SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

COURSE NAME : 19CS302 AGILE SOFTWARE ENGINEERING

II YEAR /III SEMESTER

Unit 1- Introduction to Software Engineering

Topic 6: Personal and Team Process Models

Brain Storming

1. What is Incremental approach?

2. What is Iterative approach?

Personal and Team Process Model

•The best software process is one that is close to the people who will be doing the work. **Watts Humphrey** proposed two process models.

•Models - "Personal Software Process (PSP)" and "Team Software Process (TSP)."

Both require hard work, training, and coordination, but both are achievable.
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Personal Software Process

- The **Personal Software Process (PSP)** emphasizes personal measurement of both the work product that is produced and the resultant quality of the work product.

- In addition PSP makes the practitioner responsible for project planning and empowers the practitioner to control the quality of all software work products that are developed.

- The aim of PSP is to give software engineers with the regulated methods for the betterment of personal software development processes.

- The PSP helps software engineers to:

- **Improve their approximating and planning skills.**

- **Make promises that can be fulfilled.**

- **Manage the standards of their projects.**

- **Reduce the number of faults and imperfections in their work.**

Personal Software Process

- The PSP model defines five framework activities:

- Planning

- High-level design

- High-level design review

- Development

- Post mortem

Conti…

Planning:

•This activity isolates requirements and develops both size and resource estimates.

•In addition, defects estimate (the number of defects projected for the work) is made.

•All metrics are recorded on worksheets or templates.

•Finally, development tasks are identified and a project schedule is created.

High-level design:

•External specifications for each component to be constructed are developed and a component design is created.

•Prototypes are built when uncertainty exists. All issues are recorded and tracked.

High-level design review:

•Formal verification methods are applied to uncover errors in the design.

• Metrics are maintained for all important tasks and work results.

•**Development:**

•The component-level design is refined and reviewed.

•Code is generated, reviewed, compiled, and tested. Metrics are maintained for all important tasks and work results.

•**Postmortem:**

•Using the measures and metrics collected, the effectiveness of the process is determined.

•Measures and metrics should provide guidance for modifying the process to improve its effectiveness.

Conti...

- PSP stresses the need to identify errors early and, just as important, to understand the types of errors that you are likely to make.

- PSP represents a disciplined, metrics-based approach to software engineering that may lead to culture shock for many practitioners.

Levels of PSP

- Personal Software Process (PSP) has four levels-

- PSP 0 – The first level of Personal Software Process, PSP 0 includes Personal measurement and coding standards.

- PSP 1 – This level includes the planning of time and scheduling .

- PSP 2 – This level introduces the personal quality management ,design and code reviews.

- PSP 3 – The last level of the Personal Software Process is for the Personal process evolution.

Team Software Process (TSP)

- Watts Humphrey extended the lessons learned from the introduction of PSP and proposed a Team Software Process (TSP).

- The goal of TSP is to build a "self directed" project team that organizes itself to produce high-quality software.

- **Humphrey defines the following objectives for TSP:**

- Build self-directed teams that plan and track their work, establish goals, and own their processes and plans.

- These can be pure software teams or integrated product teams (IPTs) of 3 to about 20 engineers.
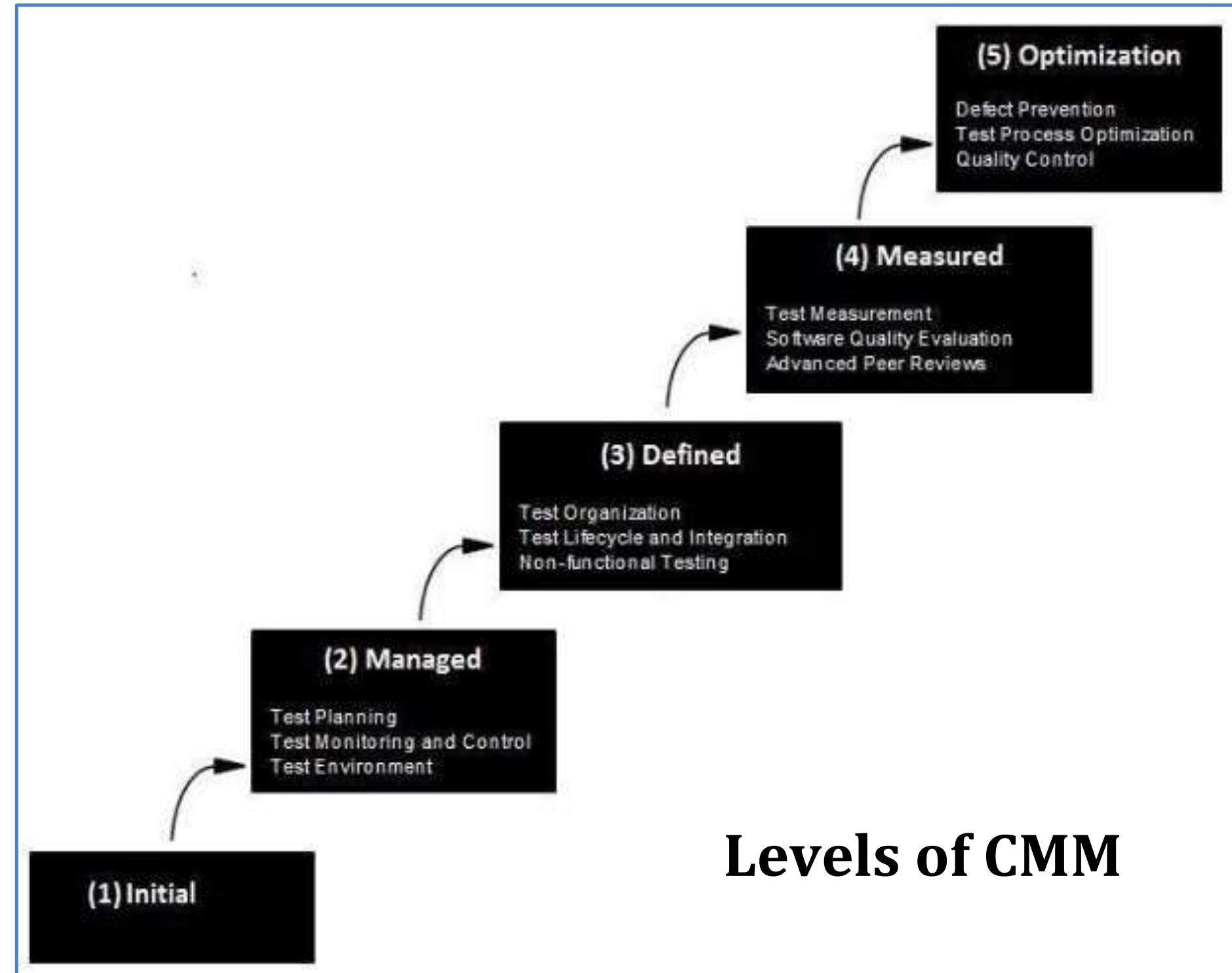
Conti...

- Show managers how to coach and motivate their teams and how to help them sustain peak performance.

- Accelerate software process improvement by making CMM23 Level 5 behavior normal and expected.

- Provide improvement guidance to high-maturity organizations.

- Facilitate university teaching of industrial-grade team skills.

- What is CMM? It is not a software process model. It is a framework that is used to analyze the approach and techniques followed by any organization to develop software products.

TSP Framework

- Launch high level design

- Implementation

- Integration

- Test

- postmortem

Levels of CMM

Conti...

- Engineering groups use the TSP to apply integrated team concepts to the development of software-intensive systems. A launch process walks teams and their managers through

-establishing goals

-defining team roles

-assessing risks

-producing a team plan

Benefits of TSP

▪The TSP provides a defined process framework for managing, tracking and reporting the team's progress.

▪Using TSP, an organization can build self-directed teams that plan and track their work, establish goals, and own their processes and plans. These can be pure software teams or integrated product teams of 3 to 20 engineers.

▪TSP will help your organization establish a mature and disciplined engineering practice that produces secure, reliable software.

PROCESS TECHNOLOGY

•Process technology tools allow a software organization to build an automated model of the process framework, task sets, and umbrella activities.

•The model, normally represented as a network, can then be analyzed to determine typical workflow and examine alternative process structures that might lead to reduced development time or cost.

PROCESS TECHNOLOGY

•Once an acceptable process has been created, other process technology tools can be used to allocate, monitor, and even control all software engineering activities, actions, and tasks defined as part of the process model.

•Each member of a software team can use such tools to develop a checklist of work tasks to be performed, work products to be produced, and quality assurance activities to be conducted.

•The process technology tool can also be used to coordinate the use of other software engineering tools that are appropriate for a particular work task.

PRODUCT AND PROCESS

- The Product is what we're actually building.

- What's our solution to the problem at hand? Half of engineering is making sure you're building the right product and have the ability to actually build it.

- For software engineers, that means coming up with a software solution and being able to code it up properly.

Conti...

- The hidden side of engineering is the Process, which means how we're actually building our product.

- Products don't just result from a single all-night coding session -- we need to make sure we're following a process that lets us create that Product in the most efficient and effective way possible.

Assessment 1

1. What is PSP?

Ans : _____

2. What is TSP?

Ans : _____

References

1. Roger S.Pressman, Software engineering- A practitioner's Approach, 10th Edition, McGraw-Hill, 2017.

2. Ken Schawber, Mike "Agile Software Development with Scrum" Pearson Education, 2nd Edition, 2015.

Thank You