PURPOSES, TYPES, COMPONENTS, BENEFITS & EXAMPLE OF TRACEABILITY MATRIX

Purpose of a Traceability Matrix

- **Requirement Coverage**: Ensures that all the specified requirements are tested. Each requirement is traced to one or more test cases, confirming that the requirement has been implemented and validated.
- **Change Management**: Helps in assessing the impact of changes to the requirements on the existing test cases, ensuring that all changes are reflected in the tests.
- **Verification and Validation**: Provides a clear and structured way to verify and validate that all requirements have been met by mapping them to test cases.

Purpose of a Traceability Matrix

- **Defect Tracking**: Identifies test cases that need to be re-executed in case of a defect, which is associated with a specific requirement.
- **Project Tracking**: Assists in tracking project progress by showing how many requirements have been tested and how many are yet to be tested.

Types of Traceability Matrices

- **Forward Traceability Matrix**: Maps requirements to test cases. This type is used to ensure that the project progresses in the desired direction and that each requirement is tested.
- **Backward (or Reverse) Traceability Matrix**: Maps test cases back to requirements. This is used to ensure that the current product remains on the correct path and helps in identifying any features that may have been added that were not part of the initial requirements.
- **Bi-Directional Traceability Matrix**: Combines both forward and backward traceability. It ensures that all requirements are covered by test cases and also that all test cases are derived from the specified requirements.

Components of a Traceability Matrix

- **Requirement ID**: A unique identifier for each requirement.
- **Requirement Description**: A brief description of each requirement.
- **Test Case ID**: Unique identifiers for test cases related to each requirement.
- **Test Case Description**: A brief description of what each test case will test.
- **Status**: Indicates whether a requirement has passed, failed, or is not yet tested.

Example of a Traceability Matrix

ID	Requirement Description	Test Case ID	Test Case Description	Status
R1	User login functionality	TC1	Verify login with valid credentials	Passed
		TC2	Verify login with invalid credentials	Passed
R2	Password recovery functionality	TC3	Verify password recovery email sent	Failed
R3	User profile update	TC4	Verify user can update profile details	Not Tested

Benefits of a Traceability Matrix

- **Ensures Completeness**: Guarantees that all requirements are covered by test cases, ensuring no functionality is overlooked.
- **Facilitates Requirement Coverage Analysis**: Helps in analyzing the coverage of requirements with test cases, making sure that every requirement is tested. Improves
- **Quality**: By ensuring that all requirements are tested, it helps in maintaining the quality and reliability of the system.

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Please
Connect

📞 Contact Number - 8130877931

✉ Email - hr@kasperanalytics.com

in LinkedIn - www.linkedin.com/company/
kasper-analytics/