Software Engineering: Phases, Stages, and Levels

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CS446

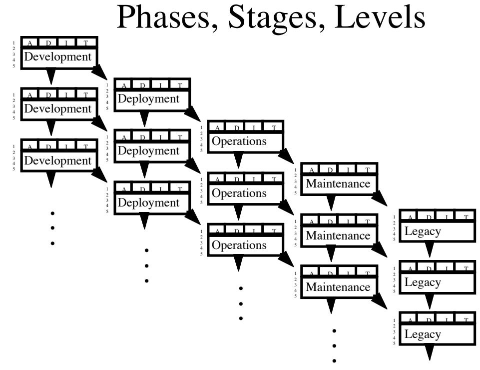
References

- www-db.stanford.edu/~burback
- Thesis on methodologies: WaterSluice

So you really want to manage a software engineering project?

Algorithms and Data Structures arn't enough.
What you need are phases, stages, and levels.

Phases, Stages, Levels



Software Engineering

- Phases (Methodology)
  - Analysis, Design, Implementation, Testing
  - A,D,I,T
- Stages (Life Cycle)
  - Development, Deployment, Operations, Maintenance, Legacy
- Levels (Team Management)
  - People, Tools, Guidance, Measurements, Control

Process Management

- What do you want to do? (Analysis)
- What are your plans? (Design)
- Now, Do it! (Implementation)
- Improve Quality (Testing)

Analysis Phase

- What do you what to build?
- Requirement Document
- Ontology
    - Things: (nouns)
    - Actions: (verbs)
- States, Transitions, Events, Triggers
- Typical Scenarios
- Atypical Scenarios

Design Phase

- What is the plan? How...
- Architecture
- Implementation Plan
- Performance Analysis
- Testing Plan
- Critical Priority Analysis

Implementation Phase

- Now build it!
- Code
- Critical Error Removal

Testing Phase

- Improve Quality
- Regression
    - gold standard, scaffolding
- Internal
- Unit
- Application
- Stress

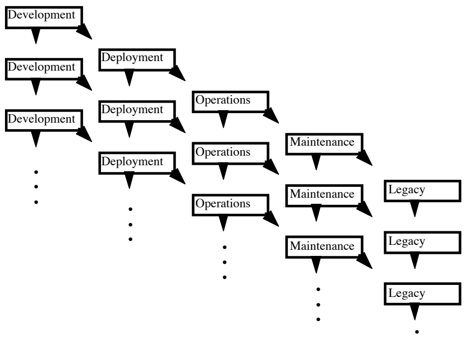
More on Quality

- Shouldn’t quality be for more than just the Implementation?
    - Analysis - Quality (Storyboards, ...)
    - Design - Quality (Simulation, ...)
    - Implementation - Quality (Testing, ...)

Life Cycle Stages

- Development - engineering
- Deployment - installing the system
- Operations - day-to-day running of the system
- Maintenance - patches
- Legacy - discontinuation

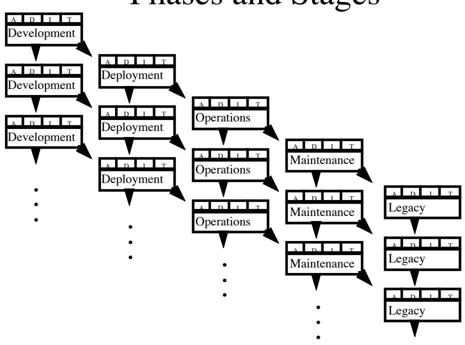
Stages



Phases on top of Stages

- Each life cycle stage needs the four fundamental phases of analysis, design, implementation, and testing.

Phases and Stages



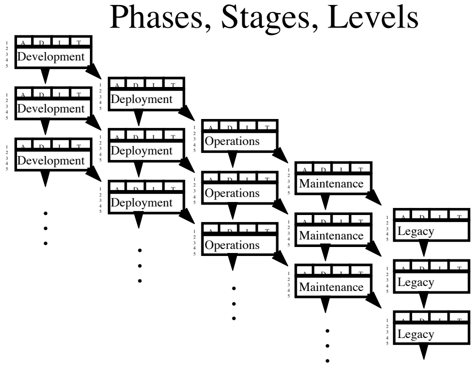
Levels

Levels are for team management.

- People
- Tools (compilers, ...)
- Guidance (paradigms, ...)
- Measurements (productivity, ...)
- Control (priority setting, ...)

Each stage needs the four phases. Each team needs the five levels.

Phases, Stages, Levels



Conclusion

- To managing a software engineering project, a story is needed for phases, stages, and levels.
- Each Stage needs the four phases.
- Each team needs the five levels.