourceForge.net

Criteria for Choosing Off-the-Shelf SW

Custom

VS

Off-The-Shelf

Criteria for Choosing Off-the-Shelf SW

- Cost
- Functionality
- Vendor support
- Viability of vendor
- Flexibility
- Documentation
- Response time
- Ease of installation


Q&A

Assignment 1

Write your answers on A4 paper (doc/docx format), with a font size of 12 pts and any serif fonts (i.e. Times New Roman). There is a 1inch margin on all sides.

Answer the following questions:

1. If you were setting up the website for a competitive soccer team, what management, organization, and technology issues might you encounter?
2. The “Drone Revolution” is currently being debated and discussed all over the world. Drones are unmanned flying machines that are built and equipped with various kinds of software systems that allow them to see, hear, and act. Discuss some of the societal challenges of building such kinds of systems.

Deadline: **September 17, 2021**

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