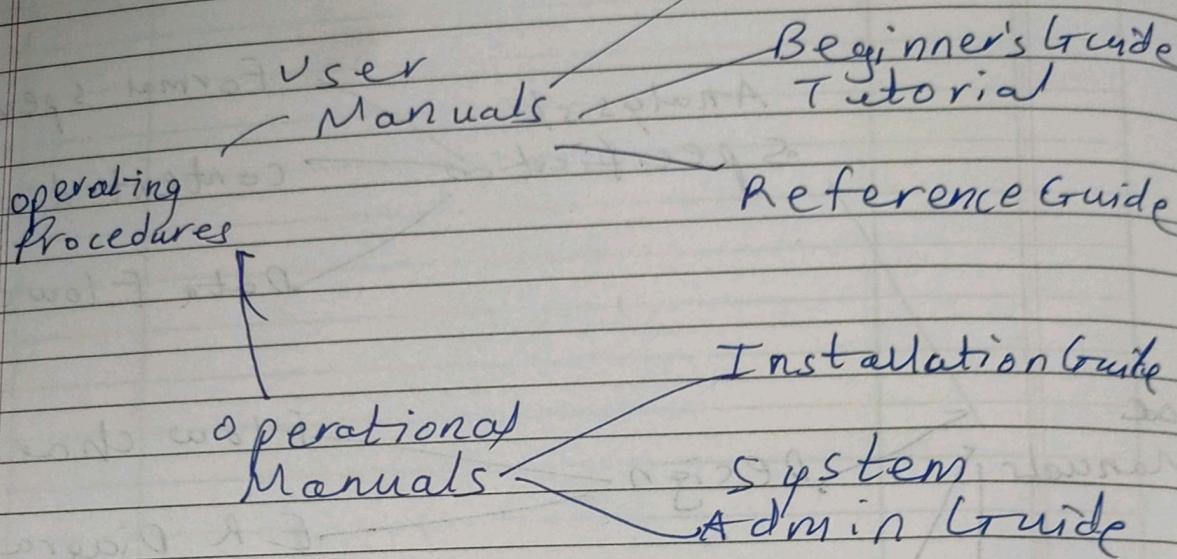


* Project Plan + Gantt chart

Assignment 1 → Formal specification
IEEE standards

System Overview



work product → deliverable
produced at a particular milestone

Fritz Bauer → The est. and use of sound eng. principles in order to obtain economically dev software that is reliable and works efficiently on real machines

Stephen Schach → A discipline whose aim is the prod of quality software, software that is delivered on time within budget, and that satisfies req.

SD Process & Process Models

A process may comprise a set of activities with actions with set of tasks

A software process - as a framework for the tasks

After Project Plan → Process Framework & Framework Activity #1, #2-7

SE action #1.1-5-1-k
#7-1---n-k

Generic Process Framework Act

Communication

Planning

Modeling

Construction

Deployment

Maintainance

Umbrella activities

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capability Maturity Model (CMM)

integration (CMMI)
Stevens

Specific goals
practices

Authentication vs Authorization

5 levels

1. Initial : - poorly managed
2. Managed : req and processes managed / planned
3. Defined : processes well charac
4. Quantitatively managed : quant analysis
5. Optimized : continuous improvement

Build & Fix Model

process as black Box

white Box

Prescriptive Model

→ Waterfall Model or Linear

sequential (Classical)

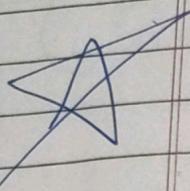
Incremental Model

→ Incremental

→ RAD (Rapid App Dev)

Evolutionary Process Model

- Prototyping
- Spiral
- Concurrent Dev
- 4th Gen Techniques (4GT)
- Component based dev (CBD)



IEEE SRS template

Process framework includes activities like:

- Communication
 - Planning
 - Modeling
 - Construction
 - Deployment
- CPMCD

Waterfall

Communication, project init, req-gathering

Planning, estimating, scheduling, tracking

Modeling, analysis, design

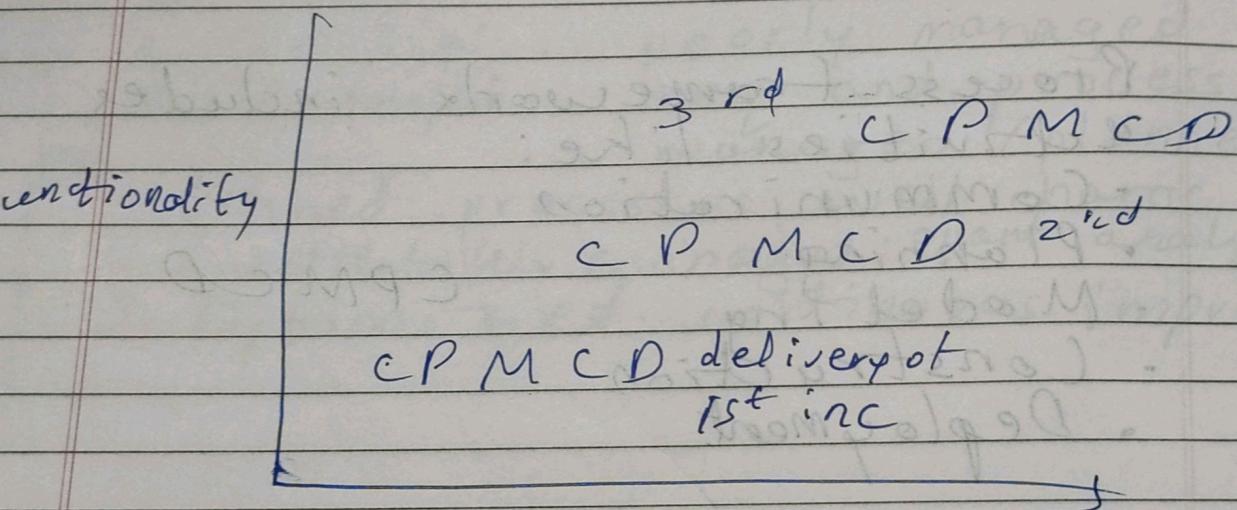
Construction, code, test

Deployment, delivery, support, feedback

cannot go back
suitable for complete
req no change

No parallel
sequential
finished product only, no
interim
surprises at end expensive
some teams idle

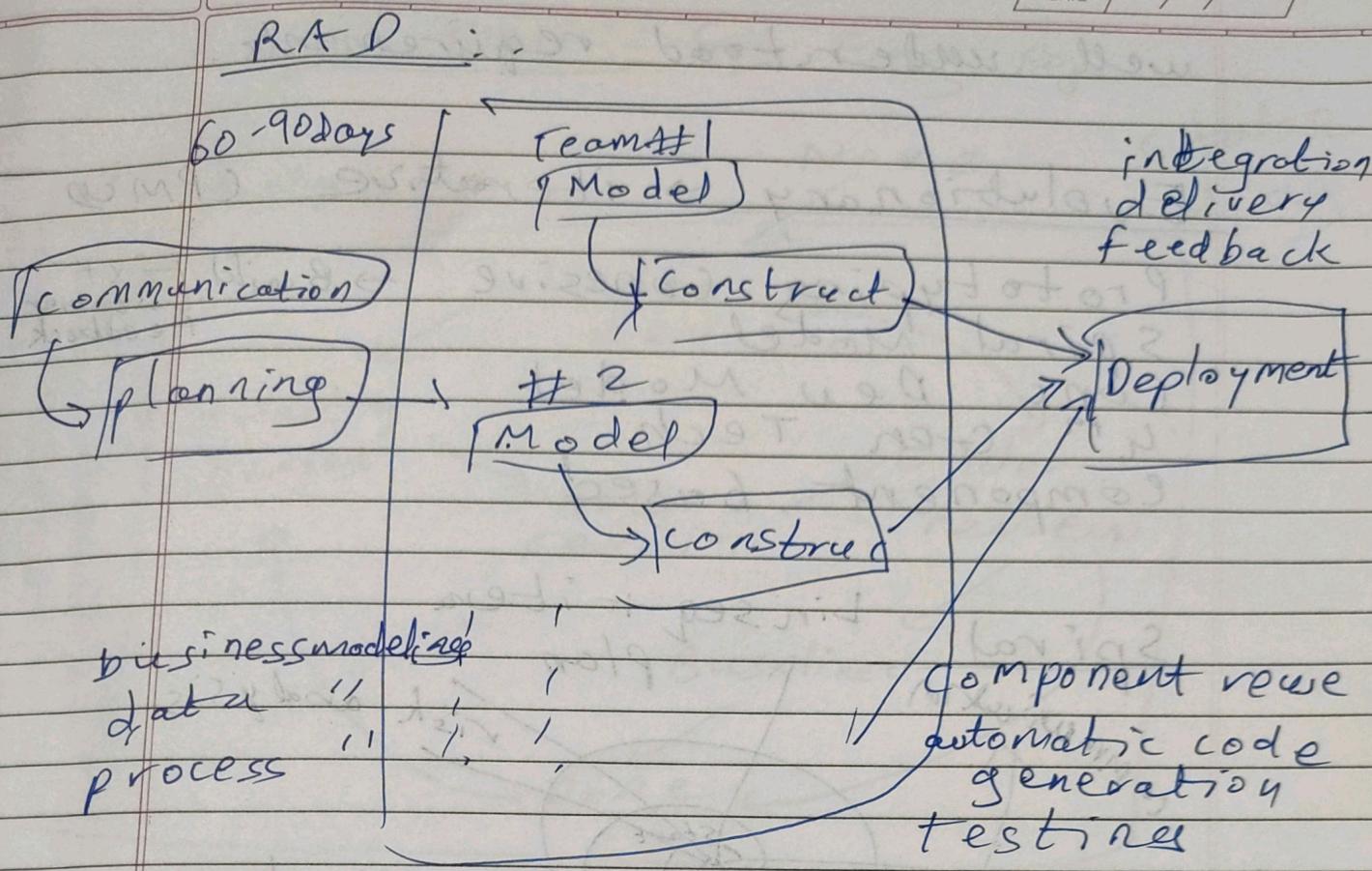
Incremental:



Delivers software in small
usable pieces

Each piece builds on prev

Adapts to change in req.



Makes heavy use of reusable software components with an extremely short dev cycle.

Communication
Planning

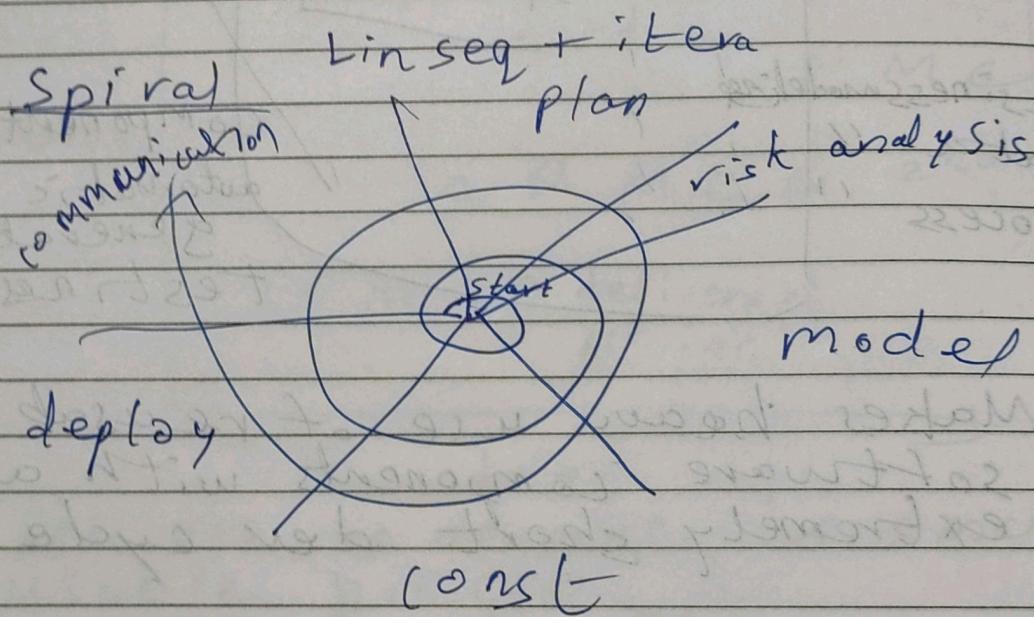
Modeling - Business - business is working info flow among
Data - data obj for business info refine into set
process dot obj → info flow necessary to implement business

construction - costs
deployment

well understood requirements.

Evolutionary → iterative (PMCD)

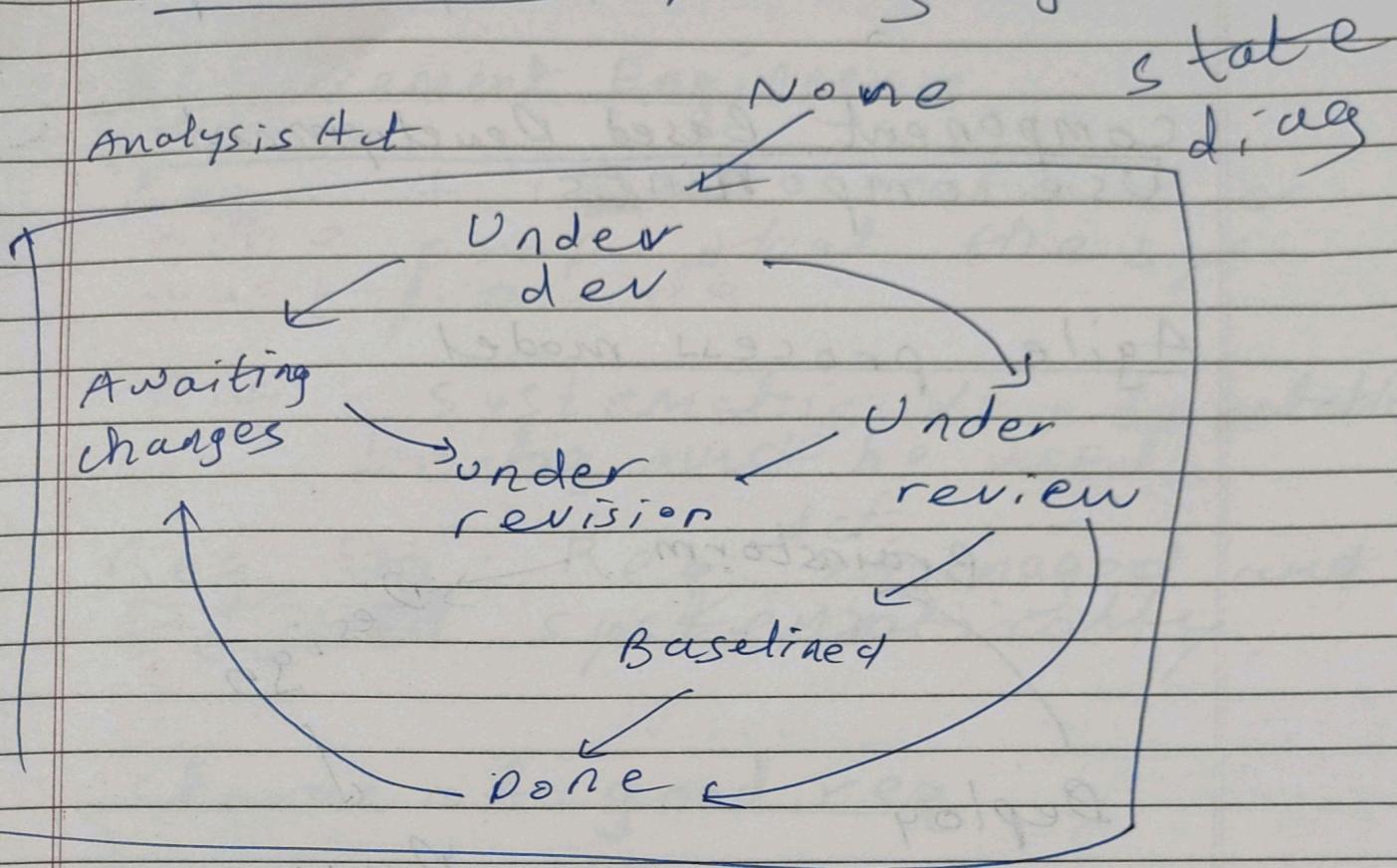
Prototyping cohesive → Build Fix
Spiral Model customer feedback
Conc Dev Model
4th Gen Tech
Component based



Types of projects

- Prod maint
- Prod enhance
- New prod dev
- Concept dev

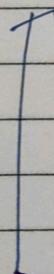
Core Dev - Sys Eng Proj



ERD, DFD

GGT

Req gathering



Design strategy

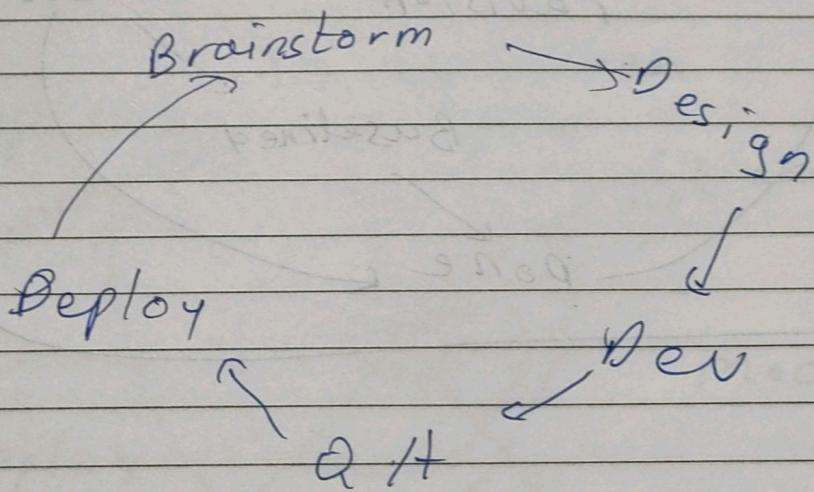
Implementation
using GGL

Testing

Time reduction, improved prod

Component Based Development
Use components

Agile process model



freq changes
high exp team avail
conti. const int.
small proj.

Freq del;
Efficient design
Anytime changes
red dev time

No formal doc

Requirement Engineering

Req : It func, constraint or
other prop that the sys
must provide

Eng : systematic & repeatable
techiq must be used

Req Eng : Req ^{def} managed and
Tested systematically

charac of good req :

Clear and Unambiguous
Correct

Understandable

Verifiable

Complete

consistent

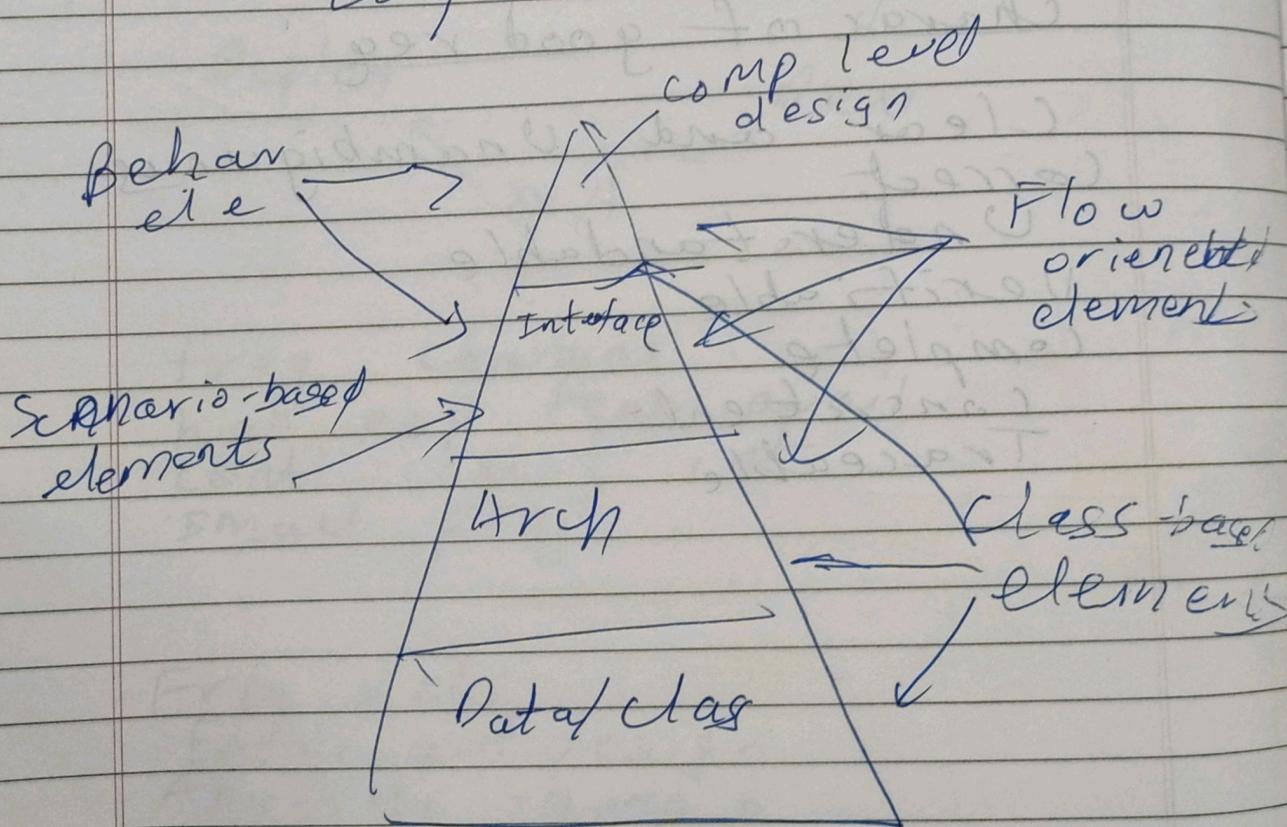
Traceable

System Architecture & Design Overview

→ struct of sys, soft component
only rep, not operational stru

Arch style :-

- Data-centred
- Data-flow
- Call ret
- OO
- Layered



13th, 14th Viva

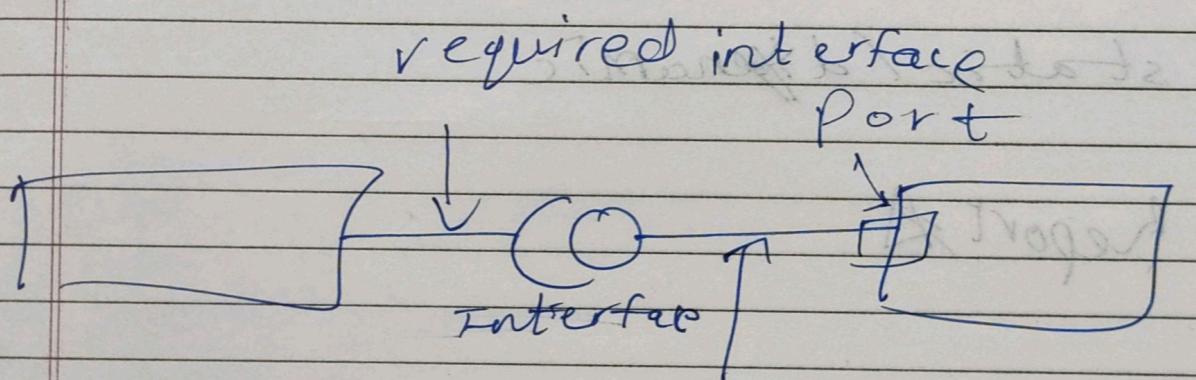
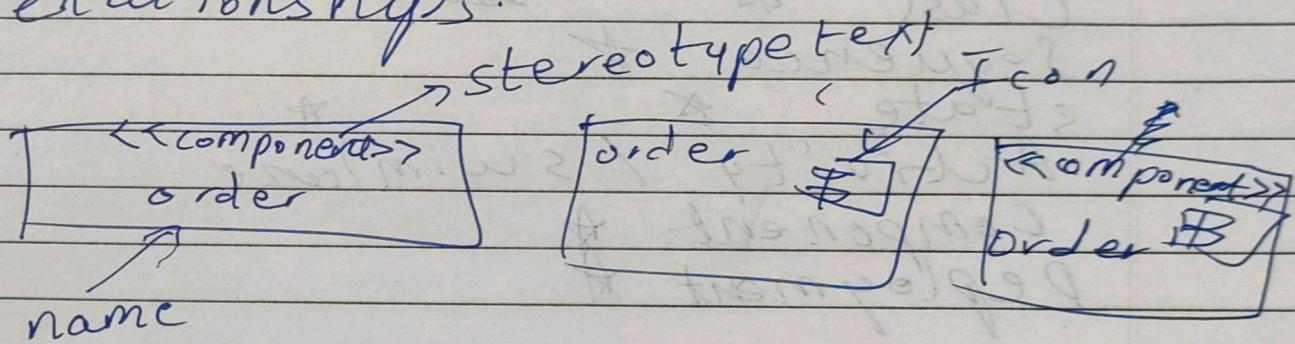
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Analysis elements

Swimlane diagram ..

component Diagram ..

contains components, interfaces and dependency, aggregation, constraint, generalization, association, and realization relationships.



dependency
---->

 composition
mandatory
components

Aggregation
non-mandatory component

Deployment Diagram

exec arch of sys
hardware, software, middleware

VCD

Class *

Sequence *

State *

Activity / swimlane

Component *

Deployment *

static / dynamic

Report *

constructive Cost Model

COCOMO \rightarrow LOC

Organic
semi-detached
Embedded

Organic: Effort = $2.4(KLOC)^{1.05}$ PM
Semi-detached: Effort = $3.0(KLOC)^{1.12}$ PM
Embedded: Effort = $3.6(KLOC)^{1.2}$ PM

Given: Tdev = $2.5(Effort)^{0.38}$ Months
" " " 0.35 " "
" " " 0.32 " "

e.g.: Organic 32 kLOC

$\approx 15,000$ / month.

$$Effort = 2.4 (32)^{1.05}$$

≈ 92 Person Months

$$Tdev = 2.5 (91.33)^{0.38}$$

$$= 13.89 \text{ Months} \approx 14 \text{ Month}$$

~~88.84~~
Team size = ? Project Last = ?