LITHAN EDU CLaaS® DIGITAL ACCELERATOR

Module: Application Implementation

Risk Assessment

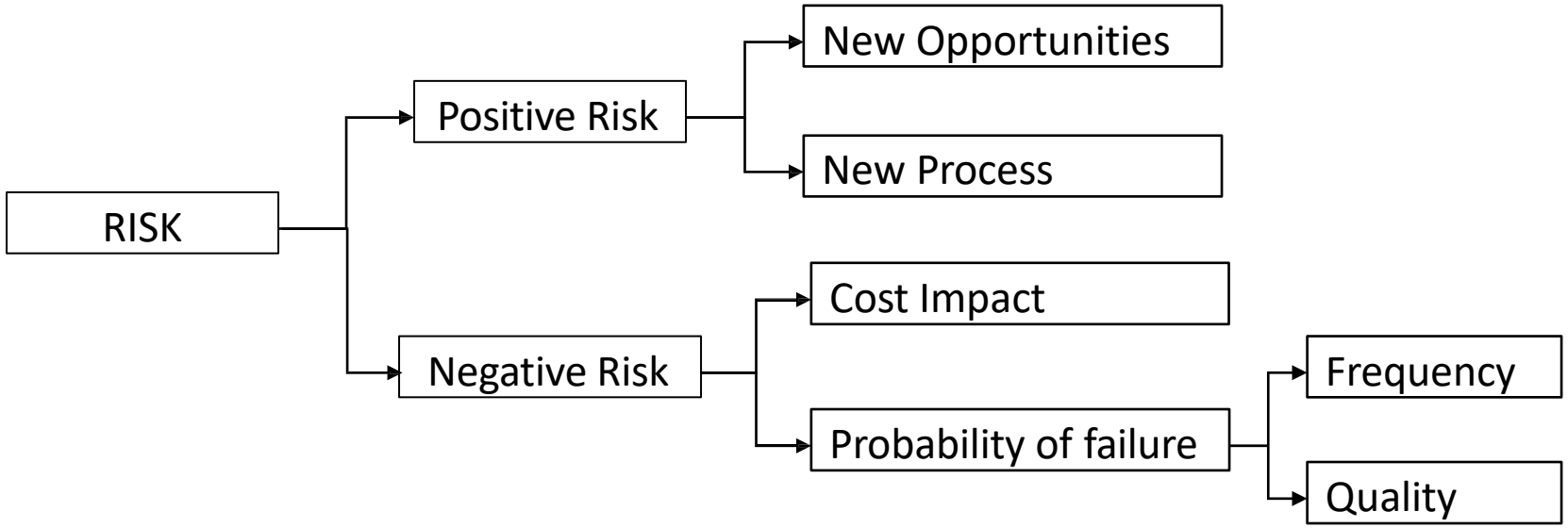
By the end of this tutorial, you will be able to understand the basics of software risk and testing

Instructional Units in the Module

S. No.	Topic Description	Required / Optional
1	What is Risk?	Required
2	Risk Based Testing	Required
3	Risk Management Process	Required
4	Characteristics of product quality	Required
5	Risk identification	Required
6	Risk strategy and assessment	Required
7	Risk mitigation	Required
8	Test planning	Required

What is Risk?

- Occurrence of an uncertain or unexpected event
- Has a positive or negative impact on a project's objectives
- Likelihood occurrence or change of a particular set of circumstances
- Might happen in the past or current or may happen in future
- May affect the budget, business, technical, performance and quality objectives



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Risk

- Cost Impact
  - Financial Loss
  - Loss of client's trust
  - Critical business impact
  - Time to market

- Probability of failure
  - Likelihood * complexity

    Likelihood – Rare, often, most likely

    Complexity – severity

- Risk = Probability of failure * Cost Impact

  R(f) = P(f)*C(f)

  R(f) – Calculated risk of function f

  P(f) – Probability of failure in function f

  C(f) – Cost Impact of failure in function f

  Results EMV – Expose Monetary Value

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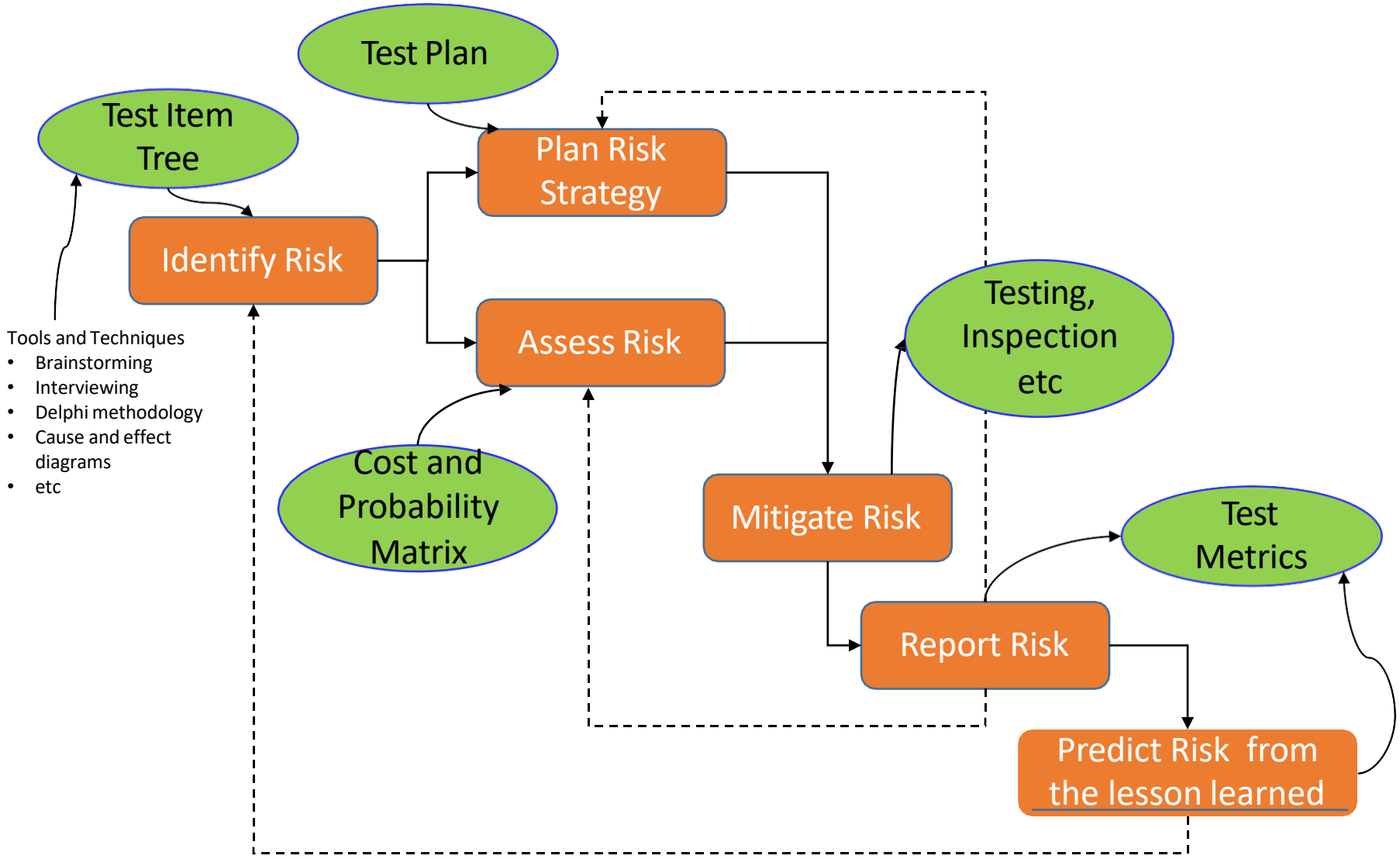
Risk Based Testing (RBT)

- Testing Strategy that implements risk management concepts
- It is an iterative process evaluated at different levels such as project level, requirements gathering level, and test level
- Client centric approach to deliver the most important feature required by the clients
- Reduces the impact and probability of negative risks and increases the risk level of positive
- Provides the high visibility of risk and helps to make a better decision by knowing the risk
- Inexperienced resources utilized while implementing the hi-tech projects
- Projects with security vulnerabilities and SQL injection threats

Risk Management Process (RMP)



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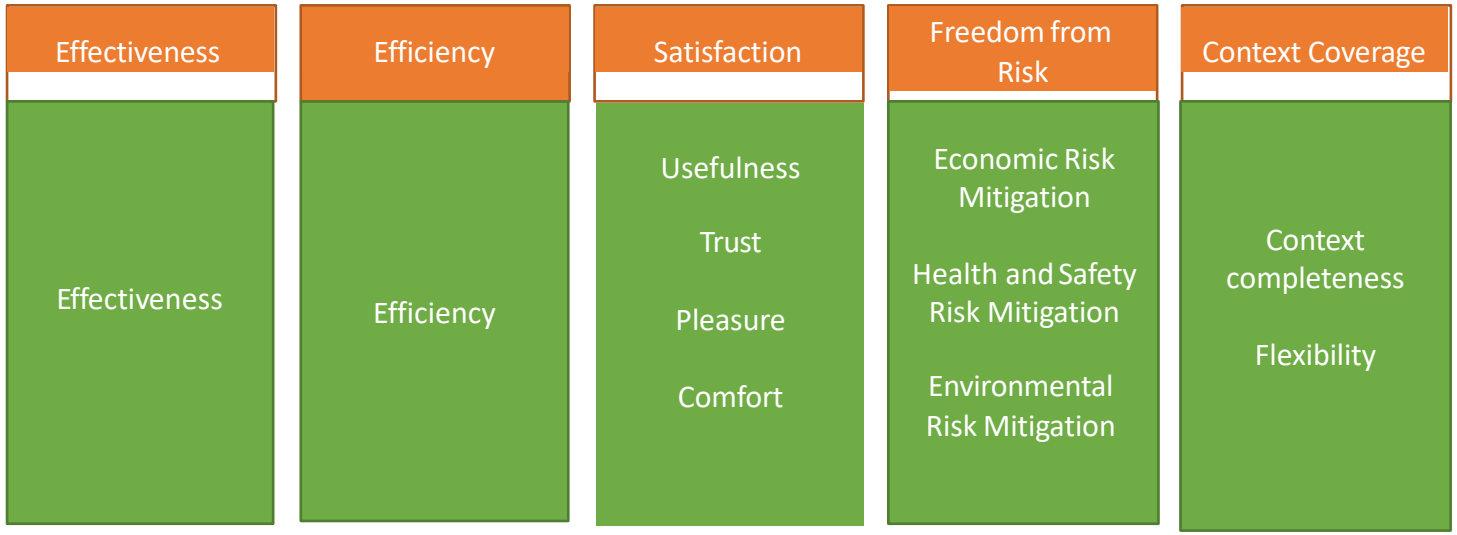
Quality in Use (ISO/IEC 25010:2011)

- Five characteristics of the product/ service quality



All characteristics can be attributed to various stakeholder activities based on the industry, such as the engagement of an operator or software maintenance.

Software Product Quality (ISO/IEC 25010:2011)

- Eight characteristics of Software product quality

Functional Suitability	Performance Efficiency	Compatibility	Usability	Reliability	Security	Maintainability	Portability
Functional Completeness Correctness Appropriateness	Time Behaviour Resource Utilisation Capacity	Co-existence Interoperability	Appropriateness Learnability User Error Protection User Interface Aesthetics Accessibility	Maturity Availability Fault Tolerance Recoverability	Confidentiality Integrity Accountability Authenticity Non-repudiation	Modularity Reusability Analyzability Modifiability Testability	Adaptability Installability Replaceability

All characteristics can be classified further based on the size and functionalities of the product

1. Risk Identification

- Risk can be
  - Known – Project team is aware of it (ex. Implementation of logics)
  - Unknown – Surfaced during the testing and become known
  - Unknowable - No one could foresee, which has the critical impact

- Risk should be identified using a structured and iterative manner with involvement of the key stakeholders to manage it better

- Sample test item tree as below

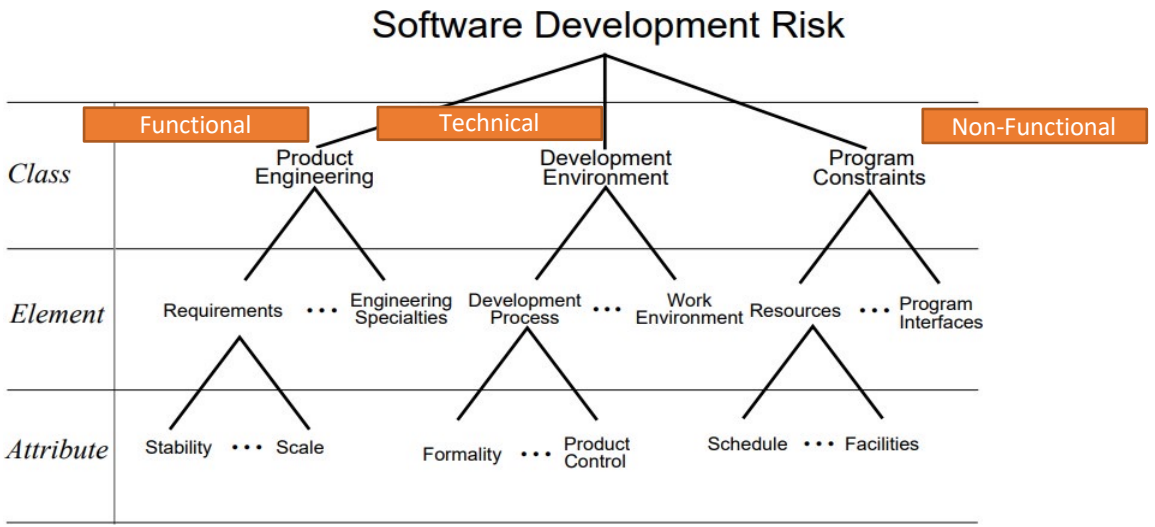
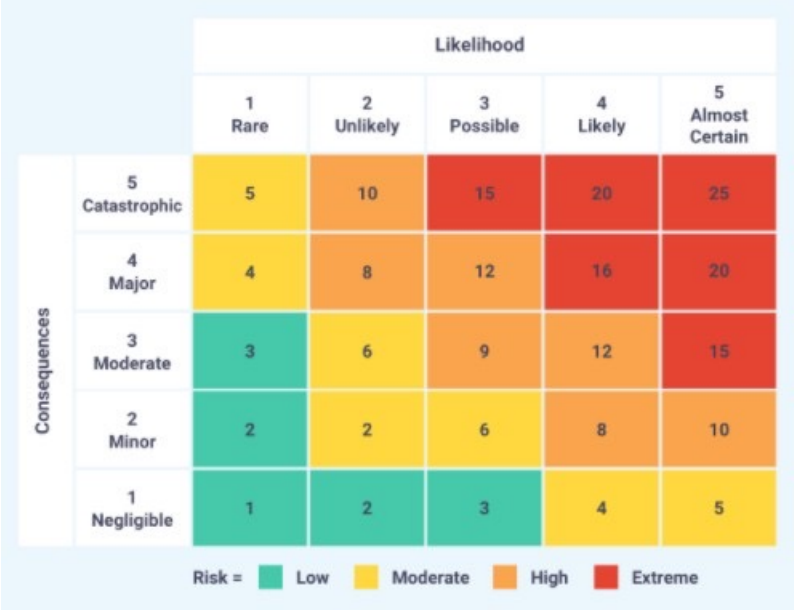


Image Source: https://resources.sei.cmu.edu/asset_files/TechnicalReport/1993_005_001_16166.pdf

2. Risk Strategy & Assessment

- Analysis of identification helps to develop the risk matrix

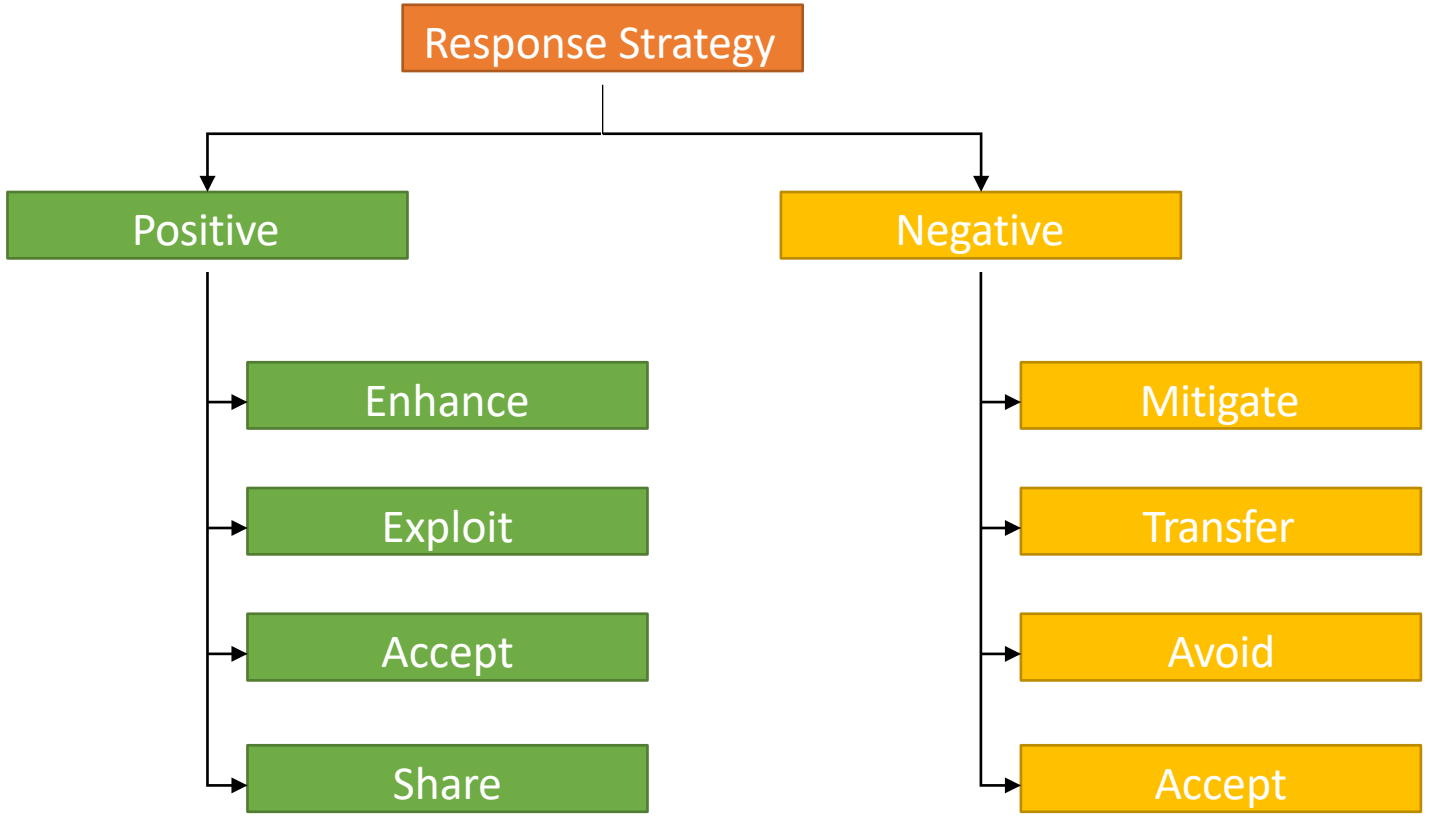
- Qualitative Risk Analysis is more subjective. Focuses to measure likelihood and consequences. The matrix size can be decided based on the project size (ex 3 * 3, 5 * 5). It gives good insight to various risks which impact the project and surfaces the one requires further assessment and controlling.



- Quantitative Risk Analysis is more objective, scientific and data intensive approach. Uses verifiable data to analyse the impact. It is optional and helps to take informed decisions.

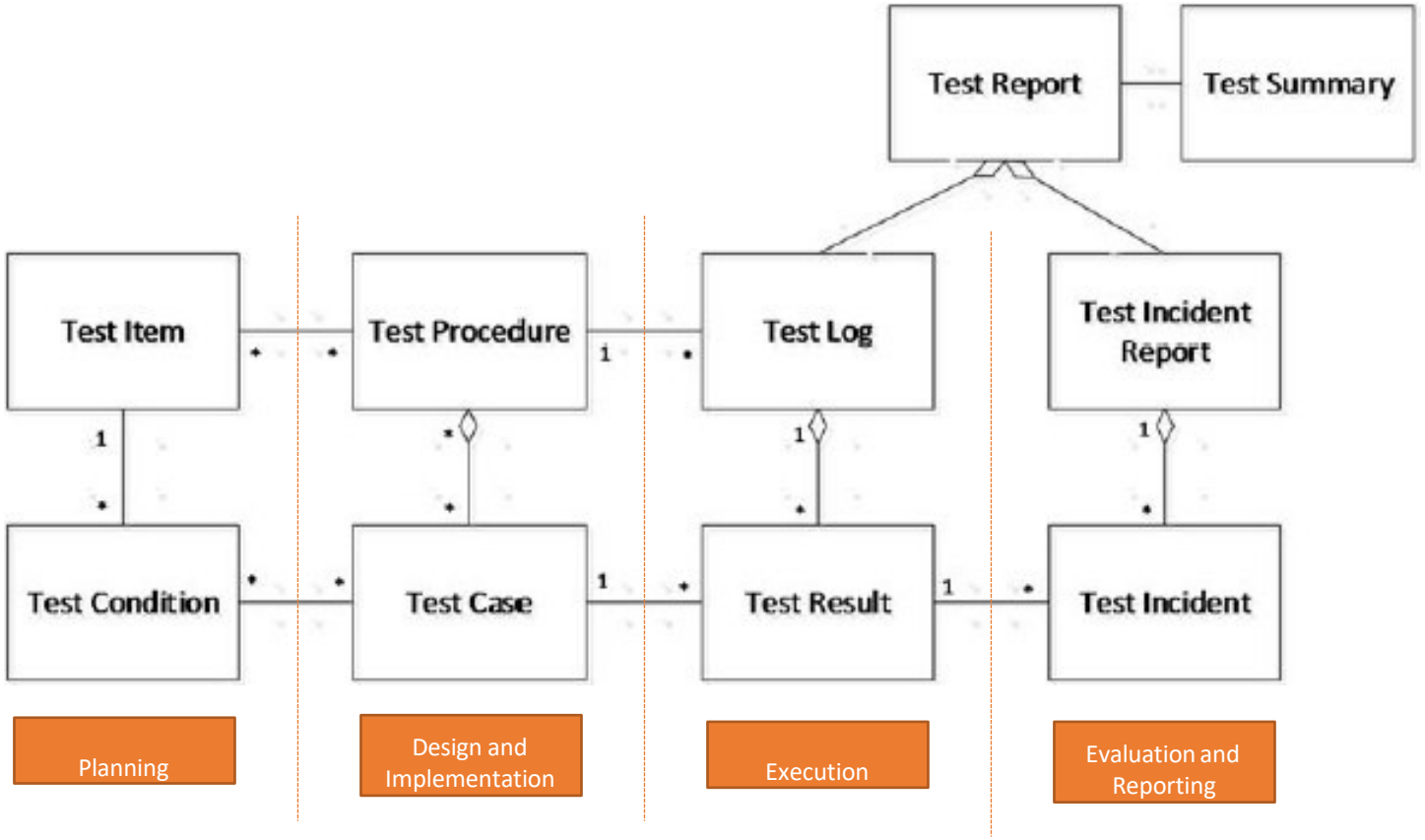
3. Risk Mitigation

- Helps to lessen the impact of possible threats



Test Planning

- Plan the test containing the details of conditions, testing techniques, coverage, and exit criteria to assess the risk



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Readings

Risk Based Testing
https://www.cs.tut.fi/tapahtumat/testaus04/schaefer.pdf

Risk Based Testing
https://www.guru99.com/risk-based-testing.html

Taxonomy-Based Risk Identification
https://resources.sei.cmu.edu/asset_files/TechnicalReport/1993_005_001_16166.pdf

Information Security Risk Analysis Method
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.476.9691&rep=rep1&type=pdf

No Risk/ No Test
https://sig-switzerland.ch/wp-content/uploads/2016/06/SIGS_TS2016_University_of_Innsbruck_No_Risk_No_Test.pdf

Qualitative vs Quantitative
https://projectriskcoach.com/evaluating-risks-using-quantitative-risk-analysis/

Qualitative vs Quantitative Risk Assessment – Construction Industry
https://www.pmu.edu.sa/attachments/academics/pdf/udp/coe/dept/ce/qualitative-quantitative-risk-assessment-models.pdf

ISO/IEC 9126-1 preview
https://webstore.iec.ch/preview/info_isoiec9126-1%7Bed1.0%7Den.pdf

BS ISO/IEC 25010:2011
https://pdfs.semanticscholar.org/57a5/b99eceff9da205e244337c9f4678b5b23d25.pdf

The Journeymap to Project Risk Analysis
https://cdn2.hubspot.net/hubfs/2405298/E-book:%20Journeymap%20to%20Project%20Risk%20Analysis.pdf

THANK YOU