SOFTWARE PROJECT MANAGEMENT

I **Project :** A temporary activity that is characterized by having

→ a start date

→ specific objectives and constraints

→ established responsibilities

→ a budget and a schedule

→ a completion date

If the objective of the project is to develop a software system, then it is called a software development project or software engineering project.

A successful project

→ started on start date   → adheres to budget and schedule

→ acheived objectives   → stops at completion date

→ respected constraints

Goal of Project Management

For a successful project, it delivers
- → defined results
- → in demanded quality
- → within scheduled time
- → using assigned resources

Secondary goals
- → build / strengthen good reputation on market
- → acquire knowledge useful for later projects
- → develop re-usable components (to save resources)
- → be attractive to employees

Common Activities

- * Planning
- * Communication
- * Assessment & Control
- * Leading and Motivating Employees
- * Recognizing and resolving issues ASAP
- * Creation and Preservation of Beneficial Conditions.

Planning

→ Without plans a project cannot be managed. Note: Planning mistakes are hard to resolve.

Communication

→ Distribute information between project participants (owner, customer, developer, admin)

Assessment and Control

→ Work results and project progress have to be assessed and compared to the plans. → ensure participants stick to agreements.

Leading

→ Showing the way, giving orientation and feedback to developers.

Recognising and fighting difficulties as early as possible

→ Project management needs to constantly "screen the horizon for icebergs" and react timely and effectively.

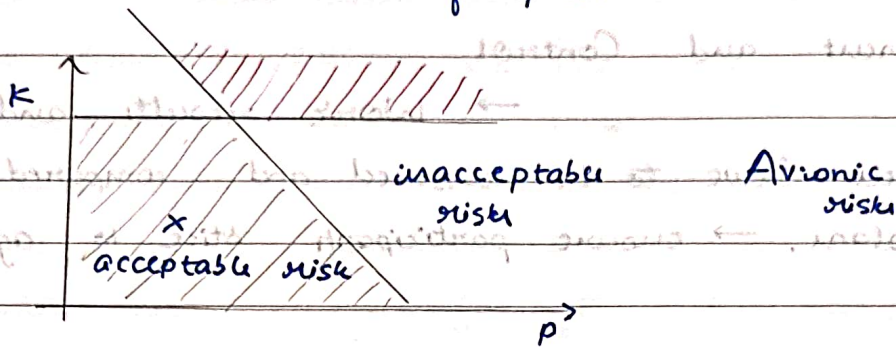## Creation and Preservation of Beneficial Conditions

→ Provide necessary infrastructure and working conditions for developers.

Risk : A problem, which did not occur yet, but on occurance threatens important project goals or results. Wether it will occur cannot be surely predicted.

$$\boxed{\text{Risk value} = p \cdot K}$$

p - probability of problem occurence
K - Cost in case of problem occurence

Ⅱ SOFTWARE DEVELOPMENT PROCESSES

PROJECT Characteristics   Developer 👤

→ Duration is limited   Customer 👤
→ Has an initiator / originator
→ Has a purpose   User 👤
→ Has a recipient

The organization determines roles of and relations between people / results / resources and the external interface of the project.

Process
1 Sequence of steps performed for a given purpose eg: software development process
2.

Software Development Process   IEEE

The process by which user needs are translated into a software product.

* The process involves translating user needs into software requirements, transforming software requirements to design, implementing the design in code, testing the code, and sometimes installing and checking out the software for operational use.

⇒ The process of software development project maybe
  * implicit
  * informally agreed upon
  * explicitly prescribed

Describing Software development Process

  * Role : Has responsibilities and rights
           Needs skills and capabilities
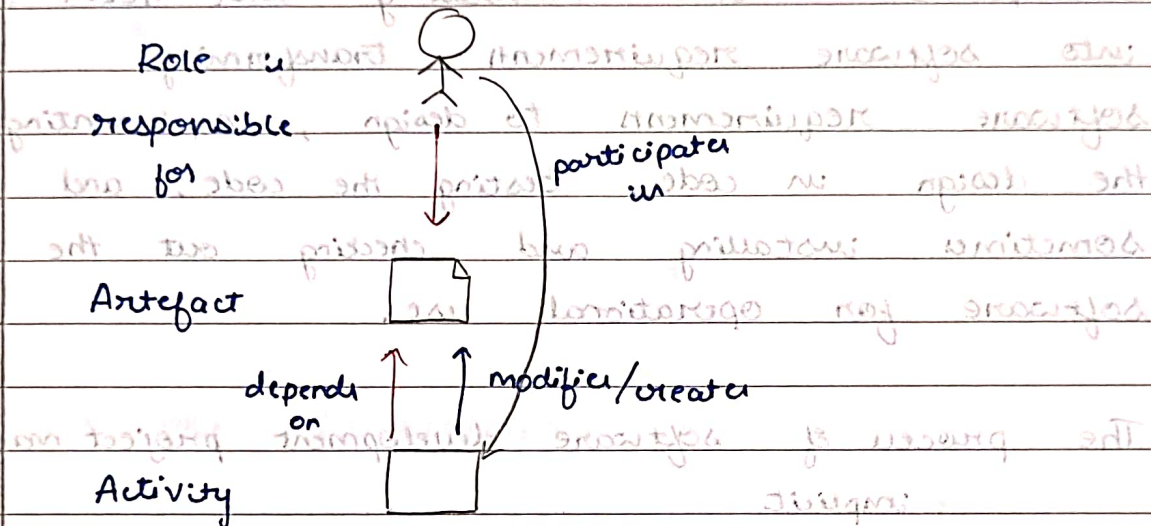
In particular : has responsibility for artefacts
                participates in activities

  * Artefact / Product : all docs, evaluation protocol
                          software modules etc.

All products emerging during software process.
Is processed by activities, may have state.

* <u>Activity</u> : any processing of artefacts,
manually / automatic ; solves task
Depends on artefacts , creates/modifies artefacts

Role is
responsible
for

Artefact

depends
on

modifies/creates

Activity

participates
in

The Concept of Roles

In a software project, at
each point in time, there is a set R
of (active) roles

$$R = \{ \boxed{mgr}, \boxed{prg}, \boxed{tst}, \boxed{anv} \}$$

A role has responsibilities and rights, and
necessary skills and capabilities.

Eg: $\boxed{mgr}$: Project manager

→ has the right to raise issue reports

→ is responsible for closing issue reports

[tst] : test engineer

→ has the right to raise issues

→ is responsible for quality control.

Given a set R of roles (eg R = { mgr , prg, tst , ana }

and a set P of people   eg   P = { ♀ ♀ ♀ ♀ }

each with skills or capabilities.

An aspect of project management is to assign

people to each role

$$assign : R \rightarrow 2^P$$

Such that each person p ∈ assign (r) assigned to role r

has skills and capabilities required by role r.

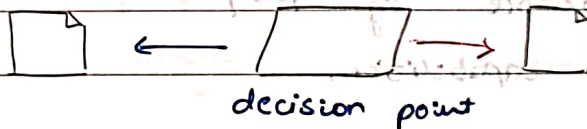Sanity Check :

Ensure that assign (r) ≠ φ for each r

Eg : We can assign

* one person one role

* multiple people one role

* one person multiple roles

Usefult and Common Rolu

→ customer , user   → system analyst

→ project manager   → software architect , deigner
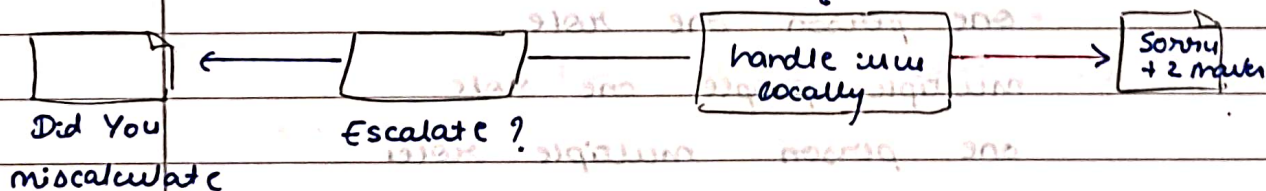
→ requirement engineer   → maintairance engineer

✗- Decision Point - special case of activity
a decision is made based on artefoct
(in a certain state) creates decision artefacts

decision point

Example for Procees

1   A post is handled locally by Tutor A

Fri : Student writes to tutor about poinst miscalculati:

Fri : Tutor decide that irrue can be handled
locally

Fri : Tutor writes to student - You get Two more poinn

< Tator A >
↓

handle iirue
locally

Sorny
+ 2 marks

Did You
miscalculate

Escalate ?

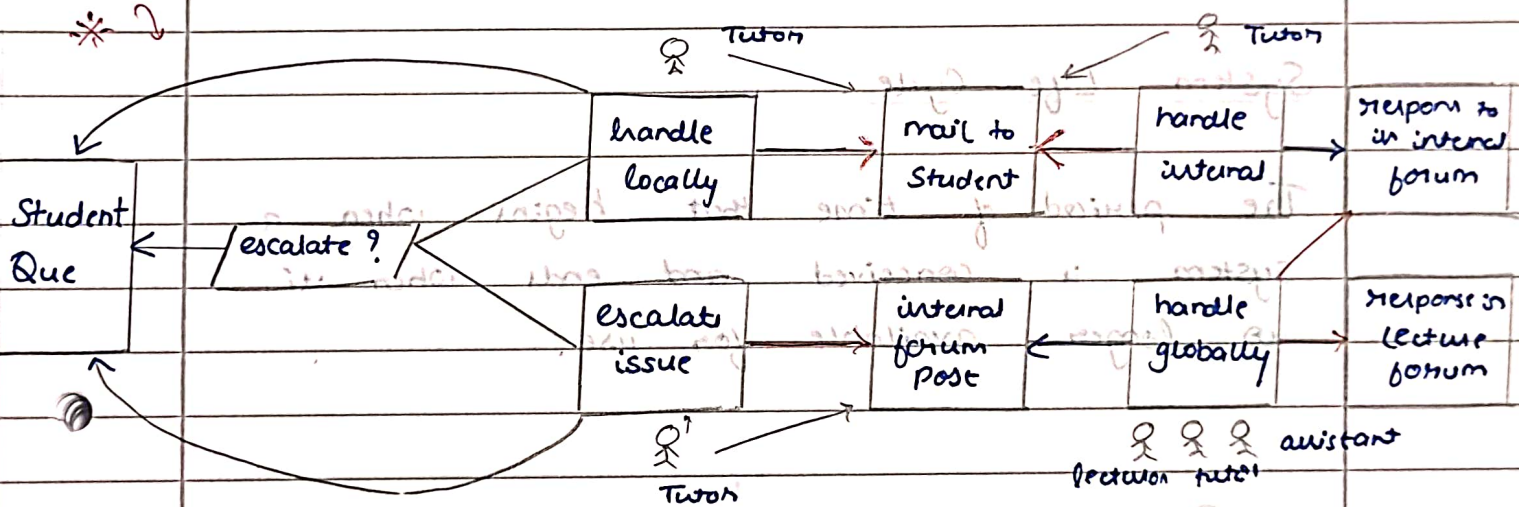# Software Project Planning

PROCESS MODELLING

A process model defines dependencies
→ which activities need to be available for which activity.

Note : A process model does not define
- when activity starts (date /time)
- activity A must be completed before B

Life and Life Cycle

Cycle : A period of time during which a set of events is completed.

Software Development Cycle

The period of time that begins with the decision to develop a software product and ends when software is delivered.

Software Life Cycle

The period of time that begins when a software product is conceived and ends when the software is no longer available for use.

System Life Cycle

The period of time that begins when a system is conceived and ends when it is no longer available for use.

Dev Cycle	Life Cycle
Cycle includes	Cycle includes
→ requirement phase	→ concept phase
→ design phase	→ dev cycle
→ implementation phase	→ operation maintainence
→ test phase	→ retirement phase
→ installation & checkout	