

Course for Software Testing

BS (Software Engineering)

Spring Semester

February 2014

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<http://www.hybriditservices.com/course/FU-BSSE8-ST>

Lecture 8



Test Plan

Plan For

- *Test Preparation*
 - *When to Test? Which Tests? How many no. of Tests? How to complete coverage the test? What to Test? In which model to execute the test process?*
- *Test Evaluation (Implementation & Execution)*
 - *How to run the program? Stubs & Drivers? How to run the unit?*
- *Recording the Observation*
 - *How to Record? Tool? What variable we choose for reporting i.e. severity etc.? What will be value of variables, information to report, i.e high, low etc.?*

Test Plan

Plan For

- *Analysis & Follow up*
 - *What is required data for analysis? What statistical information is needed? Which metrics & indicators will be useful? To whom report? What will be reporting information? Reporting Channels i.e. development lead, testing lead, project manager?*

- *Towards Closing (Test Closure Activities)*
 - *When to terminate? Make a checklist? A follow up of checklist? if need to Re-test?*

Test Plan

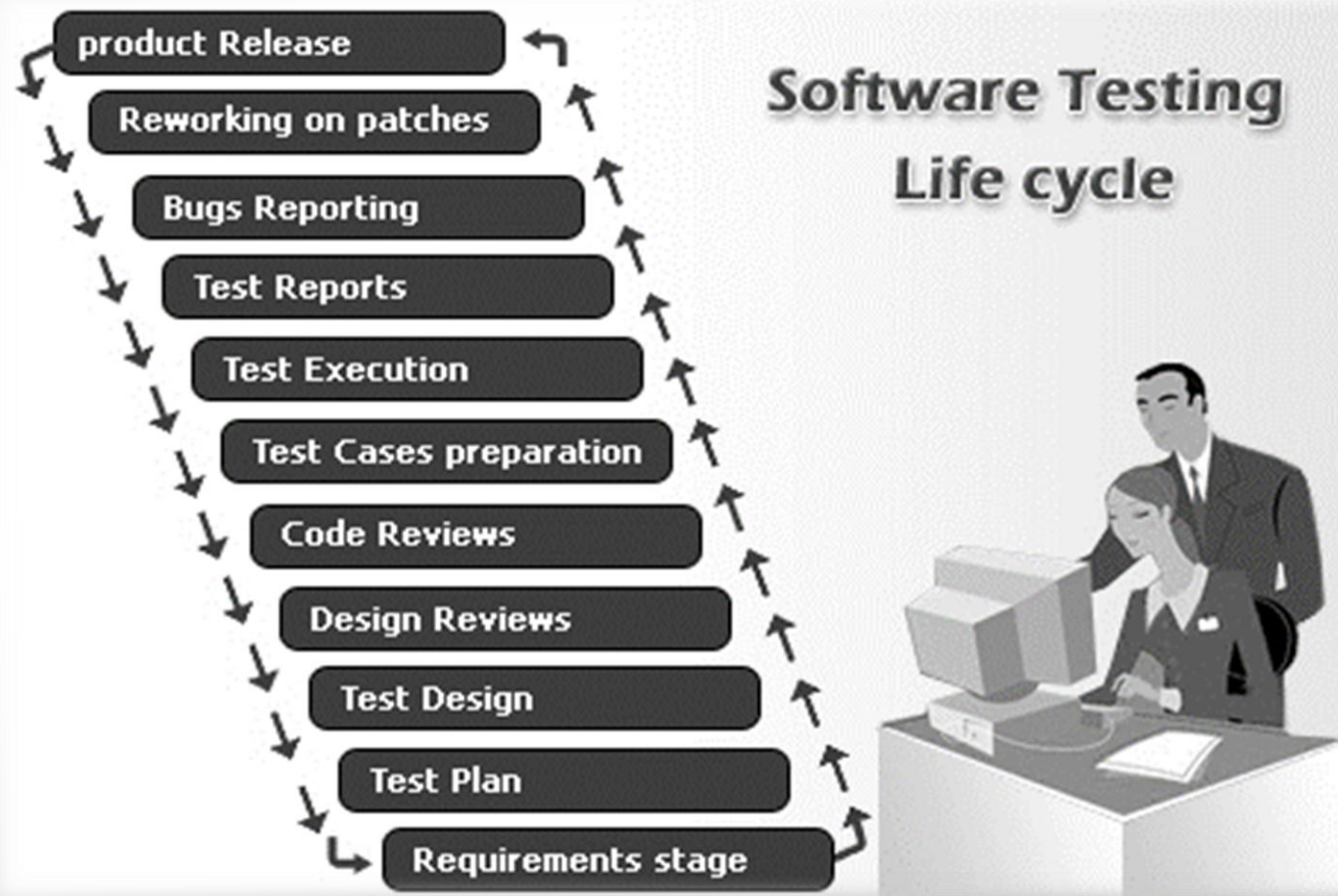
Plan For

- *Preparing the Test Report*
 - *Format of test report? Can export from tool? If archive? Send to whom*

- *How to Control Test (Management Perspective)*
 - *These activities are logically sequential, but, in a particular project, may overlap, take place concurrently and even be repeated*

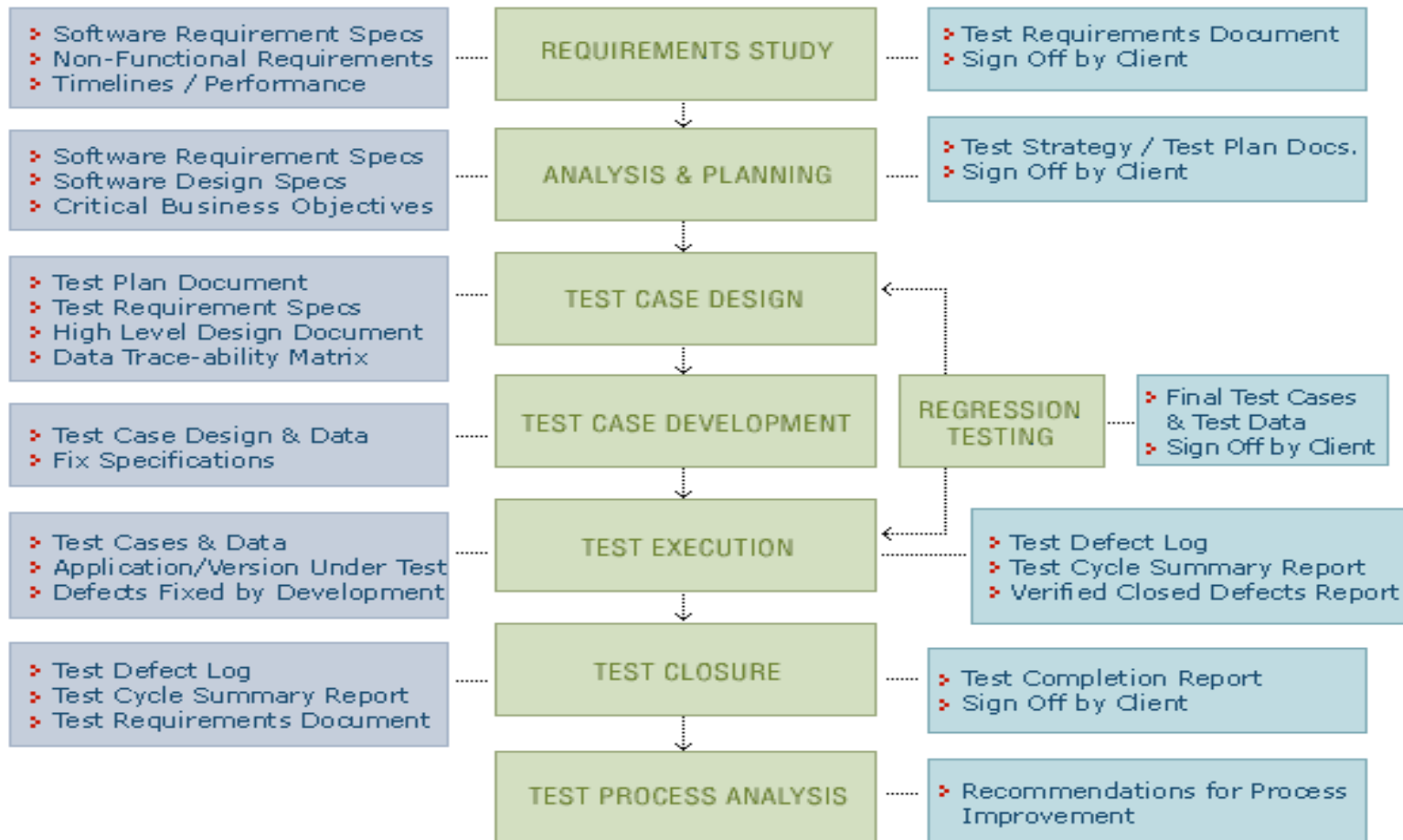
- *What will be Your Software Testing Life Cycle?*
 - *What will be key process activities & key product artifacts?*

Your Software Testing Life Cycle

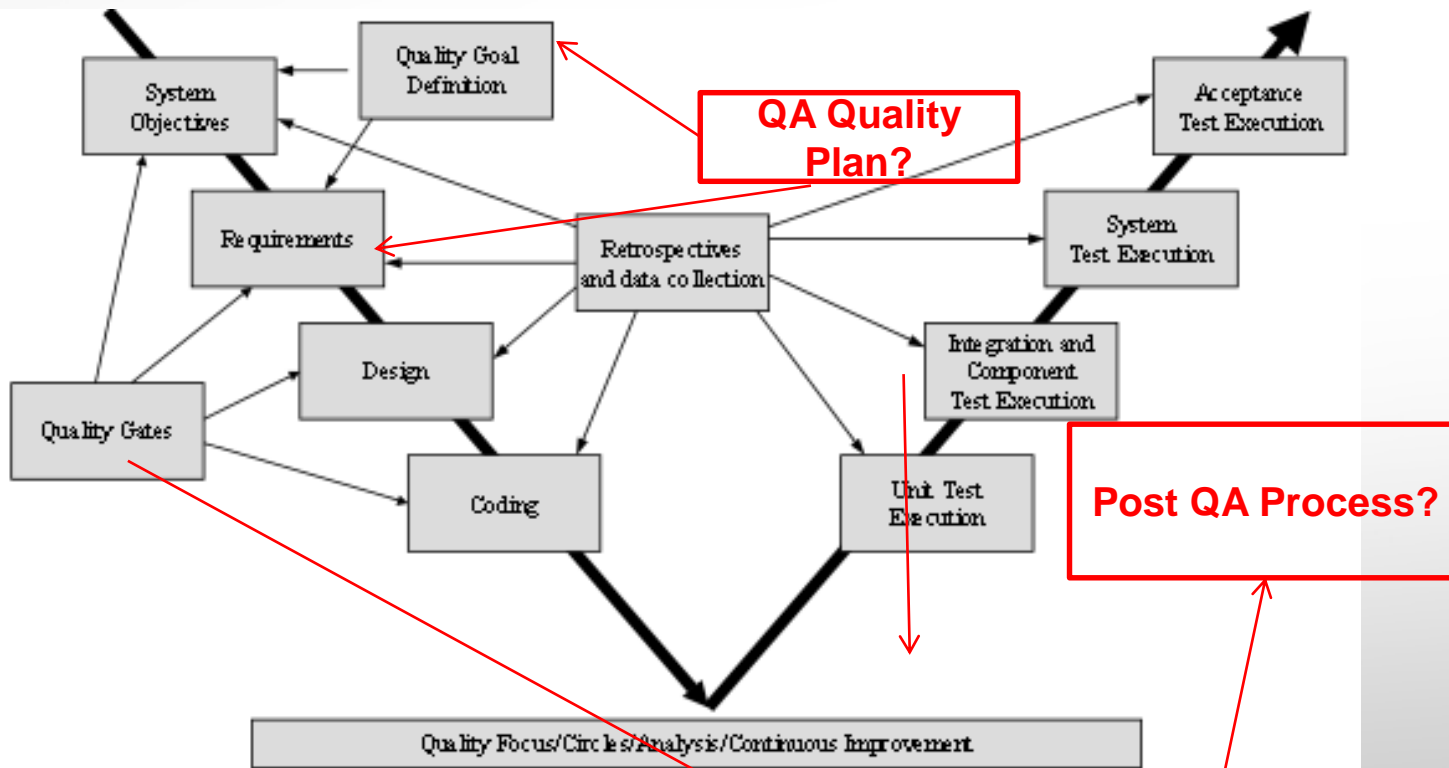


Your STLC: activities & artifacts

TEST LIFECYCLE



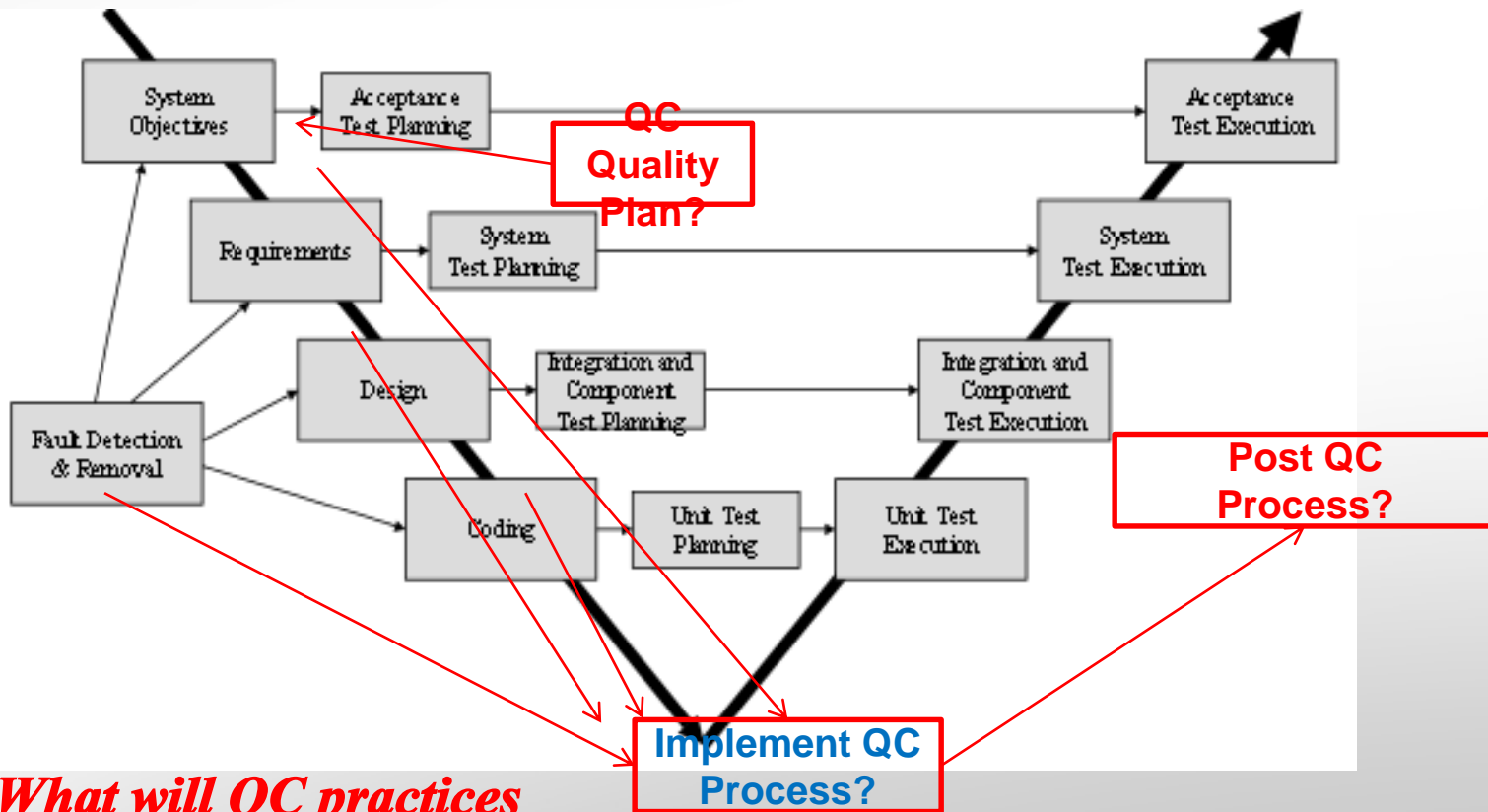
STLC & QA Practices in the SDLC



What will be QA practices for STLC

Implement QA Process?

STLC & QC Practices in the SDLC



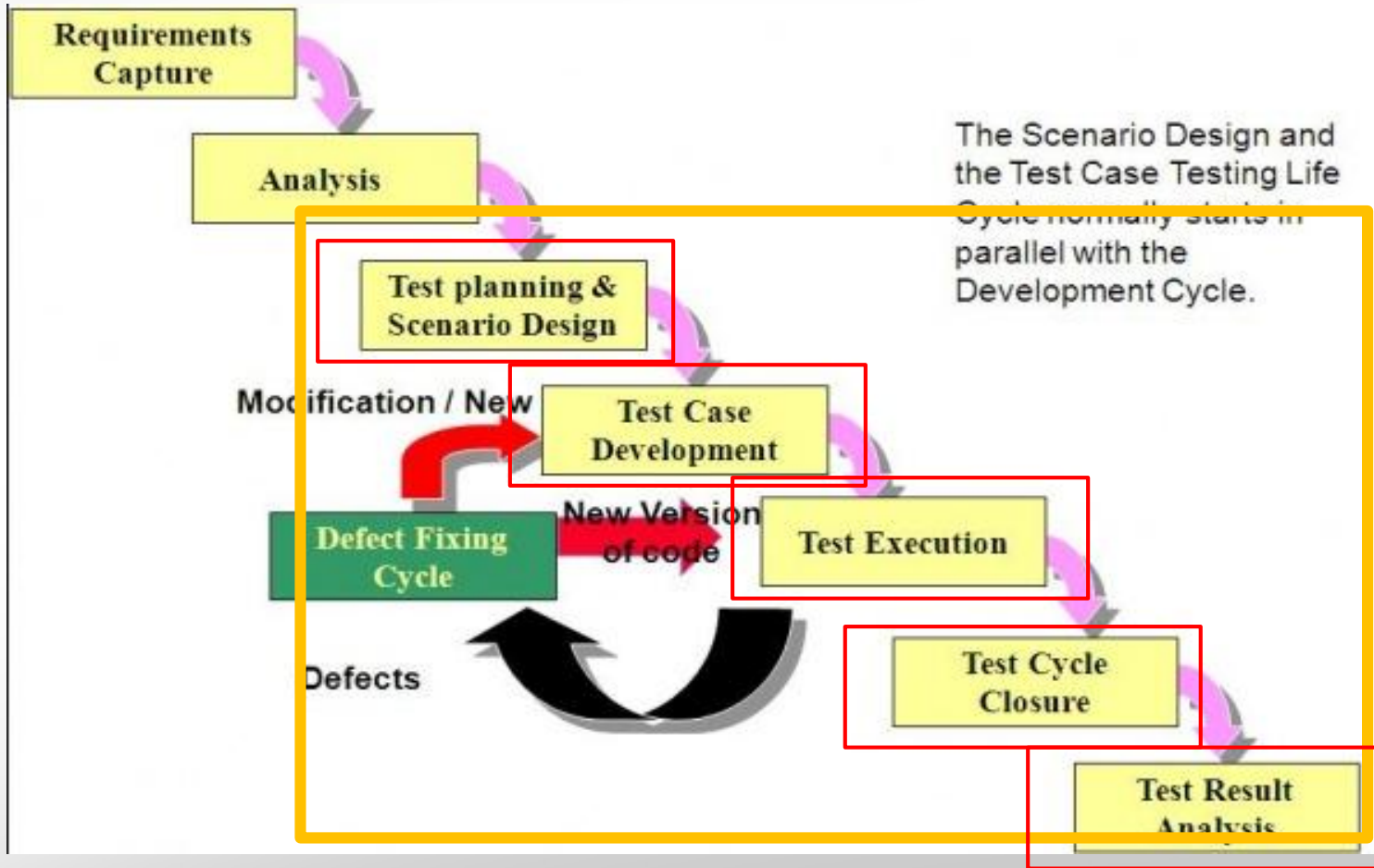
What will QC practices for STLC

USE IEEE 829 – Standards for Software Testing Documentation

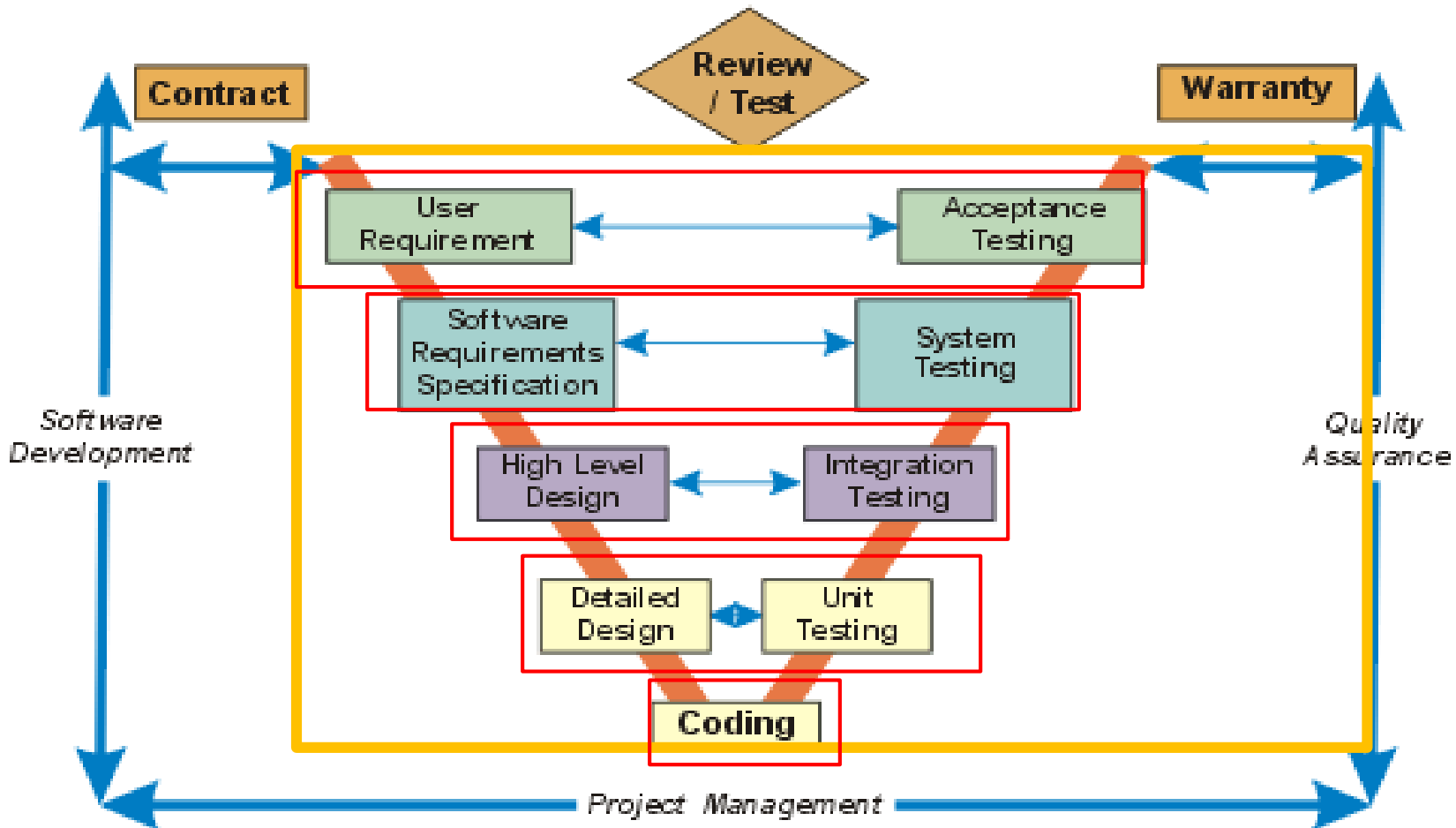
Recommends 8 types of testing documents used in **STLC**:

1. **Test Plan**
2. **Test Design Specification**
 - expected results, pass criteria, ...
3. **Test Case Specification**
 - test data for use in running the tests
4. **Test Procedure Specification**
 - how to run each test
5. **Test Item Transmittal Report**
 - reporting on when components have progressed from one stage of testing to the next
6. **Test Log**
7. **Test Incident Report**
 - for any test that failed, the actual versus expected result
8. **Test Summary Report**
 - management report

Which Model? Test Activities Start from Beginning..

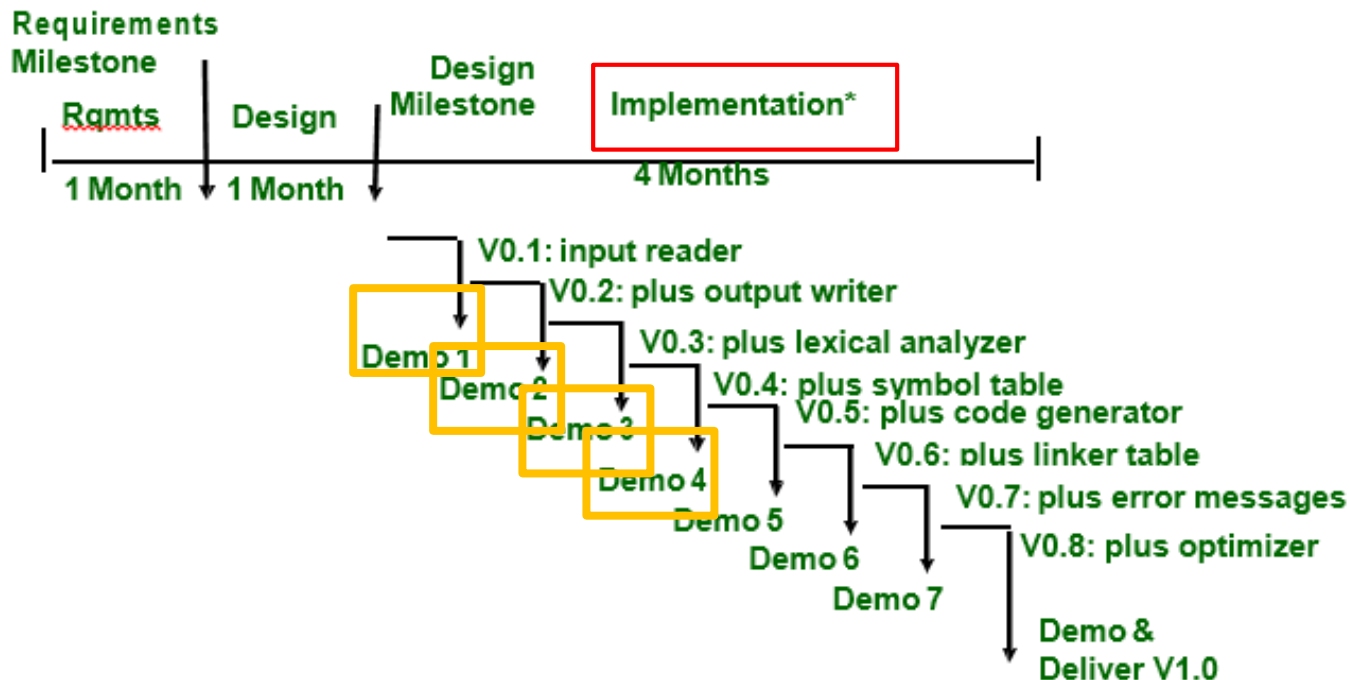


Which Model?



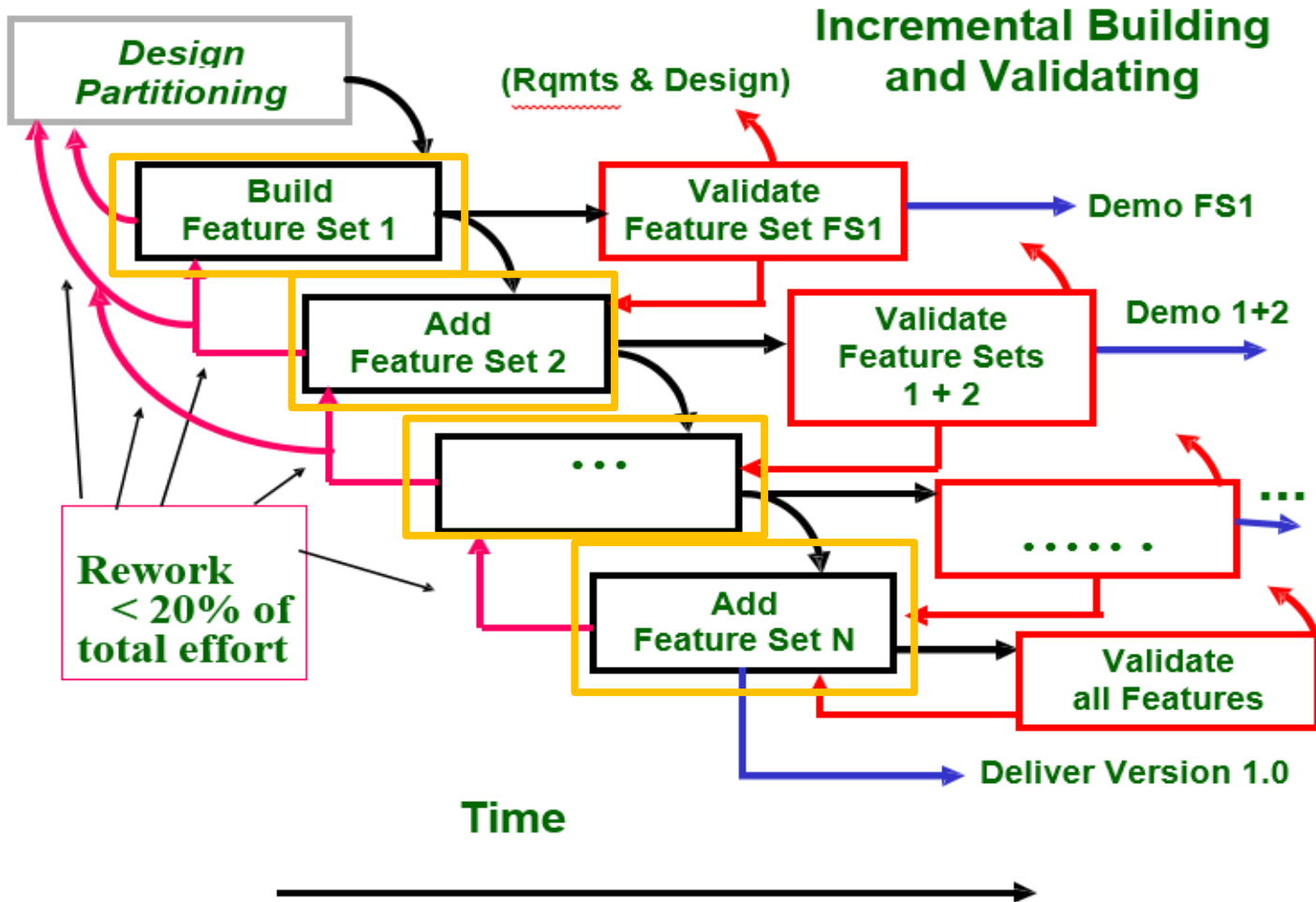
Which Model?

An Incremental-build Example Implementing a Compiler

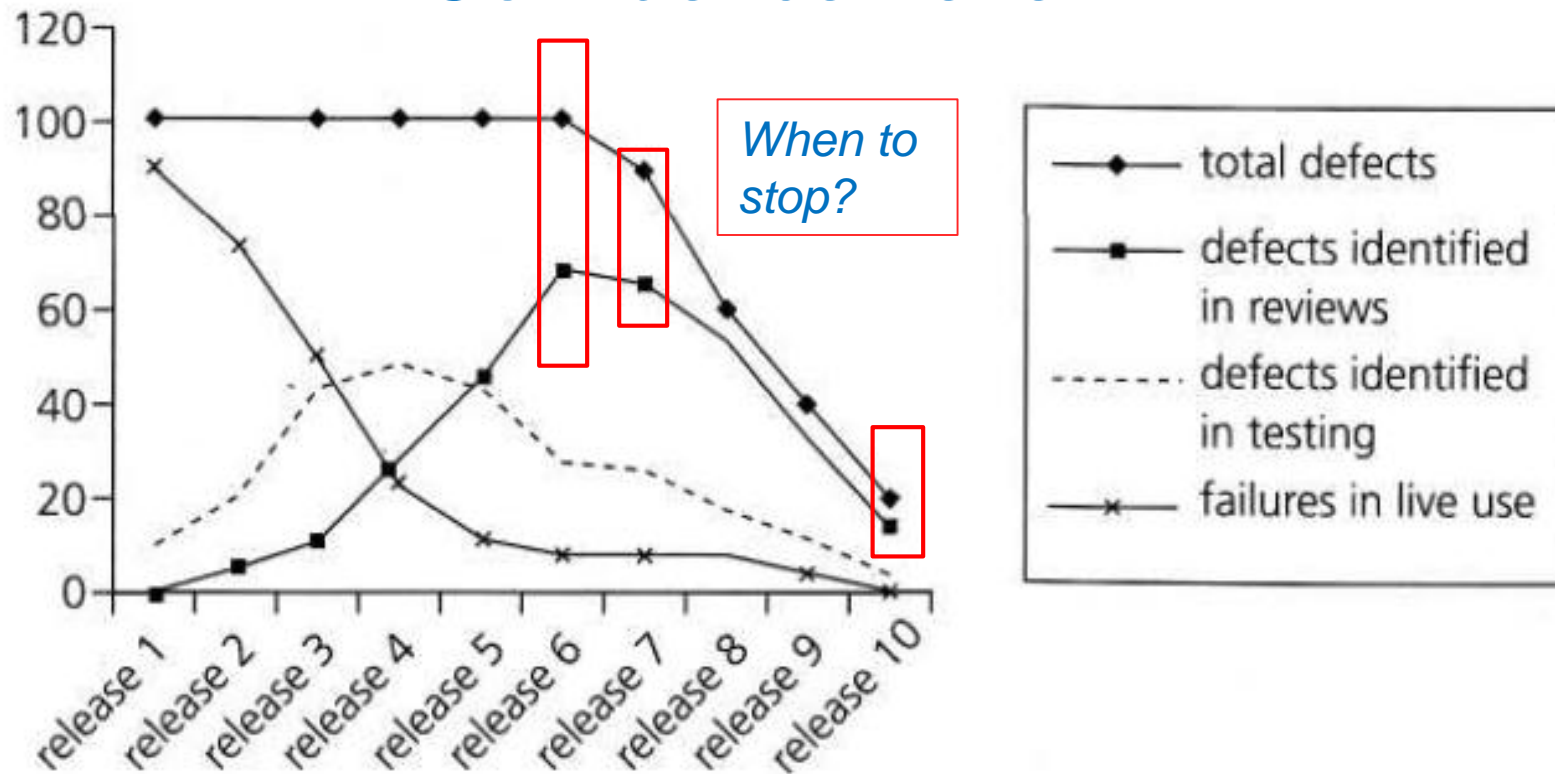


*implementation of each increment includes detailed design, coding, review, integration, testing, and demonstration

Which Model?



What is status of Defects? Confidence Level?



Changes in defect numbers during process improvement

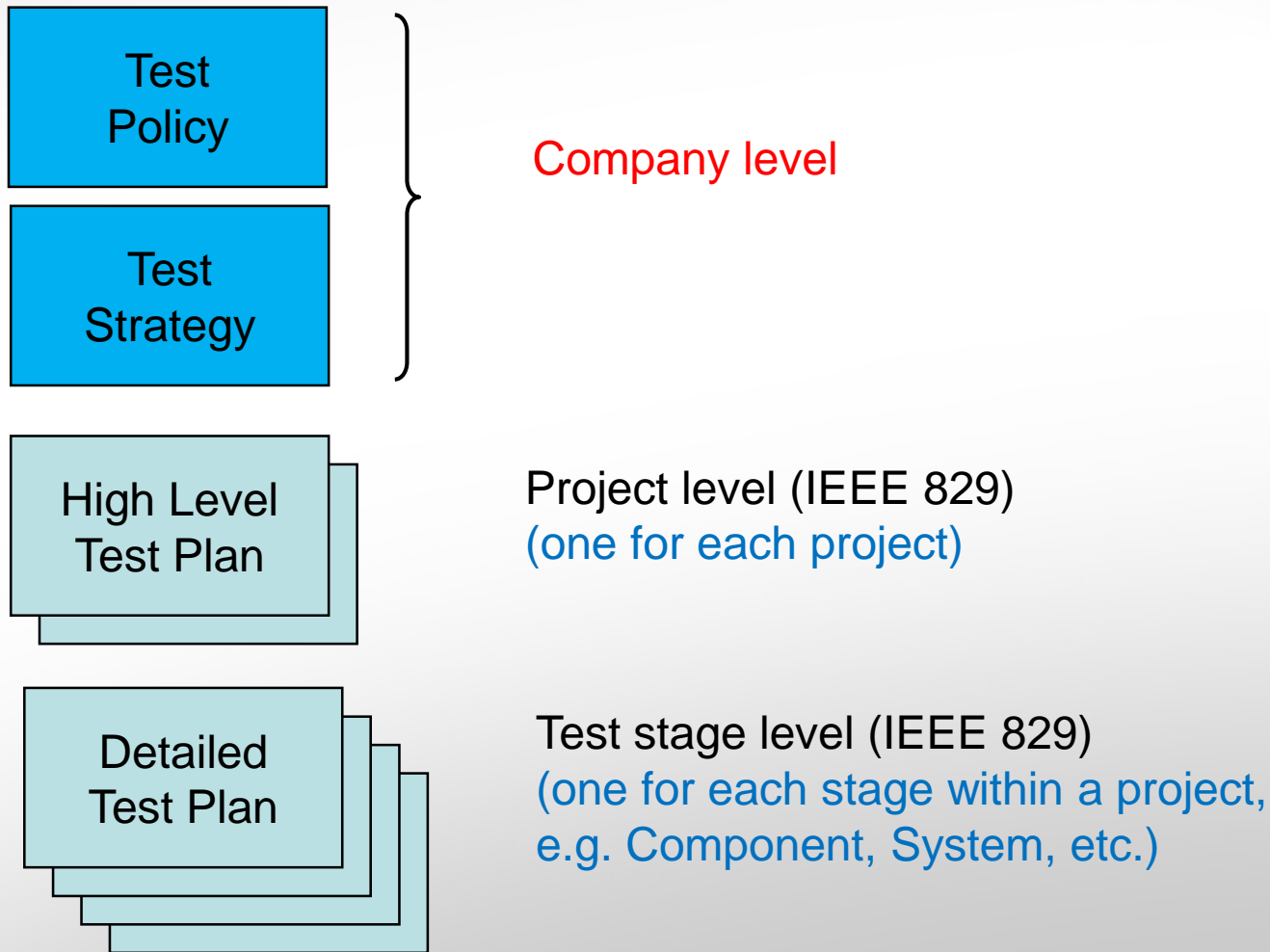
Test Control (Management Perspective)

- **Test control is an ongoing activity** to measure progress against the plan and take corrective action
- Measure, Monitor and Document the progress, test coverage and exit criteria
 - Compares actual progress against the planned progress
 - Report to project manager and customer on the current status of testing
 - what the results are, and what conclusions and risk assessment we have made.
 - **Priorities; when to fix; which defect to fix, delay or ignore,**
- Corrective actions: **once measured the deviation** & monitored the issues
 - For example, **tighten exit criteria for defects fixed,**
 - ask for more effort to be put into debugging or **prioritize defects for fixing test blockers.**

Test Control (Management Perspective)

- Corrective actions (Cont..)
- Based on information from **measuring & monitoring**, any information related to business & project risks
 - **Decision to continue** testing, **to stop** testing, to release the software or to retain it for further work for example.
- **Report the changes or deviations** from the plan.
- Re-plan
 - Feedback from **monitoring and** control activities which take place through out the project.
 - **Action to change the plan** and inform
- Promote good coordination within & across different groups

Test Planning - different levels



Test Policy & Strategy

- Test Policy & Test Strategy is developed at company level.
- This generic company level test policy strategy is then applied to prepare test plan for a project.
- Test policy gives rules for testing, e.g. 'we always review the test design documents, we hire junior Testing Engineer having min. 1 year experience, fresh entrant must take 1 month preparatory course
- Test strategy is the overall high-level approach, e.g. 'system testing is carried out by an independent team reporting to the program quality manager.

Test Policy & Strategy

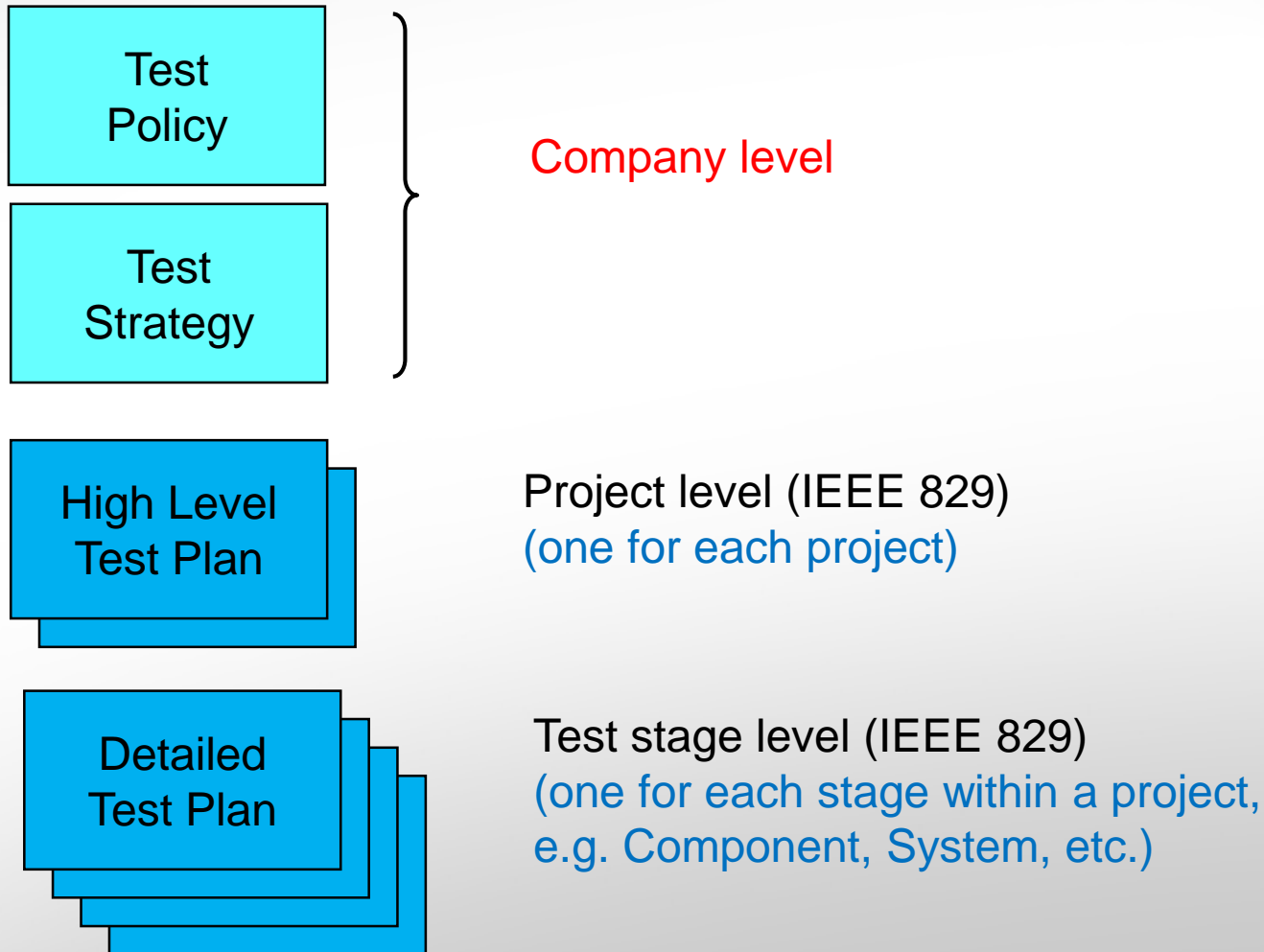
- Strategy defines the scope and general directions or approach or path for testing in the project.
- If there is no Test Policy and Strategy
 - State the Test Policy and Strategy First
- Our planning should adhere (follow) the Defined Test Policy and Strategy

Test Policy & Strategy

Test strategy must answer the following questions

1. When will testing occur?
2. What kinds of risks come?
3. What are the critical success factors?
4. What tools will be used?
5. Where requires more attention?
6. How to measure? What metrics to apply? What will be the indicators?

Test Planning - different levels



High level test planning

- What is the purpose of a high level test plan?
 - Who does it communicate to?
 - What is your standard for contents of a test plan?
 - What is not included in a test plan?



High level test planning

- How the test strategy and project test plan apply to the software under test
- Other software needed for the tests, **such as stubs and drivers**, and environment details
- set test completion criteria
- **Realistic about where defect come from**
- **Use Historic Information for Defects Gaps**
- **How to analyze the defect sheet**
- Selection those testing techniques that are **appropriate to a particular type of software application**

High level test planning

- In General, the **test planning process starts** with test team formation depends upon the below factors:
 1. Availability of testers
 2. Availability of the test environment resources.
- After completion of test team formation the **test lead concentrate** on risk analysis and mitigations or solutions.
 - Types of Risks:
 1. **Lack of knowledge on the domain.**
 2. Lack of budget.
 3. **Lack of resources.**
 4. **Delay in deliveries.**
 5. **Lack of development team seriousness.**
 6. **Lack of communication.**

High level test planning

- Goal
- An **Exit point** from testing process **once Testing GOAL is met...**
- Test Objective
- It is a statement of what the tester is expected to perform during the testing activity.
- During Test Plan
 - **understand the goals and objectives of** the customers, stakeholders, and the project, and the risks which testing is intended to address.
 - Set the goals and objectives for the testing itself
 - Derive an approach and plan for the tests
 - **Note: Planning within the company test policy & strategy**

High level test planning

- What are the critical or most complex modules?
 - make sure they get integration tested first
 - probably deserve white-box attention
- Where have you had problems **in the past**?
- **Third-Party delivered** components?
- What training is required?
 - conducting formal reviews
 - use of testing tools
 - defect report logging

IEEE 829 Format – Test Plan Contents

1. Test Plan Identifier
2. References
3. Introduction
4. Test Items
see next slide
5. Software Risk Issues
6. Features to be Tested
7. Features not to be Tested
8. Approach
9. Item Pass/Fail Criteria
10. Suspension Criteria and Resumption Requirements
11. Test Deliverables
12. Remaining Test Tasks
13. Environmental Needs
14. Staffing and Training Needs
15. Responsibilities
16. Schedule
17. Planning Risks and Contingencies
18. Approvals
19. Glossary

IEEE 829 Format – Test Plan Contents

1. TEST PLAN ID

- The unique name and number will be assigned for every test plan

2. References

3. INTRODUCTION/SUMMARY

- Brief account about the project.
- software items and features to be tested
- references to project authorisation, project plan, QA plan, CM plan, relevant policies & standards

IEEE 829 Format – Test Plan Contents

4. Test Items

- Requirements Specification
- Design
- Code Modules
- User / Operator Material
 - the user interface
 - User Guide
 - Operations Guide
- Non-Functional Requirements
 - response time, data accuracy, security, etc.
- System Validation
 - alpha and beta testing
- test items including version/revision level

Other Items of Plan IEEE 829

5. SOFTWARE RISKS ISSUES

- A risk is a condition that can result in a loss. The risk that may occur/arise during the analysis of the testing.
- Unavailability of resources – software or hardware etc .

6. FEATURES TO BE TESTED:

- Testing only responsible modules (or) the names of the modules to be tested.

7. Features not to be tested

- reasons for exclusion

8. Approach

- activities, techniques and tools
- detailed enough to estimate

Other Items of Plan IEEE 829

8. Approach

- specify degree of comprehensiveness (e.g. coverage) and other completion criteria (e.g. faults)
- identify constraints (environment, staff, deadlines)

9. ENTRY CRITERIA: Item Pass/Fail Criteria

- Whenever the test engineers, starts test execution.
 - i. All test cases are completed
 - ii. Receive stable build or software build from developer
 - iii. Establish test environment.

EXIT CRITERIA:

- Whenever the test engineers are able to stop test execution
- - i. All the test cases should be completed.
 - ii. Cross the schedule.
 - iii. All the defects resolved.

Other Items of Plan IEEE 829

10. SUSPENSION CRITERIA and resumption criteria

- Whenever the test engineers are able to interrupt test execution
 1. Major bugs or severe bugs occur.
 2. Resources are not working.
- for all or parts of testing activities
- which activities must be repeated on resumption

11. TEST DELIVERABLES

- The number of required documents submitted to the test lead by the test engineers.
- Documents are
 1. Test plan
 2. Test design specification
 3. Test Case specification

Other Items of Plan IEEE 829

11. TEST DELIVERABLES:

4. Test procedure specification
5. Test Logs
6. Test reporting documents.
7. Test summary documents
8. Test incident reports

12. REMAINING TEST TASKS

- including inter-task dependencies & special skills

13. Environment

- Required documents to prepare during testing
- Required physical, hardware, software, tools used in the project.
- mode of usage, security, office space

Other Items of Plan IEEE 829

14. STAFF & TRAINING PLAN:

- The names of selected testing team and number of training sessions required for them.

15. ROLES & RESPONSIBILITY

- to manage, design, prepare, execute, witness, check, resolve issues, providing environment, providing the software to test
- **Test manager**
 - manage and control a software test project
 - supervise test engineers
 - define and specify ----- > **A Test Plan**
- **Software Test Leads**
- **Software Test Engineers and Testers**
 - define test cases, write test specifications, run tests
- **Independent Test Group**
 - customers or client initiative

Other Items of Plan IEEE 829

15. ROLES & RESPONSIBILITY

- Development Engineers

- Only perform unit tests and integration tests

- Quality Assurance Group and Engineers

- Perform system testing
- Define software testing standards and quality control process

16. Schedule

- test milestones in project schedule
- what resources are needed when

Task	Duration	Resource
Test plan	3	1
Test design	5	3

Other Items of Plan IEEE 829

17. Planning Risks and Contingencies

- contingency plan for each identified risk
- Mitigation plan - - -
- What are the ways to overcome

18. Approvals

- Signature of PM/QA / responsible people.
- Names and when approved

19. Glossary

Other Items of Plan IEEE 829

Other Items

- Communication Plan
 - The communications during the project will be informed through this communication approach.
- Tools
 - Identify which tools is used for each individual test
 - Should know the test level criteria

Other Items of Plan IEEE 829

- REVIEW ON TEST PLAN:
 - After completion of test plan document, the test lead concentrate on review of the document for completeness & correctness.
 - In this review meeting, testing team conducts Coverage Analysis.