Software Maintenance 23 Jan 2024

Maintenance vs Evolution

....

Maintainability of software:

1) Analyzability:
   - ~~on which~~ based on ~~software~~ metrics, how well the software can be ~~analyzed~~ ~~or~~ evaluated

3) Stability:

:

New Developments vs Maintenance:

Activities

Impact

Cost

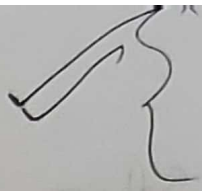
Maintenance cost

↳ might cover as a topic later

Importance & Types:

GeeksforGeeks

am suggests → Radix web



Bug fixing
P feature enhancement
P Performance improvement
adaptability to new environ

Adaptive, Perfective, Corrective, Preventive → Radix web

Software Maintenance process

Radix Web

Maintenance process and models 24/11/24

30/11/24

Change Management
- Why " "
- Types of " "
- Change management process
  - Change request
  - " " review
  - " plan
  - " review and reporting

Only remember the points

Impact Analysis
Risk management

is related to change management

Best practices:

Similar to 'why change management' and 'improvements obtained / benefits of chan management'

Lehman's Laws:

Rule 3 and 5 ~~are~~ have similarities

Law 1 → ~~deals with~~ talks about changing the software

Law 6 → talks about what happens due to Law 1

Reorganized into:

1. Evolution of software system characteristic:
   1, 2, 6, 7
2. Organizational resource constraints
   4, 5
3. Meta-laws
   3 &

Program comprehension এর জন্য reverse engineering করা লাগে.

" " এর one of the goals we can achieve is program reuse

3/1/24

Program Comprehension → Reverse engineering
Code comprehension

6/2/24

Plans:

Two broad plans:

1 0

Hypothesis:

Mental Model:

(1) Understanding the software Architecture

→ Static Analysis ⟶ Done in lab

→ Reverse Engineering

(2) Software Behaviour

→ Dynamic Analysis

→ Debugging

(3) Identifying and Documenting functionality

→ Feature Tracing → Documentation Generation

Tools use করে metrics গুলো value calculate. Then Lehman এর law proof করা

④ Managing Complexity and Dependencies

→ Dependency Analysis → Refactoring

⑤ Collaborative program Comprehension ⟶ A broader term

→ Team Collaboration → Domain Expert Involvement

7/12/24

2-7

Reverse engineering: (Can follow Geeks for Geeks)

Steps of Reverse engineering: From geeks for geeks

↳ program এর high level view দেখতে সাহায্য করে, program visualization

↳ not necessary to run the program

Objectives:

* To extract reuseable components (Important)

Benefits:

Benefits:

Maintenance

Reuse

Improvement

Abstraction level:

Study: Just the figure (NB: The steps aren't sequential)

Levels of Abstraction:

1) Redocumentation → study

2) Design Recovery: skim

3) Specification recovery: skim

Factors:

6 & 7 one pretty same

Supporting Techniques: (Important)

Re-engineering → different chapter ↗ behaviour of program may change

Forward engineering → After reverse engineering, if we need to alter/correct, that is forward engineering

Code Restructuring Techniques → ① Code smell detection and Refactoring
② Simplification Techniques
③ Applying Design Patterns
④ Documentation and Document generation

Current problems:

→ very manual

4/12/24

Ch-8

Reuse and Reuseability:

Targets for Reuse:

Process, ~~Pro~~ Personnel, Product

Approaches to reuse:

↳ read section III of the paper

Horizontal & Vertical reuse

↳ ~~figures~~ Understand figure 2

↳ section IV (go through)

Domain Analysis:

Horizontal reuse → DSA

Vertical " → Cloud, Design Patterns (Application specific)

Domain Analysis এর figure → not much important

Component Engineering:

Reuse based development

① Design for reuse:

- Generality: Using Interfaces

Problems: সমস্যুলা পড়ে নিজের মত একটা answer তৈরি করব,

Reuse process Model:

See the figure

Factors দরকার নাই

Application framework ~~[illegible]~~ এর আগ পর্যন্ত পড়ব

Islamic University of Technology

Department of Computer Science and Engineering (CSE)

Examination: Quiz 2 **Time:** 30 Minutes **Full Marks:** 15

SWE 4801- Software Maintenance

1. Why is it necessary to automate reverse engineering? What are the supporting techniques for reverse engineering?
2. How mental model is related with program comprehension.
3. How can you overcome the shortcomings of top-down and bottom-up program comprehension strategies?

Categories & maintenance, কী, কেন দরকার → slide 1

Frame work (6 টা element) → slide 2

Lehman's law দেয় নাই → slide 3

~~Maintenance~~ → chapter 5, 7 পুরাটা

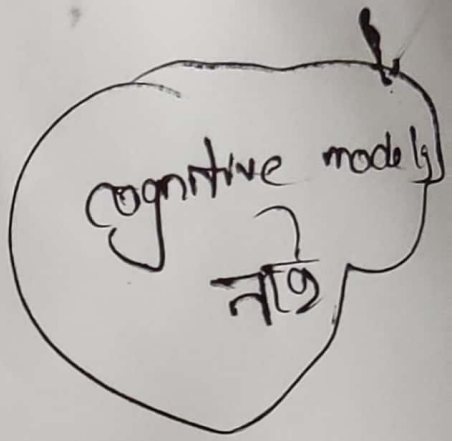
change management কী, কেন দরকার

বড় মার্ক carry করে → chapter 6 ↩ paper টা লাগবে

~~techniques and benefits, abstraction~~

Reuse → component engineering : , paper, blog
domain analysis

Composition Based Reuse (Black & White box)



Impact Analysis কী, কেন লাগবে, technique, কোন situation এ
কোনটা লাগবে