

Requirements Traceability Matrix



"A factor present in every successful project and absent in every unsuccessful project is sufficient attention to requirements¹." - Suzanne & James Robertson. The PMBOK® Guide 6th Edition includes the gathering of requirements² and the production of a 'Requirements Traceability Matrix' as a key process in the development of the project scope statement.

Requirements traceability is the process that ensures the requirement is fulfilled in the design, build and testing phases of the project and delivered to the customer or user. Requirements documentation describes the requirement.

The requirements traceability process operates in two directions:

- Traceability through to delivery:
 - Each requirement needs to be incorporated in the design and build.
 - Many requirements directly influence testing, if a requirement is for a process to operate in 2.5 seconds, a test needs to be included in the test plan to ensure actual performance is less than 2.5 seconds.
 - On delivery, the project needs to be able to demonstrate positively all of the requirements have been met either as tangible elements of the delivered artefact or as successful tests.
- Traceability of the effect of changes on requirements:
 - Each element of the system needs to identify what requirements its functionality supports.
 - Where a design change is being contemplated, it is important to trace the effect of the change back to the requirements and see what impact the change has on the requirements.
 - All changes to requirements should be recorded and traced.
 - If a requirement is changed, the customer needs to explicitly accept the modified requirement a part of the overall change approval.

There are numerous tools available to manage requirements gathering and traceability; the Requirements Traceability Matrix is one.

¹ For more on **defining requirements** see: https://www.mosaicprojects.com.au/WhitePapers/WP1071_Requirements.pdf

² For more on **data gathering** see: https://www.mosaicprojects.com.au/WhitePapers/WP1068_Data_Gathering.pdf

Requirements Traceability Matrix

The Requirements Tractability Matrix can be developed in several different ways:

Each 'X' represents a point where functionality needs to be included in the system to deliver the requirement.

| Requirements | Subsystems | | | | | Layers | | | | | Tiers | | | | |
|--------------|----------------|------------|------------|----------|---------------|--------------|----------------|----------------|-------------|----------|-------------|--------|-----|-------------|------|
| | Administration | Publishing | Scheduling | Expenses | KPI Dashboard | Presentation | User Interface | Business Logic | Data Access | Services | Persistence | Client | Web | Application | Data |
| SR 1.1 | | x | | | | x | x | x | x | | x | x | x | x | x |
| SR 1.2 | | x | | | | x | x | x | x | | x | x | x | x | x |
| SR 1.3 | | x | | | | | | x | x | x | | | | x | x |
| SR 2 | | | x | | | x | x | x | | x | | x | x | x | |
| SR 3 | | | x | | | x | x | x | | x | | x | x | x | |
| SR 4 | | | | x | | x | x | x | x | x | | x | x | x | x |
| SR 5 | | | | | x | x | x | x | x | x | | x | x | x | x |
| SR 6 | x | | | | | x | x | x | x | | x | x | x | x | x |

- For software development, requirements are mapped on one axis with the system elements on the other; the matrix identifies which system elements support the delivery of the requirement.
- Alternatively, requirements may be mapped against defined objectives, to produce 'big tasty cookies' you need:

| Req. # | Req. Description | Objectives | | |
|--------|----------------------------------|-------------|-----|------|
| | | Tastes Good | Big | Safe |
| 1.1.1 | Use non-expired ingredients | x | | x |
| 1.2.1 | Do not use wheat | | | x |
| 1.3.1 | Use gourmet chocolate chips | x | | |
| 2.3.1 | Cook thoroughly | x | | x |
| 3.1.1 | Cookie diameter is 6 inches | | x | |
| 4.1.1 | Cooks take food handler's course | | | x |

Each requirement contributes to one or more objectives.

- In more sophisticated situations, each requirement can be linked to specific processes or documents:

| Requirement | Design Element | Construct Component | Test Case |
|-------------|------------------------|------------------------|--------------------|
| TAB-001 | D-APR607P | C-APR607P | T-004-01 |
| TAB-002 | D-ARX607P | C-ARX607P | T-004-09, T-004-15 |
| TAB-003 | D-APC103D D-APC103E | C-APC103D C-APC103E | T-004-22 |

- A third option is to trace requirements against the entity responsible for the work and delivery:

| FPM # | | Training Requirements | Responsible Organisation | Delivery Achieved |
|-------|-------|--|--------------------------|-------------------|
| | 4 | Training Requirements | | |
| | 4.1 | Training Plan | | |
| | 4 | FPM is requested to provide and quote on an initial and ongoing training support package for VIPER and ACOS®. This quotation will include the following major components: Components and Methods of Delivery Organisational Levels for Component Delivery Ongoing Training Overheads for Training System as Designed | FPM | |
| | 4.2 | Phase 1 | | |
| | 4.2.1 | Planning staff, and Trade Coordinators, at a minimum, must be trained prior to the 09 Oct 09 delivery. Remaining users may be trained in follow-on up to 15 Nov 09 in preparation for the initial induction. Where possible, training should reduce the double up of system running process to a minimum. | Mosaic | |
| | 4.3 | Phase 2 | | |
| | 4.3.1 | To be defined prior to beginning of Phase 2 based upon agreed outcomes. | FPM | |

This allows the status of requirements to be traced and reported

| | | | | |
|------------------------|-------|--|-----------------------------|--|
| | 4 | Training Requirements | | |
| | 4.1 | Training Plan | | |
| 5 | 4 | FPM is requested to provide and quote on an initial and ongoing training support package for VIPER and ACOS®. This quotation will include the following major components: Components and Methods of Delivery Organisational Levels for Component Delivery Ongoing Training Overheads for Training System as Designed | Complies | Training and training documentation sufficient to start the VIPER process and start the management of the first AC are covered herein and comprise: Initial skill development Ongoing support via telephone & email Induction training for AA to incorporate The 'Train The Trainer' component will be a separate quotation which will be developed in Phase 2 |
| | 4.2 | Phase 1 | | |
| 5 5.1 5.7 5.8 | 4.2.1 | Planning staff, and Trade Coordinators, at a minimum, must be trained prior to the 09 Oct 09 delivery. | See FPM response | FPM can comply with this, however, as indicated in AA email 12 AUG09 09:11 AA staff will not be available to train. Noting your staff availability it is unlikely that we can conduct a Basic ACOS course before 17NOV09 Noting your staff availability it is unlikely that we can conduct a Manage a VIPER Schedule course before 17NOV09 |
| 5.2 5.3 5.4 | 4.2.1 | Remaining users may be trained in follow-on up to 15 Nov 09 in preparation for the initial induction. | Complies [see FPM response] | Subject to the availability of ECUS system training will be provided. VIPER Familiarisation will be provided. Working with WPs training will be provided |

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