UNIT-5

SOFTWARE MAINTENANCE AND SOFTWARE PROJECT ~~MANAGEMENT~~ MEASUREMENT

① **Need for maintenance** -
(1) Requirements are changing
(2) Environment changes
(3) Correct faults
(4) Improve the design
(5) Interface with other systems
(6) Replacement of old software

② **Types of software maintenance** -
(1) Corrective maintenance
(2) Adaptive maintenance
(3) Perfective maintenance
(4) Preventive maintenance

SCI → software configuration item

③ **Software configuration management (SCM)** -
It is a set of activities carried out for identifying, organizing and controlling changes throughout the life cycle of computer software.

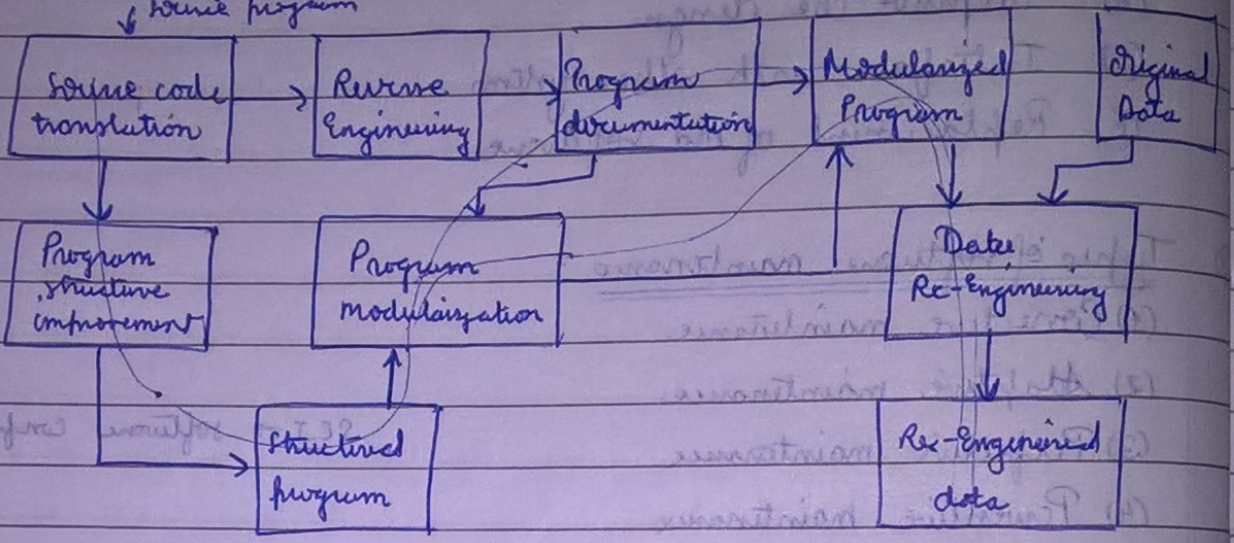
④ **SCM Process** - Various tasks carried out in SCM process are -
Identification ⇒ Each SCI must be named & identified as object.
Version control → combines procedure and tools to manage different versions of configuration objects
Change control →
change request indicate a change → configuration object is checked out
object is then 'checked in' ← changes are applied
Configuration audit → Assess the configuration object done by SQA group
Status Reporting → Report the changes.

⑤ Program comprehension techniques → are static analysis and dynamic analysis.

⑥ Re-engineering -

Re-structuring or re-writing part or all of the software engineering system.

Advantages → Reduced risk, Reduced cost.



⑦ Reverse Engineering -

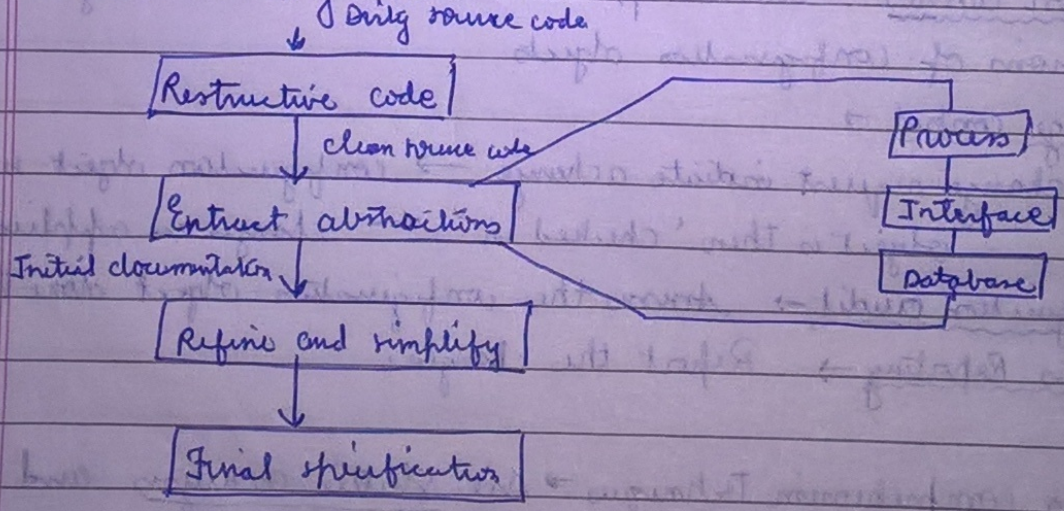
It is the process of design discovery. Data, architecture and procedural information is extracted from the source code.

Three levels are -

(1) Abstraction level

(2) Completeness level

(3) Directionality level



(8) CASE Tool support - (Computer Aided Software Engineering) ←
Automate the project management activities, manage all the work products.

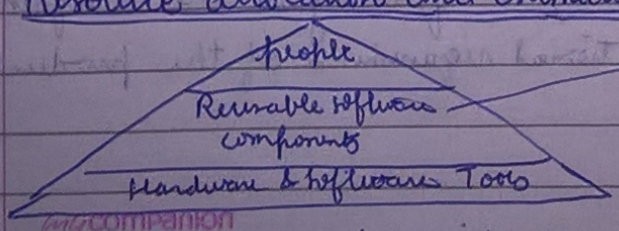
→ Classification of CASE Tools -
(1) Functionality Perspective
(2) Process Perspective
(3) Integration Perspective

(9) Project Management Concepts -
Software project management is an activity of organizing, planning and scheduling the software project.
Objective is to provide framework for the project.

(10) Feasibility Analysis / Study -
It is a test of the system according to its workability, impact of the organization, ability to meet user needs and effective use of the resources. There are as follows -
(1) Technical Feasibility - Front End and Back end selection
(2) Economical Feasibility
(3) Operational Feasibility
(4) Schedule Feasibility
(5) Behavioral Feasibility.

(11) Project and Process Planning -
Project planning is an iterative process and it gets completed only on completion of the project.

(12) Resource allocation and estimation -



Resource pyramid

→ Off the shelf, full experience partial experience, new components

→ Measure, metrics and indicators -

Measure - Amount, dimension, size of some attribute

Metrics - degree to which a system, component, process possess a given attribute

Indicators - Combination of metrics that provides insight into the sof

(19) Software measurement - Direct and Indirect.

a) Size oriented metrics

b) Function oriented metrics

c) Object oriented metrics

(20) Software Project Estimation Techniques -

(1) Empirical estimation technique (Educated guess of project parame

(2) Heuristic technique (COCOMO model → constructive cost model)

(3) Analytical estimation technique (certain basic assumption of project

(21) Project scheduling -

Estimate time and resource of the project

(22) Error tracking - It is a process of accessing the status of the software project

(23) Risk assessment - prepare set of questions that can be answe by project managers in order to access the overall project risks.

(24) Risk mitigation - preventing the risk to occur (risk avoida

(25) Software quality assurance (SQA) - quality is the conforman to functional and non functional requirements of the product.

(26) Project Plan – document that can be used to guide the execution of a project

(27) Project metrics – Every project should measure –
Inputs, Outputs and results,