

Need and Usage of Traceability Matrix for Managing Requirements

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Abstract: Requirement Traceability Matrix (RTM) keeps track of all user requirements and maps it with test case ids. This document contains the various steps that are used to create a traceability matrix. In this paper, we have discussed template of RTM which contains requirements and its associated test case that is required in any of web based project. We have also discussed benefits of using this matrix.

Keywords:

RTM- Requirement Traceability Matrix

U T- Unit Testing

I T-Integration Testing

S T-System Testing

I Introduction

1.1 What is a Traceability Matrix?

This document is used to track the requirements [1] and check whether all the test cases are covered against the requirement. It checks whether each and every requirement is having a test case. This document is maintained to map test requirements and test cases.

Requirement Traceability Matrix (RTM)

RTM document [2] helps to identify missed requirements which are covered in test cases. It keeps track all requirements and maps it with Test case Ids.

The RTM is used to determine that how many tests are required, what kind of tests are required, tests can be automated or manual, if any existing tests can be re-used. RTM ensures that the resulting tests are most effective [3]. RTM includes the following parameters: Requirement ID, Type, Description, Specification, Unit, Integration, System & User Acceptance test case.

Traceability Matrix Types:

It is of two types: Forward Traceability: Requirements Mapping to Test cases and Backward Traceability: Test Cases Mapping to Requirements [4].

Forward Traceability Backward Traceability

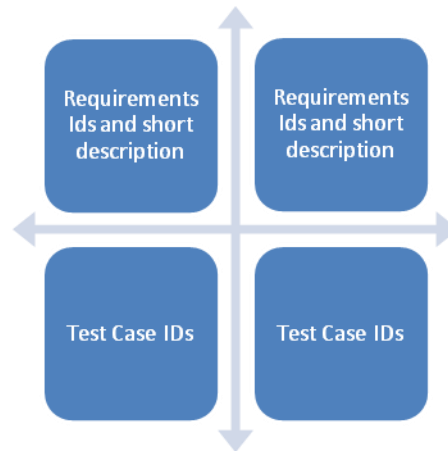


Figure 1: Forward and Backward Traceability

II Benefits of using Traceability Matrix

- It checks software requirements and its associated test case.
- It is used to find out the missing requirements.
- Its helps to find out the test cases against any change requirement[5].

III How to create a traceability matrix

1. Click on All Programs -> Microsoft Office -> Click on Microsoft Excel
2. Describe these columns: Requirement ID, Requirement description and one column for each test case.
3. Identify all the testable requirements.
4. Then identify all test flows and scenarios.
5. Requirement IDs are mapped to the test cases [6].

The following figure shows traceability matrix [7] covers lifecycle of each requirement which is required in each phase of a project.

Table 1: Requirement Attributes (at end)

Above figure includes requirement attributes, requirement version, its unique identifier and name[8].

The following table contains the template of Requirement Traceability Matrix[9].

Table 1: Template of RTM (at end)

The above table is the template of RTM and contains those details i.e. required in any website project.

IV Conclusion

This paper has presented a simple approach for creating a Requirement Traceability Matrix (RTM). There are various benefits of creating this document. RTM template are used to define the various requirements that is required in any website project. The traceability matrix covers lifecycle of each requirement as it evolves through each phase of a project.

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PROJECT PHASES	Requirements Definition	High-Level Design	Detailed Design	Implementation	Testing	Deployment
REQUIREMENT EVOLUTION	Requirements version 1	Requirements version 2	Requirements version 3-5	Requirements version 6	Requirements version 7	Final baselined requirements
REQUIREMENT TRACEABILITY	<ul style="list-style-type: none"> ▪ Requirement ▪ Unique Identifier ▪ Name 	<ul style="list-style-type: none"> ▪ Design document reference ▪ Business rule reference 	<ul style="list-style-type: none"> ▪ Design document reference ▪ Business rule reference 	<ul style="list-style-type: none"> ▪ Implementation reference ▪ Testing Reference 	<ul style="list-style-type: none"> ▪ UAT tested reference ▪ Tracing reference 	<ul style="list-style-type: none"> ▪ Confirmation of complete trace of each requirement

Table 1: Requirement Attributes

ReqID	Risk	Requirement Type	Requirement Description	Trace from user requirement/Trace to System requirement	Trace to Design Specification	S T	UAT	Trace to test script
1	Low	UI	User should be able to login to website	User Login Module	UI DESIGN	YES	YES	STC001
2	Medium	UI	Error message should be displayed to the operator on entering wrong password	User Login Module	UI DESIGN	YES	YES	STC002
3	High	UI	User account should be locked on entering wrong password three times	User Login Module	UI DESIGN	YES	YES	STC003
4	Medium	UI	User account is locked message should be displayed to the operator	User Login Module	UI DESIGN	YES	YES	STC004
5	Low	UI	Website pages should be displayed to the operator based on its access rights	User Login Module	UI DESIGN	YES	YES	STC005

Table 2: Template of RTM