



Bashundhara
Exercise Book
Write Your Future

Tasmia Jannat
Software Engineering

Software Engineering

Software Engineering → Roger S. Pressman (Fifth Edition)

Chapter 01: Computer System Analysis &

The product (software)

independent

Definition & :

(i) instruction for predefined function

(ii) data structure

(iii) documentation (README) (user के लिए डाटा का विवरण)

* Characteristic: Diff betⁿ software and hardware

1) S/W is developed or engineered, it is not manufactured

in the classical sense.

2) S/W doesn't "wear out". (कम्प्यूटर के लिए नहीं)

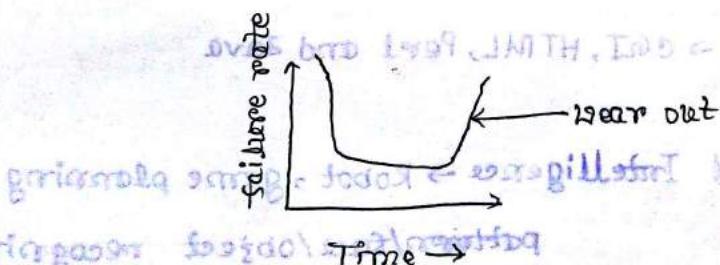


Fig 1.1: Failure curve for h/w

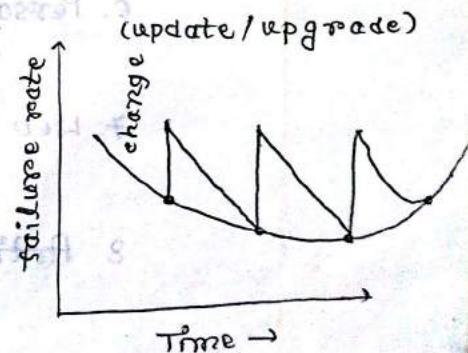


Fig 1.2: s/w

(circuit/capacitor)

3. Although the industry is moving toward component based assembly, most s/w continues to be custom built.

↳ algorithm / data structure →
customised

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1.2.2 S/W application (জ্ঞানকেন্দ্র সফট কোড সফটওয়্যার)

telecommunication processor

1. System S/W → operating systems, compilers, editors, drivers, interface
2. Real time S/W → weather, live score update, monitoring component
3. Business S/W → payroll, inventory, banking software, MIS
4. Engineering & scientific → AUTOCAD, simulator, MATLAB, proteus.
5. Embedded → প্রস্তরিন যীবজ ব্যবহৃত instrument এবং ইলেক্ট্রনিক এম্বেড্ড Keypad control, digital function, fuel control
6. Personal computer → word processing, spreadsheets, graphics.
7. Web based → CGI, HTML, Perl and Java
8. Artificial Intelligence → Robot, game planning pattern/face/object recognition.

chapter 02

The process:

Diff betⁿ software and software engineering



product and use as main process

Process:

1. A Layered Technology

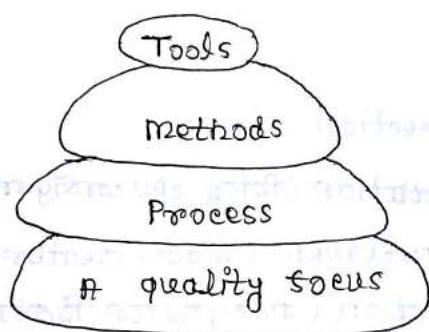


Fig 2.1: s/w Engineering Layers

is quality measure करो ; 1st व design, then design का कठ percent achieve करते possible होंगे, ताकि उन्हें depend

ii) KPR,

iii) Analysis, design, program construction testing & support

→ user requirement → design → implement → testing

(iv) CASE (computer Aided Software Engineering)

database/information combine

hardware-software combine

performance results from products and did it

2.1.2 A generic view of S/W Engineering (ଯେତେ ଏହି କୌଣସି)

① Definition phase (କ୍ରମ ନିର୍ଦ୍ଦେଖ କରିବାରେ ଯାଇ)

② Development phase (କ୍ରମିକରଣ କରିବାରେ)

③ Support:

- correction
 - Adaptation (ପିଛି କାମ କରିବାରେ ଯାଇ)
 - Enhancement (update, feature redefinition କରିବାରେ ଯାଇ)
 - Prevention (ବାଧିତୁଳାକାରୀ କରିବାରେ ଯାଇ)
- କାମଟାରେ କାମଟାରେ କାମଟାରେ ଯାଇ

Definition phase:

What information is to be processed

What functions and performance are desired

What system behavior can be expected

What interfaces are to be established

What design constraints exist

What validation criteria are required to define a successful

system

Development Phase:

How data are to be structured

How function is to be implemented

How procedural details are to be

How interfaces are to be characterized

How the design will be translated into programming language

* How testing will be performed

Umbrella Activities : (तीनों फ़िल्मेशनोंमध्ये दिलें गायत्रे)

1. S/H project tracking & control

2. Formal Technical reviews

3. S/H quality assurance

4. S/H configuration management

5. Document preparation & production

6. Reusability management

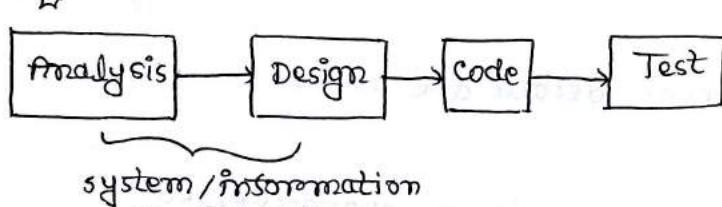
7. Measurement : responsibility

8. Risk management (अंतर्गत तुलना, प्रयोग)

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2.3 S/W Process Model

2.4 Linear sequential Model :



i) Linear sequential model / waterfall model

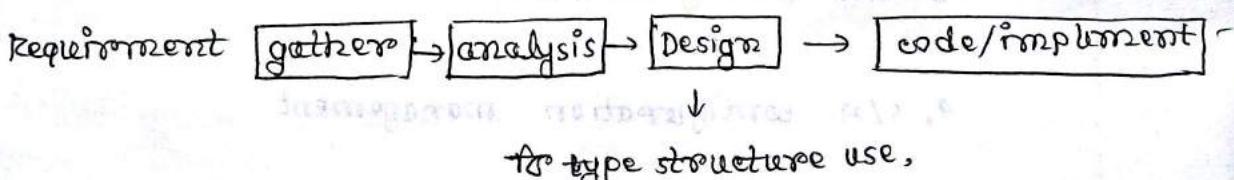
ii) Prototype model

iii) RAD

i) LSM : backtracking ଥାଏ ମୁଁ ନେଇ, ତାଏ ଥିଲେ waterfall

model ହିଁ !

Requirement analysis → user interface



for algorithm, feature,

database function

trigger program logic

Project manager : client କୁଟୀ ଆଣେ deal କୁରାଯେ, requirement

analysis and design

Testing: अलादा team यात्रेते गाठे / developer राखा



support:

Types of question →

- i) Model का description
- ii) situation create करते, तरनको use करता हो
- iii) Advantage / Disadvantage

Advantage: (i) complex ना (ii) कम माहज़ा / कम area में अद्वितीय

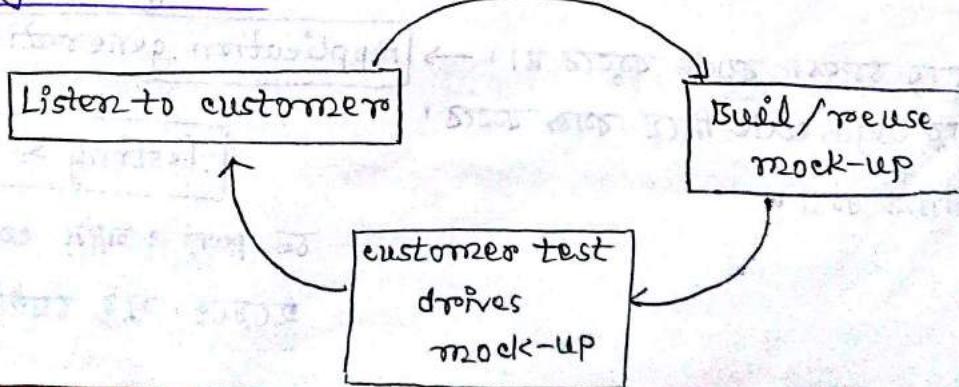
Disadvantage: (i) backtrack करना चाहाय जाए

(ii) customer इच्छाएं यादें ना,

(iii) change का रखना यादें ना,

(iv) real life में useful ना,

Prototype Model:



शुद्ध उपयोगकर्ता की वापर के लिए उपयोग का।

reactions quick

Advantage: customer involved

Disadvantage: efficient algorithm use रक्षण एकत्र है ना।

(चेसिंगम ऐल्गो)

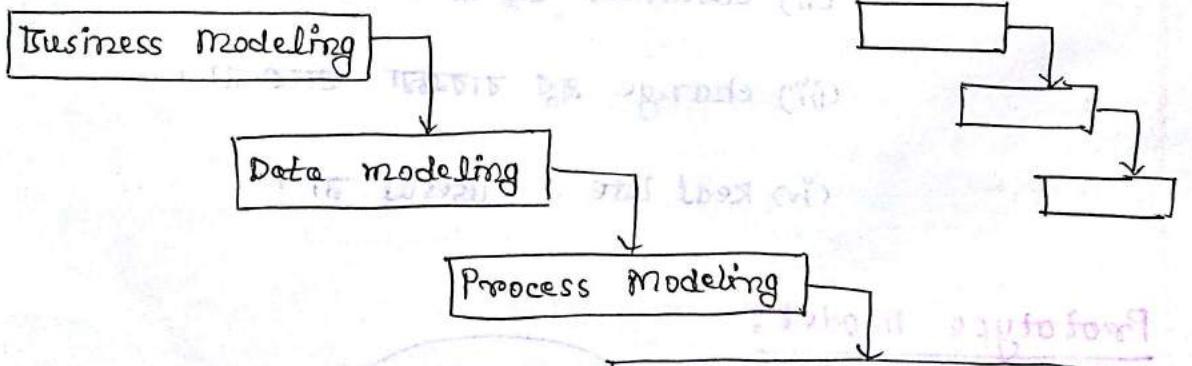
3.5

RAD Model

3.6 Rapid Application Model Development

Team #1

Team #2



जल्दी बनाये रखें जोड़े रखें ना। → Application generation

आगे दूर अल्गो, कोड नियून रखें रखें।

बैट टाइम रखें।

Testing & turn over

first
second
third
fourth

यह पार्ट A जल्दी कोड लिया जाएगा।

हृष्ट छोड़ दें और अर्थात् छोड़ दें।

যাহার requirement clear, develop এর time কম

disadvantage: Human resource দ্বারা জোগাড়ে,

team এর communication এর time জাগে অসুবিধা

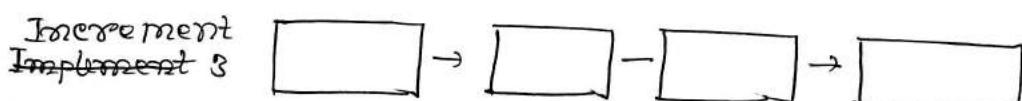
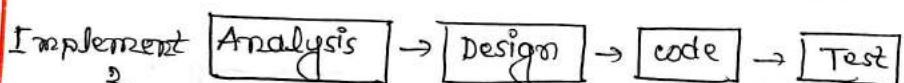
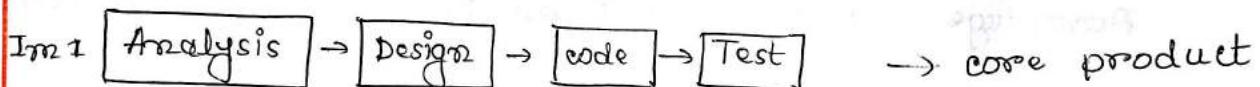
reusable algorithm and code

High risk → quality assure কৃতা শক্তি নয়।

এই team এর বেজেন্টেনে parallel কার্য করবে।

২. ৩rd

3rd Implement Model:



philosophy ইটো

1 prototype model আছে

calendar time

LSM + low maintain করে

LSM and prototype model এর combination

{ 1 Microsoft জিয়ে , write, save, edit → delivery / core product

2 spelling check add

3 grammar

additional
features

more product customer का user करते रहता है। तो

additional feature add करने का implement use करता है।

Disadvantage : time consuming

fixed delivery date जारी

एक्सिट feature add करने से अक्सर वारेंटी

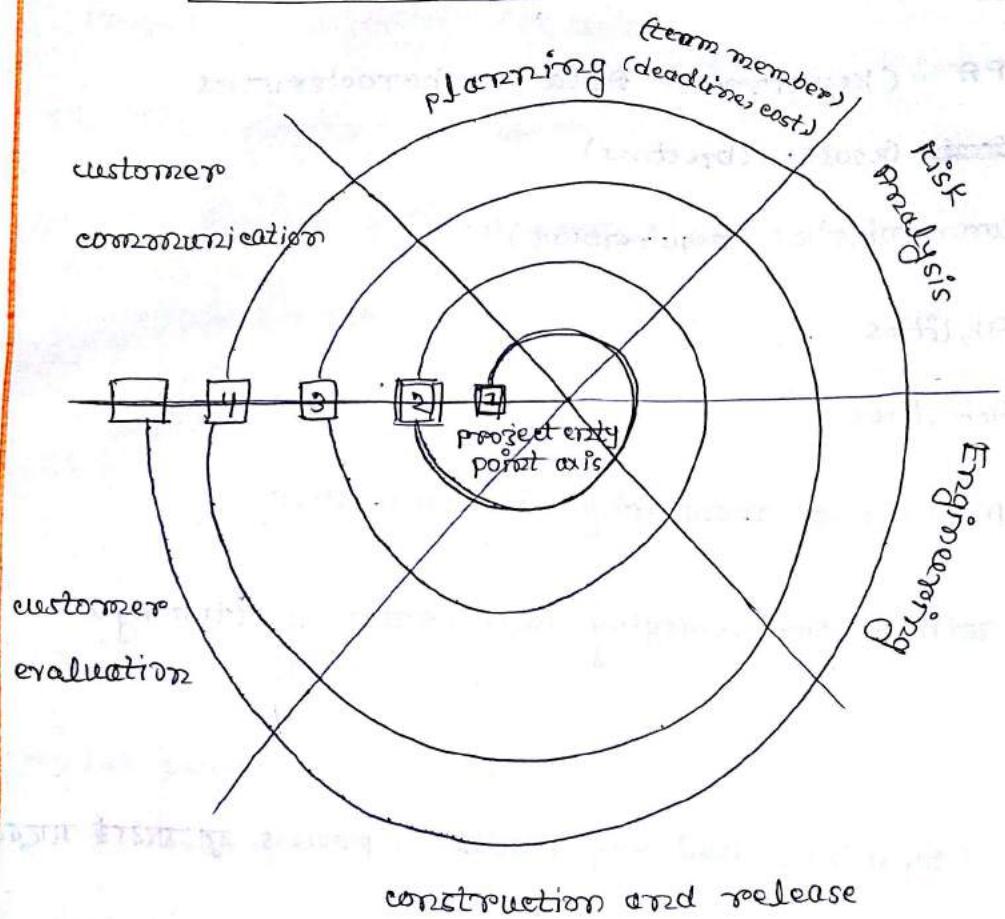
feature add करते हैं।

Advantage : 1. real life का use है

2. employee प्रश्न करता

3. additional feature use करता है।

2.7.2 The spiral Model:



4th model of combination.

- (1) concept developing process
- (2) New product developing project
- (3) Product enhancement Project
- 4) " maintaining Project

Page 25:

* * KPA (Key Process Area) characteristics

1. ~~Goals~~ Goals (objectives)
2. Communication (requirement)
3. Abilities
4. Activities
5. Methods for monitoring implementation
6. Methods for verifying implementation. (testing)

✓ CMM (Capability maturity model) process શ્રેણીઓ માટે આપેલું મોડે

5 લેvel

1. Initial
2. Repeatable
3. Defined
4. Managed
5. Optimising

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રજા: software quality as , change management

Project management concepts

3.1 The management spectrum

1. The People (user, creator) 4P concept / management
2. The Product (software)
3. The Process
4. The Project

3.2 People : (Important)

* The players (role play কর্তৃ)

1. Senior Manager (define business issues, CEO)
2. Project Manager (Technical manager)
3. Practitioners (যায়াগতি developing এবং যায়ে জটিল, developer)
4. customers/client (কাজ করায় নিবে)
5. End users (যাদ্বা software কে use করবে)

Qs : কাজ করা রক্ত

Senior and project managers এবং যার্টে diff. এক organization
customer, end user কেনেকেন situation এ স্থানাদা /
এবং (situation)

H.W. (5th software)

to submit

User → customer same → banking software

different → anti-virus

Q. 2: Team Leaders: (काज बहुत ही ले लिए)

MOI models of leadership (characteristics of leader)

1. Motivation

2. Organization

3. Ideas or Innovation

Project manager

1. Problem solving

2. Managerial identity

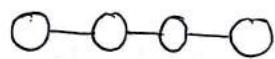
3. Achievement

4. Influence & team building.

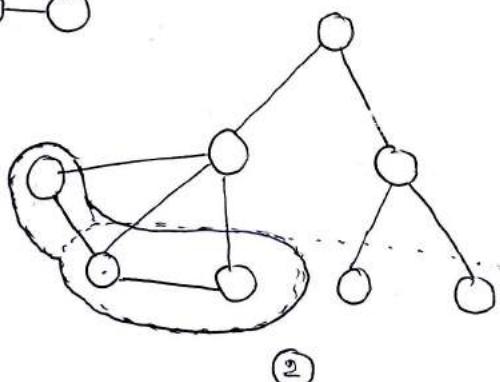
৩.২.৩ The S/L Team:

Generic Team Organization:

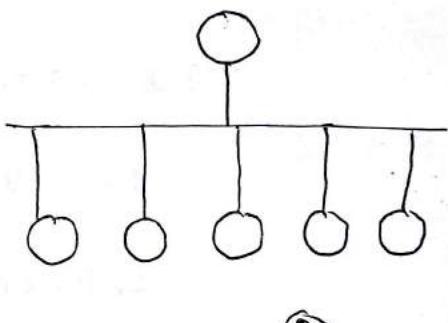
1. Democratic decentralized (মাঝি রাজ্য রাষ্ট্র)
2. controlled, decentralized
3. controlled, centralized



①



②



③

teacher - student

Q: description

চেনাল situation এ চেনাল ব্যবহার কৈ শব্দে ?

cooperation = coordination (team work)

৩.২.৪

coordination & communication Issue

1. Formal impersonal approaches (schedule, control tools)
2. Formal interpersonal procedures
3. Informal interpersonal , ,

4. Electronic communication

5. Interpersonal Networking:

Fig 8.1

3.3 The product:

3.3.1 Software scope

1. Context

2. Information objectives

3. Function & performance.

3.4 The process

process model

3.5 The project: (total total situation a jeopardy)

1. S/W people don't understand their customers needs.

2. The product scope poorly defined

3. Changes are managed poorly.

4. The chosen technology changes.

5. Business needs change [or are ill-defined]
6. Deadlines are unrealistic.
7. Users are resistant
8. Sponsorship is lost [or was never properly obtained]
9. The project team lack people with appropriate skills.
10. Managers [and practitioners] avoid best practices and lessons learned.

3.6 The W5H principle:



(W 5 क्या होता)

1. Why is the system being developed?
2. What will be done by when?
3. Who is responsible for a function?
→ people
4. Where are they organizationally located.

8. HH

- (i) How will the job be done technically and managerially
each
- (ii) How much of resource is needed?
 - human resource, hardware resource.

" WSHH → qstr and ans "

chapter 04

S/W process and project metrics

4.3: S/W measurement

(गणिताग रस्या
याम्)

1. Direct Measures (line of code, execution speed, size)
defects report
2. Indirect measures (quality) → sa
 - (i) functionality
 - (ii) quality
 - (iii) complexity.
 - (iv) efficiency
 - (v) reliability
 - (vi) Maintainability

4.3.1

Size Oriented Metrics

Line of code (use এর আজ) (use কৃত মাত্র)

Project	Loc	Effort	\$ (000)	Pp doc	Errors	Defects	People
Alpha	12,000	24	168	365	184	29	3
Beta		(person month)			20	-	
Gamma					20	0	

$$\hookrightarrow 24 \times 5 = 8$$

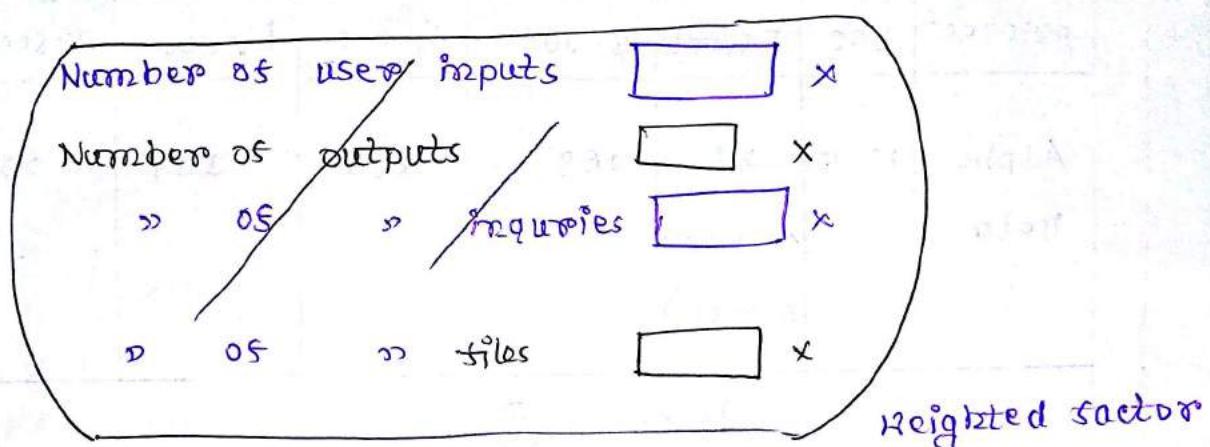
month

LOC এর টার্গেট depend করবে। (Errors, Defects)

KLOC \rightarrow Kilo

4.3.2 Function Oriented Metrics (Indirect measure)

measurement parameter count (simple average complex)



		Simple	Avg	Complex	
Number of user inputs	$\boxed{200} \times$	3	4	6	<u>1800</u>
" " outputs	$\boxed{50} \times$	4	5	7	<u>350</u>
" " inquiries	$\boxed{30} \times$	3	4	6	<u>180</u>
" " files	$\boxed{100} \times$	7	10	15	<u>700</u>
" " External interfaces	$\boxed{70} \times 5$	7	10	15	<u>490</u>
total count					<u>2520</u>

→ যোগ

20. Quality

$$FP = \text{constant} \times [0.65 + 0.01 \times \sum (F_i)]$$

$$= 2520 \times [0.65 + 0.01 \times 15]$$

complexity

(F_i) → simple adjustment

values, \rightarrow

0-5 ଏହି ମର୍ଦ୍ଦୀ ପାଇଁ କେତେ ଶତାଂଶୀଳୀଙ୍କୁ

ହେବେ,

$$1+5+2+3+4 = 15$$

କଣନ ବିଷ୍ଟ ଚାହୁଁ ଆଧାରରେ

ବିଷ୍ଟ ଉଚ୍ଚାର ସବୁ କ୍ଷେତ୍ର ଅବସାନୀ

ଅବସାନୀ କ୍ଷେତ୍ରରେ ରୁପେ 100 !

Quality measure:

ଏକଟି ଶ୍ରୀ କଣ୍ଠ ଦାତା dollar /

କ୍ଷେତ୍ର ଫଳାଫଳ.

1, 2, 3, 4, 6, 7, - 9, 10, 18

କାମକାରୀ ପାଇଁ କାମକାରୀ କାମକାରୀ କାମକାରୀ କାମକାରୀ

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chapter 05

S/W project planning:

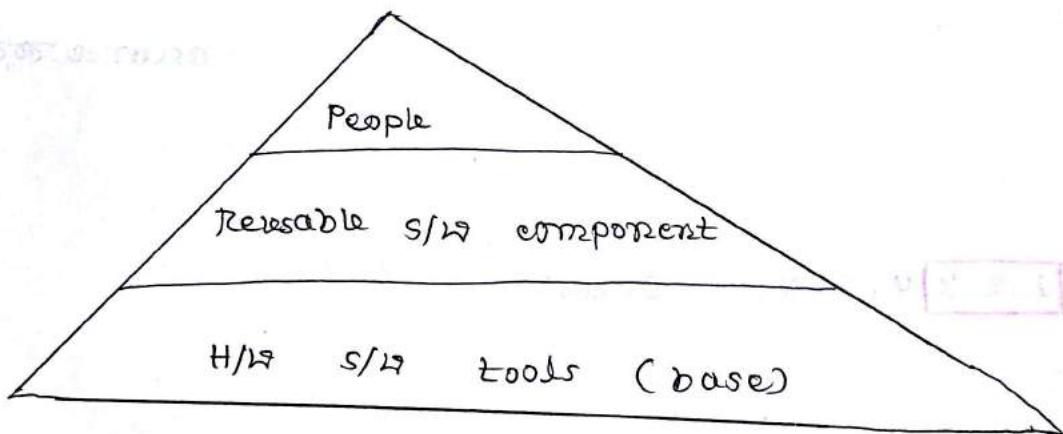
chap 6

objectives: cost estimation

resource estimation

schedule

5.4 Resources



1. Human resources (team leader, project manager)

2. Reusable S/W resources

3. Environmental resources (hardware, software)

* 2. Reusable S/I

- কাঁক বংশ same pro
- i) off the shelf components : নিজেরা তৈরী না হওয়ে, আব্যন্তর বণ্টন
 - ii) Full experience component : same project না, পিছু
তার স্থানে অন্য প্রজেক্টে এই নোক দিয়ে বণ্টন
 - iii) Partial experience component : পুরোটি নষ্ট বংশে,
অন্য প্রজেক্টে কাজ বাণ্টেচে
 - iv) New components : previous পিছু কোড বিগত কাগজের মতো কাজ করে

5.7.2 The cocomo model

constructive cost model

- Application composition Model
- Early design stage Model
- Post architecture-stage model (code পর্যন্ত)

~~A~~ ~~K~~

5.7.3 : The S/N Eq³² :

$$E = [LOC \times B^{0.333} / P]^3 \times \left(\frac{1}{T} \right)$$

E = Effort in person-months or person-years

t = project duration in months or years

B = "special skills factor"

P = "productivity parameter" the / yr

KLOC = 5 to 15 , B = 0.16

KLOC > 20 , B = 0.39

i) Real time embedded software $P = 2000$

ii) Telecommunication and system software $P = 1000$

iii) Commercial business system software $P = 28,000$

software নাম এবের P কেবল কৃত হয়।

chapter 06 (imp)

(6B)

Risk Strategy:

Risk Analysis & Management

→ Reactive Risk strategy → প্রিমিয়াম আয়কে গুরুত্বপূর্ণ এবং ক্ষেত্র

✓ Proactive " , → আগণেকে প্রিমিয়াম এবং ইন্ডিপেন্ডেন্ট
strategy উভয়ে, manage

i) Uncertainty → ঘটতেও নাহি, নাও ঘটতে নাহি

ii) Loss → কোর্সনেইসে loss, (ক্ষেত্র শর)

category:

→ Project risk (budget, schedule) → Evaluation এর মধ্যে risk

→ Technical " (design এর মাঝে
algo সিঁত নাইয়া,..) → predictable→ Business (senior manager) Unpredictable (Offer মাঝে কেউ
চলে নেবে)

• Market risk (market এ কোর্স দিলে না, market পর্দা)

• Strategic risk (

• Management (represent, how to sell)

• budget

RISK Identification:

effort + line of code

1. Product ^{size}

2. Business Impact

3. customer characteristics (requirement)

4. Process Definition

5. Development environment

6. Technology to be build

7. Staff size & experience.

RMM Model

Risk mitigation, monitoring & Management model
(avoidance)

→ Risk tolerance

Method, resources, framework

→ Risk limit

Proactive : risk

Risk components and Drivers:

capability → time management

Performance

cost

Support

Schedule

risk

Operating system → hang/deadlock → ignorable

marginal:

critical: do or die, step 級別で 命運!

catastrophy: already 終焉の 瞬間 まで!

(अपराध की तरह अवैधता) या ग्राही रूप से निष्पत्ति

(प्रत्यक्षित अवैधता के बावजूद)

risk mitigation, monitoring and management (RMMM)

↳ risk avoidance

• risk avoidance / mitigation

staff turn over → କାର୍ଯ୍ୟ ହଦେ ଚଳେ ଯାଇଥିବା

reason →

environment

Monitoring

i) working pressure

ii) technical skill

interpersonal skill

iii) benefit, award

iv) other company → benefit

contingency : ଅତ୍ୟ, ମିଥ୍ୟ ଏବଂ (ଜାତ, ଜ୍ଞାନ କୁର୍ଦ୍ଦାର୍ଥ ହତୋପାତ୍ର)

(topology, contradiction, contingency)

Software Quality Assurance

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Quality: A characteristic or attribute of something refers to measurable characteristics that we are able to compare with standards.

Two kinds of Quality:

1. Quality of ~~the~~ design :

2. Quality of conformance : यहाँ design का हमें कैसे उत्पादन करते हुए कौन सी तरफ़ से quality of conformance.

User satisfaction:

Quality control :

Involves series of inspections, reviews & tests, feedback i.e. combination of measurement & feedback

→ May be automated or manual..

Quality Assurance

consists of auditing or reporting function

8.1.4 cost ~~of~~ of quality:

- Prevention: planning
- Appraisal → in process and after process
- Failure →

Prevention:

1. Quality Planning
2. Formal Technical review
3. Test equipment
4. Training

Appraisal cost

- 1.
2. testing
- 3.

AMC → Annual Maintenance cost

Failure:

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S&A activities (20)

composed of task associated with two different constituencies

-S/W engineering who do technical work.

→ SQA group who is responsible for quality assurance.

planning, oversight, record keeping, analysis and reporting.

① Prepare an S&A plan for project: (developed during project planning)

→ evaluation

→ audit and reviews

→ standard

→ procedure of S/W reporting

② Participates in the development of project's S/W process

③ Reviews S/W engineering activities to verify compliance

(জ্ঞানি সমাজে বৃত্তি)

with the defined software process.

④ Audits designated software work products to verify compliance

with those

→ randomly select part select for check

Ensure that deviations in software work and work

products are

→ design ଏବଂ ସାର୍କ୍ୟ କାତ ରାହିଲେ ଯେବେ ଦୁଇମାତ୍ର ଦୋଷ

ରୂପରେ ହାତ / explain

Records ଏବଂ noncompliance ଏବଂ

(control)

କୋଟିନା ଦିଶାରେ ଅନୁରୋଧ କରିବାକୁ ପରିବର୍ତ୍ତନ କରିବାକୁ ପରିବର୍ତ୍ତନ କରିବାକୁ

8.7 Statistical Software Quality Assurance

① Software defects data set → google ✓

cnl(attribute)	LOG	11		
202				

REEL data repository

2.

* * (3.) Pareto principle

100% error 20% cause
80% error 20% cause

S

10E

10.5.4 10.6

System Modeling: describes the process that defines the needs of the views (world, detailed view etc) under consideration.

Several factors should be considered:

- ✓ Assumption: reduce the number of possible permutations and variations [requirement विषय]
- ✓ Simplification: Enable the model to be created in a timely manner.
- ✓ Limitations: help to bound the system.
- ✓ Constraints: Guide the manner in which the model is created and implemented.
- ✓ Preference: Indicate preferred architecture for all

date, fin and technology. Sometimes there's conflict.

Business Process Engineering (BPE)

Define architecture that will enable a business to use info effectively.

Three architecture:

Data architecture: provides a framework for the info needs of a business or business unit individual building blocks are data objects, Object: customer

Application architecture: Encompasses those elements that transform objects within data architecture. (data relation / link up)

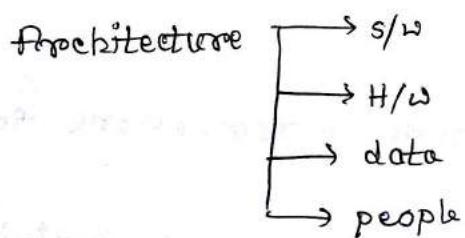
Technology infrastructure: Provides foundation for data & application architecture.

[ವರ್ಣನ model, ಸಂಪರ್ಕ, ಪ್ರಾಯೋಗಿಕ ಬಗ್ಗೆ ಉದ್ದೇಶ
- ರಾತ್ರಿ ಸೆಂಟ್ರು

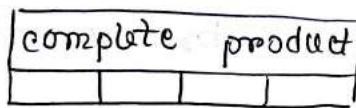
Product Engineering? (20'4)

Goal is to translate the customer's requirement into a working product.

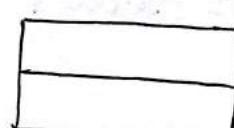
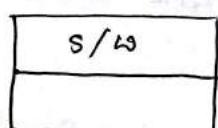
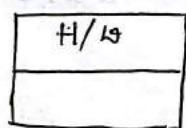
to achieve goals?



infrastructure



Requirement Engineering (World view)



component Engineering

Five distinct steps for Requirement Engineering

→ Requirement elicitation (वर्तना वापा)

→ " analysis

→ " specification

→ System modeling

+ requirement mgt.

chapter 9

Software configuration mgt (scm)

scm activities are developed to (version change)

- identity change

- control "

- ensure that change is being properly implemented

- report changes to the interrelated people

software support vs scm

S/MS support : client ଥିବା କାମରେ ପରିପ୍ରେକ୍ଷଣ ଗୁଡ଼ିକ ଦିଲ୍ଲିପି

SEM: client ଥିବା କାମରେ ପରିପ୍ରେକ୍ଷଣ ଗୁଡ଼ିକ

Four Fundamental sources of changes:

- New business / market condition
- New customer requirement - business growth / downsizing
- budgetary / scheduling constraints

Baseline: A SEM concept that helps to control change

Without seriously preventing justifiable change.

(standards, ଯାଏ ନିମ୍ନ ଏ ଉଚ୍ଚ କାମରେ ହୁଏ)

LOE lecture:

Project Scheduling and Tracking

Presentation এ scheduling আববে।

- * কাজ

- * resource

- * time

✓ CPM (imp)

2) PERT

Critical Path:

T ₁	T ₂	T ₃	T ₄
4	5	6	8

T₁ → T₂ (T₁ আগে গোব
ইতে হবে) = 9

T₂ → T₃ → T₄ = 15

T₂ → T₃ → T₄ = 19

Critical path

float :

Critical path - অন্য path

1st এ critical path

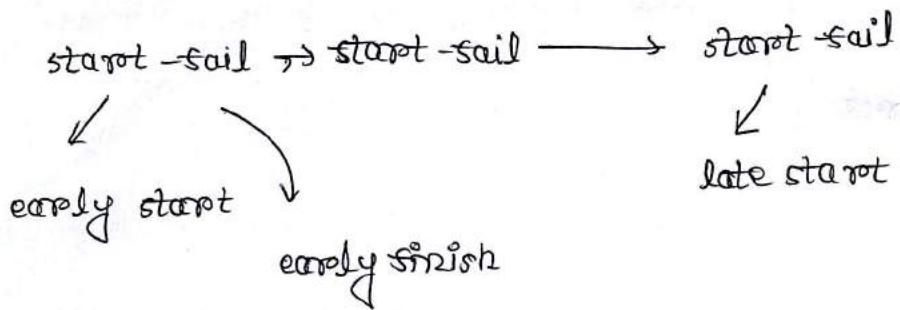
$$CP - CP = 0 \quad (\text{individual float } 0 \text{ হবে})$$

then $CP - AP =$

$$14 - 12 = 0 \quad (\text{critical path যেকে সাধ্যা float বাদ দিয়ে})$$

partitions have been made between

Early start and early finish



critical path ଥାଏ (ସମ୍ପର୍କ) element/activity ଥାଏ early start = 1

activity 2

early start + duration - 1

$$= 1 + 5 - 1 = 5$$

ପରେଯ element ଥାଏ କଣାଏ,

-ଆଗେଯ element ଥାଏ finish + d

$$ES \text{ (1st)} = 1$$

$$EF = ES + \text{duration} - 1$$

$$LF = EF$$

$$LS = LF - \text{duration} + 1$$

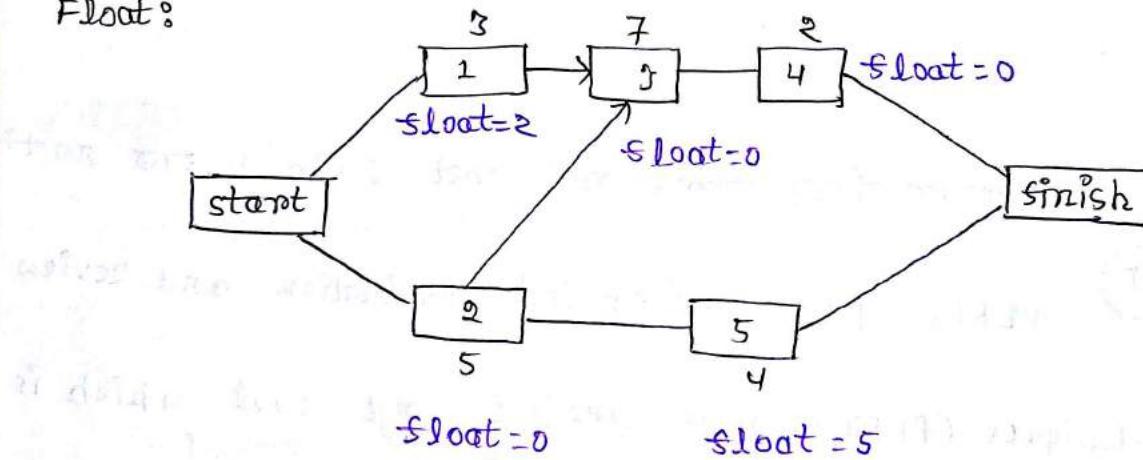
$$ES = EF + 1$$

$$EF = ES + \text{duration} - 1$$

$$LF = LS - 1$$

$$LS = LF - \text{duration} + 1$$

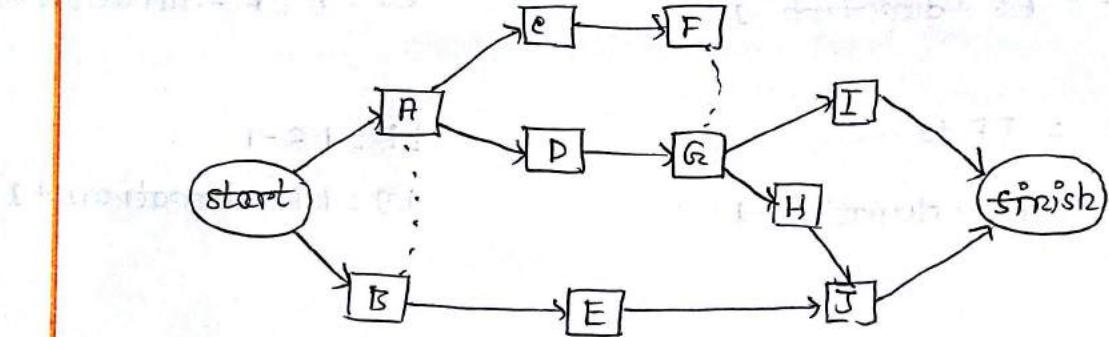
Float:



$$\text{Activity 1} + \text{Activity 3} + \text{Activity 4} = 12$$

$$\text{Activity 2} + \text{Activity 3} + \text{Activity 4} = 14$$

$$\text{Activity 2} \rightarrow \text{Activity 5} = 9$$



main responsibility time, not cost (finish by ~~on time~~)

11E

PERT: Program/ project Evaluation and Review

Techniques (PERT), is a project mgmt tool which is used

to analyse & represent the task involved in

completing a given task.

✓ used in conjunction with CPM.

✓ used in project where time is the major factor

✓ rather than cost.

✓ Event oriented technology rather than start

and completion oriented.

✓ Represents arrows and node diagram of activities and nodes. events.

- Arrows represents the activities / work

- Node represents events.

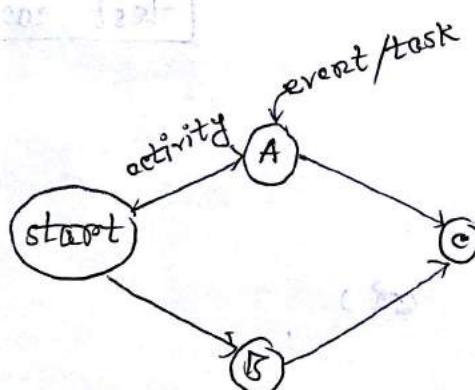
✓ PERT utilizes several times. (Google)

- optimistic time : शक्ताय मध्ये याच (O)

- Expected " : वार्षी तिनांचा mathematical formula (E)

- pessimistic " : दोनि आव्हान (P)

- most likely time : ग्राह्य time (M)



$$\text{Expected time (ET)} = (O + 4M + P) / 6$$

ST =

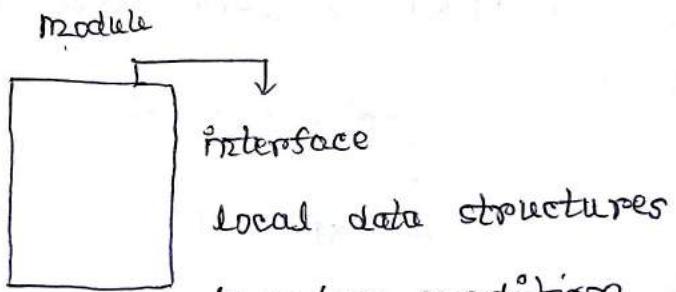
(wiki)

④ 12A

S14 testing strategies

Unit testing (पूर्ण वर्तावात्मक ना कर्तव्य
part part कर्तव्य testing)

- * Verification: program
फिरावत ग्रन्थ कर्तव्य होना
- * Validation
customer requirement
fulfill करना, नहीं



Independent paths
Error handling path
[test cases]

Integration Testing:

Top down integration

Bottom up

Regression testing (नया feature add करने पर testing)

* → Representation sample of testing

sample जैसे उन्हें added feature का करना चाहिए

- Additional test that focus on software components that are likely to be affected by the change.

be affected by the change.

- Test that focus on changed software components.

test

"Online fiction writing management software"

- Team organization
- Coordination & contribution
- Process Model
- S/W mg management
- Budget

- Timeline
- Risk management
- Version control.

highlighted topic

10 minute as presentation.

2nd best answer

2 points

Software

123 validation testing (customer satisfy किना)
 (developer यह आवाहित customer
 (developer side), verify करवे)

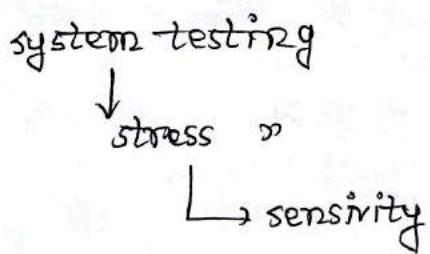
(imp) → Alpha testing (developer side),
 → Beta testing (end-user side), developer presence
 आवाहन, requirement fulfill ना होने
 report करवे

* System testing : A series of diff tests whose

primary purpose is to fully exercise the computer based system.

** stress testing : Executes a system in a situation that demands resources in abnormal quantity, frequency or volume. फ्रेक्वेंसी अल्टों वाले

*** sensitivity Testing : Uncover combinations within valid input classes that may cause instability.



Art of debugging:

3 questions (self study)

- brute force
- back tracking
- cause elimination

12E → slide (Testing)

18A (chapter -17)

control structure testing (self-study)

↳ condition testing (if - else)



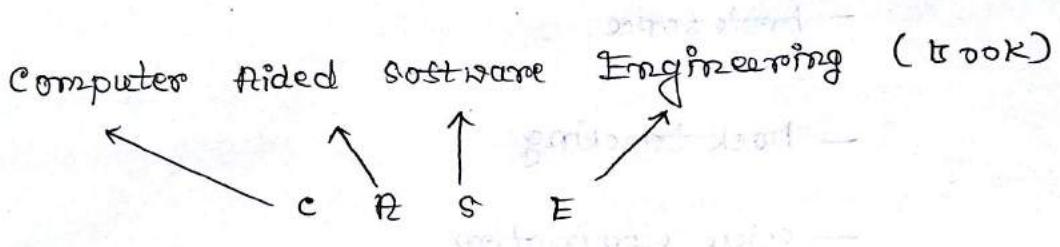
→ Branch testing

→ Domain testing

→ **BRO** (branch and relational operator)

testing

Computer Aided Software Engineering chapter 31



✓ CASE tools assign SW Engineering managers and practitioners in every activity associated with the SW process.

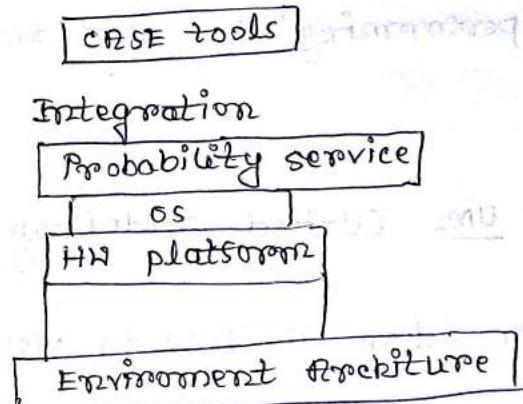
✓ They automate project mgmt activities, manage all work products produced throughout the process and assist engineers in their analysis, design → coding and test work.

page no

31.5 Business Process Engineering tools,
project planning tools. (2 mark qstn)
[Environment for software deve]

project planning tools (survey → design)

* CASE building blocks:



(18B)



SN Reliability Metrics:

Probability statement that are measurable by test or analysis

4 categories:

Product Metrics: such as FP which is used to estimate the size and complexity of the project.

Project mgt metrics helps to increase reliability by evaluating the mgt process.

Process metrics: used to estimate, monitor and improve the

reliability and quality of SW.

Fault and Failure Matrices: Determine whether the SW is

performing the whole function.

UML (Unified modeling language) → graph/diagram provides a way to visualizing specifying, constructing and documenting, a system architectural blue print in a diagram.

UML: two general set of diagrams

structural diagram: depicts the static view (link shows)

- class diagram

- object

- component

- Package

- composite

- Deployment

Behavioral diagram: depicts the varieties of interactions within a system being modeled. (dynamic, interaction)

- Activity diagram
- State-machine diagram
- Communication "
- Sequence "
- Timing "
- Interaction overview "