Maintenance and Management Information Systems
Chapter_1

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MAINTENANCE MANAGEMENT

- The process of overseeing **maintenance** resources so that the organization does not experience downtime from broken equipment or waste money on inefficient **maintenance** procedures.

- **Maintenance management** software programs can assist with the process.

MAINTENANCE MANAGEMENT

- **A maintenance information** system is a necessary part of a good maintenance program.
- Such a system makes the maintenance program more effective and reduces its cost in the long run.
- A suitable system allows the maintenance manager to gather data to support maintenance decisions.

MAINTENANCE MANAGEMENT

- Includes equipment failure data that may be fed back to designers or manufacturers, used for process hazard evaluation or sent to the purchasing department to support changes to specifications or to support the selection or avoidance of particular vendors or equipment types.
- The maintenance information system is also a valuable resource for the planning department to use when preparing job packages for future maintenance work.

Maintenance Information Management provides the following services:

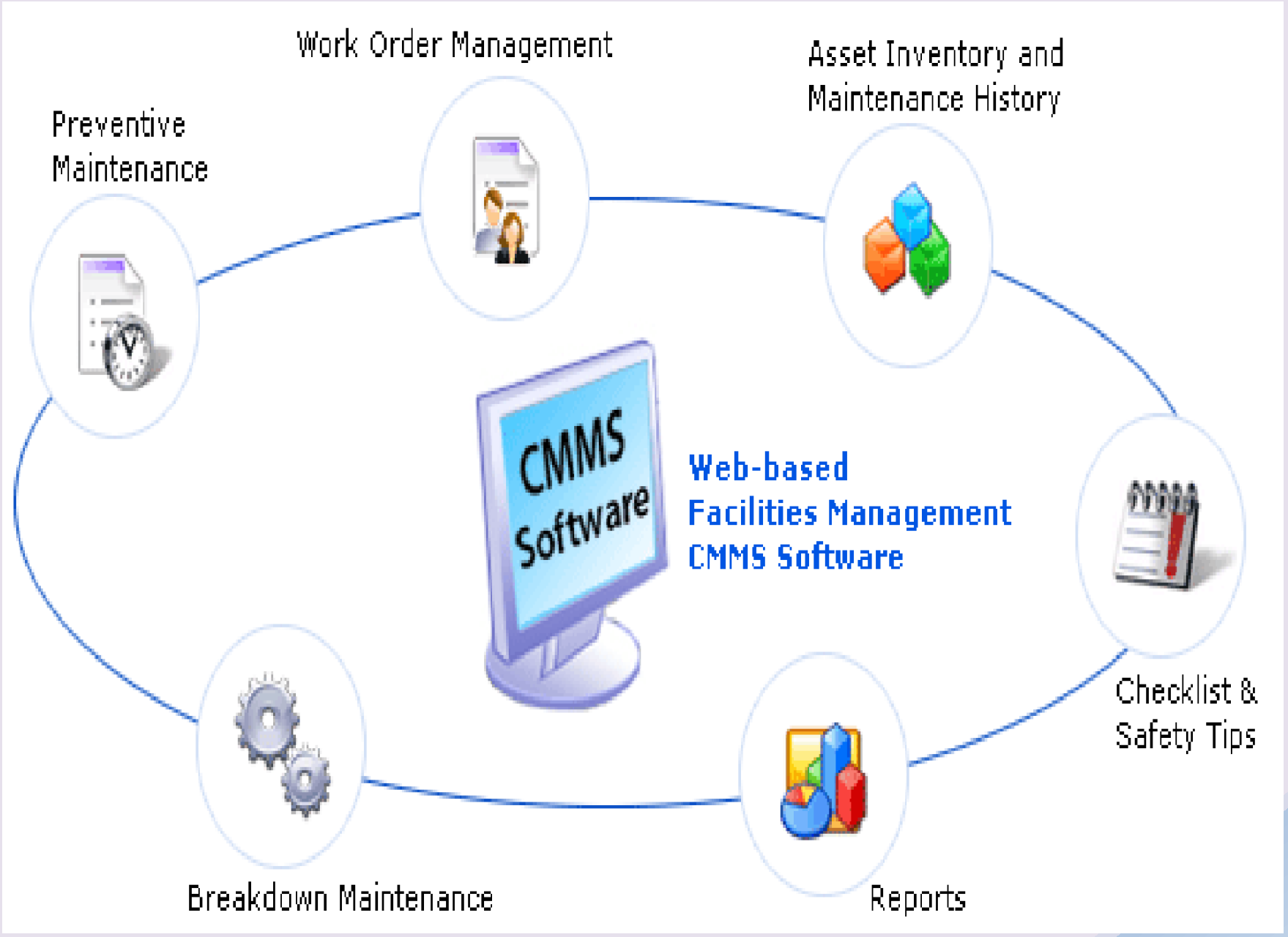
- An easily retrievable historical record for each major piece of equipment or group of similar equipment
- Equipment inspection and service schedules that specify the inspection and service scope and standards.
- A persistent follow-up or tracking system to ensure that proper inspection and maintenance service are being performed according to schedule.
- Programs to analyse the effectiveness and cost of inspection and maintenance procedures

What is CMMS Software?

- Computerized maintenance management software (CMMS), is a software package that helps users manage various maintenance tasks, inventory, and assets.
- CMMS provides a centralized database for all maintenance-related information by tracking work orders and maintenance costs.
- CMMS software is a Software-as-a-Service (SaaS) platform, meaning it is delivered via the internet and does not require installation of any software on your computer. It is accessed via a web browser on any internet-enabled device, such as a laptop, tablet, or smartphone.

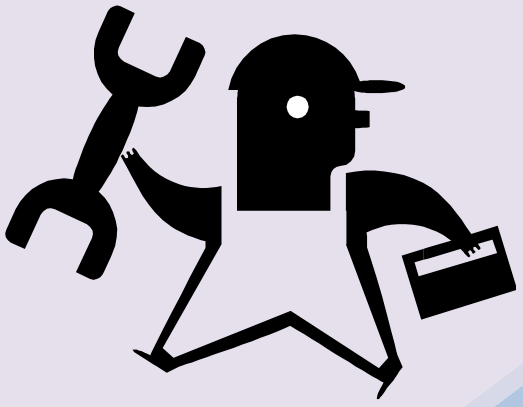
COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM

- Also known as computerized maintenance management information system (**CMMIS**)
- **software** package that maintains a computer database of information about an organization's maintenance operations
- **Information** is intended to help maintenance workers do their jobs more effectively (and to help management make informed decisions (for example, calculating the cost of machine breakdown repair versus preventive maintenance for each machine, possibly leading to better allocation of resources).
- **CMMS data** may also be used to verify regulatory compliance.


Work Order Management
Asset Inventory and Maintenance History
Preventive Maintenance
CMMS Software
Web-based
Facilities Management
CMMS Software
Checklist & Safety Tips
Breakdown Maintenance
Reports

Software Maintenance, definition

The process of modifying a software system or component after delivery to correct faults, improve performance or other attributes, or adapt to a changed environment



Maintenance is thus concerned with:

- correcting errors found after the software has been delivered
- adapting the software to changing requirements, changing environments, ...

Maintenance Management Process

- Maintenance management process is driven by a maintenance management system components of which are
- A maintenance policy
- Maintenance objectives and targets.
- A process manual
- A maintenance plan
- A maintenance schedule
- A maintenance budget

Systems Development Challenges

- Determining requirements
- Estimating schedule and budget
- Changing technology
- Diseconomics of scale
  - As the development teams become larger, the average contribution per worker decreases
  - Brooks's Law: adding more people to a late project makes the project later
  - Training and coordination

Types of System Development Methods

- Four major methods
  - Systems Development Life Cycle (SDLC)
  - Rapid Application Development (RAD)
  - Object Oriented Development (OOD)
  - Extreme Programming (EP)

- No single method works for all information systems

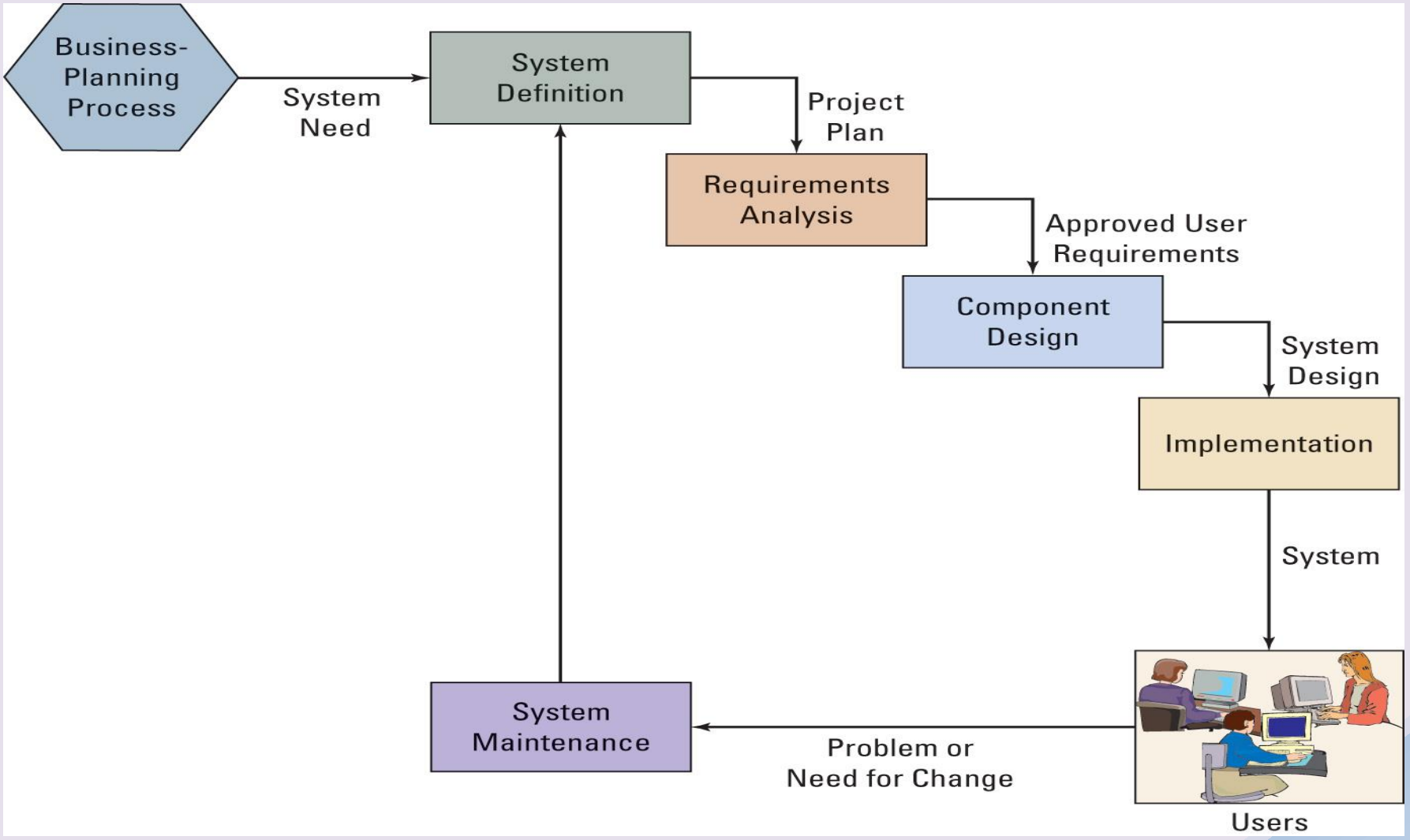
Comparison of Development Techniques

Systems Development Methodology	Scope	Advantages	Disadvantages
SDLC	All five components	• Comprehensive. • Addresses both business and technical issues. • Tried and tested.	• Requirements analysis may lead to analysis paralysis. • Waterfall nature unrealistic.
RAD	All five components	• Iterative nature reduces risk. • JAD improves design. • Use of prototypes and CASE tools increases productivity.	• Requirements analysis may lead to analysis paralysis. • Less suited to very large projects.
OOD with UP	Primarily object-oriented programs	• Use cases are effective requirements documents. • Risk moved forward to elaboration phase. • Each iteration terminates with a working system.	• Less useful for business systems development than for program development. • Danger of sinking into elaboration black hole.
Extreme Programming	Programs	• Customer (user) is always involved. • Paired programming improves quality and reduces risk. • Most useful when requirements evolve with systems development.	• Focus is on programming. • JIT design can require wasteful redesign. • Less useful when system involves many users having different, possibly conflicting, requirements.

Systems Development Life Cycle

- Classical approach
- Five phases
  - System definition
  - Requirements analysis
  - Component design
  - Implementation
  - Maintenance
- Problems

Five Phases in the SDLC



Maintenance Phase

- Fixing the system to work correctly or adapting the system to changes in requirements
- Tracking failure or enhancement requests for all five components
- Prioritize requests
- Fixing failures
  - Patch: high priority failures
  - Service pack: low priority failures
  - New release: major enhancements

System Maintenance Phase