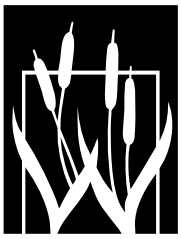

Whitemarsh
Information Systems Corporation

Whitemarsh Metabase System
Project Management
Users Guide

June 2015

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1.0 Introduction and Rationale

This Whitemarsh Project user guide addresses two objectives: First, to have its readers understand the Whitemarsh approach to project management and second, to enable the Whitemarsh Metabase System user perform the role of project manager over various Metabase System-centric projects. This section, Section 1, addresses the first objective. Sections 2 through to the end address the second objective.

If the reader is not convinced with the rationality and engineering of the Whitemarsh approach to project management, they should look elsewhere for a software system to manage Metabase System-centric projects.

This approach was conceived in response to over 40+ years of suffering through the traditional approach to project management. There is an often quoted Einstein adage: “Insanity: Doing the same thing over and over again expecting different results.” While the Whitemarsh is different, its differences must be shown to be worthwhile, not just another form of insanity.

1.1 Why Project Management is Important

Project Management is important because almost all enterprises suffer from one or more of the following problems:

- Inaccurate estimates
- Conflicting priorities among projects
- Inability to deal with varying levels of work conditions, staff skills, and the like
- No intra- and inter-project reporting

Simply put, a common lament is that while there are projects everywhere, the ability to effectively manage these projects on an individual or enterprise-wide basis is nowhere.

For example, studies by have shown that many, if not most, knowledge worker projects exhibit these characteristics: over budget, under specified, delivered late, and fail to meet organizational expectations. While not all reasons for failure can be laid at the foot of project management, too many can. Among the underlying reasons are invalid work plans, insufficient time for requirements changes, and inexperienced or mis-allocated staff resources.

The United States Government’ General Accounting Office (GAO) has been studying IT projects for a number of years, and a review of 10 GAO studies clearly shows that the main reasons why IT systems fail has nothing to do with IT. Again, while not all reasons are specifically related to project management, some of the reasons have to do with critical components of project management. And again, these are invalid work plans, insufficient time for requirements changes, and inexperienced or mis-allocated staff resources.

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Today's most popular project management system is Microsoft's Preoject (www.microsoft.com). It exists in two forms: PC based and Server based. While the server-based verison is designed for enterprise-wide projects, and while the PC-based version is suited for scheduling a single project of relatively simple complexity, both the high end and low end solutions do not really address the problems associated with:

- Disjoint projects
- Management of generally uncontrolled resources
- Repeatability of projects
- Incorporation of learned experience into the project estimation cycle

Many knowledge worker projects involve persons from within different organizations over whose time the project manager may not have direct control. Thus, the best the project manager can do is to request participation and to create approximate schedules that show deliverables from these non-controlled participants.

If the knowledge worker project manager creates elaborate project schedules based on many layers of intricately crafted activity networks, then while they look magnificent the instant they are first created, these project plans cannot withstand assaults from all the schedule conflicts. Once these assaults are underway, the project manager has to continuously adjust the layers of project activity networks, resource estimates, parallel and serial paths, etc. Soon the project manager's life is consumed by project management rather than project accomplishment.

The dilemma then becomes:

- Accomplish the project, or
- Plan the project's accomplishment.

All too often, project planning is discarded because the project management system, initially thought to be the savior from chaos actually had become another source of chaos. The castle of project management becomes the project manager's dungeon wherein time is the dungeon master, the PERT chart is the shackles, and the schedule is the rack.

To be successful at project management, an approach must:

- Concurrently manage disjoint projects
- Manage generally uncontrolled resources
- Enable maximum re-use of past efforts
- Incorporate learned experiences
- Not require a full-time project planner
- Support what-if resource allocation scenarios
- Enable management to know about and view all projects and resources across the enterprise

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- Support the presentation of projects individually, or from the perspective of a business-defined set of priorities
- And finally, enable project managers to view the actual project deliverables from within the project management system

1.2 Whitemarsh Project Management Environment

Whitemarsh project management is based first and foremost on its database design. The general "life cycle" of Whitemarsh project management is:

- Employ project, deliverable, and task templates to plan projects
- Plan and estimate projects in a gross way and accommodate different work environment factors
- Allocate staff including their skill levels and work velocities to projects and generate schedules
- View, review, and revise actual project deliverables
- Record progress of deliverable accomplishments
- Re-plan projects as needed
- "Learn" from actual durations of accomplished deliverables

Whitemarsh believes that project management success is predicated on:

- Continuous optimization of repeatable projects,
- Accommodation of various work environments and factors within these environments,
- Adjustment of project schedules based on differing staff and skill levels, and
- Capturing actual work accomplishment metrics that support earned value analysis and reporting.

Whitemarsh project management serves the need of the independent project manager who has to accomplish the definition, management and reporting of diverse and possibly disjoint projects with staff of varying skill levels within mixed work environments that are generally not within direct control. Whitemarsh believes that this type of project management environment is the rule in today's organizations, not the exception.

1.3 Whitemarsh Project Management, A Difference in Kind

A key distinction of the Whitemarsh project management approach and others is that the Whitemarsh approach concentrates on the management of "nouns," not "verbs." Clearly, since there is no one sacred, perfect way to produce a deliverable (i.e., the nouns), if the focus of project management is to identify and control the "methods" (i.e., the verbs) by which deliverables are produced, then, to have enterprise-wide project management and/or to have

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enterprise-wide metrics, the enterprise must first carve-into-stone the processes by which work is done. Not only is this impossible, it is highly undesirable. It is impossible because it is inconceivable that there is only one way to accomplish any deliverable. It is undesirable because it is insulting to the project's staff to presume to control their every technique, process and step. Not only can't it be done, no one will allow it to be done.

In contrast to managing "verbs," Whitemarsh project management manages "nouns." It does this by collecting the quantities of resources expended to produce deliverables. Whitemarsh project estimates are therefore based on the staff hours required to produce deliverables rather than to accomplish tasks.

This technique enables different styles of project management to be employed or be set one against the other by comparing the resources expended to produce deliverables. There might be one project template for mainframe development, another for micros, and finally a methodology for web-based systems even though all the deliverables might be essentially the same. Alternatively, there might be multiple deliverable templates that essentially produce the same set of deliverables to serve the needs of different styles or techniques as might be the case for the data-driven and process-driven approaches.

Additionally, the Whitemarsh project management approach enables enterprise-wide project reporting in terms of the cost and effort to produce deliverables versus the accomplishment of activities. As work techniques improve, either through the increased skill of staff, or through the adoption of different techniques, the efforts remain comparable because it is the quantity of resources expended to produce the deliverables that are compared rather than the activities that are no longer able to be compared because they are now different.

To illustrate, when you go into a grocery store and buy an apple, the cost is expressed in terms of the product you are buying, the apple. While you may wonder how much the various activities cost that ultimately produced the apple, fundamentally, you probably do not care. When you go to five different stores and compare the cost of apples (given a standard for equating quality), again you are only comparing the cost of the deliverable, the apple. If one store spends 10% for transportation and another spends 8%, you probably don't care. It's the final cost of the apple that matters, nothing else. So also should it be with project management. The only thing that should matter is the final cost of the deliverable. Nothing more, and nothing less.

If however, you are a wholesale apple buyer that deals with a co-operative and by contract, you have to pay every apple grower the maximum cost incurred by any one member of the cooperative, then you have a real incentive to look "behind" the costs of the deliverables (the apples) to find the different underlying processes that make the costs different. Even then, the goal is to find the lowest-cost set of activities that result in the least expensive apples, and to highly recommend that set of activities to all members of the cooperative so your costs for the deliverable–as a buyer–will go down. So, while there may be an interest in activity-sets, they are not the driving force. So too with Whitemarsh project management where the cost of deliverables rather than the cost of methods is the driving force.

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Whitemarsh project management enables the melding Project Templates with selected Deliverable Templates, which are the enterprise's specifications of deliverables and the unit effort metrics for these deliverables.

Thereafter, the Deliverable templates are melded with Task Templates, which are the enterprise's processes or methods that have been proven over the years to accomplish work in a most cost effective manner.

The resulting Project Templates, and by reference, include Deliverable Templates and Task Templates are tuned into "real" projects by determining the quantity of deliverables. Thereafter, the projects are modified to reflect:

- Work environment factors–that is, the effects from varied work environments on the creation of deliverables according to certain task templates.

- Staff–that is, the effects from persons and their varying types and degrees of skills on the rate of production of deliverables according to the task templates.

Collectively, these four project management components are an exemplary use of the database fundamental, *define once, use many times*. Whitemarsh believes it has achieved the ability to have maximum reuse with minimum original, one-off effort.

1.4 Whitemarsh Project Management ROI

Project Management "data" is just another form of metadata that is included within the Whitemarsh Metabase System Environment. Because the project management data is stored in the Metabase System's database, individual project plans are able to be manufactured and are completely integrated, interoperable, and non-redundant.

Project accomplishment status is able to be recorded as work is accomplished. In addition, the actual created or modified work products can be directly accessed through the project management's entered data.

The project management development effort from this Metabase integrated project management approach is about 5% of that expended through the traditional approach, not because the Whitemarsh project management approach are easier to accomplish but because there is only one set of project management enterprise-wide project management metadata that can be used multiple times and can be reconfigured in multiple ways.

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1.4.1 Traditional Approach Problems

The traditional approach to project management builds work breakdown structures (WBS) that result in many different forms with different task lists and deliverables even when the overall project is the same. Because of these same but different projects, almost all project managers create task lists that support different strategies and approaches.

It is not uncommon therefore to have deliverables with different names, contents, quality controls for both creation and execution even when the deliverables are essentially the same. Adding to that complexity and uncertainty are variable work environments and different proficiency levels and skills of those assigned to work on the projects. Added finally are the serial or parallel nature of tasks. Because of all of this, the list of problems exhibited by traditional project management strategies are:

- Different WBSs for essentially the same project, that, in turn, makes inter-project comparisons difficult to almost impossible
- Difficulty in comparing work by assigned persons with varying skills and proficiencies
- Difficulty in reconciling deliverables stylized to fit all the variable work breakdown structure task lists
- Difficulty in identifying, quantifying, and assessing the effects of variable work environments
- Difficulty in assessing the relative performance of one project with another as the majority of comparable items are not able to be interrelated
- Virtual impossibility in prototyping and comparing various project plans
- Difficulty in producing really verifiable earned value reports

1.4.2 Traditional Approach Solution

Accomplishment of a solution to the problems cited above begins with clearly separating out the project management components that must ultimately comprise a viable project management solution. These include:

- Projects
- Deliverables
- Work process tasks

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- Work environments
- Persons with varying levels of skills and performances

Projects can range from simple to complex. Simple projects are those that are short-term, single purpose with one or a few well defined deliverables and just a few persons.

Complex projects are those that are long-term, have multiple purposes consisting of interrelated, hierarchical as well as network engineered organized agendas, task lists, deliverables, and large collections of persons with varying skill levels and performance capabilities.

Initially large collections of projects must be identified and examined to discern patterns through which complex projects can be broken down into smaller well defined projects that can, in turn, be interrelated through the production of output deliverables from one project that become inputs to the next project.

Deliverables need to be identified and examined in a way similar to projects. This results in collections of smaller, well defined deliverables that are created within one project and are then used within another.

Work process tasks are troublesome to standardize. That's because the vast majority of projects accomplished within the Whitemarsh business domain are "intellectual property" projects rather than "product manufacturing" projects. Designing a database or business information system, or deducing an enterprise's architecture are examples of the former while building a computer, automobile, or production line manufacturing are examples of the later.

Because of the critical difference between intellectual-property projects and product-manufacturing projects, the ability to identify, standardize, and rigorously monitor work process tasks ranges from close to impossible for the manager to completely frustrating to the persons actually performing the work.

Work environments within intellectual property projects can also have great variability. These variabilities include work performance enhancement tools, availability of reviewers, and the like.

The final component of effective project management includes the identification and assessment of persons, their skills and levels, and their relative levels of performance. Without being able to quantify performance based on audited deliverable accomplishment, project estimates are educated guesses at best.

1.4.3 Solution Engineering

The engineered solution is founded on a highly engineered data model of database tables (about 75). Within that collection of database tables are three collections of template components that

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can be used over and over to effect standardization, comparison, and assessments across the many projects within an enterprise. The templates are:

- Project Template Types and Project Templates
- Deliverable Template Types and Deliverable Templates
- Task Template Types and Task Templates

These three collections of templates are hierarchically organized. That is, each "type" template can have multiple levels. Each type leaf is able to be related to a template apex/root record, which, in turn, can be hierarchically decomposed.

The relationship between template collections is many-to-many. This enables:

- Projects to be related to one or more deliverables and vice versa
- Deliverables to be related to one or more tasks and vice versa.

Deliverables and Tasks commonly exist in groups founded on an apex/root deliverable or apex/root task and subordinate deliverables or tasks. Deliverables or contained deliverables are specified and are determined to have unit-effort staff-hour accomplishment estimates. In contrast, tasks and contained subordinate tasks are not precisely specified nor are their work accomplishment hours estimated. That is because deliverables accomplishments are what are identified, estimated, scheduled. Tasks, in and of themselves, do not result in the accomplishment of actual project products. Rather they only result in "time-burned."

The fourth component are work environment factors. These are identified and assessed as to how their presence within a project result in deliverables being accomplished faster or slower.

The fifth component are persons assigned along with their determined skills, skill levels to specific project deliverables.

Whitemarsh project management does not directly support the creation of Gantt, PERT or CPM charts. Rather, these charts are accomplished through a project management data export process that is fed to an add-on project management package from Critical Tools, http://www.criticaltools.com/

1.4.4 Project Development

Projects are developed through the application of templates and the assignment of work environment factors and person skills.

A new project is instigated by creating a new project record. The project is named and described. The next step is the assignment of one or more specific project templates from within the set of project templates. These assigned projects are sequenced.

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At that point, the actual detailed project work plan creation process is started. The result of that process is a completely identified set of the project's deliverables and project tasks. Generated as well are unit effort estimates, for example, it takes a half hour to identify, name, and describe a table. The quantity of tables is then estimated. Estimated as well is the average quantity of columns, and the like.

The project development effort continues with the assignment of persons work environment factors to project deliverables. At this point, embedded processes are executed to determine the overall project duration, staff hour estimates, and the like.

1.4.5 Project Execution Context

Projects are the "mechanism" through which a myriad of enterprise work products are created, reported, modified and evolved. Included are enterprise:

- Enterprise Architectures including Missions, Organizations, Functions and Positions
- Information Needs that satisfy enterprise architectures
- Resource Life Cycle Analysis network that support enterprise architecture and information systems plan component justification and build sequencing
- Data Architectures including database objects, data elements, three layers of data models, and business information system data interface models
- Business Information Systems including User Acceptance Testing models

As projects are accomplished that is, as the enterprise architecture work products are created, the Whitemarsh project management can be employed to plan, schedule, and record their accomplishment and also directly access the created deliverable.

1.4.6 The ROI

A traditionally developed project plan typically consists of:

- 250 work tasks
- 50 specific deliverables
- A PERT chart
- Assignment of staff
- Development of a project management proposal

The amount of time for such a project is commonly:

- Work tasks of 3 minutes each or 12 hours

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- Deliverable specification at 1 hour each or 50 hours
- PERT chart at 2 minutes per task or 10 hours
- Assignment of staff at 3 minutes per task or 12 hours
- Development of an oveall project management proposal, 8 hours

The total time is therefore 92 hours or 8 calendar days.

In contrast, using the Whitemarsh Project Management system project plan development only takes about 4 hours. That's a 20:1 ROI.

1.4.7 The "Real" ROI

The 20:1 ROI for project plan development is only the surface layer of the ROI resulting from Whitemarsh project management. The real ROI is almost uncalculable becuase with the Whitemarsh Project Management approach:

- Every WBS is drawn from standardized collections of Projects, Deliverables, and Tasks that makes comparisons quick and easy.

- The assignment of and assessment of assiged persons is both easy and comparable as deliverable-accomplishment results are entered by each assigned person on a no less often than weekly.

- Every deliverable specification is standardized, and the actual deliverables accomplished are able to be retrieved and reviewed during the project's actual execution.

- The effect of assigned work environnments can be determined, and if possible changed along with the ability to re-generate the remaining project deliverables estimates.

- Quick, easy, and effective assessment of various project performances across the enterprise by mission, organization, business function, and by type of deliverable.

- Quick and easy prototyping of project plans through changes in person skill and performance levels and changes in work environment factors.

- Generation of current and predicted earned value reports.

1.5 Presumed Knowledge

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This user guide, as with all the other metabase user guides presume that the reader has read and is completely familiar with the following documents: Metabase Common Processes, and Metabase Bill of Materials and Single File Recursion (BOM/SFR Guide). These documents serve as metabase teaching guides for processes that commonly occur throughout the metabase system.

1.6 Metabase Example

The metabase example, Movies, is a complete example of a business which is available from the Whitemarsh website. The Movies Rental Corporation was modeled after the largest movies rental corporation in the United States. As such, the example has national, regional, and retail outlets. The example data has several data models, one for an original data capture, store based system, and another which is a data warehouse for rented movies.

2.0 Software Installation

Metabase installation is explained in the Metabase Administrators Guide.

3.0 Database Design

3.1 Database Design Architecture

Whitemarsh Project Management is squarely founded on a database application that captures and manages the data critical to effective project management. The database's design, depicted in Figure 1, consists of a number of entities. All these entities are traditional third normal form tables are interconnected through one-to-many relationships except for those entities that show either hierarchical or network relationships.

An example of a hierarchical relationship is represented by a one-to-many relationship from the entity to itself. Examples of this are:

- Contracts
- Deliverable Template Types
- Deliverable Templates
- Project Deliverables
- Project Tasks
- Project Template Types
- Project Templates
- Task Template Types
- Task Templates

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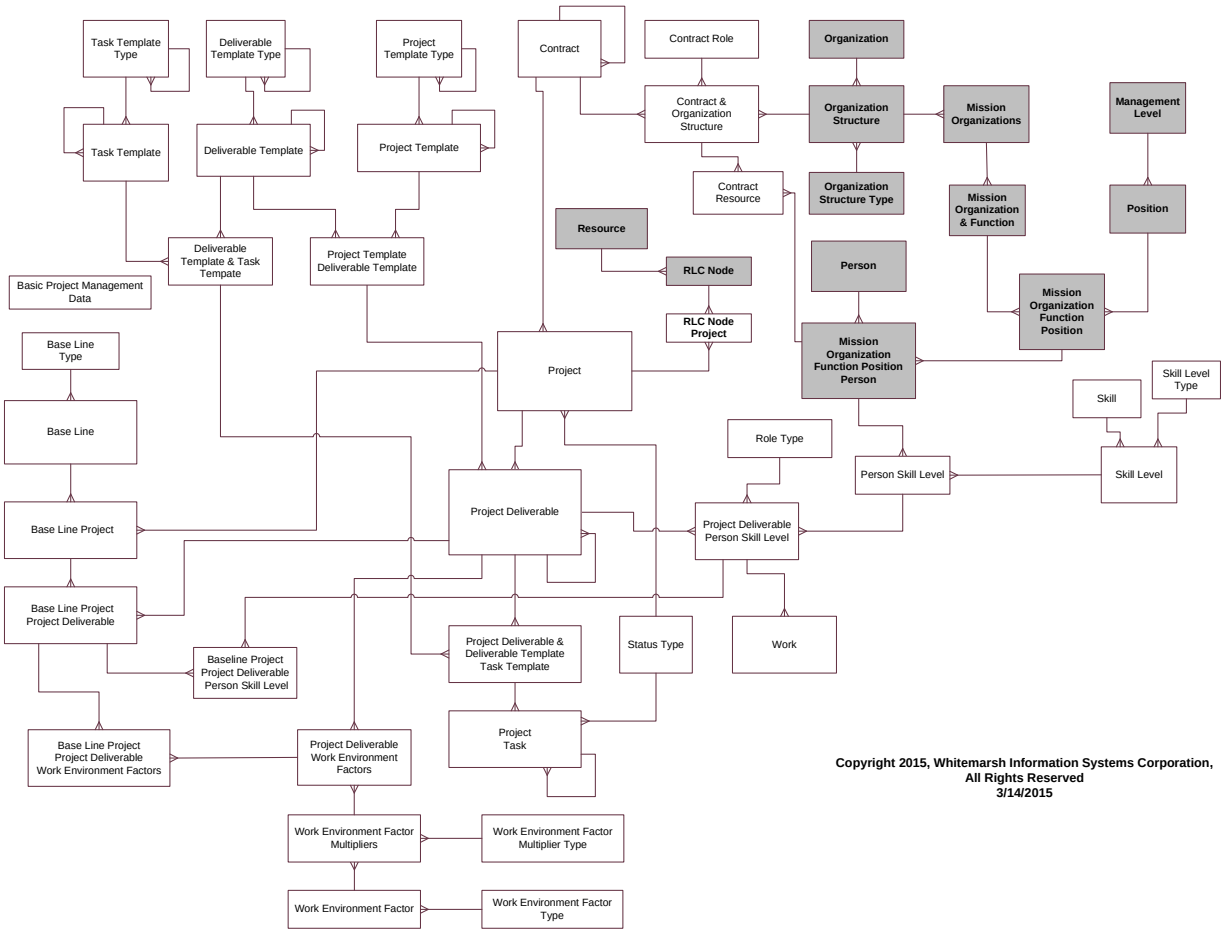

Figure 1. Whitemarsh Project Management Data Model Diagram.

An examples of a network relationship is:

- Organization,
- Organization Structure
- Organization Structure Type

The entities from Figure 1 are also divided into seven distinct clusters, which are:

- Baseline Management
- Contract Management
- Template Management
- Project Management

Person and Skill Management

- Resource Life Cycle Management
- Work Environment Factor Management

Each distinct cluster of Whitemarsh Project Management entities are identified and described in Table 2.

Entity Cluster	Entities	Description
Baseline Management	• Baseline Type • Baseline • Baseline Project • Baseline Project-Project Deliverable • Baseline Project-Project-Deliverable Person Skill Level • Baseline Project-Project-Deliverable Work Environment Factor	The collection of tables for baseline enable the fixing of all project related resources at the date established for that baseline.
Contract Management	• Contracts • Contract Role • Contract Organization Structure • Contract Resources	The collection of tables for contract management provide the context necessary to understand the project related data associated with a contract.
Template Management	• Deliverable Template • Deliverable Template Type • Project Template • Project Template Type • Task Template • Task Template Type	The collection of tables for template management address the three sets of templates: Project, Deliverable, and Task. Each of the three sets are able to be hierarchical. Collectively the three sets of templates enable the generation of project plans. Deliverable Templates also have unit effort metrics that are the foundation for resource generation.
Project Management	• Project • Project Deliverable Person Skill Level • Project Deliverable Work Environment Factors • Project Deliverables • Project Tasks • Project-Deliverable & Deliverable-Template & Task Templates • Status Type • Work	The collection of tables for project management provide the ability to create and/or modify all the data relevant to a specific project. The tables, Project Deliverables, Project Deliverable & Deliverable Template Task Template, and Project Tasks form the majority of the project data. These data records are automatically generated once a Project Template is selected. Project Deliverable Person Skill Level are easily assignable. The only table that requires continuous attention is the Work table.
Organization, Person	• Management Levels	The collection of tables for

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Entity Cluster	Entities	Description
and Skill Management	• Mission Organization Function Position Person • Mission Organization Function Positions • Mission Organization Functions • Mission Organizations • Organization • Organization Structure • Organization Structure Type • Person • Person Skill Levels • Position • Skill • Skill Level Type • Skill Levels	Organizations, Person, and Skill Management enable the establishment of the contexts within which projects exist. The tables, Mission et al, Organization et al, Persons and Positions are entered through the Mission-Organization-Function Position Assignment module. Entered within the Project Management module are skill, skill level type, and skill levels which are thereafter assigned to Person Skill Levels.
Resource Life Cycle Node Management	• Resource • Resource Life Cycle Node Project • Resource Life Cycle Node	The collection of tables for Resource Life Cycle Node Management are already created in the Resource Life Cycle Analysis module. The only module created within Project Management is the assignment of a project to a specific Resource Life Cycle node. This provides the ability to know which projects are associated with specific Resource Life Cycle Nodes.
Work Environment Factors Management	• Work Environment Factor Type • Work Environment Factor Multiplier • Work Environment Factor Multiplier Type • Work Environment Factors	The collection of tables for Work Environment Factors enable the modification of generated project resources based on specific work environment factors such as reviewer availability, tools selected, computer outages, and the like.

Table 1. Whitemarsh Project Management Entity Clusters

Because Whitemarsh project management system is implemented as a database application, it supports the following types of reports:

- Projects and project statistics of a certain project template
- Projects and project statistics within certain [business area] resources
- Projects and project statistics by deliverable types
- Projects and project statistics by organizational units
- Projects and project statistics by specific project staff members
- Projects and project statistics by certain types of skills
- Projects and project statistics according to certain status types
- Projects and project statistics according to certain work environment factors

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3.2 Database Design Entities

The entities that comprise the Whitemarsh project management design are identified and briefly defined in Table 2.

Database Table	Definition
Baseline	A baseline is the collection of all relevant data that represents a project at a certain point in time. The baseline enables a look-back from some point in the future to how a project was constructed in the past.
Baseline Project	A baseline project represents a project that is a component part of an overall baseline.
Baseline Project Project Deliverable	A baseline project deliverable is a project deliverable that belongs to a specific baseline project.
Baseline Project Project Deliverable Person Skill Level	A baseline project deliverable person skill level represents one of the assigned person and their skill level that was assigned to the project at the time of the recorded benchmark.
Baseline Project Project Deliverable Work Environment Factors	A baseline project deliverable work environment factor is one of the assigned work environment factor that was assigned to the project at the time of the recorded benchmark.
Baseline Type	A baseline type is a class of baselines.
Basic Project Management Data	A collection of project management data identifies the days of week that are work days, the hours per work day that is set at the time the project is started.
Contract	A contract is an agreement among parties that represents governs a collection of projects.
Contract Organization Structure	A contract organization structure represents the assignment of organization participants in a given contract. The contract organization structure is further refined by a specific role that the organization is to perform while assigned on the contract.
Contract Resource	A contract resource represents the assignment of a particular mission-organization-function-position-person as a particular resource within the scope of the contract.
Contract Role	A contract role is the identification and specification of a role that is performed within a contract's collections of assigned organizations.
Deliverable Template	A deliverable template represents a collection of deliverables within an overall class of deliverables set out in a deliverable template type. A deliverable is what is identified within a project that is to be accomplished during the execution of a project. Deliverable templates can be hierarchical collection of a set of subordinate deliverables.

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Database Table	Definition
Deliverable Template List	The deliverable template list is a generated set of the deliverables that can then be updated for whether the quantity of the specific deliverable is absolute or is relative. Example, a quantity of 5 for Schemas is an absolute quantity. Unit multiplier is thus, absolute. If the deliverable is for a column, and there are 200 tables, then if there are 15 columns then the Unit Multiplier would be Relative and the quantity of columns would be 200 times 15, or 3,000. In addition to this deliverable characteristic, there is also the characteristic of unit effort. That is, the quantity of hours (or partial hours) required to create one unit of that deliverable.
Deliverable Template Task Template	A deliverable-template task-template is the association of a deliverable template with a task template. This enables the association of a deliverable with the root level of a collection of tasks that are to be employed as a guide in the creation of the deliverable. Because the relationship is many-to-many, a collection of tasks can be employed in many different deliverables, and vice versa.
Deliverable Template Type	A deliverable template type is a collection of deliverables of an identified class. A deliverable template type can be a hierarchical collection of deliverable templates.
Mission Organization Function Position	A mission-organization-function-position is the representation of a given position within the context of the accomplishment of a function from within an organization in the accomplishment of a mission.
Mission Organization Function Position Person	A mission-organization-function-position-person is the assignment of a person to a specific mission-organization-function-position.
Organization	An organization is a unit of the enterprise involved with the accomplishment of a project.
Organization Structure Type	An organization structure type is a named collection of organization structures. An organization structure is the association of two organizations.
Organization Structure	An organization structure is the association of two organizations.
Person	A person is one who is assigned to worked on a project.
Person Skill Level	A project skill level is an identified skilled and an associated level of competence for the accomplishment of work.
Project Deliverable	A project deliverable is the assigned deliverable from the deliverable template. When the assigned deliverable template contains a collection of subordinate templates, these subordinate deliverable templates are assigned as subordinate project deliverables.
Project Deliverable Business Event	A project deliverable business event is a given project deliverable that represents the business event that is a component part of the project's deliverables.
Project Deliverable Business Information System	A project deliverable business information system represents the project deliverable that is accomplished within the project.
Project Deliverable Data Element	A project deliverable data element represents one of the project deliverables accomplished within the project.

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Database Table	Definition
Project Deliverable DBMS Column	A project deliverable DBMS column represents one of the project deliverables accomplished within the project.
Project Deliverable DBMS Schema	A project deliverable DBMS schema represents one of the project deliverables accomplished within the project.
Project Deliverable Database Object	A project deliverable database objects represents one of the project deliverables accomplished within the project.
Project Deliverable Deliverable Template Task Template	A project deliverable and deliverable-template-task-template association represents the association of a project deliverable with a given deliverable-template-task-template. This association enables the assignment of a collection of project tasks that are drawn from the task templates.
Project Deliverable Data Integrity Rule	A project deliverable data integrity rule represents one of the project deliverables accomplished within the project.
Project Deliverable Document	A project deliverable document represents one of the project deliverables accomplished within the project.
Project Deliverable Mission Organization Function	A project deliverable mission-organization-function represents one of the project deliverables accomplished within the project.
Project Deliverable Person Skill Level	A project deliverable person skill level represents the assignment of one or more person skill levels to accomplish the project deliverable.
Project Deliverable Resource Life Cycle Node	A project deliverable resource life cycle node represents one of the project deliverables accomplished within the project.
Project Deliverable Schema	A project deliverable Schema represents one of the project deliverables accomplished within the project.
Project Deliverable Subject	A project deliverable subject represents one of the project deliverables accomplished within the project.
Project Deliverable User Acceptance Test	A project deliverable user acceptance test represents one of the project deliverables accomplished within the project.
Project Deliverable Use Case	A project deliverable use case represents one of the project deliverables accomplished within the project.
Project Deliverable Work Environment Factor	A project deliverable work environment factor represents the assignment of a particular work environment factor to a project deliverable.
Project Task	A project task is the generated task that is generated from an assigned task template.
Project Template	A project template represents a collection of projects within an overall class of projects set out in a project template type. Project templates can be hierarchical collection of a set of subordinate projects.

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Database Table	Definition
Project Template Deliverable Template	A project template and deliverable-template association represents the association of a project template with a given deliverable-template. This association enables the assignment of a collection of project templates that are drawn from the deliverable templates, and vice versa.
Project Template Type	A project template type is a collection of projects of an identified class. A project template type can be a hierarchical collection of project templates.
Resource	A resource is a component of an enterprise that is affected by the accomplishment of one or more projects.
Resource Life Cycle Node	A resource life cycle node is a defined state within the life cycle of a resource. Projects are accomplished in the support of the transformation of the resource from one resource life cycle node to the next.
Resource Life Cycle Node Project	A resource life cycle node project is the association of a particular project with a given resource life cycle node.
Skill	A skill is a capability that can be possessed by a person according to a certain proficiency that can be assigned to a project deliverable.
Skill Level	A skill level is an assessed proficiency of a given skill that is to be assigned to a person.
Skill Level Type	A skill level type is the identification of a specific proficiency level that can be assigned to a skill that results in a skill level.
Status Type	A status type is an identified state for a particular project and/or project task.
Task Template	A task template represents a collection of tasks within an overall class of tasks set out in a task template type. Task templates can be hierarchical collection of a set of subordinate tasks.
Task Template Type	A task template type is a collection of tasks of an identified class. A task template type can be a hierarchical collection of task templates.
Work	Work is an accomplishment of effort by an assigned person in support of the accomplishment of a project deliverable. The processing of work against the expected duration, start and end dates of a project deliverable support the computation of earned value reports.
Work Environment Factor	A work environment factor is a condition within a work environment that is assessed and represented as a multiplier that is assigned to a project deliverable as a project deliverable work environment factor.
Work Environment Factor Multiplier	A work environment factor multiplier is an assessed work environment factor that is employed as a multiplier of a unit effort within a project deliverable.
Work Environment Factor Multiplier Type	A work environment factor multiplier type is a classification of a collection of work environment factor multipliers.
Work Environment Factor Type	A Work Environment Factor Type is a collection of work environment factors of an identified class. A Work Environment Factor Type can be a hierarchical collection of Work Environment Factor Type.

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Database Table	Definition

Table 2. Project Management Tables and Descriptions.

4.0 Operation

Once the application is installed it is ready to use. Just invoke the software from the metabase program. The application is a traditional windows application. Metabase reports are accomplished through any ODBC class report writer such as Crystal Reports.

4.1 Log In Process

Figure 2 shows the log-in screen that appears immediately after the application is started. Choose the specific DBMS that is to be accessed, press the Set Connection String Indicator. This also closes the DBMS selection screen. Finally, press the Close button that is the top of the overall screen to close the overall window.

Figure 3 shows the screen that appears after the DBMS is chosen. At first all the data areas are empty. Enter your user name (e.g., MyName), and your password (e.g., MyPassword). The user name and password must have already been created by the Metabase Administrator through the metabase administration

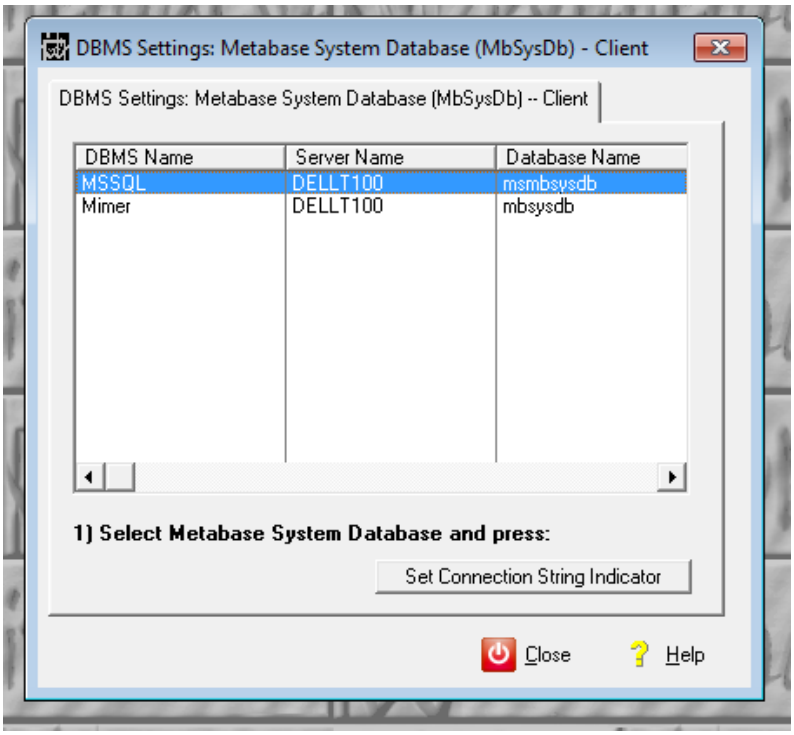

Figure 2. Log-in screen for DBMS Selection.

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module. Please contact your metabase administrator to set up your user name and password. Once the user name and password is entered, press the “Process...” button. Needless to say, MyName and MyPassword are neither safe nor secure. If the user name and password is acceptable, the metabase specific metabase database instances that can be accessed by the user are presented.

The Metabase System is designed to allow users to use specific metabase instances and specific metabase modules.

In this particular example, the user, once they sent their user name and password are shown the metabase database that they can access, that is, Movies. Highlight the choice and press the

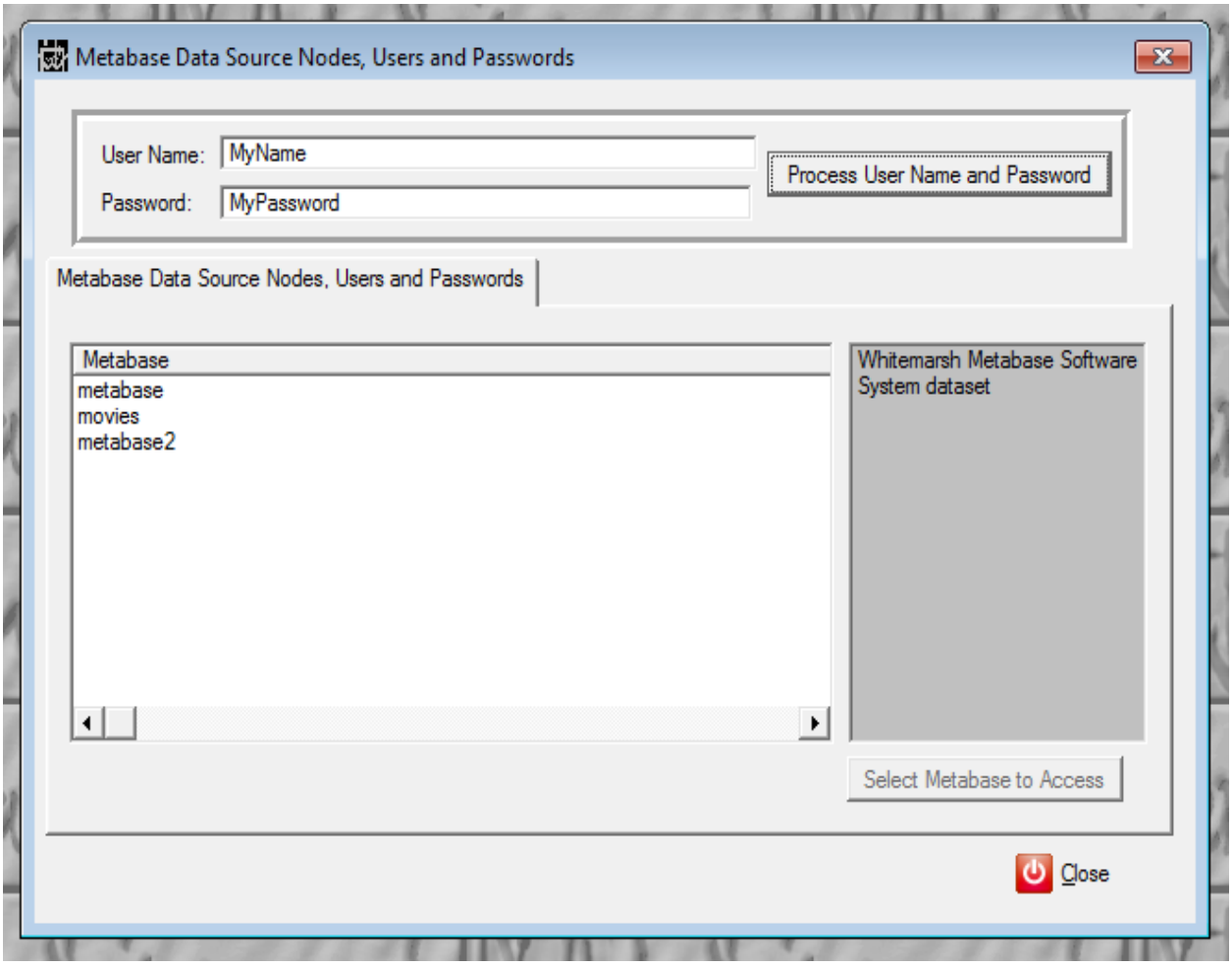

Figure 3. User Name and Password Entry and Processing Screen.

“Select Metabase to Access” button. Once that is done then the metabase name, Movies, is shown as the data set that is being accessed.

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5.0 Process Model

The process model for Whitemarsh Project Management consists of the following major sections:

- Menu Structure
- Process Specifications

5.1 Menu Structure

The top level of the Requirements Management module includes the following:

- Project Management
- Work Environment Factor Management
- 'Persons Skills and Project Assignments'
- Resource Life Cycle Analysis
- Templates
- Contract Management
- Reference Data

A complete menu is provided Table 3.

Menu for Whitemarsh Project Management
1 Project Management 1.1 Project Initiation 1.1.1 Project Creation and Update 1.1.2 Resource Life Cycle Node Project Assignment 1.1.3 Project Work Plan Generation 1.1.4 Work Plan Person Skill Level Assignment 1.1.5 Work Plan Work-Environment-Factor Assignment 1.1.6 Projects Resource Generation 1.2 Project and Deliverable and Task Assignment 1.2.1 Deliverable Template And Task Template To Project Deliverable Assignments 1.2.2 Project Deliverables Management 1.2.2.1 Project Deliverables 1.2.2.2 Project Deliverable Assignments 1.2.2.3 Project Deliverables Person Skill Level Assignment 1.2.2.4 Project Deliverable Work Environment Factor Assignments 1.2.2.5 Work 1.2.3 Project Task Management 1.2.3.1 Project Tasks 1.2.4 Project Deliverables Association Management

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Menu for Whitemarsh Project Management

1.2.4.1 Data Model Related
1.2.4.1.1 Project Deliverable Data Integrity Rule Assignment
1.2.4.1.2 Project Deliverable Database Object Assignment
1.2.4.1.3 Project Deliverable Data Element Assignment
1.2.4.1.4 Project Deliverable Specified Data Model Subject Assignment
1.2.4.1.5 Project Deliverable Implemented Data Model Schema Assignment
1.2.4.1.6 Project Deliverable Operational Data Model DBMS Schema Assignment
1.2.4.1.7 Project Deliverable DBMS Column Assignment

1.2.4.2 Architecture Related
1.2.4.2.1 Project Deliverable Mission Organization Function Assignment
1.2.4.2.2 Project Deliverable Resource Life Cycle Node Assignment
1.2.4.2.3 Project Deliverable Document Assignment

1.2.4.3 Business Information System Related
1.2.4.3.1 Project Deliverable Business Event Assignment
1.2.4.3.2 Project Deliverable Business Information System Assignment
1.2.4.3.3 Project Deliverable Use Case Assignment
1.2.4.3.4 Project Deliverable User Acceptance Test Assignment

1.3 Baseline Management
1.3.1 Baseline Inventory

1.3.2 Baseline Management
1.3.2.1 Baseline Types
1.3.2.2 Baselines
1.3.2.3 Baseline Projects
1.3.2.4 Baseline Project - Project Deliverable Assignments
1.3.2.5 Baseline Project - Project Deliverable - Person Skill Level Assignments
1.3.2.6 Baseline Project - Project Deliverable - Work Environment Factor Assignments

2 Work Environment Factor Management
2.1 Work Environment Factor Types
2.2 Work Environment Factors
2.3 Work Environment Factor Multipliers
2.4 Work Environment Multiplier Types
2.5 Work Environment Factor Multiplier Assignment

3 Persons Skills And Project Assignments
3.1 Persons
3.2 Personnel Project Assignments Listing
3.3 Person Skill Level Assignments

4 Resource Life Cycle Analysis
4.1 Resources
4.2 Resource Life Cycle Nodes

5 Templates
5.1 Template Assignments
5.1.1 Project Templates AND Deliverable Template Assignment
5.1.2 Deliverable-Templates Task-Templates Assignment

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Menu for Whitemarsh Project Management

5.2 Project Templates
5.2.1 Project Template Type
5.2.2 Import Project Template Types
5.2.3 Project Template Type Reallocation
5.2.4 Project Templates
5.2.5 Import Project Templates
5.2.6 Project Template Reallocation

5.3 Deliverable Templates
5.3.1 Deliverable Template Types
5.3.2 Import Deliverable Template Types
5.3.3 Deliverable Template Type Reallocation
5.3.4 Deliverable Templates
5.3.5 Import Deliverable Templates
5.3.6 Deliverable Template Reallocation

5.4 Task Templates
5.4.1 Task Template Type
5.4.2 Import Task Template Types
5.4.3 Task Template Type Reallocation
5.4.4 Task Templates
5.4.5 Import Task Template
5.4.6 Task Template Reallocation

5.5 Template Assessments
5.5.1 Project Based Template Assessment
5.5.2 Deliverable Based Template Assessment
5.5.3 Task Based Template Assessment

6 Contract Management
6.1 Contracts
6.2 Contract Organization Structures
6.3 Contract Resources

7 Reference Data
7.1 Basic Reference Data
7.2 Holidays
7.3 Contract Roles
7.4 Role Types
7.5 Skill
7.6 Skill Level Types
7.7 Skill Level Assignments
7.8 Skill Levels
7.9 Status Types

7.10 Import Reference Data
7.10.1 Contract Role Source
7.10.2 Holiday Source
7.10.3 Role Type Source
7.10.4 Skill Level Type Source

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Menu for Whitemarsh Project Management
7.10.5 Skill Source 7.10.6 Work Environment Factor Type Source 7.10.7 Work Environment Multiplier Type Source 7.10.8 Work Environment Factor Source

Table 3. Project Management Menu Structure

5.2 Project Management Process Architecture

Table 4 presents brief descriptions for all the processes contained in the Whitemarsh project management system.

Sections 5.3 through 5.9 present the processes in detail including screen shots, descriptions and steps necessary to accomplish the process. The menu level processes are:

- Project Management (Section 5.3)
- Work Environment Factor Management Process Specifications (Section 5.4)
- Person Skills and Project Assignments (Section 5.5)
- Resource Life Cycle Analysis (Section 5.6)
- Templates Process Specifications (Section 5.7)
- Contract Management Process Specifications (Section 5.8)
- Reference Data Process Specifications (Section 5.9)

Project Management Process Architecture	
Process	**Description**
1 Project Management	The project management process represents the collection of processes that initiate a project including: 1. The update of project attributes, 2. The assignment of resource life cycle nodes affected by the project, 3. The identification and then automatic generation of the complete project plan, 4. The assignment of persons and their skill levels assigned to the project deliverables, 5. The assignment of work environment factors, 6. The generation of all unit-effort based resources across all project deliverables, and 7. The management of project deliverables including skilled persons and work environment factors, and 8. Baseline management.
1.01 Project Initiation	Project initiation includes the following subordinate processes:

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Project Management Process Architecture	
Process	**Description**
	1. Project Initiation 2. Process Creation and Update 3. Resource Life Cycle Node Project Assignment 4. Project Work Plan Generation 5. Work Plan Person Skill Level Assignment 6. Work Plan Work Environment Factor Assignment 7. Projects Resource Generation 8. Project and Deliverable and Task Assignment 9. Deliverable Template And Task Template To Project Deliverable Assignments 10. Project Deliverables Management 11. Project Task Management 12. Baseline Management 13. Baseline Inventory Management 14. [Individual] Baseline Management
1.01.01 Project Creation and Update	The project creation and update establishes a new project by supplying the highest level of information for the project itself.
1.01.02 Resource Life Cycle Node Project Assignment	The Resource Life Cycle Node Project Assignment enables the assignment of a given project to one or more Resource Life Cycle Nodes. This enables one or more projects for a given Resource Life Cycle node and vice versa.
1.01.03 Project Work Plan Generation	The Project Work Plan Generation process begins by selecting one or more specific Project Templates for a given project. Once selected and the Work Plan Generation button is pressed, all the deliverables from Project Template associated Deliverable Templates are accessed and become one or more hierarchical Project Work Plans for a specific Project Deliverables and its generated subordinate Project Deliverables. Each associated Deliverable Template is also associated with one or more collections of Tasks within Task Templates. These task template collections are accessed and become Project Task collections associated with each Project Deliverable.
1.01.04 Work Plan Person Skill Level Assignment	Once a project plan is generated, the project manager can associate specific collections of persons along with their assigned skills and skill levels.
1.01.05 Work Plan Work-Environment-Factor Assignment	Also, once a project plan is generated, the project manager can associate specific collections of work environment factors along with their allocated work effort multipliers.
1.01.06 Projects Resource Generation	Once a Project Plan is generated and all project persons and work environment factors have been allocated, the overall set of project resources is generated. This is generally accomplished by multiplying individual Project Deliverable (and subordinate project deliverables) by unit efforts and quantities. Thereafter, these unfactored quantities of hours are multiplied by the person skill level multipliers and then by the work environment multipliers. Once these factored hours are determined, the serial or parallel indicators for projects are determined

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Project Management Process Architecture	
Process	**Description**
	and the overall duration of a project deliverable is computed. The entire project plan is then able to be printed.
1.02 Project and Deliverable and Task Assignment	The Project and Deliverable Task Assignment enables the customized creation of a project plan rather than through the automated generation that was based on selecting one or more project templates.
1.02.01 Deliverable Template And Task Template To Project Deliverable Assignments	The Deliverable Template And Task Template To Project Deliverable Assignments process enables the customized creation of a project task rather than through the automated generation that was based on selecting one or more project templates.
1.02.02 Project Deliverables Management	This process focuses on the management of project deliverables including the contained processes: 1. Project Deliverables 2. Project Deliverable Assignments 3. Project Deliverable Person Skill Assignments 4. Project Deliverable Work Environment Factor Assignments 5. [Recording] work accomplishment data
1.02.02.01 Project Deliverables	The Project Deliverables process presents the current set of project deliverables and project tasks for a given project and then enables changes to certain previously computer generated values.
1.02.02.02 Project Deliverable Assignments	The project deliverable assignment process enables the creation of assignments between projects and project-template deliverable-template pairs. Once a project deliverable is created, two of the project deliverable characteristics, parallel/serial, and divisible status can be changed.
1.02.02.03 Project Deliverables Person Skill Level Assignment	The project deliverables person skill level assignment process enables the selection of a project deliverable and assigning to that project deliverable one or more work environment factors.
1.02.02.04 Project Deliverable Work Environment Factor Assignments	The project deliverables work environment factor assignment process enables the selection of a project deliverable and assigning to that project deliverable one or more work environment factors.
1.02.02.05 Work	The Work process enables the entry of data for work performed in support of the accomplishment of a particular project deliverable. Entered is the start and end dates of the work, the house, the quantity of deliverable units completed, and a description of the work actually performed.
1.02.03 Project Task Management	The Project Tasks process enables the creation of a specific project task.
1.02.03.01 Project Tasks	The Project Tasks process enables the creation of a specific project task without regard to whether the added and/or modified task already exists within the collection of tasks in a Task Template. Once added and/or modified, the Task Template remains unchanged.
1.03 Baseline Management	The baseline management process enables the discovery and presentation of

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Project Management Process Architecture	
Process	**Description**
	existing baselines. Included are baseline types, baselines, baseline project deliverables, baseline assigned persons with skill levels and baseline assigned work environment factors.
1.03.01 Baseline Inventory	
1.03.02 Baseline Management	Baseline Management enables the following contained processes: 1. Baseline Types 2. Baselines 3. Baseline Projects 4. Baseline Project - Project Deliverable Assignments 5. Baseline Project - Project Deliverable - Person Skill Level Assignments 6. Baseline Project - Project Deliverable - Work Environment Factor Assignments 7. Baseline Project - Project Deliverable - Work Environment Factor Assignments
1.03.02.01 Baseline Types	The Baseline Type process enables the creation of a baseline type within which collections of baselines can exist.
1.03.02.02 Baselines	The Baseline process enables the creation of a specific baseline within an existing baseline type.
1.03.02.03 Baseline Projects	The baseline project process enables the identification of a specific baseline, and one or more to be assigned projects. Specific project information is copied to the newly created baseline project record.
1.03.02.04 Baseline Project - Project Deliverable Assignments	The baseline project project-deliverable process enables the identification of a specific baseline project, and one or more to be assigned project deliverables. Specific project deliverable information is copied to the newly created baseline project deliverable record. In addition to this information, all project deliverable person skill level records are copied to newly created baseline records for project deliverable person skill level records, as are all project deliverable work environment factor records.
1.03.02.05 Baseline Project - Project Deliverable - Person Skill Level Assignments	The Baseline Project - Project Deliverable - Person Skill Level process enables the tagging of one project deliverable and then one or more project deliverable person skill level records to create Baseline Project - Project Deliverable - Person Skill Level including all relevant Project Deliverable - Person Skill Level data.
1.03.02.06 Baseline Project - Project Deliverable - Work Environment Factor Assignments	The Baseline Project - Project Deliverable - Work Environment Factor process enables the tagging of one project deliverable and then one or more Project Deliverable - Work Environment Factor records to create Baseline Project - Project Deliverable - Work Environment Factor records including all relevant Project Deliverable - Work Environment Factor data.

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Project Management Process Architecture	
Process	**Description**
2 Work Environment Factor Management	The Work Environment Factor Management process enables: 1. Work Environment Factor Types 2. Work Environment Factors 3. Work Environment Factor Multipliers 4. Work Environment Multiplier Types
2.01 Work Environment Factor Types	The Work Environment Factor Type process enables the creation of a class of work environment factors.
2.02 Work Environment Factors	The Work Environment Factor process enables the creation of a class of work environment factor within an existing work environment factor type.
2.03 Work Environment Factor Multipliers	The work environment factor process enables the creation of a work environment factor multiplier within the context of a work environment factor associated with a work environment factor type. The assigned numeric value is thereafter used as a multiplier of unit effort hours.
2.04 Work Environment Factor Multiplier Types	The Work Environment Factor Multiplier Type process enables the creation of a class of work environment factor multiplier.
2.05 Work Environment Factor Multiplier Assignment	The Work Environment Factor Multiplier Assignment process enables the assignment of one or more work environment multiplier types to a selected work environment factor.
3 Persons Skills And Project Assignments	The Person Skills and Project Assignments includes: 1. Persons 2. Personnel Project Assignments Listing 3. Person Skill Level Assignments
3.01 Persons	The person process enables the creation of a new person. Persons need to exist within the context of Missions-Organization-Function-Position. This is accomplished through the MOFPA metabase module. This is required because persons are assigned from within their Missions-Organization-Function-Position-Person context.
3.02 Personnel Project Assignments Listing	The Personnel Project Assignments Listing presents all the different roles performed by a given person across all assigned projects and the project deliverables.
3.03 Person Skill Level Assignments	The Person Skill Level Assignments process assigns to a selected person who exists within a Mission-Organization-Function-Position-Person context to one or more Skill Levels. Each skill level, which includes a skill level multipliers is a combination of a skill and skill level type.
4 Resource Life Cycle Analysis	The Resource Life Cycle Analysis process includes: 1. Resources 2. Resource Life Cycles

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Project Management Process Architecture	
Process	**Description**
4.01 Resources	The Resources process lists the specific resources from within their specific resource types. Creation, updating and all other actions associated with Resource Life Cycle Node activities are contained in the Resource Life Cycle Node metabase system module.
4.02 Resource Life Cycle Nodes	The Resource Life Cycle Node process lists the Resource Types, their associated Resources, and the life cycle for each resource. The association of a project to one or more resource life cycle nodes is accomplished in the process, Resource Life Cycle Node Project Assignment.
5 Templates	Template processes enable the following: 1. Template Assignments 2. Project Templates AND Deliverable Template Assignments 3. Deliverable-Templates Task-Templates Assignments 4. Project Templates 5. Deliverable Templates 6. Task Templates 7. Template Assessments
5.01 Template Assignments	The Template Assignments include: 1. Project Templates AND Deliverable Template Assignment 2. Deliverable-Templates Task-Templates Assignment
5.01.01 Project Templates and Deliverable Template Assignment	The Project Templates and Deliverable Template Assignment process associates a project template with one or more deliverable templates. A deliverable template may also be assigned to one or more project templates.
5.01.02 Deliverable-Templates Task-Templates Assignment	The Deliverable-Templates Task-Templates Assignment process associates a deliverable template with one or more task templates. A task template may also be assigned to one or more deliverable templates.
5.02 Project Templates	The Project Template process manages all templates associated with projects and includes: 1. Project Templates 2. Import Project Templates 3. Project Template Reallocation 4. Project Template Types 5. Import Project Template Types 6. Project Template Type Reallocation
5.02.01 Project Template Type	The Project Template Type process enables the creation of a new project template type.
5.02.02 Import Project Template Types	The Import Project Template process imports an entire list of project templates.
5.02.03 Project Template Type Reallocation	The Project Template Reallocation process enables the movement of a project template from within an existing project template tree to a different project

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Project Management Process Architecture	
Process	**Description**
	template tree.
5.02.04 Project Templates	The Project Template process enables the creation of a new project template within the context of a project template type.
5.02.05 Import Project Templates	The Import Project Template process imports an entire list of project templates.
5.02.06 Project Template Reallocation	The Project Template Reallocation process enables the movement of a project template from within an existing project template tree to a different project template tree.
5.03 Deliverable Templates	The Deliverable Template process manages all templates associated with deliverables and includes: 1. Deliverable Templates 2. Import Deliverable Templates 3. Project Deliverable Reallocation 4. Project Deliverable Types 5. Import Deliverable Template Types 6. Deliverable Template Type Reallocation
5.03.01 Deliverable Template Types	The Deliverable Template Type process enables the creation of a new deliverable template type.
5.03.02 Import Deliverable Template Types	The Import Deliverable Template process imports an entire list of deliverable template types.
5.03.03 Deliverable Template Type Reallocation	The Deliverable Template Reallocation process enables the movement of a deliverable template type from within an existing deliverable template type tree to a different deliverable template type tree.
5.03.04 Deliverable Templates	The Deliverable Template process enables the creation of a new deliverable template within the context of a deliverable template type.
5.03.05 Import Deliverable Templates	The Import Deliverable Template process imports an entire list of deliverable templates.
5.03.06 Deliverable Template Reallocation	The Deliverable Template Reallocation process enables the movement of a deliverable template from within an existing deliverable template tree to a different deliverable template tree.
5.04 Task Templates	The Task Template process manages all templates associated with tasks and includes: 1. Task Templates 2. Import Task Templates 3. Task Template Reallocation 4. Task Template Types 5. Import Task Template Types 6. Task Template Type Reallocation

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Project Management Process Architecture	
Process	**Description**
5.04.01 Task Template Type	The Task Template Type process enables the creation of a new task template type.
5.04.02 Import Task Template Types	The Import Task Template Type process imports an entire list of task template types.
5.04.03 Task Template Type Reallocation	The Task Template Reallocation process enables the movement of a task template type from within an existing task template type tree to a different task template type tree.
5.04.04 Task Templates	The Task Template process enables the creation of a new task template within the context of a task template type.
5.04.05 Import Task Template	The Import Task Template process imports an entire list of task templates.
5.04.06 Task Template Reallocation	The Task Template Reallocation process enables the movement of a task template from within an existing task template tree to a different task template tree.
5.05 Template Assessments	The Template Assessments process examines and presents an analysis of the templates including: 1. Project Based Template Assessment 2. Deliverable Based Template Assessment 3. Task Based Template Assessment
5.05.01 Project Based Template Assessment	The Project based template assessment performs an analysis of an existing collection of project templates and project template types and formats a report about the assessment. The project assessment includes related deliverable and task template data.
5.05.02 Deliverable Based Template Assessment	The Deliverable based template assessment performs an analysis of an existing collection of deliverable templates and deliverable template types and formats a report about the assessment. The project assessment includes related project and task template data.
5.05.03 Task Based Template Assessment	The Task based template assessment performs an analysis of an existing collection of task templates and task template types and formats a report about the assessment. The task assessment includes related project and deliverable template data.
6 Contract Management	The Contract Management process enables the creation of very high level contract information including: 1. Contracts 2. Contract Organization Structures 3. Contract Resources
6.01 Contracts	The Contract process enables the creation of very high level information for a contract.

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Project Management Process Architecture	
Process	**Description**
6.02 Contract Organization Structures	The Contract Organization Structure process enables the association of a contract with the enterprises organizations involved in the contract. Included with each contract organization structure is the control role assumed by that contract organization structure.
6.03 Contract Resources	The Contract Resource process enables the association of Contract-Organization-Structures and Mission-Organization-Function-Position-Persons. Because of this association and the associations between Mission-Organization-Function-Position-Persons and the rest of Whitemarsh project management, the costs, deliverables, staffing, and schedules can be tracked continuously or through the use of baseline events.
7 Reference Data	The Reference data process enables the creation and management of reference data that is used throughout the accomplishment of Whitemarsh project management. Included in reference data are: 1. Basic Reference data 2. Holidays 3. Contract Roles 4. Role Types 5. Skills 6. Skill Level Types 7. Skill Level Assignments 8. Skill Levels 9. Import Reference Data
7.01 Basic Reference Data	The Basic Reference Data process enable the creation of reference data that is used throughout the project management system for staffing and scheduling calculations.
7.02 Holidays	The Holidays reference data enables the creation of those other-wise work days that are provided to staff as days off.
7.03 Contract Roles	The Contract Roles reference data process identify and describe the various roles that are undertaken by Organizations (through their Organization Structures) with respect to Contract Organization Structures.
7.04 Role Types	Role Types reference data process identify and describe the roles undertaken by persons with their associated skill levels in the accomplishment of the work required to complete a project deliverable.
7.05 Skill	The Skill reference data process identifies and describes an overarching skill that is associated with a person who is to perform work on a project. This does not preclude the person from performing other work outside this overarching skill area.
7.06 Skill Level Types	The Skill Level Type reference data process identifies and describes a classification of a collection of skills.
7.07 Skill Level Assignments	The Skill Level Assignment reference data process enables the association of a

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Project Management Process Architecture	
Process	**Description**
	skill level with a skill level type. This process also includes the ability to assign a proficiency multiplier from a list of values from 0.5 (works twice as fast as normal) to 3.0 (works three times slower than normal).
7.08 Skill Levels	A Skill Level reference data process provides a complete list of all Skill Levels with their associated Skills and Skill Level Types.
7.09 Status Types	The Status Type reference data process enables the naming and description of various statuses that can be associated with either a project and/or a project task.
7.10 Import Reference Data	The Import Reference Data process enables the importation of collections of ASCII-based data into various reference data including: 1. Contract Roles 2. Holidays 3. Role Types 4. Skill Level Types 5. Skills 6. Work Environment Factor Types 7. Work Environment Multiplier Types 8. Work Environment Factors
7.10.01 Contract Role Source	The Contract Role reference data import process enables the bulk importing of contract role names and descriptions.
7.10.02 Holiday Source	The Holiday reference data import process enables the bulk importing of dates and names.
7.10.03 Role Type Source	The Role Type reference data import process enables the bulk importing of role types names and descriptions.
7.10.04 Skill Level Type Source	The Skill Level Type reference data import process enables the bulk importing of skill level type names and descriptions.
7.10.05 Skill Source	The Skill reference data import process enables the bulk importing of skill names and descriptions.
7.10.06 Work Environment Factor Type Source	The Work Environment Factor Type reference data import process enables the bulk importing of Work Environment Factor Type and descriptions.
7.10.07 Work Environment Multiplier Type Source	The Work Environment Multiplier Type reference data import process enables the bulk importing of Work Environment Multiplier Type names and descriptions.
7.10.08 Work Environment Factor Source	The Work Environment Factor reference data import process enables the bulk importing of Work Environment Factor names and descriptions.

Table 4. Whitemarsh Project Management Architecture

5.3 Project Management

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The project management menu item shown in Figure 4 enables the invocation of the following items:

- Project Initiation
- Project and Deliverable and Task Assignment
- Baseline Management
- Work

The little “greater than” sign on the right side of each of these entries indicate that each has a subordinate menu. Each is addressed in sections that follow.

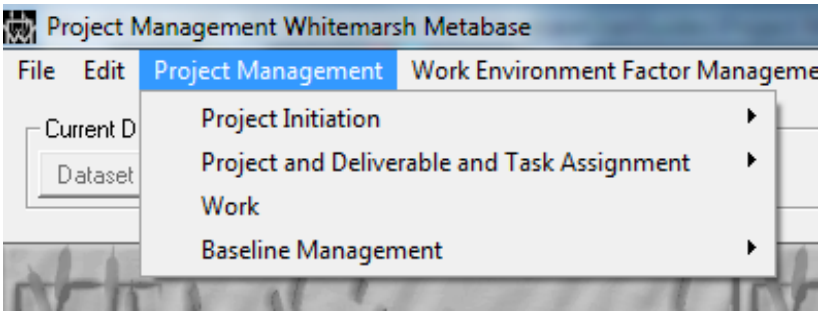

Figure 4. Menu items within Project Management.

The project management process represents the collection of processes that initiate a project including:

- The update of project attributes
- The assignment of resource life cycle nodes affected by the project
- The identification of and automatic generation of the complete project plan
- The assignment of persons and their skill levels assigned to the project deliverables
- The assignment of work environment factors
- The generation of all unit-effort based resources across all project deliverables
- The management of project deliverables including skilled persons and work environment factors
- Capture of work in support of Project Deliverables accomplishment
- Baseline management.

5.3.1 Project Initiation

The Project Initiation menu item shown in Figure 5 enables the invocation of the following items:

- Project Creation and Update

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- Resource Life Cycle Node Project Assignment
- Project Work Plan Generation
- Projects Resource Generation

Each item is addressed in Sections that follow.

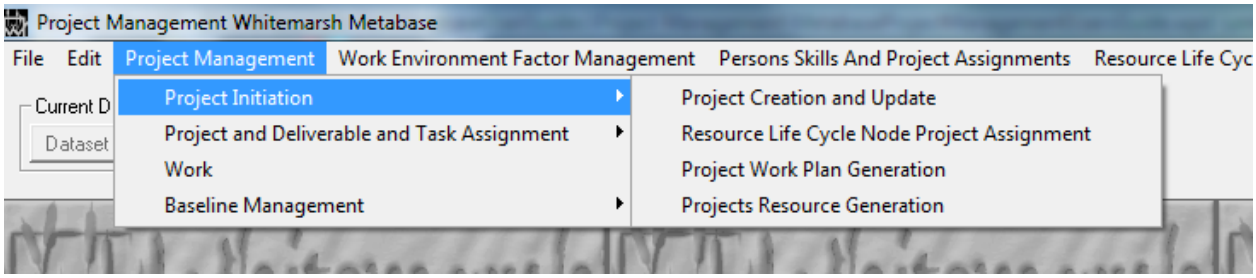

Figure 5. Project Management actions within Project Initiation.

5.3.2 Project Creation and Update

Figure 6, the screen for creation and update, establishes a new project by supplying the highest level of information for the project itself. The action buttons at the bottom of the screen enable project creation, update, or deletion. In this example, first, the Status for a project is selected, and second, the contract or sub-contract within which the project is accomplished is selected. When a new project is created, the relationships from the Status Type and Contract are established to the new project.

To establish a new project, select the project's context by selecting a status type and contract, and press insert. At this point, Figure 7 is displayed. The Resource Type will have already been selected. Select the appropriate Resource and Resource Life Cycle Node. The Contract and the Status Type will already be selected from Figure 6. Finally, in Figure 7, enter project's name and description.

To update a project, select the Status Type and Contract from Figure 6, select the project, and press enter. Update the project's name and description as appropriate.

If the Contract is to be changed, enter a "0" (zero) and then hit the tab key. When that is done, the Contract select screen appears. See Figure 8. In this case, the Mission Model Development contract was selected.

In a similar way, selection of Status Type to be changed, enter a "0" (zero) and then hit the tab key. When that is done, the Status Type select screen appears. See Figure 9. In this case, the Unknown status was selected.

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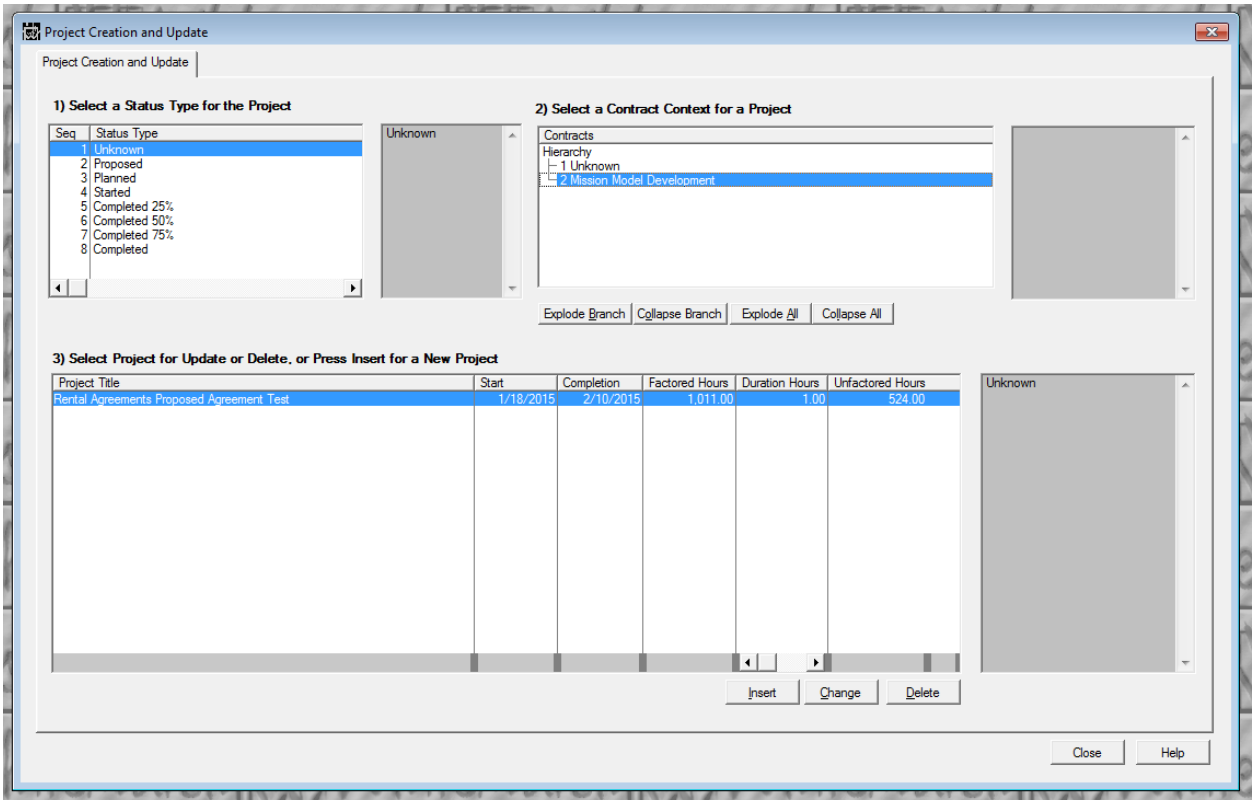

Figure 6. Project creation.

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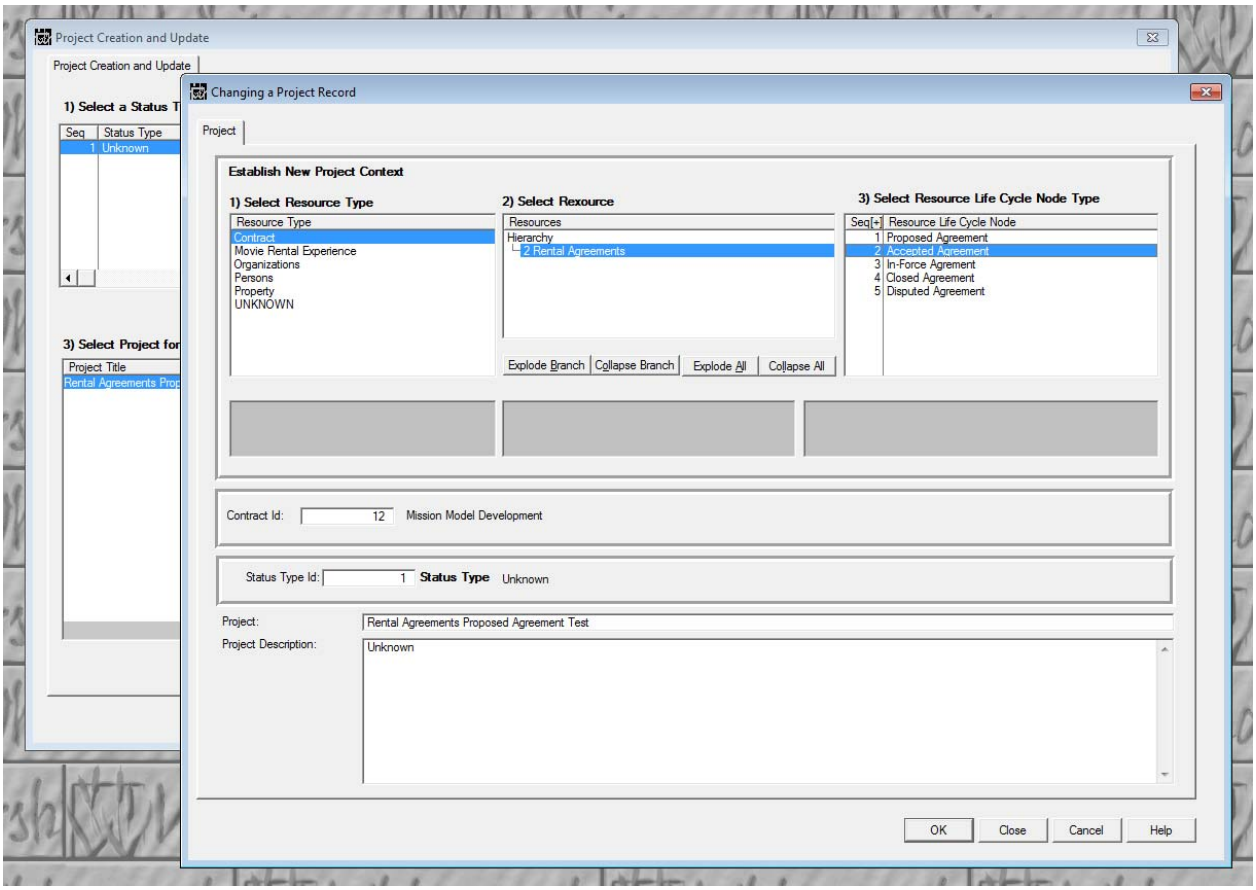

Figure 7. Project creation screen update.

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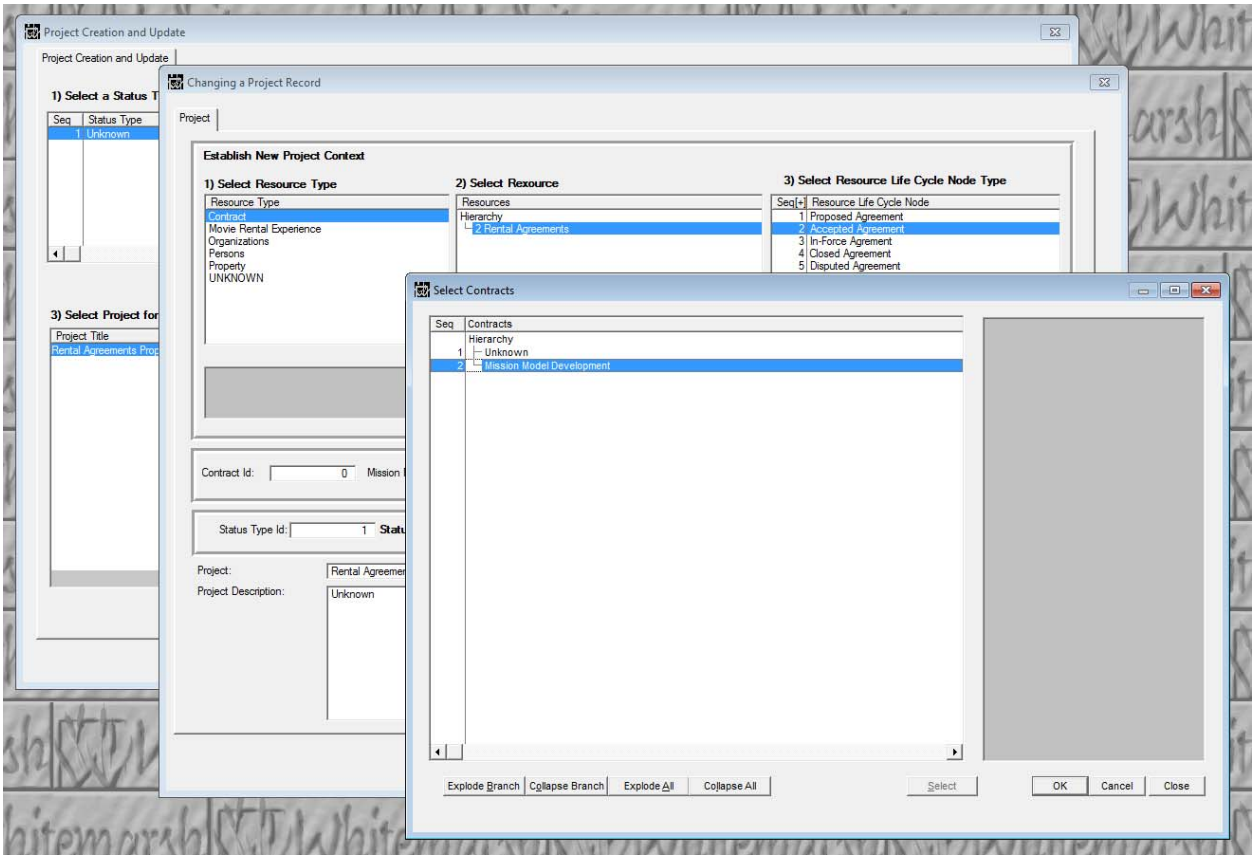

Figure 8. Contract selection for a new project.

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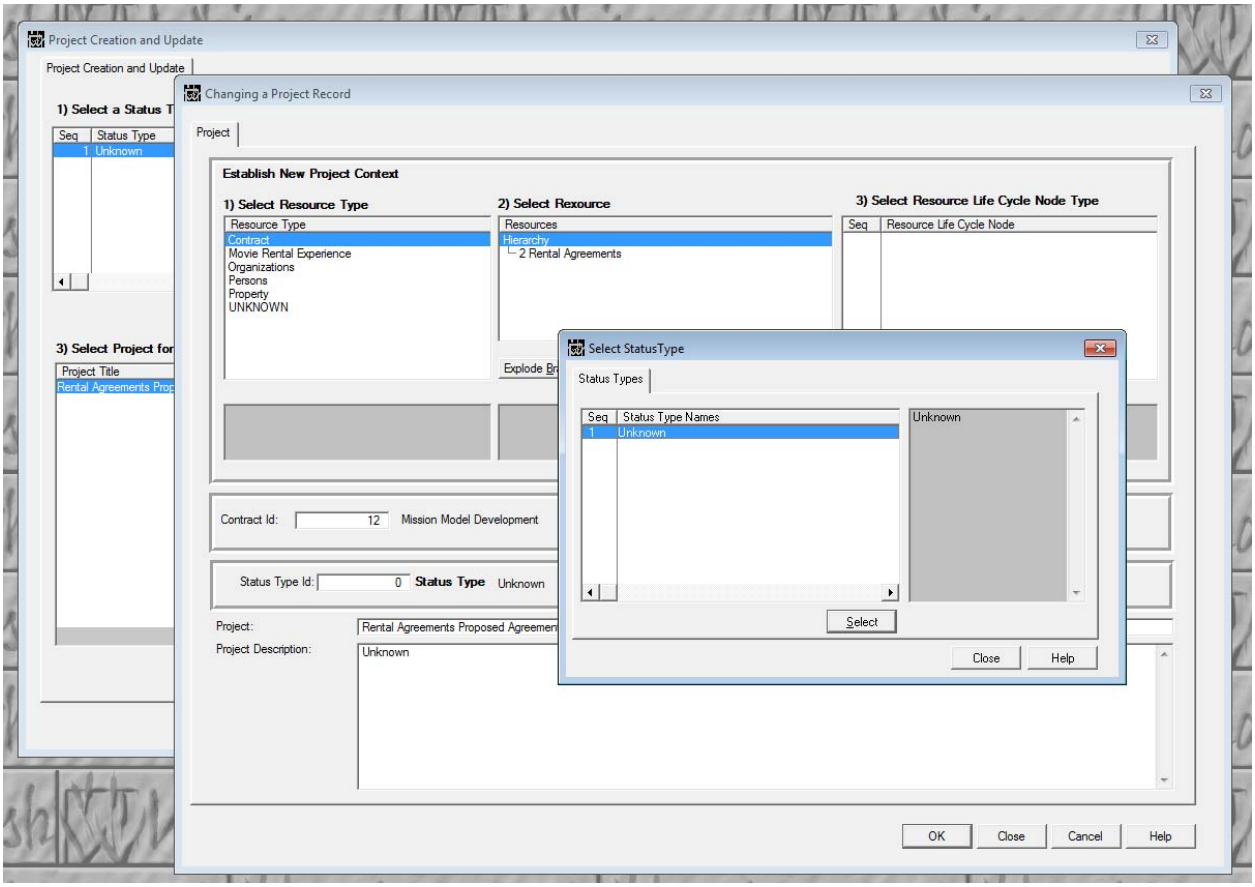

Figure 9. Status Type Selection for a new project.

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5.3.3 Resource Life Cycle Node Project Assignment

Projects are not accomplished in isolation. The resource life cycle node screen, shown in Figure 10, enables users to identify which particular resource life cycle node represents the contextual target for which the project is accomplished. To create the association, select and tag the project on the left browse, and select and tag one or more resource life cycle nodes on the right-side browse. Thereafter, press the Build button to create the association(s).

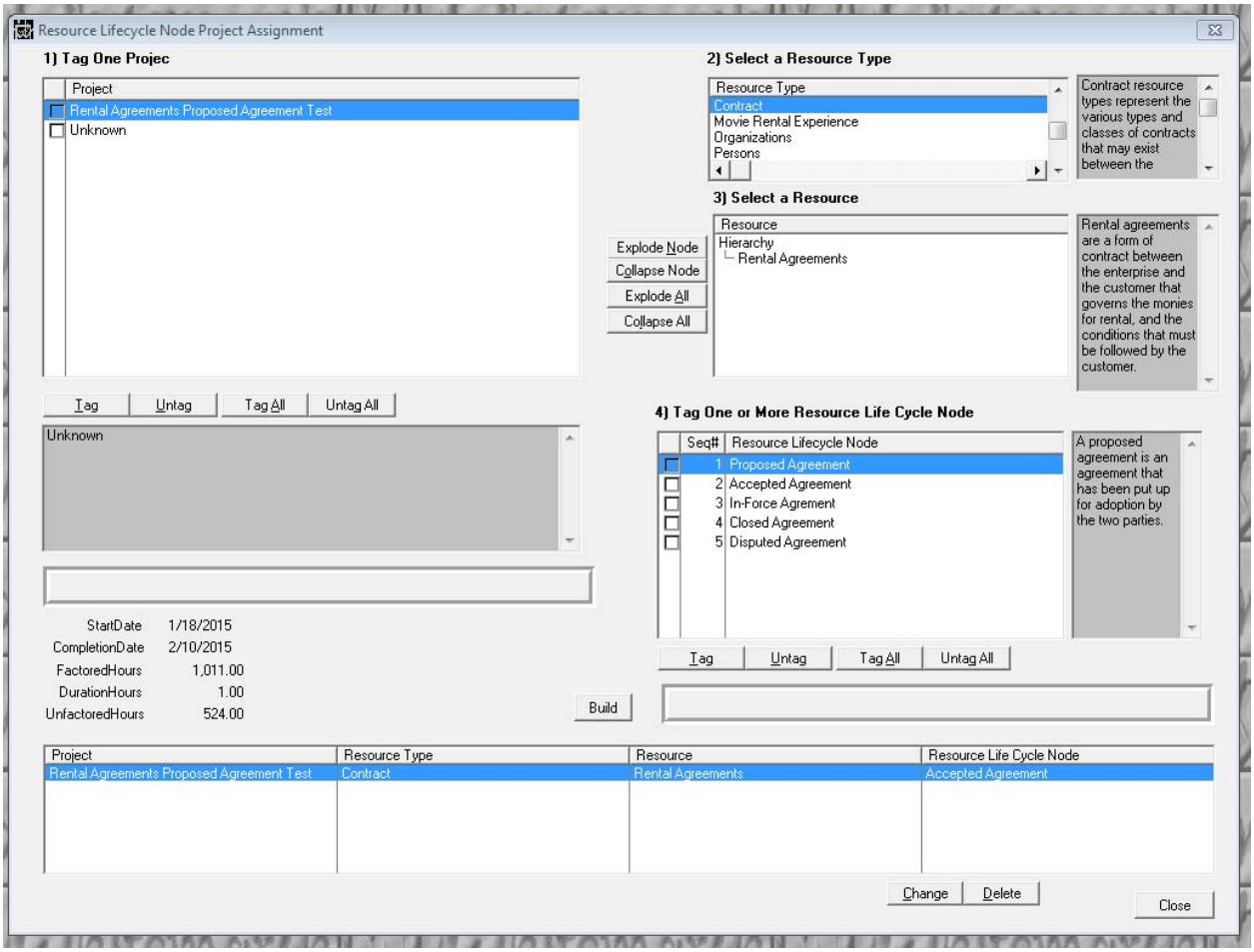

Figure 10. Project Resource Life Cycle Node assignment start and end date change.

Once the assignment(s) are created, the Change button enables the establishment of the start and end dates of the project for each different associated resource life cycle node. The change screen is shown in Figure 11.

At this point in a project's development, these dates are almost always 100% wrong. Only after all the work involved in Section 5.3 Project Resources Generation is accomplished are these dates set based on real project start and end dates.

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Since there are no specific project deliverables assigned to individual Resource Life Cycle Nodes, it is impossible to precisely set the start and end dates for project work associated with each involved Resource Life Cycle Node. The dates for the interior set of Resource Life Cycle Nodes are set proportionally based on the quantity of Resource Life Cycle Nodes for that project, the project's start and end dates, and the computation of an equal sized interval across the set of Resource Life Cycle Nodes. The Resource Life Cycle Node dates are set only when the Generate Project Deliverable Schedule button is pressed. See Section 5.3.5.3 and Figure 14.

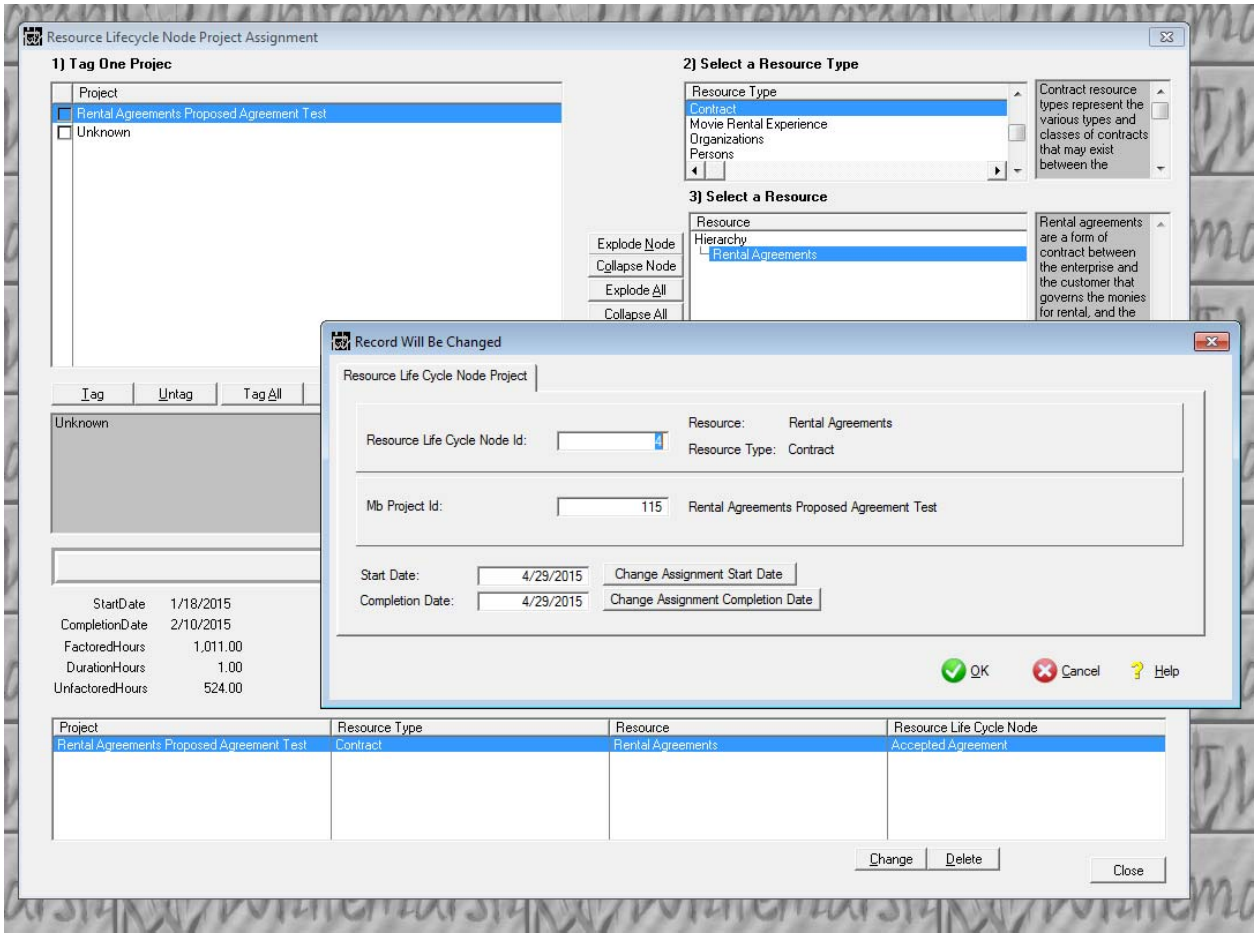

Figure 11. Project Resource Life Cycle Assignment Update.

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5.3.4 Project Work Plan Generation

Project work plans can be automatically generated. This process, shown in Figure 12, can be accomplished once a complete set of templates (Project, Deliverable and Task) have been installed in the Metabase System database.

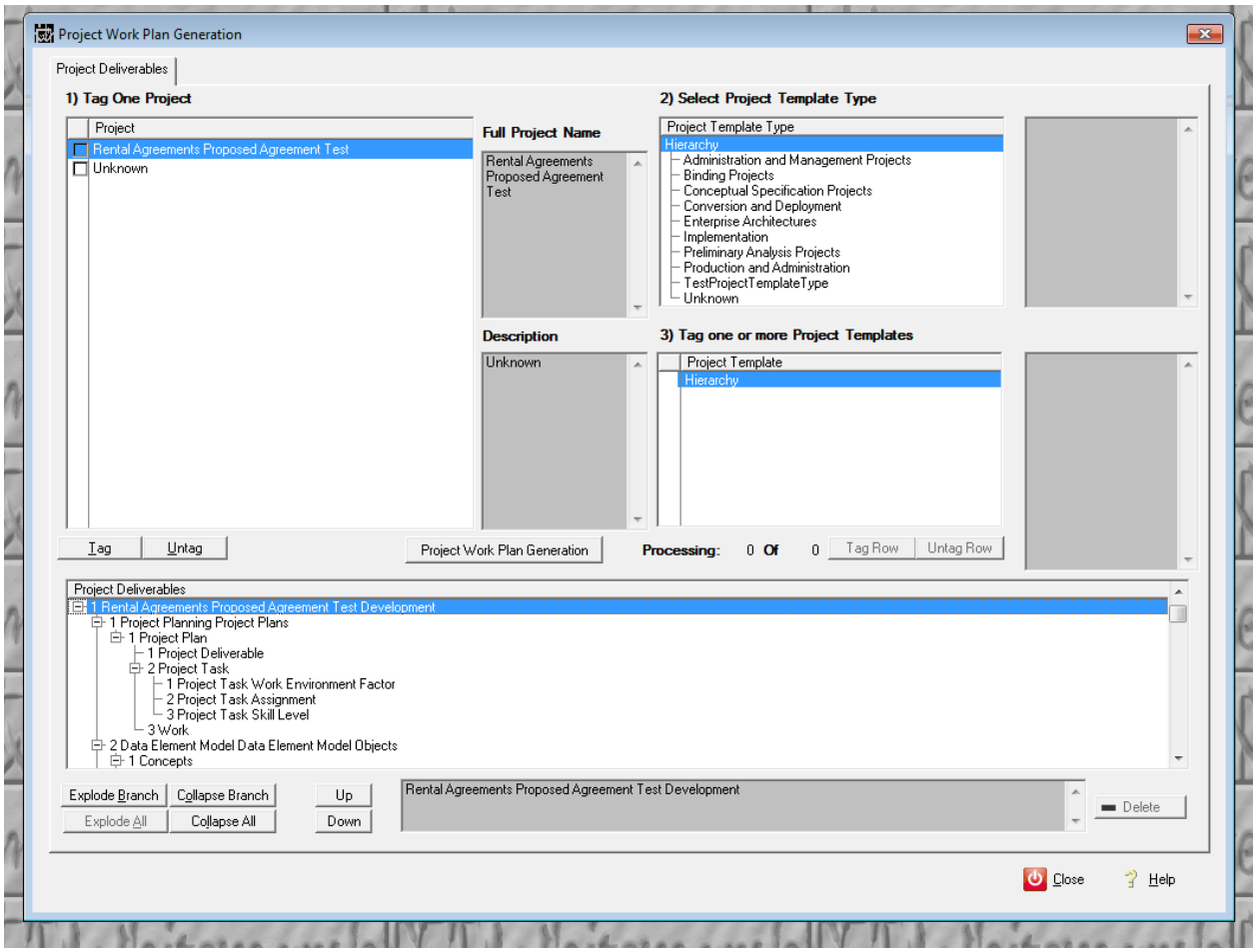

Figure 12. Project Work Plan Generation.

Loading these templates is accomplished through the user guide sections:

5.7.4 Project Templates including its subordinate six processes (5.7.4.1 through 5.7.4.6)
5.7.5 Deliverable Templates including its subordinate six processes (5.7.5.1 through 5.7.5.6)
5.7.6 Task Templates including its subordinate six processes (5.7.6.1 through 5.7.6.6)

The Project Work Plan Generation process assumes that all that has been accomplished.

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To accomplish the generation of a project work plan, select and tag the project on the left browse. Then, select the appropriate project template type on the top-right browse. Then tag one or more project templates on the right side. Once completed, press the Project Work Plan Generation button.

The generation process creates the following:

- Project Deliverable and subordinate project deliverables
- Project Tasks for each Project Deliverable and contained subordinate Project Tasks

Each Project Deliverable and subordinate project deliverables contains the unit effort quantities, and indications as to whether the project deliverable's work can be divided across multiple staff and whether the project deliverable can be accomplished in parallel with peer-level project deliverables. All three of these project deliverable properties can be subsequently changed on Project Deliverable screens. See Section 5.3.8.1, Project Deliverables. That, however is not the end of project estimation. Subsequent sections enable the assignment of persons who will be performing the work and their attendant varied velocities (Section 5.3.8.3), and also the assignment of work environment factors (Section 5.3.8.4) that will affect the speed that work can be accomplished.

5.3.5 Projects Resource Generation

The Project Resource Generation process consists of two screens. The first, Figure 13 shows the list of all projects. Once a project is selected and the Change button pressed, Figure 14 shows the "Change" screen for a particular project, and it is from within that screen that the actual resources are generated. The five project resource generation buttons are:

- Generate Project Deliverable Hours
- Generate Project Deliverable Durations
- Generate Project Deliverable Schedule
- Generate Project Deliverable Report
- View [Project Deliverable] Report

Generated are gross hours, skill and work environment factor affected hours, start and end dates for projects, distribution of work loads for assigned persons, and the effects of work division and also serial/parallel are accomplished.

Prior however to the generation of actual project resources, the additional adjustments need to be made. Those related to individual Project Deliverables contained in Section 5.3.8.1 are:

- Quantity of units within any given project deliverable
- Work divisibleness

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- The serial or parallel nature of a project deliverable with respect to peer project deliverables

The additional allowed adjustments are:

- 5.3.8.2 Project Deliverable deletions to tailor a Project Deliverable from what was generated from the Project Deliverable templates
- 5.3.8.3 Project Deliverable Person Skill Level Assignments
- 5.3.8.4 Project Deliverable Work Environment Factor Assignments

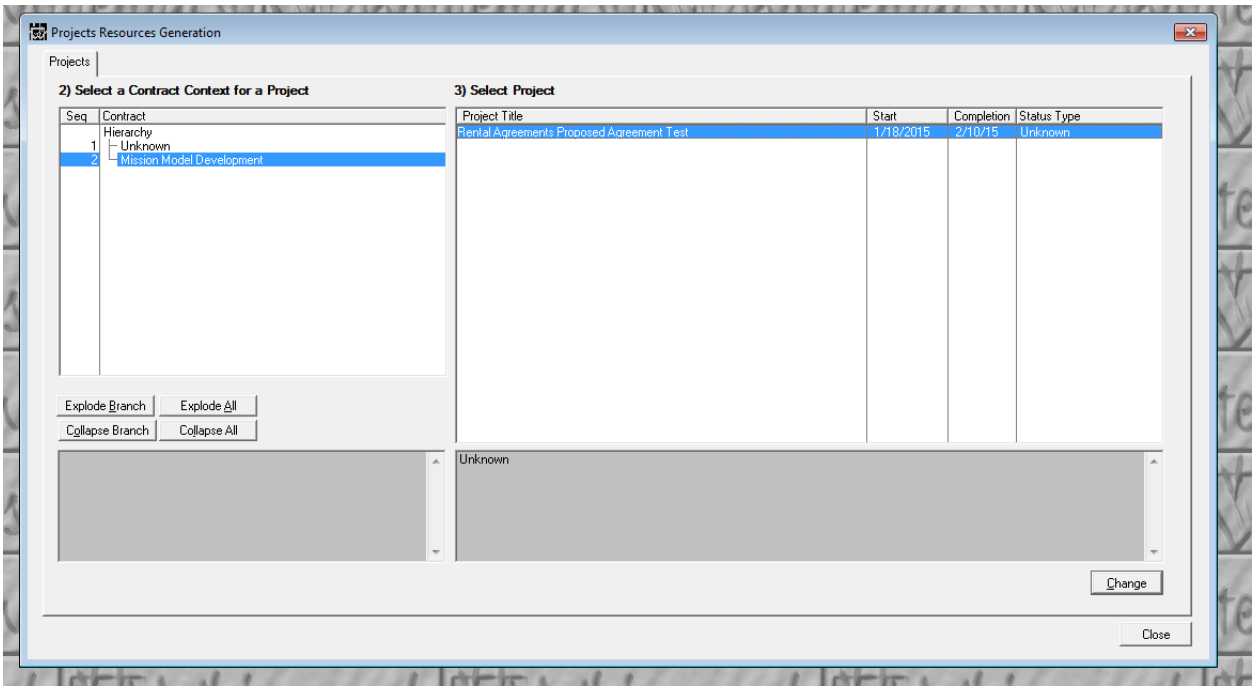

Figure 13. Project Screen for Project Resource Generation.

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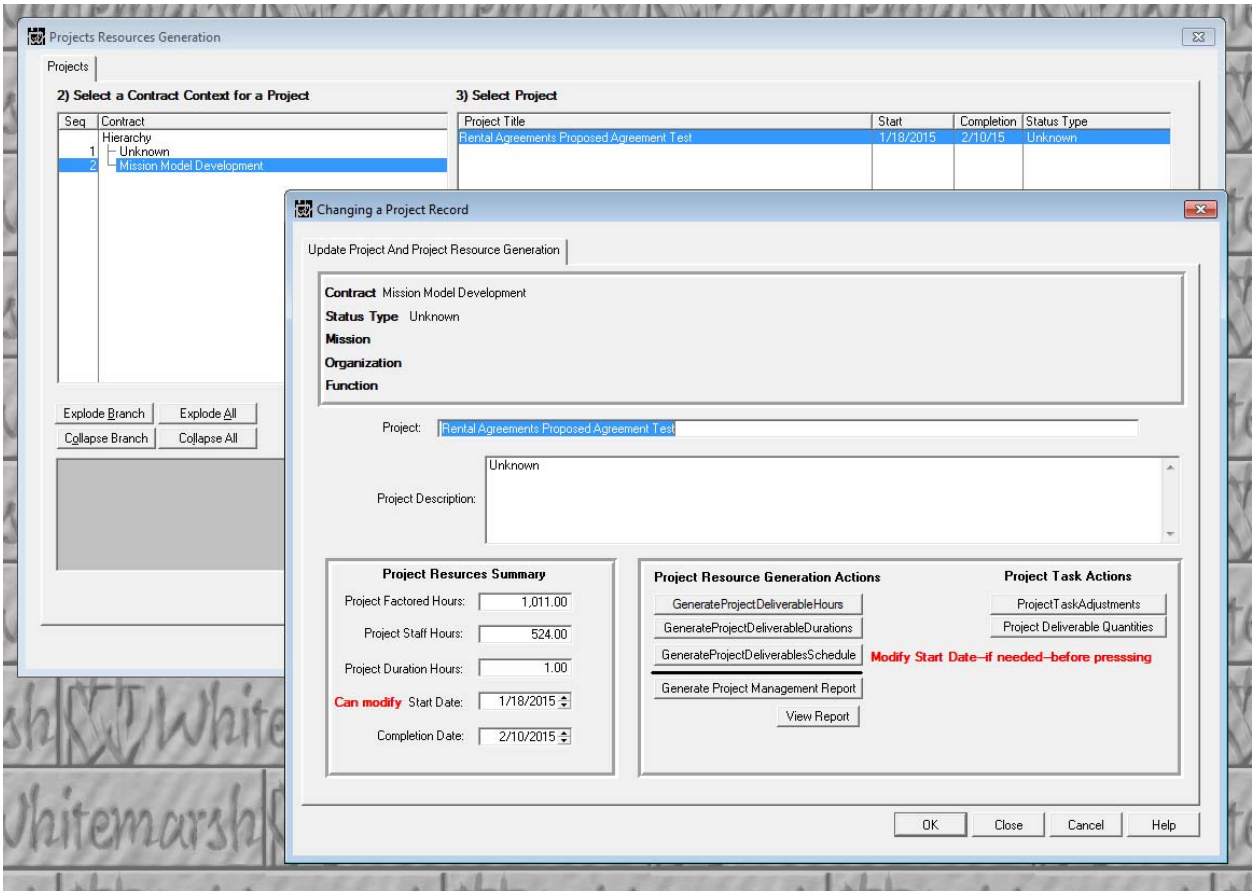

Figure 14. Project Resources Generation.

5.3.5.1 Generate Project Deliverable Hours

The initial project deliverable hours results from multiplying the quantity of units for a Project by the pre-defined quantity of hours estimated to produce one unit of the Project Deliverable. This is called unfactored hours. If there were 15 units at 10 hours each the unfactored hours becomes 150.

This calculation does not take into account the effects of Project Deliverable hierarchies that are described in Section 5.3.8.1.

Additionally, the unfactored hours computation does not, however, take into account either the assessed skill level of an assigned person(s), or the various work environment factors that affect a person's total hours.

The unfactored hours become the basis for factored hours. These are calculated first by affecting the hours by the persons assigned. If only one person is assigned, and the Skill Level Multiplier is 2.0 (e.g., novice), the unfactored hours of 150 becomes 300 hours.

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If, however, there is more than one person assigned, and the work is divisible, the computations are not just a matter of dividing by the quantity of persons and then multiplying by the Skill Level Multiplier for each of the assigned person's hours to arrive at a result where both assigned staff finish at about the same time. That's because each person might have a different Skill Level Multiplier.

Suppose for example one person assigned had a Skill Level Multiplier of 0.75 and the other assigned person's Skill Level Multiplier was 2.0. For the 0.75 Skill Level staff person, the initial 150 hours would have become 75 as a result of equally dividing the work. But because of the person's Skill Level Multiplier, the 75 hours would be accomplished in 0.75 amount of the time. That is, 75 times 0.75 or about 56 hours. But for the 2.0 Skill Level person, the evenly divided hours of 75 hours would be multiplied by 2 and become 150 hours of work. In short, the faster person would have done the 75 units in about 56 hours and the slower person would have taken 150 hours.

To address the need to have Project Deliverables completed at about the same time by all assigned staff, the project management software processes increases the quantity of units for the faster person until that person's time to completion roughly equals the time to completion of the slower person's reduced unit quantity. The ultimate result becomes the Project Deliverable Skilled factored hours.

Once the Project Deliverable Skilled Factored hours are determined, the work environment factors are taken into account. This is done by using the work environment factor multipliers for each assigned work environment factor and multiplying these by the Project Deliverable Skilled Factored hours. This is a multiplicative summation, not an additive summation.

The total person hours are computed by adding the hours together for each assigned person.

5.3.5.2 Generate Project Deliverable Durations

Project Deliverable durations take the Project Deliverable Factored hours and determines the duration for each set of parallel Project Deliverables taking into consideration the parallel and serial nature of all the Project Deliverables in the Project Deliverables tree.

5.3.5.3 Generate Project Deliverable Schedule

The Project Deliverables schedule is computed by starting at the set Project Start date and for each Project Deliverable hierarchical level determine that level's critical path Project Deliverable and setting the start and end dates for that Project Deliverable cluster.

Whenever a Project Deliverable that is not on the critical path of a cluster of Project Deliverables, the slack duration is also computed.

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5.3.5.4 Generate Project Report

The overall generation of a resource and scheduled project can be generated and formatted into a hierarchically organized report that shows each Project Deliverable and then all assigned staff, work environment factors, person hours computations, start and end dates, slack hours.

5.3.5.5 View [Project] Report

This process enables the viewing of the Project report. This release of the Metabase System does not have “pretty” formatted reports. Thus this report’s value is mainly to enable a full understanding of the entire project that has been estimated.

5.3.6 Project and Deliverable and Task Assignment

The processes identified in Figure 15 accomplish the following:

- Deliverable-Template and Task-Template To Project Deliverable Assignments
- Project Deliverables Management and its contained subordinate processes
- Project Task Management
- Project Deliverables Association Management

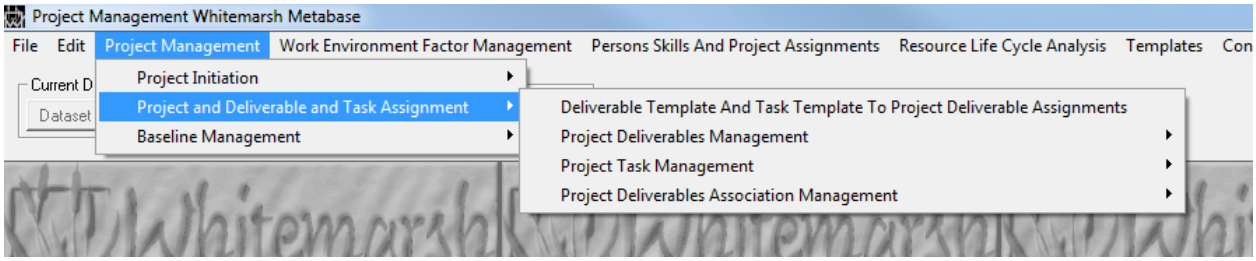

Figure 15. Project and Deliverable Task Assignment processes.

Each of these are detailed in subsequent sections. Collectively, these processes enable the creation and/or modification of what is automatically generated through the processes described in Section 5.3.4. The key goal of having template-based project plan generation is to enable analysis of multiple projects that result from using the projects, deliverables and task templates.

5.3.7 Deliverable Template And Task Template To Project Deliverable Assignments

The Deliverable Template And Task Template To Project Deliverable Assignments process shown in Figure 16, associates a Deliverable Template & Task Template combination with one

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or more Project Deliverables. The result of this assignment process includes the creation of all the Project Tasks associated with the Task Template that is associated with the selected Deliverable template.

Modification of the generated Project Tasks is accomplished in Section 5.3.9.1, Project Tasks.

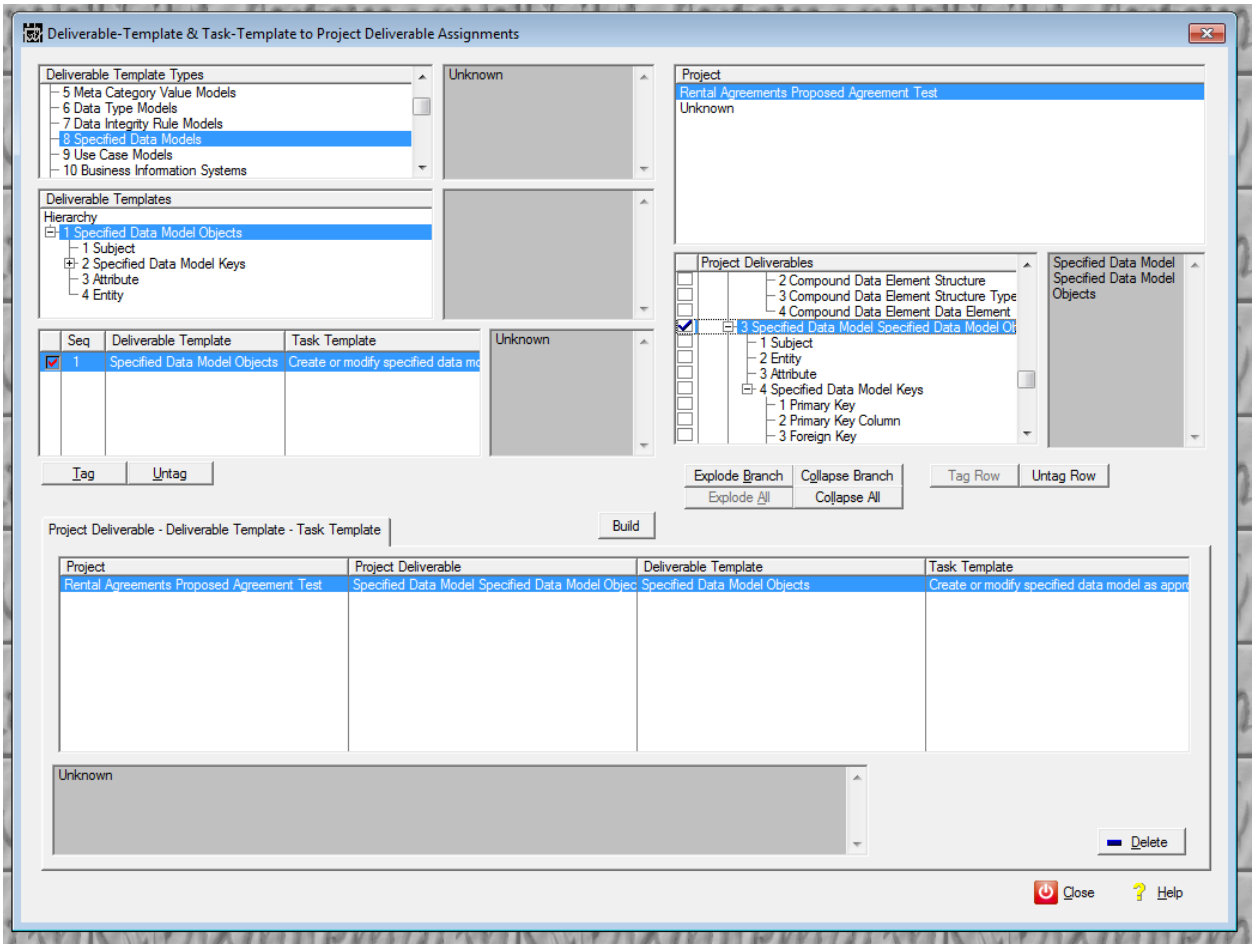

Figure 16. Deliverable-Template and Task-Template to Project-Deliverable Assignments.

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5.3.8 Project Deliverables Management

Figure 17 set out the specific processes associated the manipulation of Project Deliverables. These include:

- Project Deliverables
- Project Deliverable Assignments
- Project Deliverable Person Skill Level Assignments
- Project Deliverable Work Environment Factor Assignments

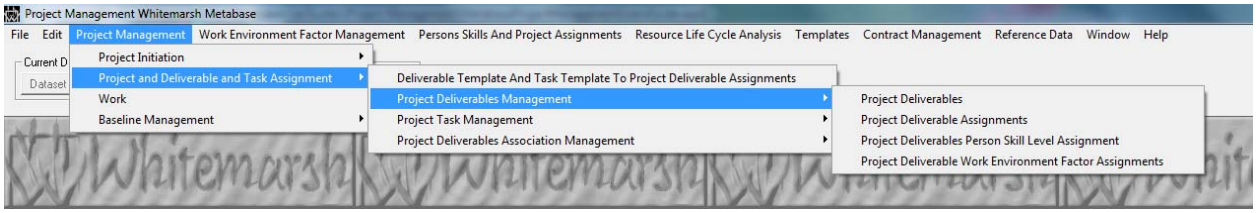

Figure 17. Project Deliverables associated processes.

5.3.8.1 Project Deliverables

Figure 18 shows a collection of Project Deliverables for the Project, Rental Agreement Proposed Agreement Test. Once the Project Deliverables are created, key characteristics of each Project Deliverable can be changed. These changes affect the computation of the Project Deliverable's needed resources. The characteristics that affect resource computation are:

- Serial or Parallel
- Divisibleness of work
- Quantity of Project Deliverable units
- Relative or absolute quantity multiplier

Each is addressed in this Project Deliverables section.

The data shown in Figure 18 is used to illustrate these resource changes:

- The ultimate deliverable is: Rental Agreement Proposed Agreement Test Development.
- Its first contained Project Deliverable is Project Planning Project Plans.
- In turn, Project Planning Project Plans has the following subordinate Project Deliverable, Project Plan.
- Project Plan in turn has the subordinate Project Deliverables, Project Deliverable, Project Task, and Work.
- Project Task has in turn, the subordinate Project Deliverables: Project Task Work Environment Factor, Project Task Assignment, and Project Task Skill Level

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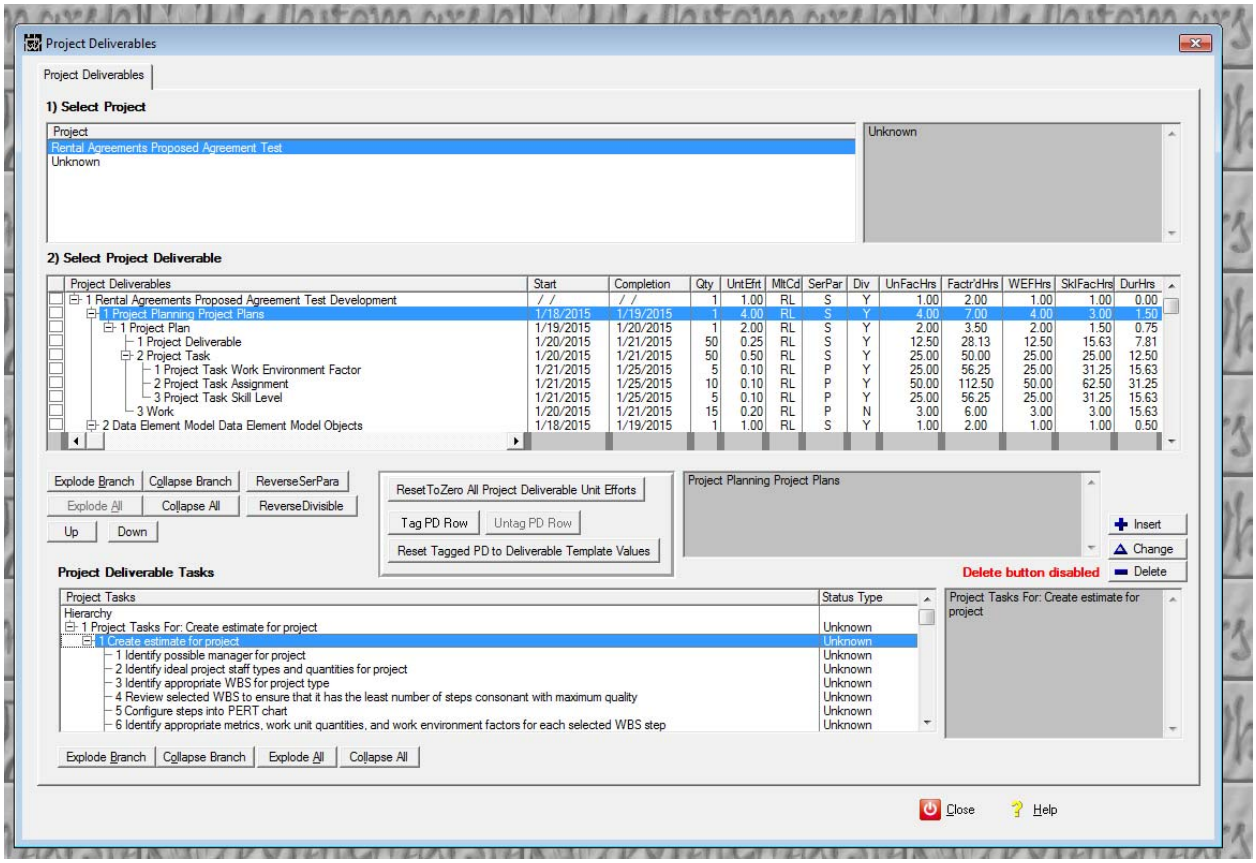

Figure 18. Project Deliverables.

5.3.8.1.1 Serial or Parallel

Project Deliverables can be in a peer relationship with each other. For example, in Figure 18, the three project deliverables, Project Task Work Environment Factor, Project Task Assignment, and Project Task Skill Level are all marked as peers. Further, all these Project Deliverables can be performed in parallel. If they are all marked as Parallel (i.e, “P”), then the staff hours duration across all three is the Project Deliverable with the maximum quantity of hours. If the hours were 10, 15, and 20 respectively, the duration would be 20. However, if they are all marked as Serial (i.e., “S”), the duration is 45 hours.

Walking back up the hierarchy to Project Plan, the following are in a peer relationship:

- Project Deliverable
- Project Task
- Work

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In this case, all three would likely be marked as Serial as the Project Deliverables would certainly have to be identified prior to the Project's Tasks, and of course recording the hours expended in the accomplishment of the would be done as the actual Project Deliverable is being created.

Walking further up the hierarchy to Rental Agreements Proposed Agreement Test Development, the Project Deliverables are:

- Project Planning Project Plans
- Data Element Model Data Element Model Objects

These should be in a Serial relationship as Project Plans certainly should be done before any actual project deliverables such as Data Element Project Deliverable are created.

The button on the screen, Reverse Sera/Para, when pressed reverses the existing value of Serial or Parallel for the selected Project Deliverable.

5.3.8.1.2 Divisibleness of Work

Figure 18 also shows a button, Reverse Divisible. If a Project Deliverable shows the column, Div as "N" then the work to accomplish this Project Deliverable cannot be divided across multiple persons even if more than one person is assigned to the Project Deliverable.

If the Div column shows "N" and the button is pressed, the value becomes "Y," and vice versa.

5.3.8.1.3 Quantity of Project Deliverable Units

Figure 18 also shows the Project Deliverable field, Qty. This shows the prospective quantity for that Project Deliverable. If the quantity is to be different, press the Change button. Figure 19 is then shown. In that update screen, the Project Deliverable Unit Quantity shows the current quantity for that deliverable.

Now, suppose the Project Deliverable was to be database tables columns. If the value is 15, then must there only be 15 columns across all tables in a database schema? Well, that all depends on the value set for the column, Project Deliverable Unit Quantity Multiplier. If the value via the radio button is set to Ab, meaning absolute, then the quantity is absolutely set to 15. But if the value is set to RL for relative, then that value, 15 is multiplied by the quantity of its containing component, that is, database tables. So, if there are 200 tables, then the quantity of columns for which resources are computed is 300.

It should thus be quite clear that how the hierarchies are established in Deliverable Templates is very important. If for example, the Project Deliverable is database schema and there are two peer

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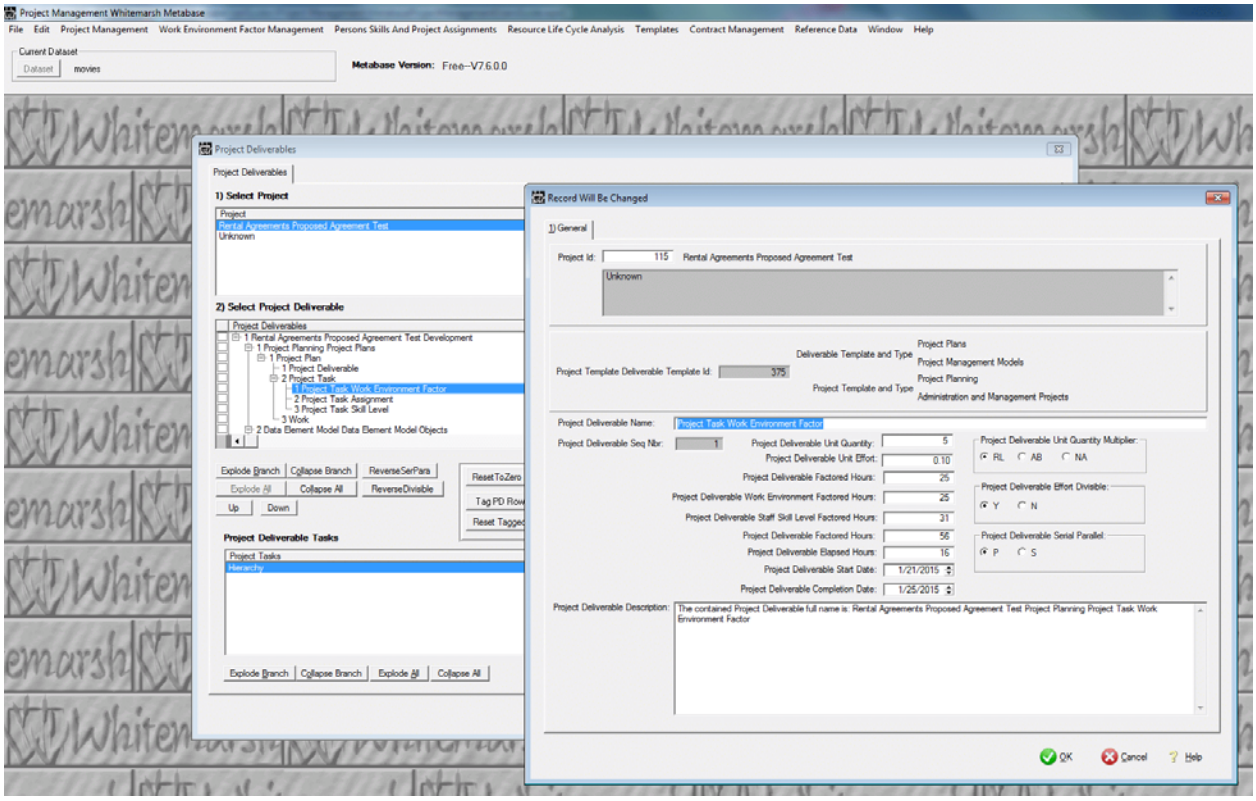

Figure 19. Project Deliverable Update.

level subordinate project deliverables, Table and Column, and if the quantity for Table was 200 and the quantity for Column was 15, then quantities estimated would be 200 for table and only 15 for column. But, if Column was established as a subordinate Project Deliverable for table, which it certainly should be, the quantity for which resources would be estimated would be 200 x 15 or 300.

5.3.8.1.4 Relative or Absolute Multiplier

The Relative or Absolute Project Deliverable characteristic is quite important as illustrated in the example in the previous section. The values are:

- AB – which means absolute
- RL – which means relative
- NA – which means not-applicable

If the value is AB, the quantity of the Project Deliverable remains as is regardless of the Project Deliverable Hierarchy within which the Project Deliverable resides.
If the value is RL, the quantity of the Project Deliverable is multiplied by the quantity value contained in the Project Deliverable of the Project Deliverable of its immediate ancestor.

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If the value is NA, the quantity of the Project Deliverable is unaffected by the quantity value of its immediate ancestor.

Figure 18 also has the following other buttons:

- Reset to Zero all Project Deliverable Unit Efforts
- Reset Tagged PD (Project Deliverable) to Deliverable Template Values

The first sets the presumed effort for accomplishing a project deliverable back to zero. The second restores the values that currently exist in the Project Deliverable Templates.

Figure 19 also shows a number of fields that are automatically calculated. These are:

- Project Deliverable Factored Hours
- Project Deliverable Work Environment Factored Hours
- Project Deliverable Staff Skill Level Factored Hours
- Project Deliverable Factored Hours
- Project Deliverable Elapsed Hours
- Project Deliverable Start Date
- Project Deliverable Completion Date

These fields are all computed by the programmed processes that are performed by Project Resources Generation screen described in Section 5.3.5

5.3.8.2 Project Deliverable Assignments

The Project Deliverables Assignment process, shown in Figure 20, accomplishes the assignment of Project Template - Deliverable Templates to a selected project.

Select and tag a Project on the left side of the screen. On the right side, select a project template type, then a project template, and finally, select and tag one or more of the Project-Template Deliverable-Templates. After tagging, press the Build button.

Once the Project Deliverables are created and shown on the bottom of Figure 20, buttons enable the reversal of the default Serial/Parallel characteristic and the reversal of the divisibleness of a Project Deliverable.

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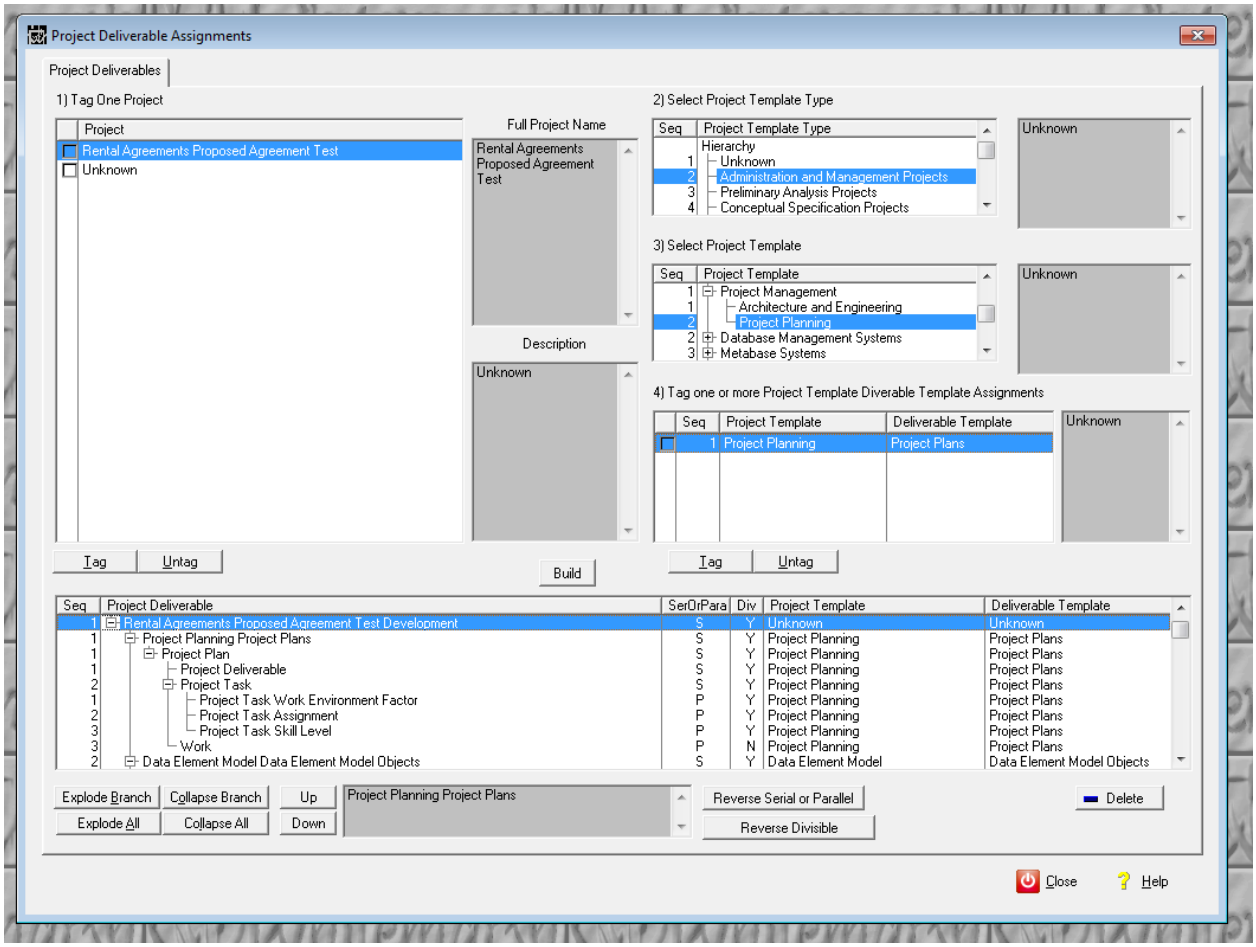

Figure 20. Project Deliverables Assignment.

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5.3.8.3 Project Deliverables Person Skill Level Assignment

Projects are not accomplished either by all turkeys or all eagles. Not only that, just because a person is an eagle in one skill area doesn't mean that they are eagles in all skill areas. Readers of this user guide are exceptions to this admonition, of course.

The creation of Work Plan Person Skill Assignments is illustrated in Figure 21. But before this is possible, Skills, Skill Levels, and the creation of skill level velocity multipliers must all come first. These are handled in the following sections:

- 5.9.5 Skill
- 5.9.6 Skill Level Types
- 5.9.7 Skill Level Assignments
- 5.5.1 Persons
- 5.5.3 Person Skill Level Assignments

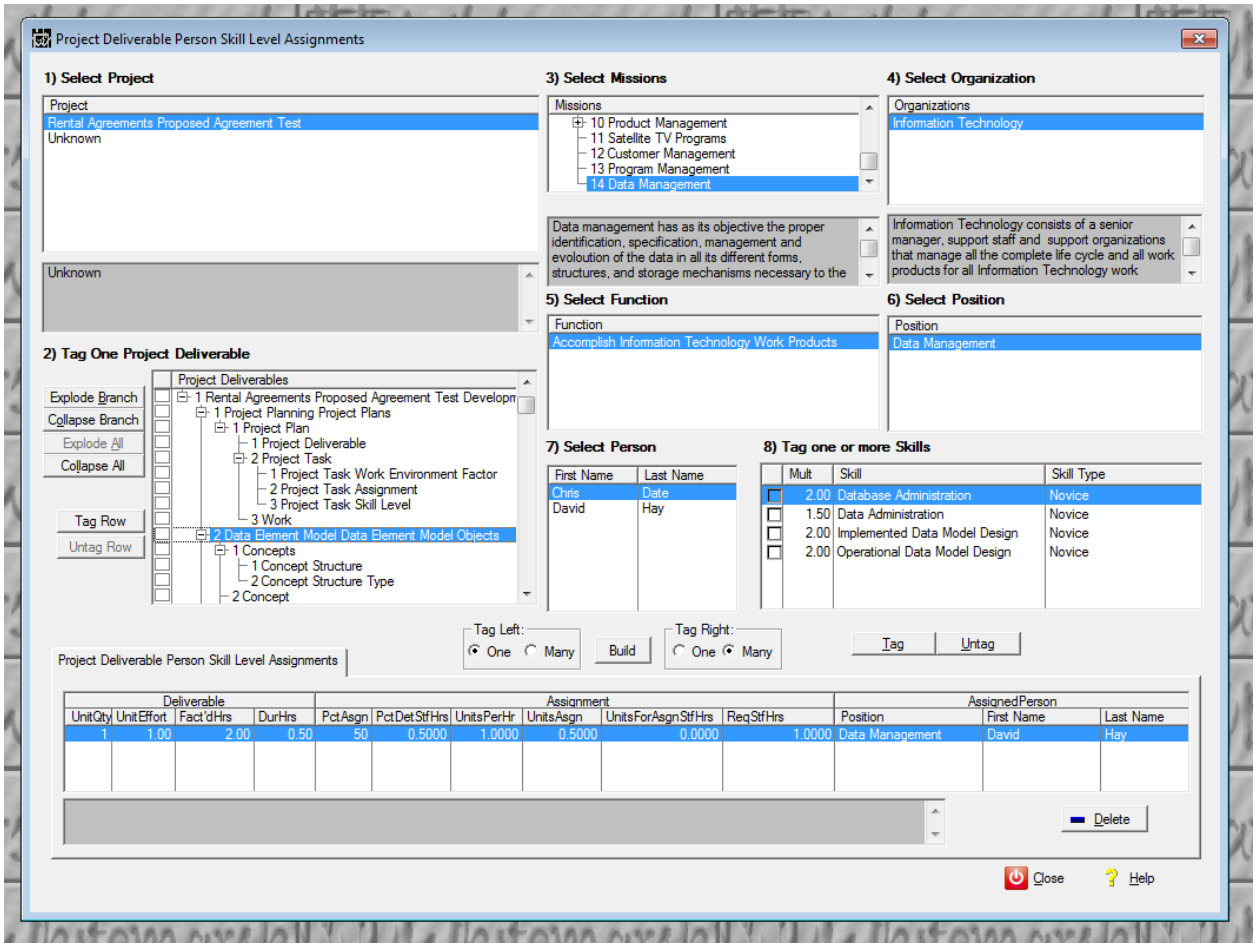

Figure 21. Project Deliverable Person Skill Level Assignment.

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Once these five sets of data are entered, the creation of Work Plan Person Skill Assignments is relatively easy.

The left side of Figure 21 enables the selection of the Project within which the Work Plan Person Skill Assignments are made to the individual Project Deliverables. Select and tag a specific Project Deliverable.

This side of the screen show a set of radio buttons, “One” and “Many.” If “One” is selected, then there can be “Many” Person Skill assignments tagged. Alternatively, if “Many” is selected then only “One” Person Skill assignment can be tagged.

On the right side of the screen, the process of selecting a person starts with selecting an enterprise’s Mission, then Organization, then Function, and then Position. At that point, the set of Persons performing a Function within an Organization for a particular Mission are shown.

Select a specific person, and from the list of skills associated with that person, tag the one that is relevant. Shown in that browse are the skill level multipliers associated for that person performing that skill. In this specific example, Chris Date has the multiplier, 2.0 for the skill, Database Administration. What that means is that the unit effort amount (in staff hours) for one unit of that deliverable is multiplied by 2.0 because Chris Date has been assessed as a novice in the particular skill, Database Administration.

Multiple persons can be allocated to accomplish the identified deliverable. If each person has different skill level multipliers, the Whitemarsh Project Management process will distribute the quantity of work across the persons such that the work required to accomplish the project deliverable will end about the same time. The lower-multiplier value person will do more of the work than the higher-multiplier value assigned person. While some might not think that is “fair,” it is however a reason to pay that higher-skilled person more because the do more in the same quantity of time.

5.3.8.4 Project Deliverable Work Environment Factor Assignments

The second factor that affects the velocity of project deliverable accomplishment is Work Environment Factors. This is shown in Figure 22. These represent things like tools, tool sophistication, availability of reviews, quality of reviewers, and the like.

As with Work Plan Person Skill Assignments, the Work Plan Work-Environment Factor Assignments can only be made after these factors have been established. The user guide sections applicable to that are:

- 5.4.1 Work Environment Factor Types
- 5.4.2 Work Environment Factors
- 5.4.3 Work Environment Factor Multipliers

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- 5.4.4 Work Environment Factor Multiplier Types
- 5.4.5 Work Environment Factor Multiplier Assignments

Once these five sets of data are entered, the creation of Work Plan Work-Environment Factor Assignments is relatively easy.

On the left side of the screen, the project is selected. Once selected, the individual Project Deliverables are shown. Select the appropriate one and press the Tag button.

This side of the screen also shows a set of radio buttons, “One” and “Many.” If “One” is selected, then there can be “Many” Person Skill assignments tagged. Alternatively, if “Many” is selected then only “One” Person Skill assignment can be tagged.

On the right side of the screen, a Work Environment Factor Type is selected. Then select a Work Environment Factor. Finally, tag a specific Work Environment Factor Multiplier.

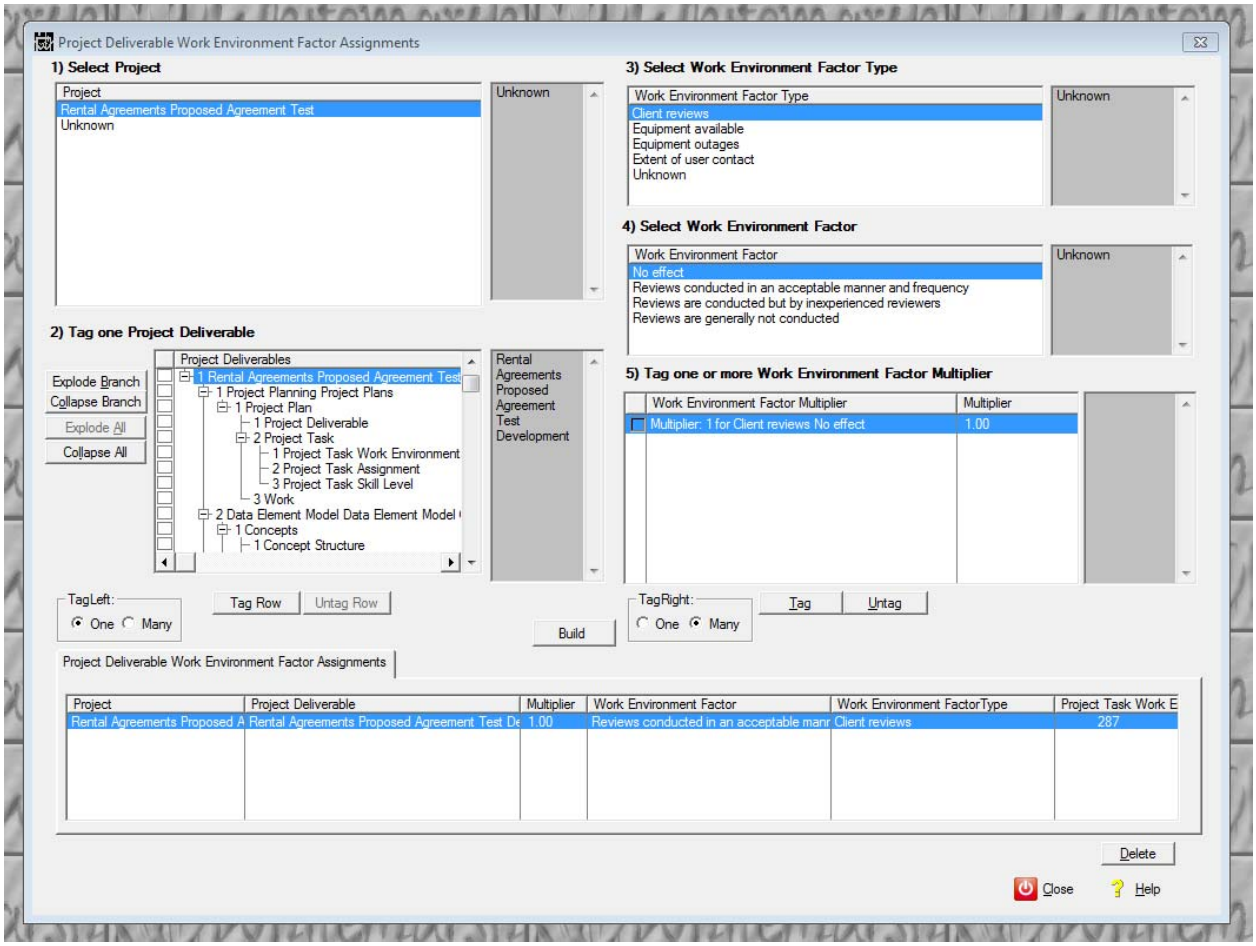

Figure 22. Project Deliverable Work Environment Factor Assignment.

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Once all the Person Skill assignments and Work Environment Factors are assigned, and given that there are no modifications to Project Deliverable characteristics of quantities, divisibleness, and serial/parallel, the overall project resources are ready to be generated.

5.3.9 Project Task Management

The Project Task management process enables the modification of a Project Task that has been previously generated through prior processes. Figure 23 shows the menu structure to access Project Tasks.

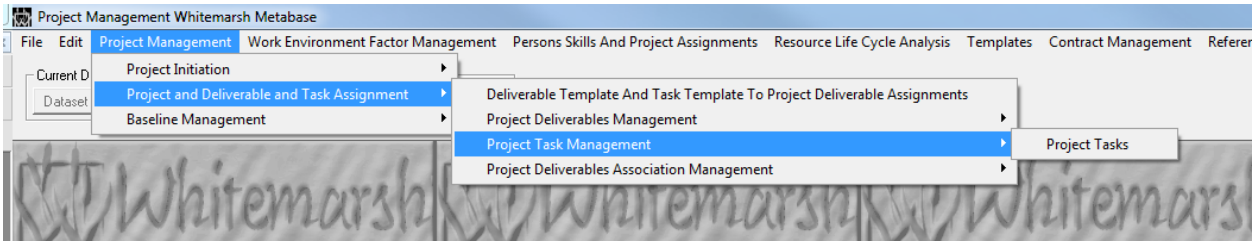

Figure 23. Project Task Management menu.

5.3.9.1 Project Tasks

Figure 24, Project Tasks shows the set of Project Tasks associated with a Project Deliverable for a selected project. The objective of a collection of Project Tasks is to provide a best practice set of steps to accomplish the Project Deliverable.

Regarding Project Tasks, in the Whitemarsh approach to project management, Project Tasks are not tracked, estimated, have staff assigned to them, or even marked as completed. Rather, Project Tasks are just "Hints from Heloise." That is, suggestions on what ought to be done in support of completing a Project Deliverable. With Whitemarsh Project Management, what is tracked are the hours needed to complete a Project Deliverable, the start and end dates, the mapping of a completed deliverable to the actual deliverable, and finally, a review and evaluation of the completed deliverable by an independent assessor.

Analogously, studying for a test does not result in an "A." What results in an "A" is the taking of the test and an independent assessment that all or an appropriate quantity of questions have been answered correctly. Students do not get the "A" for being a person who studies. That's a Task. Rather the "A" is awarded only after the Test is taken and scored. That's the Deliverable.

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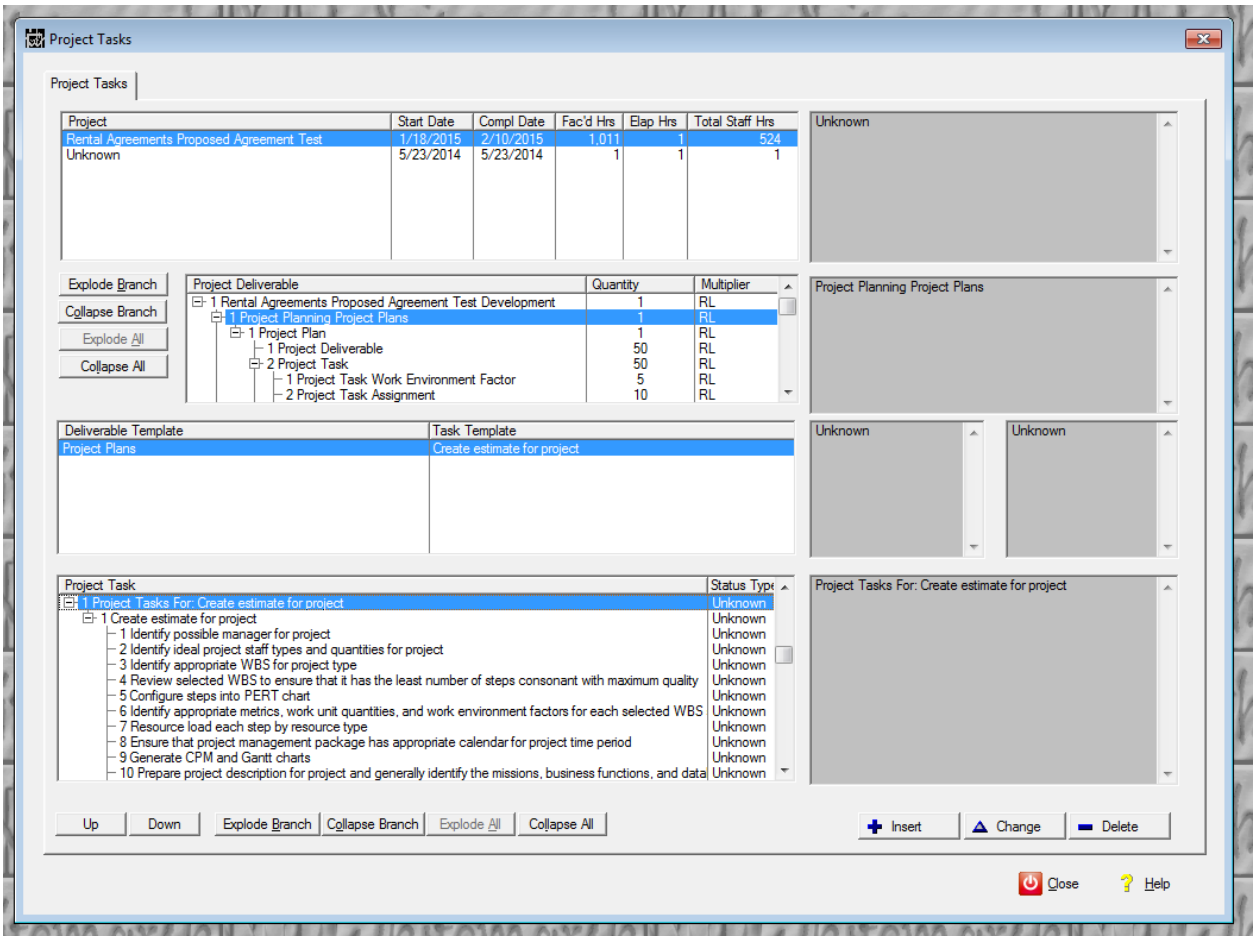

Figure 24. Project Tasks.

Figure 25 presents the insert or update screen for Project Tasks. What can be changed is the project task's name and description. The name that initially exists is automatically generated from prior processes involving Deliverable-Template Task-Templates.

If the project task name and description is changed in Figure 25, that change is local only. The task's name remains unchanged in the Task Template source table. Because the changes are "local only," projects can be compared across the business unit, functional area, or the entire enterprise.

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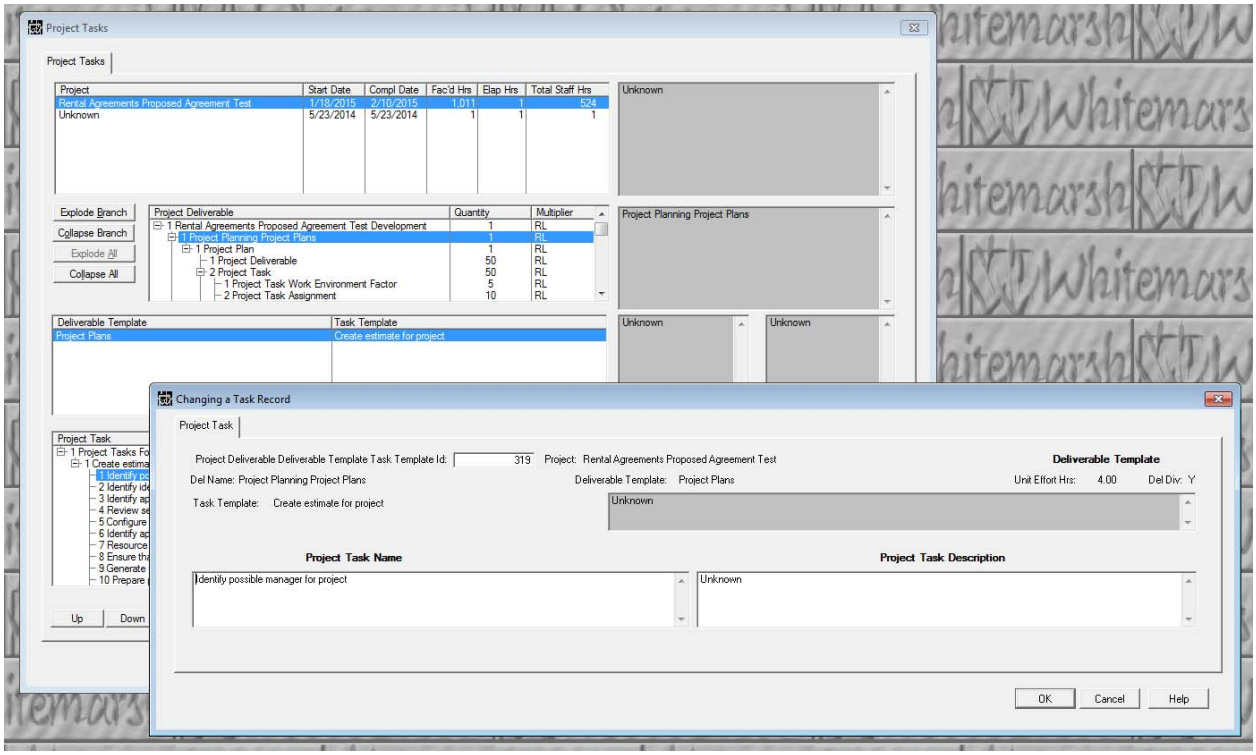

Figure 25. Project Task update.

5.3.10 Project Deliverables Association Management

There's an obvious difference between the naming, scheduling, and identifying a project deliverable specification within project's plan and project's execution management and the actual project deliverable. Project deliverables, such as documents, database designs, and user acceptance test steps are fundamentally different--in kind--from the names of those project deliverables.

The Project Deliverables Associations are grouped into four types, identified in Figure 26, are:

- Data Model related
- Architecture related
- Business Information System related

Not every possible project deliverable that is possible to create within the Whitemarsh Metabase systems has been "pointed to" from within Whitemarsh project management. For example, within the Specified Data Model contains three main tables: Subject, Entity, Attributes. There are also Keys. What the Project Deliverables Association process allows is the association of the "doing" of a specified data model and the actual set of Subjects created. Once identified and

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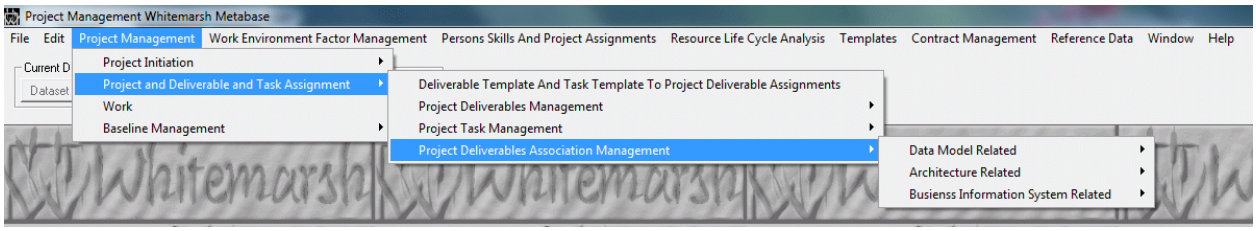

Figure 26. Project Deliverables Association Management Types.

associated, the Metabase System user is able to access the actual Subject and its contained entities, attributes and created Keys from within the Specified Data Model module.

There are 14 different Project Deliverables Association Management processes. Each enables the creation of a rationale for the assignment. Figure 27 shows the typical Project Deliverables Association.

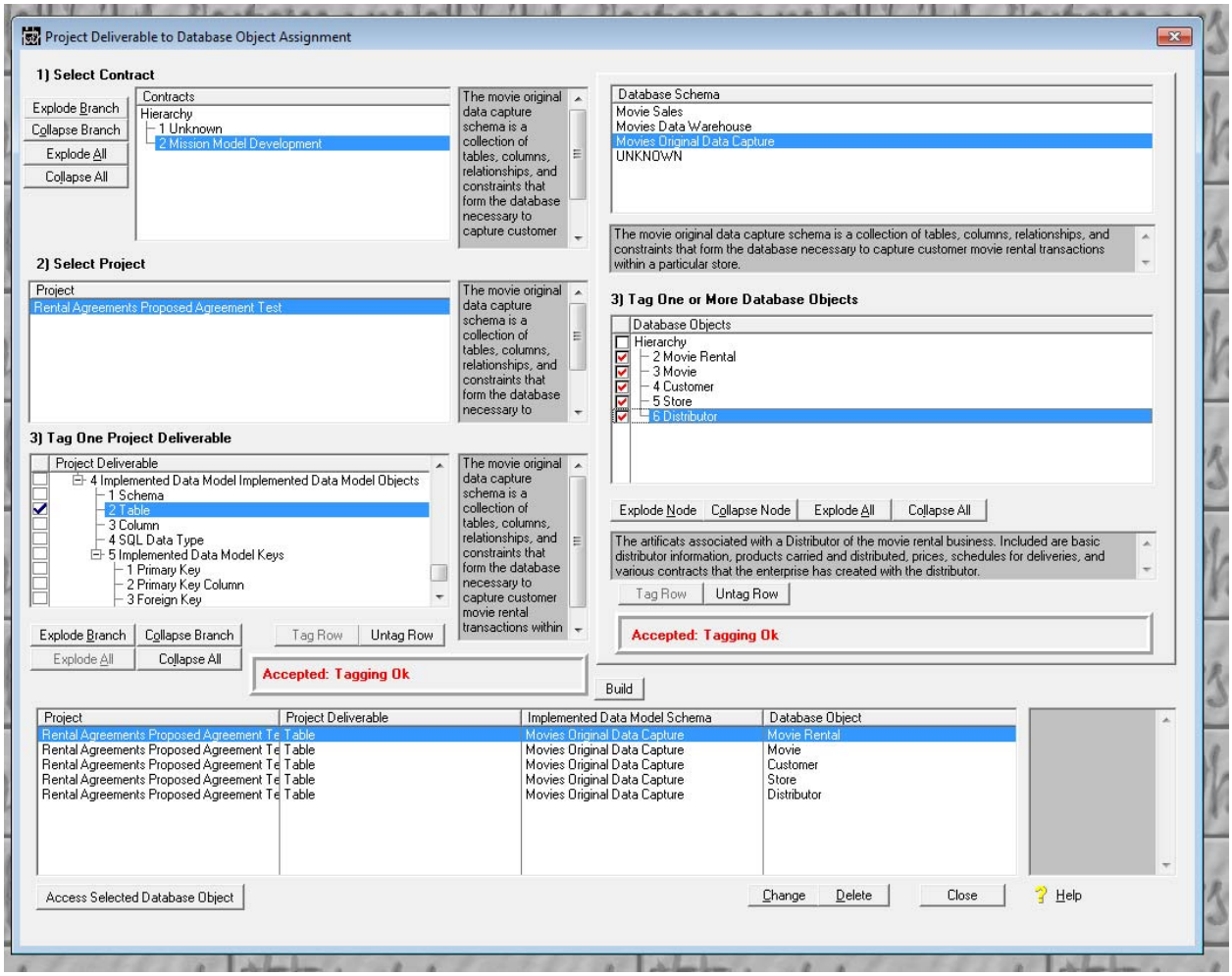

Figure 27. Typical Project Deliverables Association.

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In this case it is for Database Objects. These database objects would have to been previously created during the accomplishment of a project. In this particular example, the left side browse has the Project Deliverable, Tables, tagged. That would be appropriate for the association of as set of specific tables. The tables are shown in the browse on the right side browse. with one or more database object tables, all within a single Database Schema, Original Data Capture. By pressing the Build button, the relevant associations are created and are shown in the bottom browse. If one association is there that should not be, select that association and press the Delete button. To create a Rational for each different association, select the association and press the Change button. Figure 28 shows the data entry screen for that particular association's Rationale.

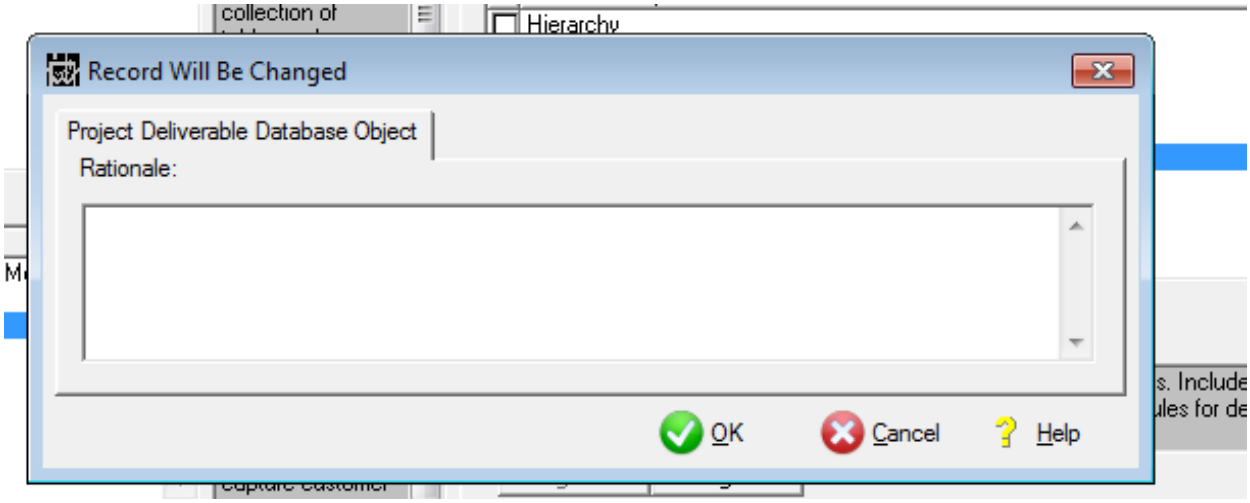

Figure 28. Typical Project Deliverable Association Rationale.

At the bottom left of each Figure 27 typical screen is an "Access" button that, when pressed, takes the project manager user directly to the Project Deliverable associated item. In this case, it would be to the selected Movie Rental. Figure 29 shows a typical screen that contains data from the specific Project Deliverable Instance.

For this specific database object project deliverable, what is shown are the tables that comprise the specification of the database object project deliverable, and for the database object table, Movie Rental Record, its contained columns are shown in the lower browse.

Shown in Figure 29 is a View button on browse that shows the specific Project Deliverable. By pressing that button, Figure 30, shows the actual data that is contained for that specific project deliverable.

This pattern of Project Deliverable Assignment, access, directly showing of the actual project Deliverable, and viewing the actual data for that project deliverable is the same throughout all the different associated Project Deliverables in all the subsections of Section 5.3.10. Because the process is identical, only the key text and the figures are shown for each associated project deliverable.

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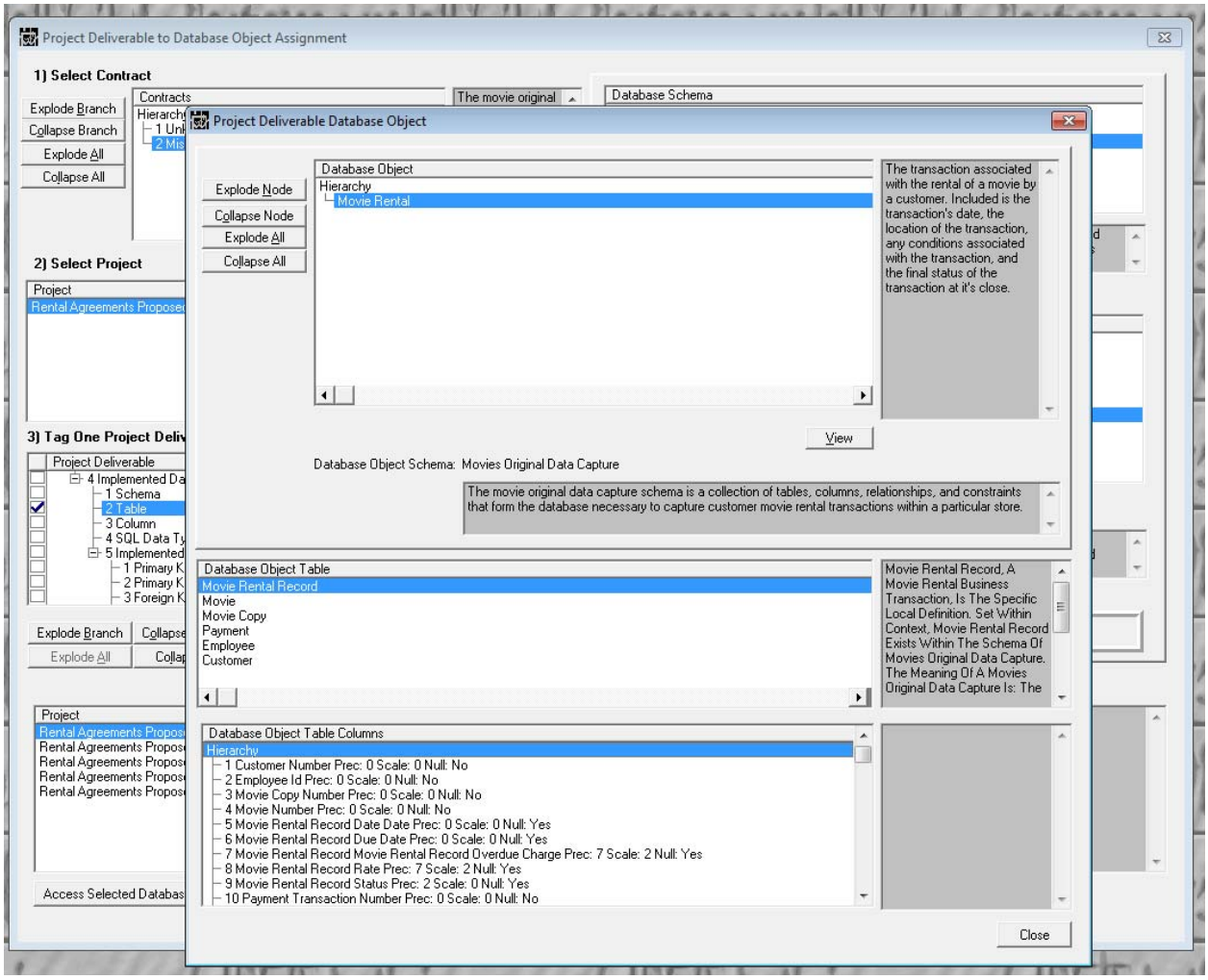

Figure 29. Typical Project Deliverable

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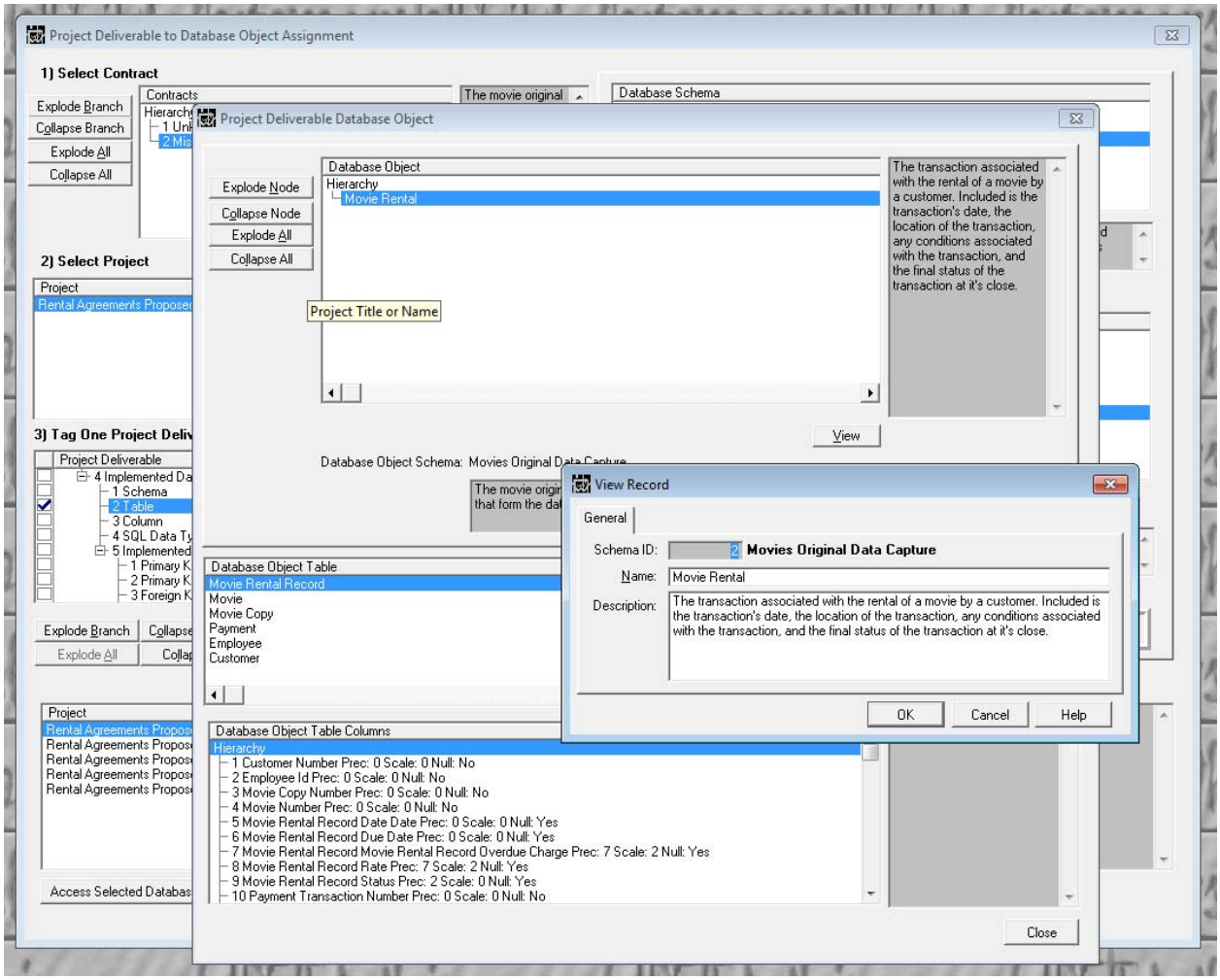

Figure 30. Typical Project Deliverable Actual Data.

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5.3.10.1 Data Model Related

There are seven data model Project Deliverable associations, as shown in Figure 28 are directly related to data models. These are:

- Project Deliverable Data Integrity Rules
- Project Deliverable Database Objects
- Project Deliverable Data Elements
- Project Deliverable Specified Data Model Subjects
- Project Deliverable Implemented Data Model Schemas
- Project Deliverable Operational Data Model DBMS Schemas
- Project Deliverable DBMS Columns

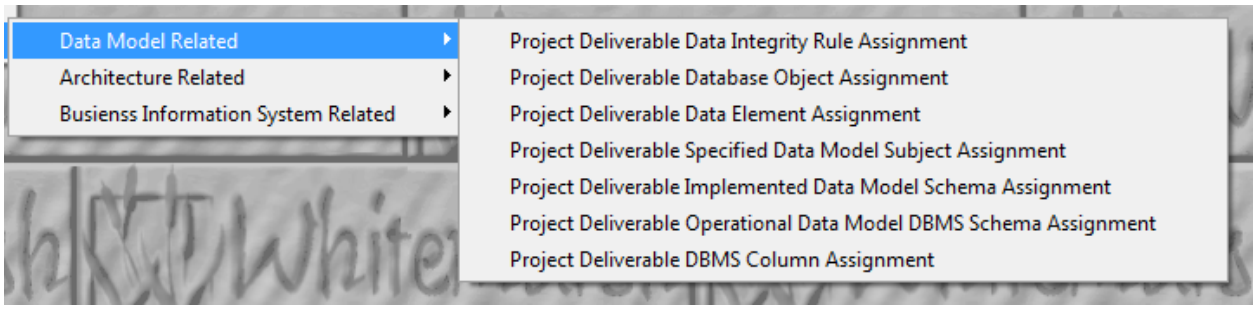

Figure 31. Data Model Related Project Deliverable Associations.

5.3.10.1.1 Project Deliverable Data Integrity Rule Assignment

The Project Deliverable Data Integrity Rule Assignment process, shown in Figure 29 enables the association of a Project Deliverables and one or more Data Integrity Rules. The browse on the left enables the identification of the specifically named Project Deliverable's data integrity rule. Select the Contract within which the project exist. Select the specific project, and finally, select and tag the Project Deliverable for the Data Integrity Rule.

The browse on the right enables the selection of Data Integrity Rule Structure Type and the selection and tagging of specific Data Integrity Rules.

Once all the appropriate Data Integrity rules have been tagged, press the Build button. The associations are shown in the browse at the bottom of Figure 29. To create a rationale for each association, press the Change button. An update screen similar to Figure 27 is presented. Enter the rationalization and press the OK button.

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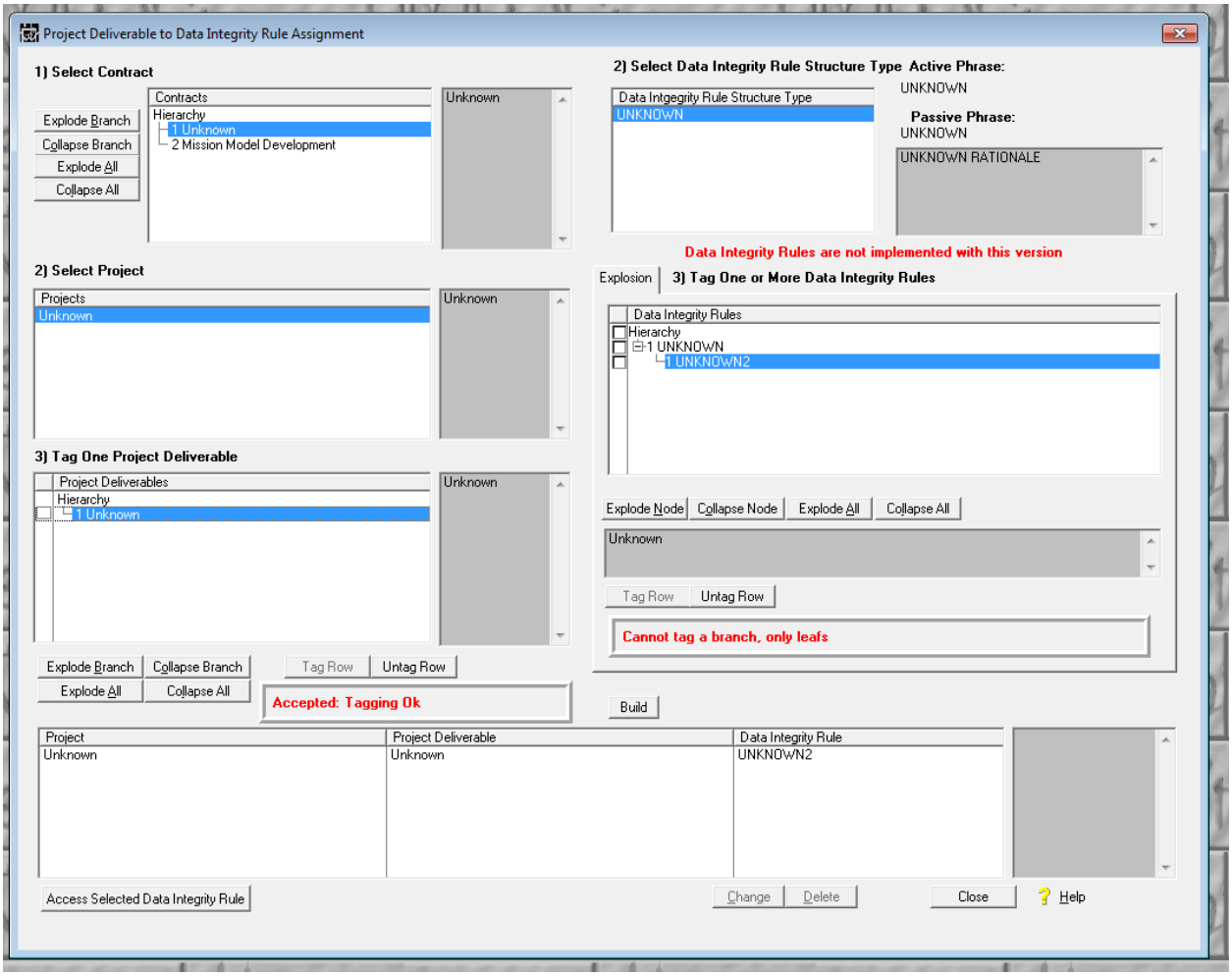

Figure 32. Project Deliverables Association, Data Integrity Rule.

Figures 33 shows that the Data Integrity Module is not yet released.

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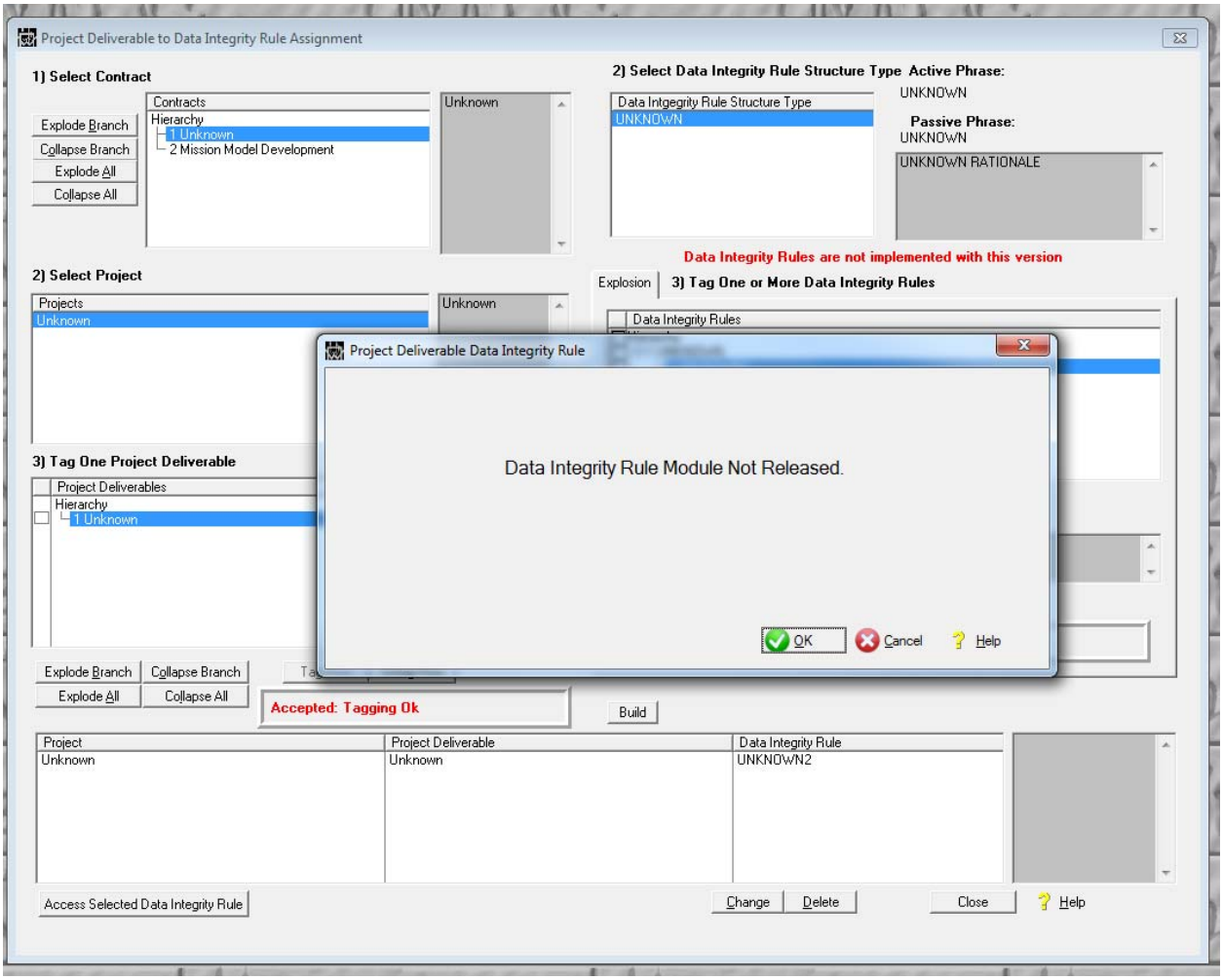

Figure 33. Project Deliverables Association, Data Integrity Rules are Not Released.

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5.3.10.1.2 Project Deliverable Database Object Assignment

The Project Deliverable Database Object Assignment process, shown in Figure 34 enables the association of a Project Deliverables and a Database Objects. The browse on the left enables the selection the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Database Object.

The browse on the right enables the selection of Database Schema and the selection and tagging of specific Database Objects..

Once all the appropriate Database Objects have been tagged, press the Build button. The associations are shown in the browse at the bottom of Figure 34. To create a rationale for each association, press the Change button.

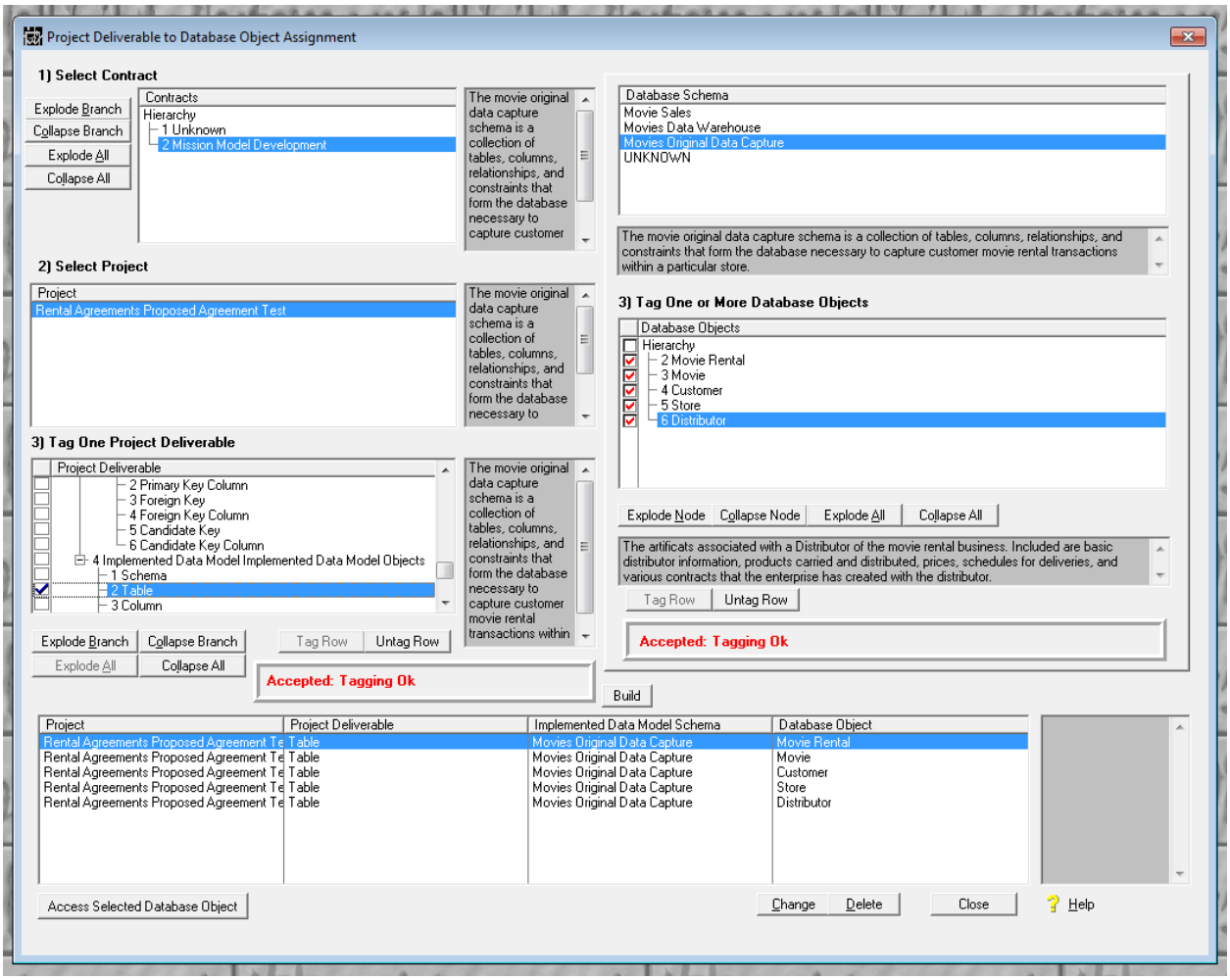

Figure 34. Project Deliverables Association, Database Object.

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Figure 35, 36, and 37 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

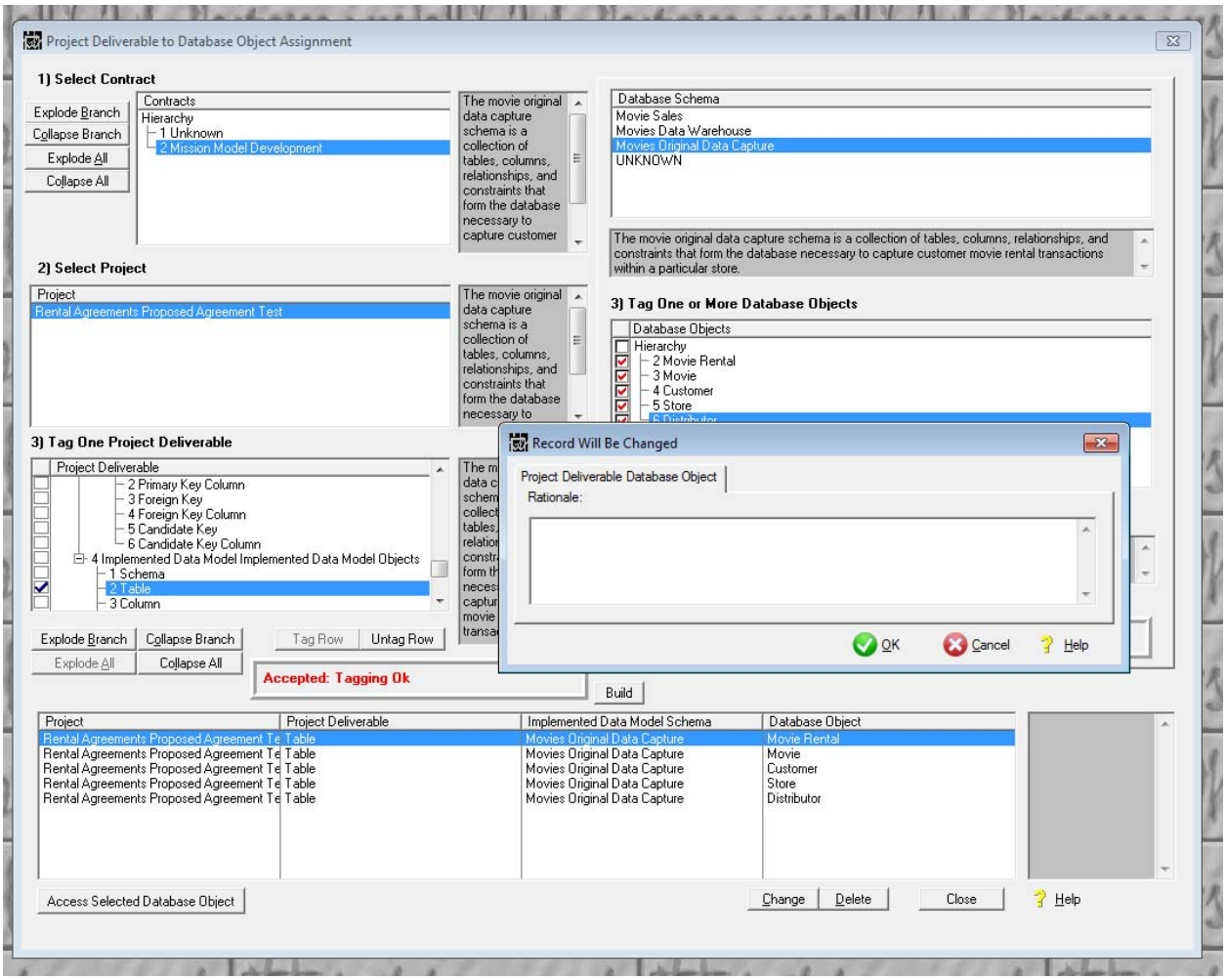

Figure 35. Project Deliverable Association Rationale, Database Object.

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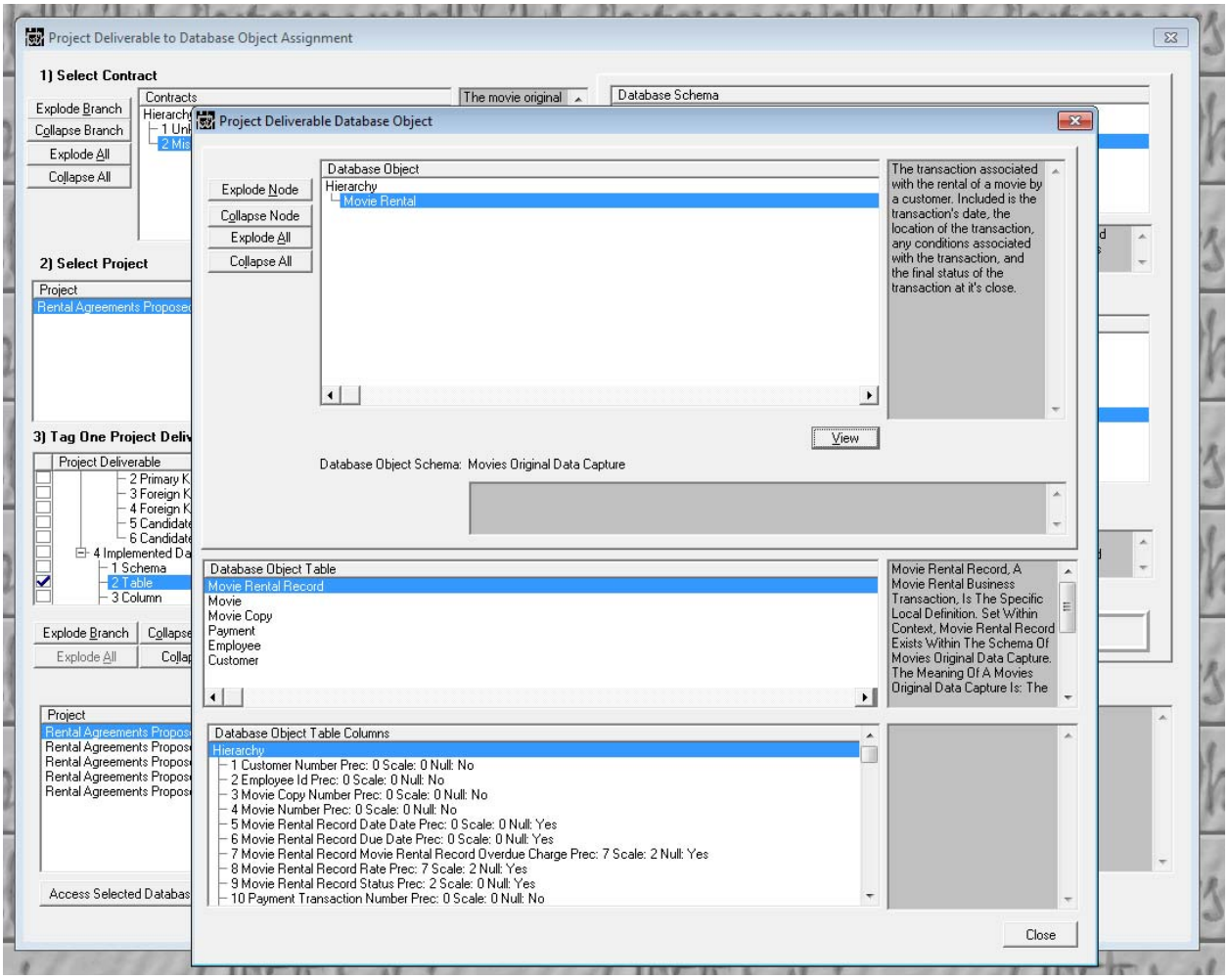

Figure 36. Project Deliverable, Database Object.

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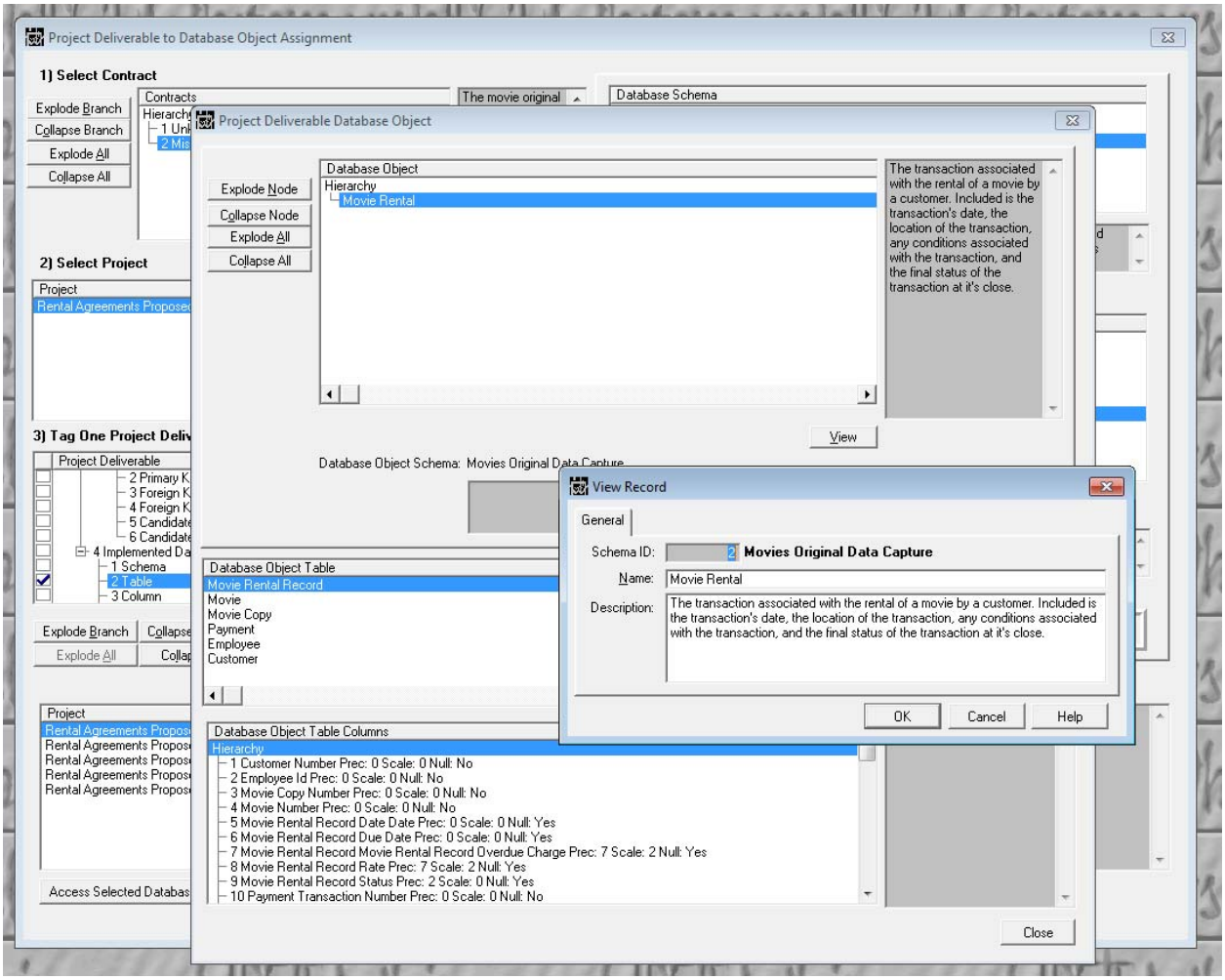

Figure 37. Project Deliverable Actual Data, Database Object.

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5.3.10.1.3 Project Deliverable Data Element Assignment

The Project Deliverable Data Element Assignment process, shown in Figure 38 enables the association of a Project Deliverables and one or more Data Elements. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Data Element.

The browse on the right enables the selection of Data Element Concept and the selection and tagging of specific Data Elements.

Once all the appropriate Data Elements have been tagged, press the Build button. The associations are shown in the browse at the bottom of Figure 38.

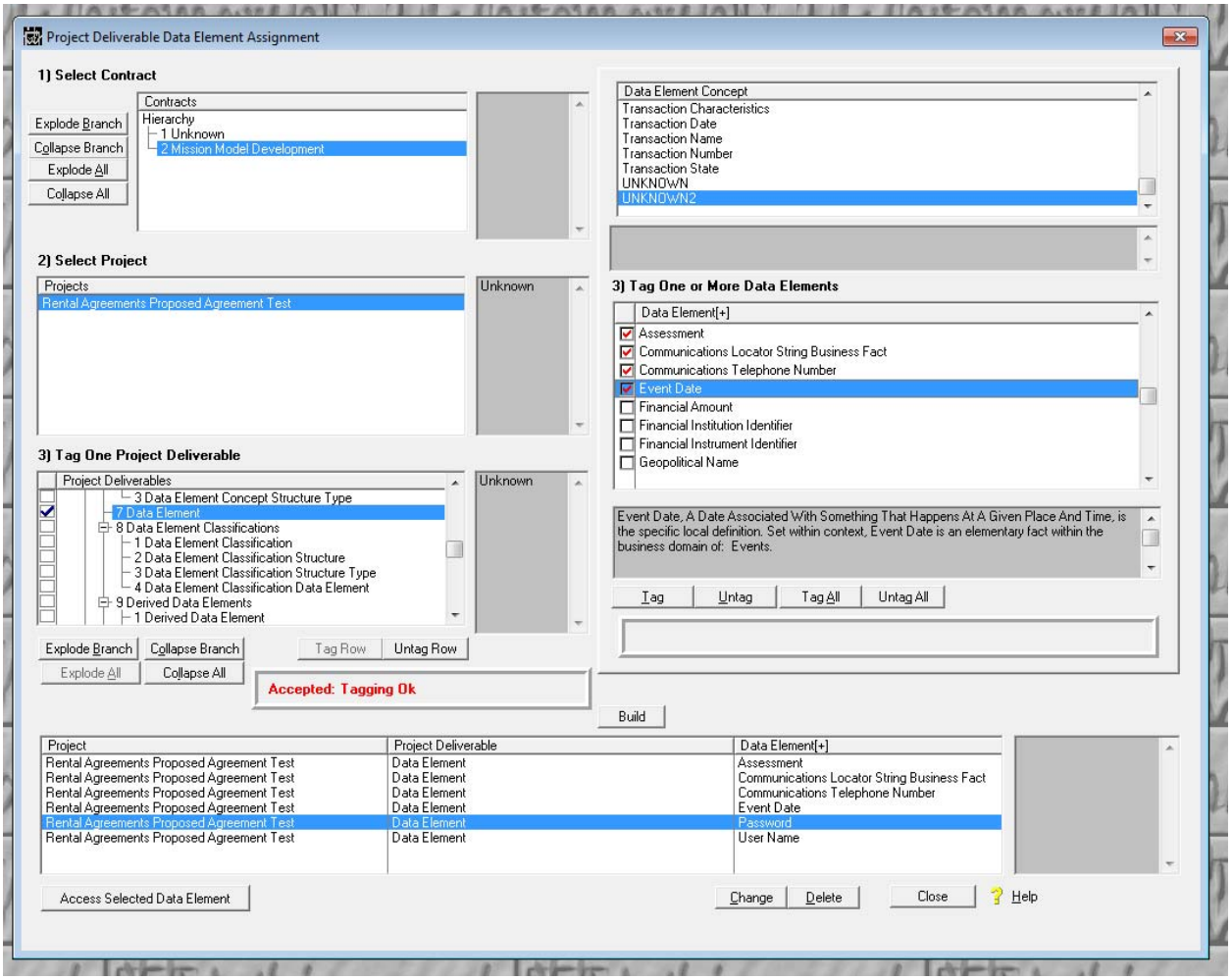

Figure 38. Project Deliverables Association, Data Element.

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Figure 39, 40, and 41 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

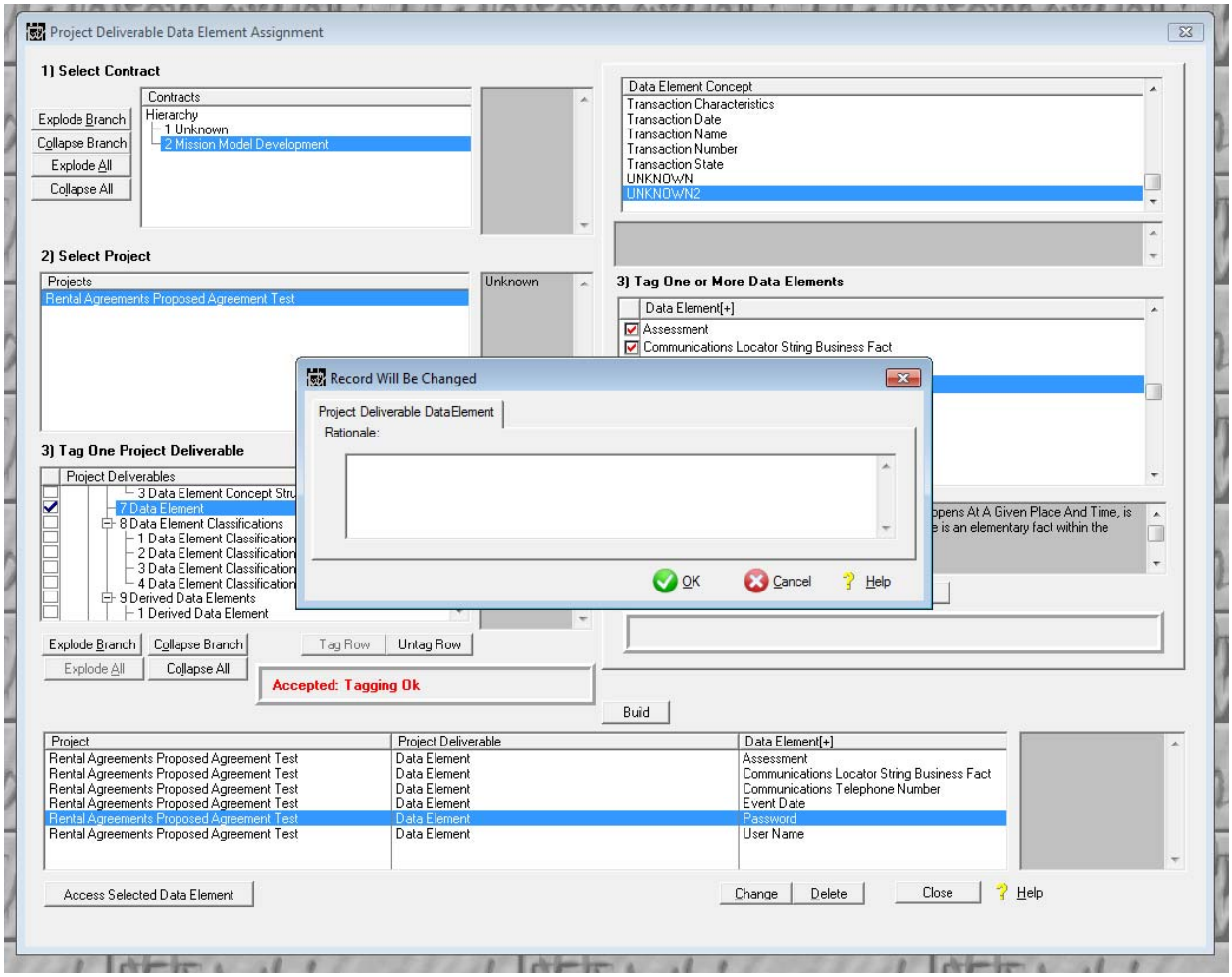

Figure 39. Project Deliverable Association Rationale, Data Element.

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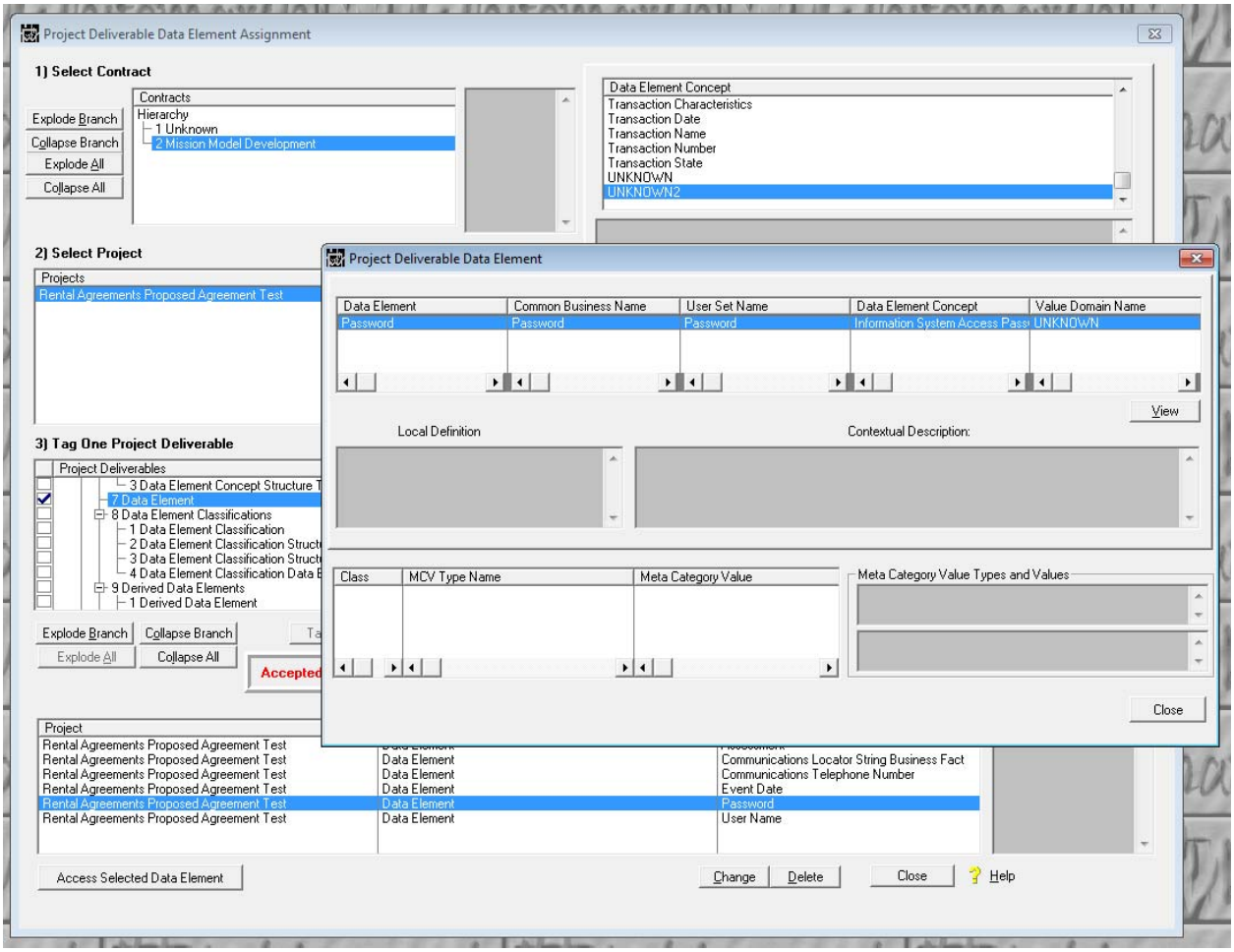

Figure 40. Project Deliverable, Data Element.

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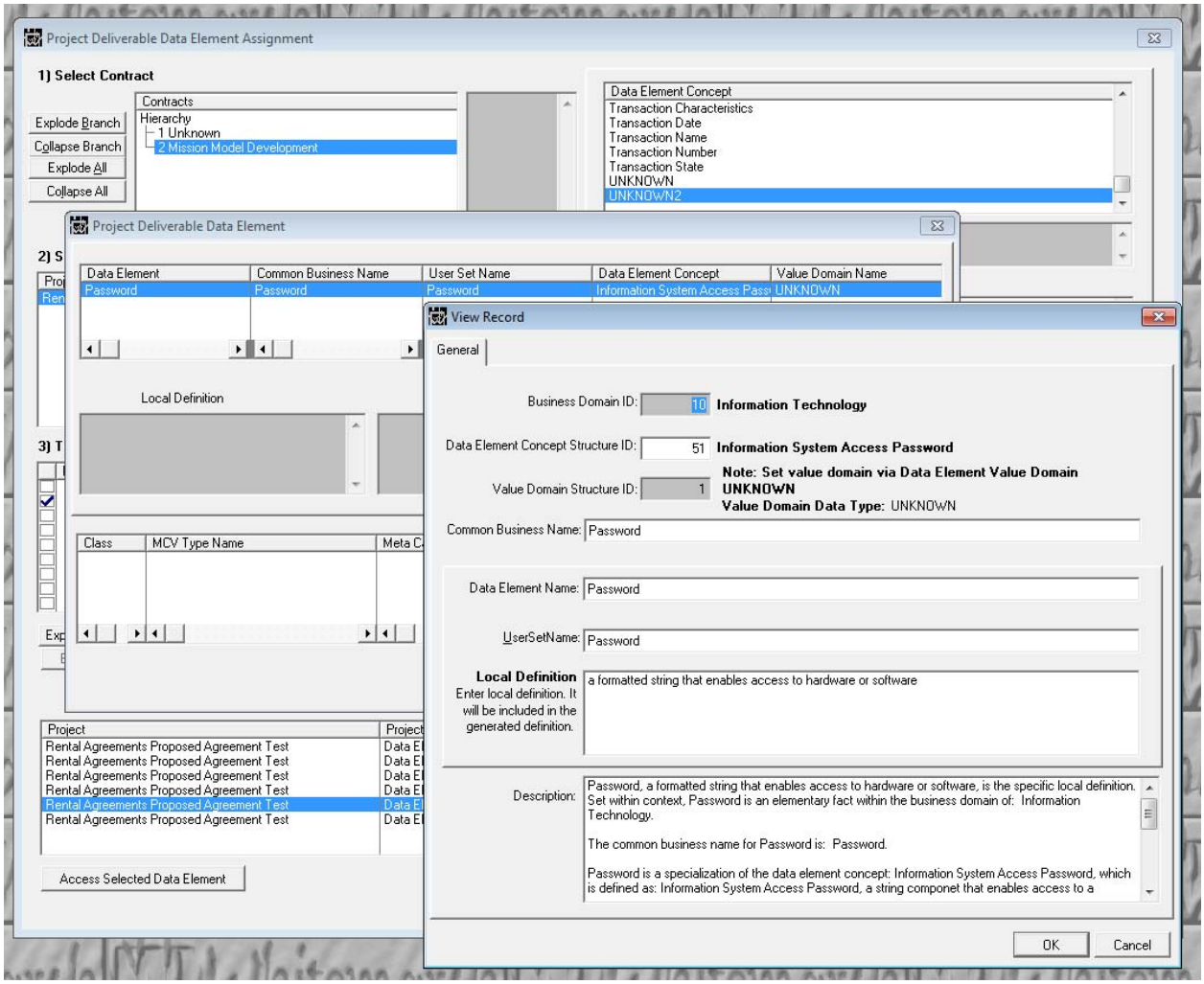

Figure 41. Project Deliverable Actual Data, Data Element.

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5.3.10.1.4 Project Deliverable Specified Data Model Subject Assignment

The Project Deliverable Specified Data Model Subject Assignment process, shown in Figure 42 enables the association of a Project Deliverables and one or more Specified Data Model Subjects. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for Subject.

The browse on the right enables the selection and tagging of one more Subjects. Once the subject is selected, its contained entities and in turn, attributes are displayed.

Once all the appropriate Subjects have been tagged, press the Build button. The associations are shown in the browse at the bottom of Figure 42. To create a rationale for each association, press the Change button.

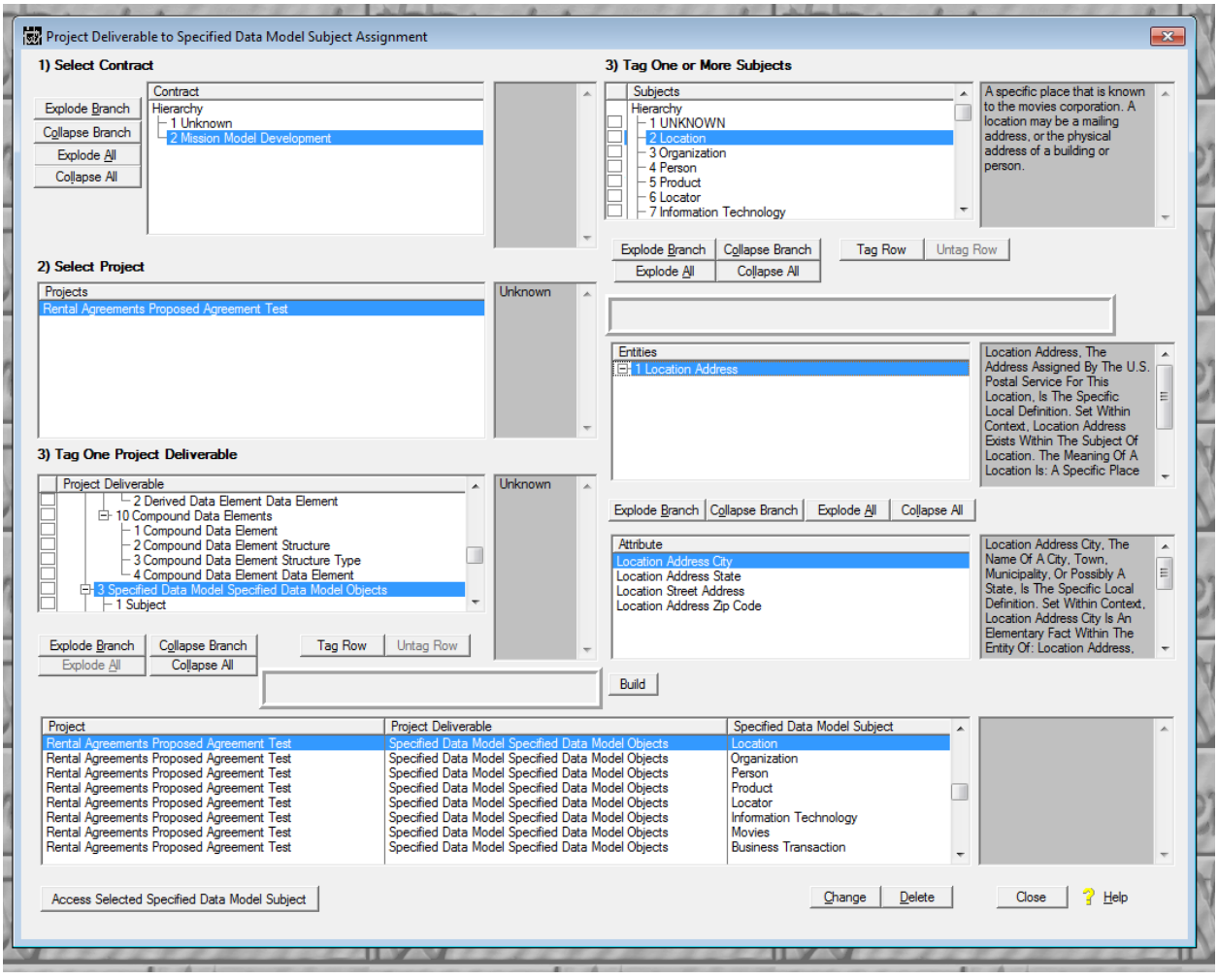

Figure 42. Project Deliverables Association, Specified Data Model Subject.

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Figure 43, 44, and 45 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

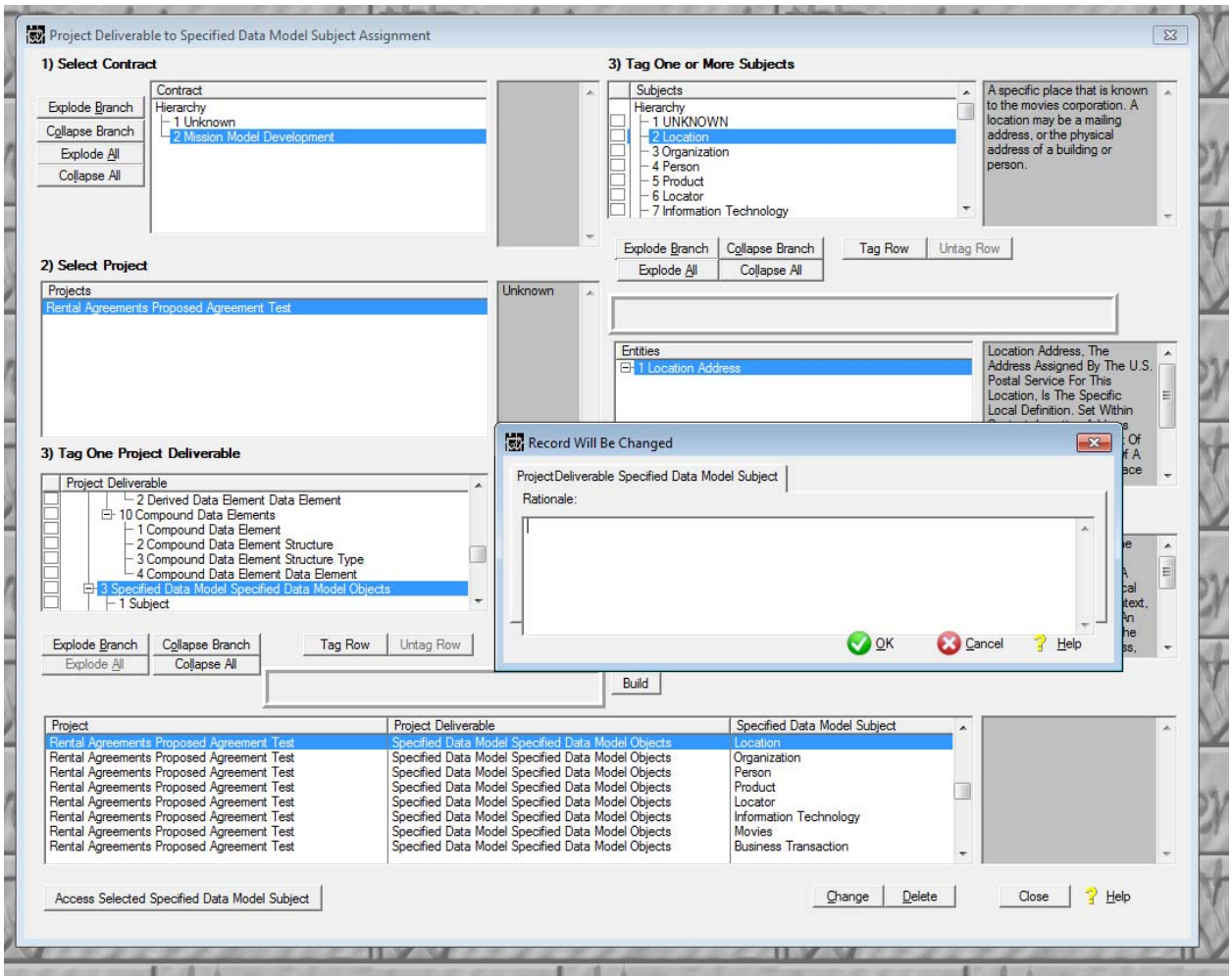

Figure 43. Project Deliverable Association Rationale, Specified Data Model Subject.

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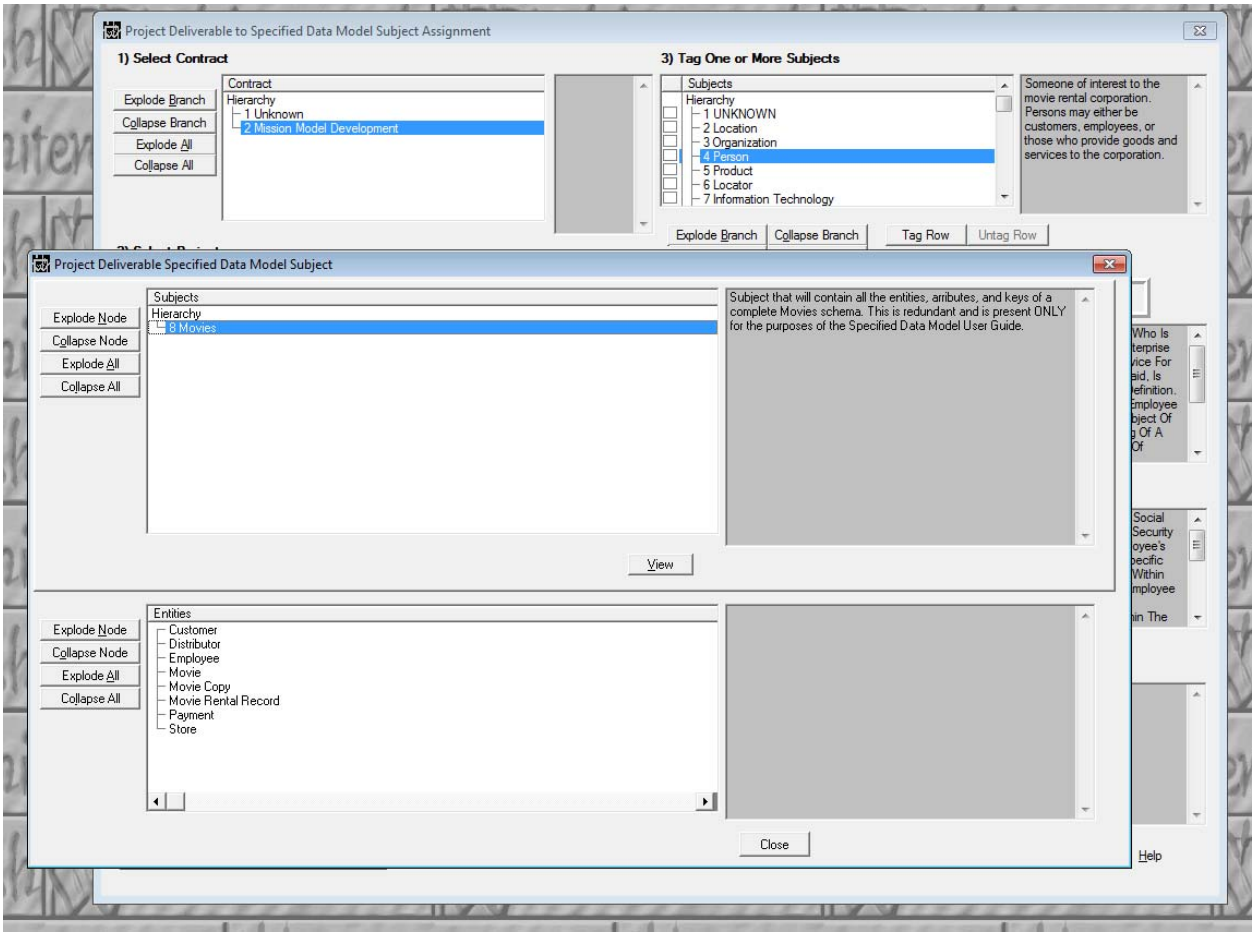

Figure 44. Project Deliverable, Specified Data Model Subject.

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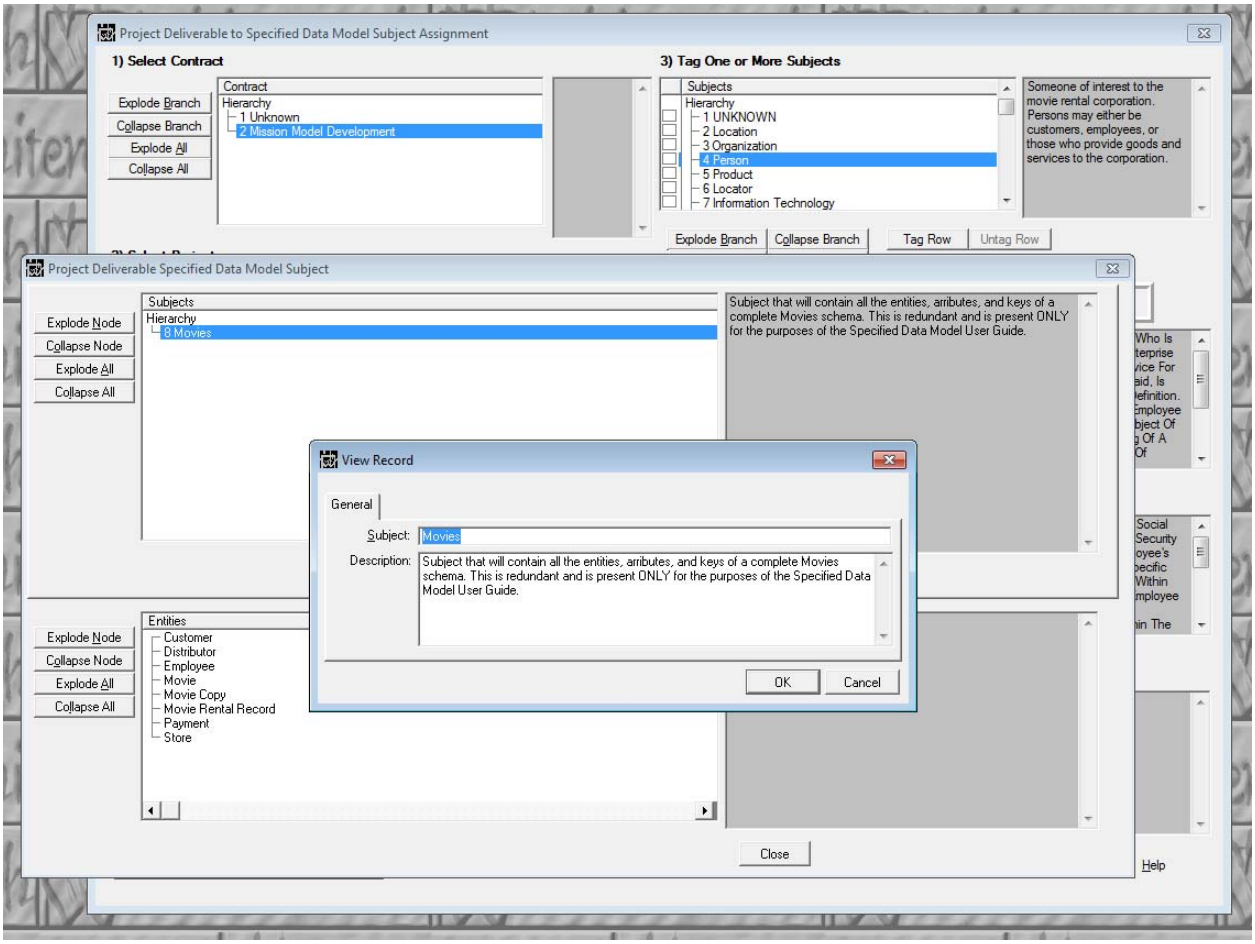

Figure 45. Project Deliverable Actual Data, Specified Data Model Subject.

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5.3.10.1.5 Project Deliverable Implemented Data Model Schema Assignment

The Project Deliverable Implemented Data Model Schema Assignment process, shown in Figure 46 enables the association of a Project Deliverables and one or more Implemented Data Model Schemas. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Implemented Data Model Schemas.

The browse on the right enables the selection and tagging of one or more Implemented Data Model Schemas. Once the schema elected, its contained tables, and in turn, columns are displayed.

Once all the appropriate Operational Data Model DBMS schemas have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 46. To create a rationale for each association, press the Change button.

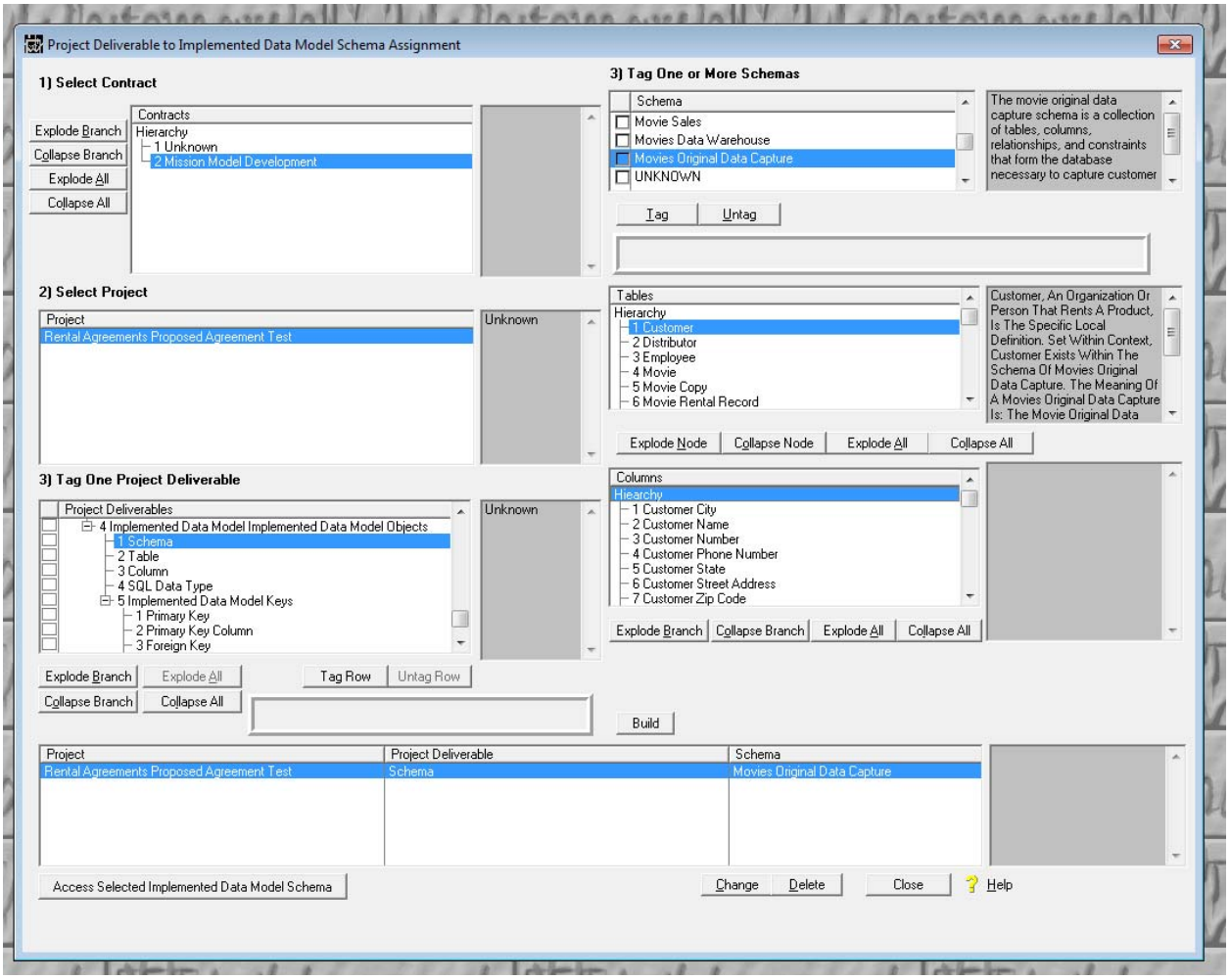

Figure 46. Project Deliverables Association, Implemented Data Model Schema.

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Figure 47, 48, and 49 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

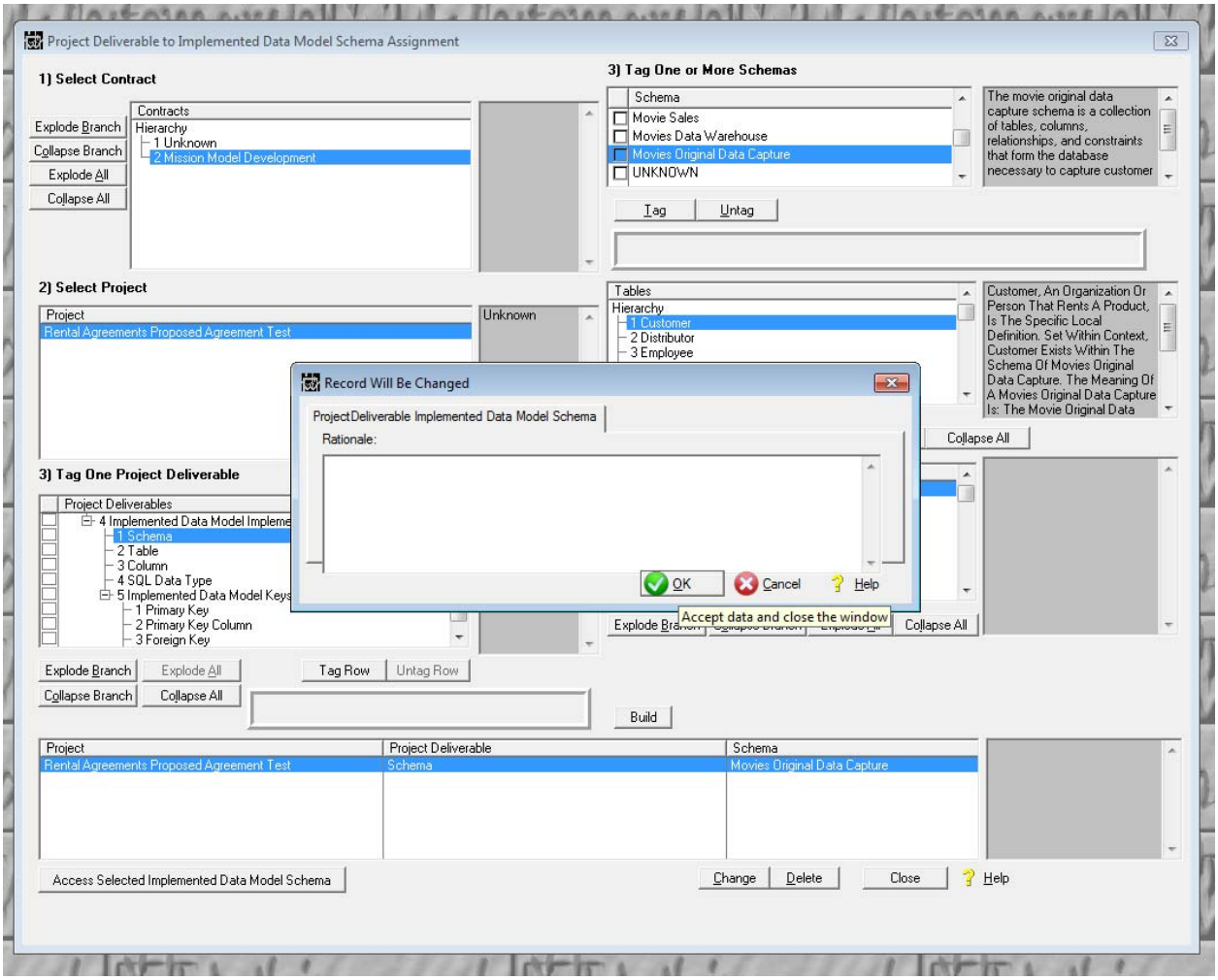

Figure 47. Project Deliverable Association Rationale, Implemented Data Model Schema.

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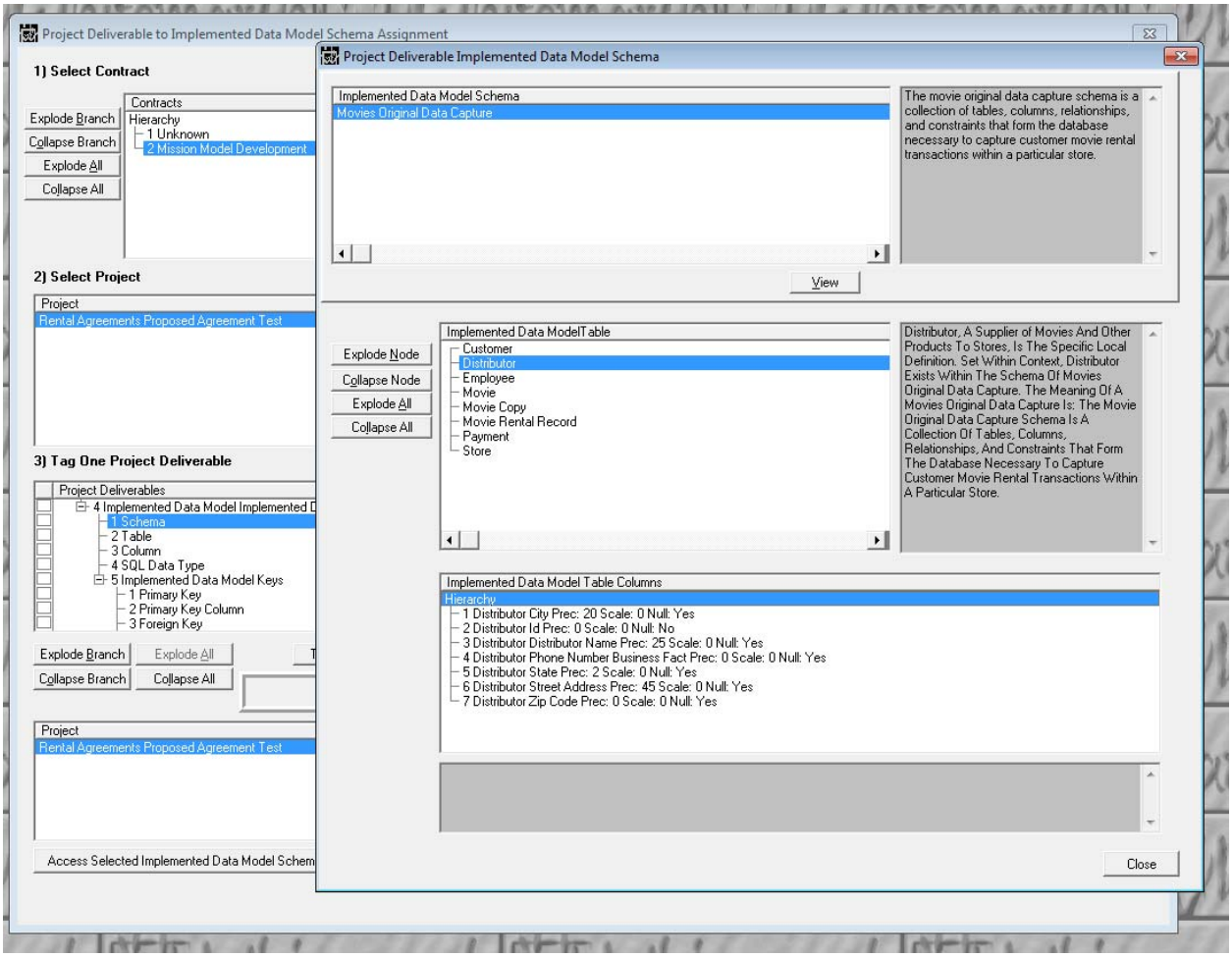

Figure 48. Project Deliverable, Implemented Data Model Schema.

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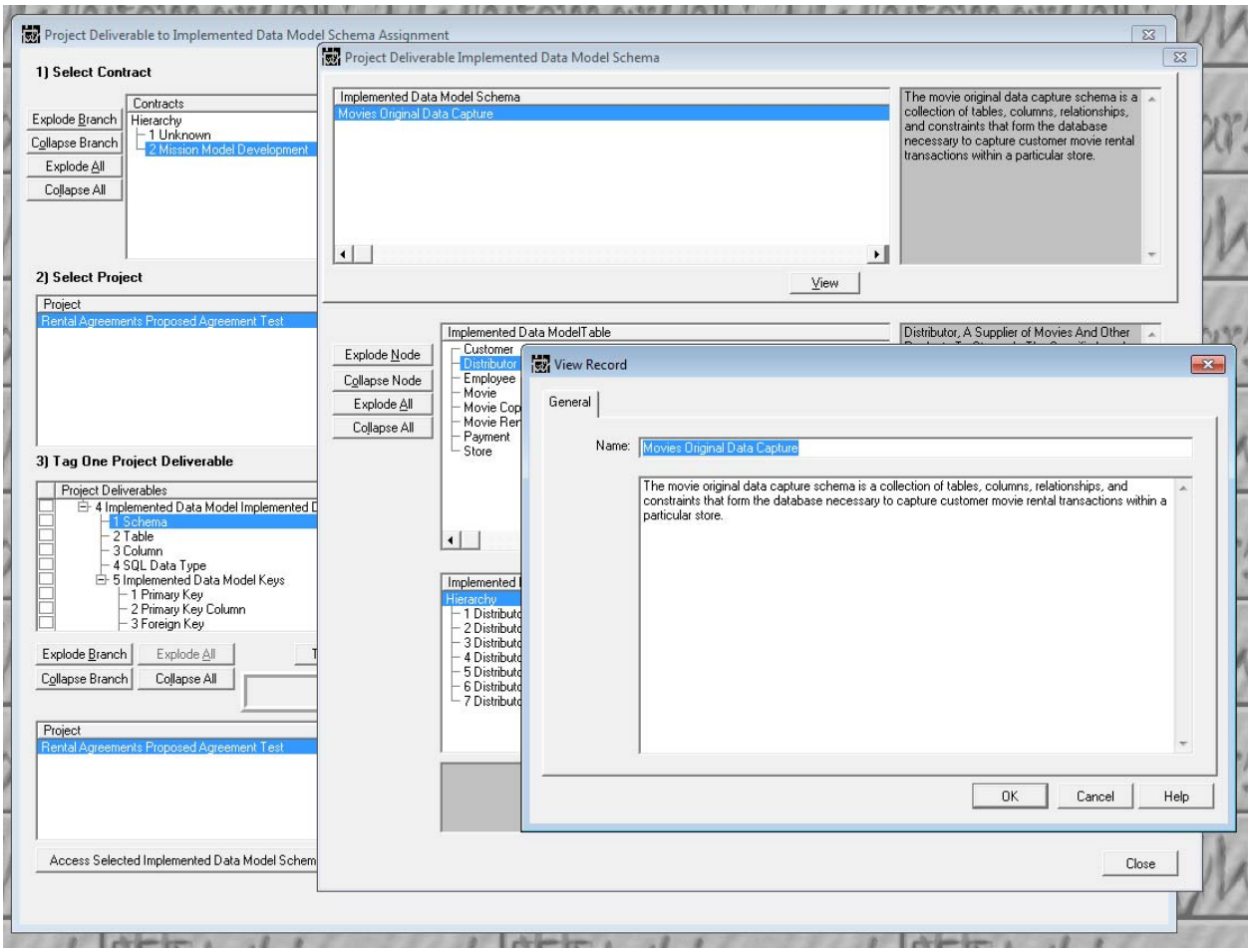

Figure 49. Project Deliverable Actual Data, Implemented Data Model Schema.

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5.3.10.1.6 Project Deliverable Operational Data Model DBMS Schema Assignment

The Project Deliverable Operational Data Model Assignment process, shown in Figure 50 enables the association of a Project Deliverables and one or more Project Deliverable Operational Data Model DBMS Schema. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Operational Data Model DBMS Schema Assignment.

The browse on the right enables the selection and tagging one or more Operational Data Model DBMS Schemas. Once the DBMS Schema elected, its contained DBMS tables, and in turn, DBMS columns are displayed.

Once all the appropriate Operational Data Model DBMS Schemas have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 50. To create a rationale for each association, press the Change button.

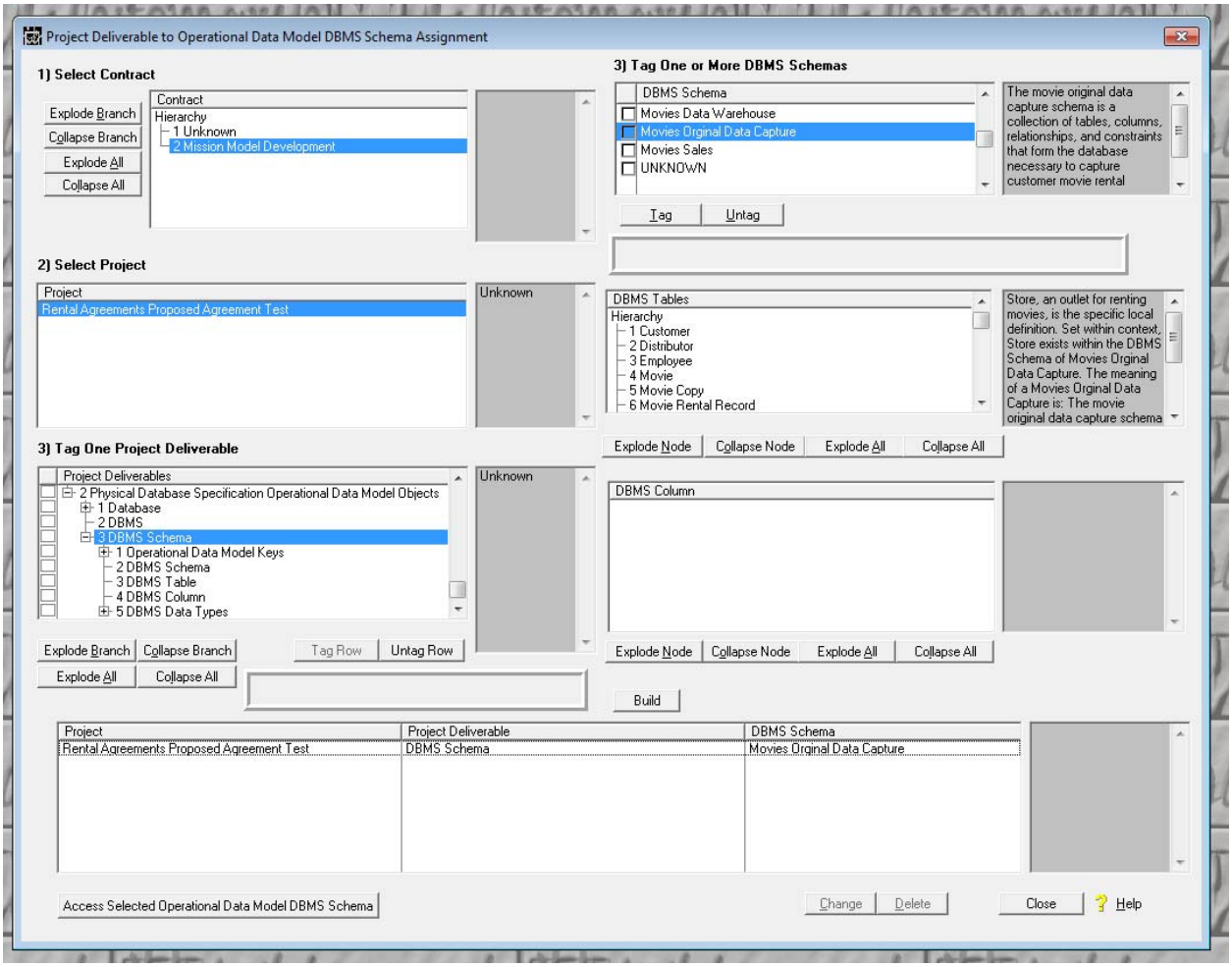

Figure 50. Project Deliverables Association, Operational Data Model DBMS Schema.

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Figure 51, 52, and 53 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

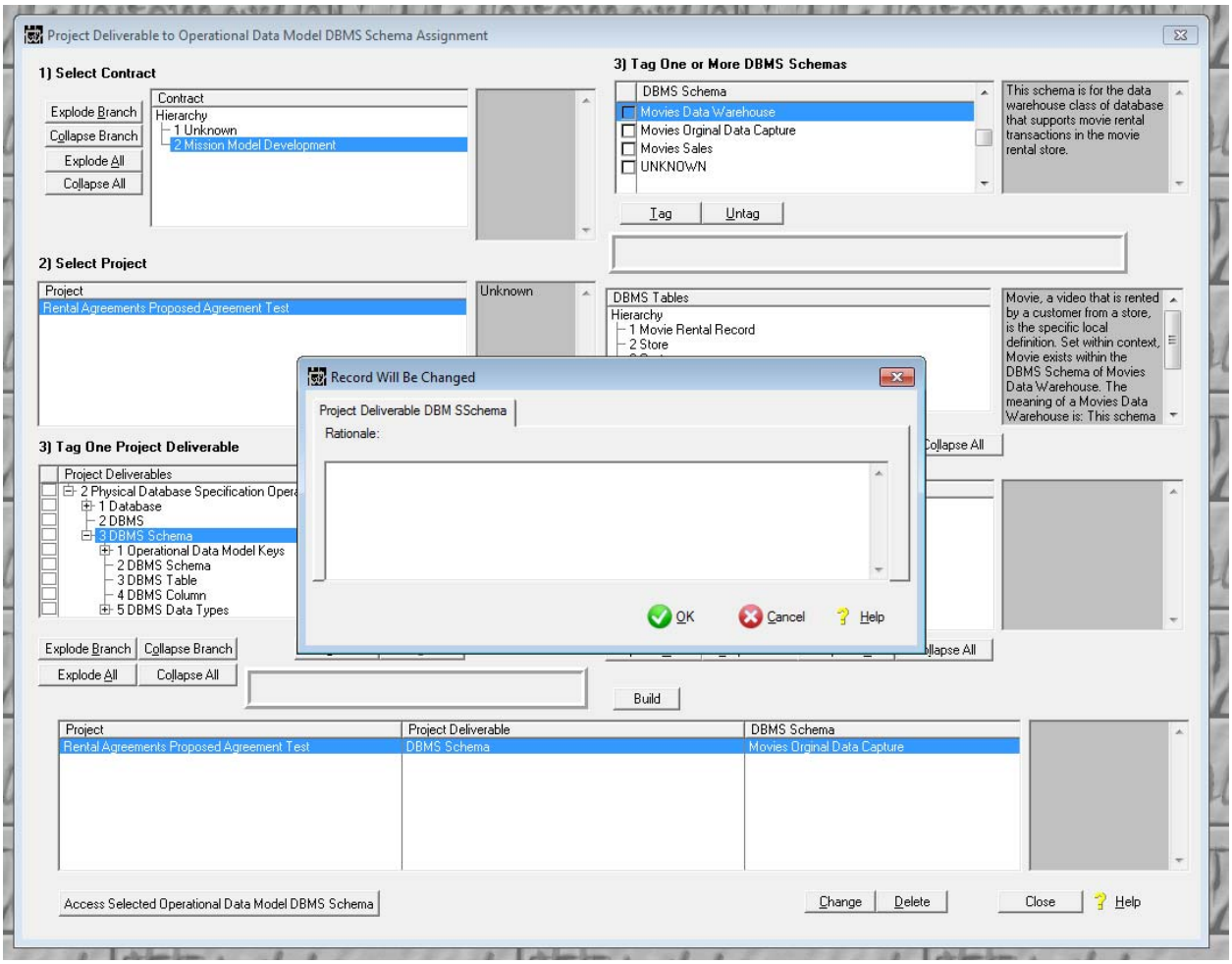

Figure 51. Project Deliverable Association Rationale, Operational Data Model DBMS Schema.

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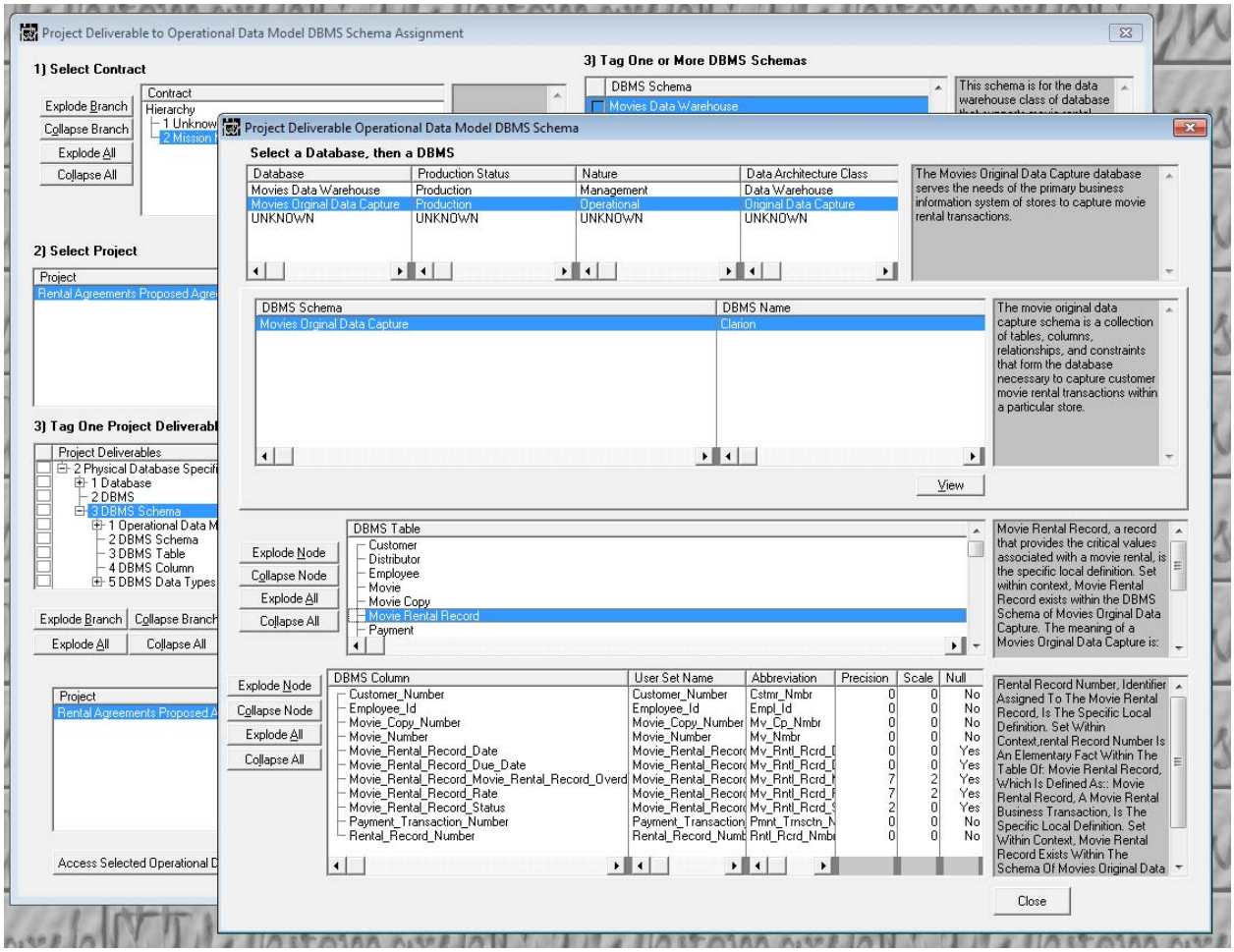

Figure 52. Project Deliverable, Operational Data Model DBMS Schema.

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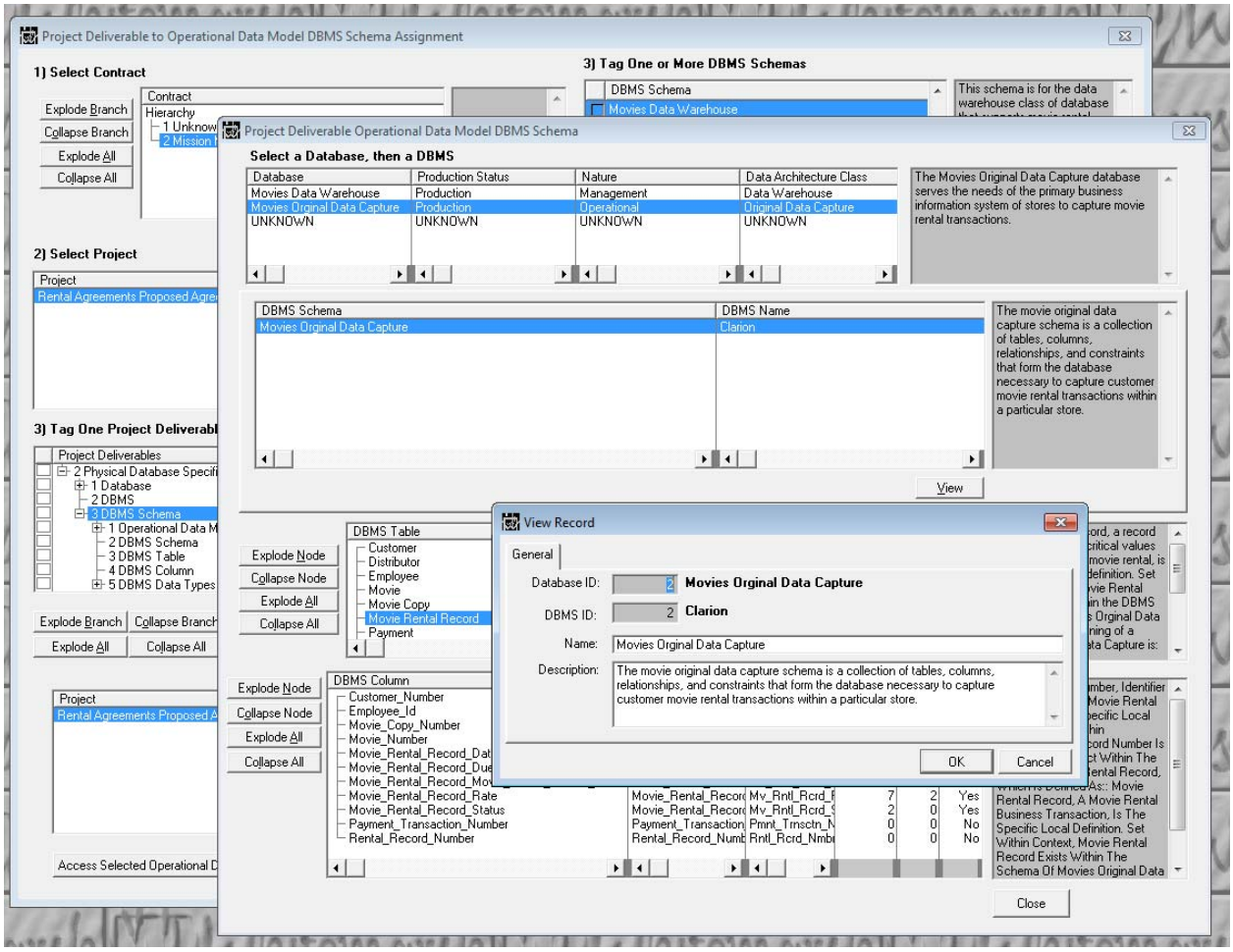

Figure 53. Project Deliverable Actual Data, Operational Data Model DBMS Schema.

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5.3.10.1.7 Project Deliverable DBMS Column Assignment

The Project Deliverable DBMS Column Assignment process, shown in Figure 54 enables the association of a Project Deliverables and one or more DBMS Columns. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for DBMS Columns.

The browse on the right enables the selection of DBMS Schema and contained DBMS Tables, and finally the selection and tagging of specific DBMS Columns.

Once all the appropriate DBMS Columns have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 54. To create a rationale for each association, press the Change button.

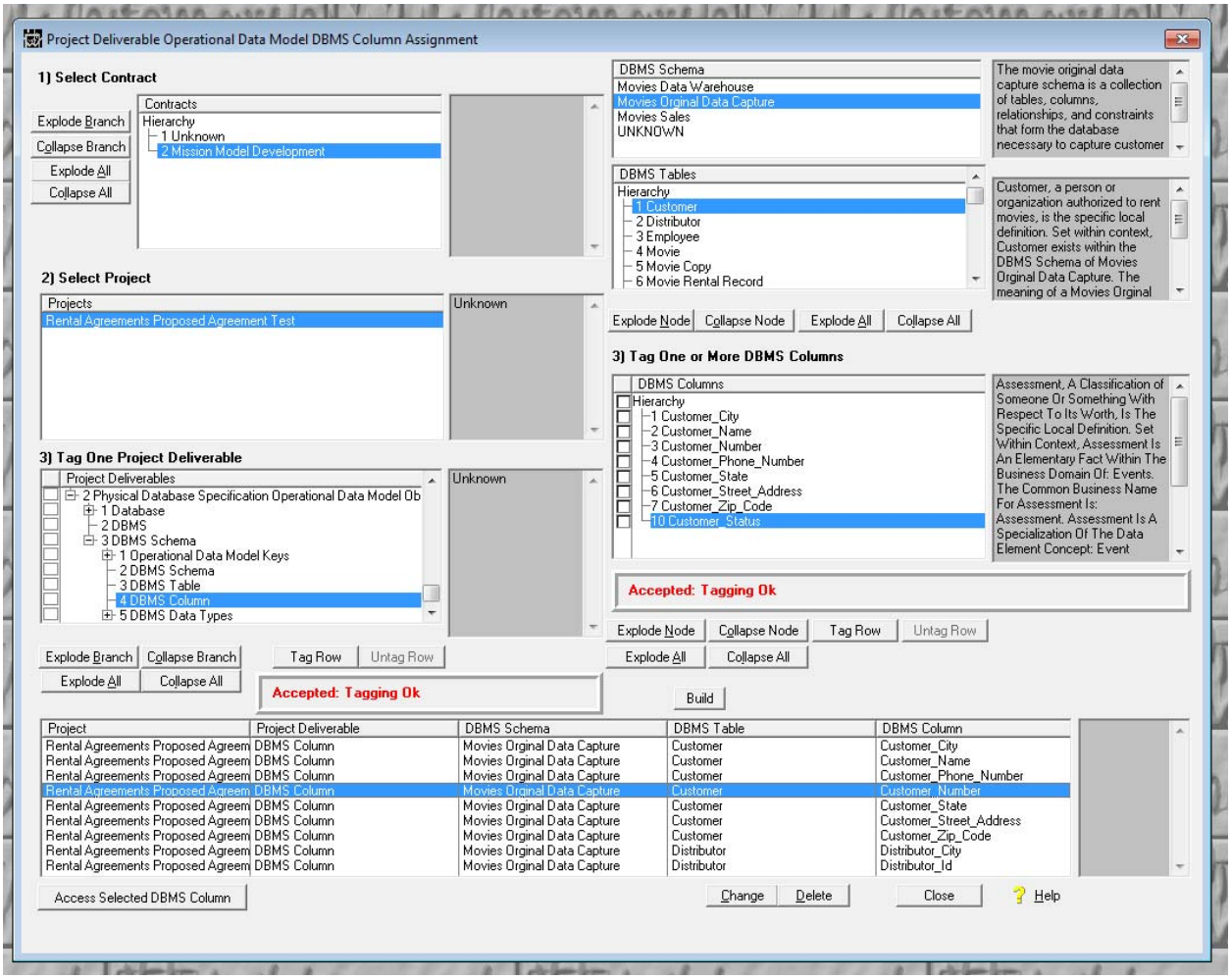

Figure 54. Project Deliverables Association, Operational Data Model DBMS Column.

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Figure 55, 56, and 57 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

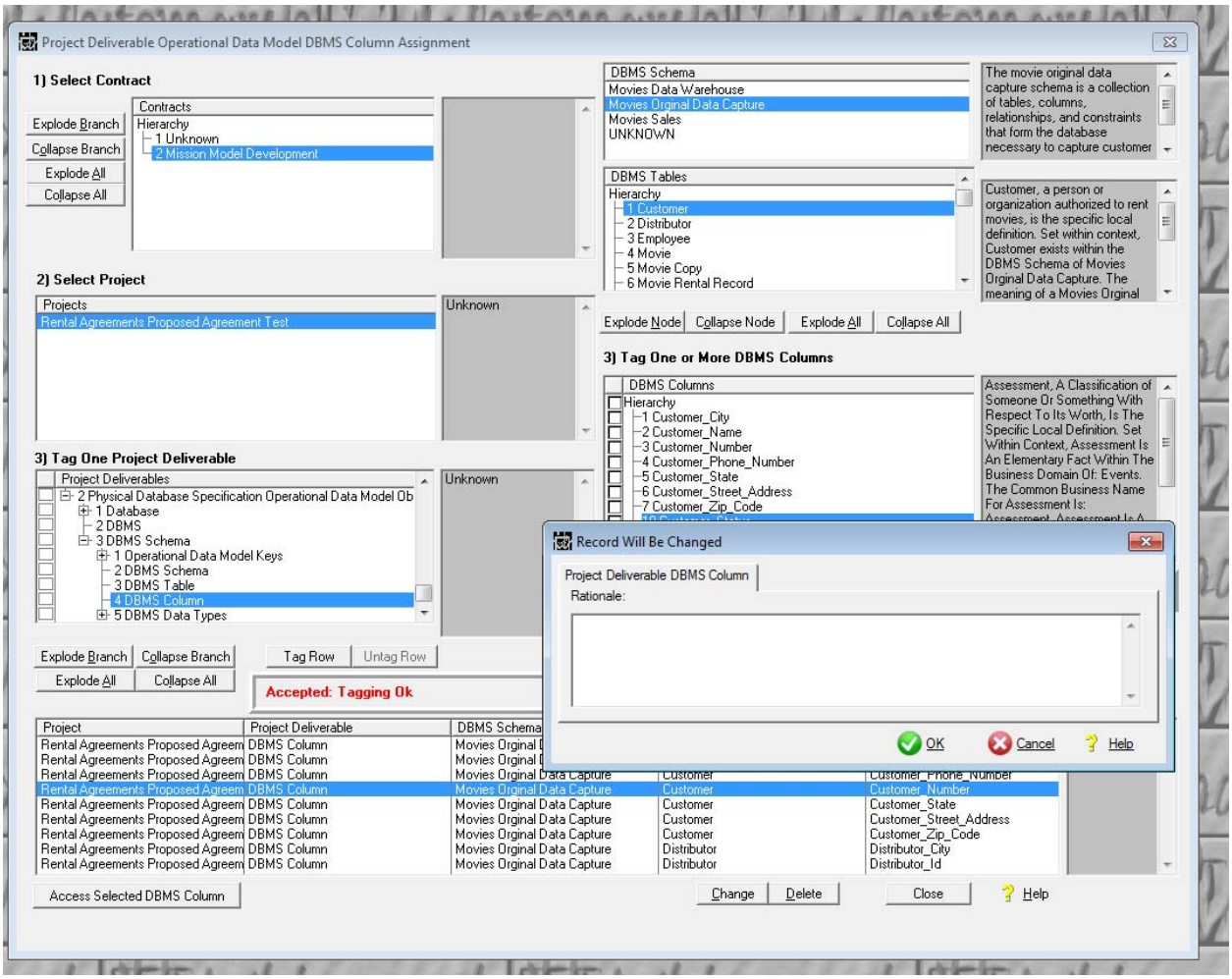

Figure 55. Project Deliverable Association Rationale, Operational Data Model DBMS Column.

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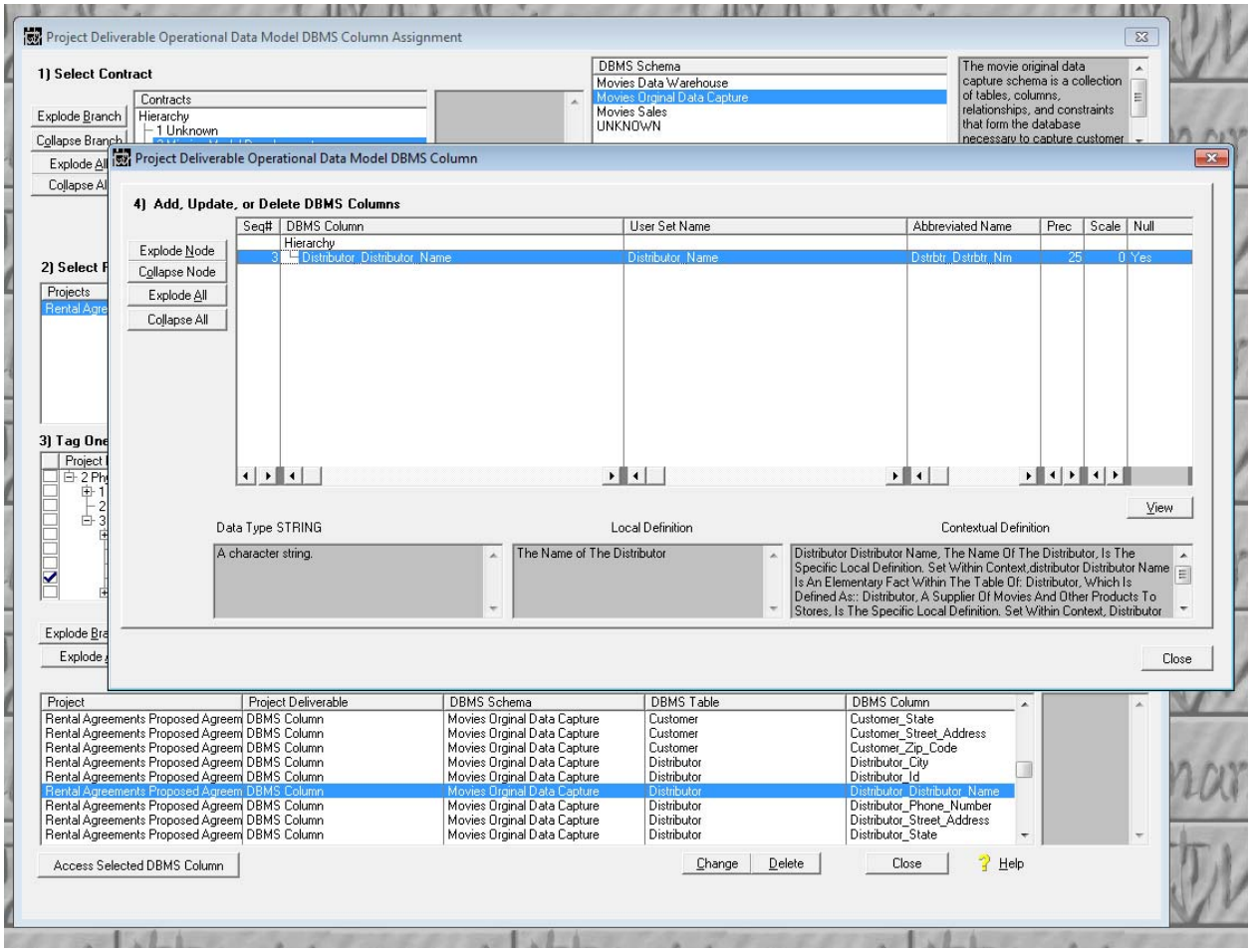

Figure 56. Project Deliverable, Operational Data Model DBMS Column.

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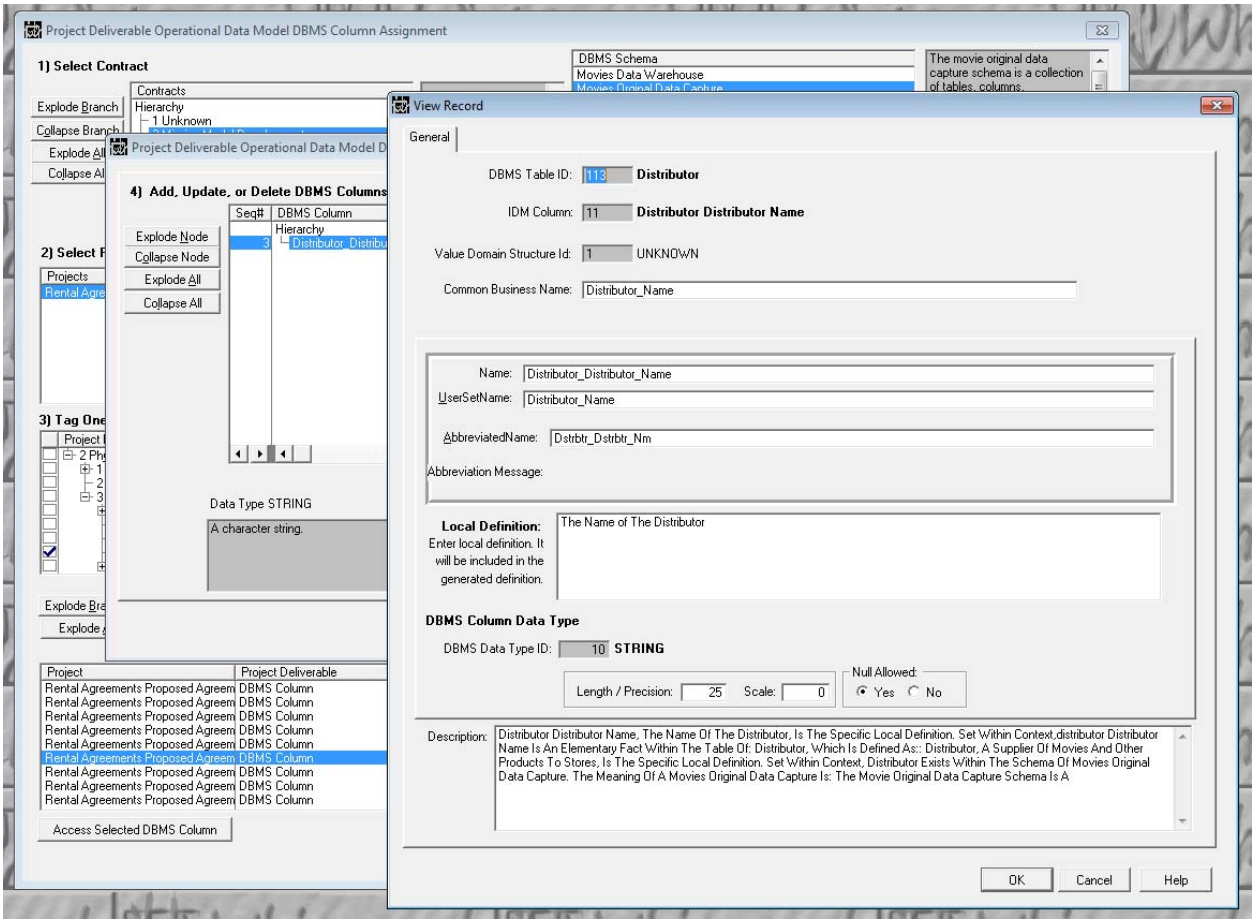

Figure 57. Project Deliverable Actual Data, Operational Data Model DBMS Column.

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5.3.10.2 Architecture Related

There are three data model Project Deliverable associations, as shown in Figure 58, directly related to architecture are:

- Project Deliverable Mission Organization Functions
- Project Deliverable Resource Life Cycle Nodes
- Project Deliverable Documents

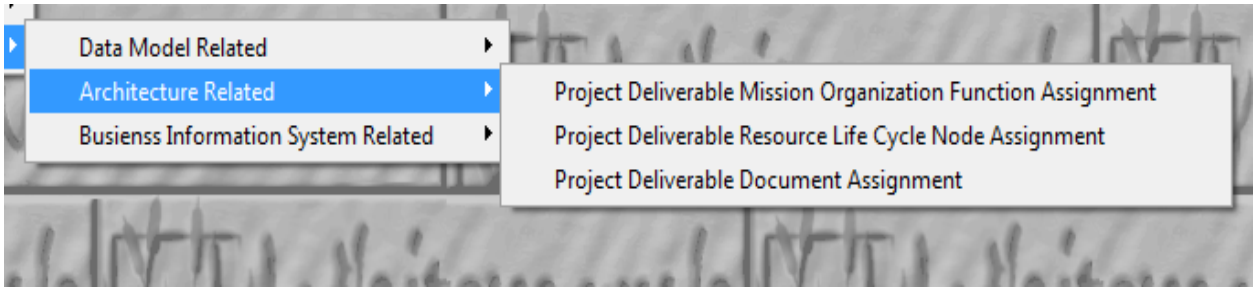

Figure 58. Architecture Related Project Deliverable Associations.

5.3.10.2.1 Project Deliverable Mission Organization Function Assignment

The Project Deliverable Mission Organization Function Assignment process, shown in Figure 59 enables the association of a Project Deliverables and one or more Mission Organization Functions. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for Mission Organization Functions.

The browse on the right enables the selection of Mission Structure Type and the selection of the related Organization, and finally, tag one or more Functions.

Once all the appropriate Functions (and reference its Organization and Mission) have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 59. To create a rationale for each association, press the Change button.

Note to Reader: The next release of Project Management will have deliverables management for Missions, Organizations, Functions, and Database Domains.

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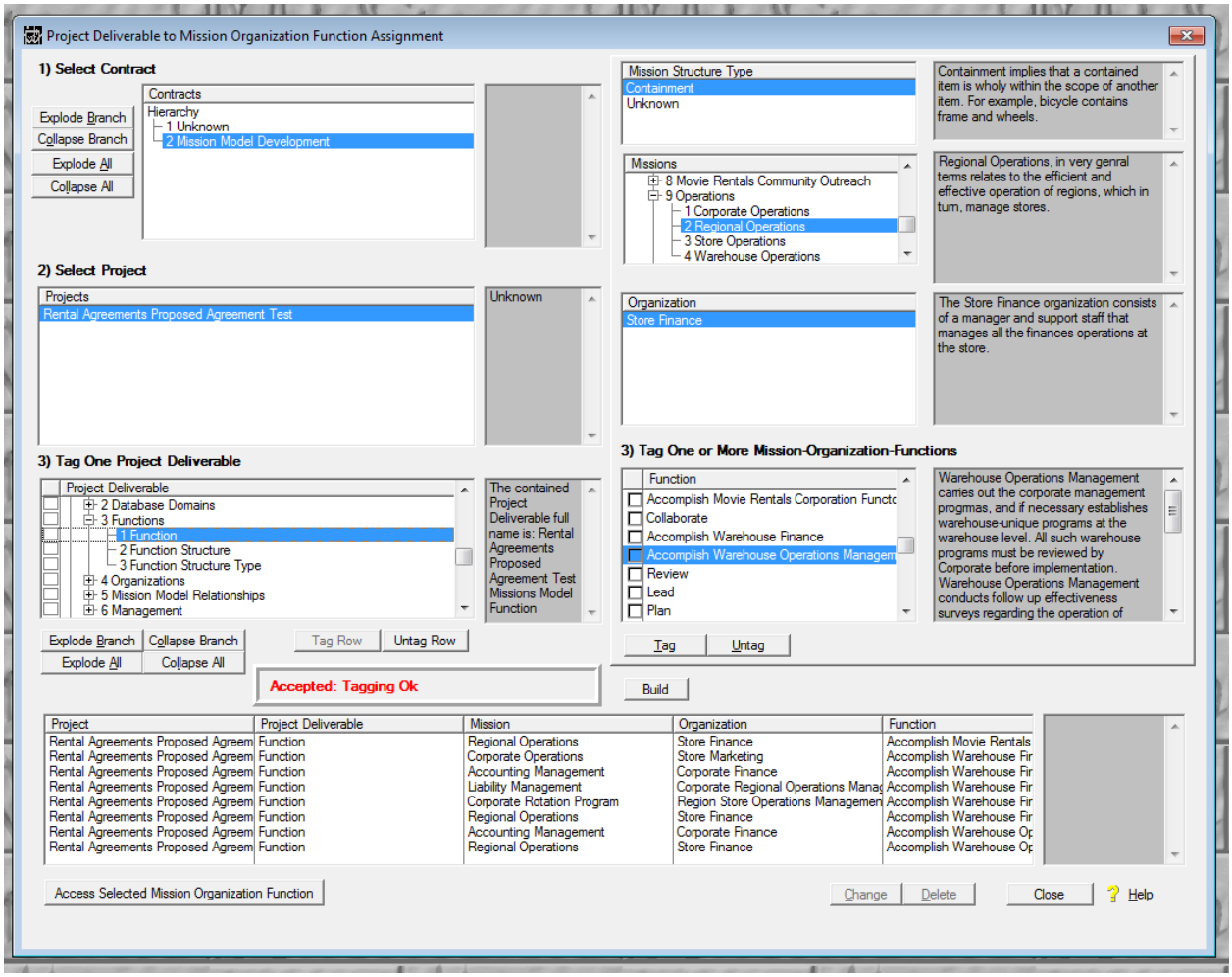

Figure 59. Project Deliverables Association, Mission Organization Function.

Figure 60, 61, and 62 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

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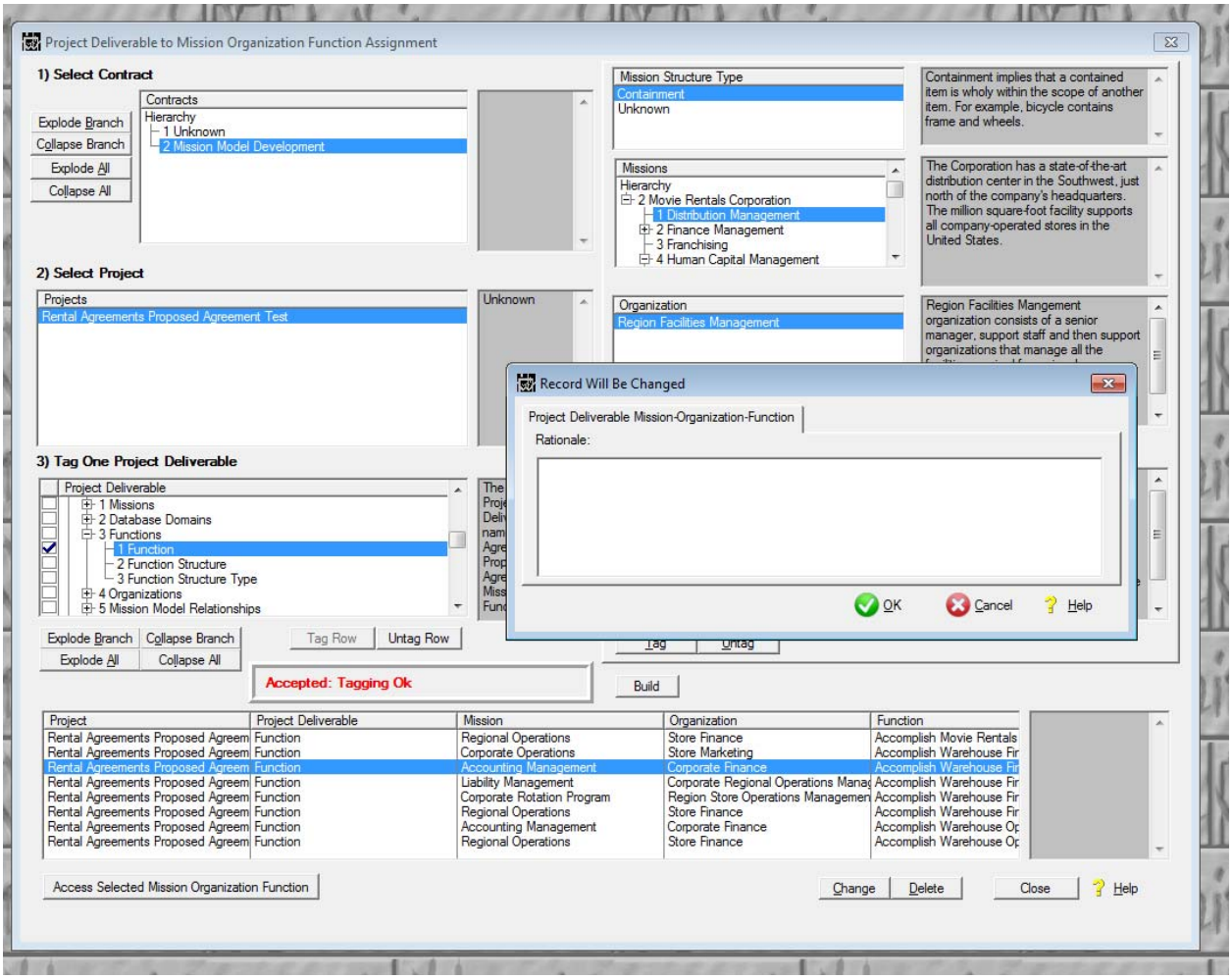

Figure 60. Project Deliverable Association Rationale, Mission Organization Function.

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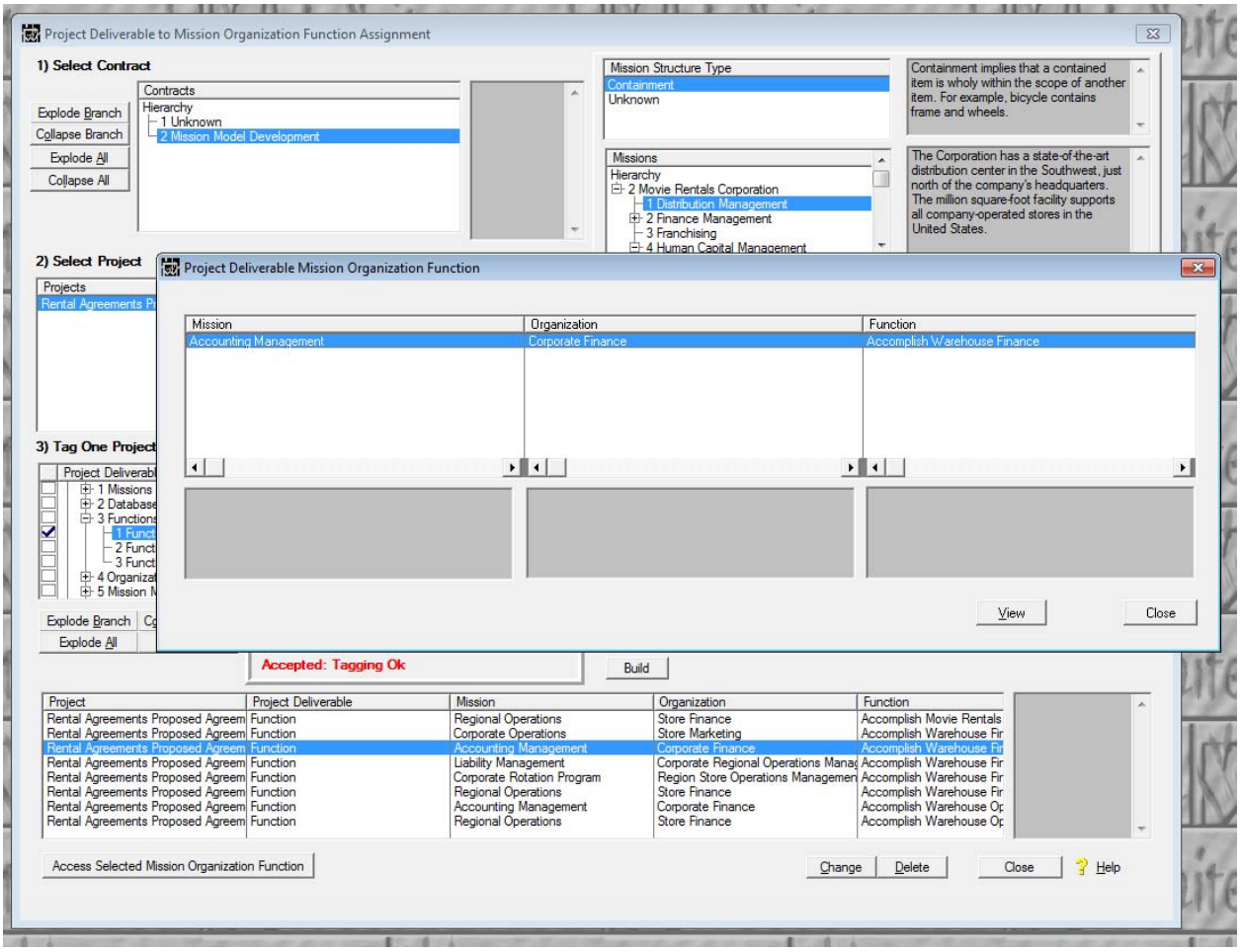

Figure 61. Project Deliverable, Mission Organization Function.

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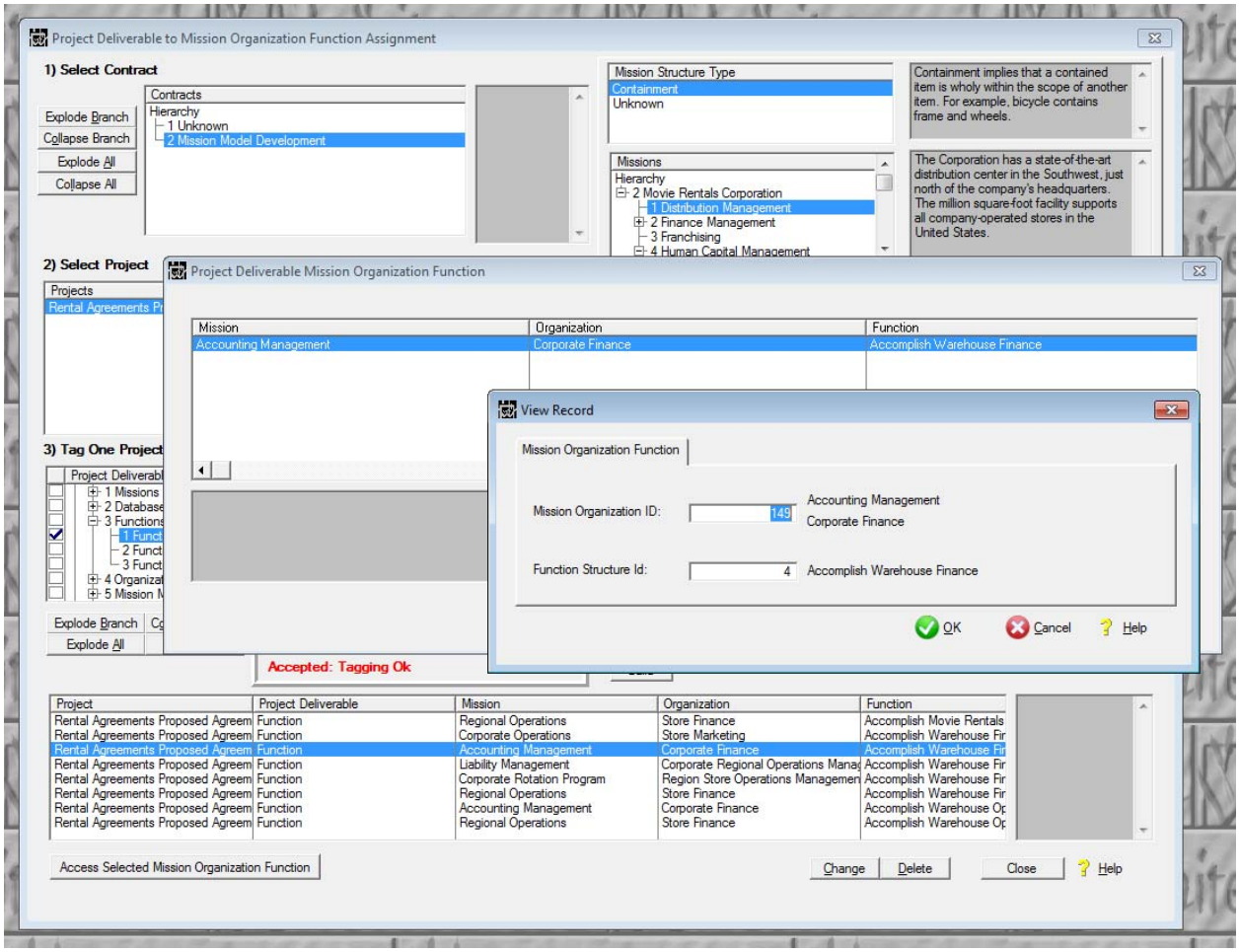

Figure 62. Project Deliverable Actual Data, Mission Organization Function.

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5.3.10.2.2 Project Deliverable Resource Life Cycle Node Assignment

The Project Deliverable Resource Life Cycle Node Assignment process, shown in Figure 63 enables the association of a Project Deliverables and one or more Resource Life Cycle Nodes. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Resource Life Cycle Nodes.

The browse on the right enables the selection of Resource Type and the selection of Resource and finally, tagging Resource Life Cycle Nodes.

Once all the appropriate Resource Life Cycle Nodes have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 63. To create a rationale for each association, press the Change button.

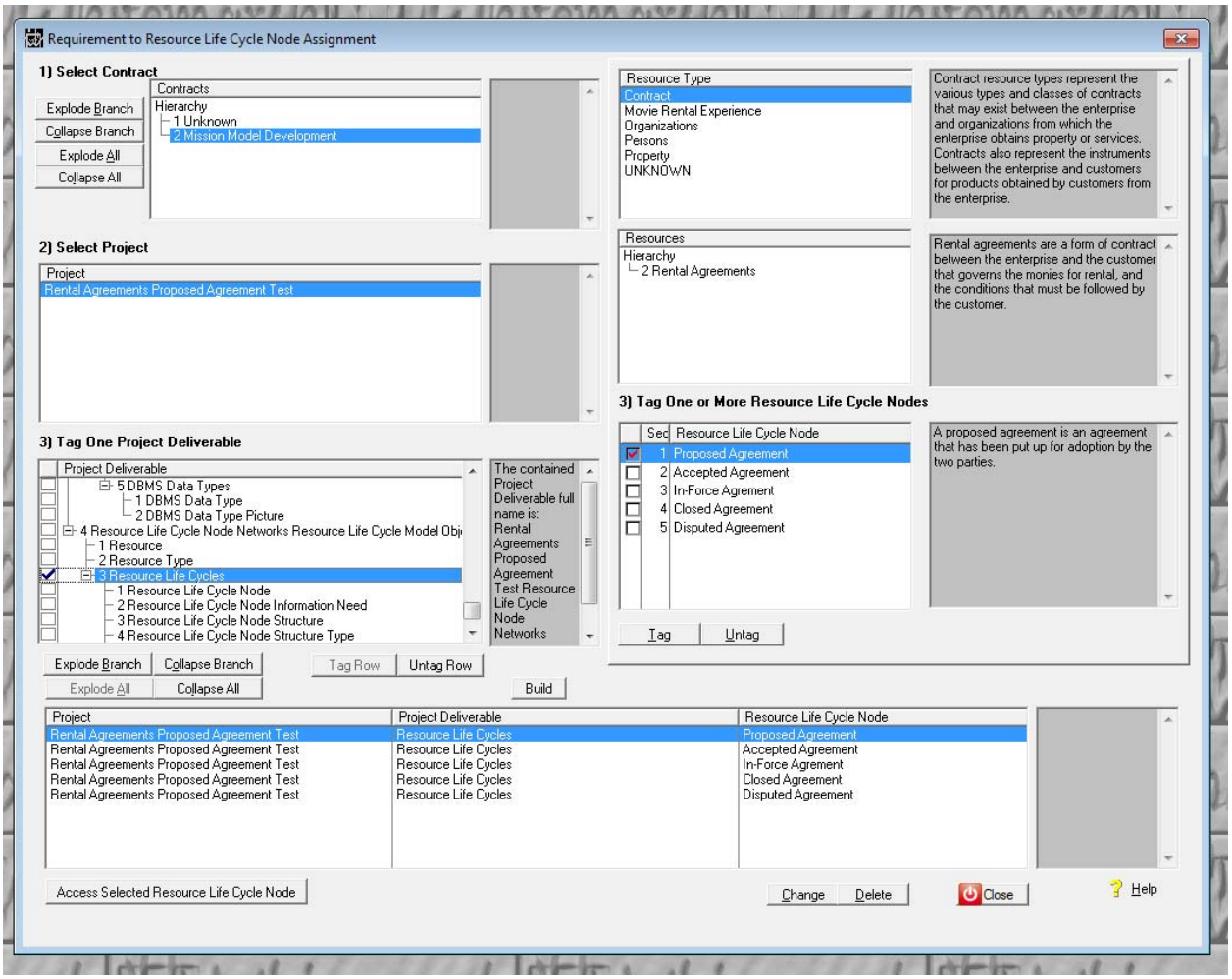

Figure 63. Project Deliverables Association, Resource Life Cycle Node.

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Figure 64, 65, and 66 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

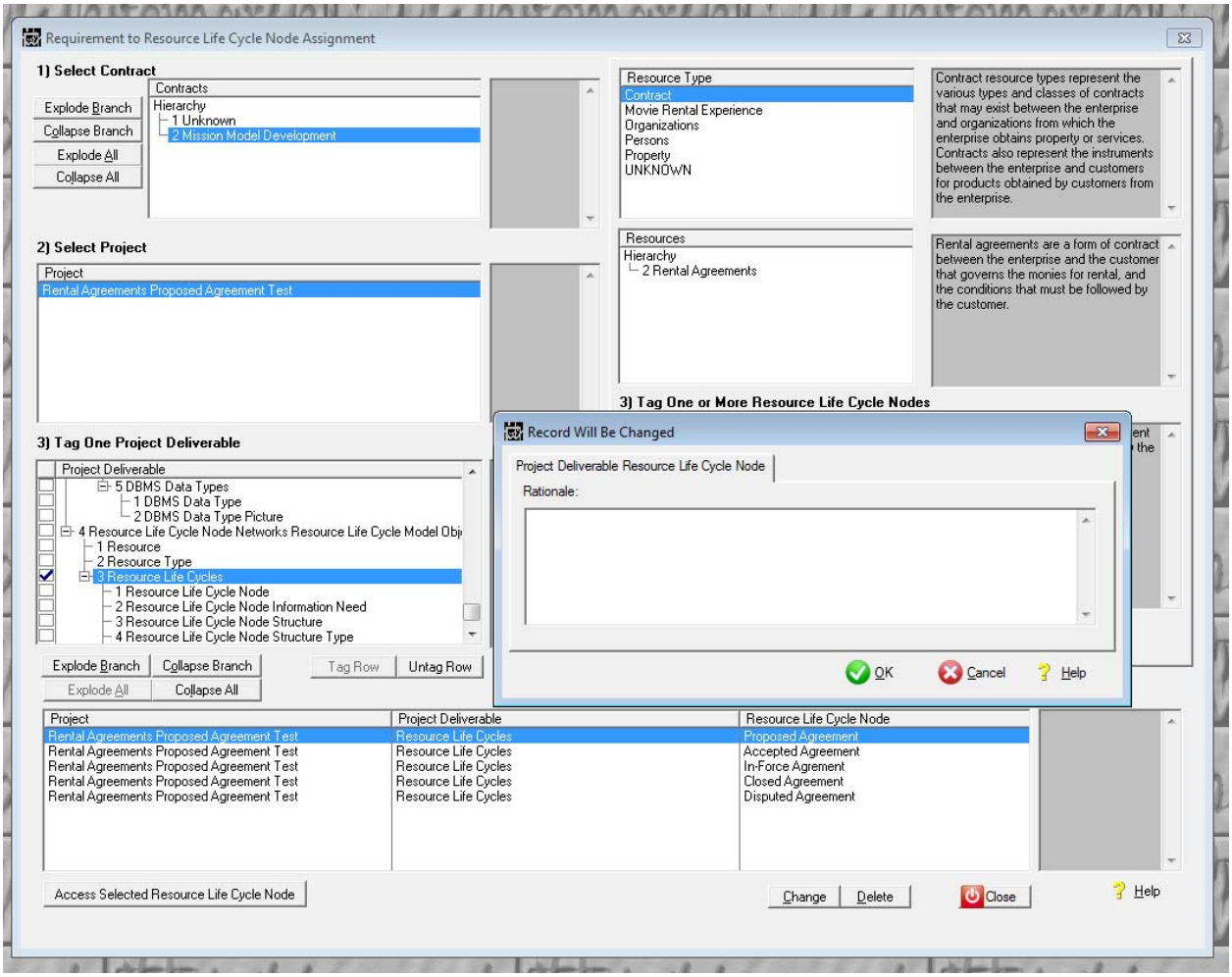

Figure 64. Project Deliverable Association Rationale, Resource Life Cycle Node.

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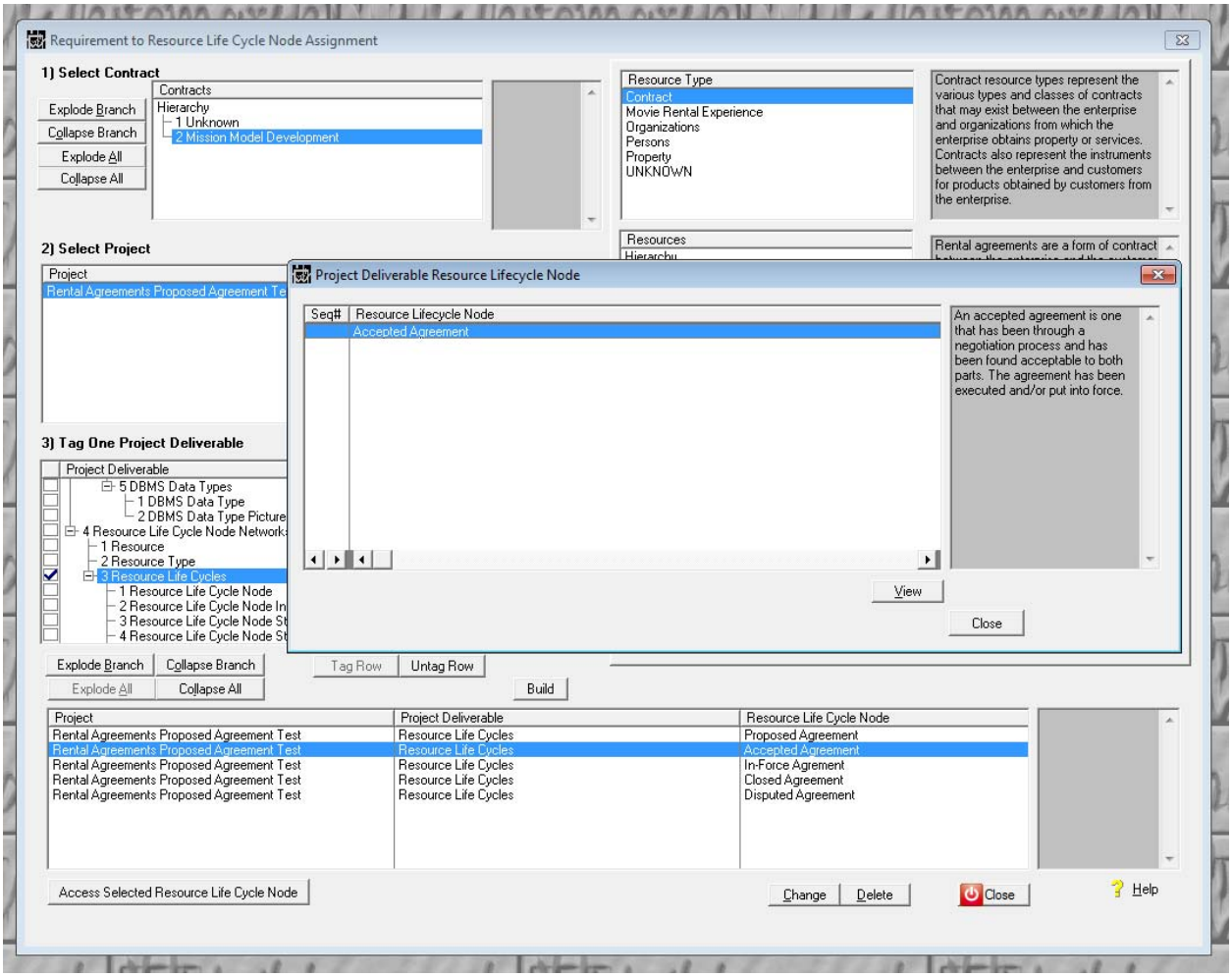

Figure 65. Project Deliverable, Resource Life Cycle Node.

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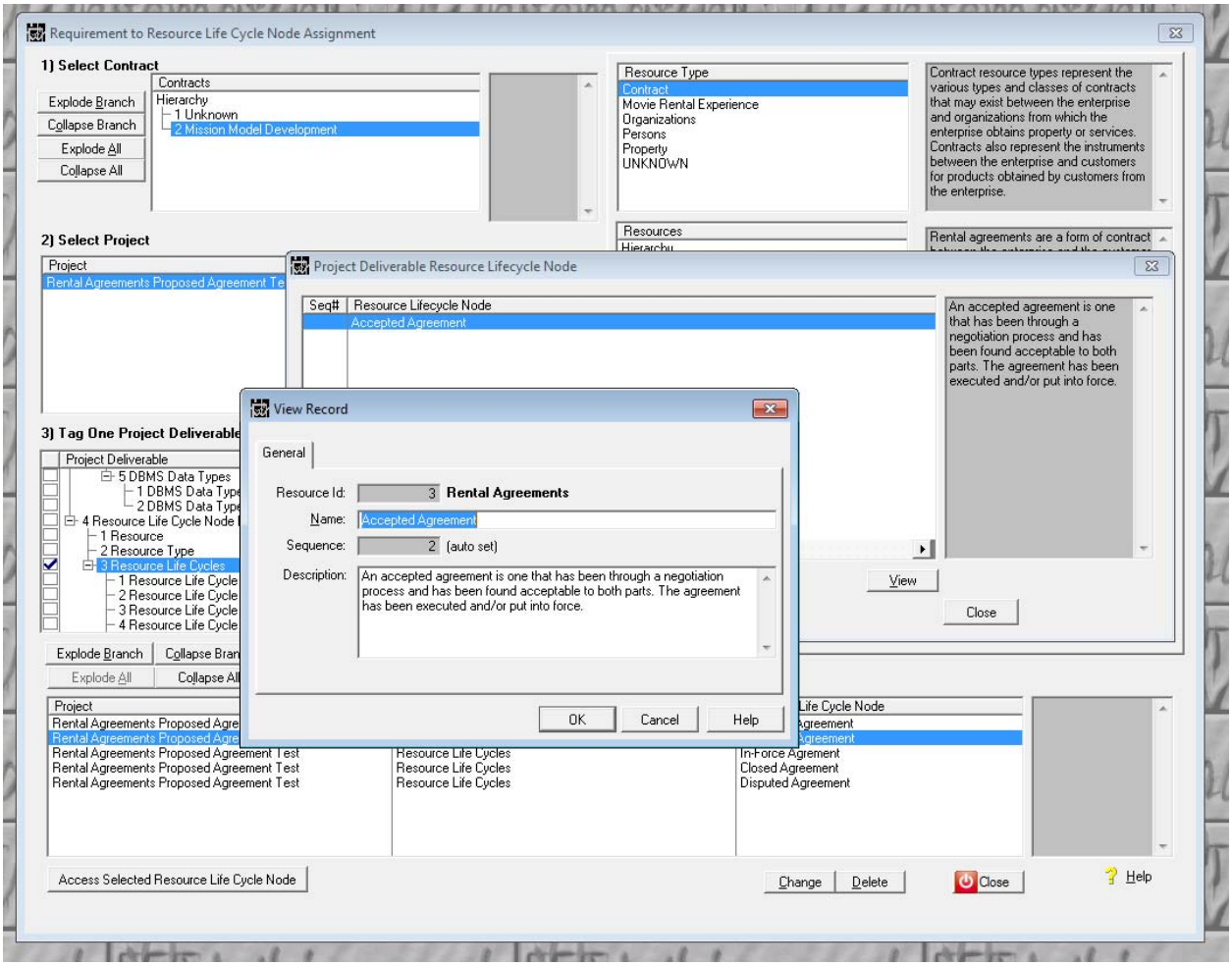

Figure 66. Project Deliverable Actual Data, Resource Life Cycle Node.

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5.3.10.2.3 Project Deliverable Document Assignment

The Project Deliverable Document Assignment process, shown in Figure 67 enables the association of a Project Deliverables and one or more Documents. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for Documents. Here examples would include presentations, reports, reviews, and the like.

The browse on the right enables the tagging of one or more Documents. Once all the appropriate documents have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 67. To create a rationale for each association, press the Change button.

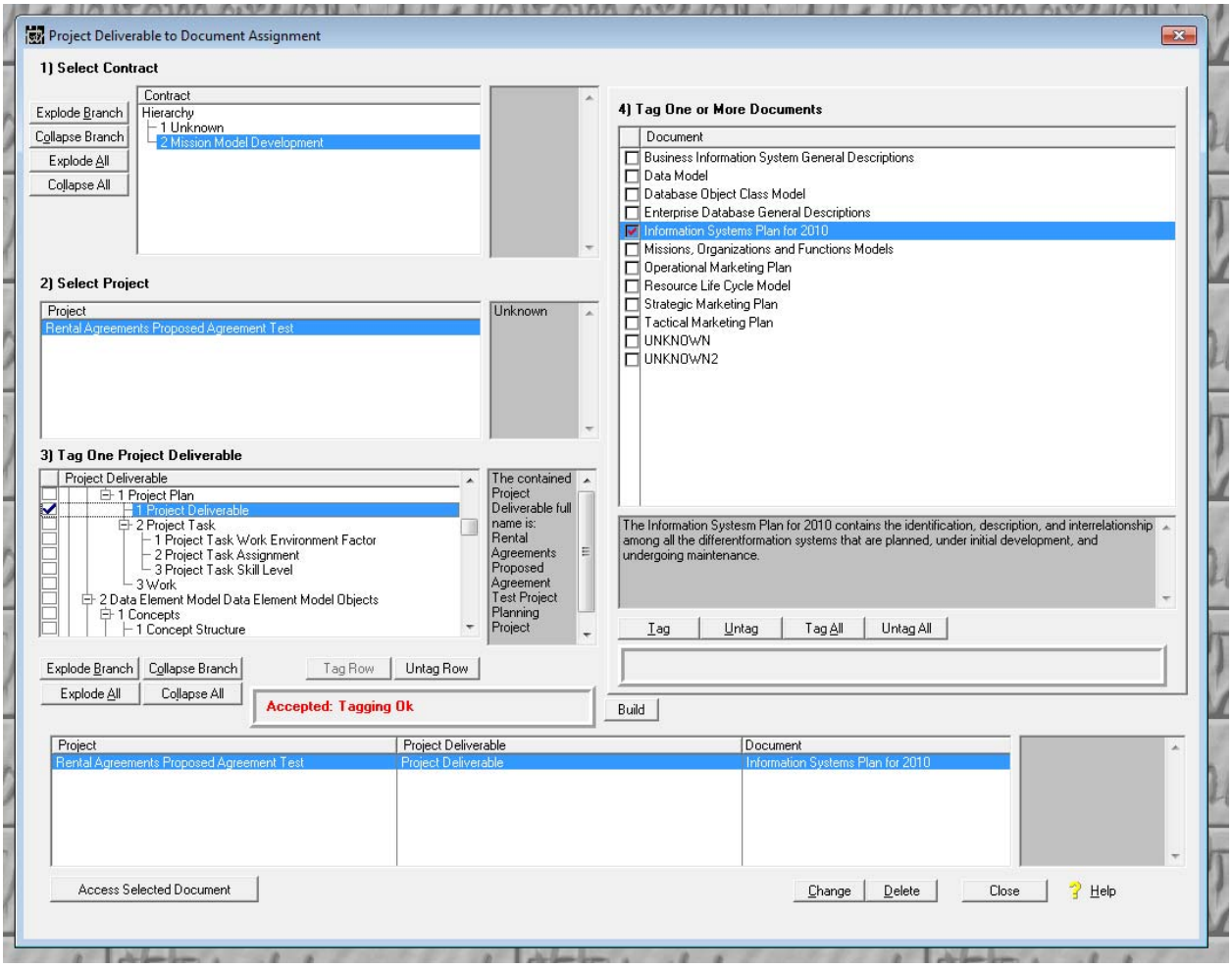

Figure 67. Project Deliverables Association, Document.

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Figure 68, 69, and 70 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

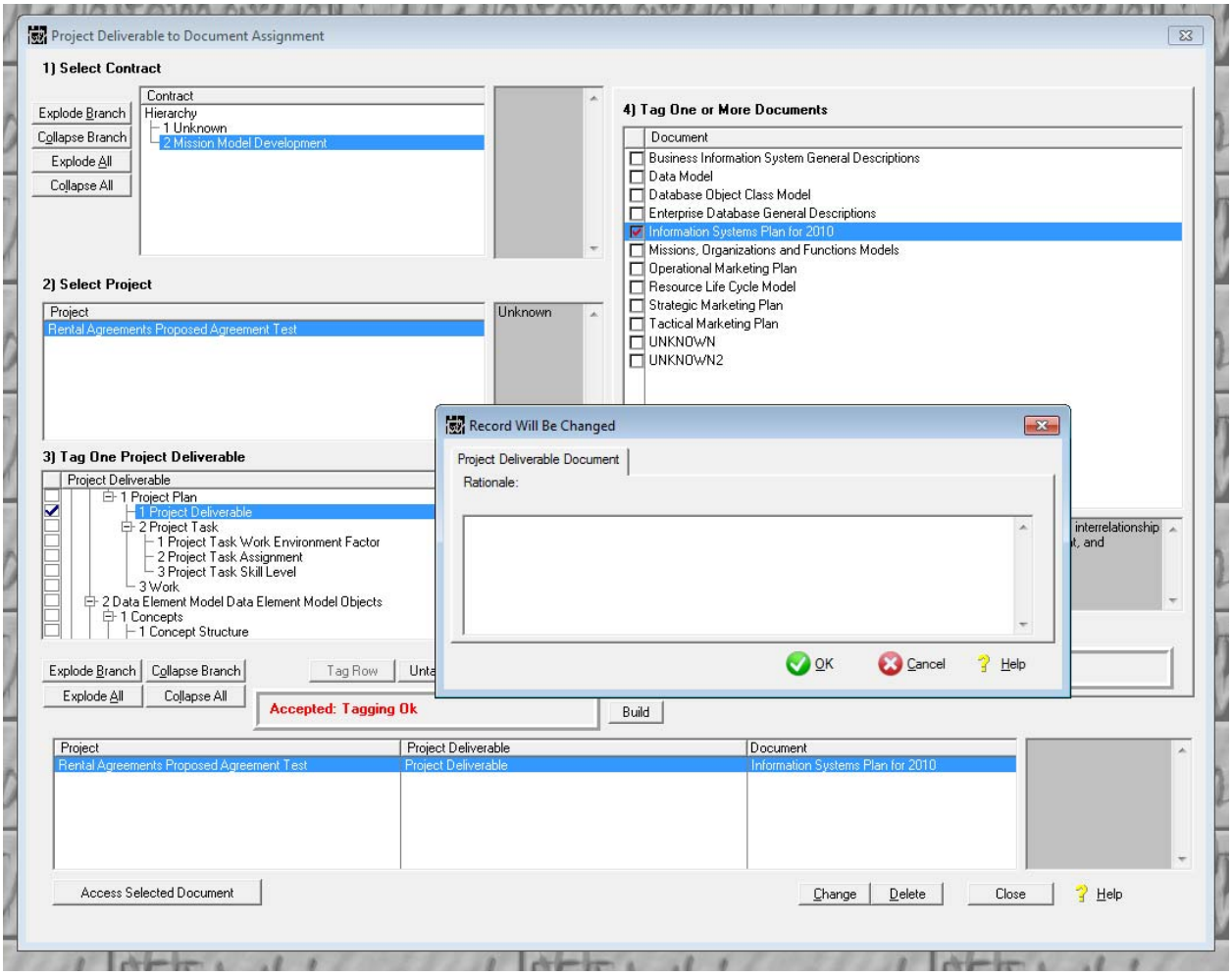

Figure 68. Project Deliverable Association Rationale, Document.

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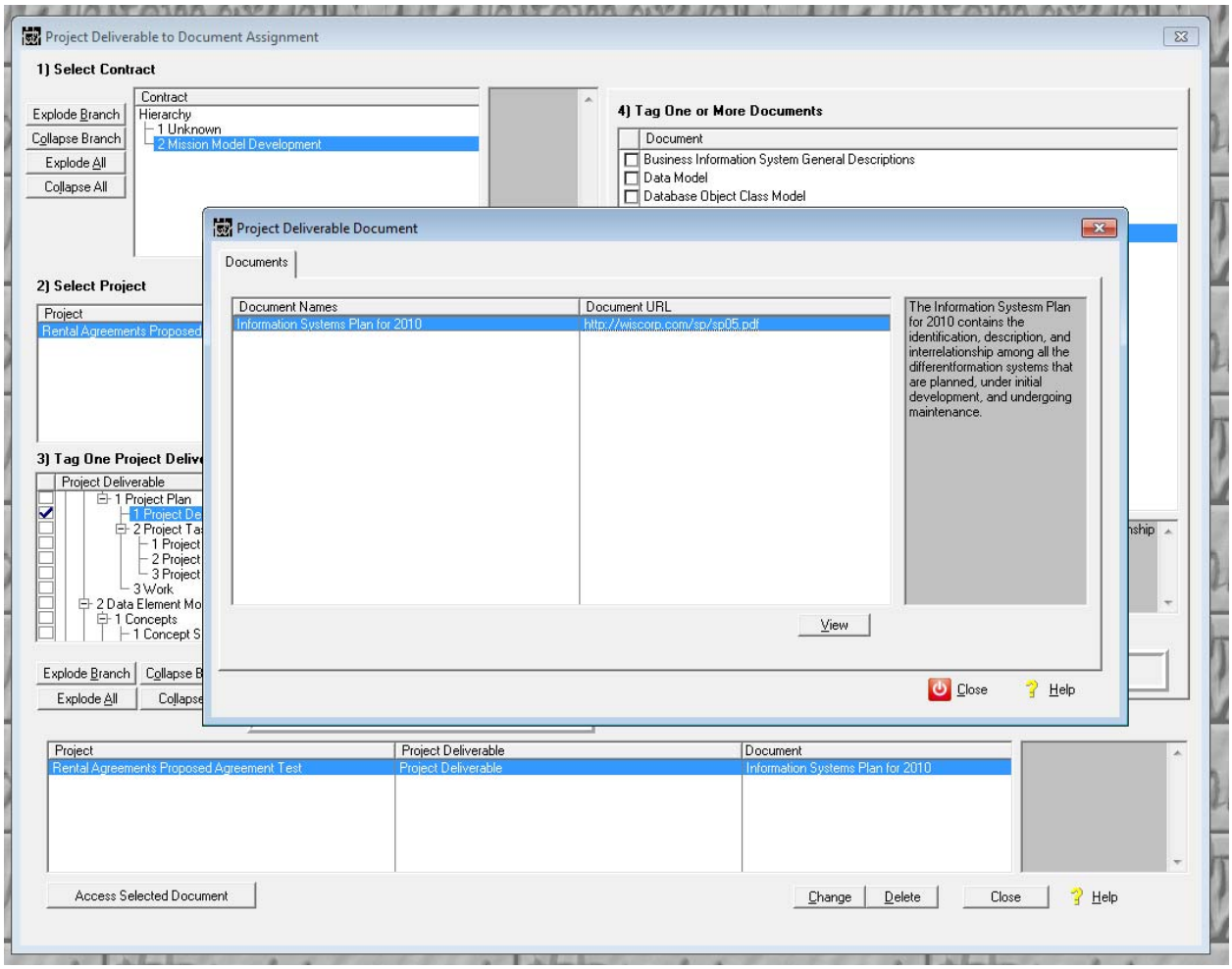

Figure 69. Project Deliverable, Document.

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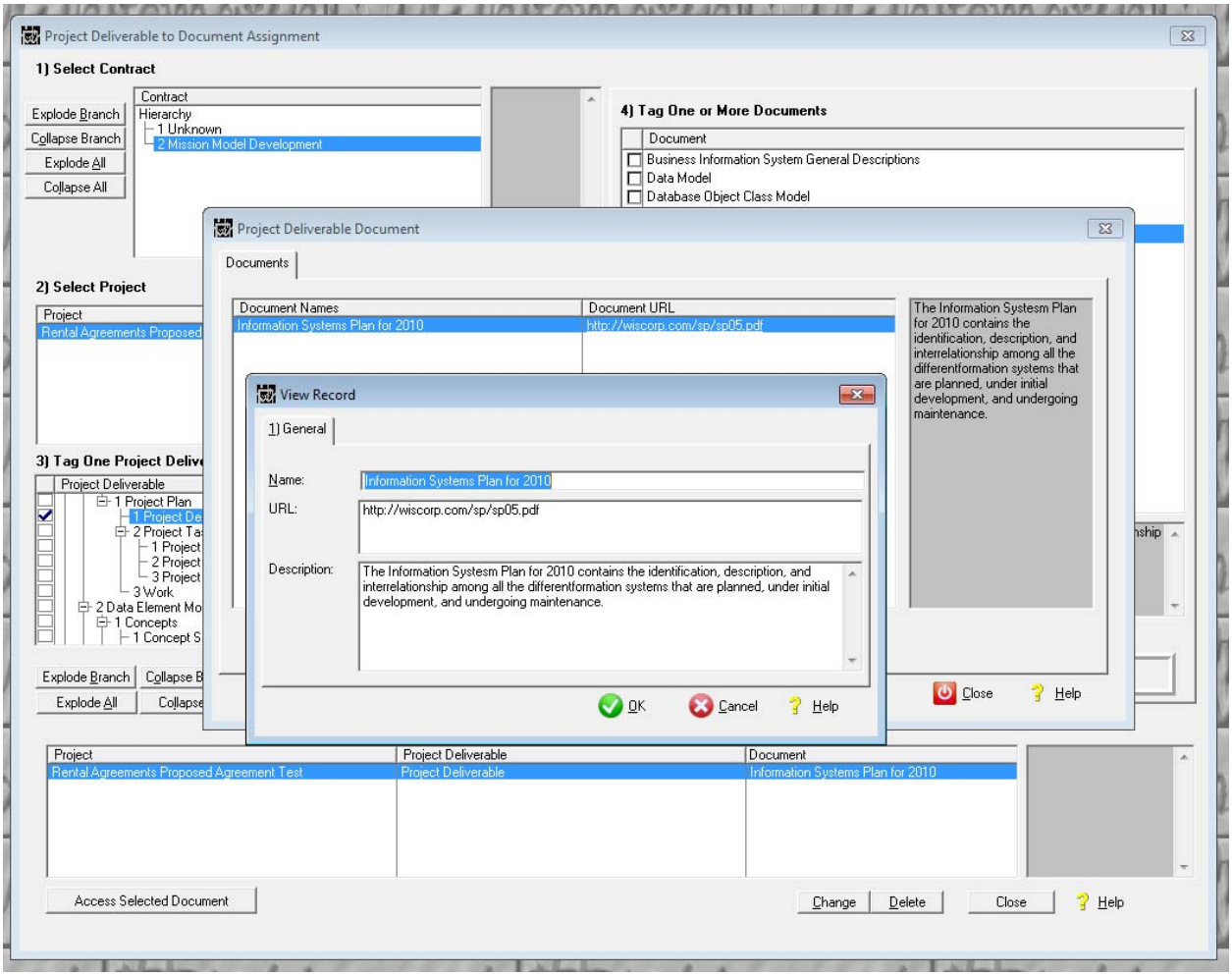

Figure 70. Project Deliverable Actual Data, Document.

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5.3.10.3 Business Information System Related

There are four data model Project Deliverable associations, as shown in Figure 40 are directly related to business information systems. These are:

- Project Deliverable Business Events
- Project Deliverable Business Information Systems
- Project Deliverable Use Cases
- Project Deliverable User Acceptance Tests

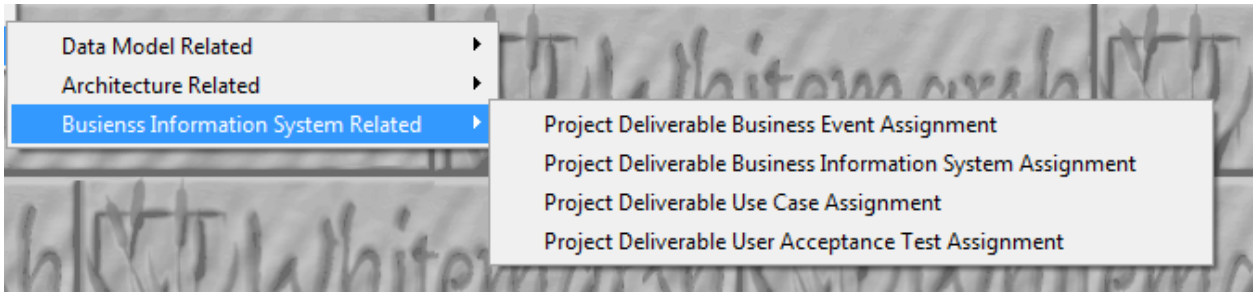

Figure 71.Business Information System Related Project Deliverable Associations.

5.3.10.3.1 Project Deliverable Business Event Assignment

The Project Deliverable Business Event Assignment process, shown in Figure 72 enables the association of a Project Deliverables and one or more business events. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for Business Events.

The browse on the right enables the selection of Mission Structure Type, then Mission, then Organization, then Function, and finally selecting and tagging one or more Business Events.

Once all the appropriate Business Events have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 72. To create a rationale for each association, press the Change button.

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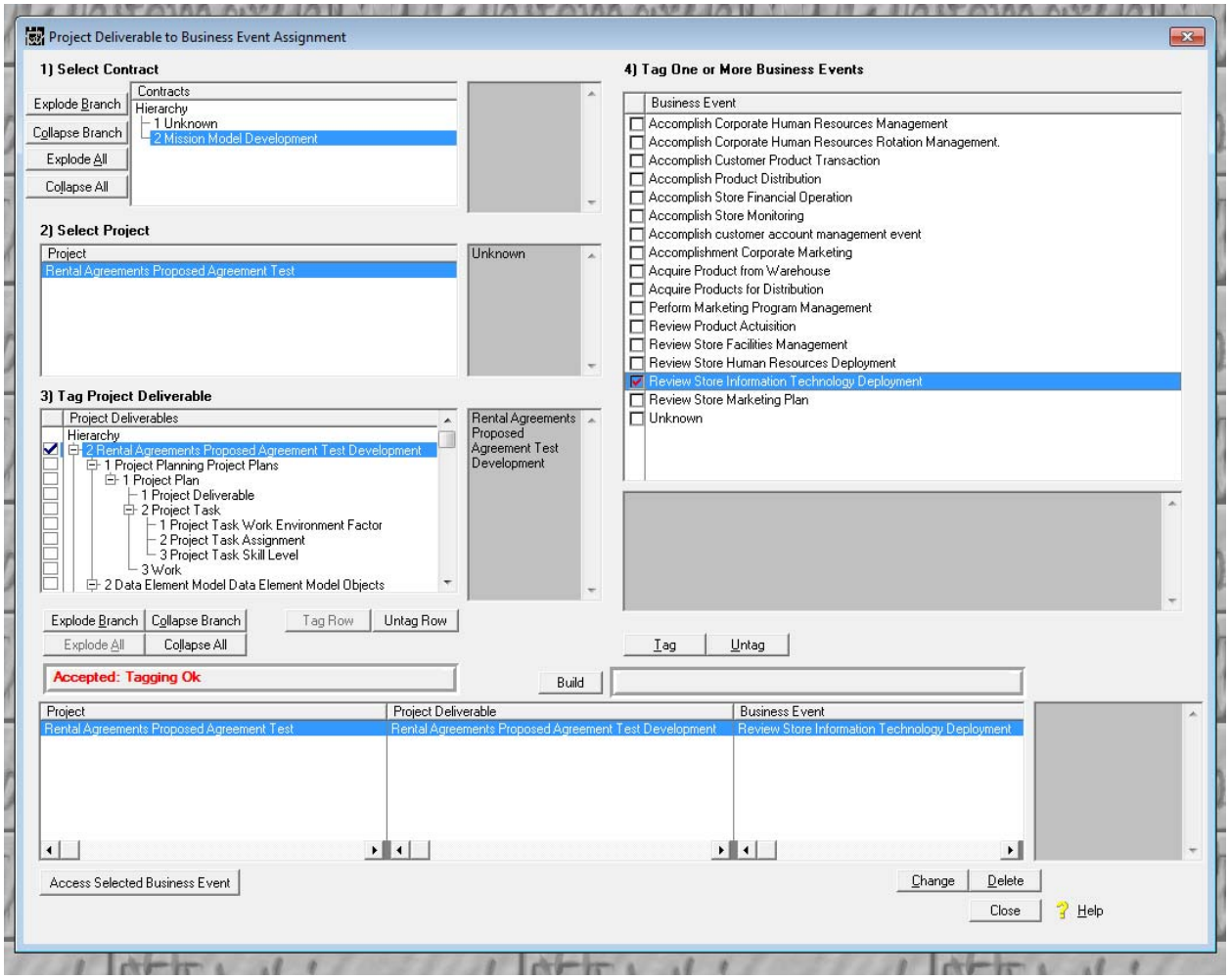

Figure 72. Project Deliverables Association, Business Event.

Figure 73, 74, and 75 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

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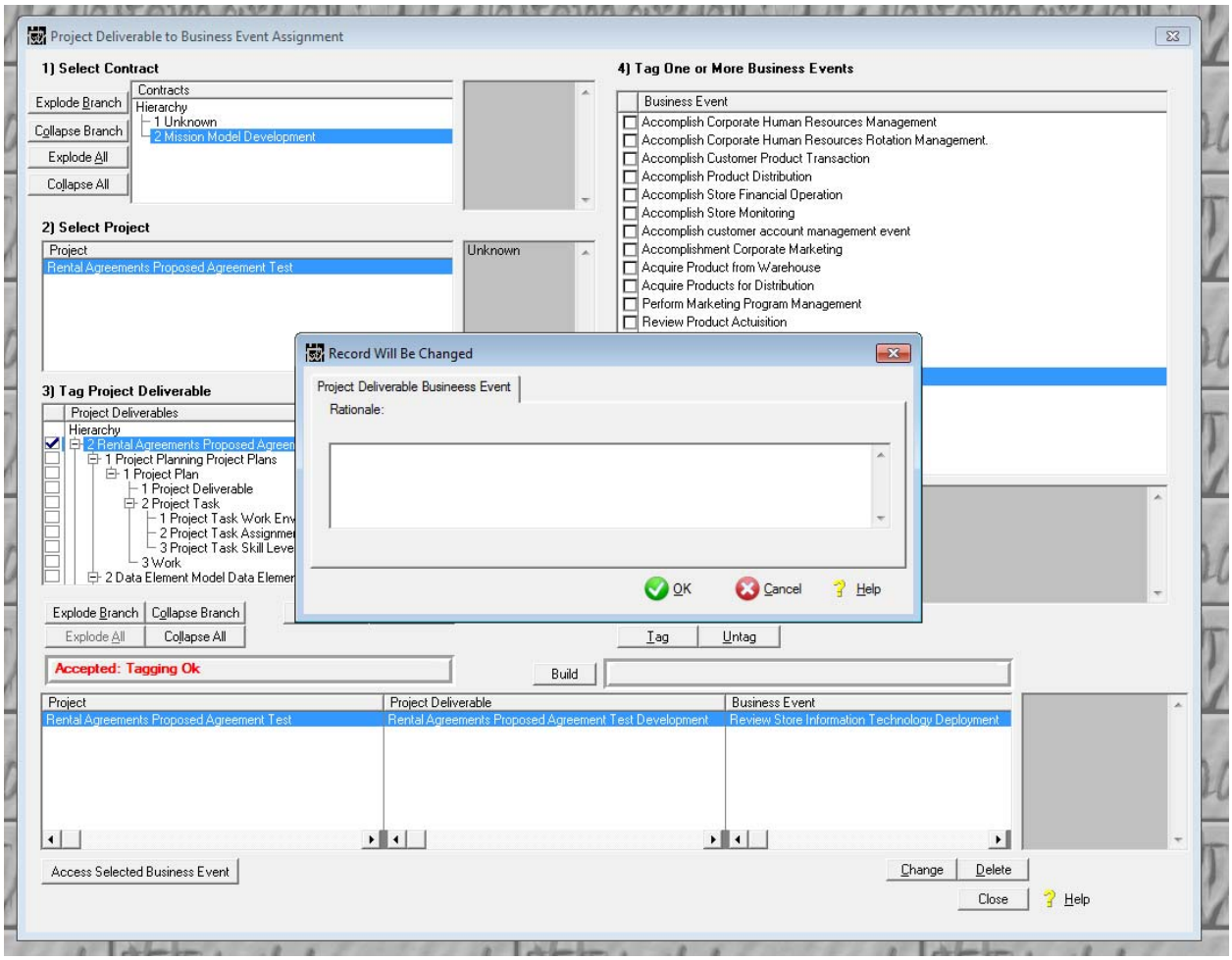

Figure 73. Project Deliverable Association Rationale, Business Event.

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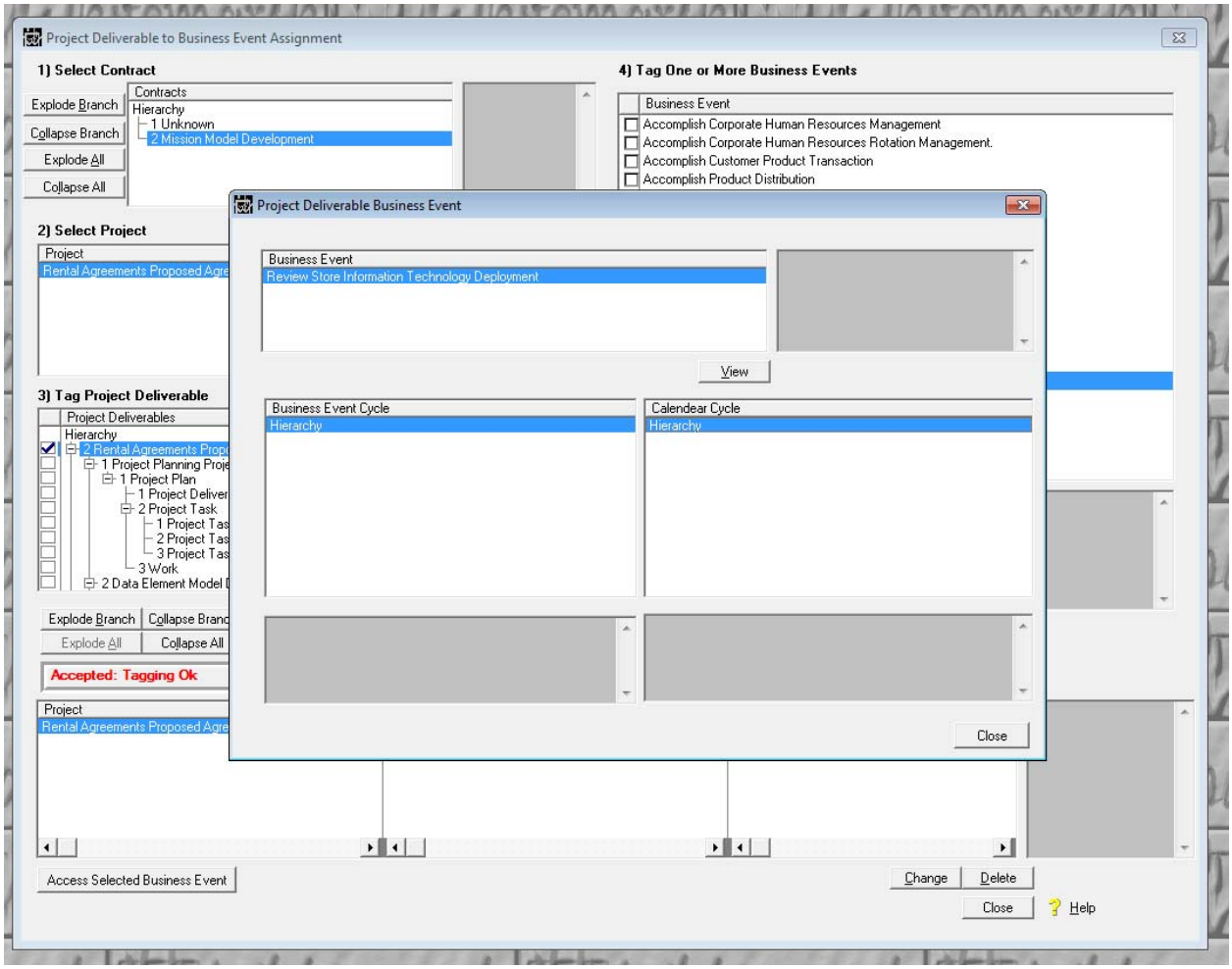

Figure 74. Project Deliverable, Business Event.

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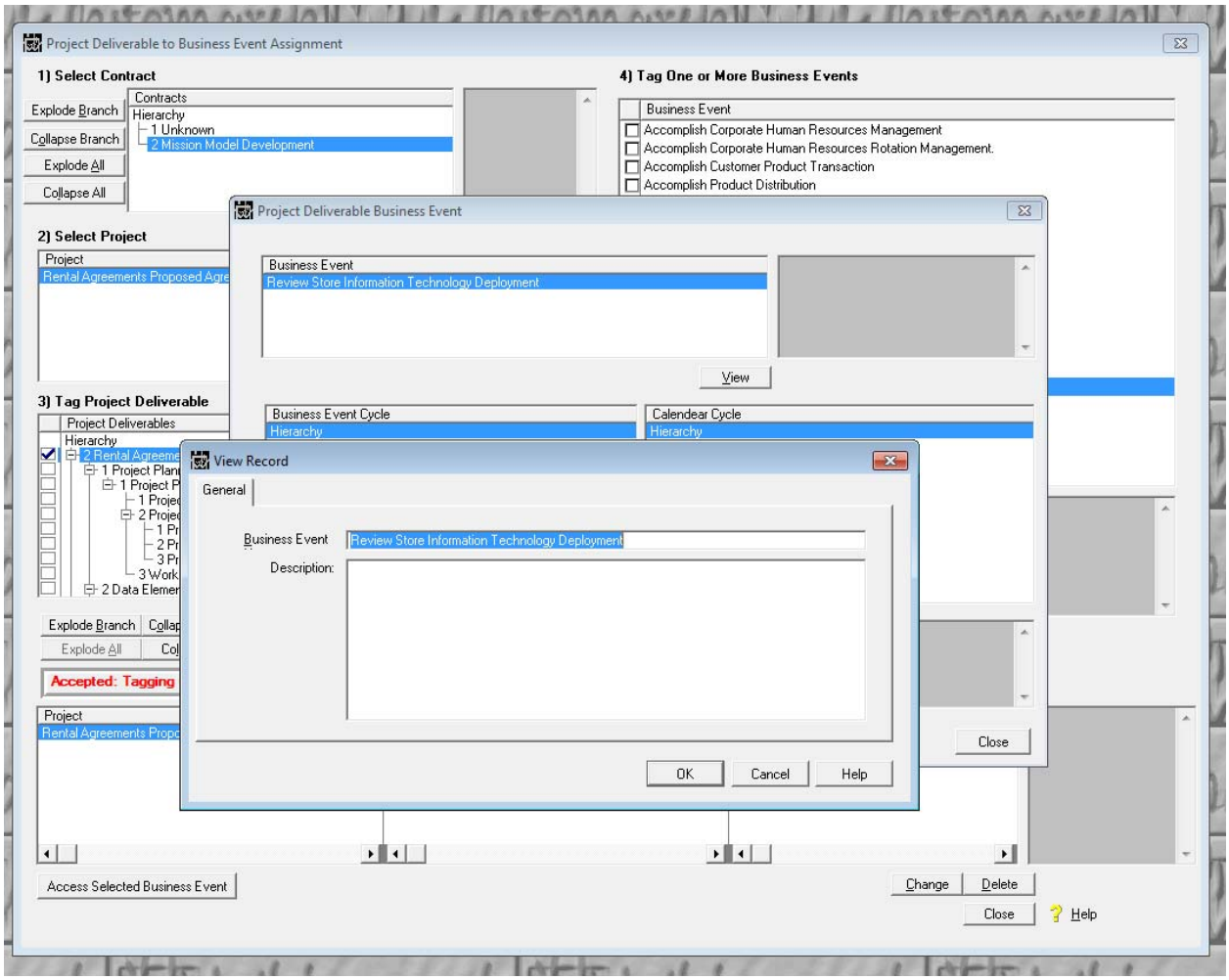

Figure 75. Project Deliverable Actual Data, Business Event.

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5.3.10.3.2 Project Deliverable Business Information System Assignment

The Project Deliverable Data Business Information System Assignment process, shown in Figure 76 enables the association of a Project Deliverables and one or more business information systems. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Business Information Systems.

The browse on the right enables the tagging one or more Business Information Systems.

Once all the appropriate Business Information Systems have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 76. To create a rationale for each association, press the Change button..

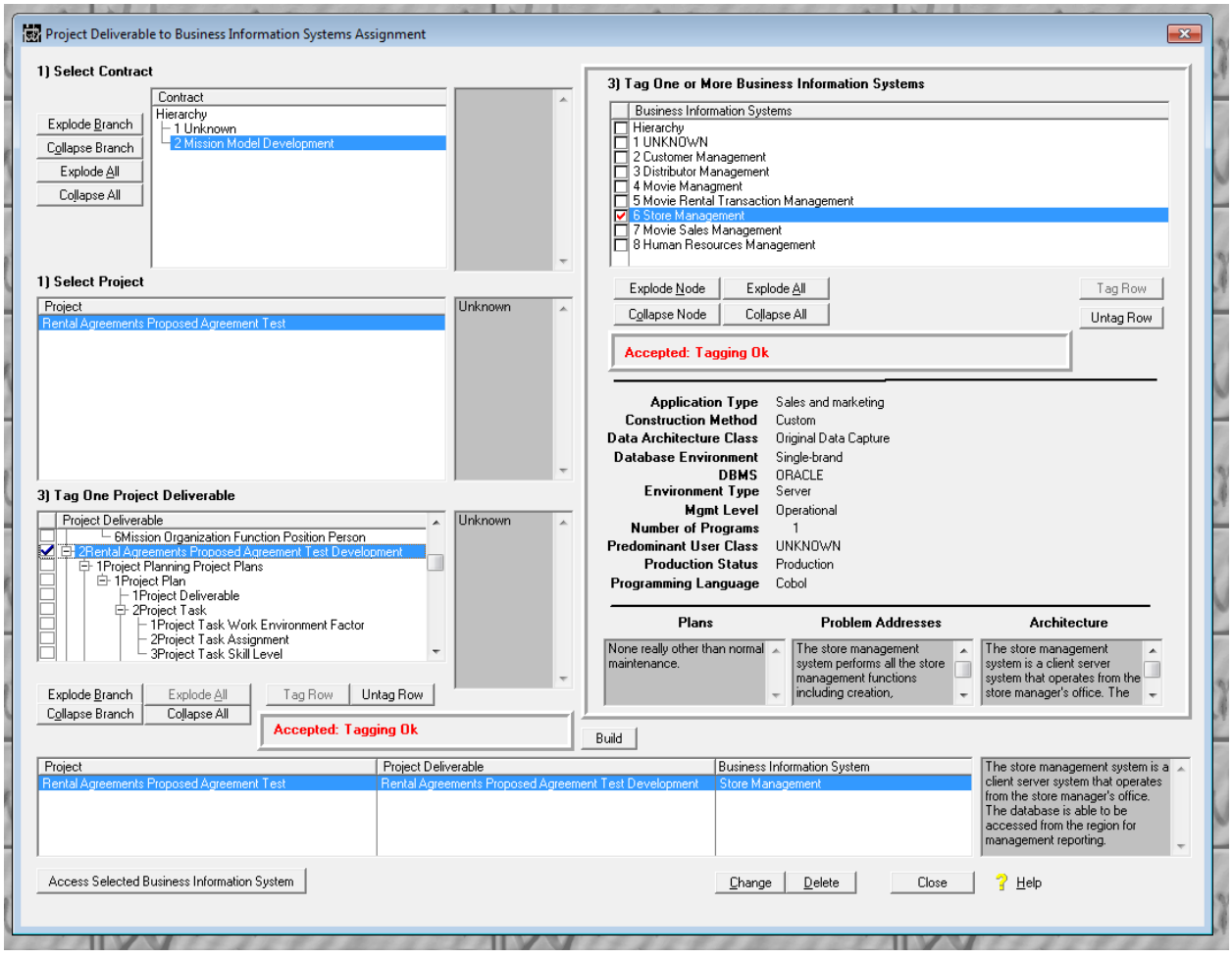

Figure 76. Project Deliverables Association, Business Information System.

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Figure 77, 78, and 79 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

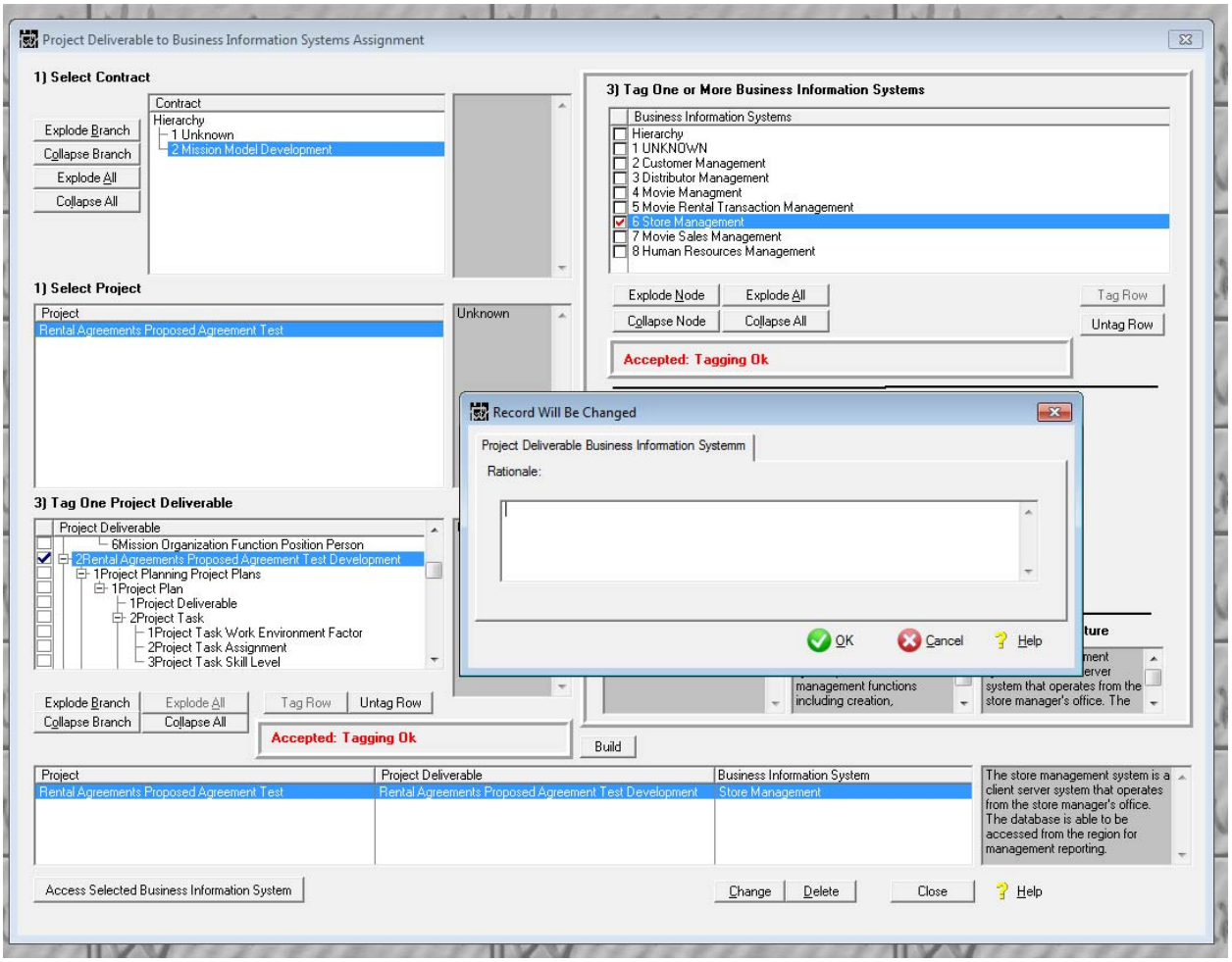

Figure 77. Project Deliverable Association Rationale, Business Information System.

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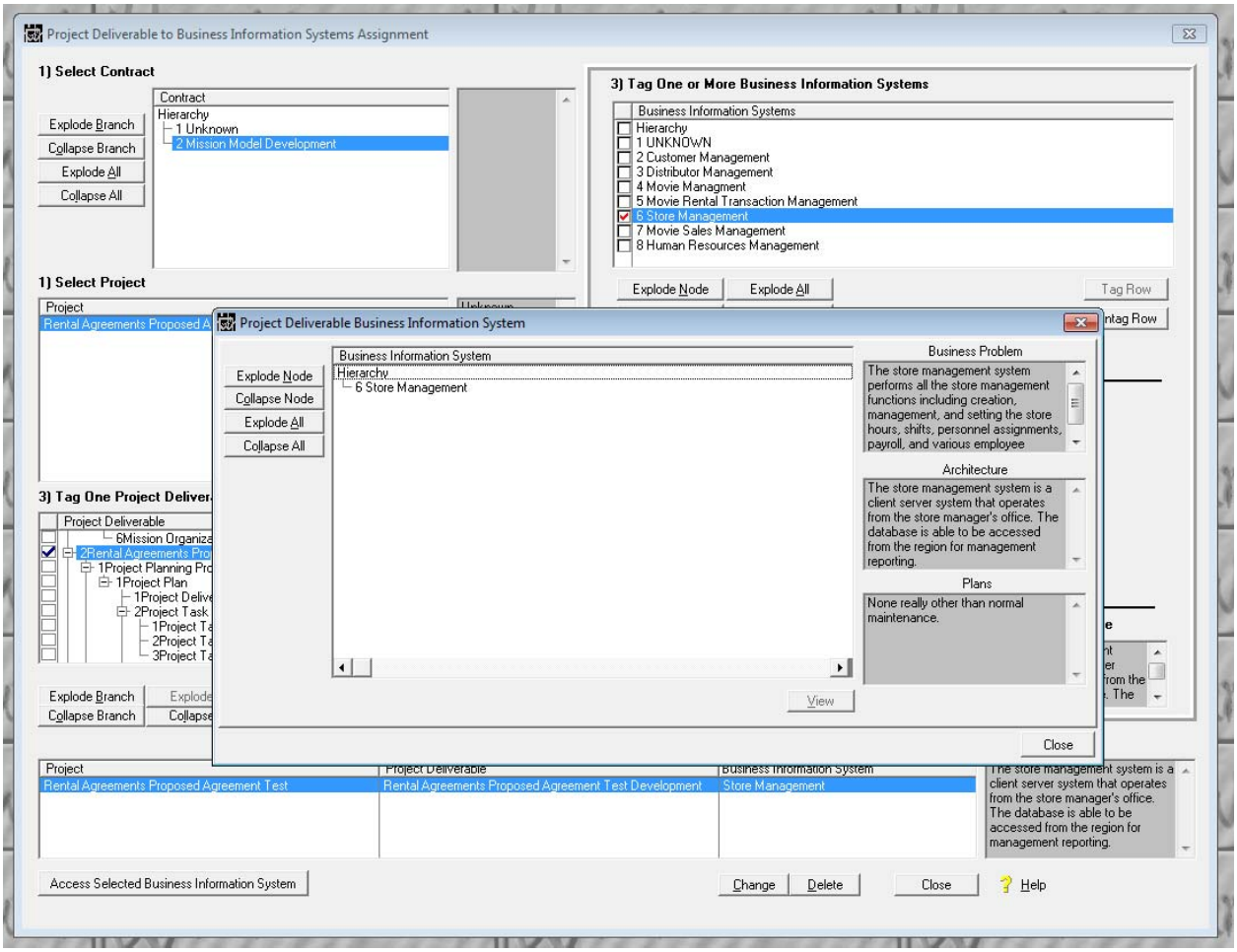

Figure 78. Project Deliverable, Business Information System.

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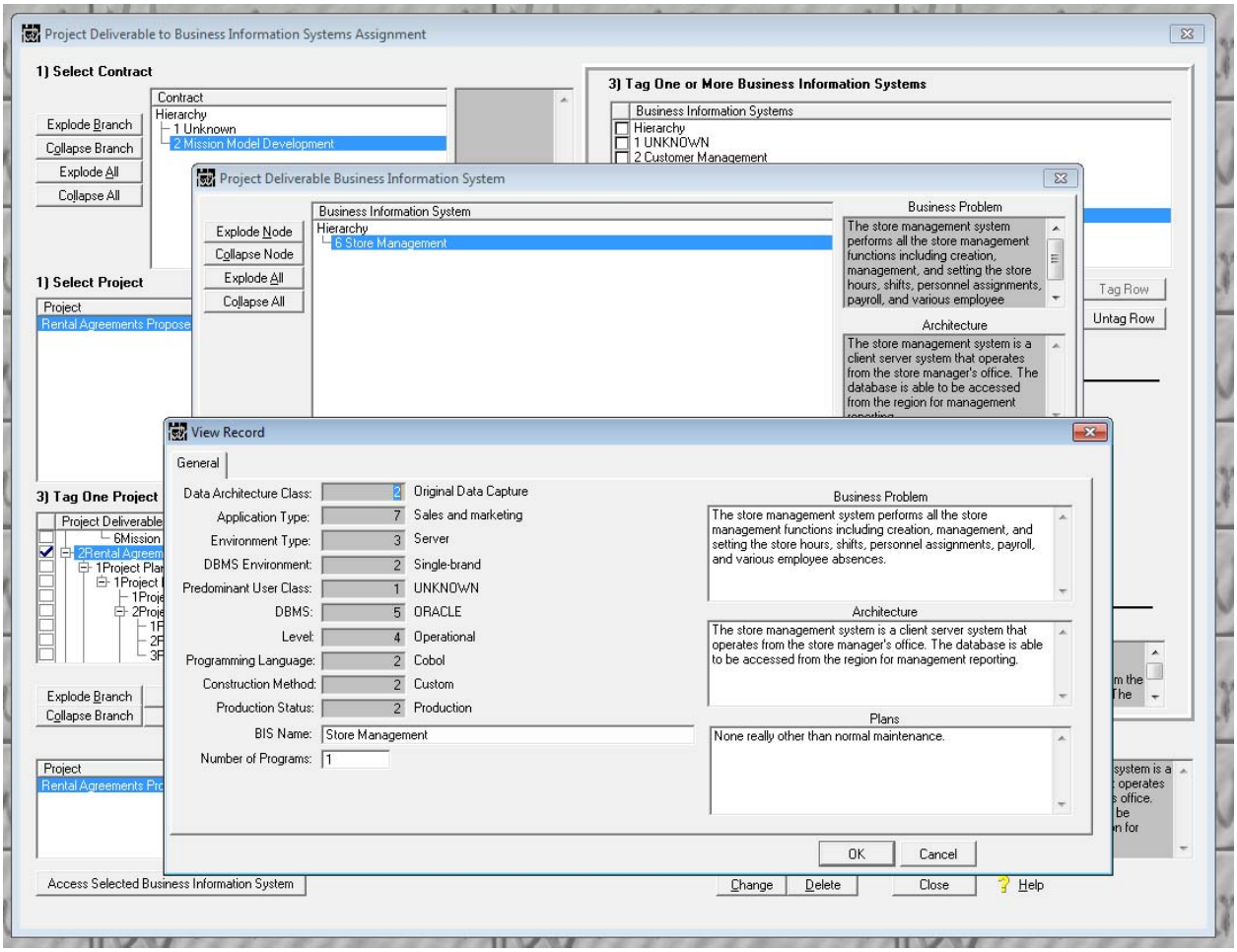

Figure 79. Project Deliverable Actual Data, Business Information System.

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5.3.10.3.3 Project Deliverable Use Case Assignment

The Project Deliverable Use Case Assignment process, shown in Figure 80 enables the association of a Project Deliverables and one or more Use Cases. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for the Use Case.

The browse on the right enables the selection and tagging one or more Use Cases.

Once all the appropriate Use Cases have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 80. To create a rationale for each association, press the Change button..

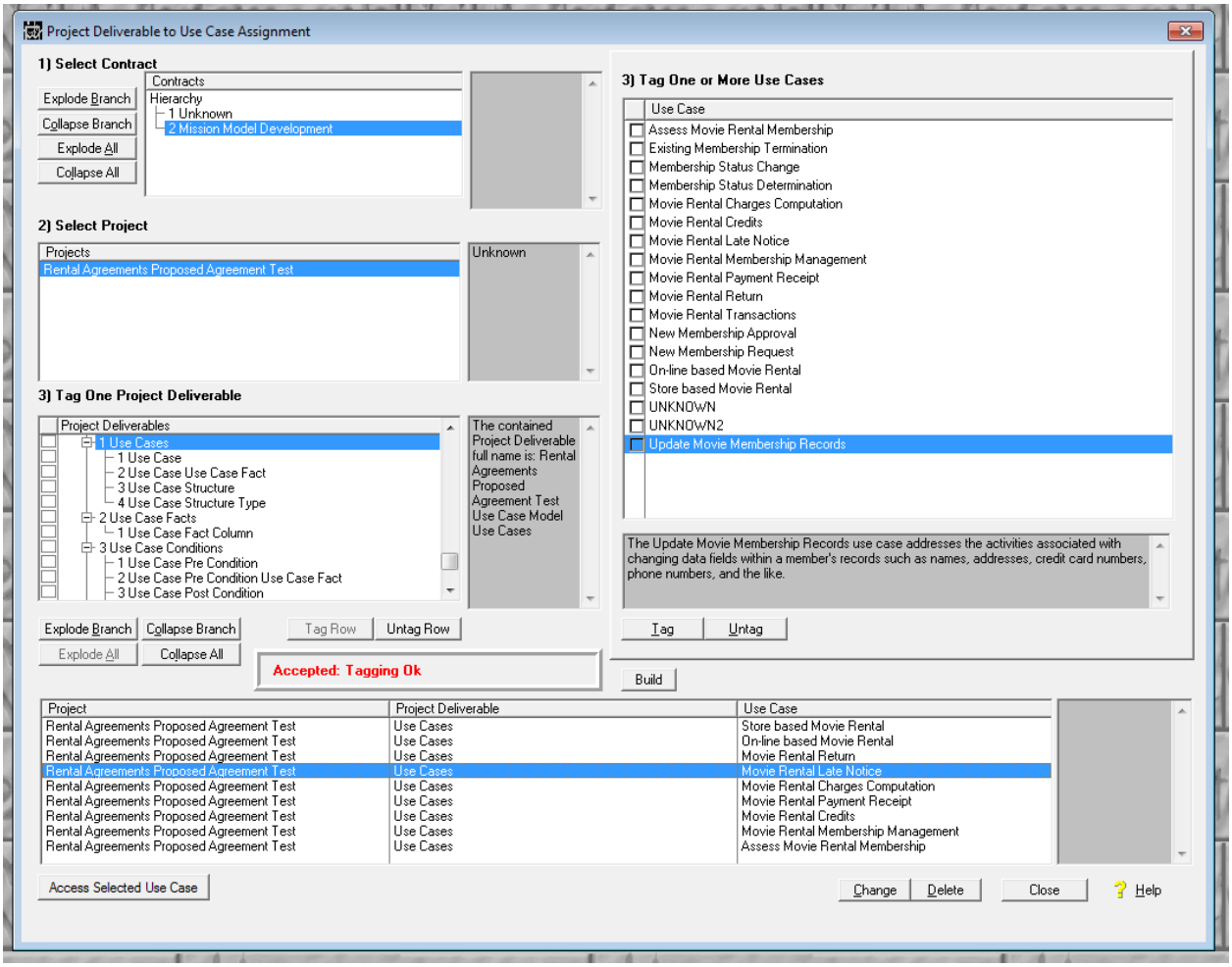

Figure 80. Project Deliverables Association, Use Case

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Figure 81, 82, and 83 show Rationale Update, the associated Project Deliverable, and the actual data for the specific Project Deliverable.

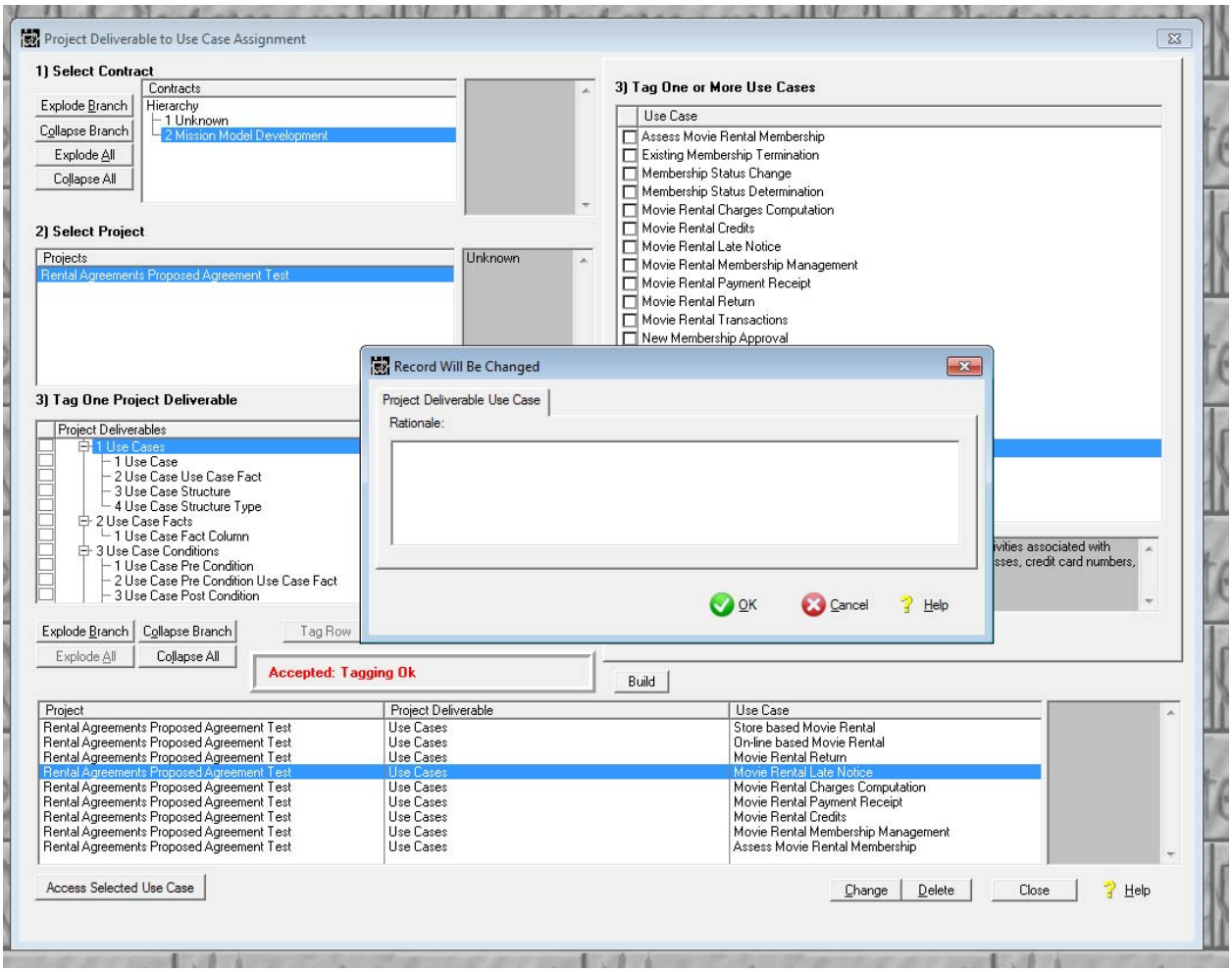

Figure 81. Project Deliverable Association Rationale, Use Case.

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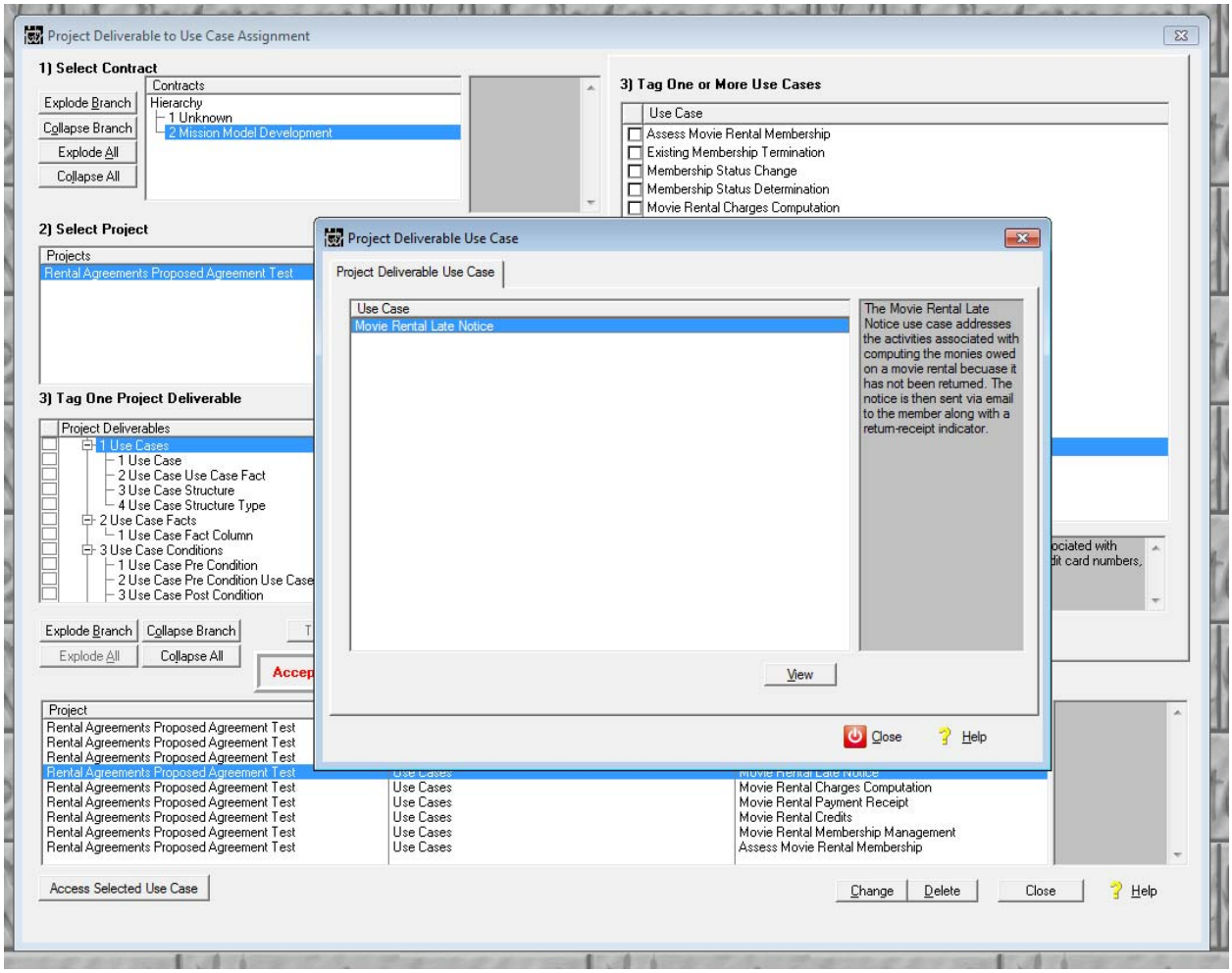

Figure 82. Project Deliverable, Use Case.

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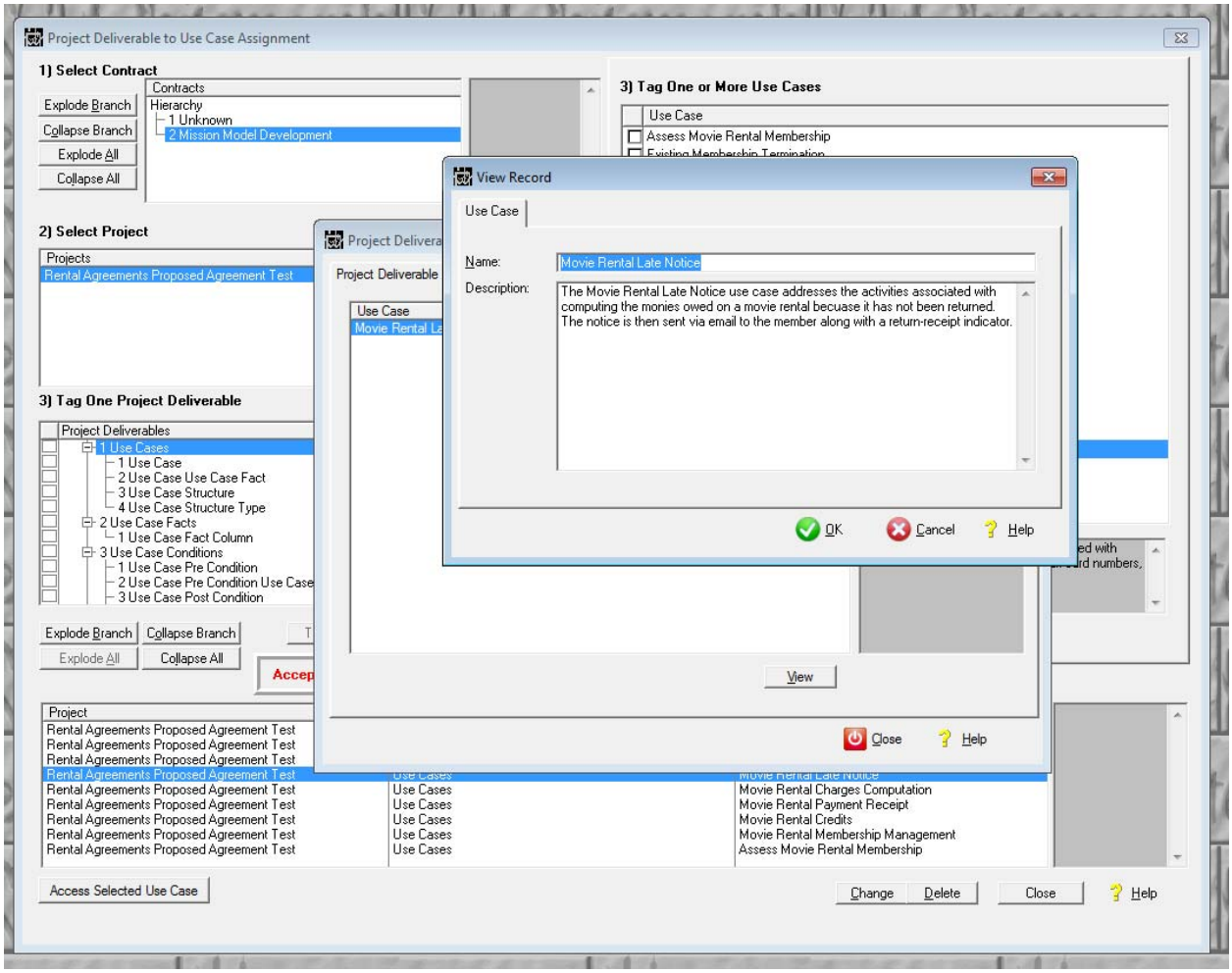

Figure 83. Project Deliverable Actual Data, Use Case.

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5.3.10.3.4 Project Deliverable User Acceptance Test Assignment

The Project Deliverable User Acceptance Test Assignment process, shown in Figure 84 enables the association of a Project Deliverables and one or more User Acceptance Tests. The browse on the left enables the selection of the Contract within which the project exists. Select the specific project, and finally, select and tag the Project Deliverable for User Acceptance Tests.

The browse on the right enables the selection and tagging one or more User Acceptance Tests.

Once all the appropriate User Acceptance Tests have been tagged, press the Build button. The associations are then shown in the browse at the bottom of Figure 84. To create a rationale for each association, press the Change button.

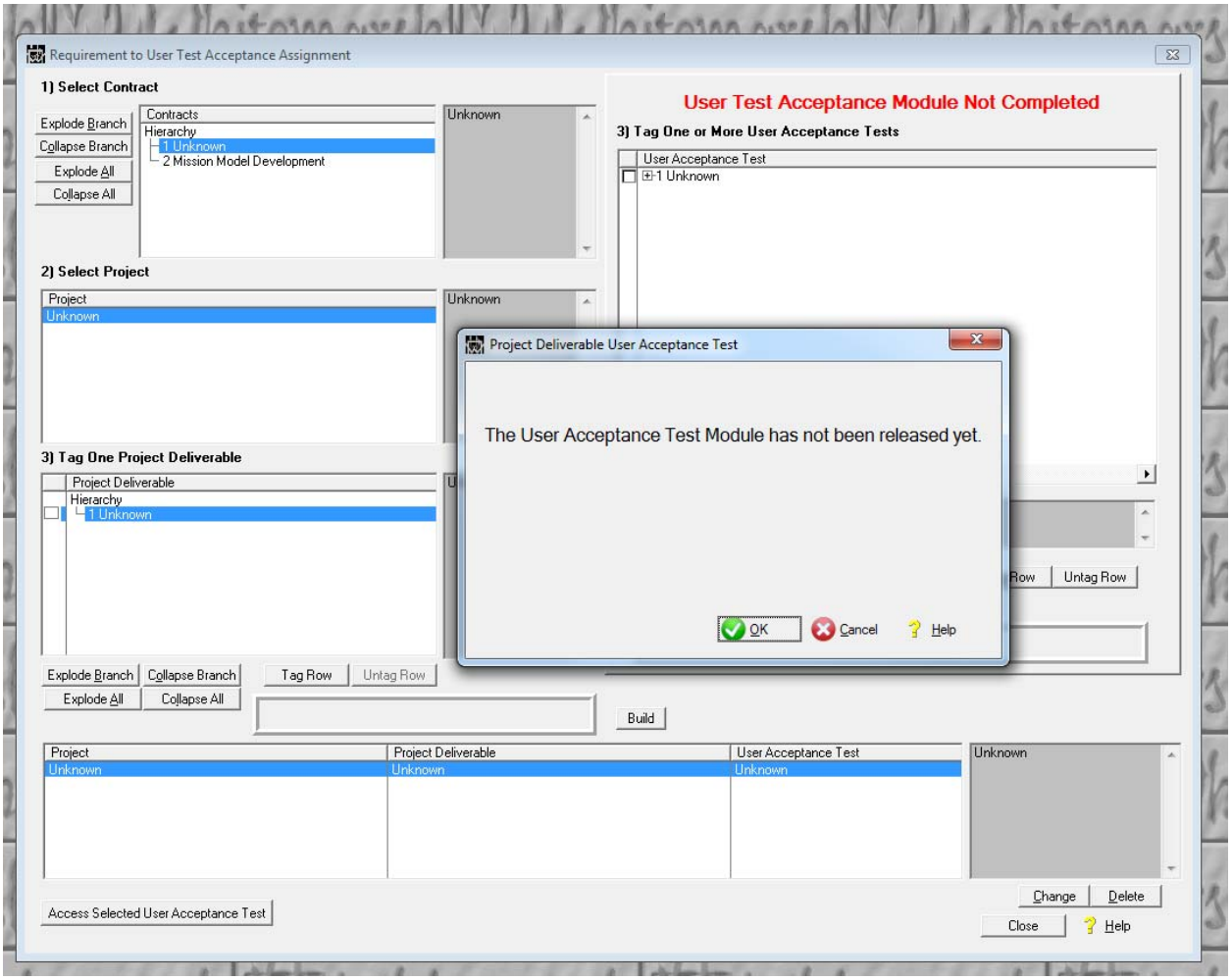

Figure 84. Project Deliverables Association, User Acceptance Test.

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5.3.11 Custom Project Work Plan Development

Candidate one-off projects should be carefully examined to determine if they are really one-off. That is, likely to never be repeated. That however, is almost always false. Thus it would be better to find a project-deliverable-task template combination and to clone it, and to modify the clone. That way it could be deployed through work plan generation.

But in the one-off case this is not true, find a project-deliverable-task template combination and clone it. Then add/delete/modify the generated subordinate project deliverables, and add/delete/modify the Project Tasks.

As already stated, Project Tasks are not tracked, estimated, have staff assigned to them, or even marked as completed. In fact, Project Tasks are just “Hints from Heloise.” That is, suggestions on what ought to be done in support of completing a Project Deliverable.

In Whitemarsh Project Management, what is tracked are the hours needed to complete a Project Deliverable, the start and end dates, the mapping of a completed deliverable to the actual deliverable, and finally, a review and evaluation of the completed deliverable by an independent assessor.

The process of complete project customization is set out in Table 5.:

Section Number	Section Name	Process Description
5.3.2	Project Creation and Update	The project creation and update establishes a new project by supplying the highest level of information for the project itself.
5.3.10.2	Project Deliverables Assignments	The project deliverable assignment process enables the creation of assignments between projects and project-template deliverable-template pairs. Once a project deliverable is created, two of the project deliverable characteristics, parallel/serial, and divisible status can be changed.
5.3.10.1	Project Deliverables	The Project Deliverables process presents the current set of project deliverables and project tasks for a given project and then enables changes to certain previously computer generated values.
5.3.10.3	Project Deliverables Person Skill Level Assignment	The project deliverables person skill level assignment process enables the selection of a project deliverable and assigning to that project deliverable one or more work environment factors.
5.3.10.4	Project Deliverables Work Environment Factor Assignment	The project deliverables work environment factor assignment process enables the selection of a project deliverable and assigning to that project deliverable one or more work environment factors.
5.3.9	Deliverable Template and Task Template to Project	The Deliverable Template And Task Template To Project Deliverable Assignments process enables the customized creation

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Section Number	Section Name	Process Description
	Deliverable Assignments	of a project task rather than through the automated generation that was based on selecting one or more project templates.
5.3.11.1	Project Tasks	The Project Tasks process enables the creation of a specific project task without regard to whether the added and/or modified task already exists within the collection of tasks in a Task Template. Once added and/or modified, the Task Template remains unchanged.
5.3.7	Project Resource Generation	Once a Project Plan is generated and all project persons and work environment factors have been allocated, the overall set of project resources is generated. This is generally accomplished by multiplying individual Project Deliverable (and subordinate project deliverables) by unit efforts and quantities. Thereafter, these unfactored quantities of hours are multiplied by the person skill level multipliers and then by the work environment multipliers. Once these factored hours are determined, the serial or parallel indicators for projects are determined and the overall duration of a project deliverable is computed. The entire project plan is then able to be printed.

Table 5. Custom Development of a Project, its Project Deliverables, Project Tasks, and Project Resource Generation.

5.3.12 Work

As projects are executed, a daily critical step must be performed: Record Work. The process of recording work is shown in Figure 85. This is accomplished by isolating the Project Deliverable and within that Project Deliverable, selecting the person performing work, and pressing Insert. Figure 86 is then brought up.

Isolating the Project Deliverable Person Skill Level record is accomplished by selecting the correct Resource Type, then Resource, and finally Resource Life Cycle Node. This presents a collection of Projects. Select the correct project Deliverable from among the displayed Project Deliverables. Finally, select the appropriate Project Deliverable Person Skill Level record, and press the Insert bottom.

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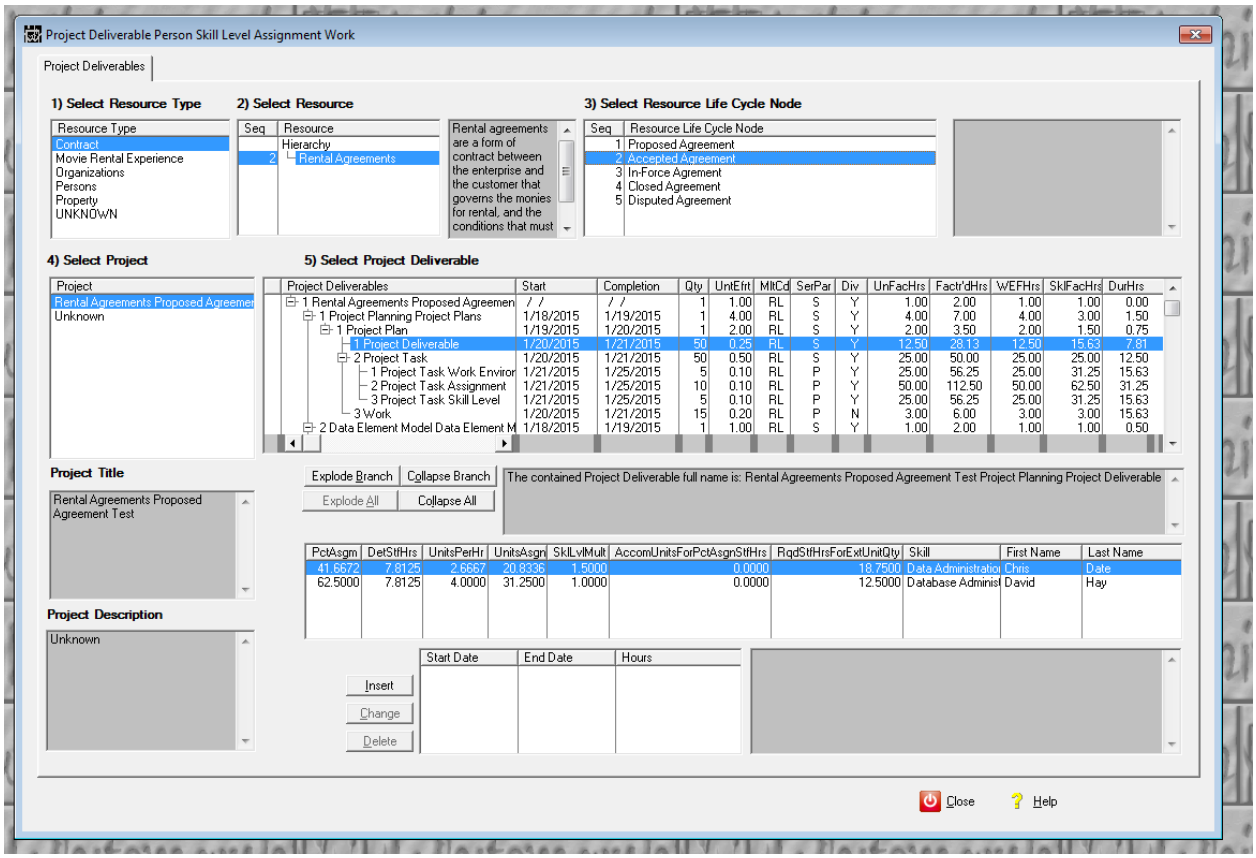

Figure 85. Recording Work Details During Project Execution.

In the example shown in Figure 86, 8 hours was expended on May 4, and there were 32 Data Elements fully specified as a consequence of reverse engineering business reports.

A key benefit from this work recording approach is that work hours are set directly against the Project Deliverables the work is accomplishing. Because of the direct relationship of expended hours to Project Deliverables, earned value reports are immediately able to be computed and the representation of completion in terms of percent can be exact.

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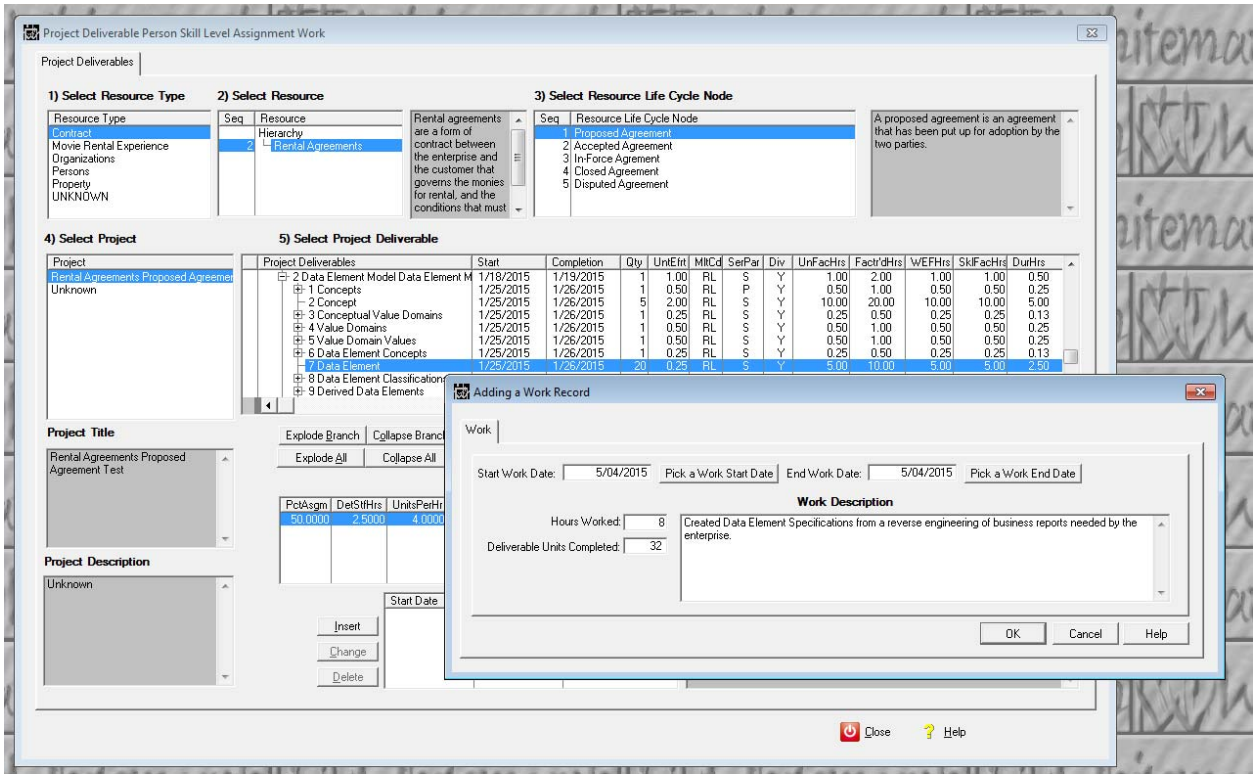

Figure 86. Recording Project Deliverable Work accomplishment.

5.3.13 Baseline Management

Immediately after a project is planned and execution is begun, a baseline should be taken to preserve the current set of values of that project. The two processes, shown in Figure 87 are:

- Baseline inventory, which lists all the currently created baselines.
- Baseline management, which includes the processes necessary to create baselines.

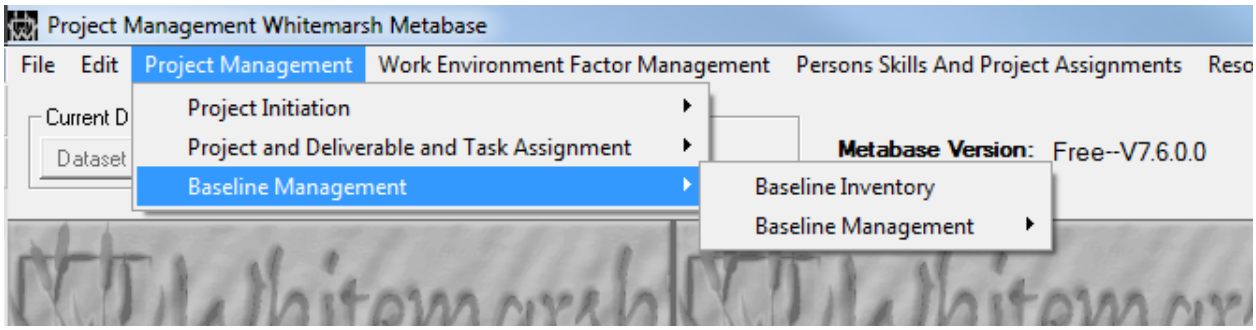

Figure 87. Baseline Management.

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5.3.14 Baseline Inventory

Figure 88 lists the current set of Baselines accomplished during the execution of a project. The screen's first browse shows Baseline Types. There also a Detail View button that displays all the fields associated with the Baseline Type.

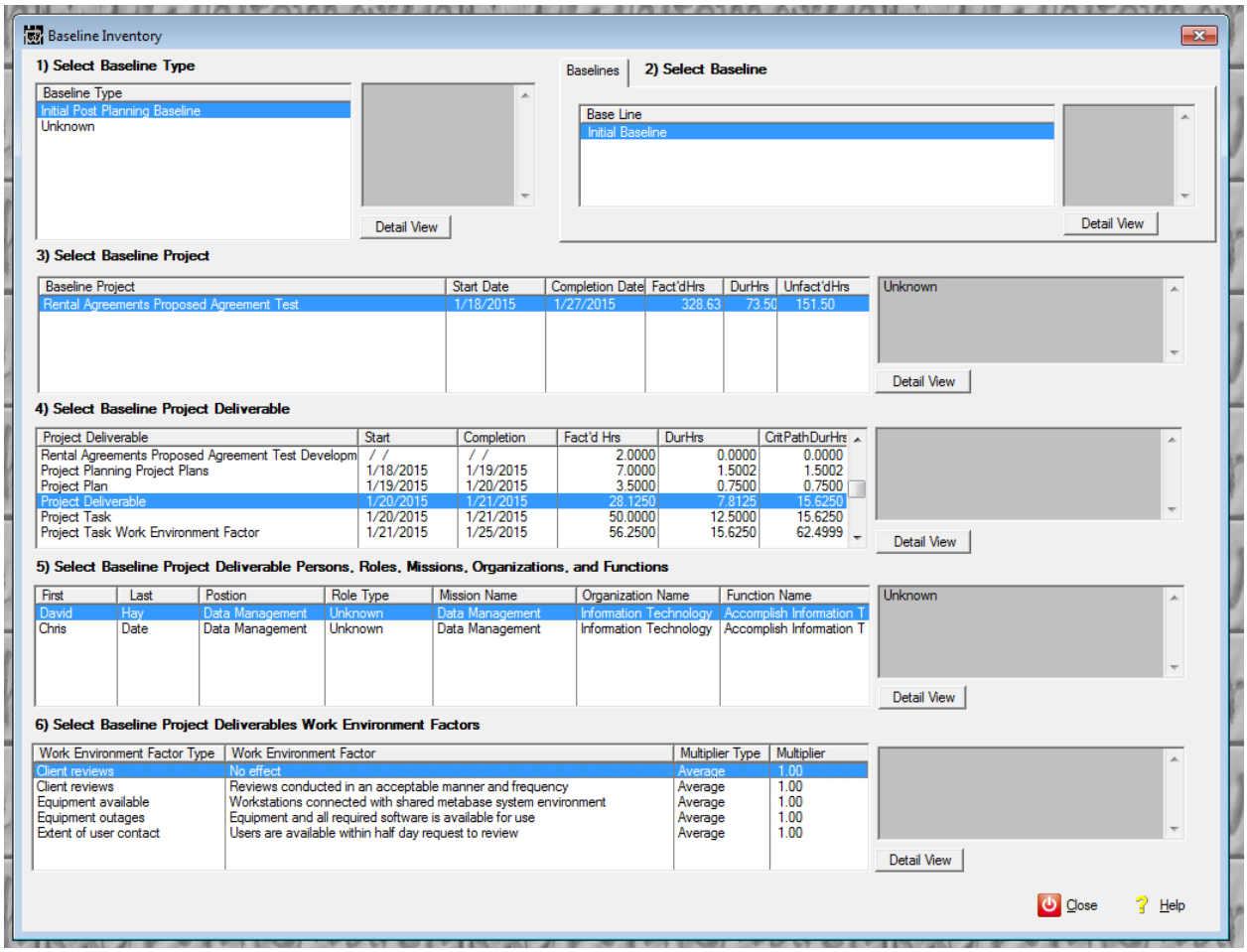

Figure 88. Baseline Inventory.

The adjacent browse shows the baseline type's contained Baselines. It too contains a Detail View button that displays all the fields associated with the Baseline.

Baselines can be the repository of multiple projects created at the same time. As with the other browses, the Detail View button that displays all the fields associated with the projects associated with the Baseline.

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Each Baseline Project can be the repository of a selected set of Project Deliverables. These are shown in the next browse. The necessary data to reflect the captured Project Deliverable can be viewed through the Project Deliverable's Detail View button.

The next browse includes the listing of the various persons, skills, and the mission-organization-functions from which they have been assigned to participate in project deliverable work. Associated with this browse is the Detail View button that presents the captured data to understand the associated person, skill, and organizational context data.

Finally, at the bottom of this screen is the Work Environment Factors associated with the Baseline. Contained too is the Detail View button that presents the captured data to understand the associated work environment factors.

Figure 89 presents the Detail View data for a baseline captured Project Deliverable. The other view detail buttons contains data appropriate for their context. That is, Baseline type through to Work Environment Factors.

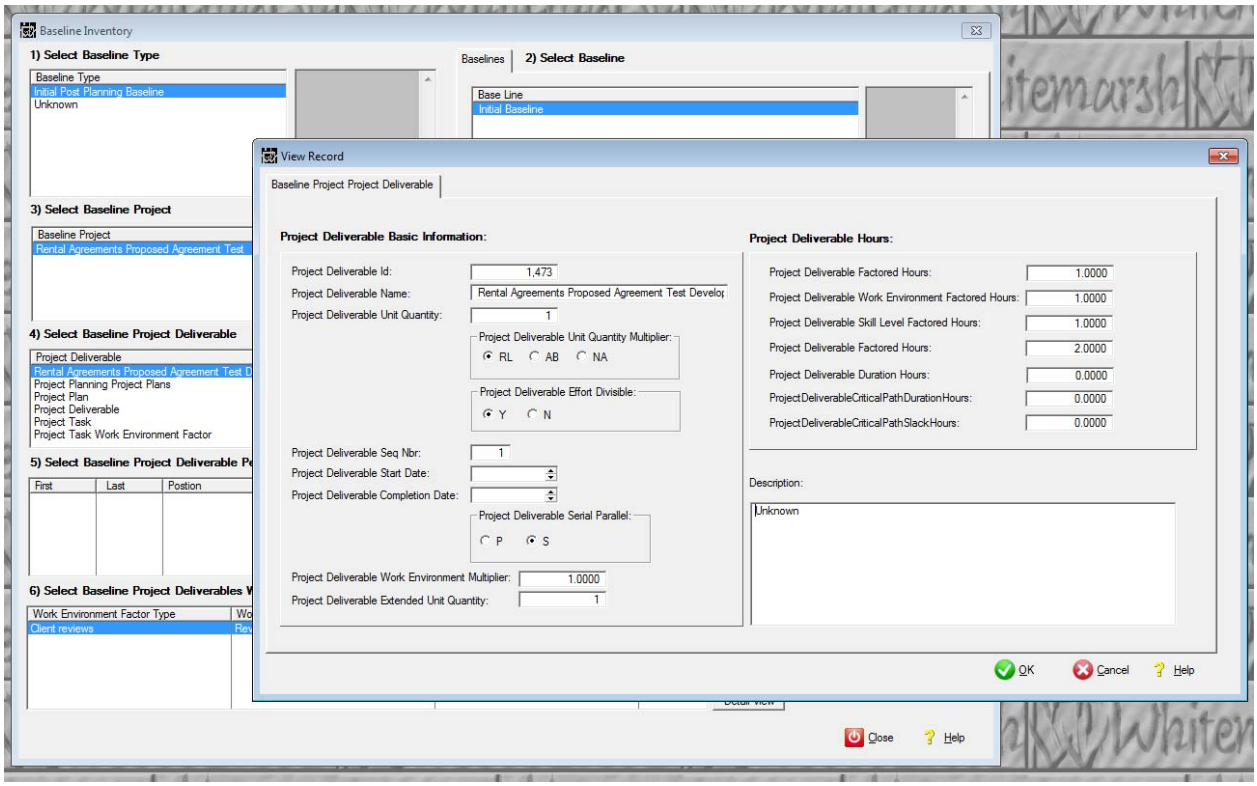

Figure 89. Project Deliverable Baseline captured data.

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5.3.15 Baseline Management

Figure 90 shows the names of the processes that manage the creation and management of baselines. These processes are:

- Baseline Types
- Baselines
- Baseline Projects
- Baseline Project: Project Deliverable Assignments
- Baseline Project: Project Deliverable Person Skill Level Assignments
- Baseline Project: Project Deliverable Work Environment Factor Assignments.

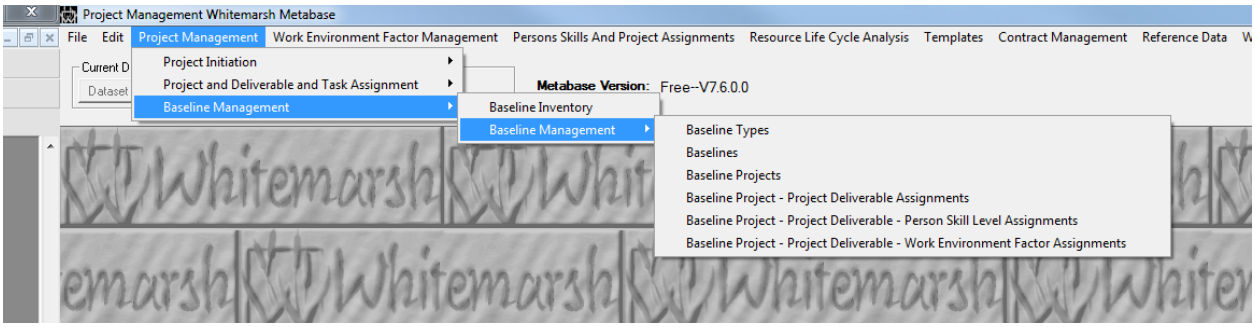

Figure 90. Baseline Management processes.

5.3.15.1 Baseline Types

Baseline types represent collections of benchmarks such as Initial, Interim, Final, or Closeout. Figure 91 sets out a list of Baseline Types.

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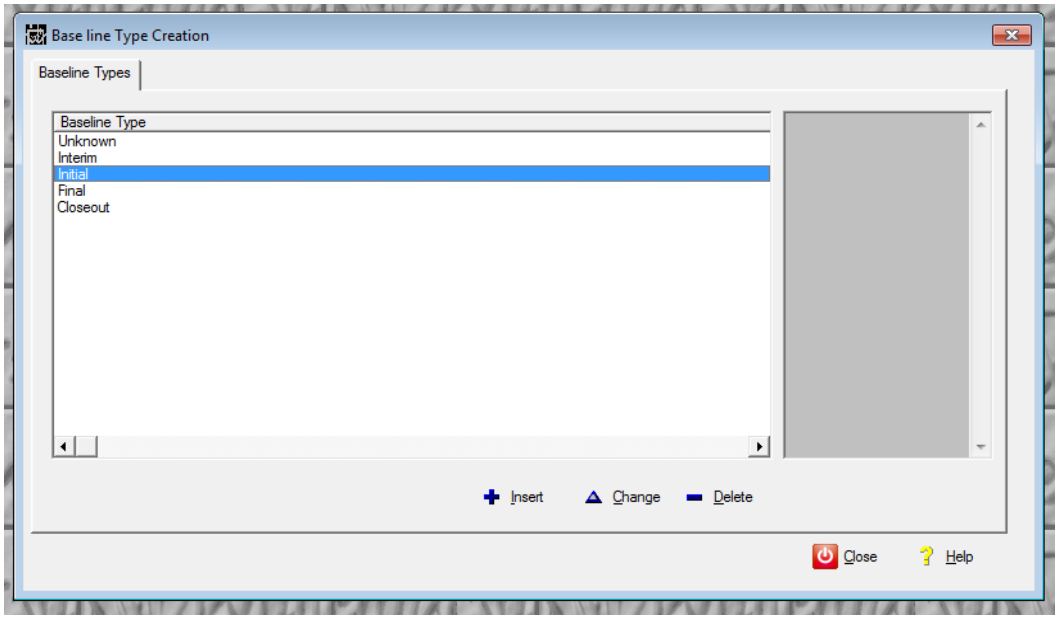

Figure 91. Baseline Types.

Figure 92 shows the update screen for the a selected Baseline Type. This screen enables the naming and describing a Baseline Type.

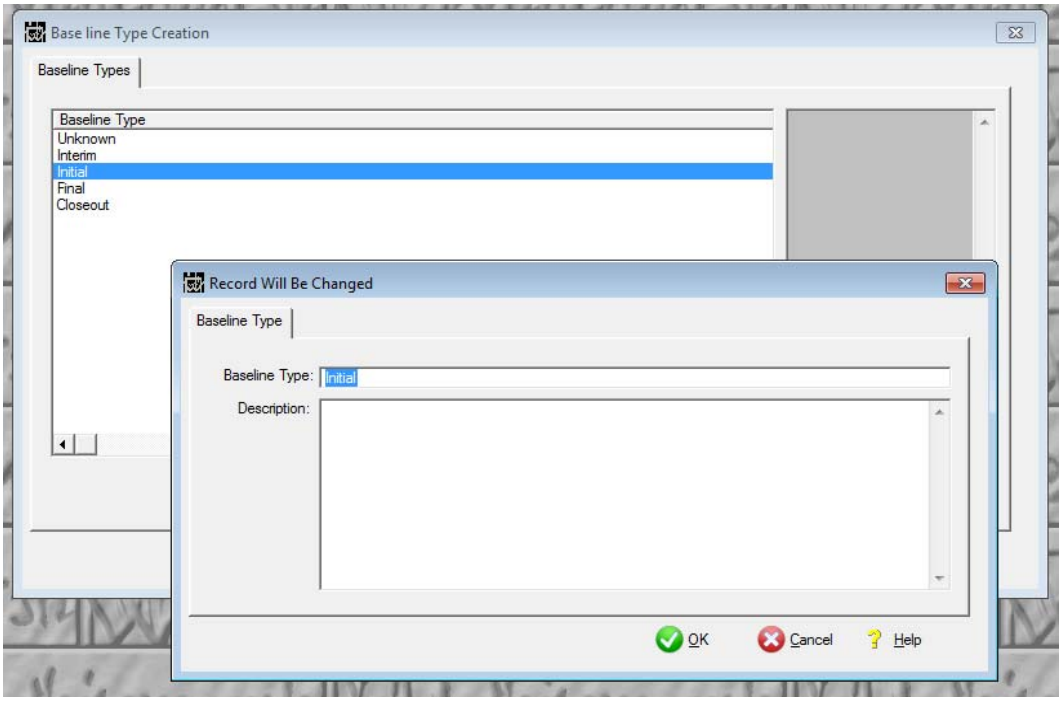

Figure 92. Baseline Type Creation.

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5.3.15.2 Baselines

Figure 93 shows the screen for creating a baseline. The top browse lists the Baseline Type. Once a baseline type is selected, the specific baselines within a baseline type are shown. To create/update a baseline, press the Insert/Change button. Figure 94 is then displayed.

The information able to be collected for a baseline is its date, name and description.

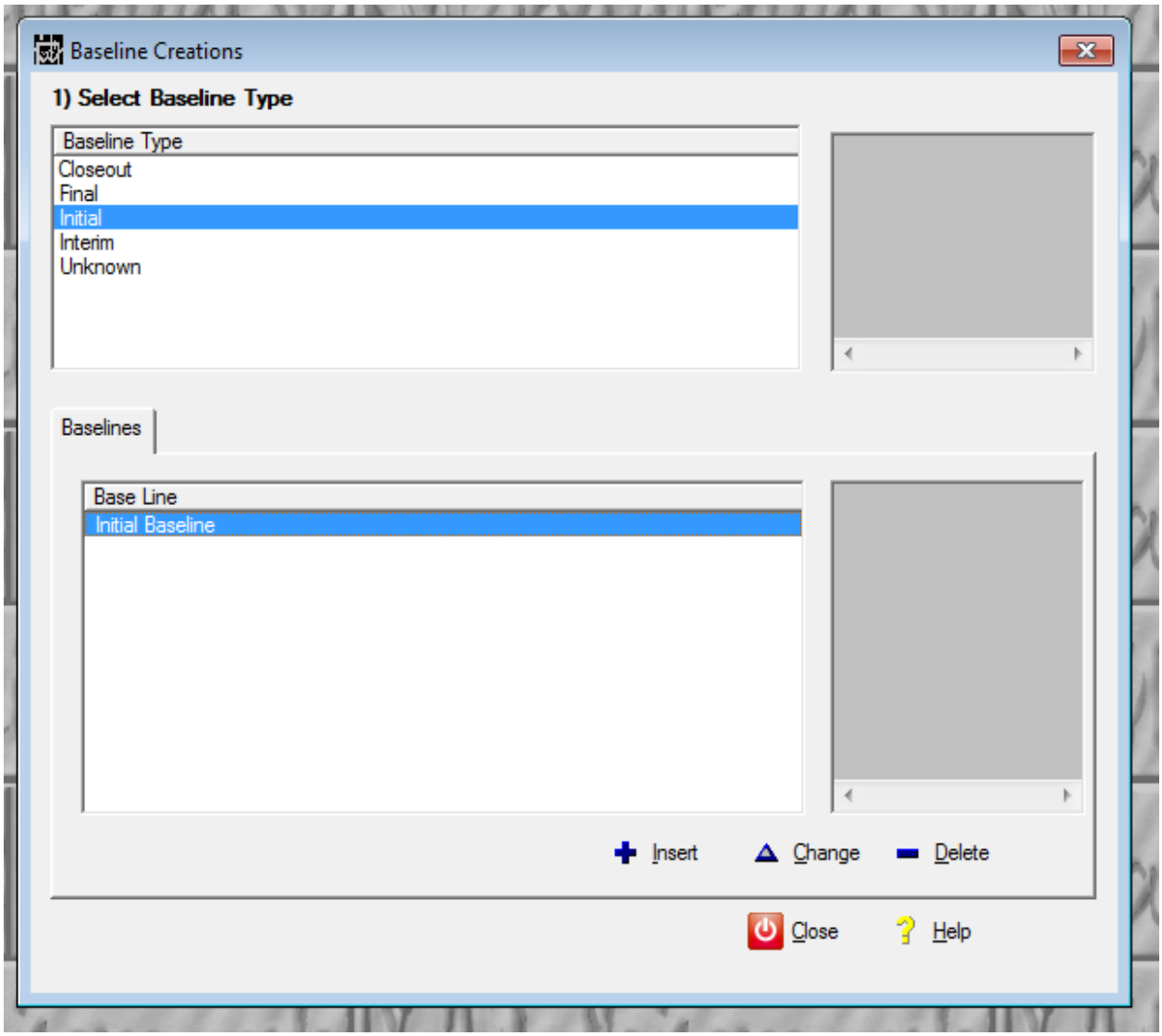

Figure 93. Baselines.

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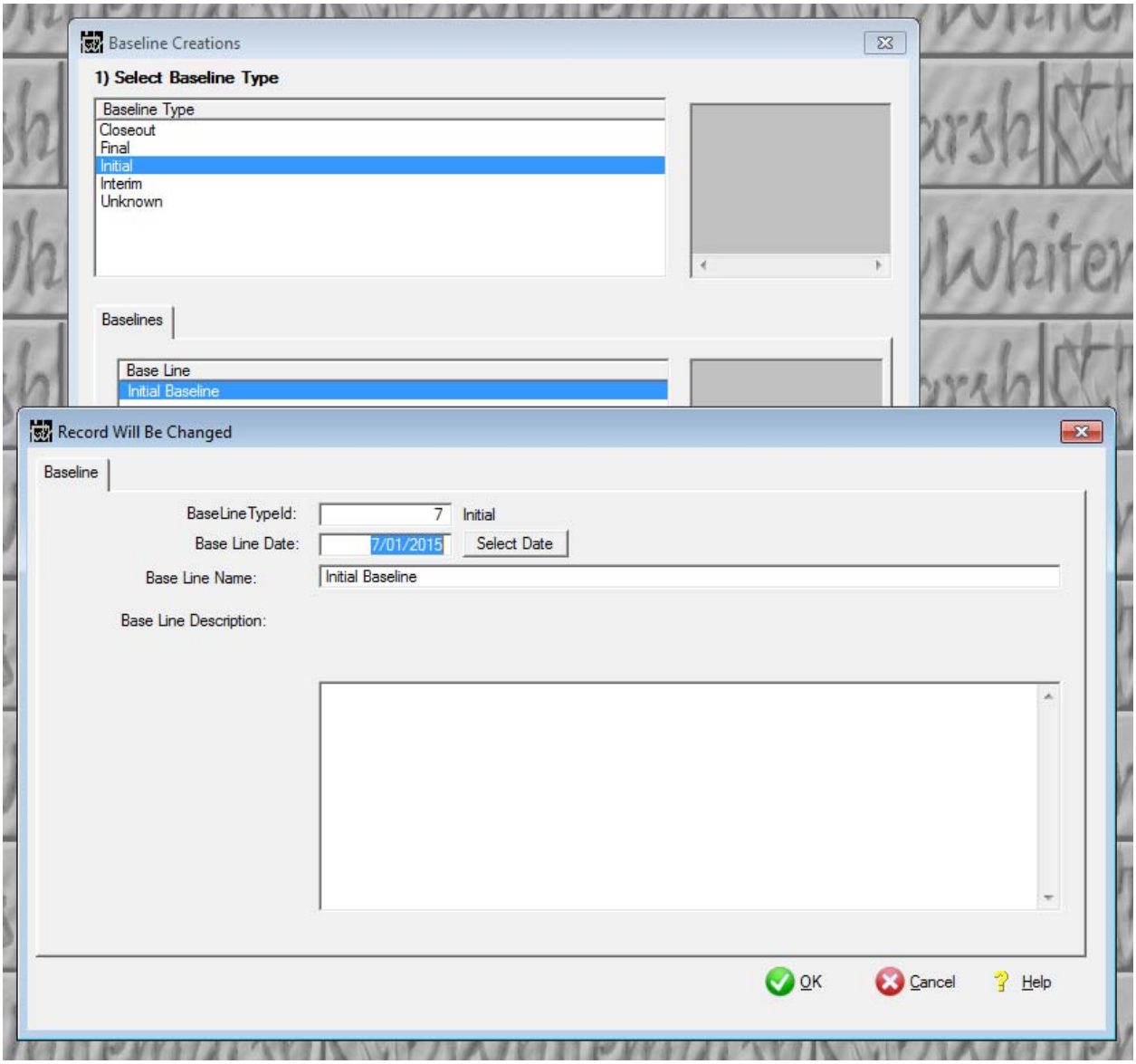

Figure 94. Baseline Update.

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5.3.15.3 Baseline Projects

Baseline Projects are created through the association of a baseline with one or more projects. In Figure 95, select a baseline type from the left side. From the displayed baseline, tag one baseline. On the right side of the window, select and tag one or more projects.

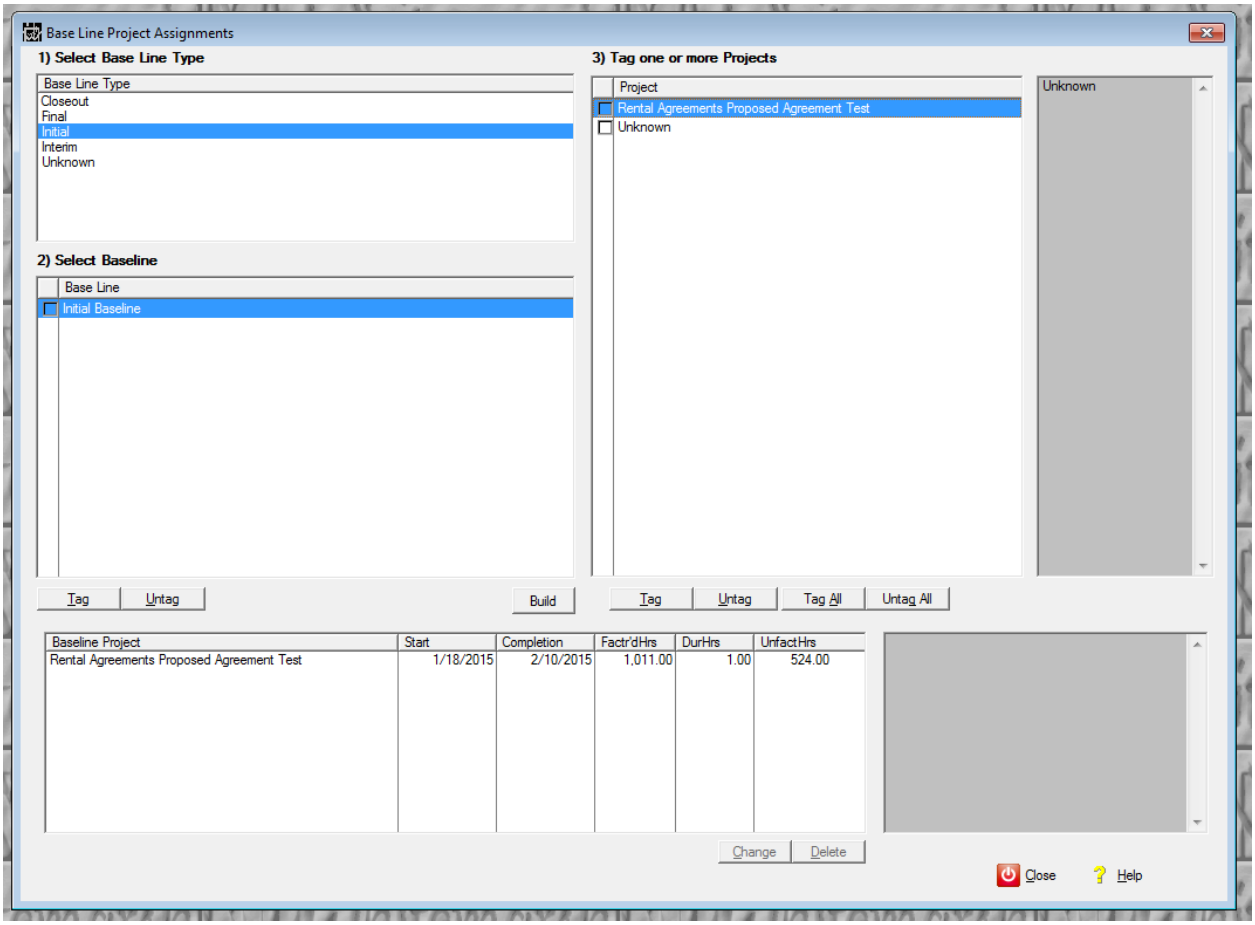

Figure 95. Baseline Projects.

Once the tagging is complete, press the Build button. The created Baseline Projects are shown at the bottom of the window.

Figure 96 shows the key values associated with each of the projects captured in the baseline project. A description of the purpose of capturing a project within a given baseline can be provided in at the bottom of Figure 96,

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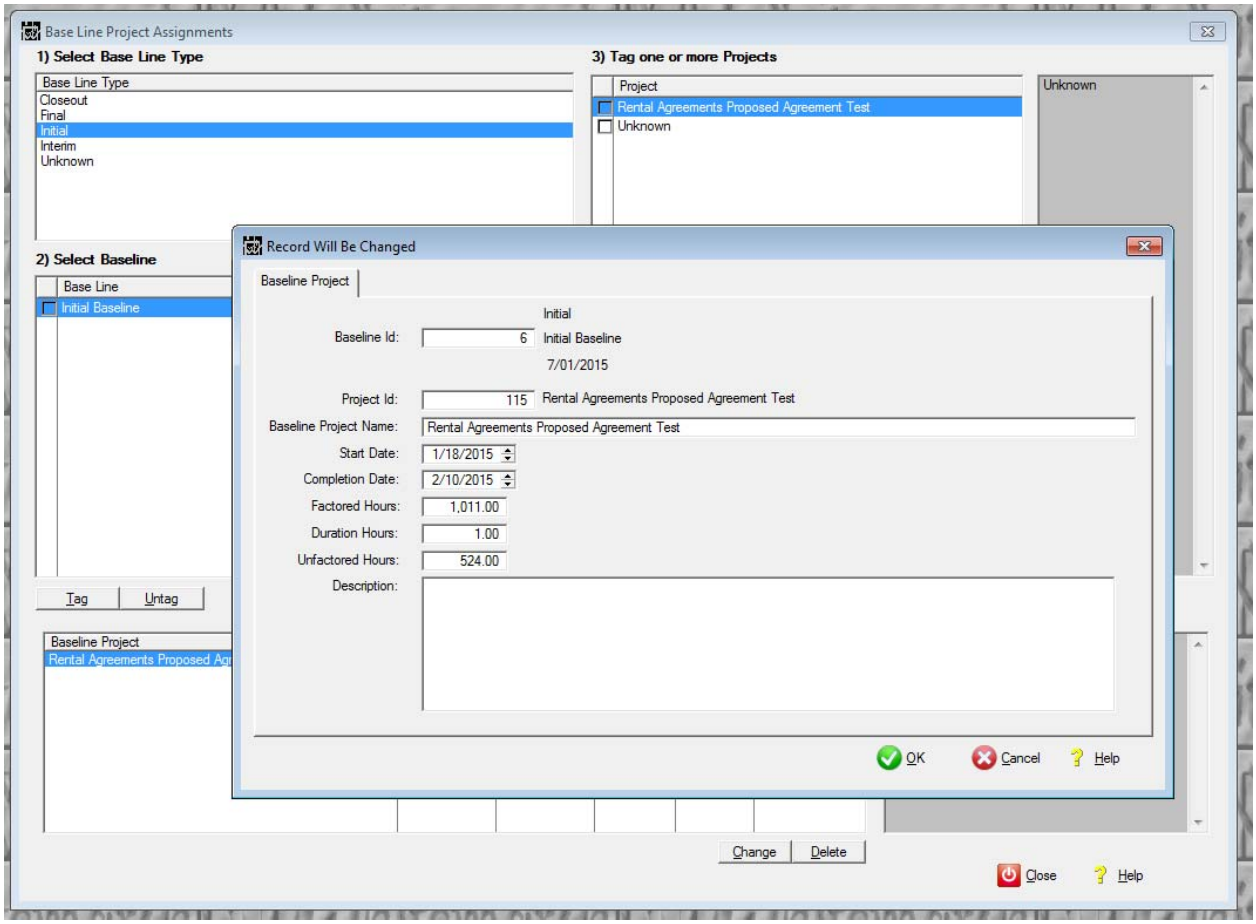

Figure 96. Baseline Project Assignment Update.

5.3.15.4 Baseline Project - Project Deliverable Assignments

Baseline-Project Project-Deliverables are created through the association of a baseline project with one or more project deliverables. In Figure 97, on the left side of the windows, select the Baseline Type, and then within the set of displayed Baselines, select one, and finally within the set of Baseline Projects, select and tag one Baseline Project.

On the right side of the window, select a Project. Then from within the set of Project Deliverables, tag one or more. Then press the Build button. The set of Baseline-Project Project-Deliverables are created and displayed at the bottom of Figure 97.

During the creation of the Baseline-Project Project-Deliverables records the baseline records for Baseline Project - Project Deliverable - Person Skill Levels and Baseline Project - Project Deliverable - Work Environment Factors are automatically created.

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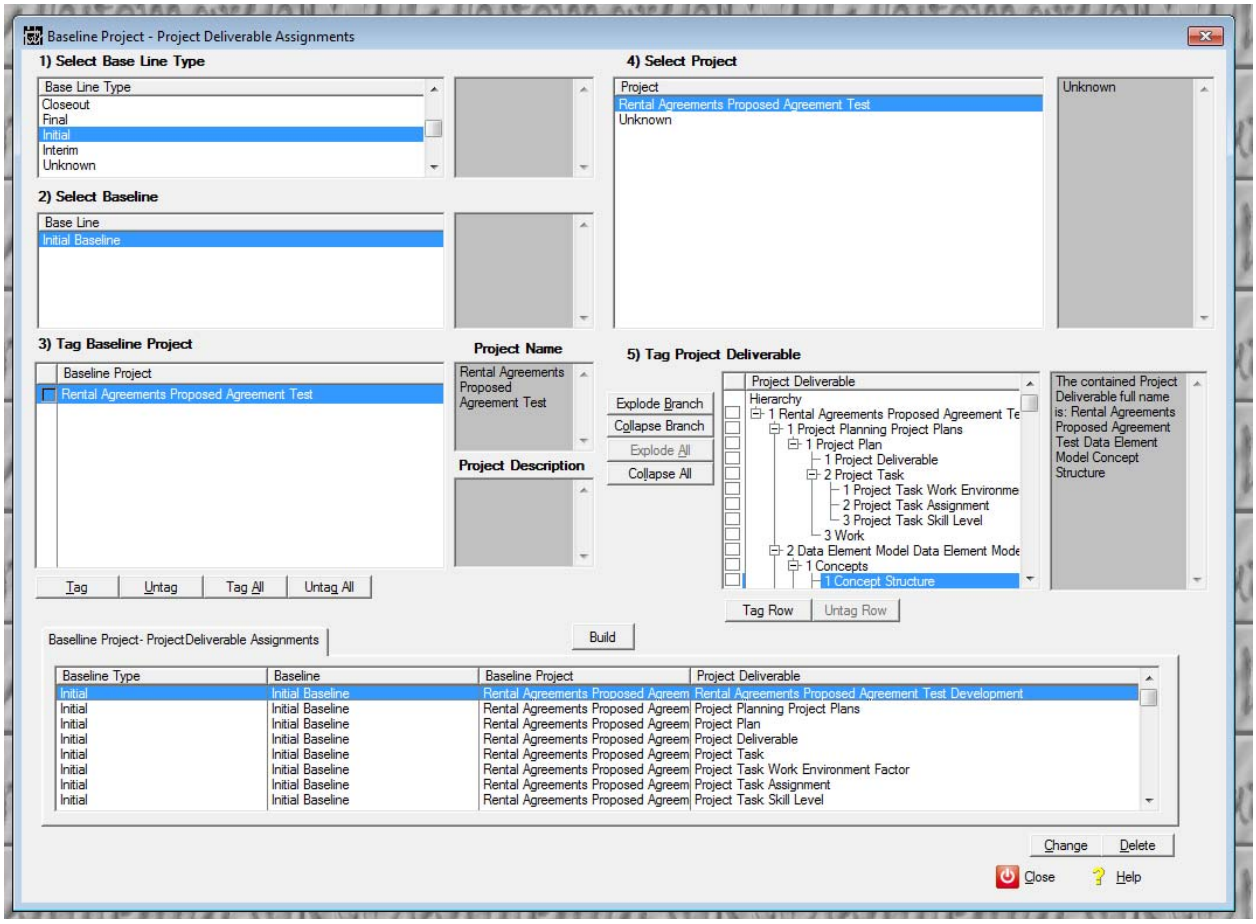

Figure 97. Baseline Project - Project Deliverable Assignments

By selecting and pressing Change for one of the created Baseline-Project Project-Deliverables, Figure 98 is displayed. That screen shows the data that is captured from the Project's actual Project Deliverable.

This data includes:

- Project Deliverable Name
- Project Deliverable Quantity
- Project Deliverable Unit Quantity Multiplier
- Project Deliverable Divisibleness Indicator
- Project Deliverable Sequence
- Project Deliverable Start and End Dates
- Project Deliverable Serial or Parallel
- Project Deliverable Work Environment Factor Multiplier
- Seven different types of different Project Deliverable hours

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5.3.15.5 Baseline Project - Project Deliverable - Person Skill Level Assignments

As stated in Section 5.3.15.4 Baseline Project - Project Deliverable Assignments, the Baseline Project - Project Deliverable - Person Skill Level records are automatically created. These records are shown in Figure 99 by selecting Baseline Type, then Baseline, Baseline Project, and Baseline Project - Project Deliverable.

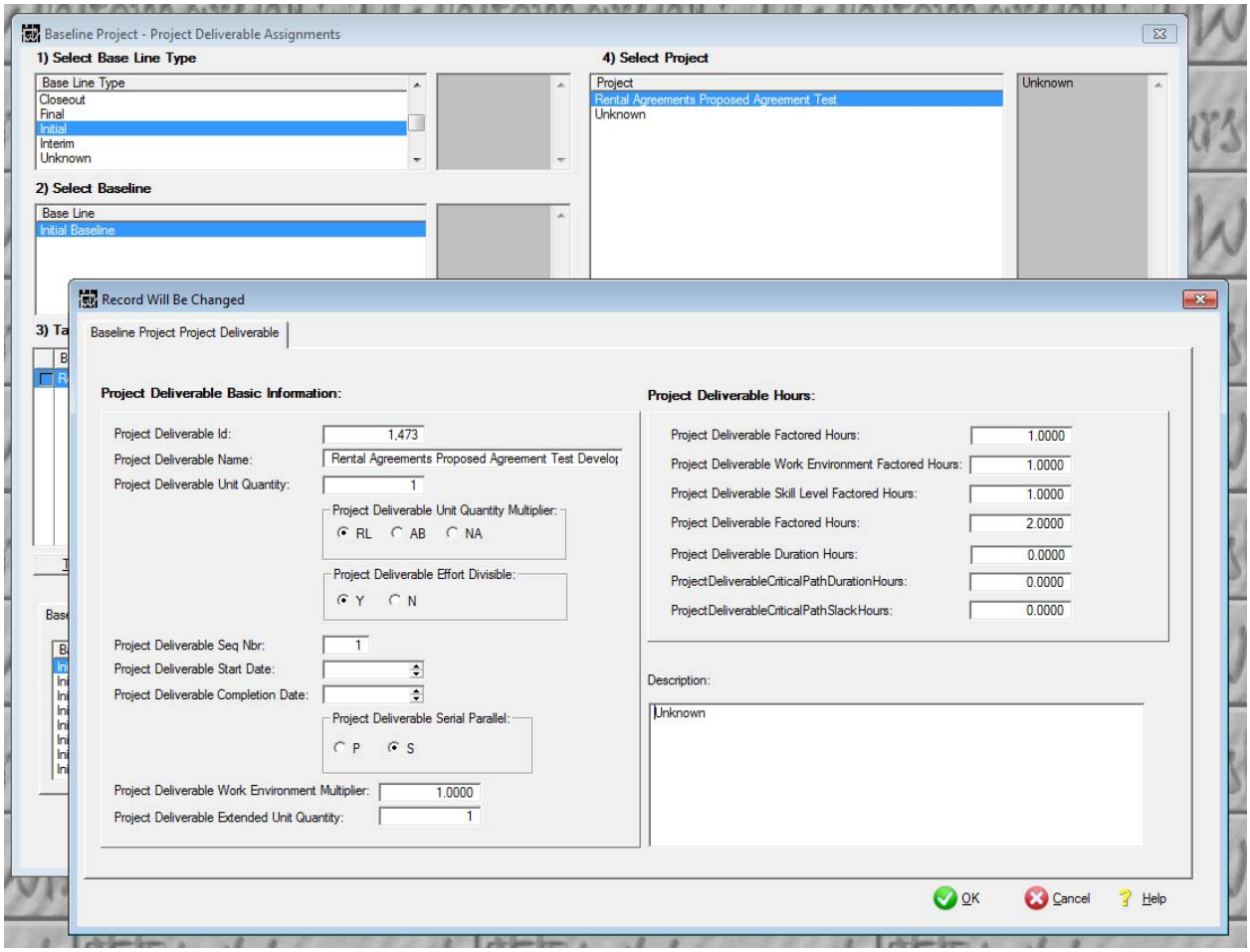

Figure 98. Baseline Project - Project Deliverable Assignment update.

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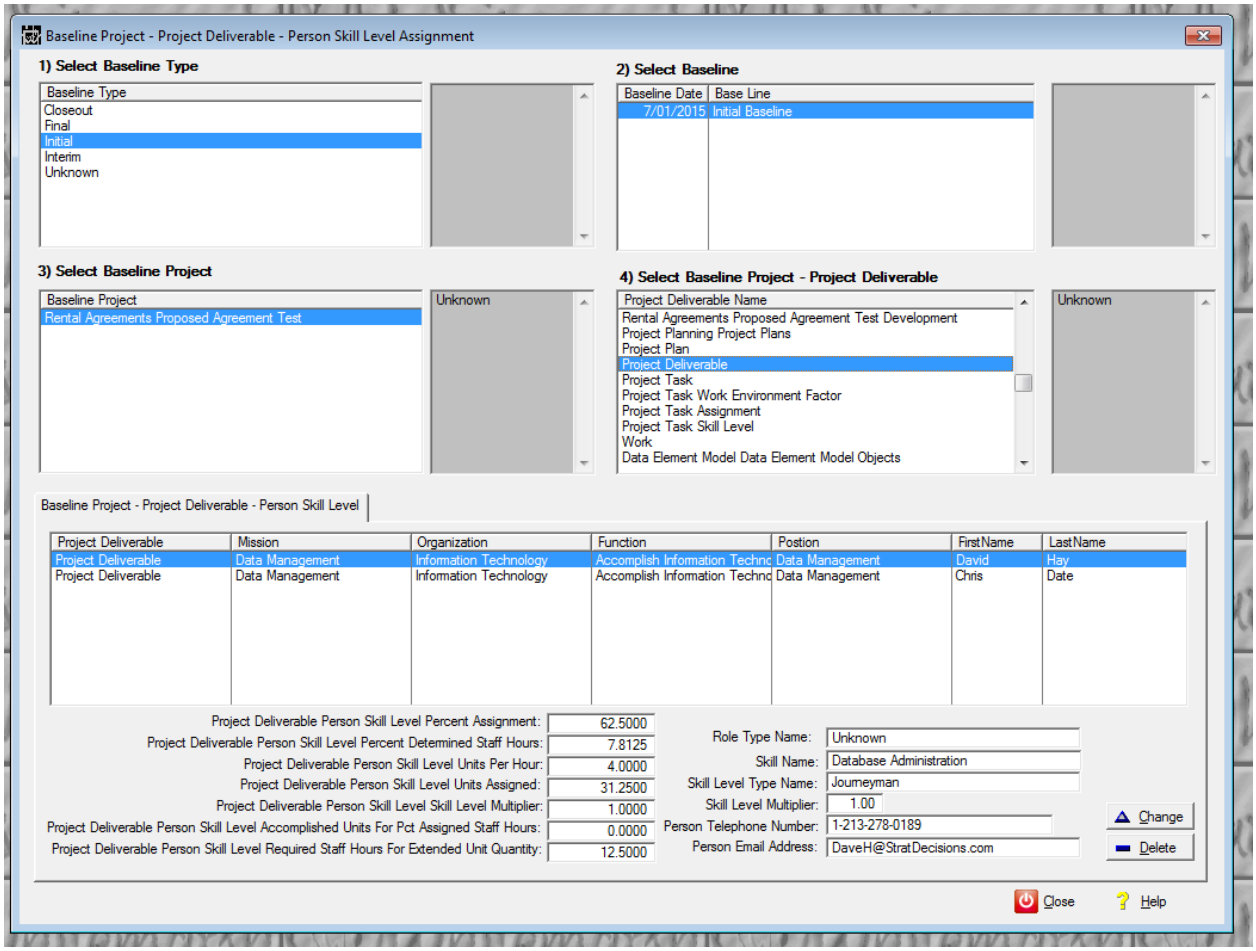

Figure 99. Baseline Project - Project Deliverable - Person Skill Level Assignments.

Figure 100 shows the set of data that is saved for each Baseline Project - Project Deliverable - Person Skill Level record. This data includes:

- Assigned Person Name
- Assigned Person Role
- Assigned Person Project Deliverable Information including:
- Skill Level Percent assigned,
- Skill Level Percent Determined staff hours
- Skill Level Units Per Hour
- Skill Level Units Assigned
- Skill Level Skill Level Multiplier
- Skill Level Accomplished Units for Percent Staff Hours
- Skill Level Required Staff Hours for Extended Unit Quantity

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And for the assigned person:

- Skill Name
- Skill Level Type Name
- Skill Level Multiplier
- Mission
- Organization
- Function
- Position
- Person First Name
- Person Last Name
- Person Middle Initial
- Person Phone Number
- Person Email Address

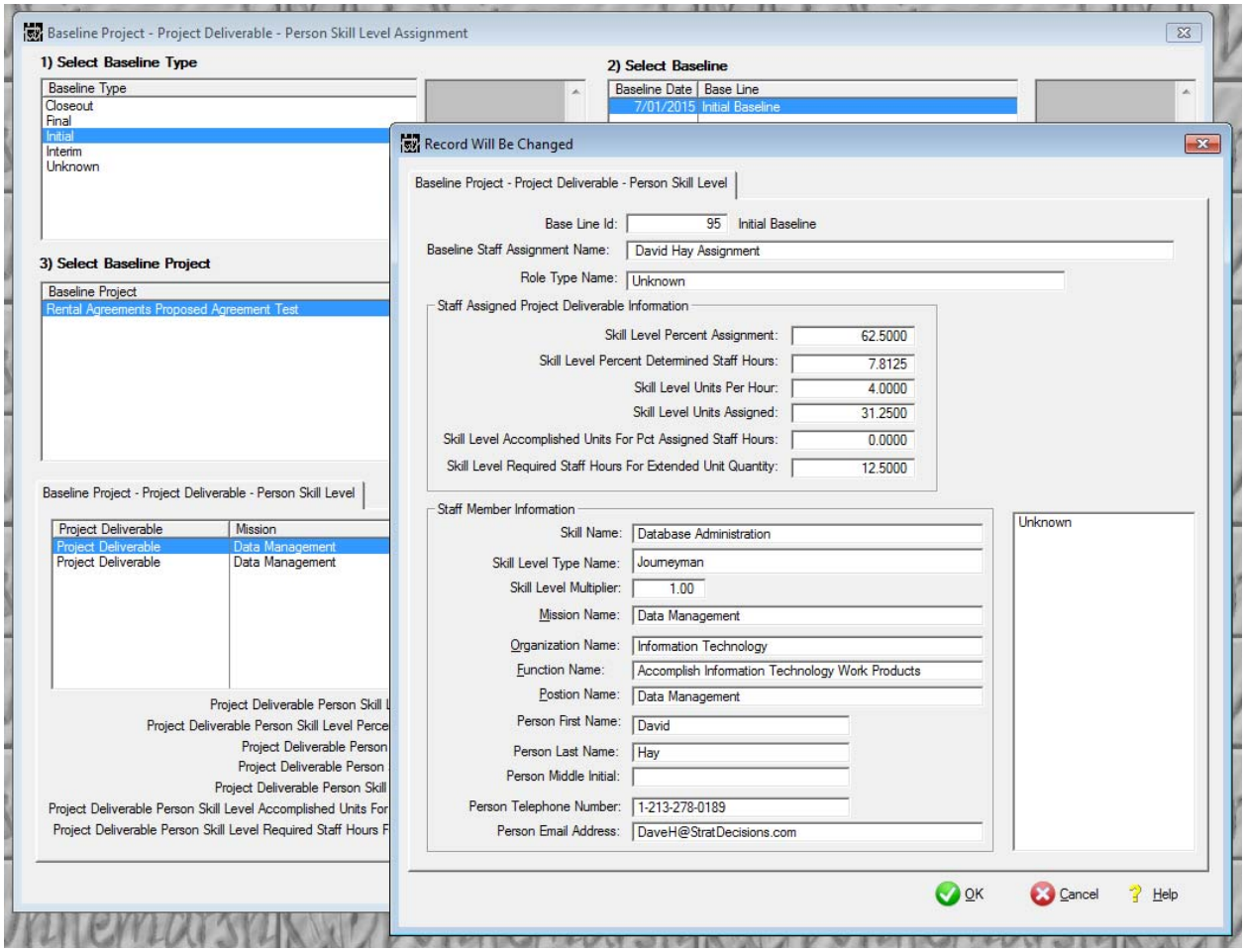

Figure 100. Baseline Project - Project Deliverable - Person Skill Level Update.

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5.3.15.6 Baseline Project - Project Deliverable - Work Environment Factor Assignments

As stated in Section 5.3.15.4 Baseline Project - Project Deliverable Assignments, the Baseline Project - Project Deliverable - Work Environment Factor records are automatically created. These records are shown in Figure 101 by selecting Baseline Type, then Baseline, Baseline Project, and Baseline Project - Project Deliverable. Shown at the bottom browse are the work environment factors that affect the determination of the factored hours of a Project Deliverable. The data that is saved for each Baseline Project - Project Deliverable - Work Environment Factor record includes:

- Work Environment Factor Type
- Work Environment Factor
- Work Environment Factor Multiplier Type
- Work Environment Factor Multiplier Name
- Work Environment Factor Multiplier Value

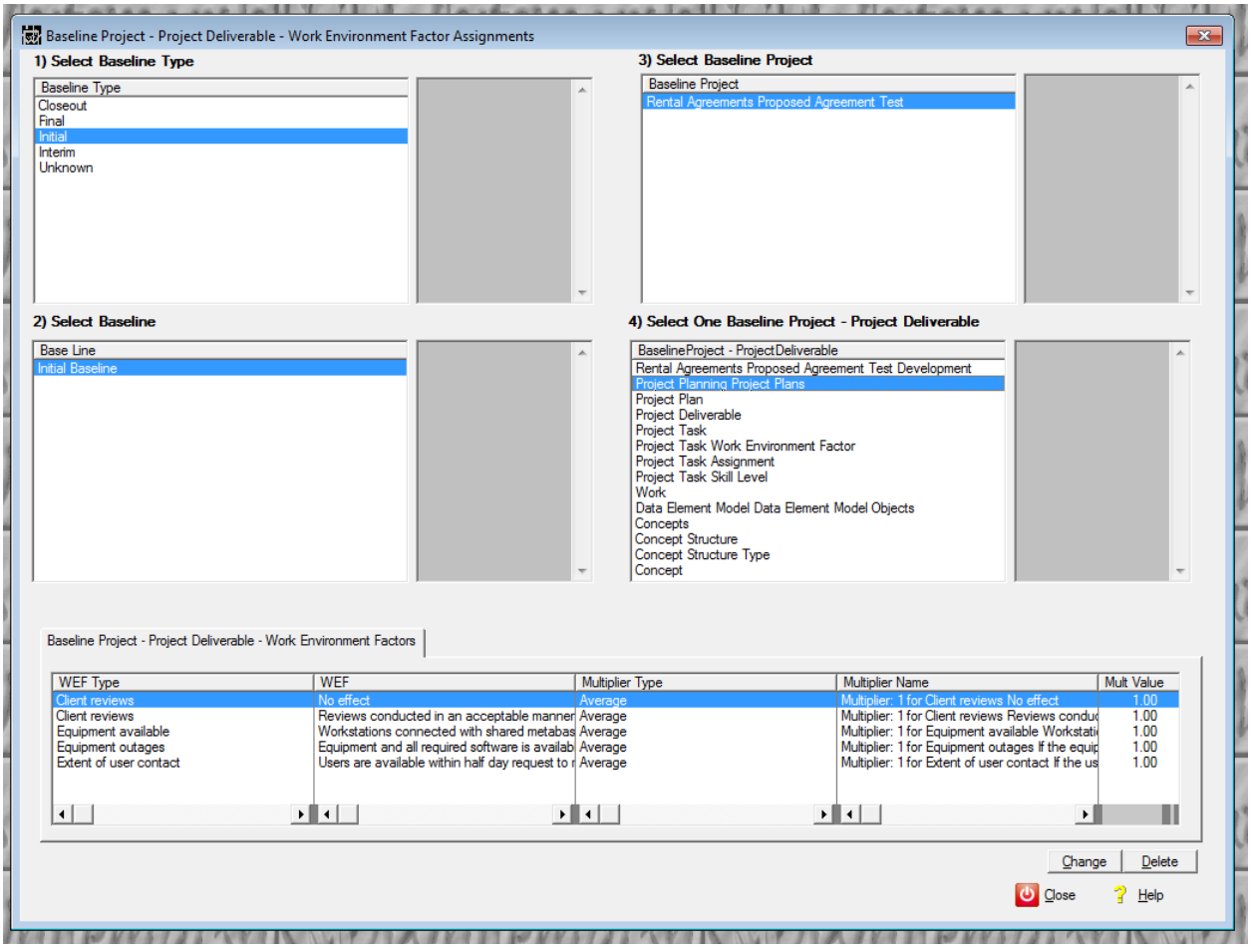

Figure 101. Baseline Project - Project Deliverable - Work Environment Factor Assignment.

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Figure 102 shows the update screen for a Work Environment Factor Assignment update. Shown on the top section of the screen are:

- Project Deliverable Name
- Baseline Project Name
- Baseline Name
- Baseline Type

Shown on the bottom section specifically relates to the Work Environment Factor are:

- Work Environment Factor Name
- Work Environment Factor Type
- [Work Environment Factor] Multiplier
- Work Environment Factor Multiplier Name
- Work Environment Multiplier Type Name

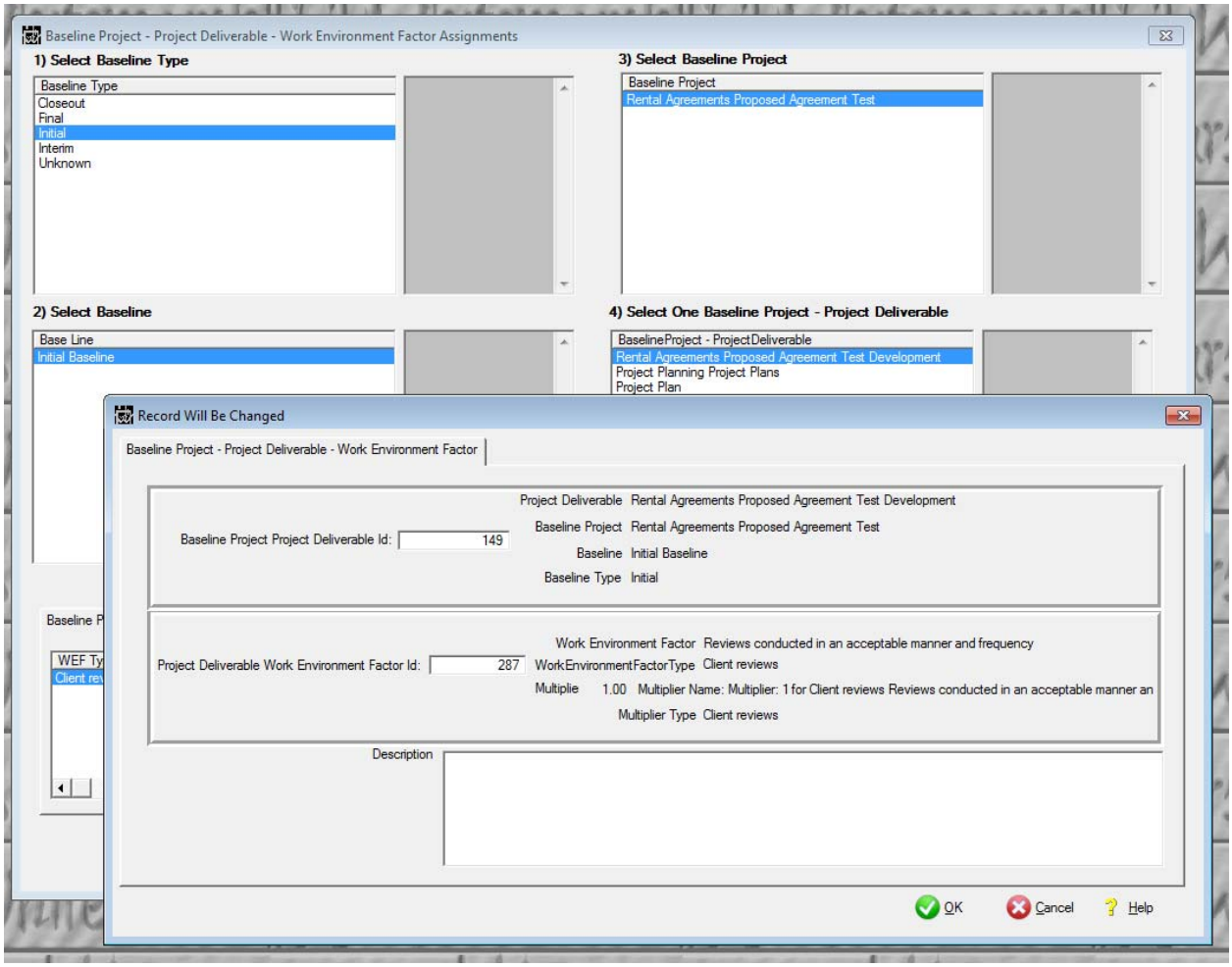

Figure 102. Baseline Project - Project Deliverable - Work Environment Factor Update.

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5.4 Work Environment Factor Management Process Specifications

The initial quantity of project deliverable hours is created by multiplying the Deliverable Template unit effort value by the quantity of the Project Deliverable. Given that a Project Deliverable is within an hierarchy, such as columns within a table that is within a schema, if there are 200 tables for the schema and typically 15 columns for each table, the actual quantity of columns is 300.

Work to create these Project Deliverable columns is affected by work environment factors that might include for example:

- Client Reviews
- Equipment Availability
- Equipment Outages
- Extent of User Contact

Individually and collectively these all have an effect on the quantity of staff hours required to do the work defining the 300 columns

The processes that manage the effects of the Work Environment Factors, set out in Figure 103, involved in the creation of Work Environment Factors are:

- Work Environment Factor Types
- Work Environment Factors
- Work Environment Factor Multiplier Types
- Work Environment Factor Multiplier Assignments
- Work Environment Factor Multipliers

Each is addressed in sections that follow.

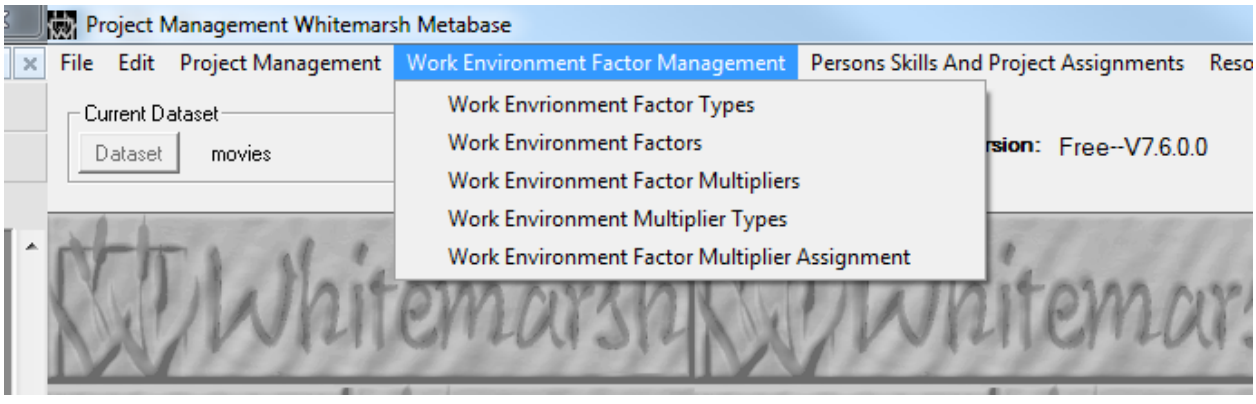

Figure 103. Work Environment Factor Management.

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5.4.1 Work Environment Factor Types

Work Environment Factor Types enable the collections of Work Environment Factors to be grouped and be set out in an order of how much of an effect each Work Environment Factor has on the velocity through which Project Deliverables are accomplished.

Figure 104 shows the browse that lists the current set of Work Environment Factor Types. Figure 105 presents the insert/update screen to add or change a Work Environment Factor Type.

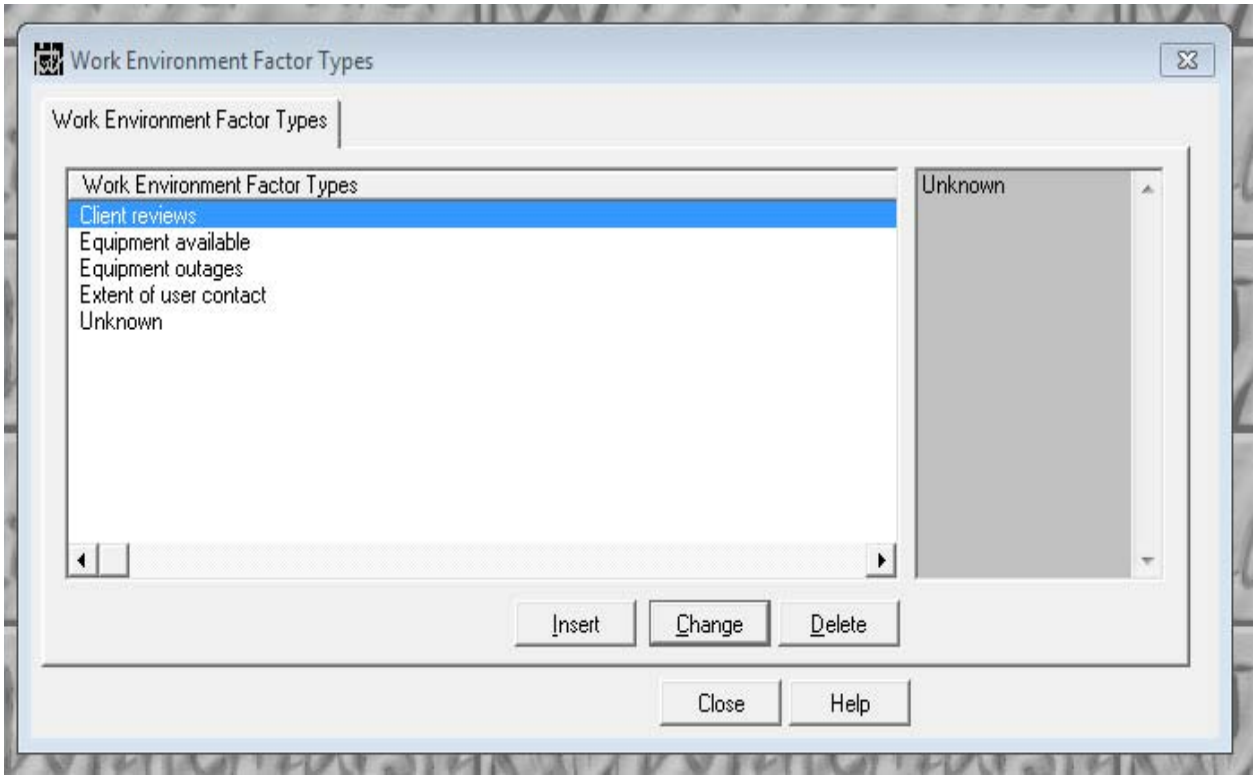

Figure 104. Work Environment Factor Types.

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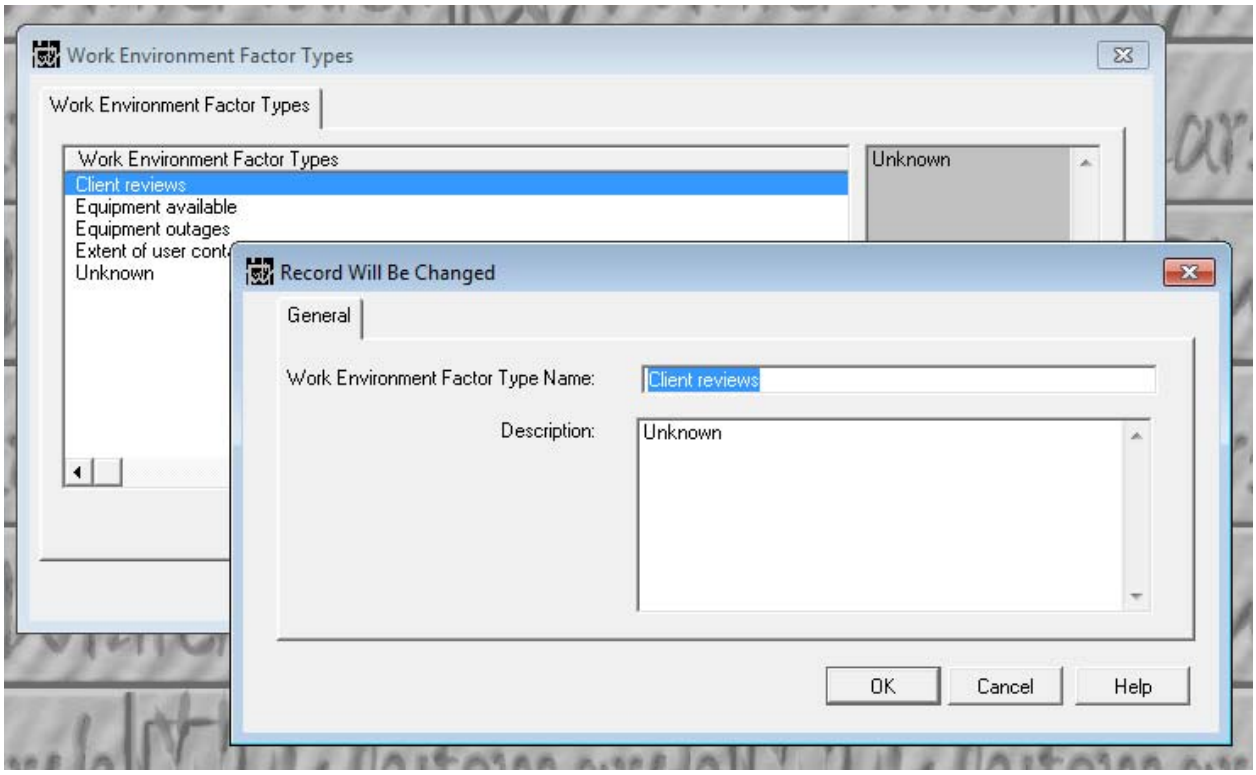

Figure 105. Work Environment Factor Type update.

5.4.2 Work Environment Factors

Work Environment Factors are those work conditions that either make the work go faster or slow it down. Each set of Work Environment Factors include one that has "No Effect," and others that have multipliers lesser or greater than 1.0.

Figure 106 illustrates the Work Environment Factors screen. To see a particular grouping, select a Work Environment Factor Type. To add or change a Work Environment Factor press the Insert or Change button. Figure 107 then shows the insert or update screen.

On this screen enter the Work Environment Factor's name that is appropriate for the Work Environment Factor Type and also its description.

The multiplier effect of the Work Environment Factor is not entered on this screen. Rather, it is created in subsequent sections for the Work Environment Multiplier Type and Work Environment Multiplier screens, and assigned to a Work Environment Factor through the Work Environment Factor Multiplier Assignment screen.

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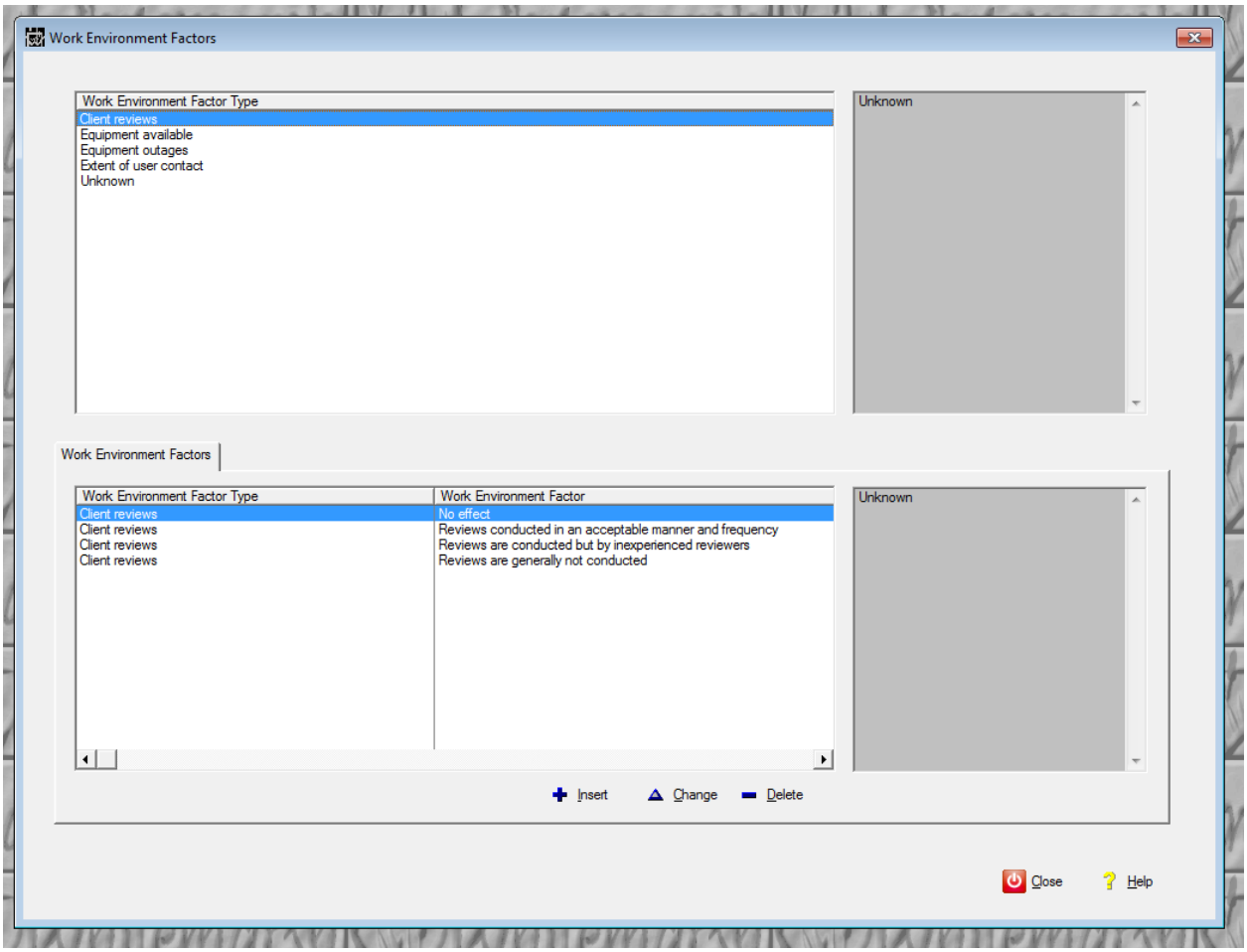

Figure 106. Work Environment Factors.

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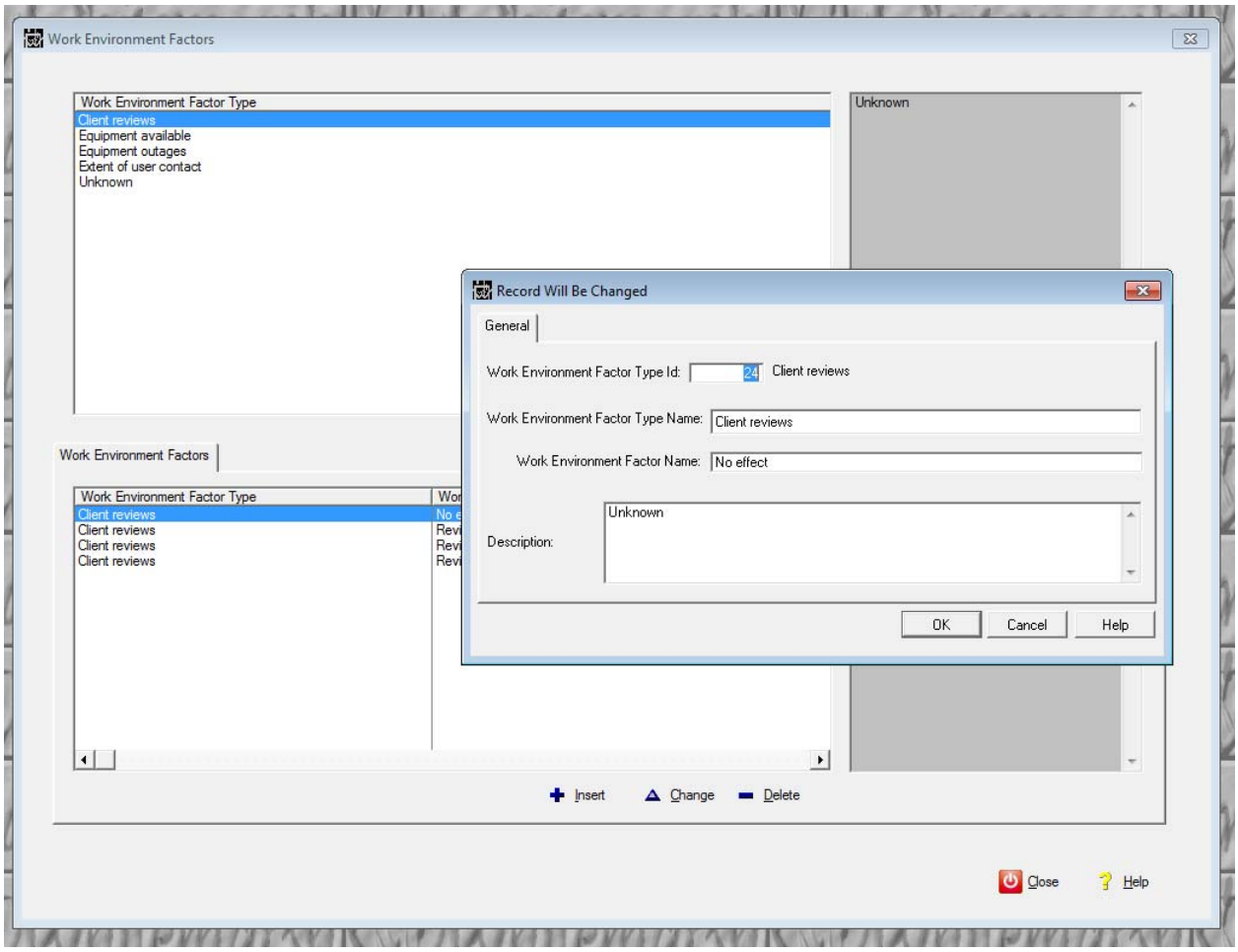

Figure 107. Work Environment Factor update.

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5.4.3 Work Environment Factor Multiplier Types

Work Environment Factor Multiplier Types are the names and multiplier values that are assigned to a Work Environment Factor that, when applied, result in a decrease or an increase in the person hours needed to accomplish a Project Deliverable,

Figure 108 depicts a set of Work Environment Factor Multiplier Types. For each there is a multiplier value, which in Figure 108 range from 0.50 up to 3.00. If the Project Deliverable hours before application are 100, and the value is 0.50 the multiplication result is 50 hours. But if the assigned multiplier value is 2.50 then the resulting hours is 250. The "radio button" list of these values are shown at the bottom of Figure 108. To change an existing value, select an existing record, select the new radio button value and press the button, Update to Selected Value.

The Work Environment Factor Multiplier Types are independent of the assigned Person Skill Level multipliers because the work environment affects all persons assigned to a particular Project Deliverable.

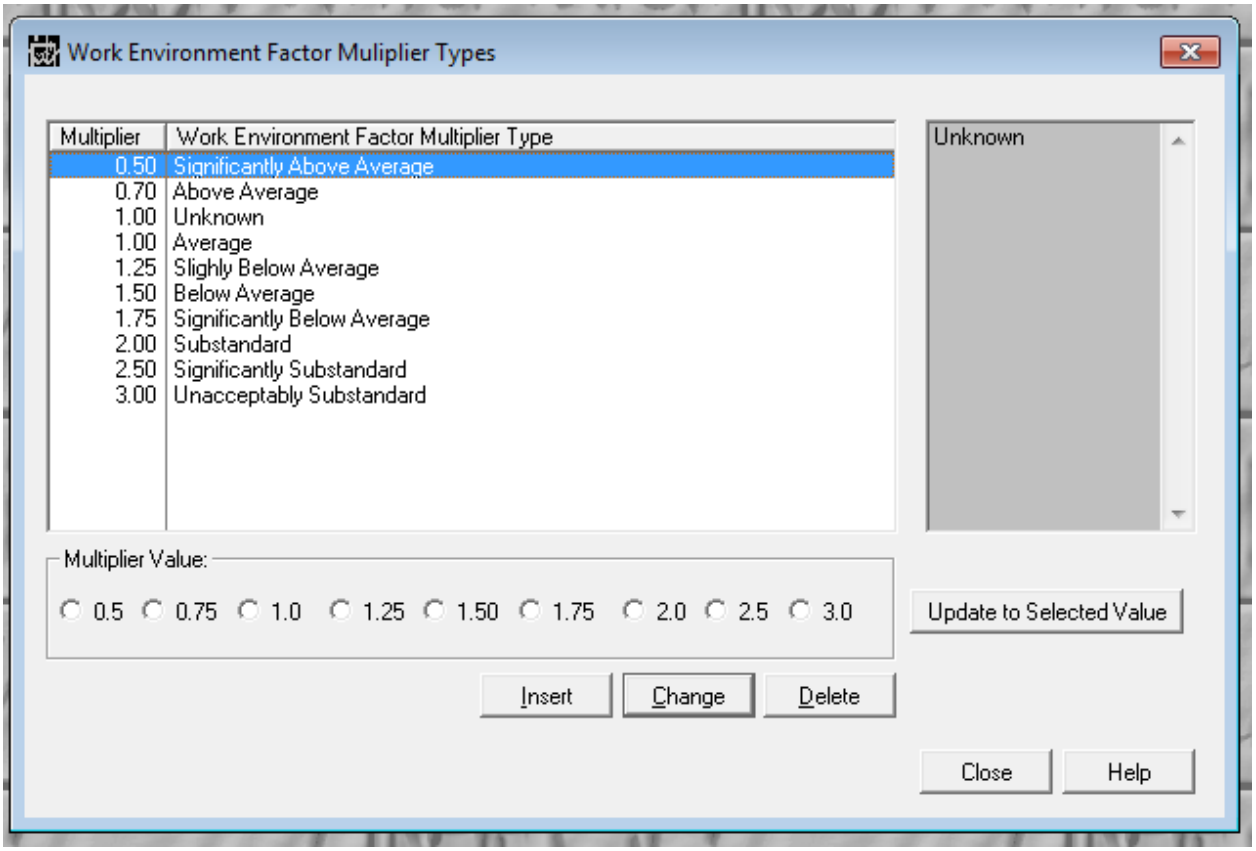

Figure 108. Work Environment Factor Multiplier Types.

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The Insert, Change or Delete screen is presented in Figure 109. While any set of values can be assigned. A value can be selected from the list and the Change button can be used to make the update.

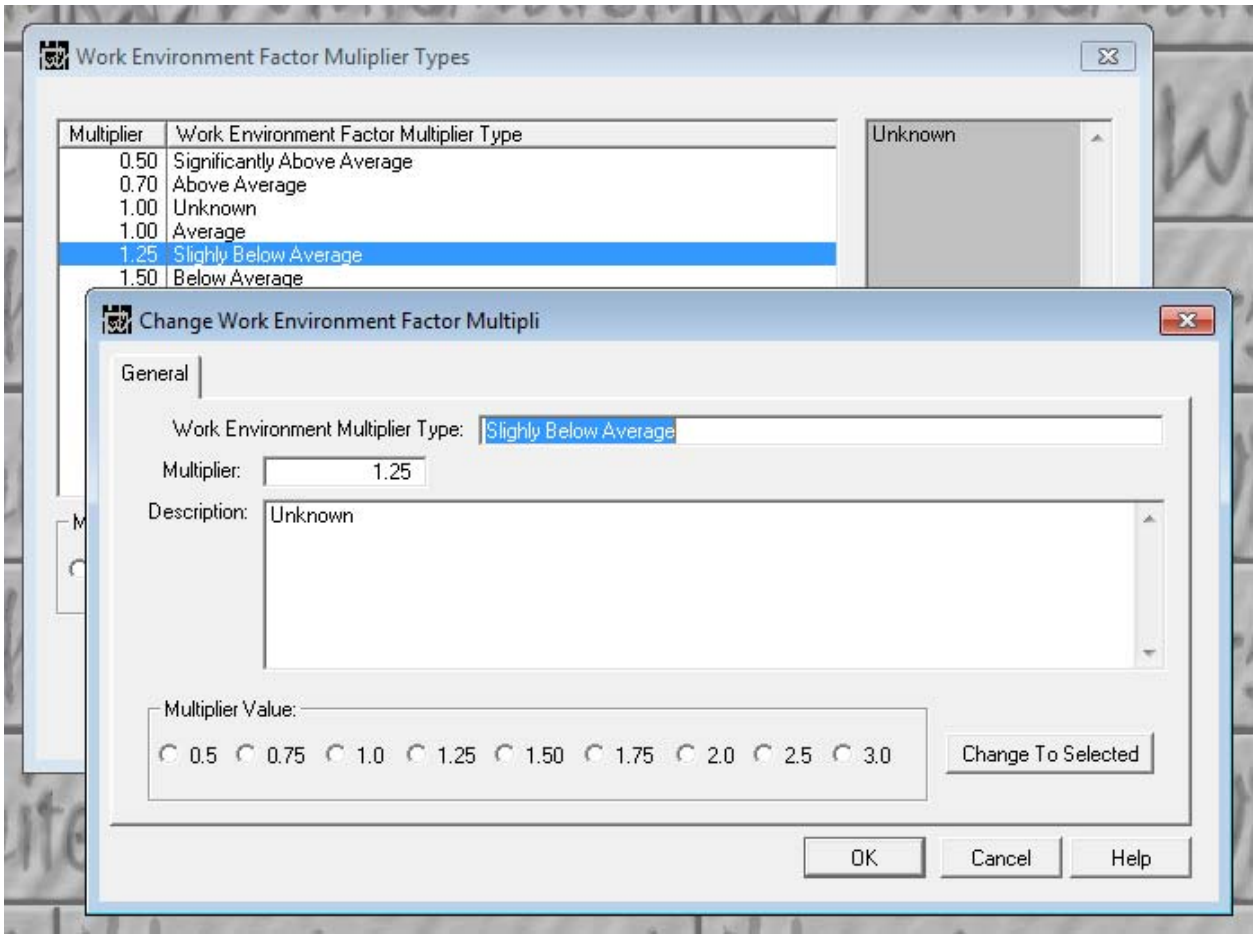

Figure 109. Work Environment Factor Multiplier Type update.

5.4.4 Work Environment Factor Multiplier Assignment

Once the Work Environment Factors and the Work Environment Factor Multiplier Types are created, the process of creating the Work Environment Multipliers can be done. This is accomplished through the process illustrated in Figure 110. On the left side, select the Work Environment Factor Type, and then tag one Work Environment Factor. On the right side select one or more Work Environment Factor Multiplier Types. Finally, press the Build button. The resulting Work Environment Factor Multipliers are created and shown in the bottom browse.

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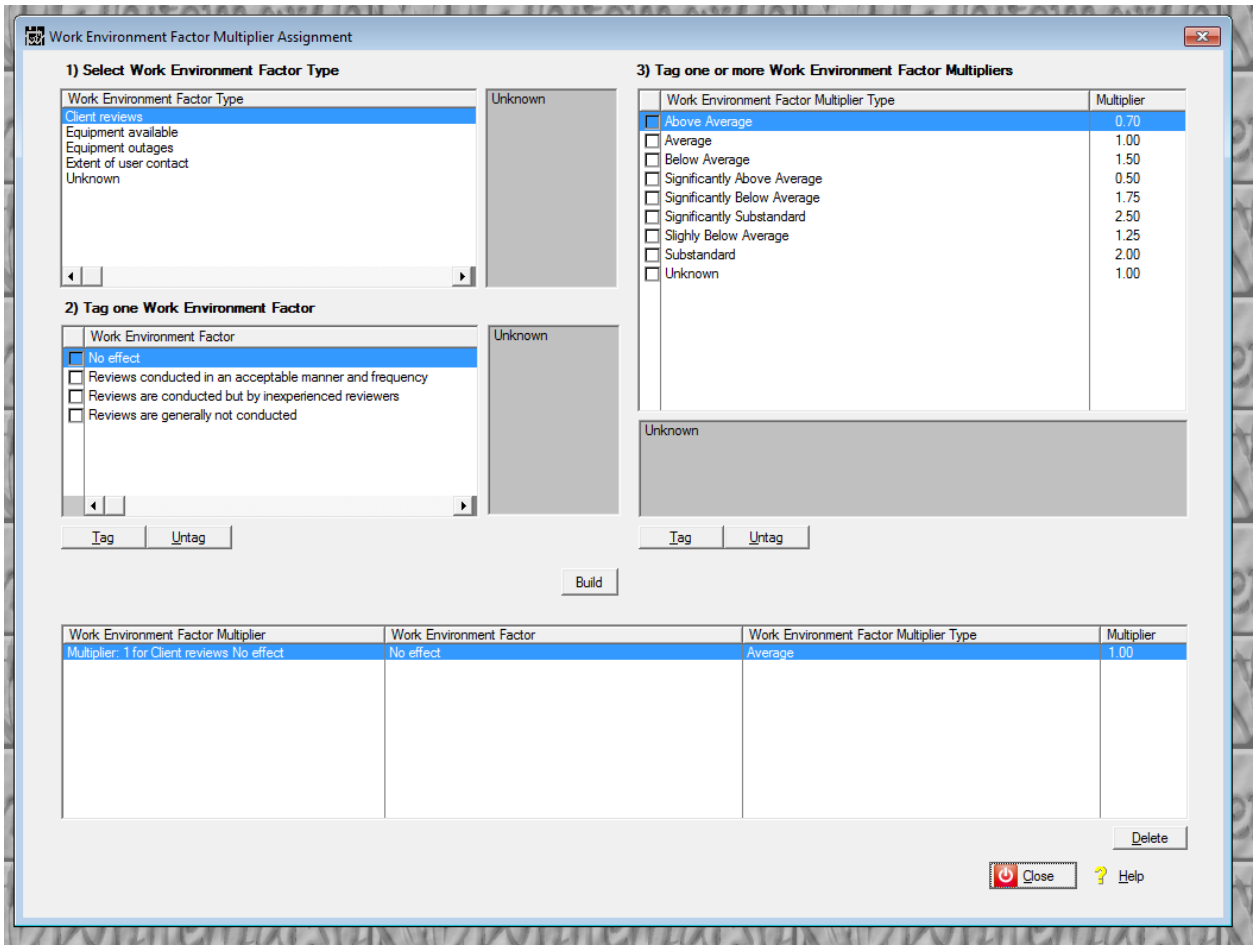

Figure 110. Work Environment Factor Multiplier Assignment.

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5.4.5 Work Environment Factor Multipliers

Figure 111 shows the screen that list all the different Work Environment Factor Multipliers. The top browse enables the selection of particular Work Environment Factor Types. The middle browse shows the Work Environment Factor, and the bottom browse shows the specific Work Environment Multiplier that has been assigned. That bottom browse displays the parent Work Environment Factor, its Work Environment Factor Multiplier Type, and the actual Multiplier Value.

To Change or Delete the Work Environment Factor Multiplier, press Change or Delete. Figure 112 is then presented. This shows its parent Work Environment Factor and also its parent Work Environment Factor Multiplier Type. The name of the Multiplier is generated but can be changed. The description can also be added.

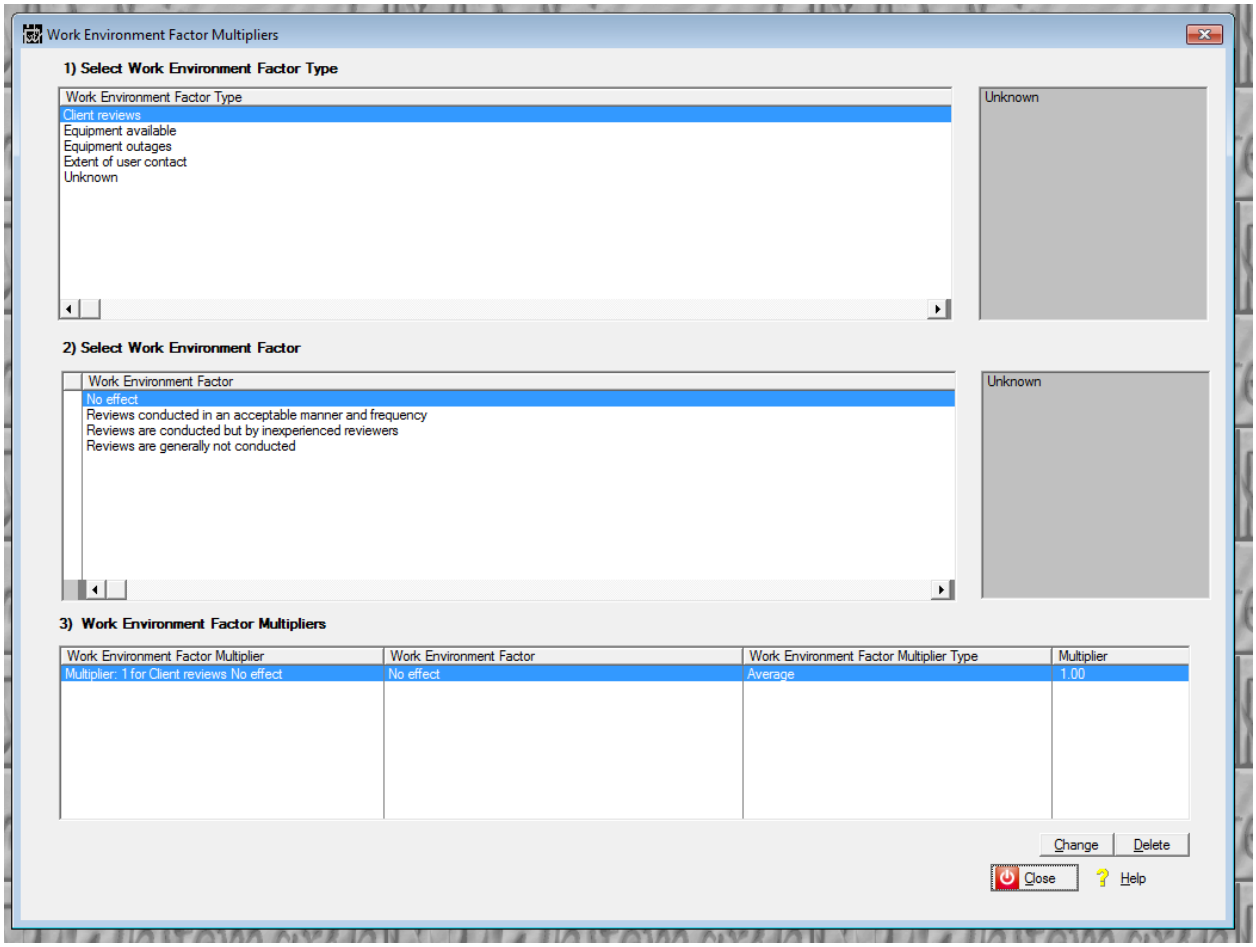

Figure 111. Work Environment Factor Multipliers.

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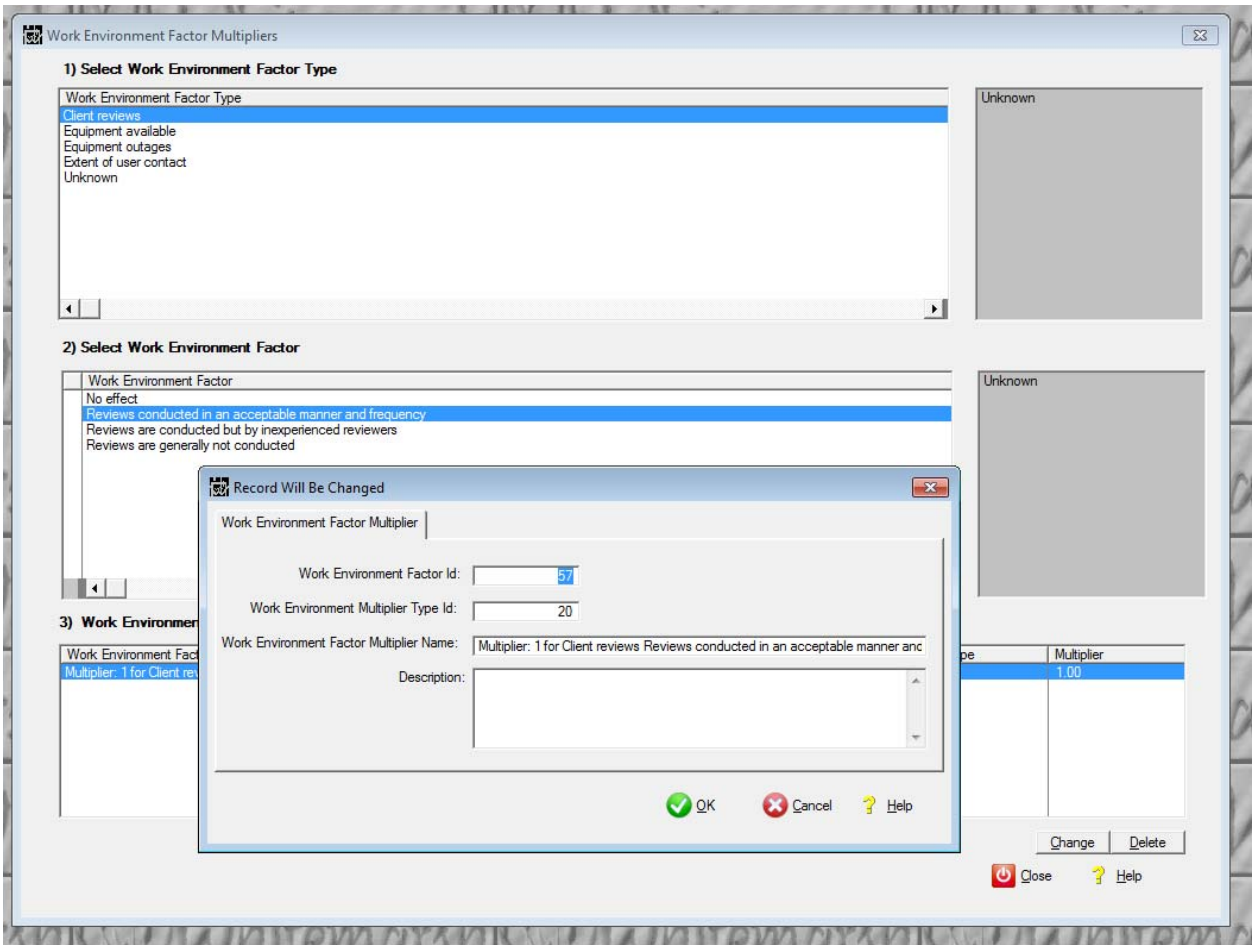

Figure 112. Work Environment Factor Multiplier update.

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5.5 Persons Skills and Project Assignments' Process Specifications

Project Deliverable accomplishment hours is also affected by the staff assigned. To affect the assigned staff, the following processes, identified in Figure 113, are:

- Persons
- Personnel Project Assignments Listing
- Person Skill Level Assignments.

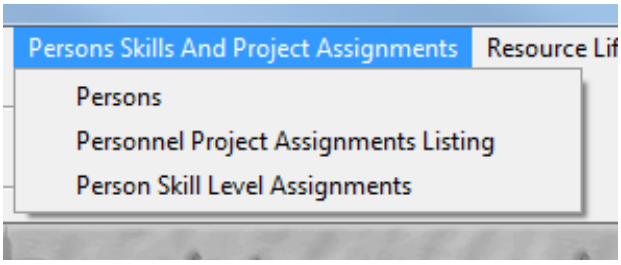

Figure 113. Person Skills and Project Assignments.

5.5.1 Persons

Persons are contained in the Metabase System database within context as shown in Figure 1. That is, within the Mission-Organization-Function-Position. Figure 114 shows persons and their mission-organization-function context. That implies that for every person involved with Whitemarsh Project Management you know their:

- Name and contact information,
- Their position,
- The function they are performing within that position
- The organization within which the functions are performed, and finally
- The enterprise missions that are being accomplished by that organization.

Because of all this context information, the process of adding persons is performed from within the Mission-Organization-Function-Position Assignment (MOFPA) Metabase System module.

5.5.2 Personnel Project Assignments Listing

Figure 115 presents the complete listing of what Project Deliverables are assigned to a particular person.

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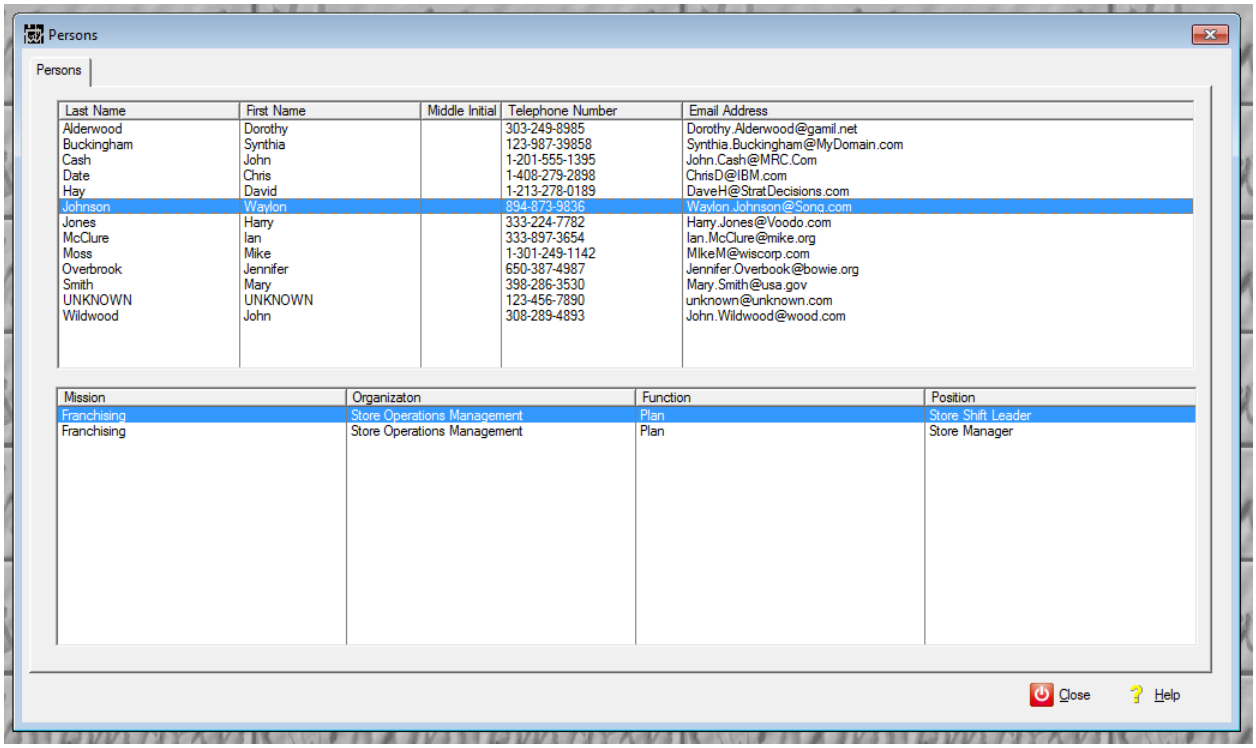

Figure 114. Persons with their associated Missions, Organizations, Functions and Positions.

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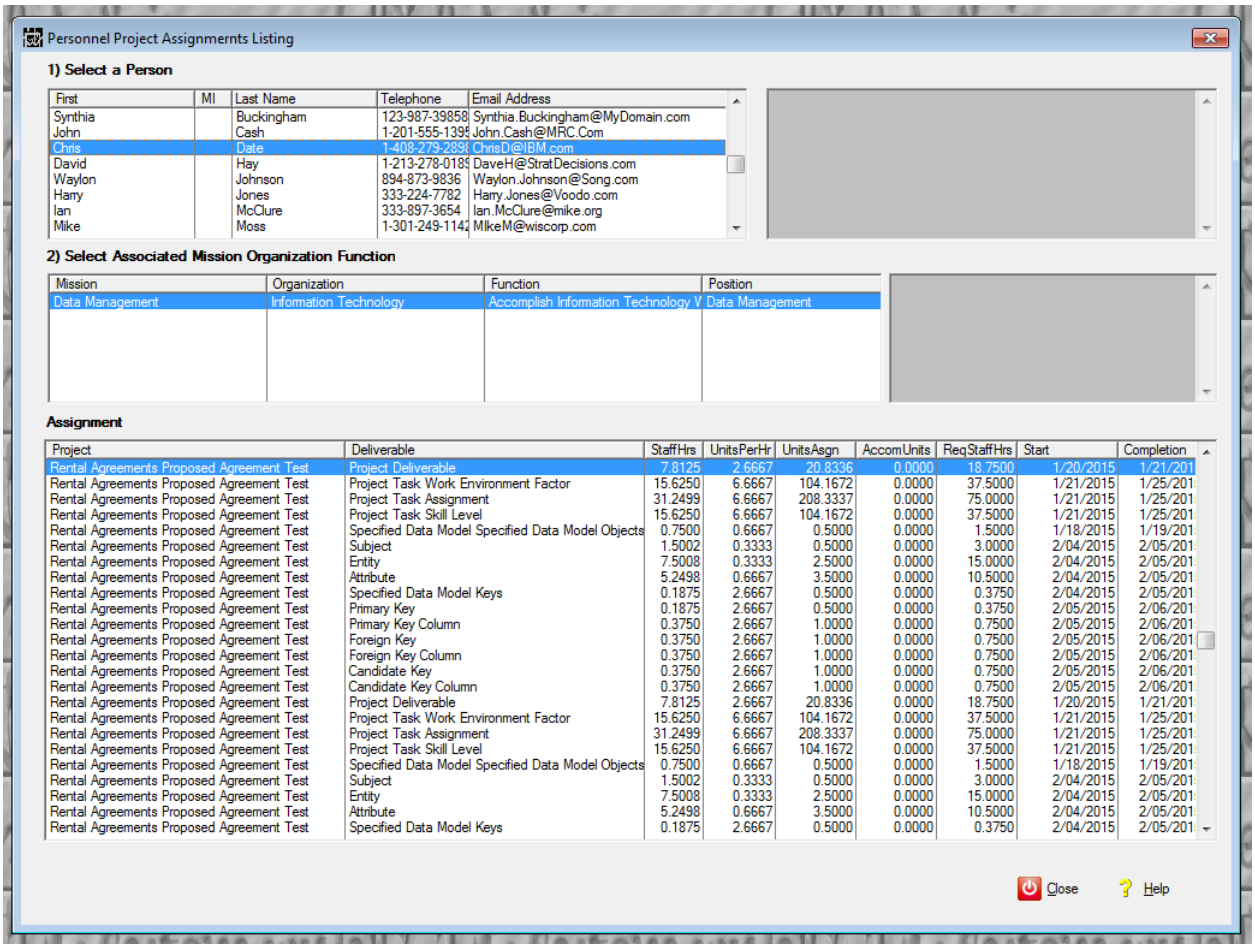

Figure 115. Listing of Persons and their Project Deliverable Assignments.

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5.5.3 Person Skill Level Assignments

Persons can have multiple skills with different levels of competence. Figure 116 shows the capability to select a person and then assign one more skills. On the top left browse, select the person. Once selected, select and tag the Mission-Organization-Function-Position context for the selected person. On the right side browse, select and tag one or more Skill Levels and press the Build button. You can select a specific Person Skill Level and press the Change button to add a description as shown on Figure 117.

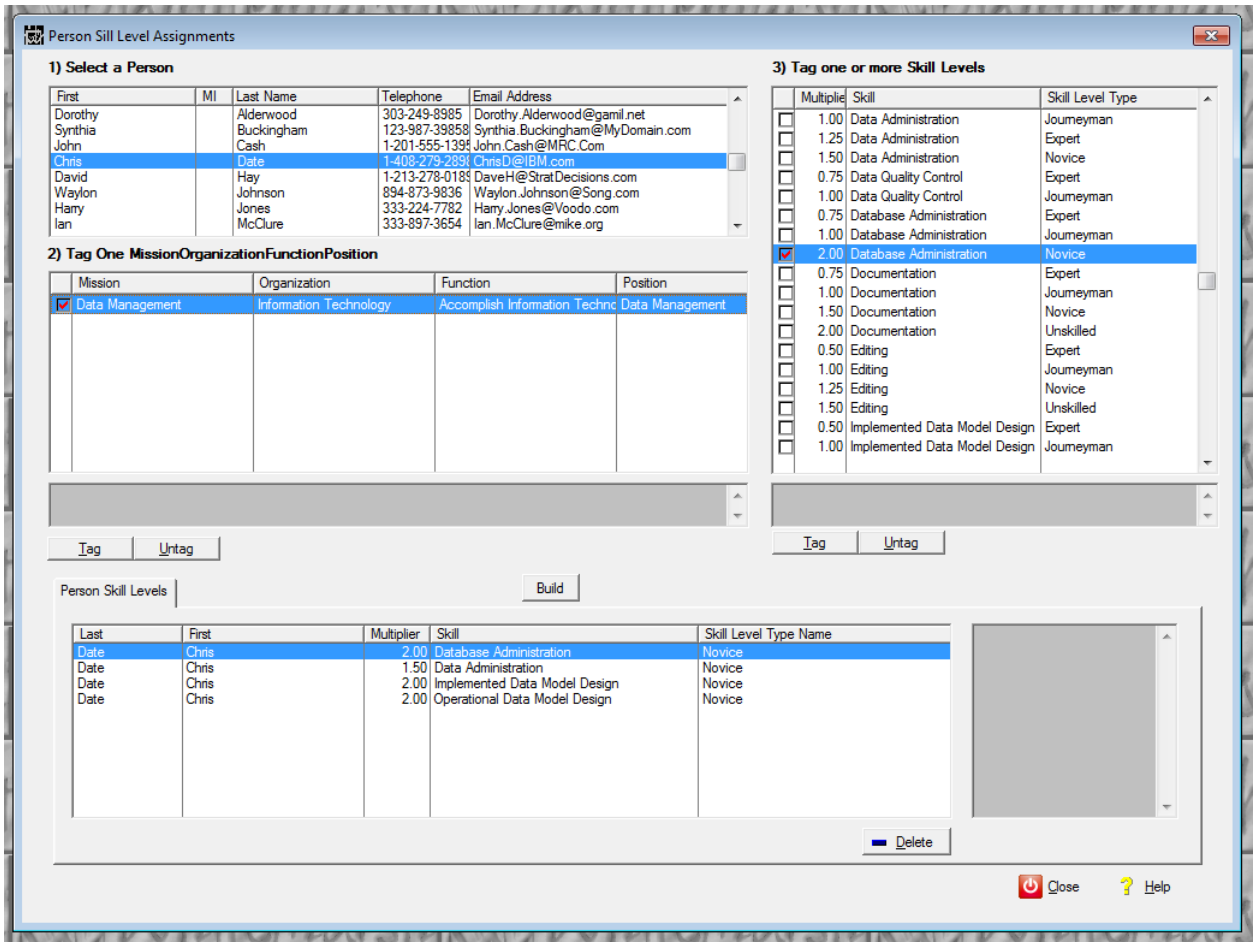

Figure 116. Person Skill Level Assignments.

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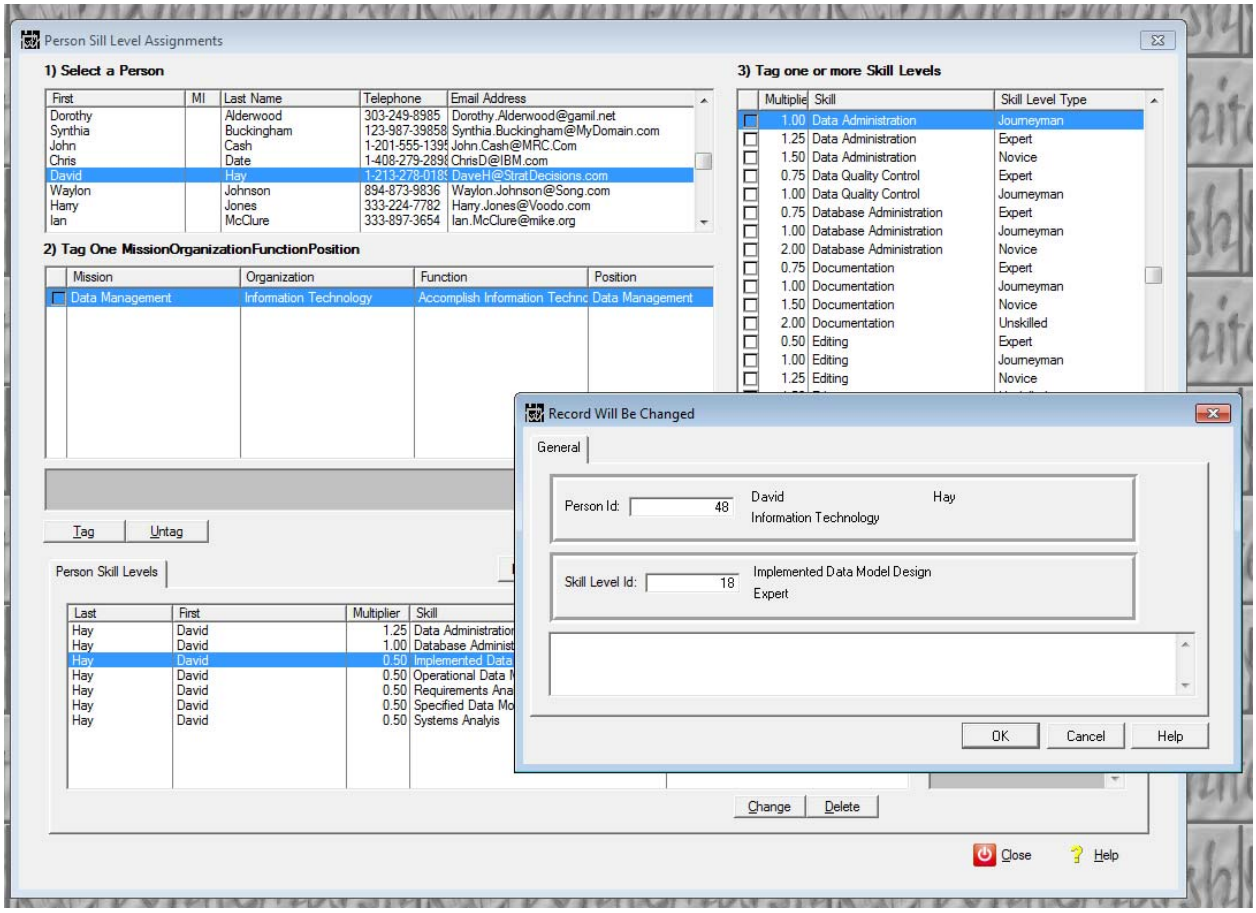

Figure 117. Person Skill Level Assignment update.

5.6 Resource Life Cycle Analysis Process Specifications

Within Whitemarsh Project Management, projects are accomplished within the context of enterprise resources and their life cycles. Figure 118 shows the processes associated with the Resource Life Cycle Analysis processes. These are:

- Resources
- Resource Life Cycle Nodes

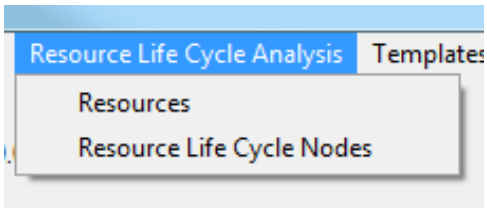

Figure 118. Resource Life Cycle Analysis processes.

Resource Life Cycle Analysis is essential for enterprise architectures and their management. Because of this, Whitemarsh has an entire Metabase Module devoted to Resource Life Cycle Analysis. Consequently, all the Resource Life Cycle Analysis data is created within that module.

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5.6.1 Resources

Resource Life Cycle Analysis is a set of enterprise resources, each set within a life cycle of major state transformations of those resources. The Metabase System module, Resource Life Cycle Analysis enables the creation and management of Resources and their attendant Resource Life Cycles.

A Resource is an enduring asset of value to the enterprise. Included for example are facilities, assets, staffs, money, even abstract concepts like reputation. Simply put, if a resource is missing, the enterprise is incomplete.

A Resource Life Cycle is a linear identification of the major states that must exist within the life of the resource. The life cycle of a resource represents the resource's "cradle to grave" set of state changes.

These Resource Life Cycles can be interconnected, and used as a lattice work to attach the enterprise's inventory of database and business information systems, which in turn, greatly assists in the formation of Business Information Systems Plans.

The fundamentals of Resource Life Cycle Analysis were first published by Ron Ross, a well known "data" consultant in his 1992 monograph, Resource Life Cycle Analysis A Business Modeling Technique for IS Planning. Resource Life Cycle Analysis (RLCA) uses a form of business modeling to perform information strategic planning.

It follows that all projects are related to one or more of an enterprise’s resources. To that end, Figure 119 displays the current set of Resource Types and for each their specific Resources. On the top browse there is the Organizations resource type. For that resource type, there are eight distinct resources. Resource Vendor includes subordinate resources: Hardware, Software, and Services.

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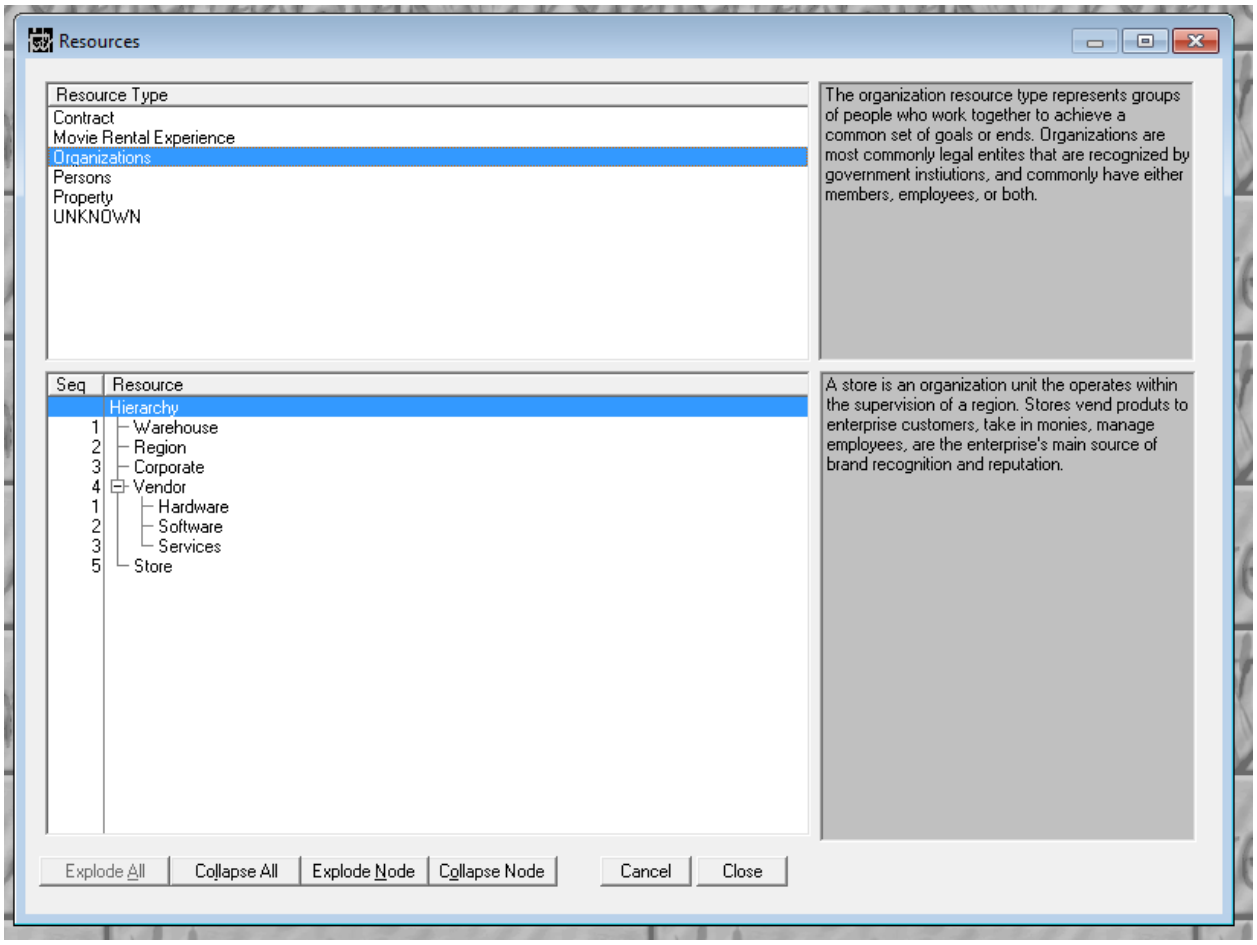

Figure 119. Resources and Resource Life Cycles.

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5.6.2 Resource Life Cycle Nodes

Figure 120 shows the life cycle for one of these specific resources. At the top of Figure 120, the Resource Type, Organizations is selected. Within those organizations, the selected Resource is Region. Finally, the Resource, Region has a life cycle of five nodes.

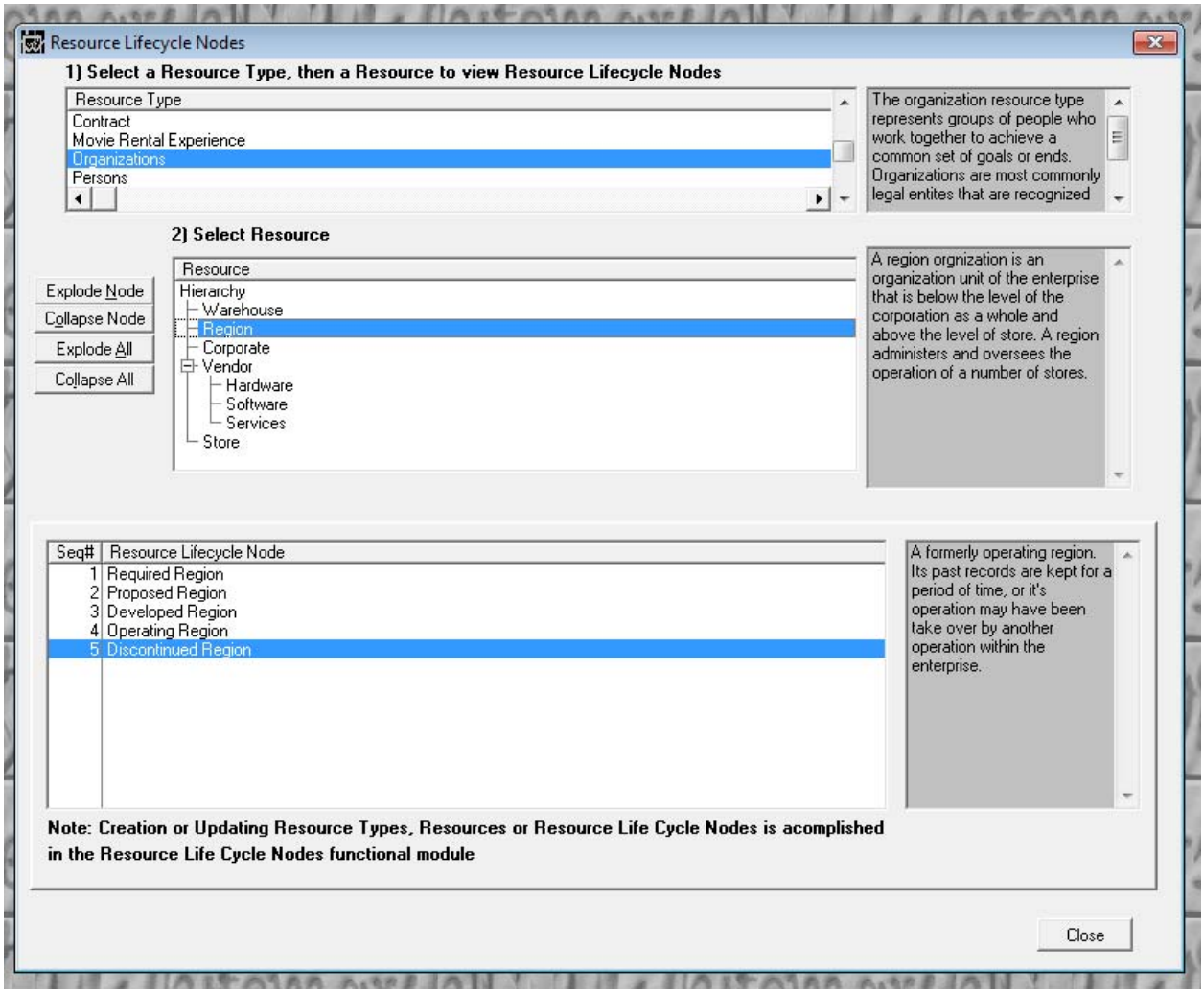

Figure 120. Resource Life Cycle Nodes.

Within this example of Whitemarsh Project management, all projects related to creation and management of enterprise organizations. The assignment of a Resource Life Cycle Node to a Project Deliverable is address in section, 5.3.3 Resource Life Cycle Node Project Assignment.

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5.7 Templates Process Specifications

There are two secrets that make Whitemarsh Project Management truly excellent. First is the tracking and management of Project Deliverables versus Project Tasks. The second secret is the creation, management and evolution of Templates. The power of Whitemarsh Project Management is through the Project, Deliverable, and Task Templates. The value of Whitemarsh Project Management is in its ability to directly access the very deliverables undertaken by the projects. The accountability of Whitemarsh Project Management is its ability to track the initially created plans (schedule and resources) with the actual accomplishment, which, in turn, provide the ability to improve planning though time.

In Whitemarsh Project Management there are three classes of templates:

- Project
- Deliverable
- Task

The processes for these are listed in Figure 121. The first and fifth process listed in Figure 121, Template Assignments, and Template Assessments accomplish template management. The second, third, and fourth enable the definition and management of the templates that bring about Whitemarsh Project Management's power, value and accountability.

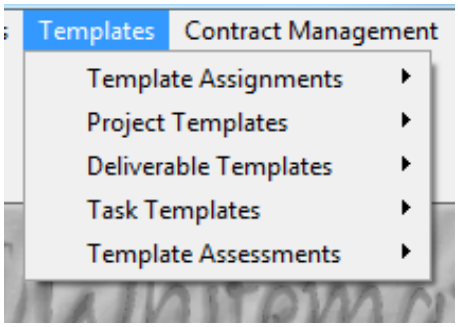

Figure 121. Project Management Templates.

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5.7.1 Template Assignments

Project, Deliverable, and Task Templates, initially built in isolation are integrated one with the other. Figure 122 identifies the processes that accomplish this are:

- Project Templates and Deliverable Templates
- Deliverable Templates and Task Templates

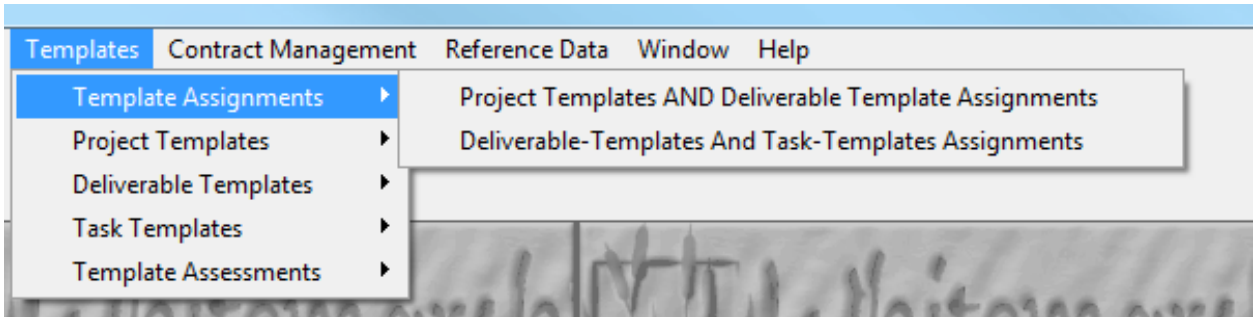

Figure 122. Template Assignments

These template are created in the following sections:

- Section 5.7.4 Project Templates and contained subsections
- Section 5.7.5 Deliverable Templates and contained subsections
- Section 5.7.6 Task Templates and contained subsections

The two sections that follow presume that all the templates have been established.

5.7.2 Project Templates AND Deliverable Template Assignment

Figure 123 sets out the screen for connecting Project Templates with Deliverable Templates. The fundamental relationship between Project Templates and Deliverable Templates is many-to-many. That is, a specific Deliverable Template can be employed from multiple Project Templates, and a Project Template can employ multiple Deliverable Templates. This strategy is both realistic and avoids redundancy.

To illustrate the value of the many-to-many relationships, reports about projects would set out, for example, a Project Hierarchy, which would naturally include all appropriate Deliverables and Tasks. If a Deliverable Template, for example, Review, is included at the end of each Project and contained subordinate project, the many-to-many strategy enables the Review deliverable to be defined only once despite its many-times use within the project and each of the contained subordinate projects.

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The process of creating the association between Project Template and Deliverable Templates is accomplished by selecting a Project Template Type from the top-left browse, and the tagging one Project Template from the middle-left browse. On the right side, select a Deliverable Template Type from the top-right browse, and one or more deliverable templates from the middle right browse. After the tagging is complete, press the Build button. The joined Project Templates and Deliverable Templates are shown in the bottom browse.

To delete a joined Project Templates and Deliverable Templates press the Delete button. The Up and Down buttons cause the sequence of the created Project Templates and Deliverable Templates to change.

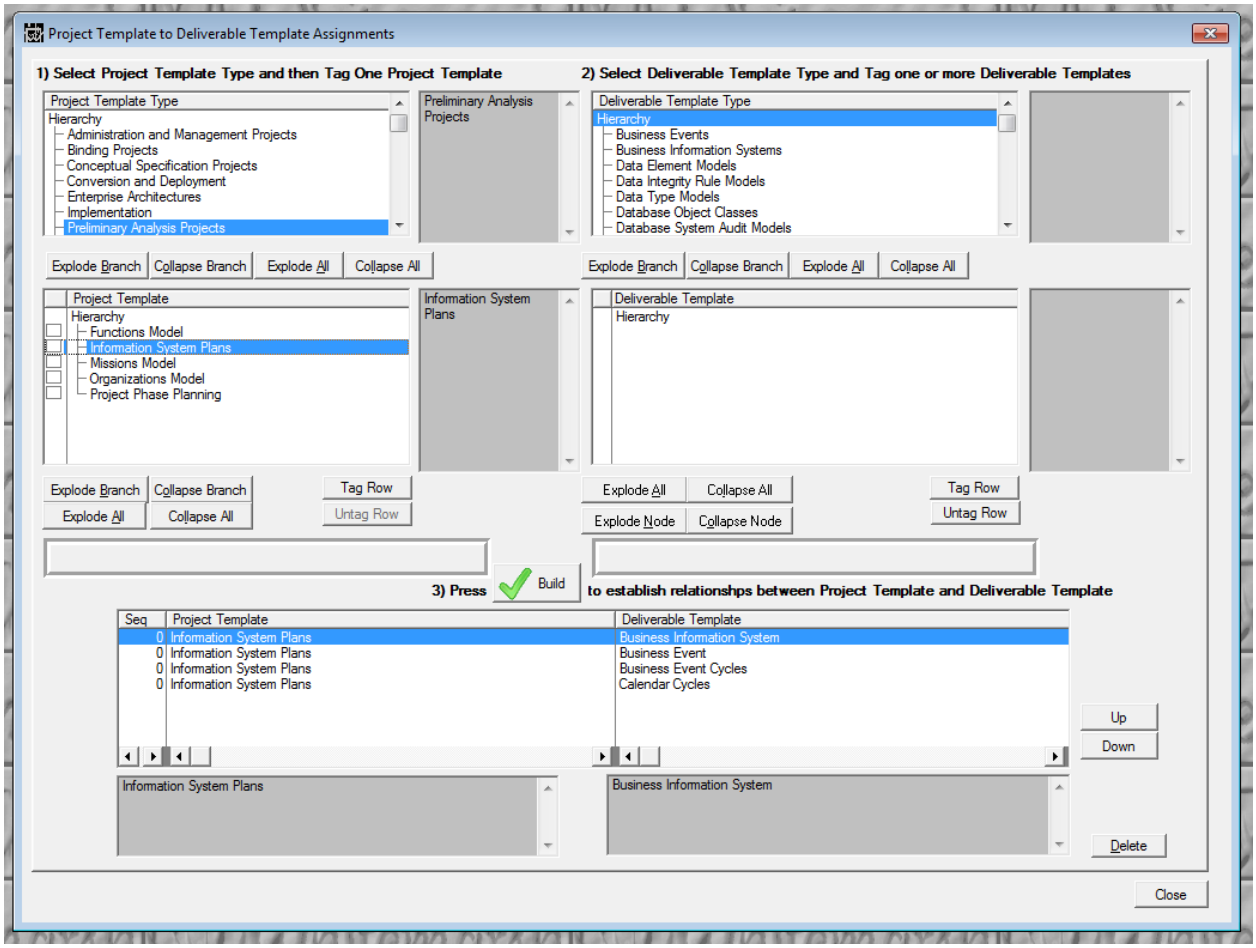

Figure 123. Project Template to Deliverable Template Assignment.

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5.7.3 Deliverable-Templates Task-Templates Assignment

Figure 124 sets out the screen for connecting Deliverable Templates with Task Templates. The fundamental relationship between Deliverable Templates and Task Template is many-to-many. That is, a specific Task Template can be deployed as the process model for multiple Deliverable Templates, and a Deliverable Template can employ multiple Task Template process models. This strategy is both realistic and avoids redundancy.

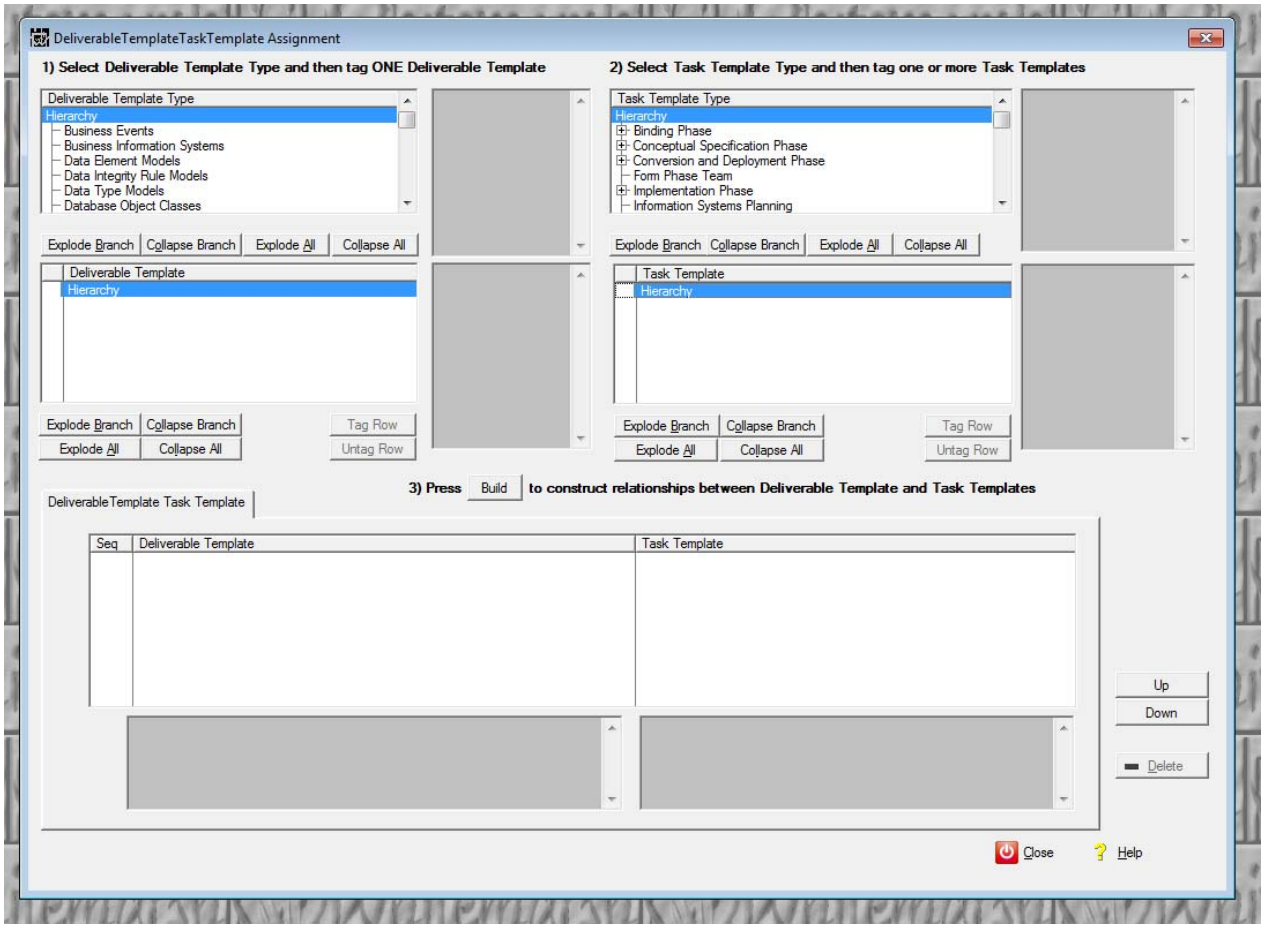

Figure 124. Deliverable Template - Task Template

The process of creating the association between Deliverable Templates and Tasks Templates is accomplished by selecting a Deliverable Template Type from the top-left browse, and the tagging one Deliverable Template from the middle-left browse. On the right side, select a Task Template Type from the top-right browse, and then one or more Task Templates from the middle right browse. After the tagging is complete, press the Build button. The joined Deliverable Templates and Task Templates are shown in the bottom browse.

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To delete a joined Deliverable Templates and Task Templates press the Delete button. The Up and Down buttons cause the sequence of the created Deliverable Templates and Task Templates to change.

5.7.4 Project Templates

Figure 125 identifies the processes supporting the creation and management of Project Templates. Included in these processes are:

- Project Template Types
- Importing Project Template Types
- Project Template Type Reallocation
- Project Templates
- Importing Project Templates
- Project Template Reallocation

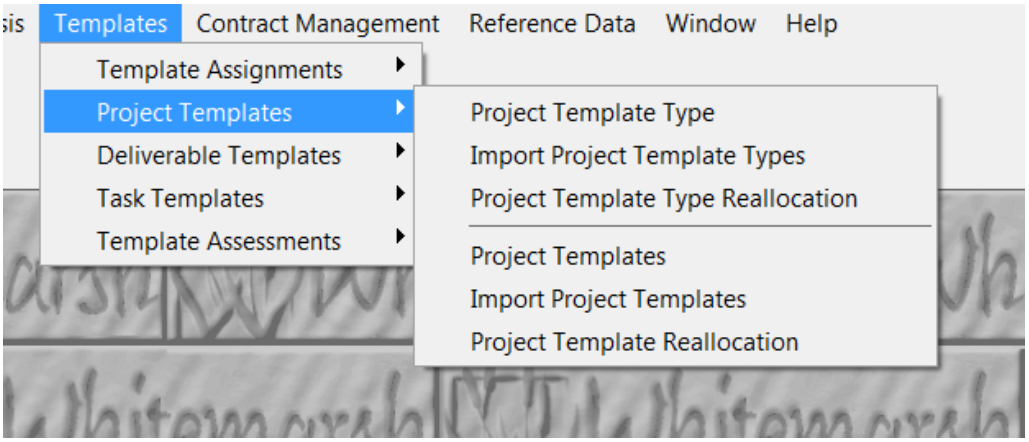

Figure 125. Project Template Processes.

A project is a formally defined collection of deliverables and tasks which govern the accomplishment of the desired state of a specific Recourse Life Cycle node. That accomplishment may become stored data in Databases managed by Business Information Systems.

Resource Life Cycle Nodes are set within a specific Resource and that may be related to other Resource Life Cycle Nodes of different Resources. Projects executions contribute to the overall accomplishment of one or more Enterprise Missions. Projects are performed by Persons performing specific Business Functions, as authorized and managed by the Organizations that manage and pay for the projects.

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It should be noted that the above words that are not accidently capitalized. These words all represent components of the suite of Whitemarsh Metabase modules employed during the execution of projects.

Within Whitemarsh Project Management, the projects themselves are drawn from within collections of project templates. Not only can projects be hierarchically organized into overarching projects and subordinate projects, but can also be set within collections of Project Templates, which themselves can be hierarchically organized.

5.7.4.1 Project Template Type

Figure 126 shows the data for a given Project Template Type along with the Project Templates that exist for a selected Project Template Type. When a Project Template Type is selected, the Project Templates that are defined within that collection are shown. While this list of Project Template Types do not contain subordinate Project Template Types, they can.

To add or modify a Project Template Type that is at the root level (no parents) select the "Hierarchy" string and then press Insert or Change. At that point, Figure 127 is presented. Added within this form is the name of the Project Template Type and its description. On the creation of the Project Template Type, its sequence is added. If the sequence of the project is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 126.

The description of the Project Template Type should be restricted to describing the Project Template Type itself. Not described should be either the Project Templates, Project Deliverables, or the Project Tasks that accomplish a given Project Deliverable.

The description of the Project Template Type should be restricted to describing the Project Template Type itself. Not described should be either the Project Templates, Project Deliverables, or the Project Tasks that accomplish a given Project Deliverable.

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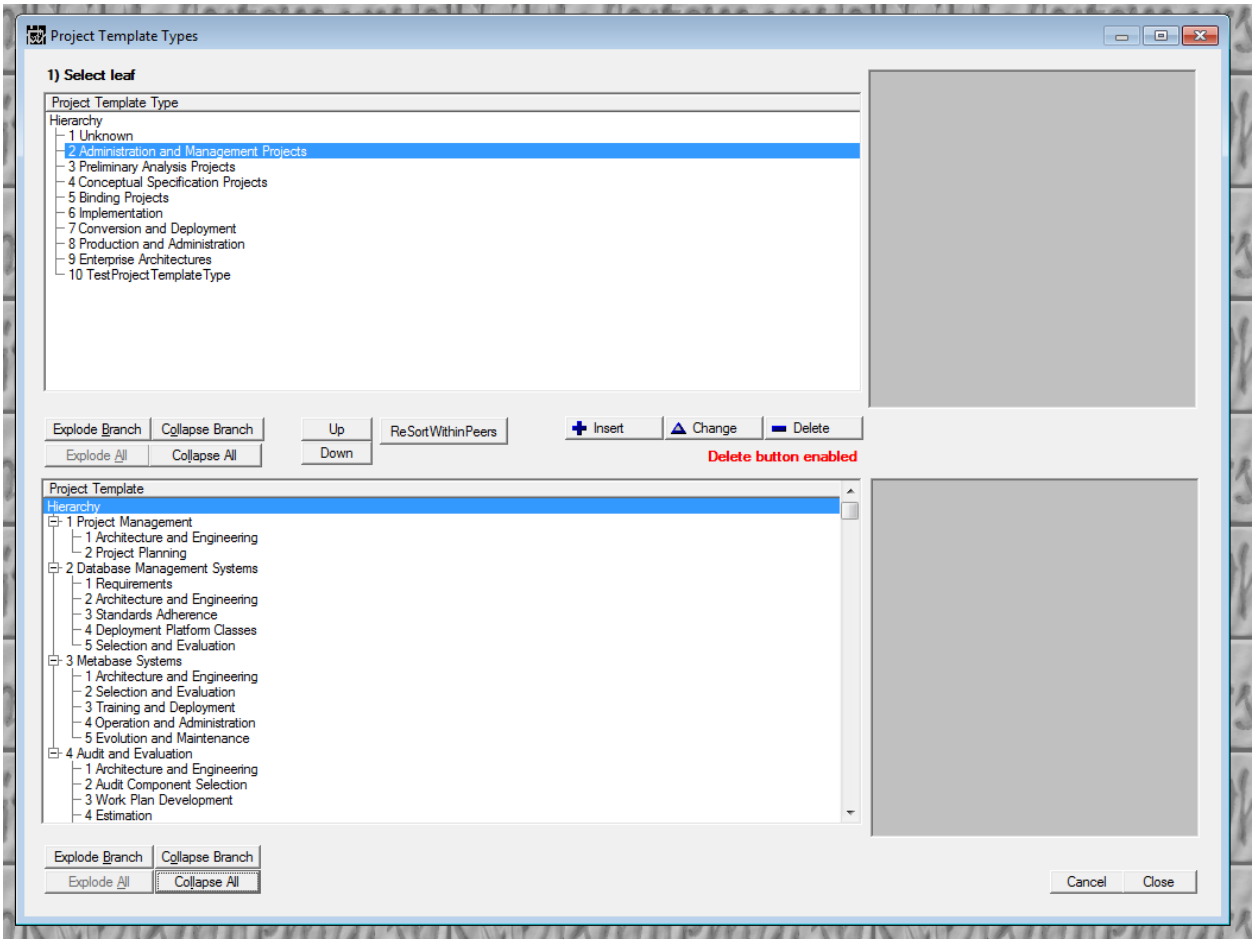

Figure 126. Project Template Type process.

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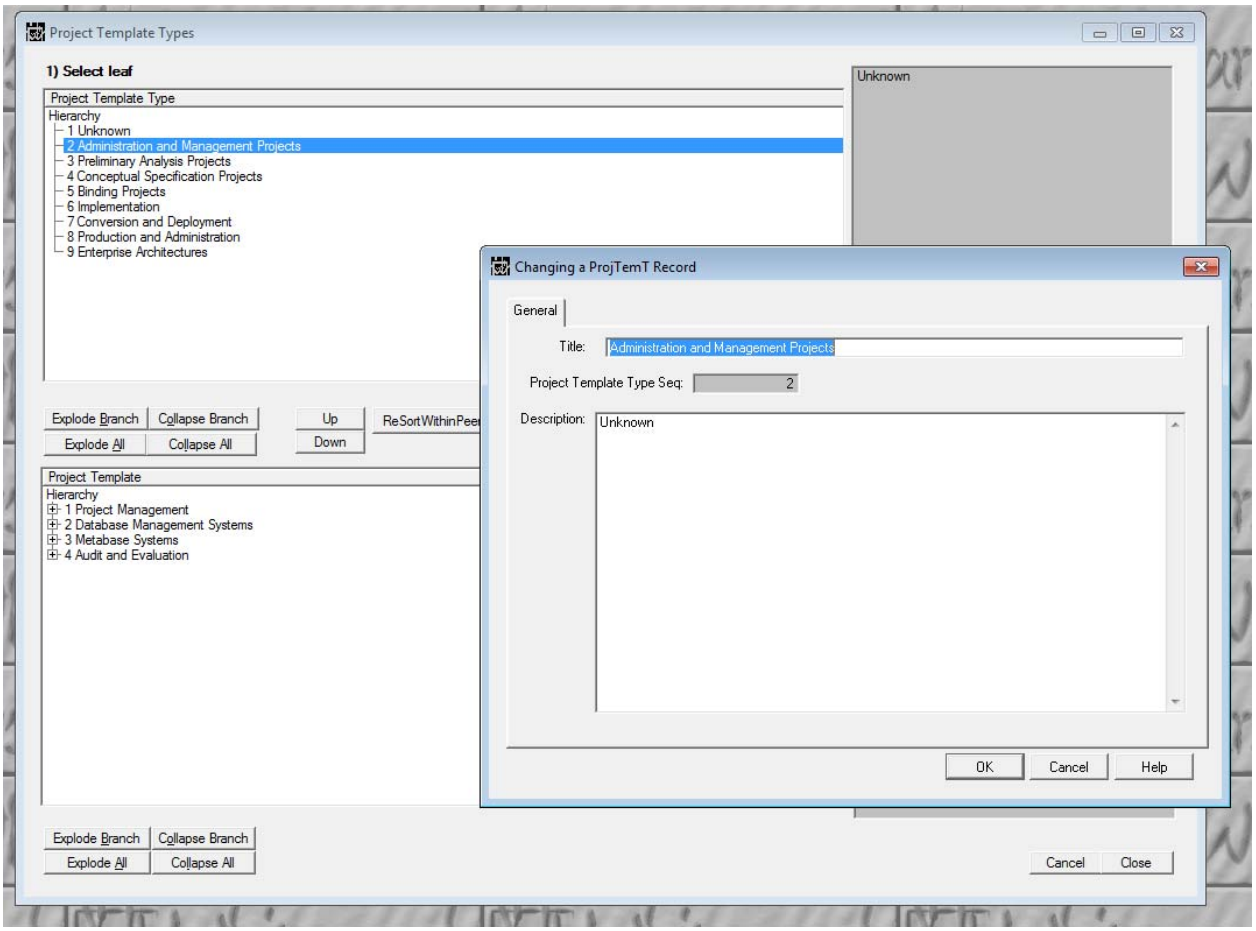

Figure 127. Project Template Type Update Process.

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5.7.4.2 Import Project Template Types

Figure 128 illustrates the process involved in importing a list of Projects Task Templates from a CSV type file. The first step is to select the 'Hierarchy' in the browse of this window.

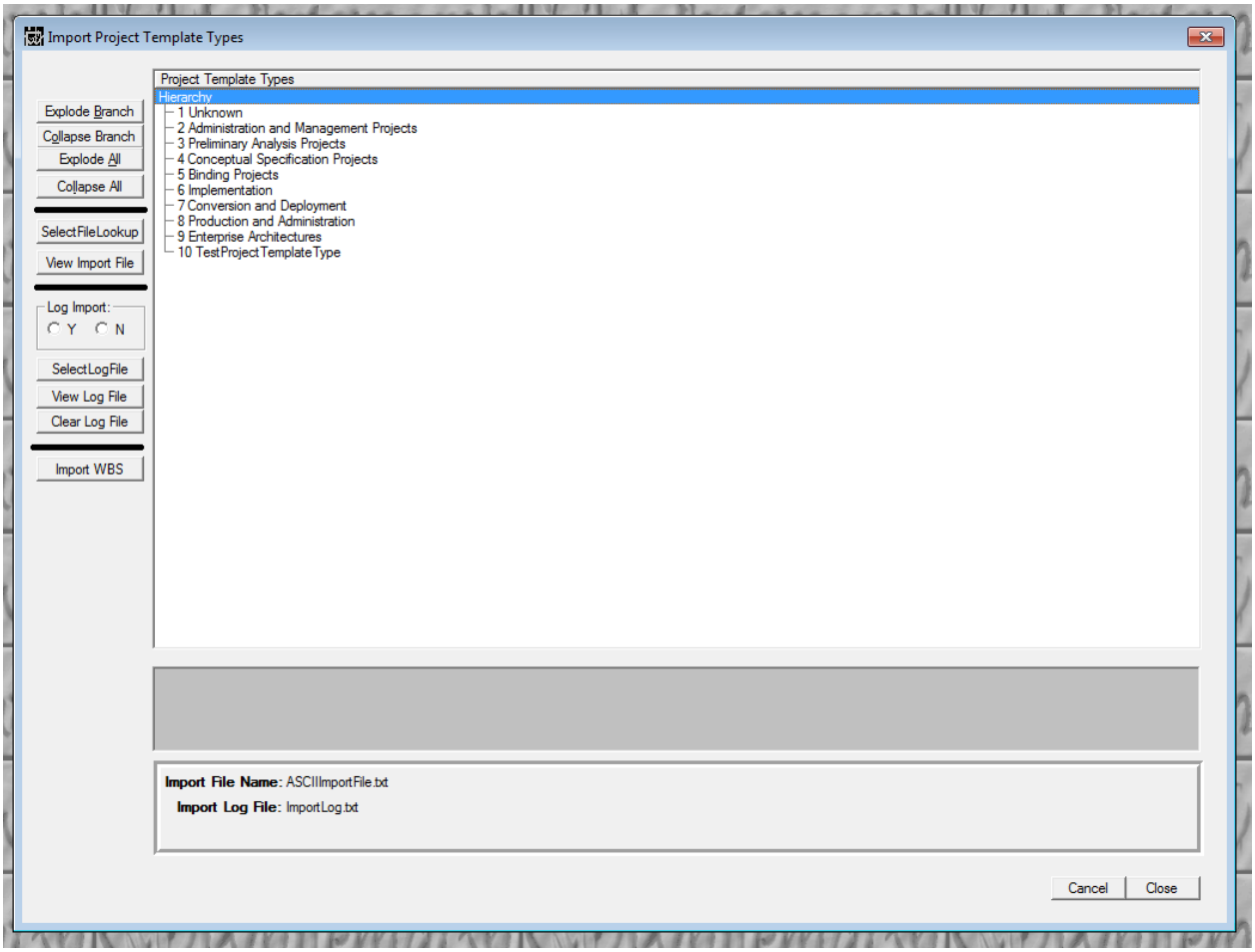

Figure 128. Import Project Template Type Process.

The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 129.

Once selected, the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and if Y, to Select the Log File. To view the Log file, press the View Log File button. At the bottom of Figure 128 the names of the import file and the log file are displayed.

At the end of the loading process, the Project Template Type browse is refreshed and shows the newly imported Project Template Types.

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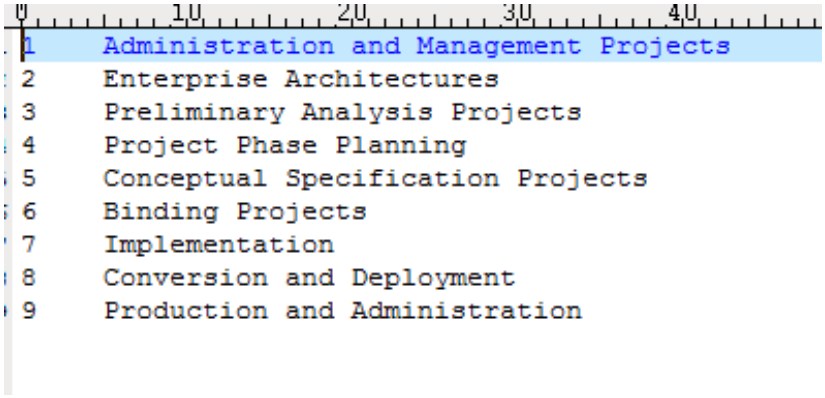

Figure 129. Project Template Type CSV Import file.

5.7.4.3 Project Template Type Reallocation

Project Templates Types as shown in Figure 130 are hierarchical. Project Templates Types can be reallocated from one Project Templates Type to another. In addition, a given subordinate Project Templates Type can be made a root project. This is accomplished through the process depicted in Figure 130.

To move a given Project Templates Type from its existing parent to a different parent, the process is simple. Just tag the Project Templates Type in the left browse and tag the new "parent" in the right browse, and then press the button, at the bottom of the window to reallocate the Project Templates Type.

Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the Project Templates Type is being moved from an existing parent on the left browse to the same parent on the right browse.

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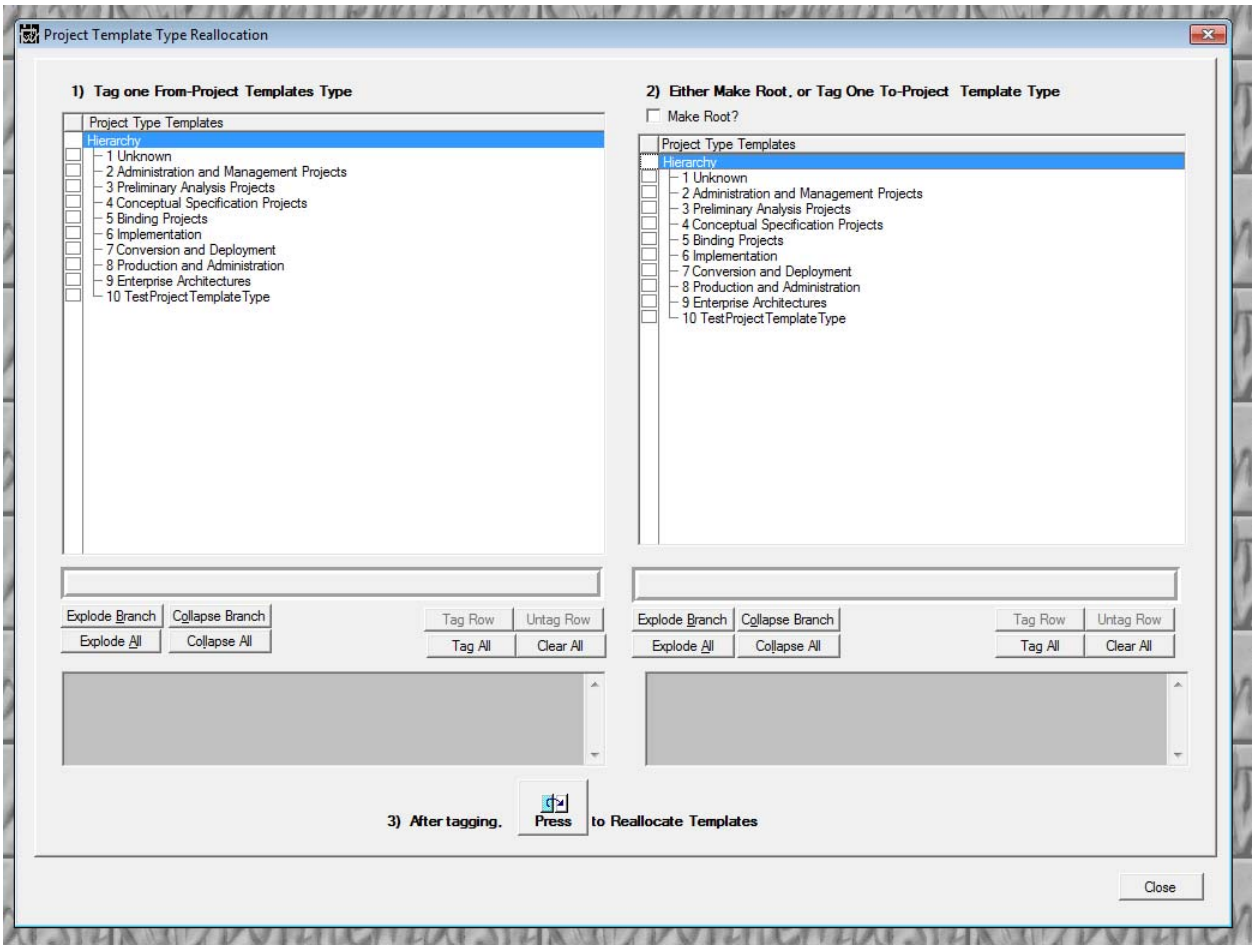

Figure 130. Project Template Type Reallocation Process.

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5.7.4.4 Project Templates

Figure 131 shows the data for a given project. Shown are two browses in the window. The top browse shows the Project Template Types. The bottom shows the Project Templates.

When a Project Template Type is selected, the projects defined within that collection are shown. From the project list, several of the projects contain subordinate projects. For example, the project, Project Management contains subordinate projects, Architecture and Engineering, and Project Planning.

To add or modify a project that is at the root level (no parents) select the “Hierarchy” string and then press Insert or Change. At that point, Figure 132 is presented. Added within this form is the name of the project and its description. On creation of a Project Template, its sequence is added.

If the sequence of the project is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 131.

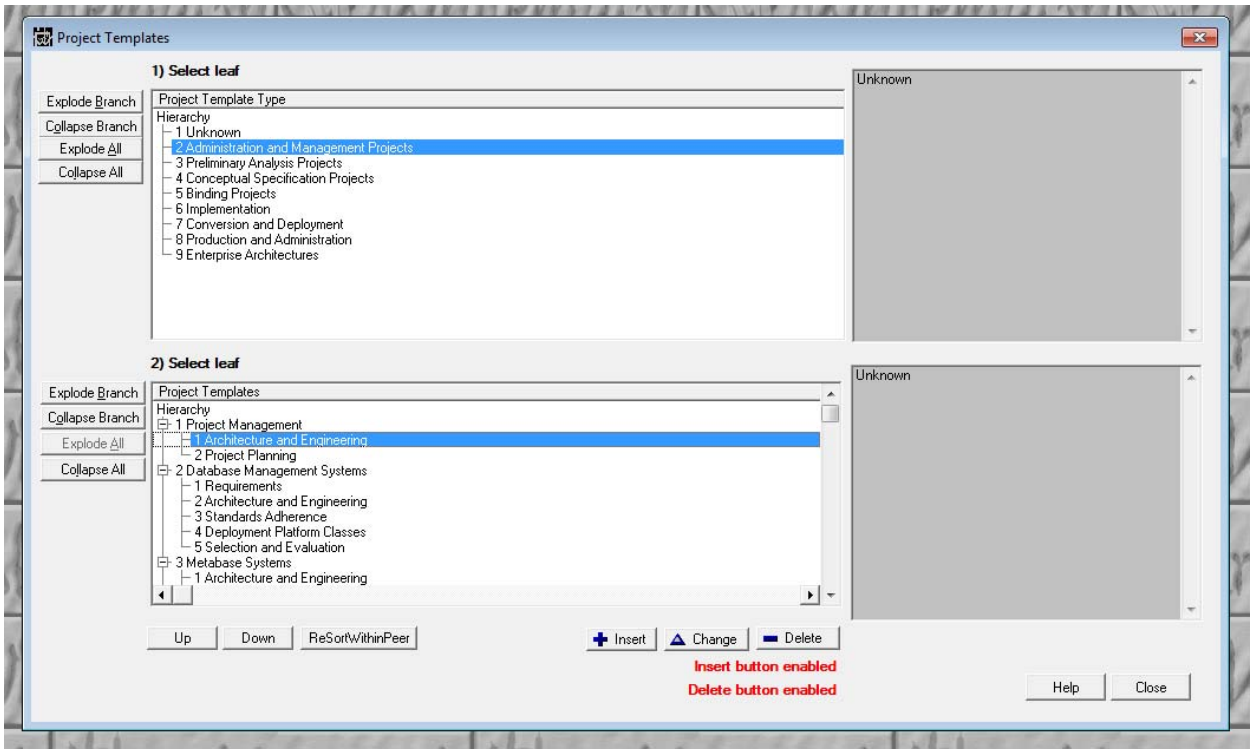

Figure 131. Project Templates.

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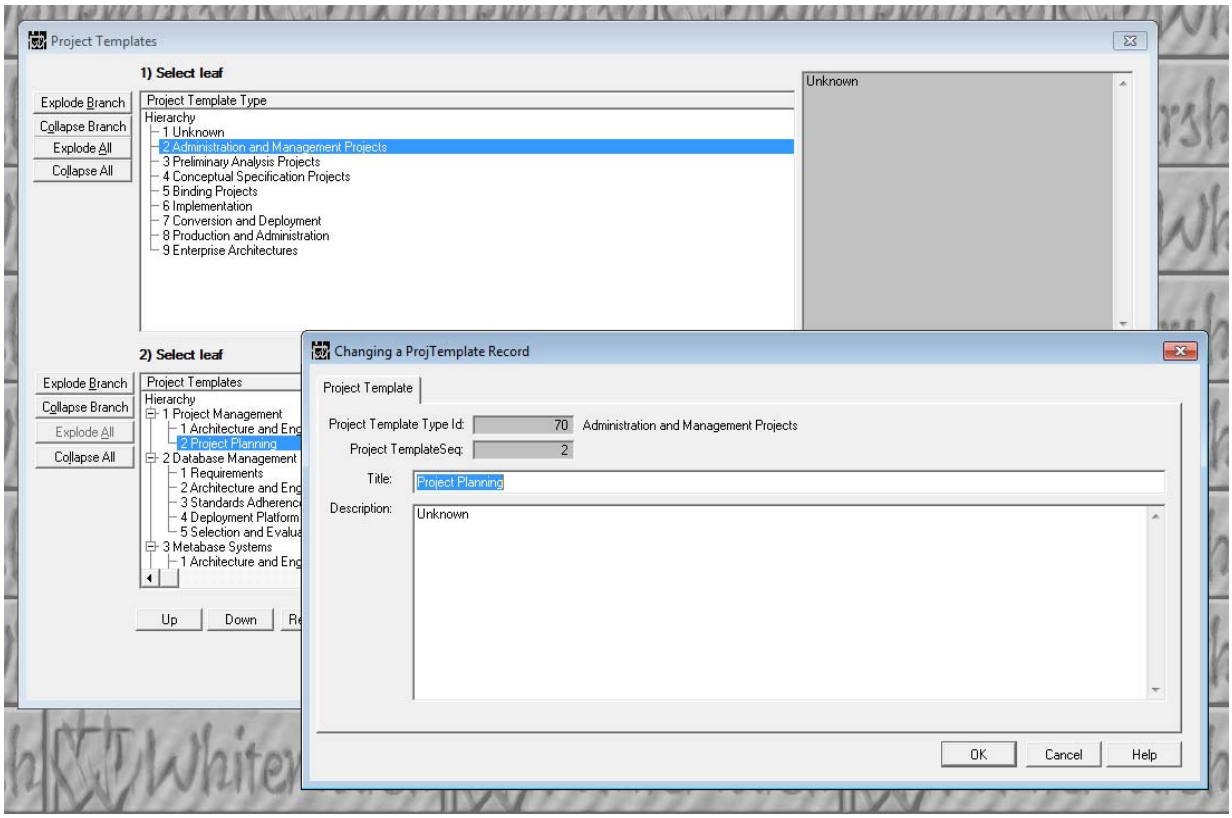

Figure 132. Project Template Update.

The description of the project should be restricted to describing the project itself. Not described should be either the project's deliverables or the tasks that accomplish a given deliverable.

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5.7.4.5 Import Project Templates

Figure 133 illustrates the process involved in importing a list of Project Template from a CSV type file. The first step is to select the Project Template Type in the top browse of this window that is to be the context for the imported set of projects.

Project Templates are imported from CSV files. The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 134. In this figure, line 1, is the Project Template Type, Administration and Management Projects.

Once selected, the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and if Y, to Select the Log File. To view the Log file, press the View Log File button. At the bottom of Figure 133 the names of the import file and the log file are displayed.

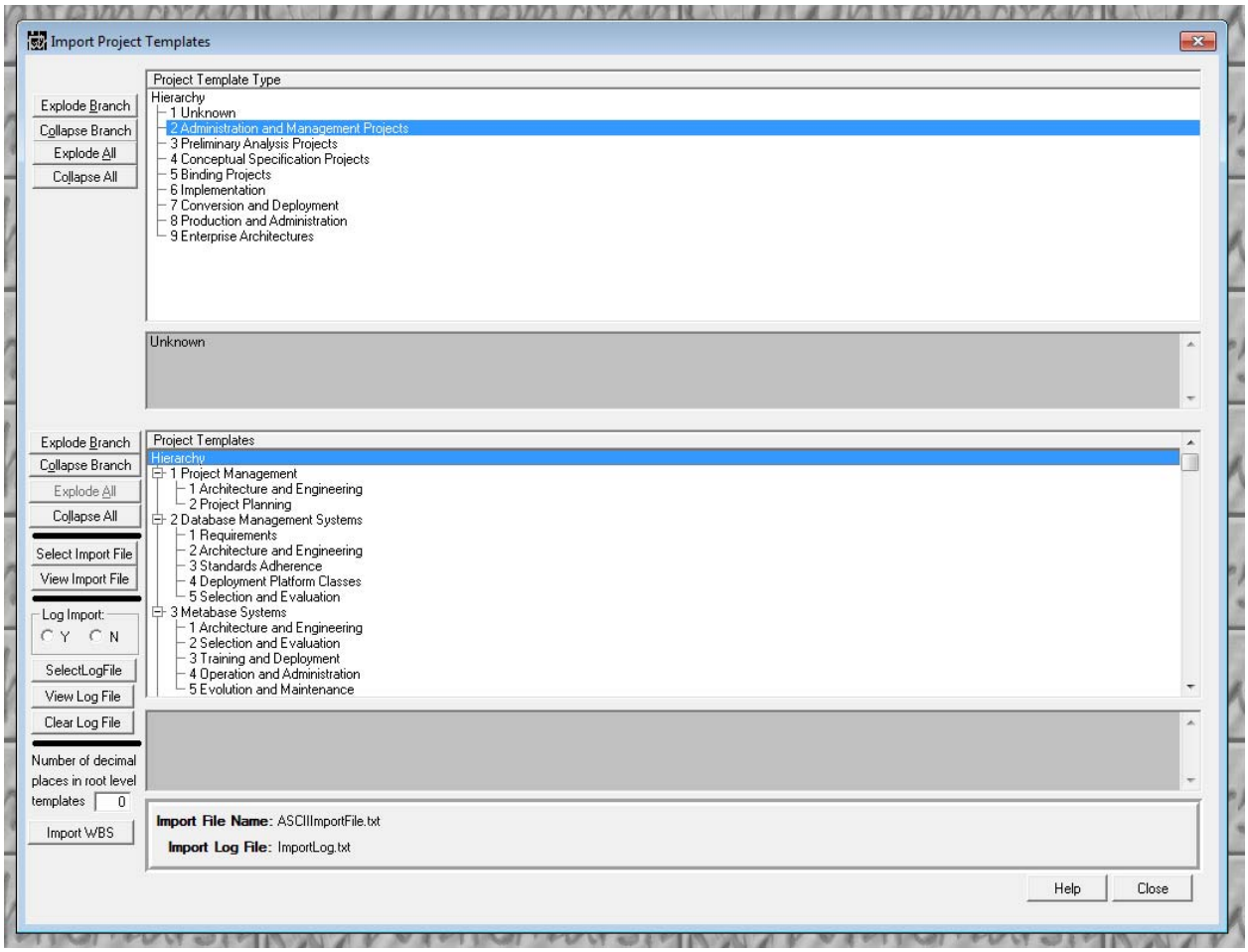

Figure 133. Import Project Template.

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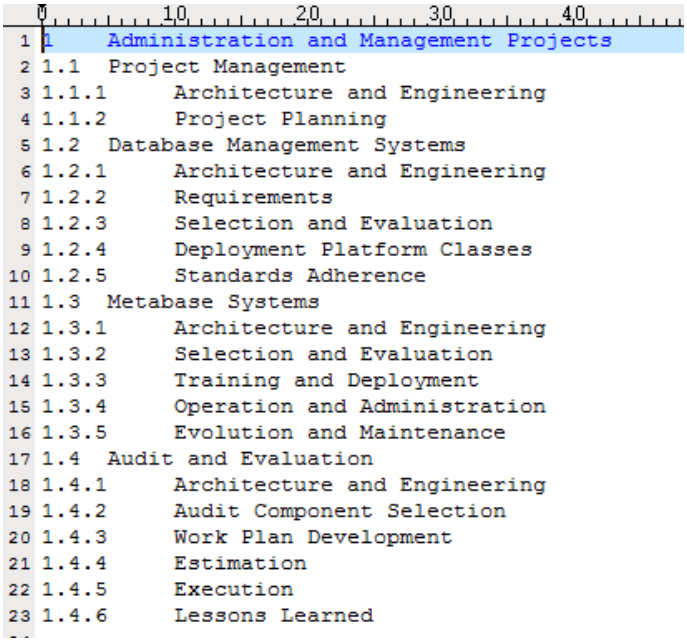
The next step is to indicate which record from Figure 134 is the first Project Template. As can be seen in Figure 93, that is to be Project Management. In Figure 134, that is the second record. What is unique about that record is that it has a single decimal place. Within it are records with additional decimal places. By placing the value 1 in the entry, Number of decimal places..., the importing process will skip the first record, and proceed to only load records with 1 or more decimal places. The actual import process starts by pressing the Import WBS button. WBS, of course means work breakdown structure. At the end of the loading process, the Project Template browse is refreshed and shows the newly imported Project Templates.



```
1  1    Administration and Management Projects
2  1.1  Project Management
3  1.1.1     Architecture and Engineering
4  1.1.2     Project Planning
5  1.2  Database Management Systems
6  1.2.1     Architecture and Engineering
7  1.2.2     Requirements
8  1.2.3     Selection and Evaluation
9  1.2.4     Deployment Platform Classes
10 1.2.5     Standards Adherence
11 1.3  Metabase Systems
12 1.3.1     Architecture and Engineering
13 1.3.2     Selection and Evaluation
14 1.3.3     Training and Deployment
15 1.3.4     Operation and Administration
16 1.3.5     Evolution and Maintenance
17 1.4  Audit and Evaluation
18 1.4.1     Architecture and Engineering
19 1.4.2     Audit Component Selection
20 1.4.3     Work Plan Development
21 1.4.4     Estimation
22 1.4.5     Execution
23 1.4.6     Lessons Learned
```

Figure 134. CSV File for Projects.

5.7.4.6 Project Template Reallocation

The Project Templates as shown in Figure 135 are hierarchical. Project Templates can be reallocated from one Project Template to another. In addition, a given subordinate Project Template can be made a root project. This is accomplished through the process depicted in Figure 135.

To move a given Project Template from its existing parent to a different parent, the process is simple. Just tag the Project Template in the left browse and tag the new “parent” in the right browse, and then press the button, at the bottom of the window to reallocate the Project Template.

Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the Project Template is being moved from an existing parent on the left browse to the same parent on the right browse.

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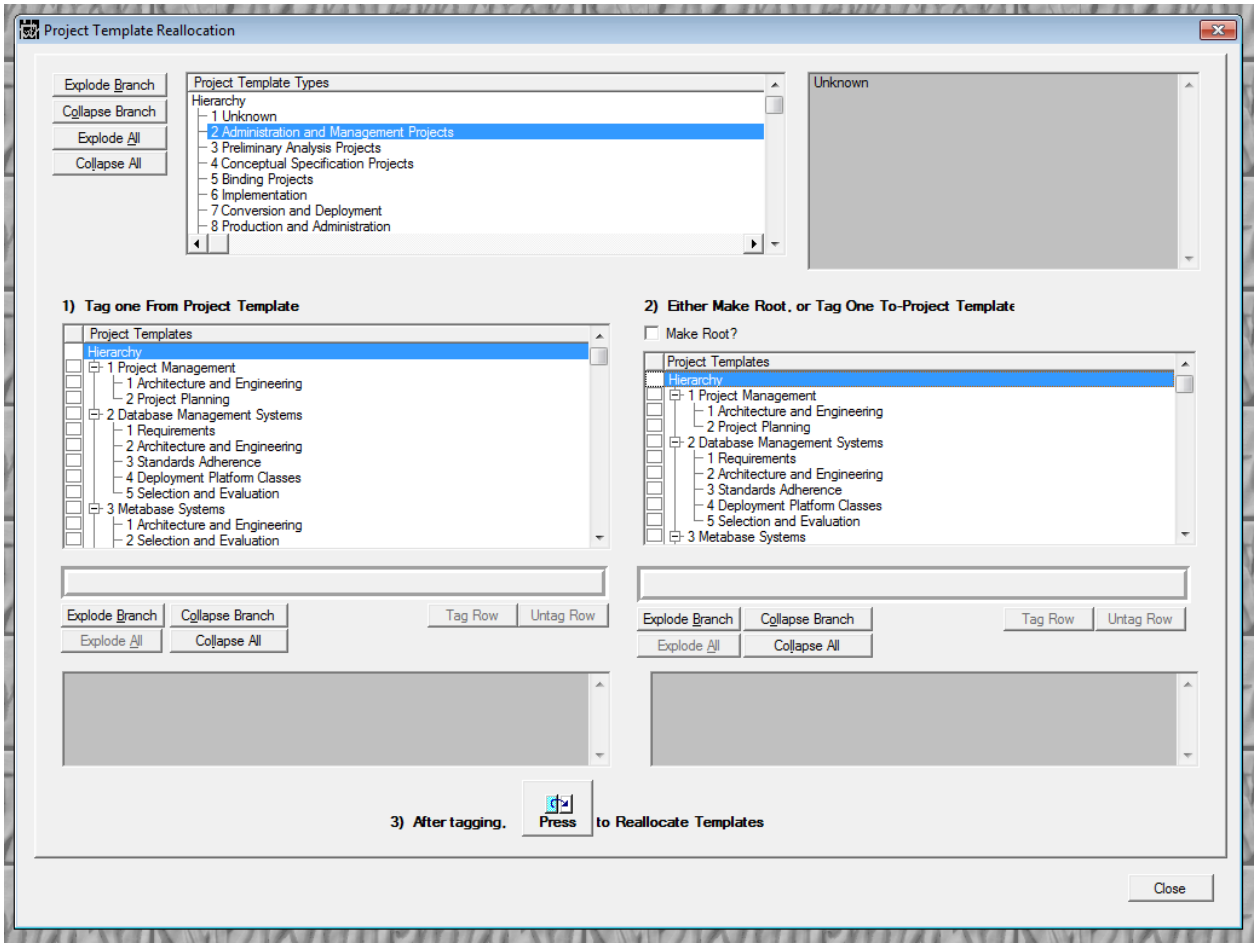

Figure 135. Project Template Reallocation.

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5.7.5 Deliverable Templates

Figure 136 identifies the processes supporting the creation and management of Project Templates. Included in these processes are:

- Deliverable Template Types
- Importing Deliverable Template Types
- Deliverable Template Type Reallocation
- Deliverable Templates
- Importing Deliverable Templates
- Deliverable Template Reallocation

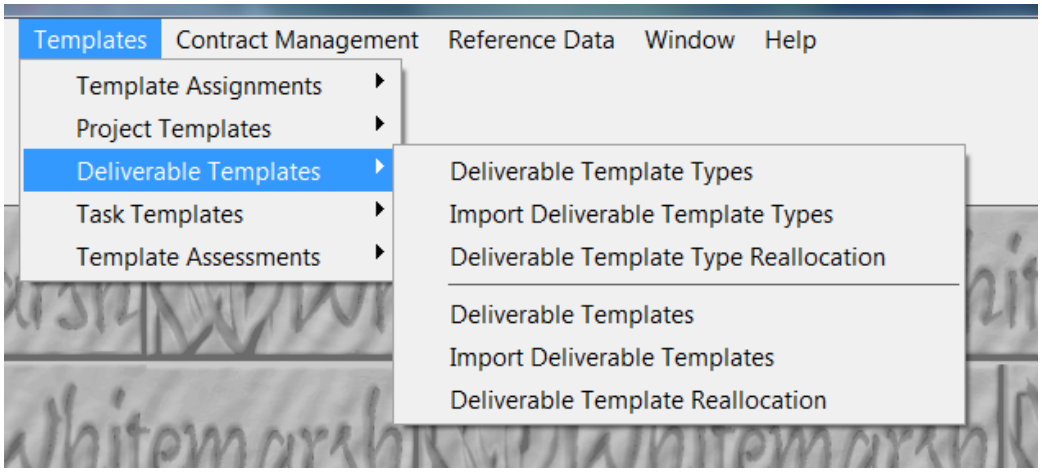

Figure 136. Deliverable Template Processes.

A deliverable is a formally defined collection of work products that represent the accomplishment of the desired state of a specific Recourse Life Cycle node. That accomplishment may be recorded in Databases that are managed by Business Information Systems.

A project is not a deliverable because while a project may have a schedule for its accomplishment, it is not an integral part. A deliverable is also not a task as a task is a process, not an outcome.

A given Resource Life Cycle Nodes may be a collection of deliverables, some of which may be simple and others complex. In Whitemarsh project management, deliverables can only be simple or hierarchical.

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5.7.5.1 Deliverable Template Types

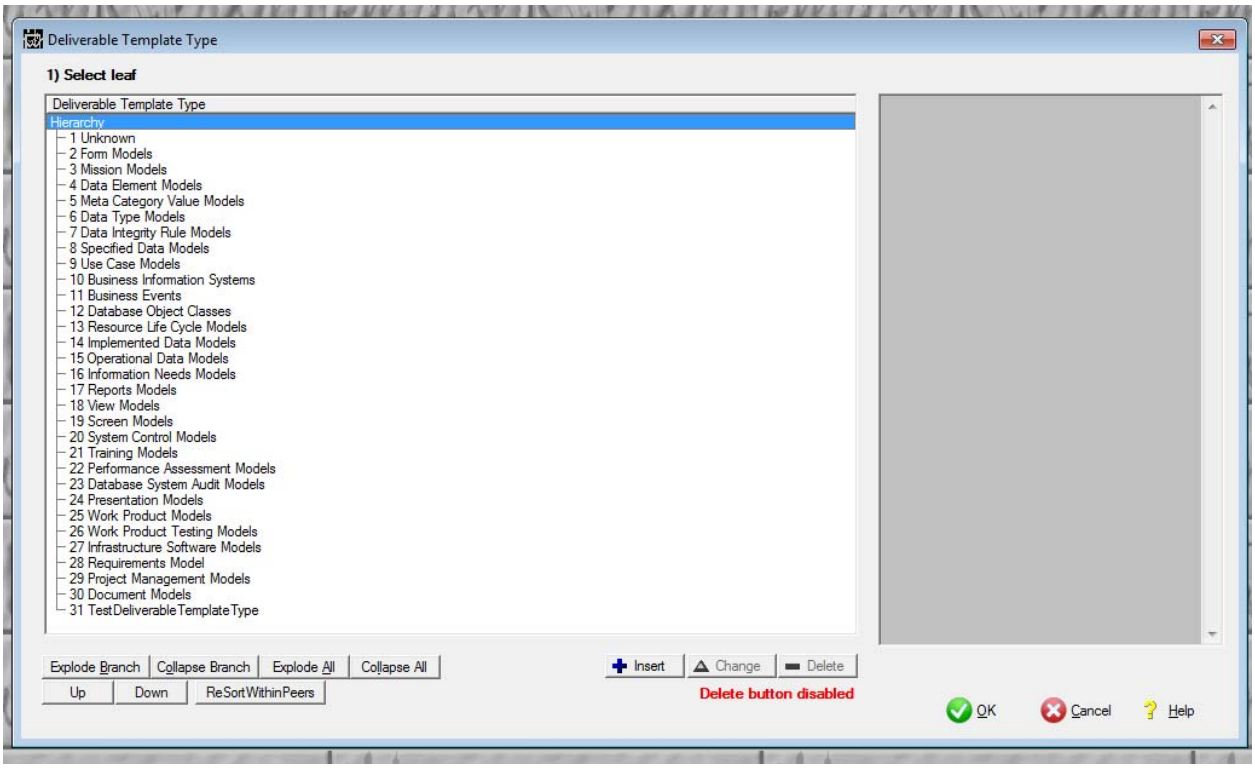

Figure 137. Deliverable Template Type Process.

Figure 137 shows the data for a given set of Deliverable Template Types. To add or modify a Deliverable Template Type that is at the root level (no parents) select the “Hierarchy” string and then press Insert or Change. At that point, Figure 138 is presented. Added within this form is the name of the Deliverable Template Type and its description. On the creation of the Deliverable Template Type, its sequence is added. If the sequence of the project is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 137.

The description of the Deliverable Template Type should be restricted to describing the Deliverable Template Type itself. Not described should be either the Deliverable Templates, Project Deliverables, or the Project Tasks that accomplish a given Project Deliverable.

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5.7.5.2 Import Deliverable Template Types

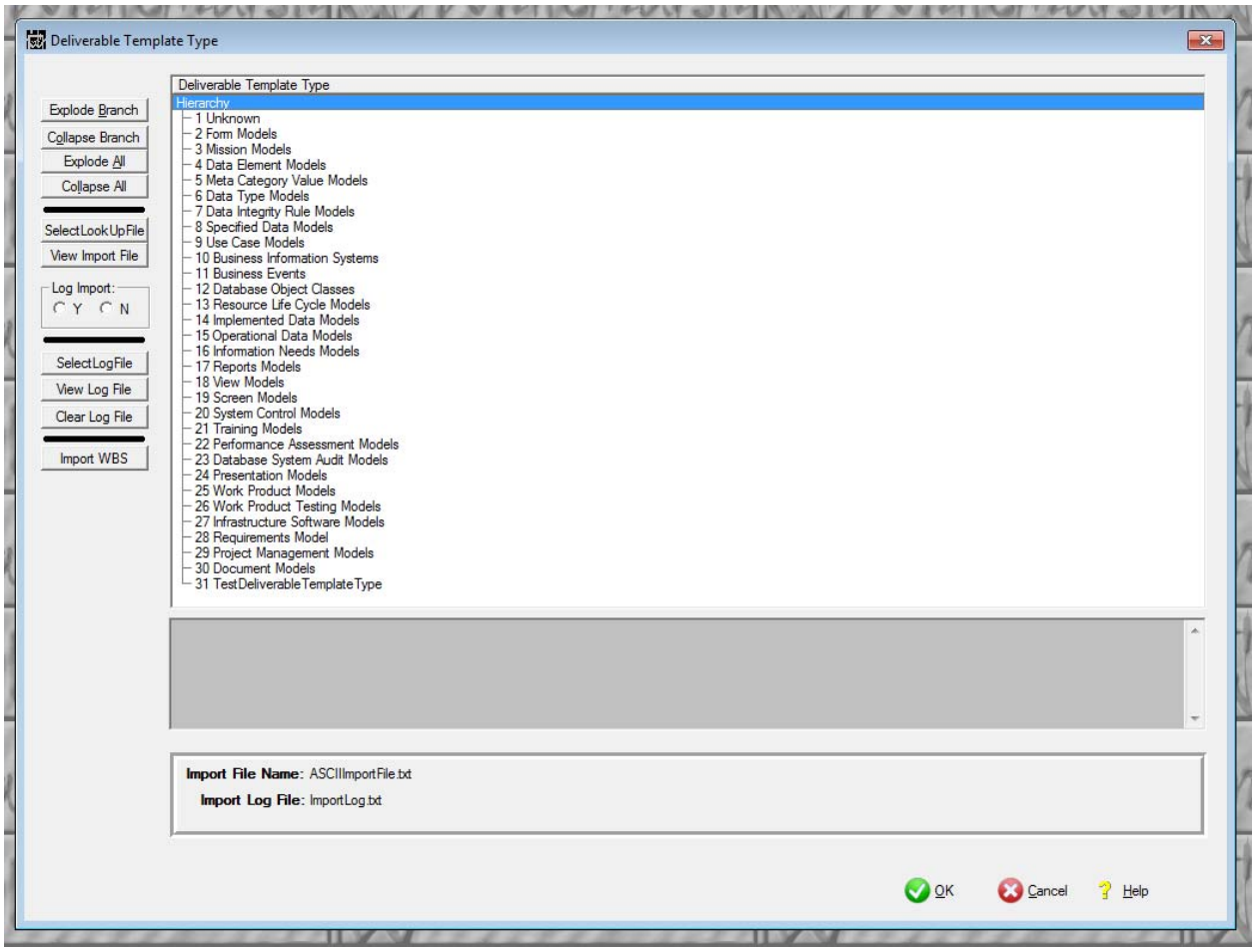

Figure 138. Importing Deliverable Template Type Process.

Figure 138 illustrates the process involved in importing a list of projects from a CSV type file. The first step is to select the 'Hierarchy' in the browse of this window.

Deliverable Template Types are imported from CSV files. The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 139.

Once selected, the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and if Y, to Select the Log File. To view the Log file, press the View Log File button. At the bottom of Figure 138 the names of the import file and the log file are displayed.

At the end of the loading process, the Deliverable Template Type browse is refreshed and shows the newly imported Deliverable Template Types.

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```
1 Project Management Models
2 Document Models
3 Form Models
4 Mission Models
5 Data Element Models
6 Meta Category Value Models
7 Data Type Models
8 Data Integrity Rule Models
9 Specified Data Models
10  Use Case Models
11  Business Information Systems
12  Business Events
13  Database Object Classes
14  Resource Life Cycle Models
15  Implemented Data Models
16  Operational Data Models
17  Information Needs Models
18  Reports Models
19  View Models
20  Screen Models
21  System Control Models
22  Training Models
23  Performance Assessment Models
24  Database System Audit Models
25  Presentation Models
26  Work Product Models
27  Work Product Testing Models
28  Infrastructure Software Models
29  Requirements Model
```

Figure 139. Deliverable Template Type CSV Import File

5.7.5.3 Deliverable Template Type Reallocation

Deliverable Template Types can be hierarchical although none in Figure 140. If some where hierarchical, Deliverable Template Types could be reallocated from one Deliverable Template Type to another.

To move a given Deliverable Template Type from its existing parent to a different parent, the process is simple. Just tag the Deliverable Template Type in the left browse and tag the new "parent" in the right browse, and then press the button, at the bottom of the window to reallocate the templates.

Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the project is being moved from an existing parent on the left browse to the same parent on the right browse.

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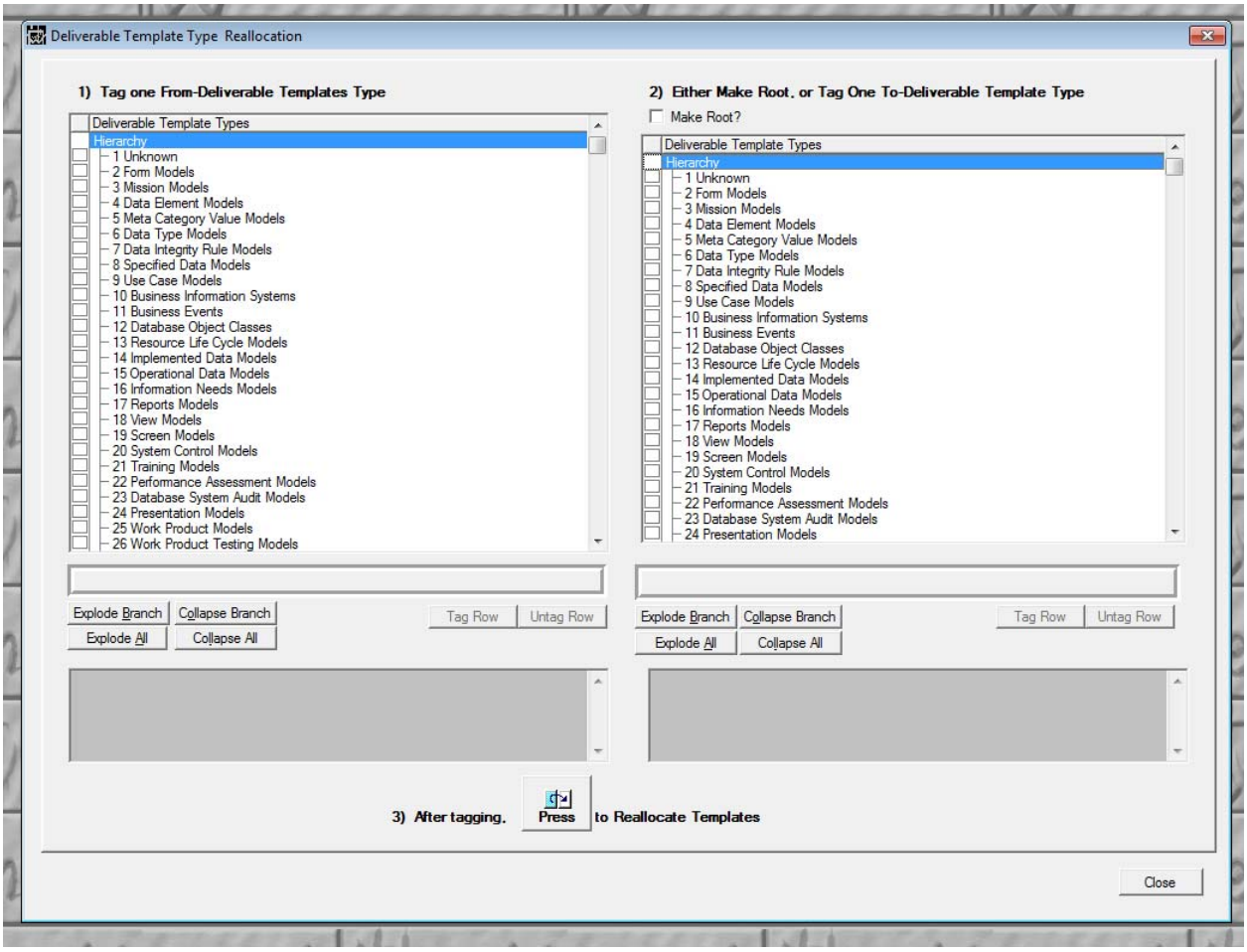

Figure 140. Deliverable Template Reallocation Process.

5.7.5.4 Deliverable Templates

Figure 141 shows two browses in the window. The top browse shows the Deliverable Template Types. The bottom shows the Deliverable Templates.

When a Deliverable Template Type is selected, the Deliverables that are defined within that collection are shown. From the Deliverable list, several of the Task contain subordinate Deliverable. For example, the deliverable, Mission Model has at least five different deliverable collections, that is, Missions, Management, Mission Model Relationships, Organizations, and Functions. In turn, Mission contains subordinate projects, Mission Descriptions, Mission Structure, and Mission Structure Type. Collectively, these three deliverables comprise the overall deliverable, Mission

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To add or modify a Deliverable that is at the root level (no parents) select the “Hierarchy” string and then press Insert or Change. At that point, Figure 141 is presented. Added within this form is the name of the deliverable and its description. On the creation of the deliverable, its sequence is

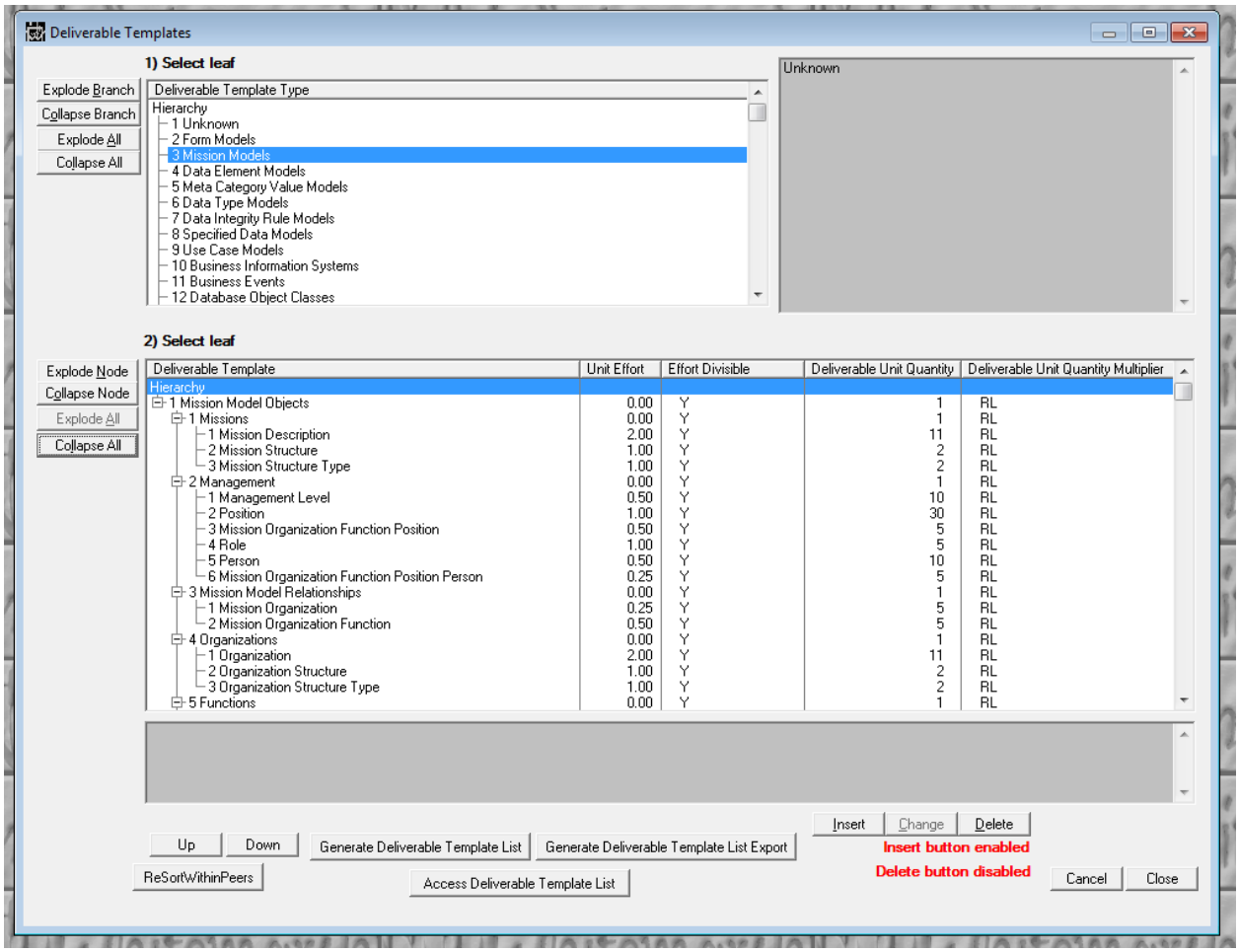

Figure 141. Deliverable Template Processes.

added. If the sequence of the deliverable is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 141.

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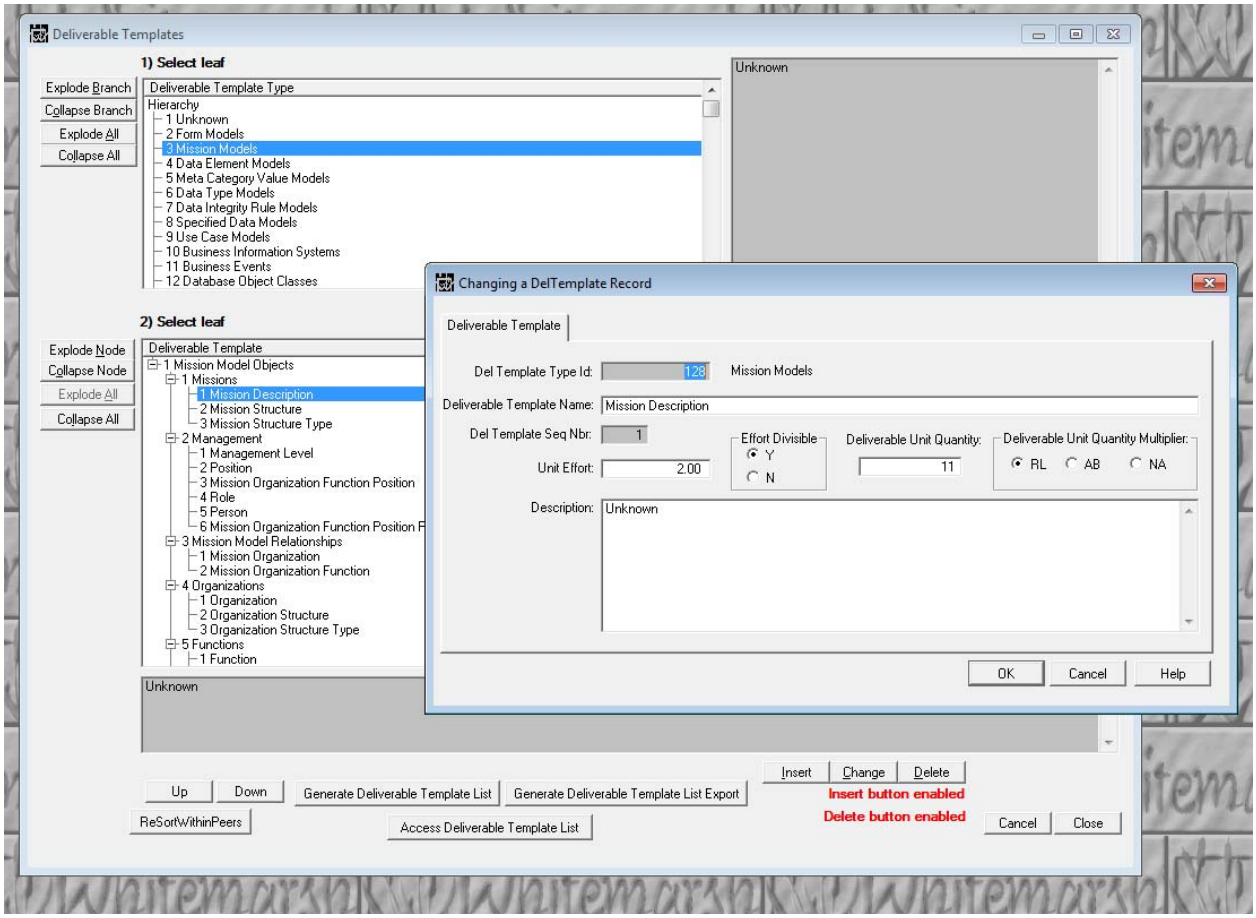

Figure 142. Deliverable Template Processes.

The most important items that can be set on a Deliverable Template are set out in Table 6. It should be quite clear that these values need to be carefully set when configuring deliverables as these values, along with Work Environment Factors and Person Skill Levels are the basis for determining all the resources necessary for a project's schedule, critical path, and total quantity of staff hours.

The Deliverables Template import process just imports the basic information, that is, Deliverable Template decimal-based sequence number and the Deliverable Template Name. The process of adding the information in Table 6 happens one Deliverable Template at a time. There is, of course software processes that assist in this effort. The sections that follow immediately describe these assists.

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Deliverable Template Critical Value	Description
Unit Effort	Unit Effort, expressed in hours is the estimated time it would take one staff person of a journeyman skill level within a working environment (e.g, tools, reviews, and the like) that is appropriate for the unit of effort in completing this deliverable.
Effort Divisible	Effort Divisible, expressed as Y(es) or N(o) is whether accomplishment this effort could be divided among persons.
Deliverable Unit Quantity	Deliverable Unit Quantity, expressed as a quantity represents the generally acceptable quantity of units that would be created for this deliverable. For example if the deliverable is the specification of database table columns, and there are generally about 10 columns per table, then the Deliverable Unit Quantity would be 10.
Deliverable Unit Quantity Multiplier	Deliverable Unit Quantity Multiplier, expressed as three legal values, RL, AB, NA. RL means relative to the quantity of the deliverable's parent deliverable. If for example that parent deliverable is a database table, and its quantity is 100, and if there are 10 columns–on average–per table, then the total quantity of columns would be 1,000. There is no practical limit to the quantity of the hierarchical levels. AB means Absolute. That means that the quantity is not multiplied by any quantity in the deliverable's parent. NA means Not Applicable. That means that there is no multiplication of the unit quantity.

Table 6. Deliverable Template Critical Values.

The description of the deliverable should be restricted to describing the deliverable itself. Not described should be either the project's deliverables or the tasks that accomplish a given deliverable.

Figure 141 shows the following buttons that assist in the specification of the values in Table 6. These are:

- Generate Deliverable Template List
- Generate Deliverable Template List Export
- Access Deliverable Template List
- Resort within Peers

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5.7.5.4.1 Generate Deliverable Template List

A complete list of all the Deliverable Templates is generated in a form so that it can be updated one row at a time in a displayed table. The button that causes the generation is: Generate Deliverable Template List, and the message that shows that the list is to be generated is presented in Figure 143.

This generated list enables the values cited in Table 6 to be updated.

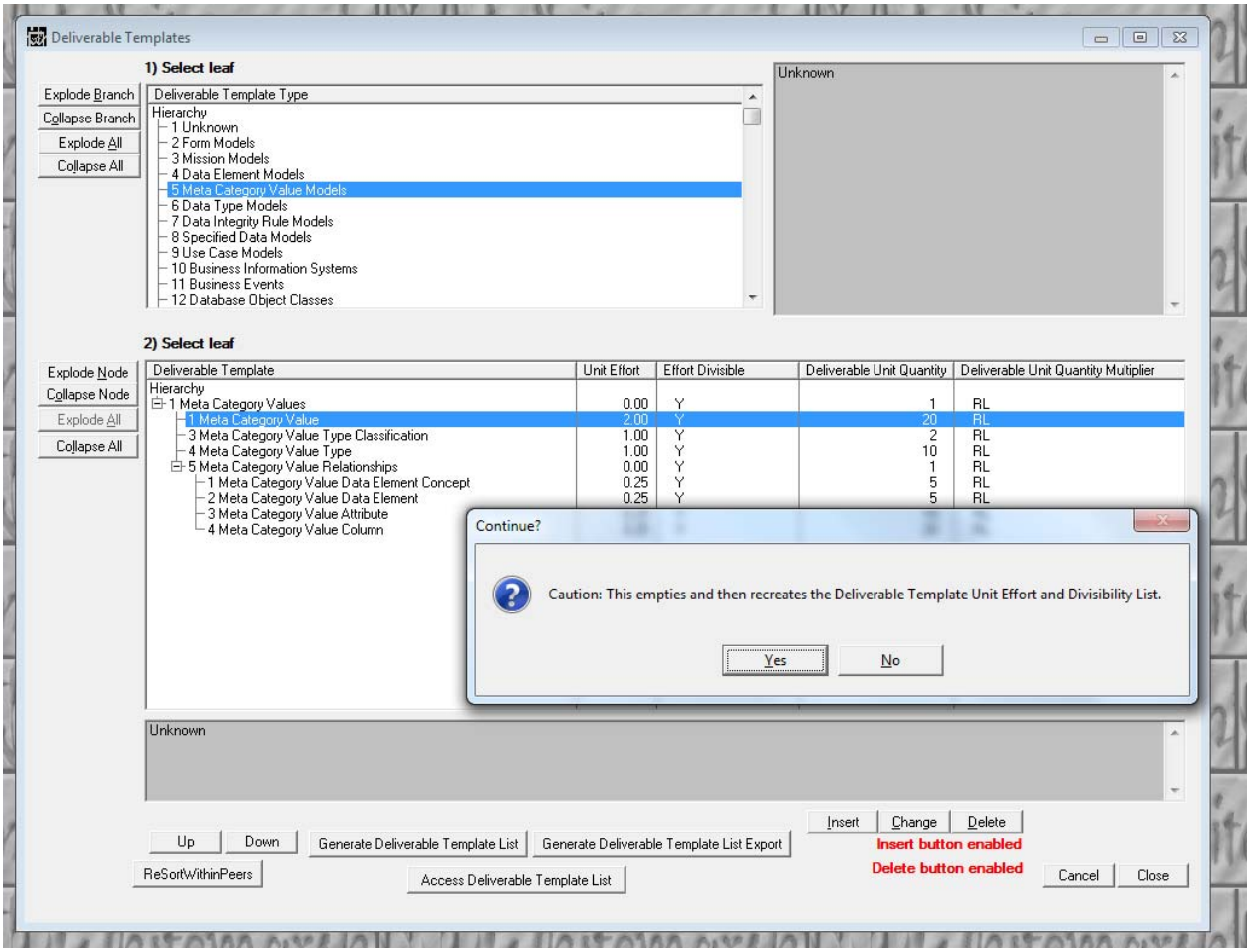

Figure 143. Generate Deliverable Template List Process.

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5.7.5.4.2 Generate Deliverable Template List Export

As an alternative to the generation of the list in a database table format, the button, Generate Deliverable Template List Export created the list in a CSV format. The message shown for the generation of the list is presented in Figure 144. An example of the actual generated list is shown in Figure 145.

The way to view the generated CSV list of Deliverable Templates is through a text editor, NOT through Excel. Viewing the list in Excel causes the values that "appear" to be numeric to be seen as floating point numbers.

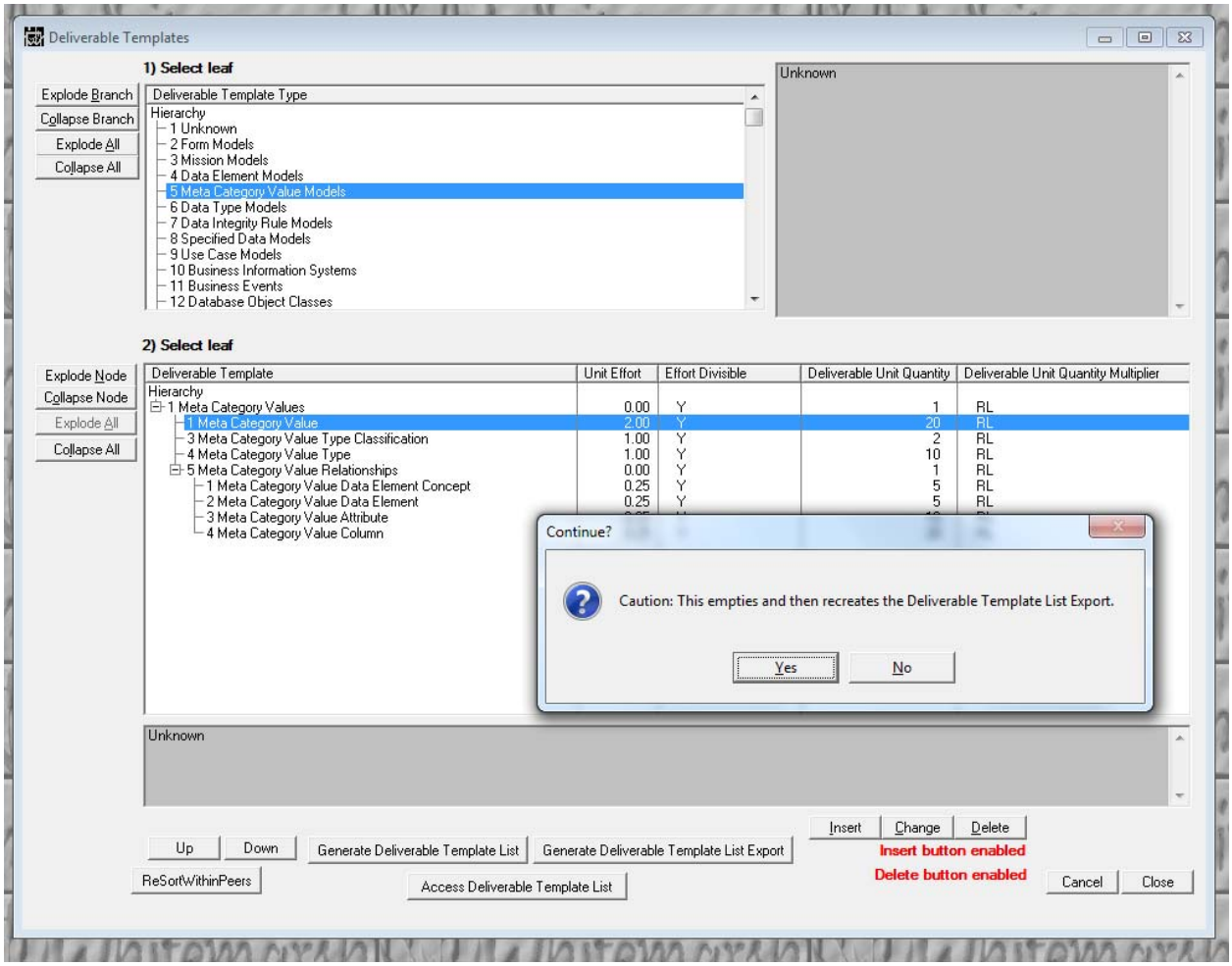

Figure 144. Generate Deliverable Template List Export.

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```
"487","1","Unknown","Unknown","00010001","1","Y","1","RL"
"488","1036","Form Models","Forms","00020001","0","Y","1","RL"
"489","596","Form Models","Form","000200010001","2","Y","1","RL"
"493","602","Form Models","Form Section Mission Organization Function","000200010002","1","Y","5","RL"
"491","601","Form Models","Form Cell View Column","000200010003","0.25","Y","5","RL"
"490","600","Form Models","Form Cell","000200010004","1","Y","5","RL"
"492","599","Form Models","Form Section","000200010005","1","Y","5","RL"
"495","598","Form Models","Form Structure Type","000200010006","1","Y","2","RL"
"494","597","Form Models","Form Structure","000200010007","0.5","Y","2","RL"
"496","1054","Mission Models","Mission Model Objects","00030001","0","Y","1","RL"
"521","603","Mission Models","Missions","000300010001","0","Y","1","RL"
"497","604","Mission Models","Mission Description","00030000100010001","2","Y","11","RL"
"498","605","Mission Models","Mission Structure","00030000100010002","1","Y","2","RL"
"499","606","Mission Models","Mission Structure Type","00030000100010003","1","Y","2","RL"
"519","622","Mission Models","Management","000300010002","0","Y","1","RL"
"511","623","Mission Models","Management Level","00030000100020001","0.5","Y","10","RL"
"515","624","Mission Models","Position","00030000100020002","1","Y","30","RL"
"512","625","Mission Models","Mission Organization Function Position","00030000100020003","0.5","Y","5","RL"
"516","626","Mission Models","Role","00030000100020004","1","Y","5","RL"
```

Figure 145. Deliverable Template List Export in CSV Format.

5.7.5.4.3 Access Deliverable Template List

Figure 146 presents the list of generated Deliverable Template records. This list is displayed upon pressing the button, Access Deliverable Template List, is at the bottom of Figure 142.

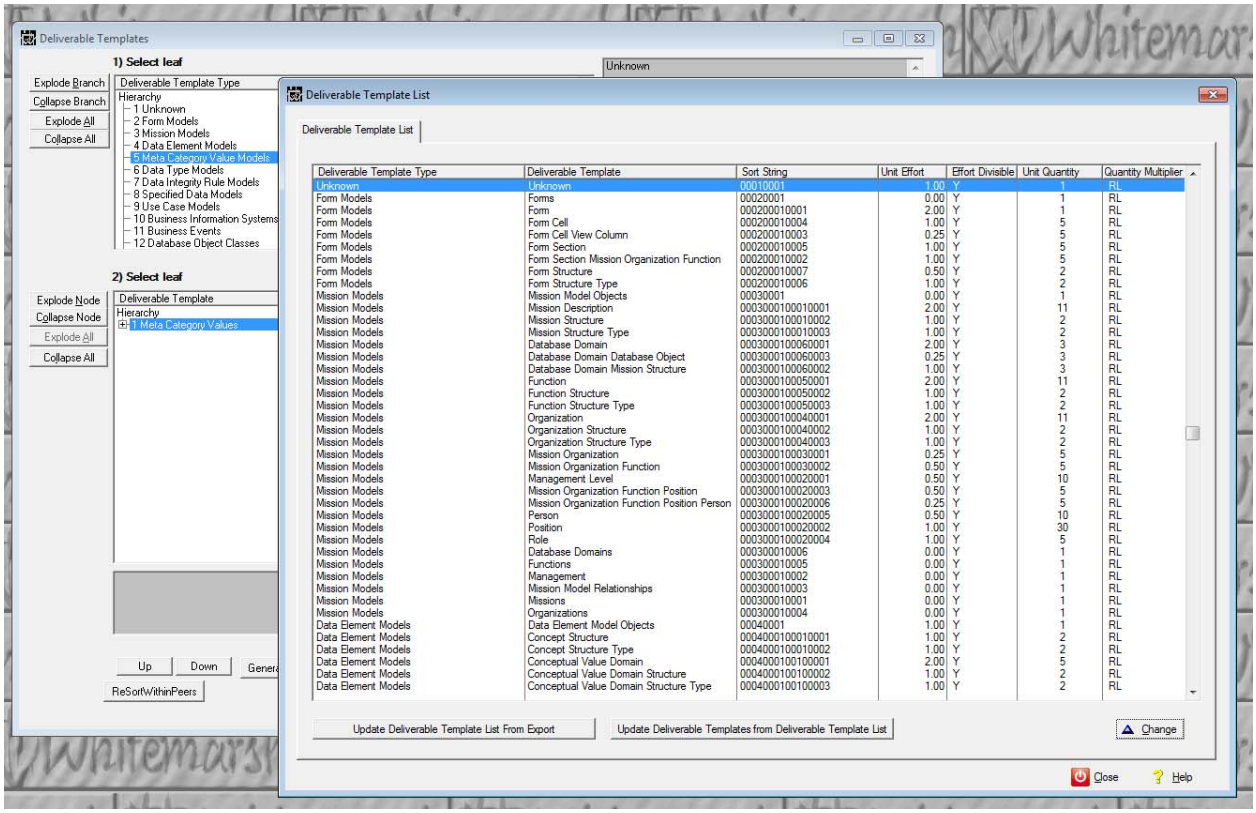

Figure 146. Access Deliverable Template List Process.

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The list enables changes to each Deliverable Template, one row at a time. This is accomplished by selecting a row, and pressing the Change button. When the button is pressed, the values of the four columns, Unit Effort, Effort Divisible, Unit Quantity, and Unit Quantity Multiplier can be changed. This is accomplished one column at a time for the selected row. To move between columns, press the Tab key.

Once all the changes are made to the list, the two buttons at the bottom of the screen are:

- Update Deliverable Template from Export
- Update Deliverable Template from Deliverable Template List

Choose the appropriate process. The result is an updated set of Deliverable Templates in the database.

5.7.5.4.4 Resort within Peers

The button, Resort Within Peers that appears at the bottom of Figure 143 causes all the sequences and the full “decimal-point-based” Deliverable Template hierarchical identifier to be resequenced.

5.7.5.5 Import Deliverable Templates

Figure 147 illustrates the process involved in importing a list of Deliverable Templates from a CSV type file. The first step is to select the Deliverable Type in the top browse of this window that is to be the context for the imported set of Deliverable Templates.

Deliverable Templates are imported from CSV files. The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 148. In this figure, line 1, is the Project Template Type, Administration and Management Projects.

Once selected, the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and if Y, to Select the Log File. To view the Log file, press the View Log File button. At the bottom of Figure 147 the names of the import file and the log file are displayed.

The next step is to indicate which record from Figure 148 is the first Deliverable Template. As can be seen in Figure 148, that is to be Templates deliverable. In Figure 148, that is the second record.

What is unique about that record is that it has a single decimal place. Within it are records with additional decimal places. By placing the value 1 in the entry, Number of decimal places..., the

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importing process will skip the first record, and proceed to only load records with 1 or more decimal places.

The actual import process starts by pressing the Import WBS button. WBS, of course means work breakdown structure. At the end of the loading process, the Deliverable Template browse is refreshed and shows the newly imported Deliverable Templates.

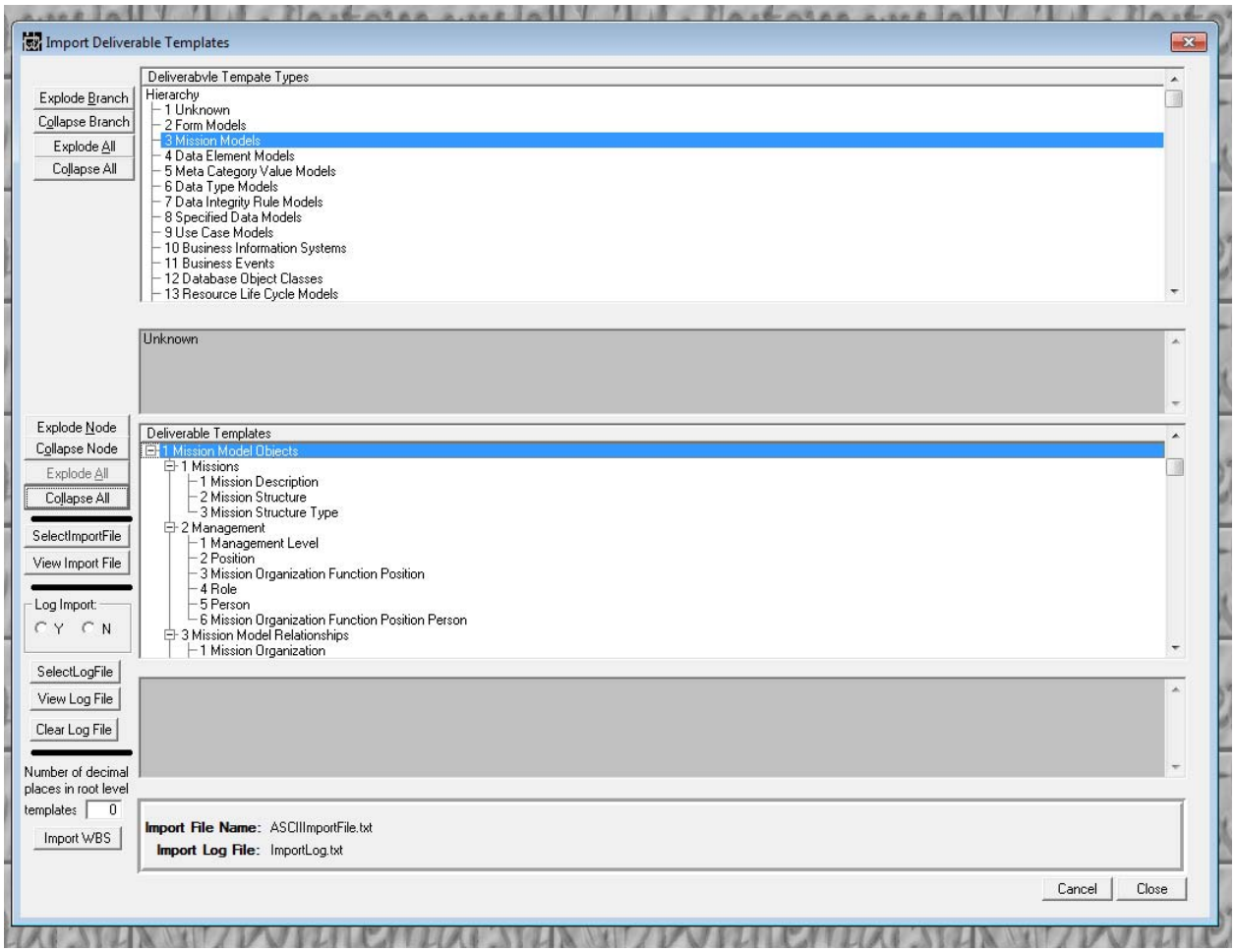

Figure 147. Import Deliverable Templates Process.

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```
1 Project Management Models
1.1 Templates
1.1.1 Project Template Type
1.1.2 Project Template
1.1.3 Deliverable Template Type
1.1.4 Deliverable Template
1.1.5 Task Template Type
1.1.6 Task Template
1.1.7 Project Template Deliverable Template
1.1.8 Deliverable Template Task Template
1.1.9 Project-Deliverable Deliverable-Template Task-Template
1.2 Contracts
1.2.1 Contract
1.2.2 Contract Organization Structure
1.2.3 Contract Role
1.2.4 Contract Resource
1.3 Projects
1.3.1 Project
1.3.2 Project Deliverable
1.3.3 Project Task
1.3.4 Project Task Base Line
1.3.5 Project Task Work Environment Factor
1.3.6 Project Task Assignment
1.3.7 Work
1.3.8 Project Task Skill Level
1.4 Reference Data
1.4.1 Status Type
1.4.2 Basic Project Management Data
1.4.3 Role Type Skill
1.4.4 Skill Level Type Skill Level Base Line
1.4.5 Person Skill Level
1.5 Base Line
1.5.1 Base Line Type
1.5.2 Base Line Work Environment Factor
1.5.3 Base Line Staff
1.6 Work Environment Factors
1.6.1 Work Environment Factor
1.6.2 Work Environment Multiplier Type
1.6.3 Work Environment Factor Type
```

Figure 148. Deliverable Template Import CSV File.

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5.7.5.6 Deliverable Template Reallocation

Deliverable Templates as shown in Figure 149 are hierarchical. That is, Mission is a subordinate deliverable to Mission Model Objects. Within the deliverable, Mission, Mission Description, Mission Structure, and Mission Structure Type are subordinate deliverables. Deliverables can be reallocated from one Deliverable to another in addition, a given subordinate deliverable can be made a root deliverable within its existing Deliverable Template Type. This is accomplished through the process depicted in Figure 149. At the top of Figure 149 are the Deliverable Template Types. When a Deliverable Template Type is selected, all the contained deliverables are immediately displayed in the left, From, Deliverable Template browse and also the To Deliverable Template browse.

To move a given deliverable template from its existing parent to a different parent, the process is simple. Just tag the deliverable in the left browse and tag the new "parent" in the right browse, and then press the button, at the bottom of the window to reallocate the templates.

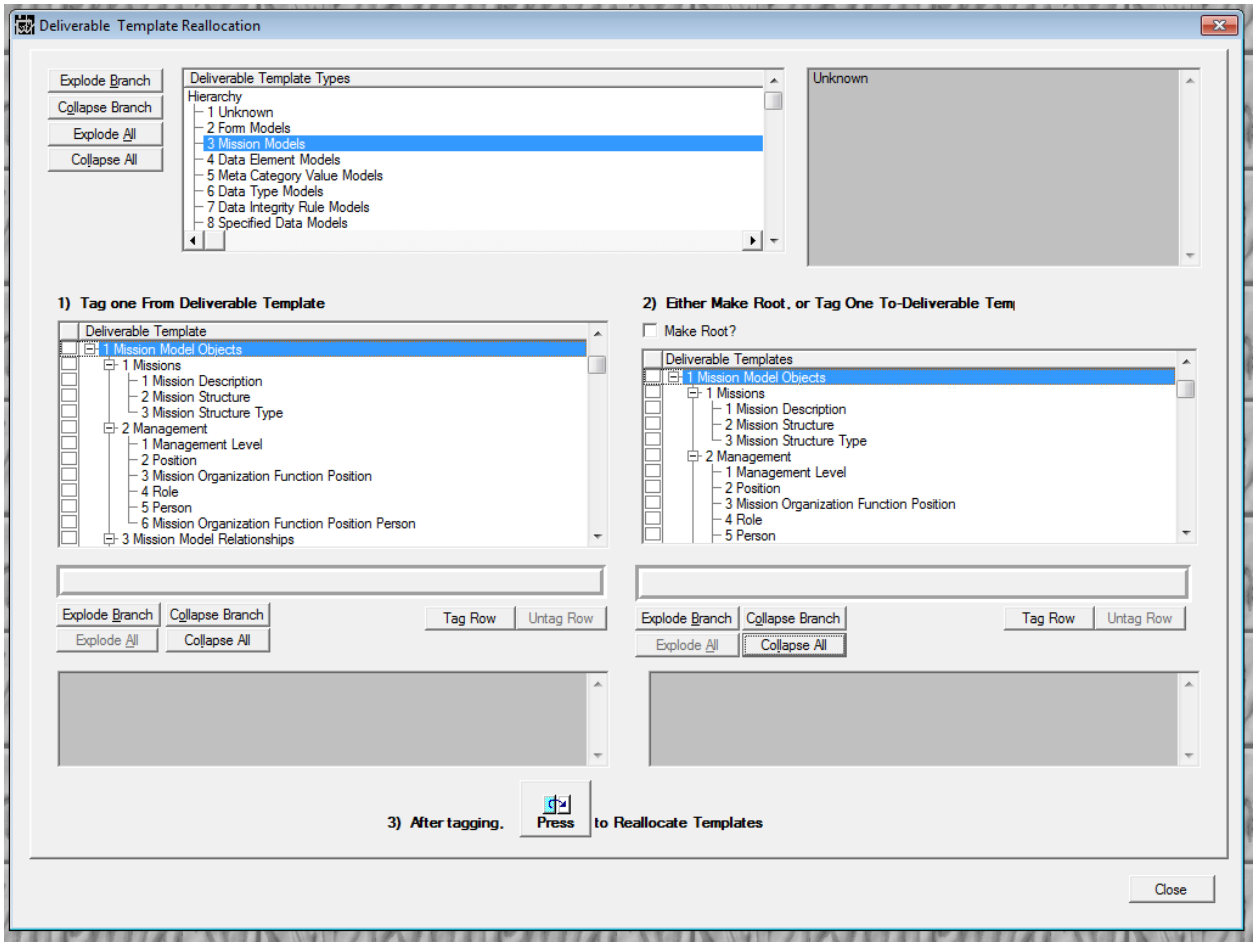

Figure 149. Deliverable Template Reallocation Process.

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Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the deliverable is being moved from an existing parent on the left browse to the same parent on the right browse.

5.7.6 Task Templates

Figure 150 identifies the processes supporting the creation and management of Task Templates. Included in these processes are:

- Task Template Types
- Task Template Type Reallocation
- Task Templates
- Importing Task Templates
- Task Template Reallocation

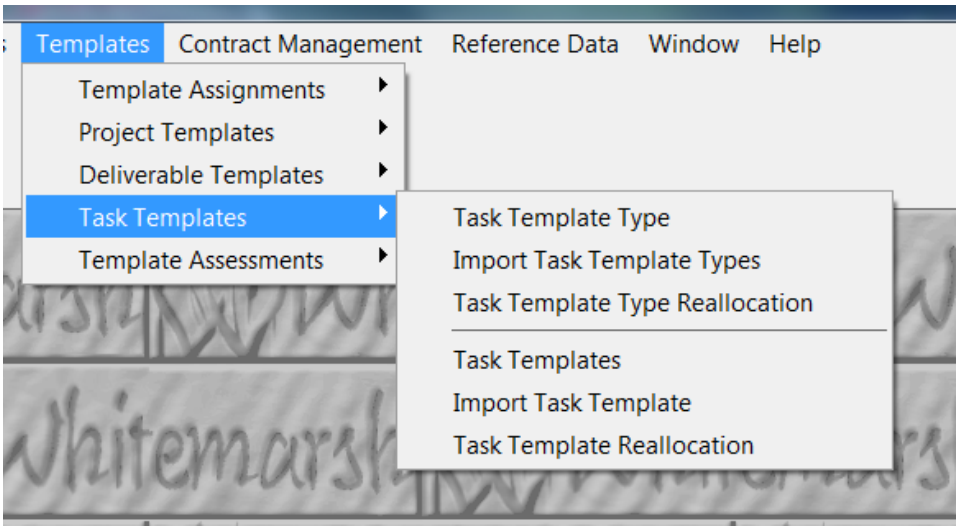

Figure 150. Task Template Processes.

A Task Template is a formally defined collection of work processes that represent a suggested best practice for the accomplishment of a collection of deliverables that represent the accomplished state of a specific Recourse Life Cycle node.

A task is not a project or a deliverable because while a task may have an implied quantity of work and a sequence of steps for its accomplishment, the implied quantity of work is not an integral part of a task. The implied sequence of steps are also just a suggestion of “how” the work should be done to produce the deliverable. A task is also not a deliverable because a task is a process, not an outcome. Deliverables are the specification of outcomes. Finally, a task is not a

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project because it does not represent a large, well-defined collection of deliverables accomplished through the task processes are a project.

5.7.6.1 Task Template Type

Figure 151 shows the data for a given Task Template Type. To add or modify a Task Template Type that is at the root level (no parents) select the “Hierarchy” string and then press Insert or Change. At that point, Figure 152 is presented. Added within this form is the name of the Task Template Type and its description. On the creation of the Task Template Type, its sequence is added. If the sequence of the project is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 151.

The description of the Project Template Type should be restricted to describing the Project Template Type itself. Not described should be either the Project Templates, Project Deliverables, or the Project Tasks that accomplish a given Project Deliverable. The description of the Task

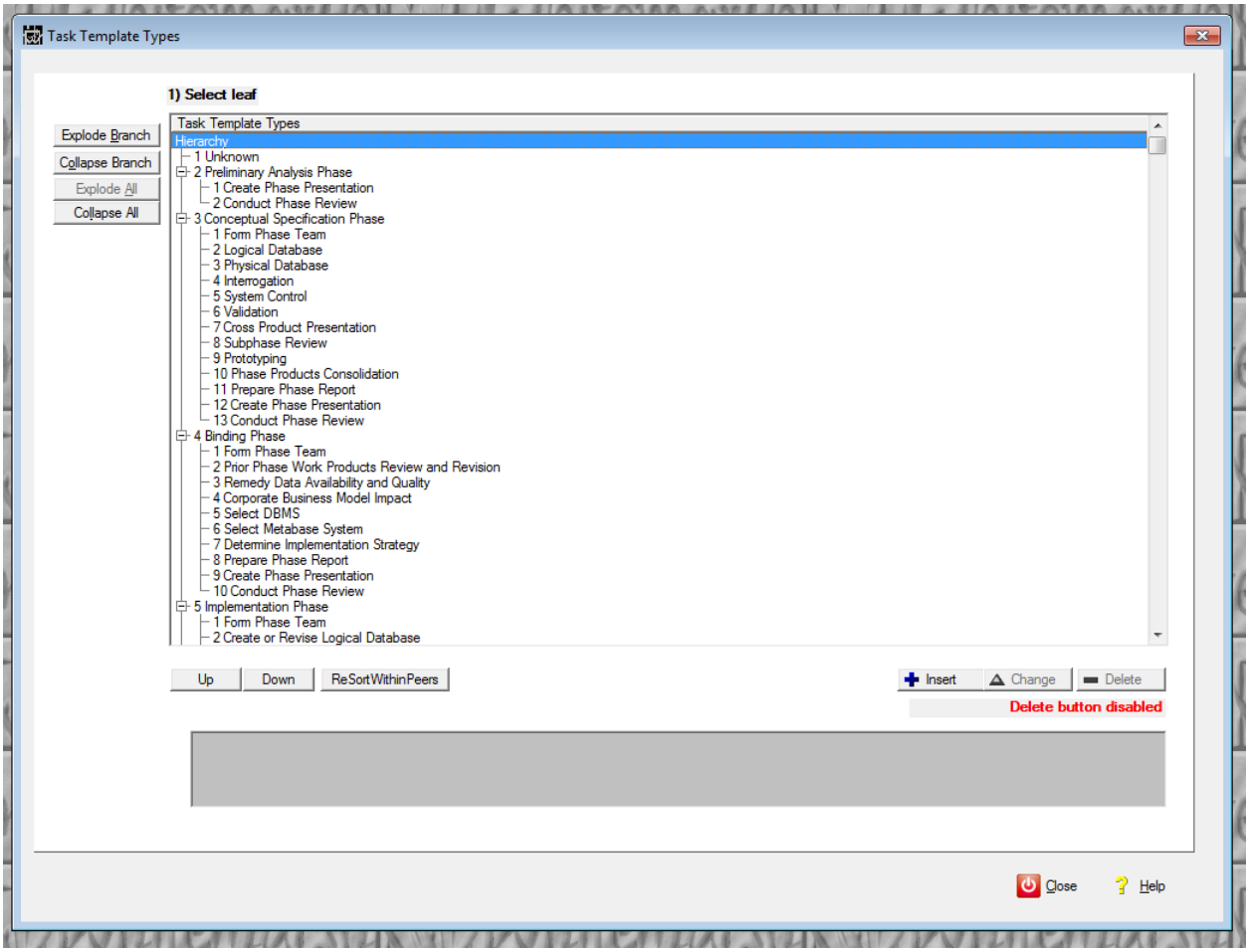

Figure 151. Task Template Type Processes.

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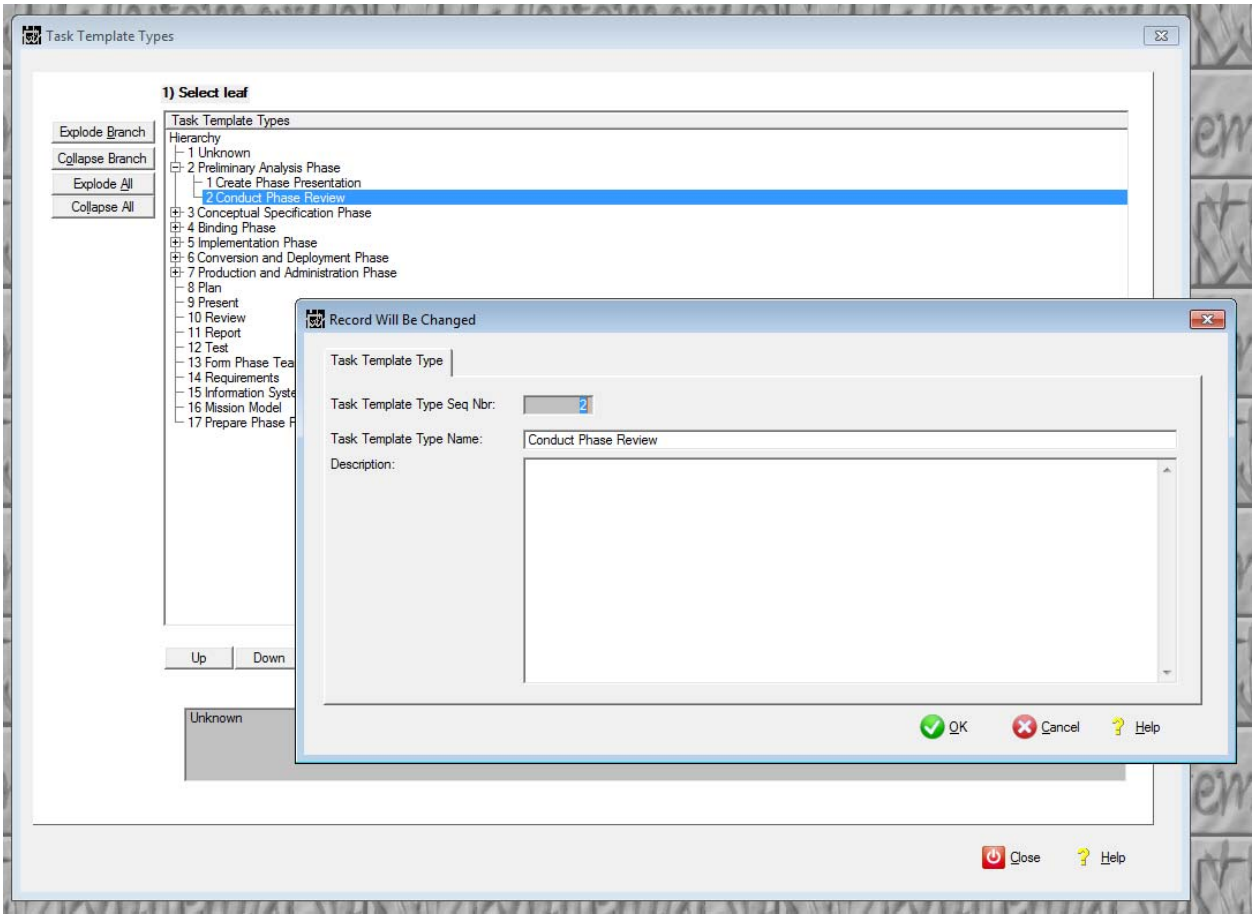

Figure 152. Task Template Type Update Process.

Template Type should be restricted to describing the Task Template Type itself. Not described should be the Task Templates.

5.7.6.2 Import Task Template Types

Figure 153 illustrates the process involved in importing a list of projects from a CSV type file. The first step is to select the Task Template Type in the top browse of this window that is to be the context for the imported set of projects.

Task Template Types are imported from CSV files. The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 154. In this figure, line 1, is the Task Template Type, Preliminary Analysis.

Once selected, the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and if Y, to Select the Log File. To view the Log file, press

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the View Log File button. At the bottom of Figure 153 the names of the import file and the log file are displayed.

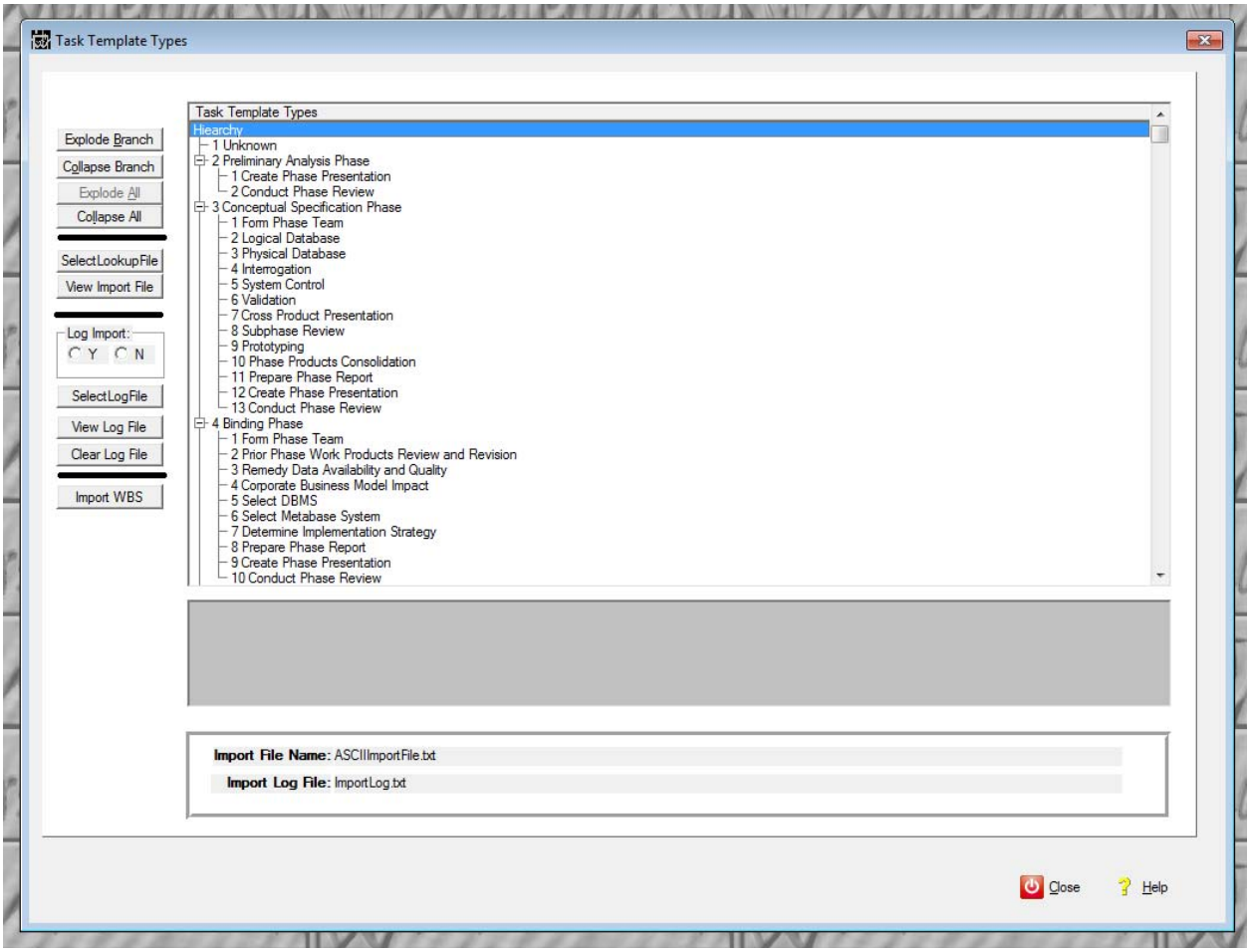

Figure 153. Import Task Template Type Processes.

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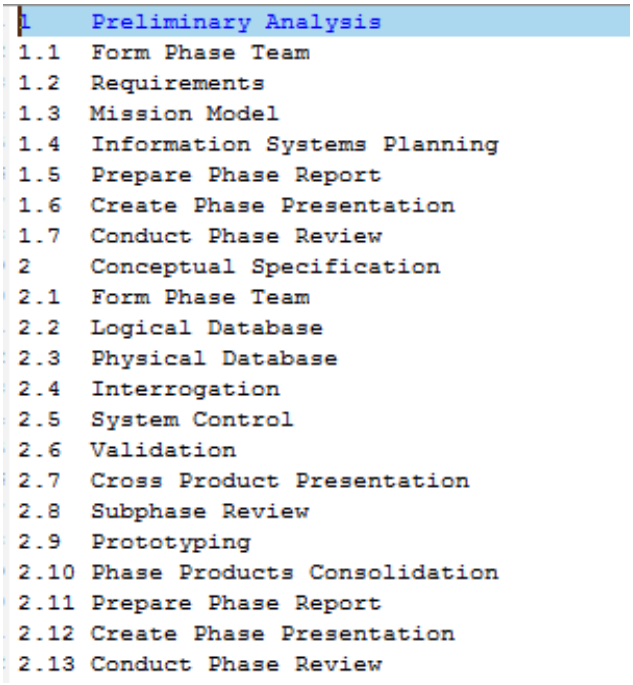

Figure 154. Task Template Types.

5.7.6.5 Task Template Type Reallocation

Task Templates Types as shown in Figure 155 are hierarchical. Task Templates Types can be reallocated from one Task Templates Type to another. In addition, a given subordinate Task Templates Type can be made a root task. This is accomplished through the process depicted in Figure 155.

To move a given Task Templates Type from its existing parent to a different parent, the process is simple. Just tag the Task Templates Type in the left browse and tag the new “parent” in the right browse, and then press the button, at the bottom of the window to reallocate the Task Templates Type.

Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the Task Templates Type is being moved from an existing parent on the left browse to the same parent on the right browse. error is that the project is being moved from an existing parent on the left browse to the same parent on the right browse.

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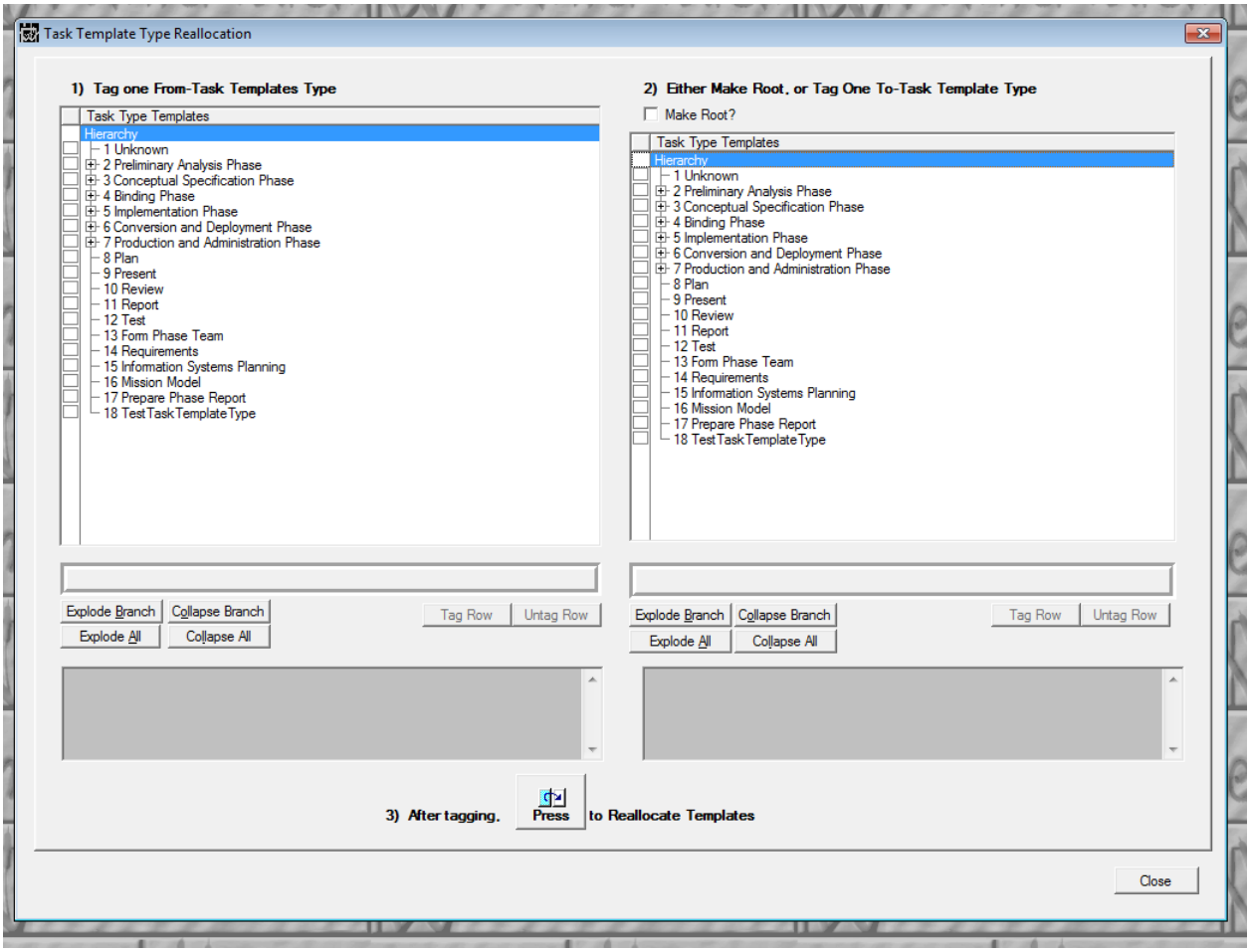

Figure 155. Task Template Type Reallocation Process.

5.7.6.4 Task Templates

Figure 156 shows the data for a given Task Template. Shown are two browses in the window. The top browse shows the Task Template Types. The bottom shows the Task Templates.

When a Task Template Type, for example, Create Phase Presentation, is selected, the Task Templates that are defined within that collection are shown in the bottom browse. In this example from the Task Template list, none of the Task Templates contain subordinate Task Templates.

To add or modify a Task Template that is at the root level (no parents) select the “Hierarchy” string and then press Insert or Change. At that point, Figure 157 is presented.

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Added within this form is the name of the Task Template and its description. On the creation of the Task Template, its sequence is added. If the sequence of the project is to be changed, it can be moved up or down in the list using the Up and Down buttons on Figure 156.

The description of the project should be restricted to describing the project itself. Not described should be either the project's deliverables or the tasks that accomplish a given deliverable.

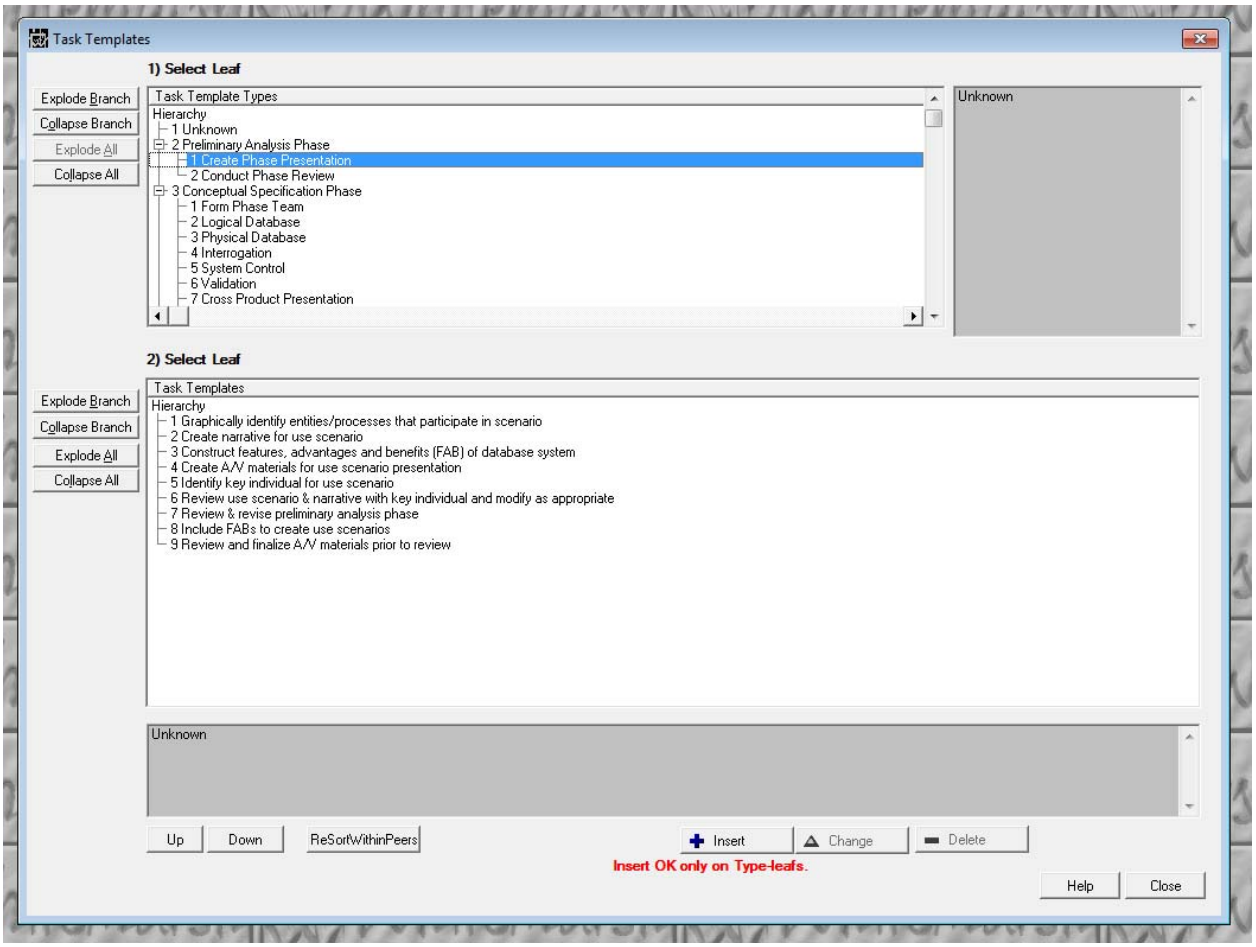

Figure 156. Task Template Process.

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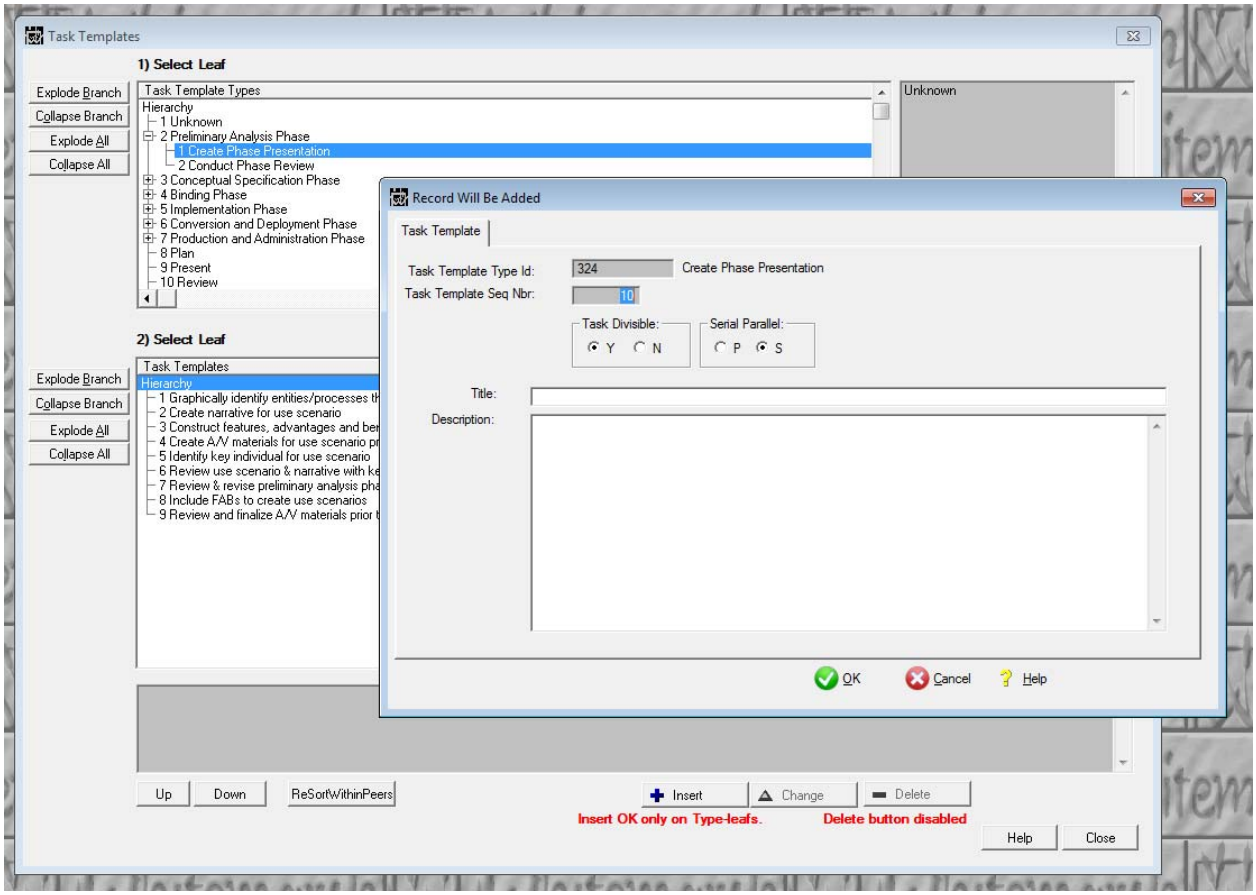

Figure 157. Task Template Creation Process.

5.7.6.5 Import Task Template

Figure 158 illustrates the process involved in importing a list of projects from a CSV type file. The first step is to select the Task Template Type in the top browse of this window that is to be the context for the imported set of Task Templates.

Task Templates are imported from CSV files. The selection of the CSV file is through the Select Import File button. An example of a CSV file is presented in Figure 159. In this figure, line 1, is the Task Template Type, Administration and Management Projects.

Once selected the file can be viewed by the View Import File button. The next step is to identify if logging is to occur, that is, Y or N, and then if Y to Select the Log File, be able to view the Log file, and if the log file has been previously used, to clear the log file. At the bottom of Figure 158 the names of the import file and the log file are displayed.

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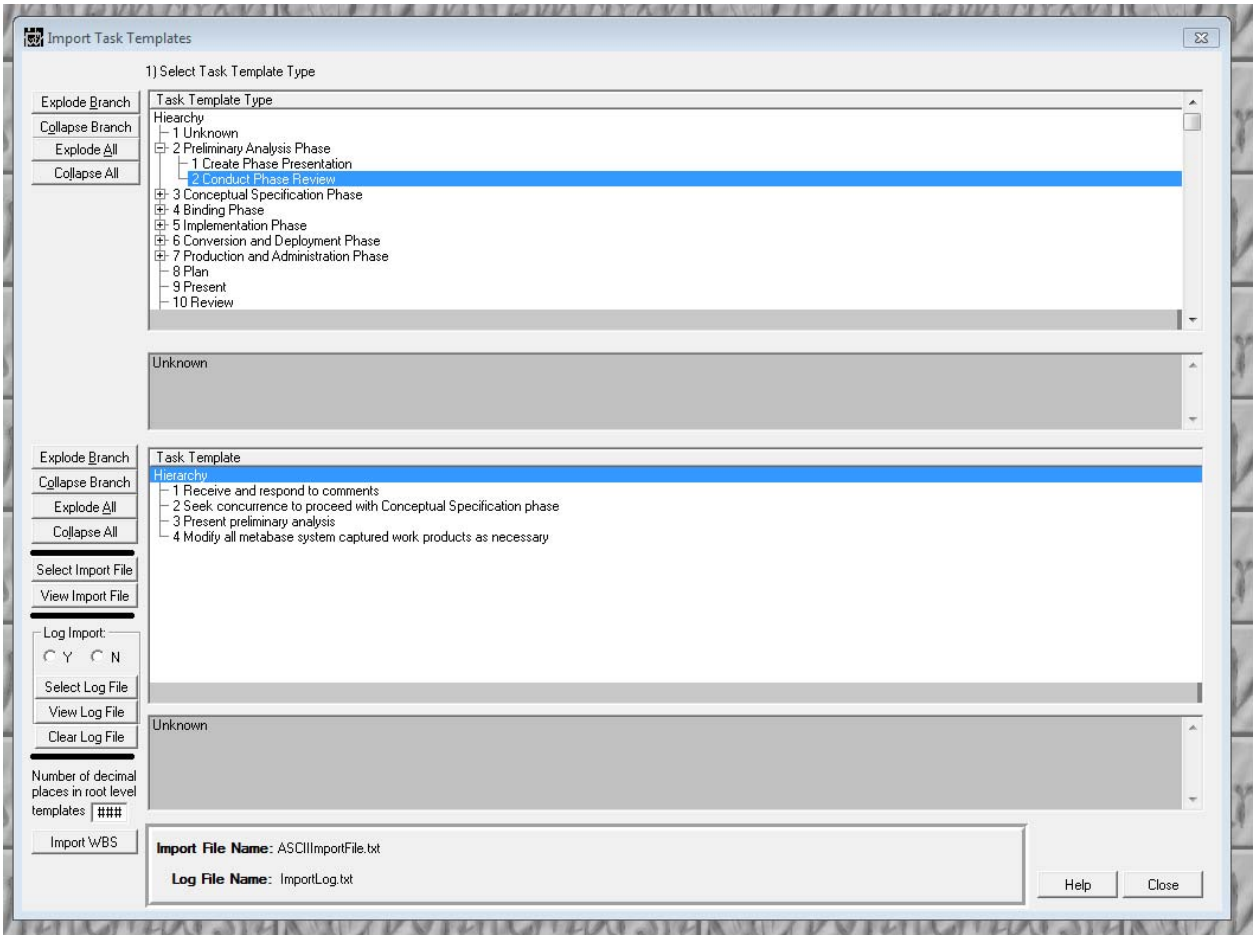

Figure 158. Import Task Template Process.

The next step is to indicate which record from the bottom browse in Figure 159 is the first Task Template. As can be seen in Figure 159, that is to be Form Project Team, Plan Phase & Estimate Project. In Figure 159, that is the second record. What is unique about that record is that it has a single decimal place. Within it are records with additional decimal places. By placing the value 1 in the entry, Number of decimal places..., the importing process will skip the first record, and proceed to only load records with 1 or more decimal places. The actual import process starts by pressing the Import WBS button. WBS, of course means work breakdown structure. At the end of the loading process, the Task Template browse is refreshed and shows the newly imported Task Templates.

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```
1    Preliminary Analysis
1.01 Form project team, plan phase, & estimate project
1.01.01   Select manager for project phase
1.01.02   Identify administrative, clerical, and computer supports
1.01.03   Select project staff for phase
1.01.03.01     Review all job descriptions of staff to match requirements of DB project methodology
1.01.03.02     Interview and select database specialist
1.01.03.03     Interview and select functional users
1.01.04   Secure commitments for staff availability
1.01.04.01     Estimate time requirement for project manager
1.01.04.02     Estimate time requirement for administrative, clerical, and computer supports
1.01.05   Create estimate for project
1.01.05.01     Identify possible manager for project
1.01.05.02     Identify ideal project staff types and quantities for project
1.01.05.03     Identify appropriate WBS for project type
1.01.05.04     Review selected WBS to ensure that it has the least number of steps consonant with maximum quality
1.01.05.05     Configure steps into PERT chart
1.01.05.06     Identify appropriate metrics, work unit quantities, and work environment factors for each selected WBS step
1.01.05.07     Resource load each step by resource type
1.01.05.08     Ensure that project management package has appropriate calendar for project time period
1.01.05.09     Generate CPM and Gantt charts
1.01.05.10     Prepare project description for project and generally identify the missions, business functions, and database objects that are to be addressed
1.01.05.11     Review with key users and revise all project estimate components until complete and acceptable
1.01.05.12     Fix project base line for earned value reporting
```

Figure 159. Task Template Import CSV File.

5.7.6.6 Task Template Reallocation

Task Templates as shown in Figure 160 are hierarchical. That is, the Task Template, Define Data Integrity Model, contains (visible on this browse) two subordinate Task Templates, Finalize Database Domain Diagram and Finalize Database Objects and Database Object Diagram. Task Templates can be reallocated from one Task Templates to another in addition, a given subordinate Task Templates can be made a root Task Templates within its existing Task Template Type. This is accomplished through the process depicted in Figure 160. At the top of Figure 160 are the Task Template Types. When a Task Template Type is selected, all the contained projects are immediately displayed in the left, From, Task Template browse and also the To Task Template browse.

To move a given Task Template from its existing parent to a different parent, the process is simple. Just tag the Task Template in the left browse and tag the new “parent” in the right browse, and then press the button, at the bottom of the window to reallocate the templates.

Two messages are able to be displayed. The first is that the reallocation is OK. The second message, which is an error is that the Task Template is being moved from an existing parent on the left browse to the same parent on the right browse.

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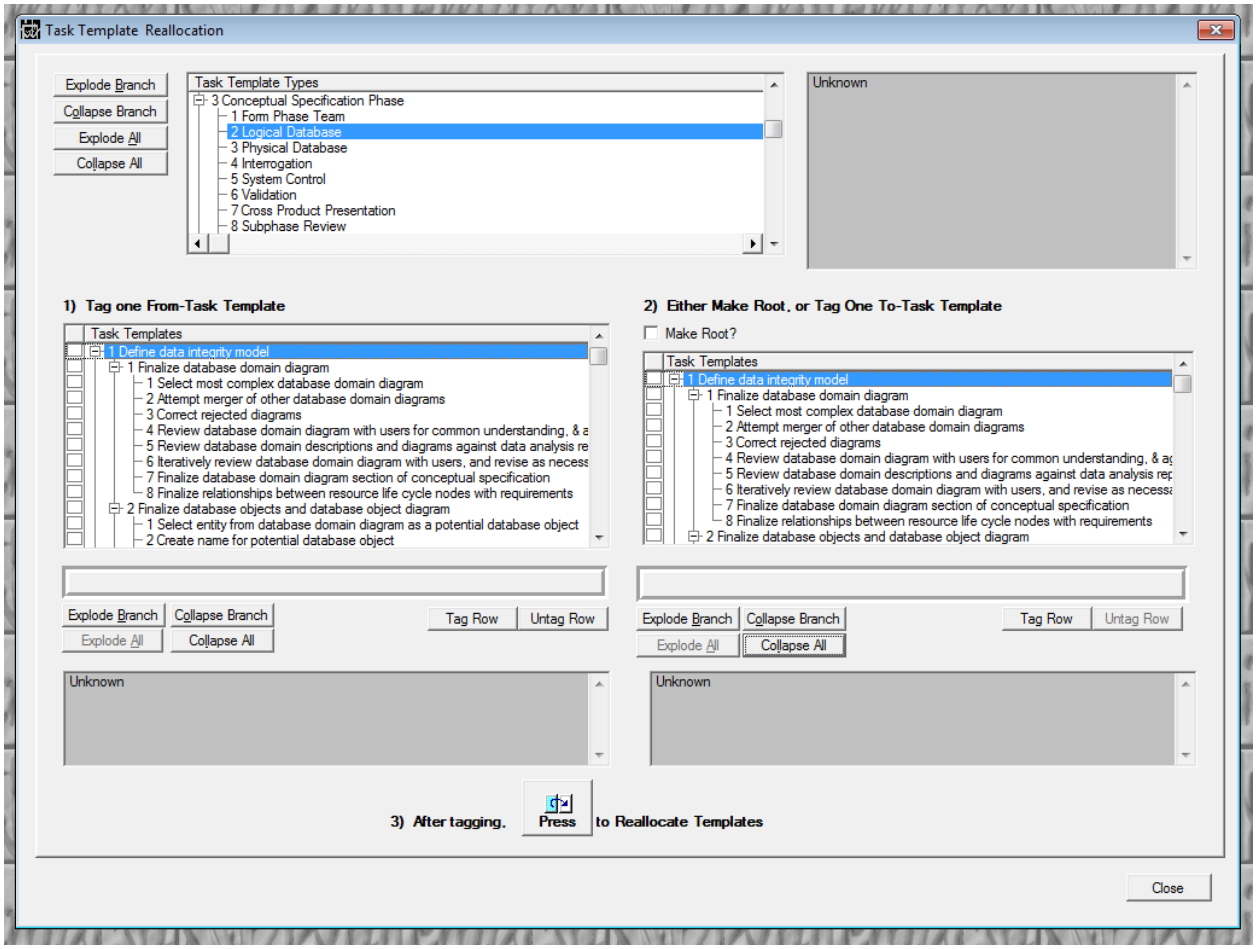

Figure 160. Task Template Reallocation Process.

5.7.7 Template Assessments

The three different Template Assessments invoked through the menu items from Figure 161 are:

- Project Template
- Deliverable Assessment
- Task Assessment

These are generators of “reports” where the apex of the report is the Project with its contained Deliverables and then deliverable associated tasks.

Or the apex of the Deliverable with it’s associated projects that included that deliverable, and the tasks that accomplish the deliverable.

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Or finally the apex of a Task that is involved in the generation of a deliverable, and the projects that are including that deliverable.

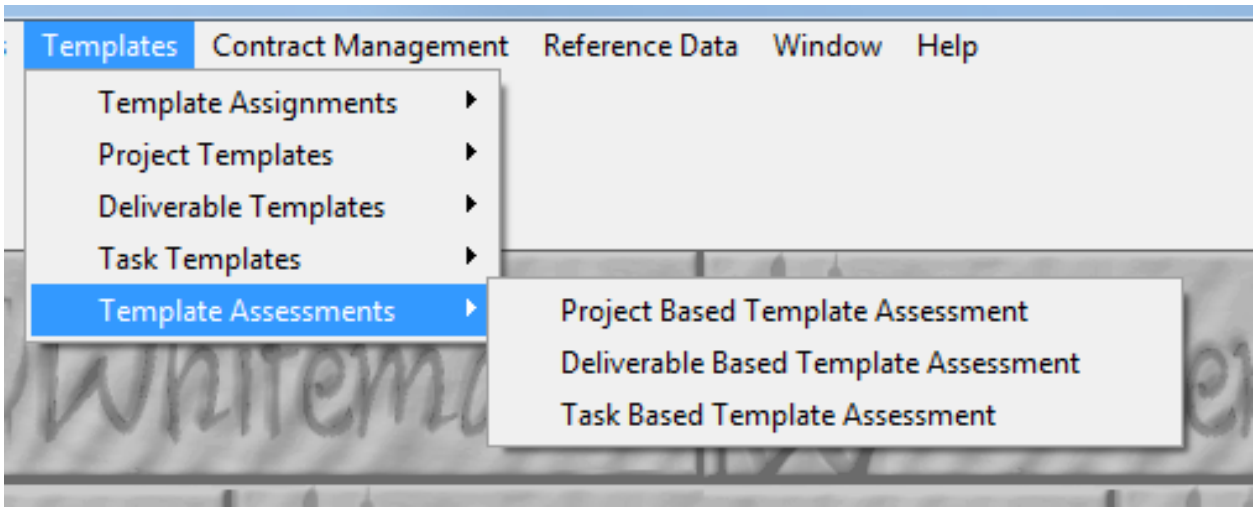

Figure 161. Template Assessment Processes.

5.7.7.1 Project Based Template Assessment

Project based Template assessments are a method of generating a hierarchical listing of all Projects that included the assigned deliverables, and all the tasks that are assigned to each deliverable.

The assessment generation process is presented in Figure 162. The three buttons at the bottom of the window are:

- Generate Project Template Assessment
- View Project Template Assessment
- View Project Template Assessment Log

To start the assessment, press the Generate button. The process selects the first Project Type and for that retrieved Project Type, the first Project Template is selected, and for that Project Template, its first related Deliverable is selected, and for that Deliverable, its first Task is selected. This process proceeds hierarchically through all the existing Project Template Types.

Generated is a hierarchically organized text output file that can be reviewed for completeness. Figure 163 illustrates the assessment output for project templates.

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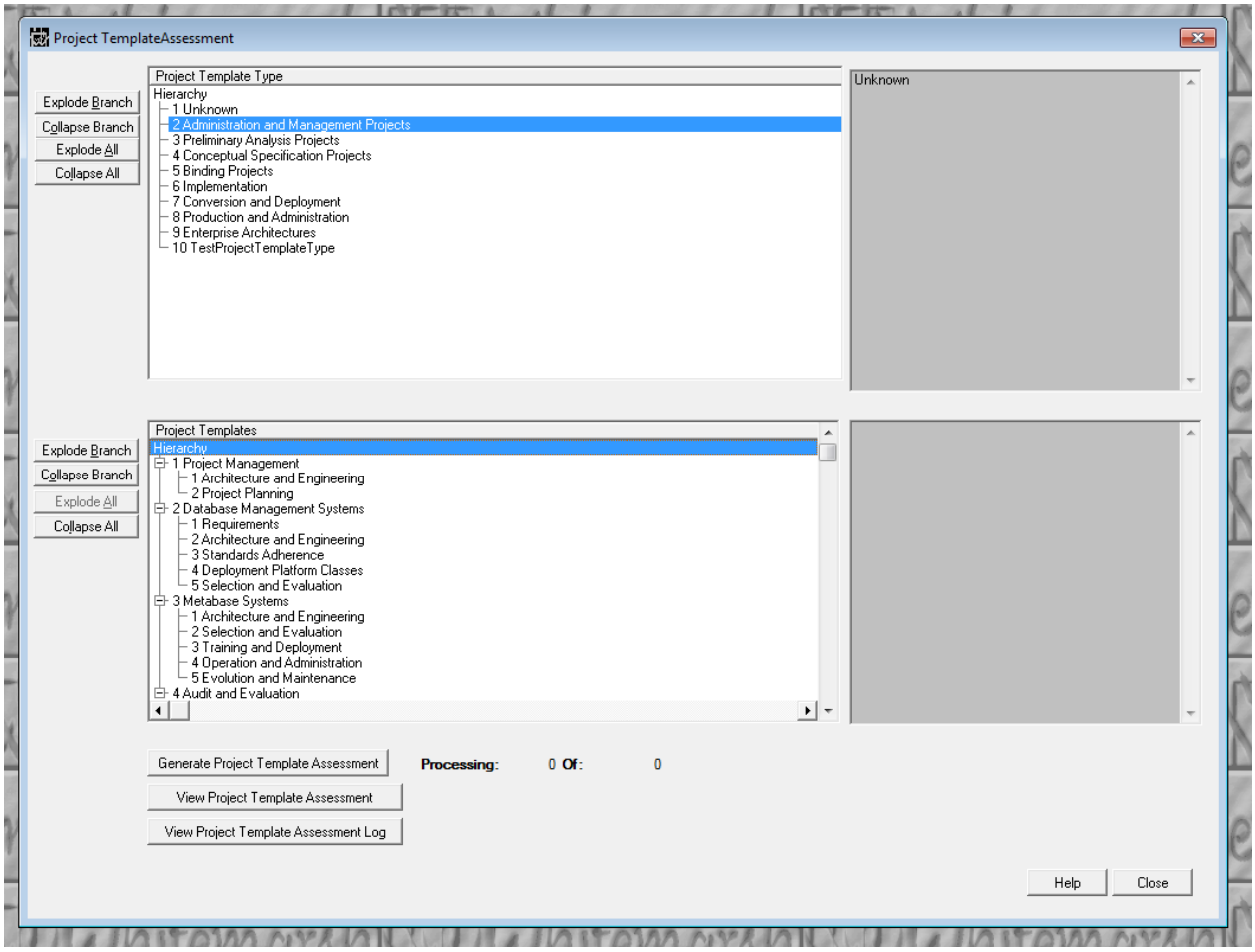

Figure 162. Project Based Template Assessment Process.

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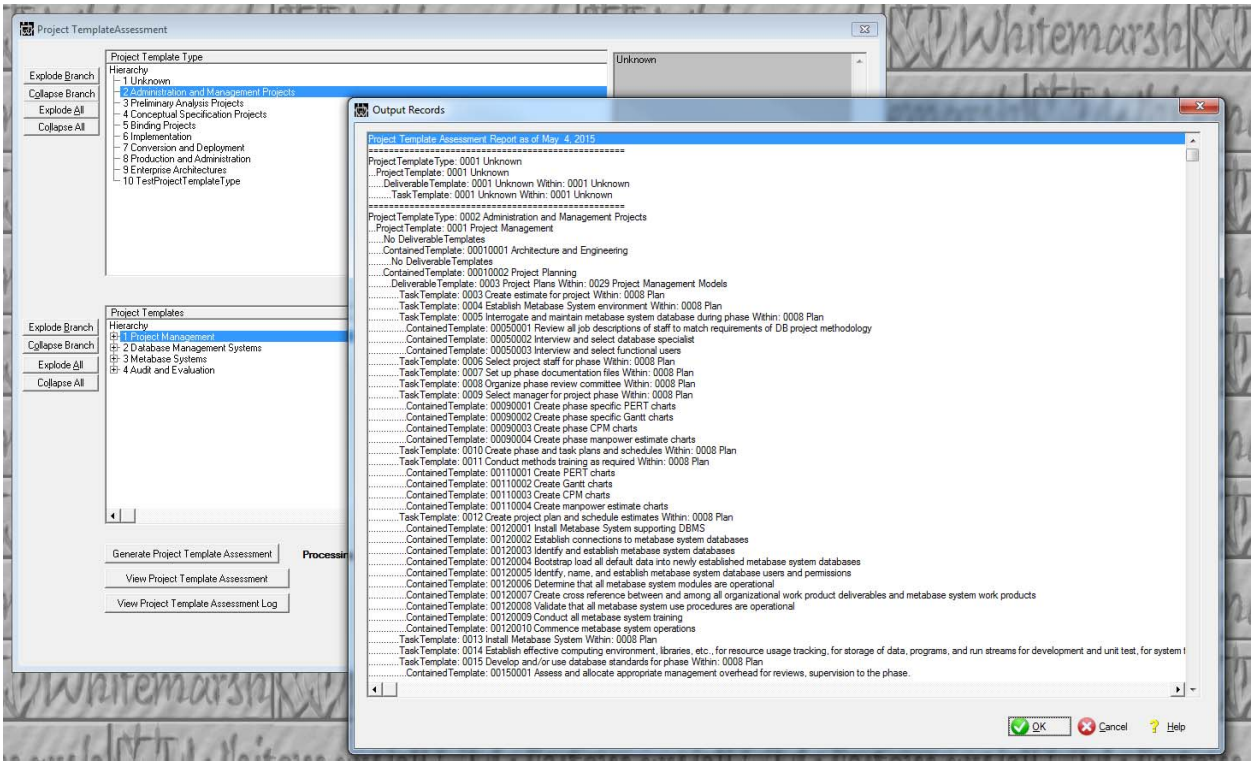

Figure 163. Project Based Template Assessment Output.

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5.7.7.2 Deliverable Based Template Assessment

Deliverable based Template assessments are a method of generating a hierarchical listing of all Deliverables that included the invoking Projects, and all the Tasks that are assigned to each deliverable.

The assessment generation process is presented in Figure 164. The three buttons at the bottom of the window are:

- Generate Deliverable Template Assessment
- View Deliverable Template Assessment
- View Deliverable Template Assessment Log

To start the assessment, press the Generate button. The process selects the first Deliverable Type and for that retrieved Deliverable Type, the first Deliverable Template is selected. Based on that

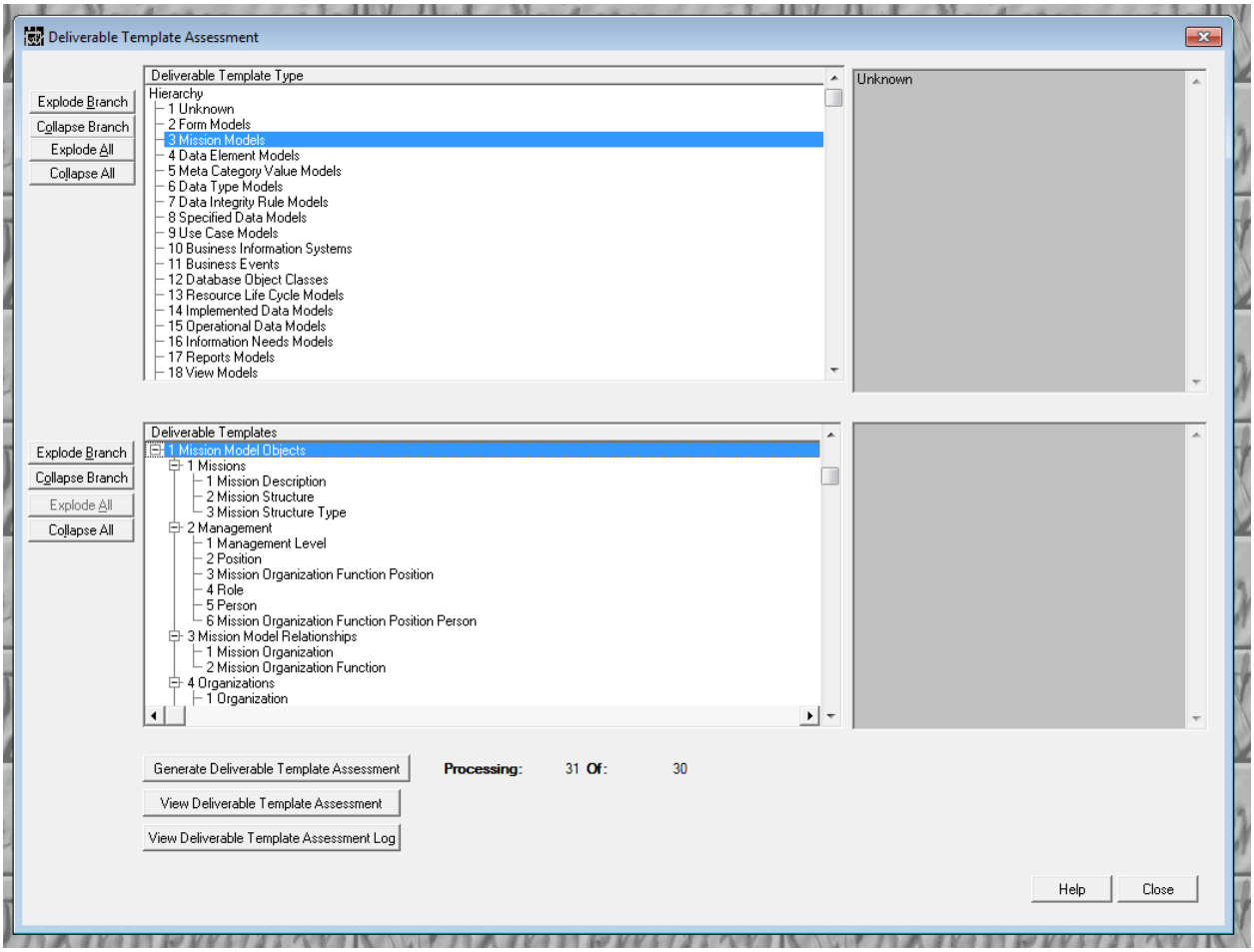

Figure 164. Deliverable Based Template Assessment Process.

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Deliverable Template, its set of host Project Templates along with their Protect Template Types are selected. Similarly, based on the same Deliverable Template, its first related Task along with its Task Template Type is selected. This process proceeds hierarchically through all the existing Deliverable Template Types until all the Project Templates that hose all the Deliverables, and all the Tasks required by the Deliverables are accessed.

Generated is a hierarchically organized text output file that can be reviewed for completeness. Figure 165 illustrates the assessment for project templates.

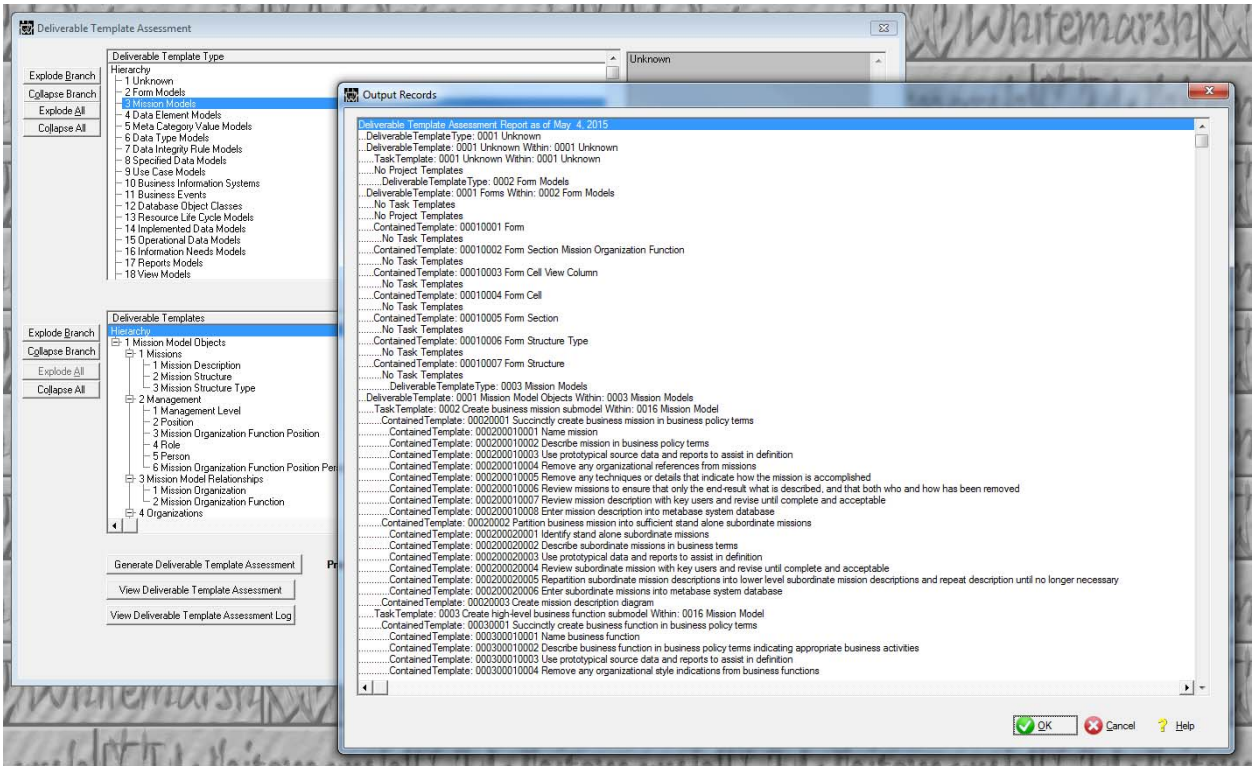

Figure 165. Deliverable Based Template Assessment Output.

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5.7.7.3 Task Based Template Assessment

Task based Template assessments are a method of generating a hierarchical listing of all Tasks that support Deliverables, and in turn, all the projects that involve the Deliverables.

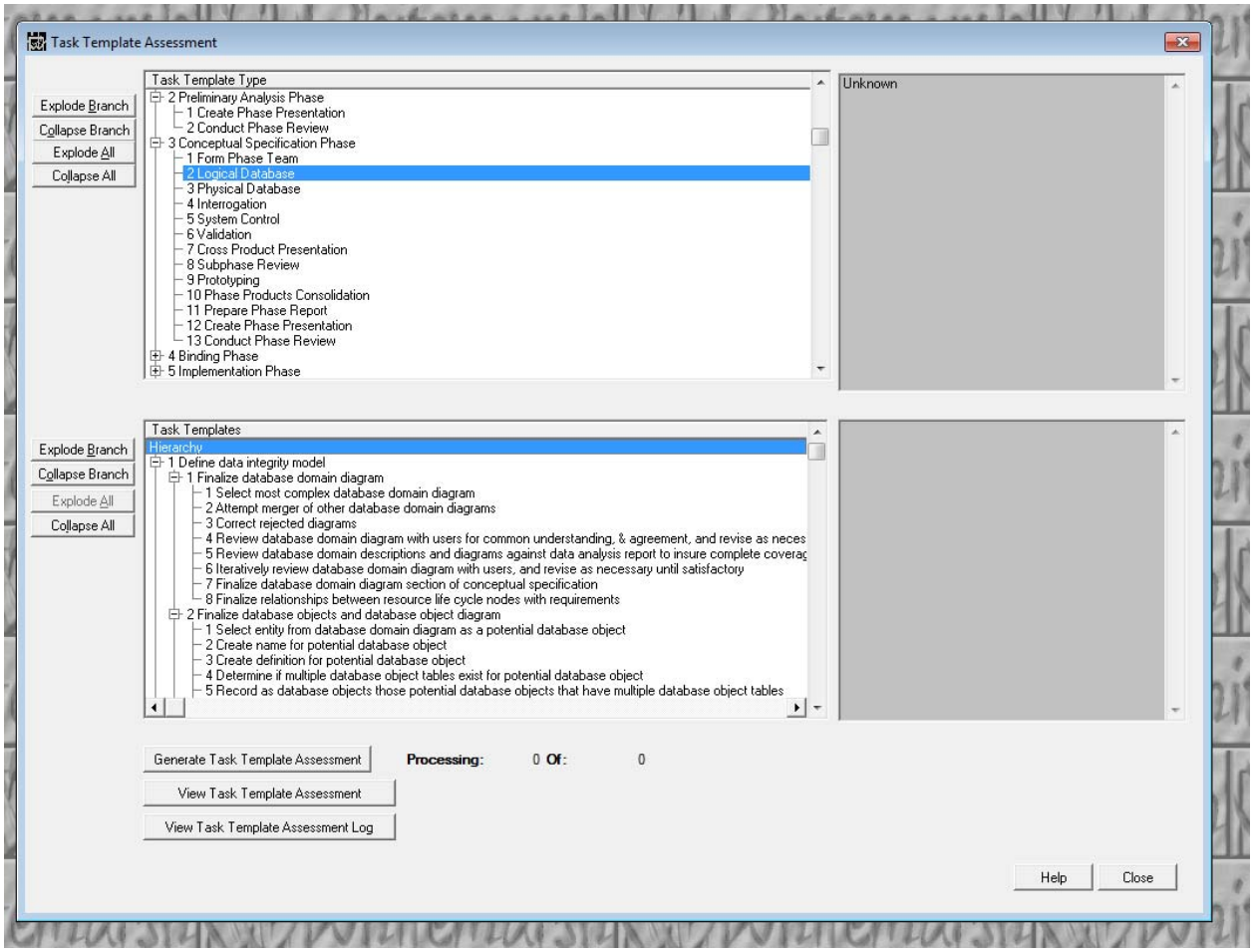

Figure 166. Task Based Template Assessment Process.

The assessment generation process is presented in Figure 166. The three buttons at the bottom of the window are:

- Generate Task Template Assessment
- View Task Template Assessment
- View Task Template Assessment Log

To start the assessment, press the Generate button. The process selects the first Task Type and for that retrieved Task Type, the first Task Template is selected, and for that Task Template, its set of host Deliverable Templates along with their Deliverable Template Type are selected. And

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for each Deliverable Template its set of host Project Templates and their Project Template Types are selected.

Generated is a hierarchically organized text output file that can be reviewed for completeness. Figure 167 illustrates the assessment for Task Templates.

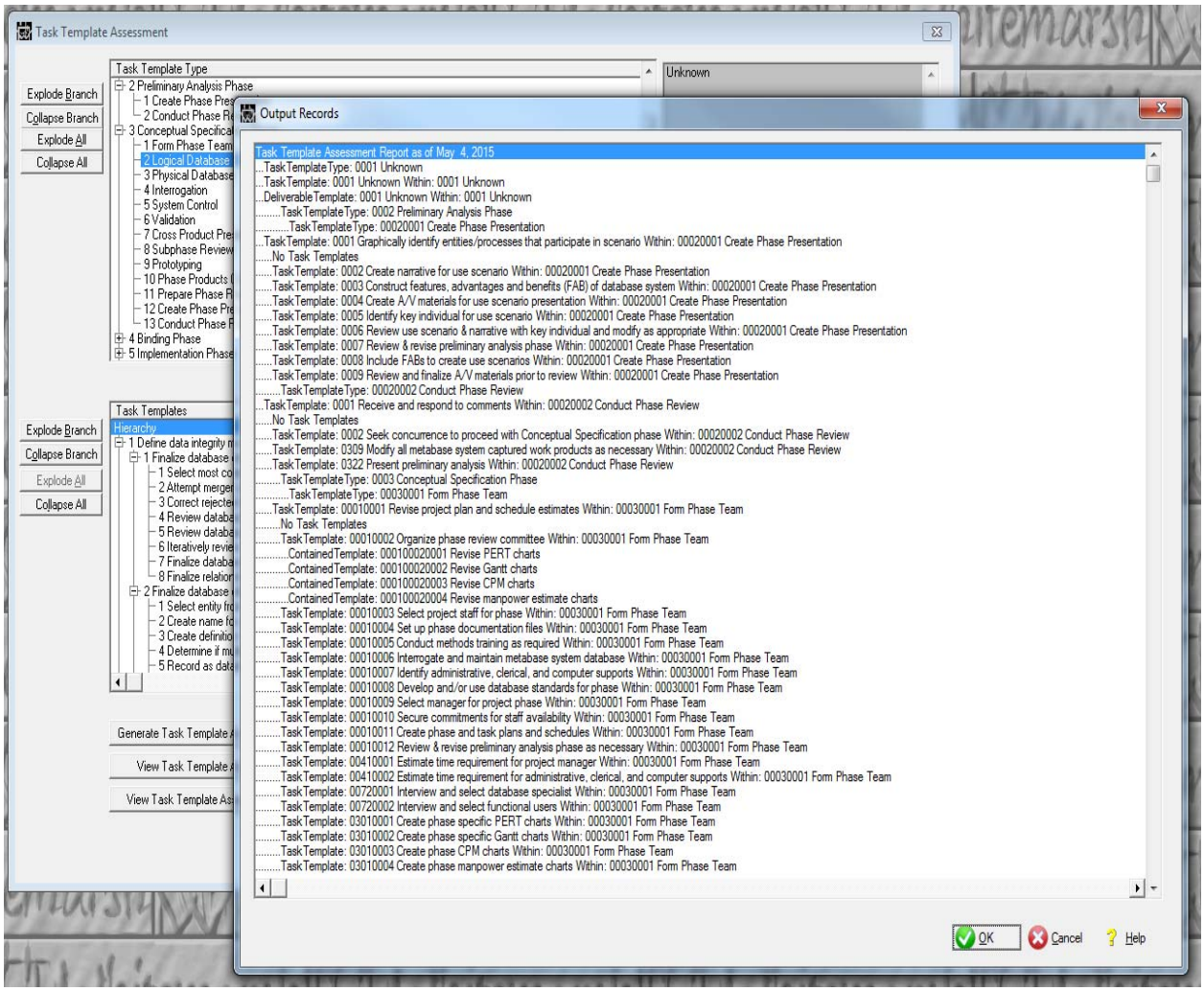

Figure 167. Task Based Template Assessment Output.

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5.8 Contract Management Process Specifications

Projects are almost always accomplished through the use of contracts and/or agreements. For Whitemarsh Project Management, the contract related processes within the menu items displayed in Figure 168 are:

- Contracts
- Contract & Organization-Structure Assignments
- Contract Resources

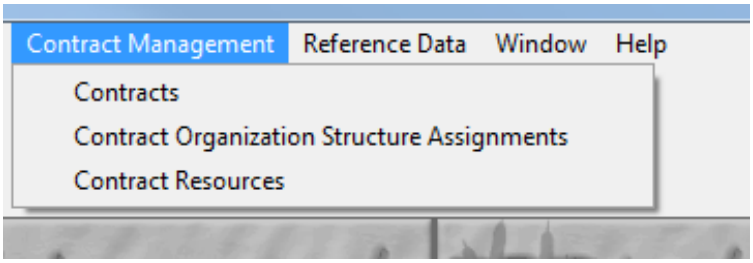

Figure 168. Contract Management Process.

5.8.1 Contracts

A contract is an agreement among parties for the accomplishment of a quantity of work. Within Whitemarsh Project Management, that contract would involve the data from many different collections of Metabase System tables. Included from Figure 1 are:

- Contract
- Contract Role
- Contract & Organization Structure
- Contract Resource
- Mission-Organization-Function, Position-Person and inherited tables of data
- Project and inherited Resource Life Cycle Node Project tables data
- Project Deliverables
- Project Deliverable Skill Level and inherited tables of data
- Project Deliverables and inherited Project Template Deliverable Templates et al
- Project Deliverable & Deliverable Template Task templates and inherited Task Templates
- Project Deliverable Work Environment Factors and inherited tables of data

The creation of a contract is shown in Figure 169. If the contract is at the root of a collection of contracts, select “Hierarchy” and press insert. If the contract is contained within an overarching contract, select that host contract and press insert. Figure 170 is then presented. Enter the Contract’s name and description. Only the contract itself should be described. All the other data relevant to the contract would be retrieved by the contract related tables cited in the list above.

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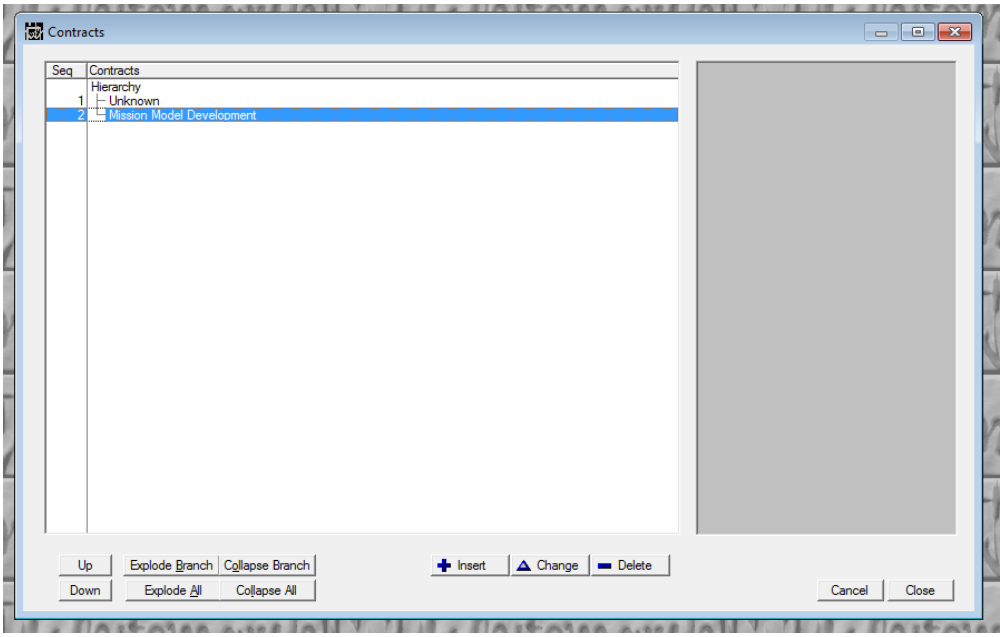

Figure 169. Contract Process.

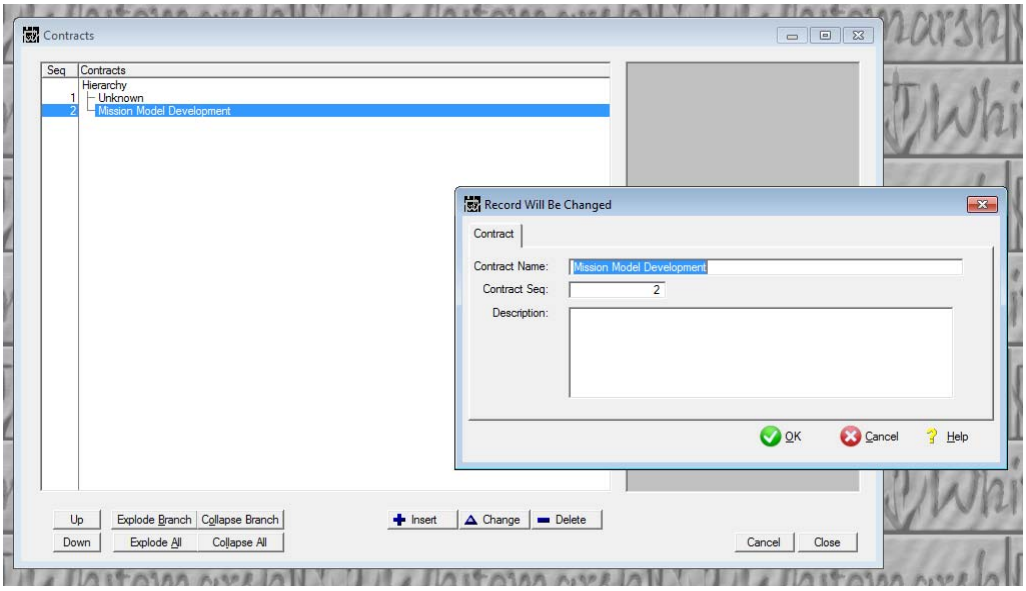

Figure 170. Contract Update Process.

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5.8.2 Contract & Organization-Structures

Contract-Organization Structures represent the assigned organizations that are going to fulfill one or more contract roles on the contract. These Contract-Organization-Structures are the basis for creating Contract Resources. Contract Roles, the parent of Contract-Organization-Structures are a type of Reference Data and is addressed in Section 5.9.

Figure 171 presents the process of creating Contract & Organization-Structure data. In the top left browse, select the Organization-Structure-Type. From the shown Organizations, tag one of the Organizations. Now, on the top right browse, tag one or more Contracts that is to receive some level of work from the previously tagged selected Contract & Organization-Structure. Finally, press the Build button. The created Contract & Organization-Structures appear in the bottom browse.

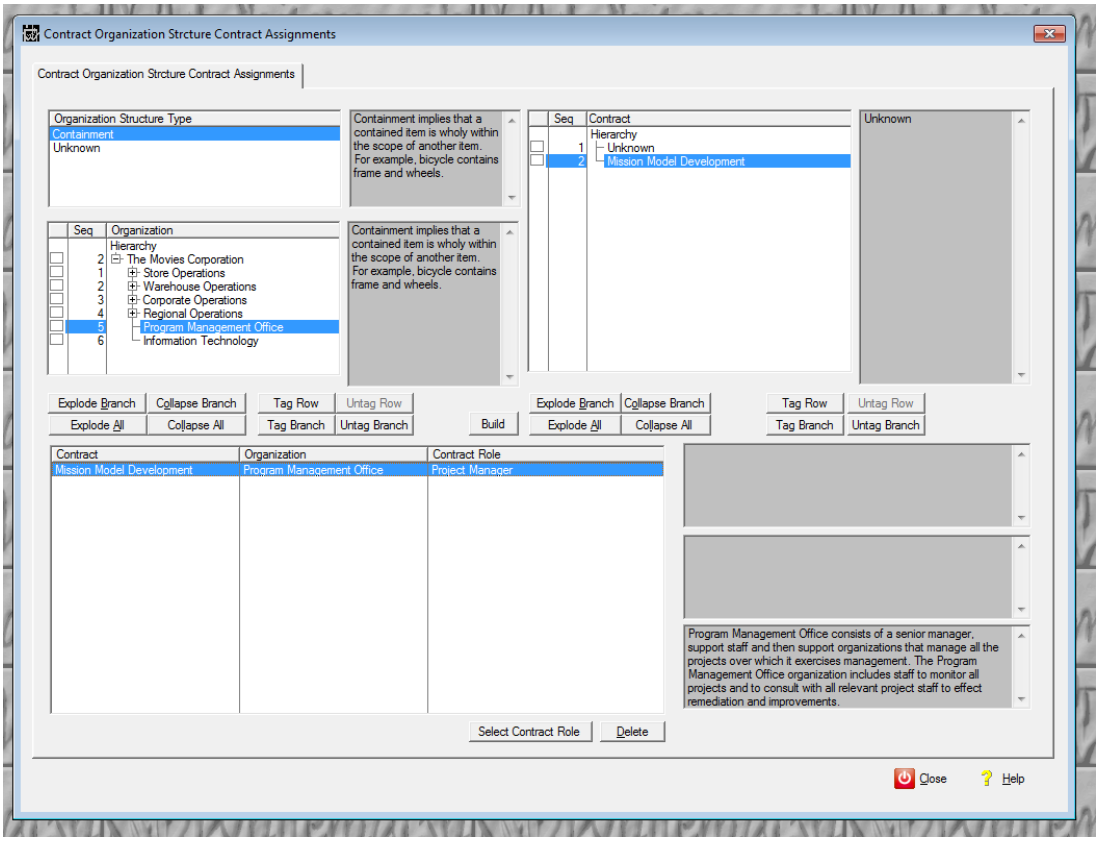

Figure 171. Contract & Organization Structure Assignment Process.

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The remaining work is to associate a specific Contract Role with a created Contract & Organization-Structure relationship. First, press the "Select Control Role" button shown in Figure 171. When this is done, Figure 131 appears.

Within Figure 172, there is a data entry column, Contract Role Id. If the value is zero, a listing of Control Roles appears. This listing is shown in Figure 173. Find the most appropriate Contract Role and press the Select Button. The identifier value for that Contract Role materializes in the Contract Role Id field. Finally, press the OK button to close the window.

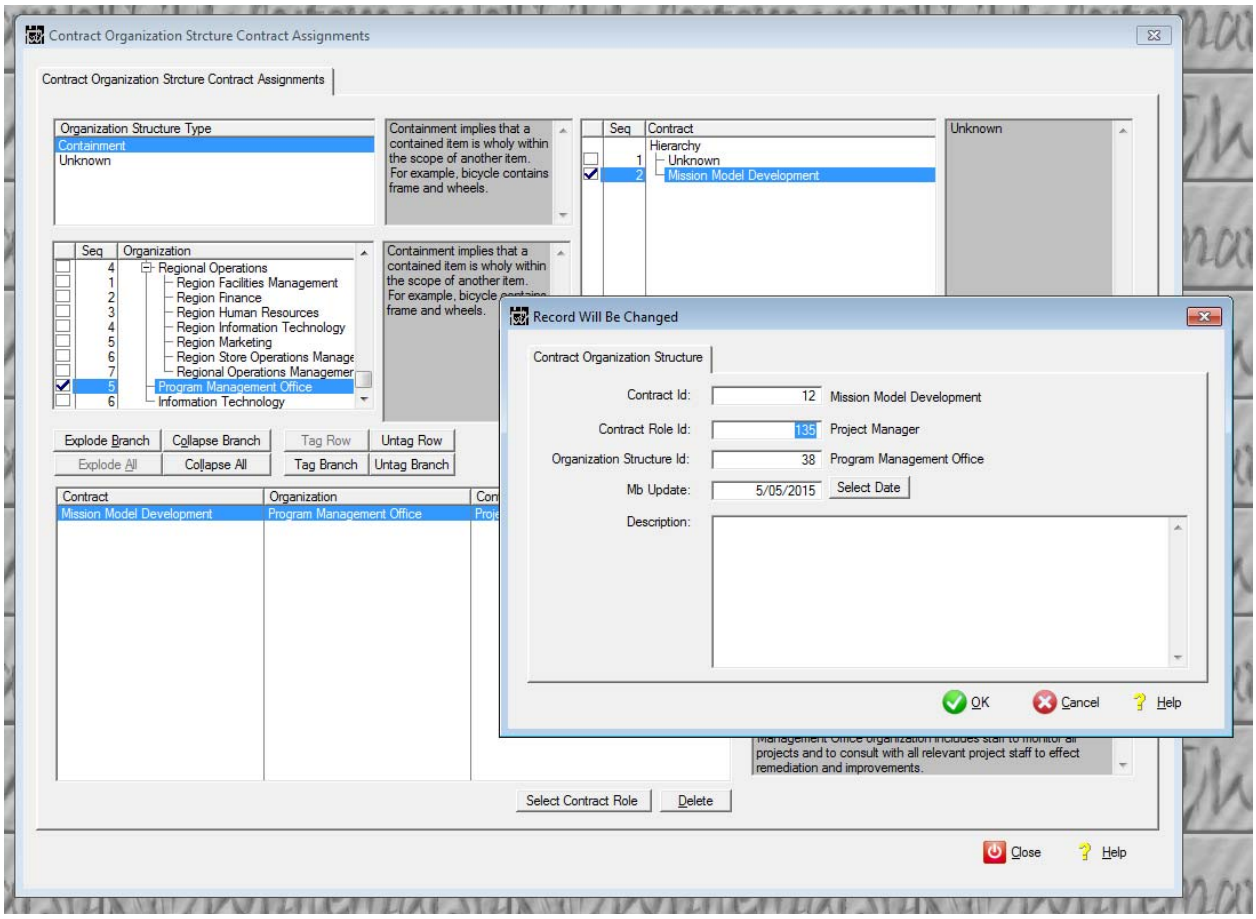

Figure 172. Contract & Organization-Structure Control Role Selection Process.

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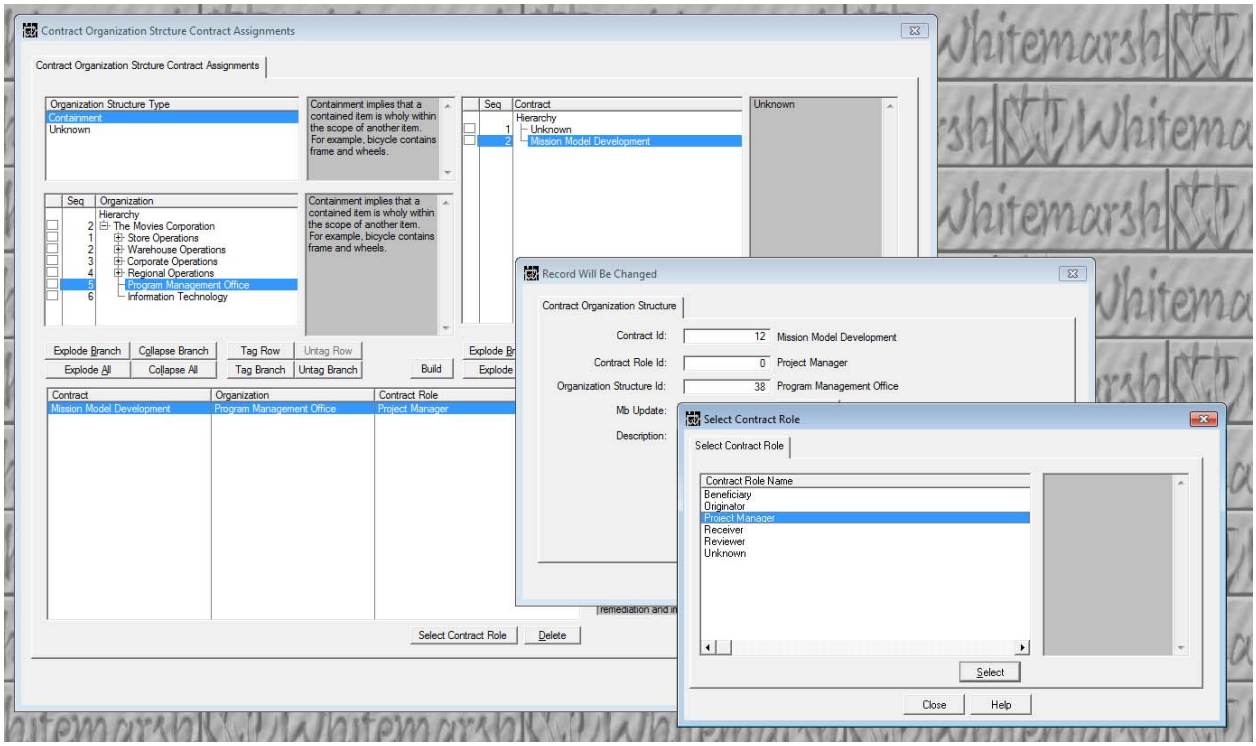

Figure 173. Contract Role Selection Screen Process.

5.8.3 Contract Resources

A contract resource is a resource that participates in a contract. While a trite definition, that's what it is. Here, resource is not the same as the Resource in Resource Life Cycle. Rather, it's a the assignment of a Mission-Organization-Function-Position-Person who is to be assigned to the contract for the accomplishment of some work. Figure 174 Illustrates the process required to assign a given resource to a Contract.

To accomplish the assignment, select a contract from the top-left browse, then tag one contract role in the middle-left browse. Contract roles are created in a section below. Here contract roles exist within their context, Contract and Organization Structures.

Select one person from the top-right browse, then tag one or more Person contexts, that is, Mission-Organization-Function-Positions from the middle right-browse. Finally, press the Build button. The created Contract resources show in the bottom browse.

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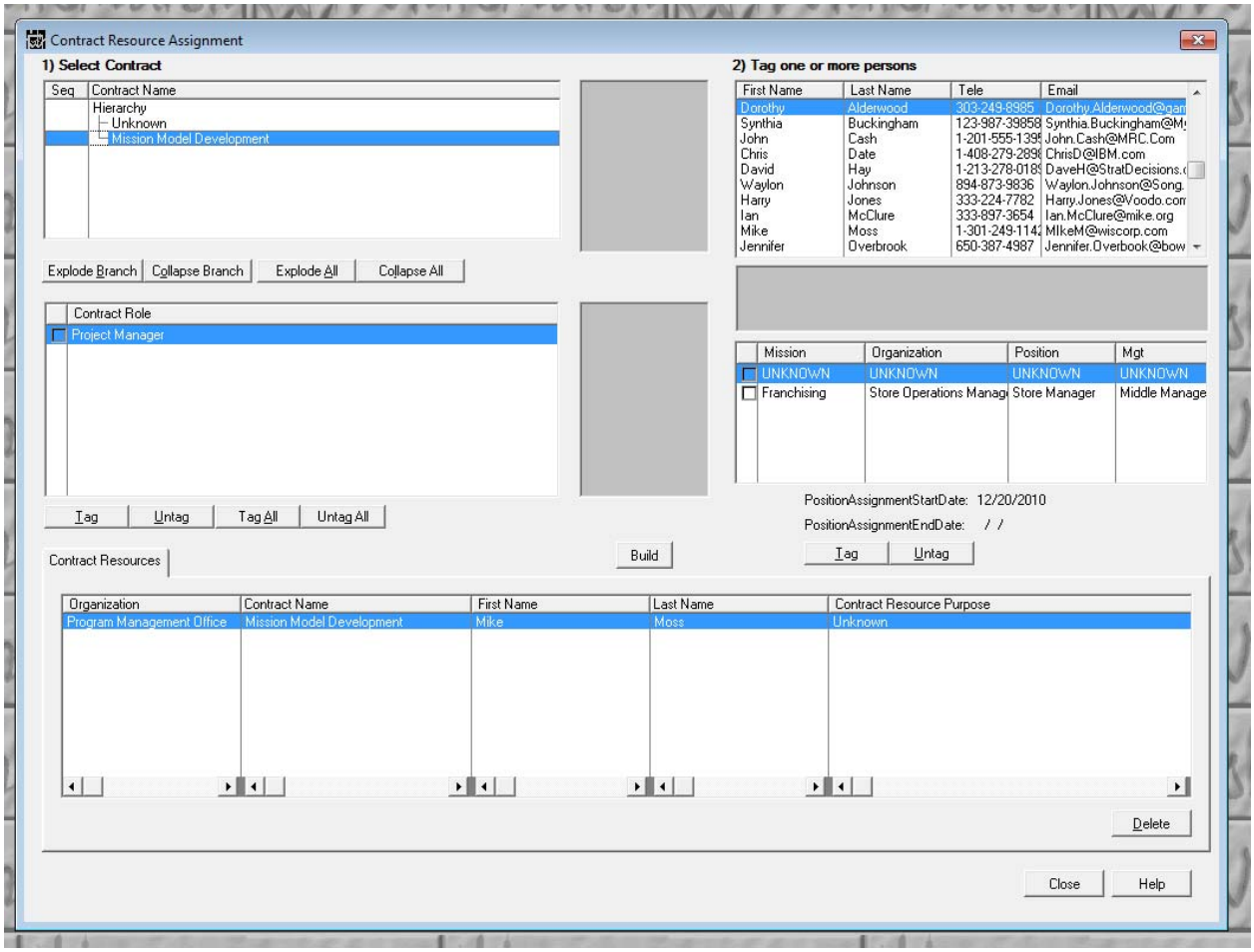

Figure 174. Contract Resources Assignment Process.

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5.9 Reference Data Process Specifications

There are a number of different types of Reference Data throughout the Whitemarsh Project Management System. The menu showing the list and from which to select is presented in Figure 175. The Reference Data Types include:

- Basic Reference Data
- Holidays
- Contract Roles
- Role Types
- Skill(s)
- Skill Level Types
- Skill Level Assignments
- Skill Levels
- Status Types

Whitemarsh Project Management data is considered to be Reference Data if that data can be used across multiple projects and are generally independent of any given project. It could be argued that some of the Work Environment Factors data are also Reference Data. While this is theoretically the case, Work Environment Factors data is almost always created and assigned within a given project. That and to just keep all that data together was the deciding factor to not consider Work Environment Data as Reference Data.

There are two methods of creating Reference Data. The first is through the most commonly used method, List and Update form, and the second is through a CSV import process. Both are presented here.

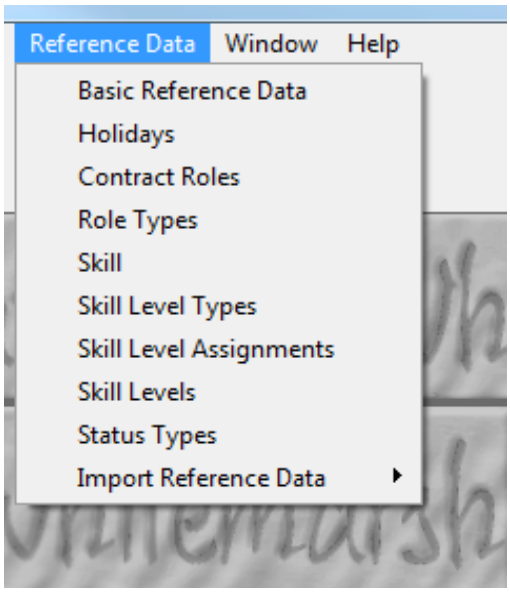

Figure 175. Reference Data.

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5.9.1 Basic Reference Data

The basic reference data for any project includes:

- Year
- Work Hours per day
- Weekend Day One
- Weekend Day Two
- Average Work Days per Month
- Average Work Days per Year

Figure 176 presents a list of these reference data for the year, 2014. To create and/or modify that basic reference data, press Insert of Change. Figure 177 is then presented. It presents all this reference data either as entry fields or as "Radio Buttons" that can be chosen.

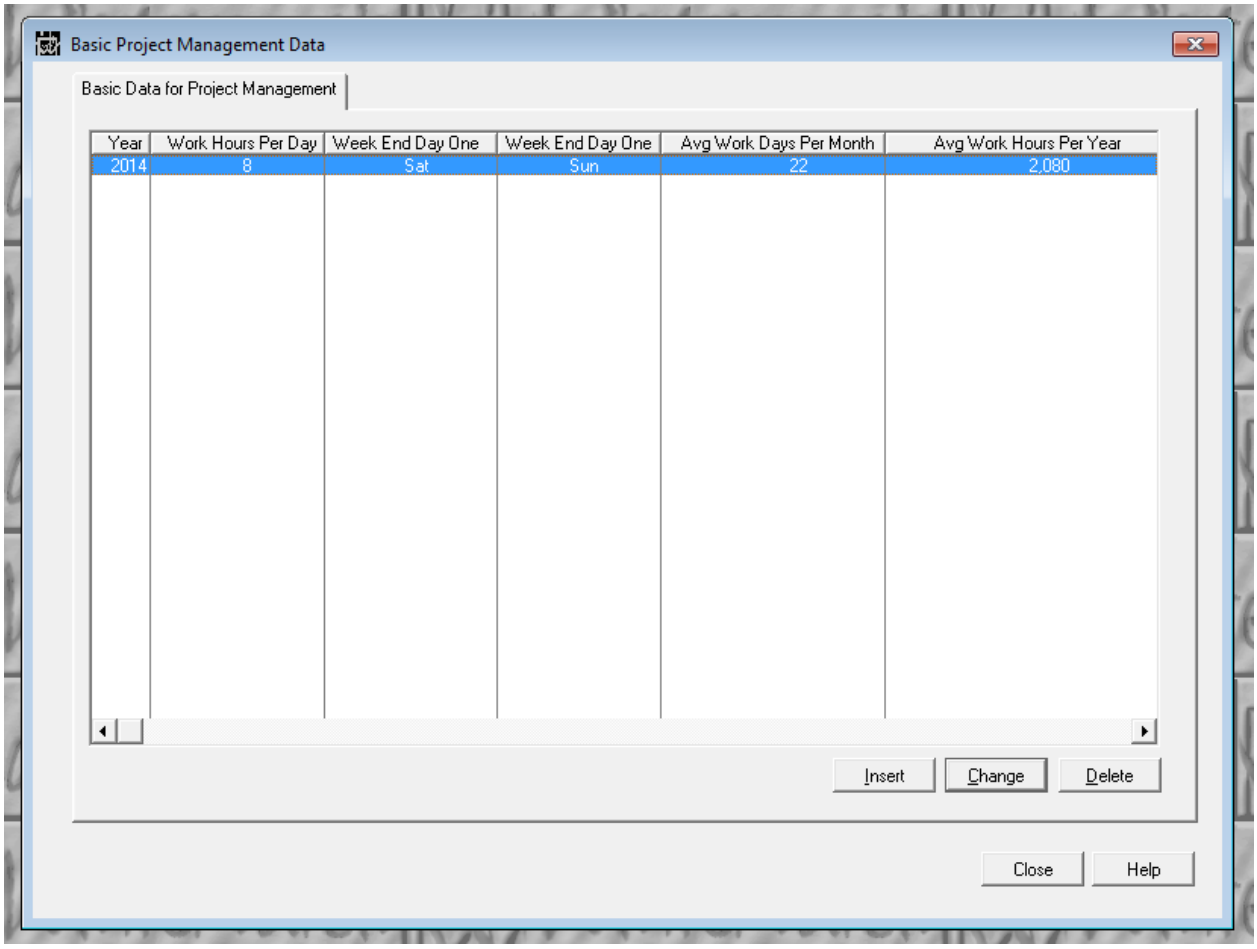

Figure 176. Basic Reference Data Process

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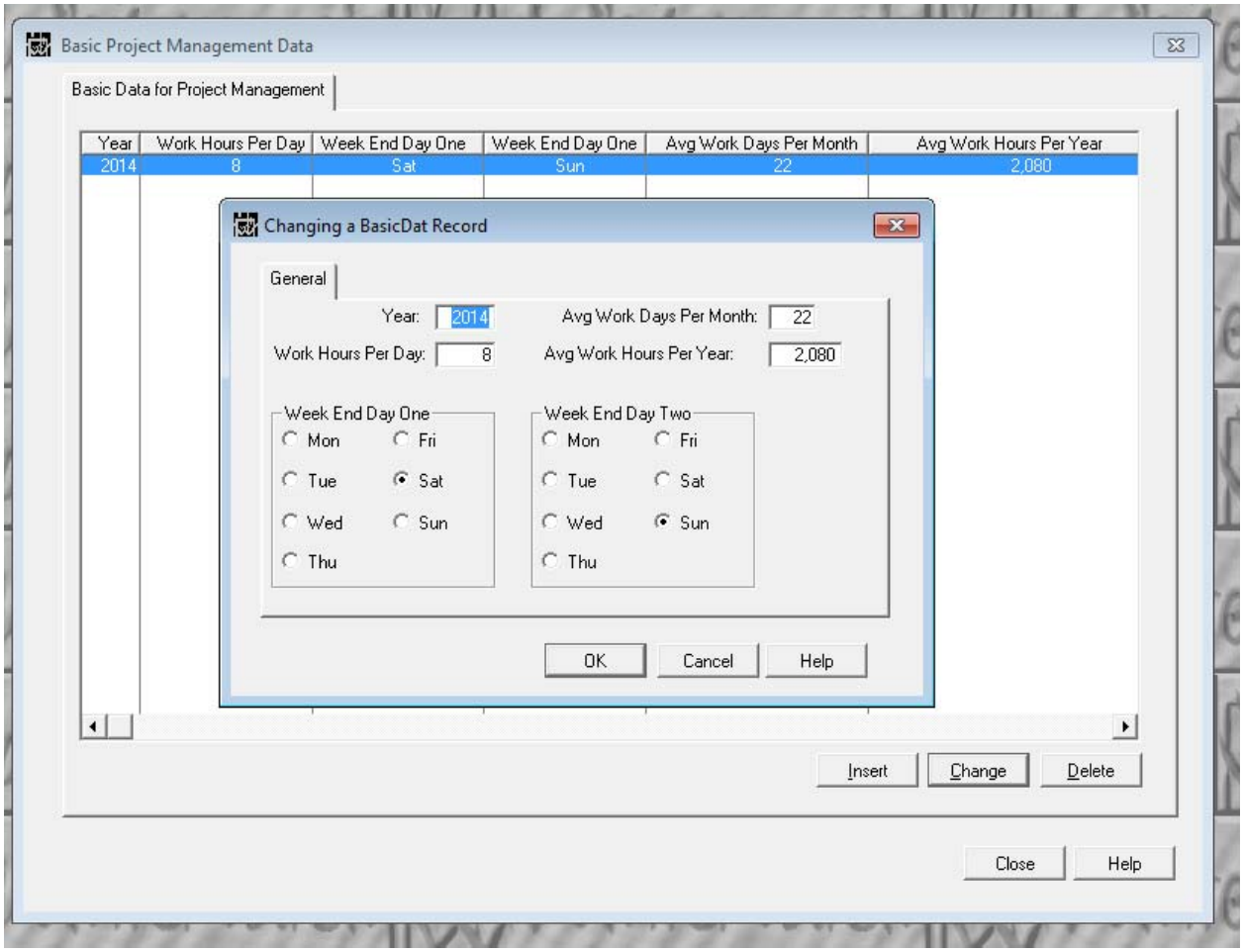

Figure 177. Basic Reference Data Update Process.

At the present time, the Whitemarsh Project Management System does not provide the ability to have multiple Basic Reference Data schemes active at the same time. While this is certainly possible, and not entirely difficult, this is for a future version of the Whitemarsh Project Management System.

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5.9.2 Holidays

Holidays, as illustrated in Figure 178, are traditionally considered to be specific dates within a given year and are named. To add or change a Holiday, press the Insert or Change button. At that point, Figure 179 is presented. It enables the selection of a date and also the naming of the Holiday.

If during the computation of a schedule for a project, a candidate work day falls on a Holiday, the calendar is advanced by one day. If it is the custom to observe a Holiday on a Friday or a Monday when that Holiday falls on a Saturday or Sunday, the date of the observed Friday or Monday is to be entered.

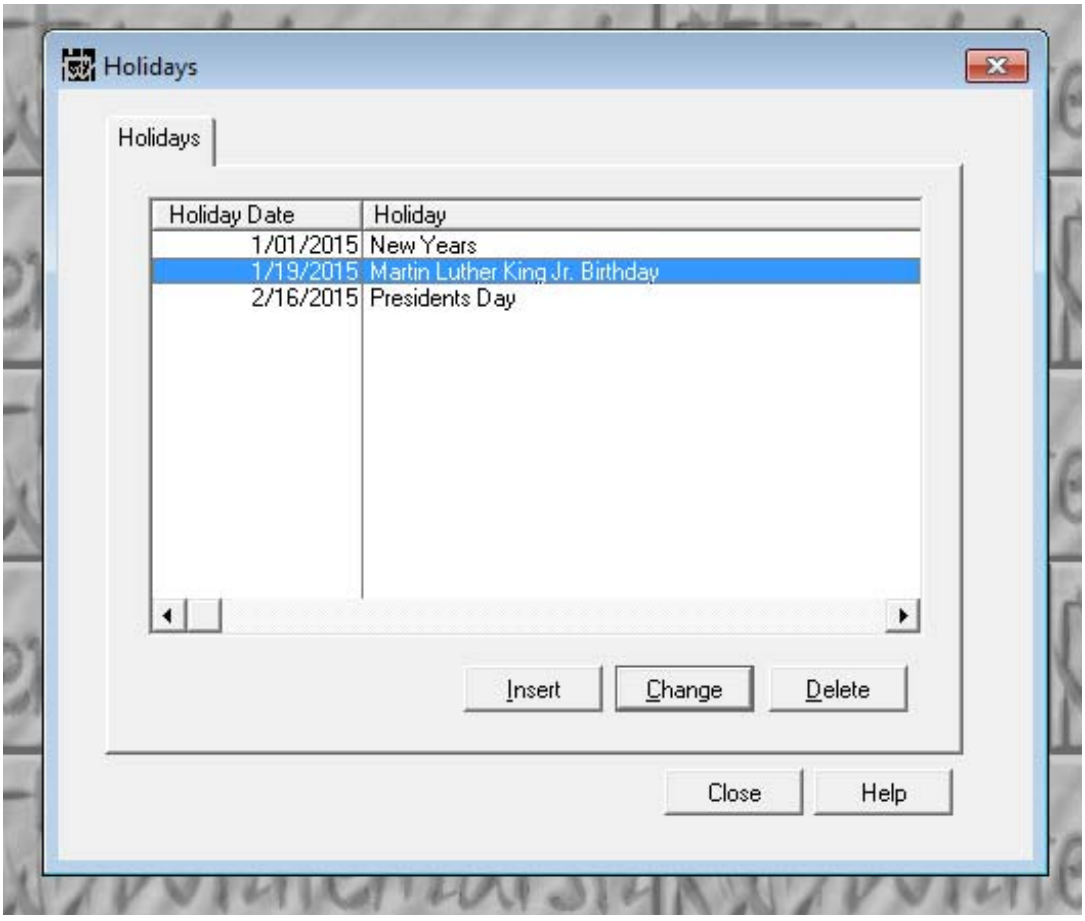

Figure 178. Holiday Process.

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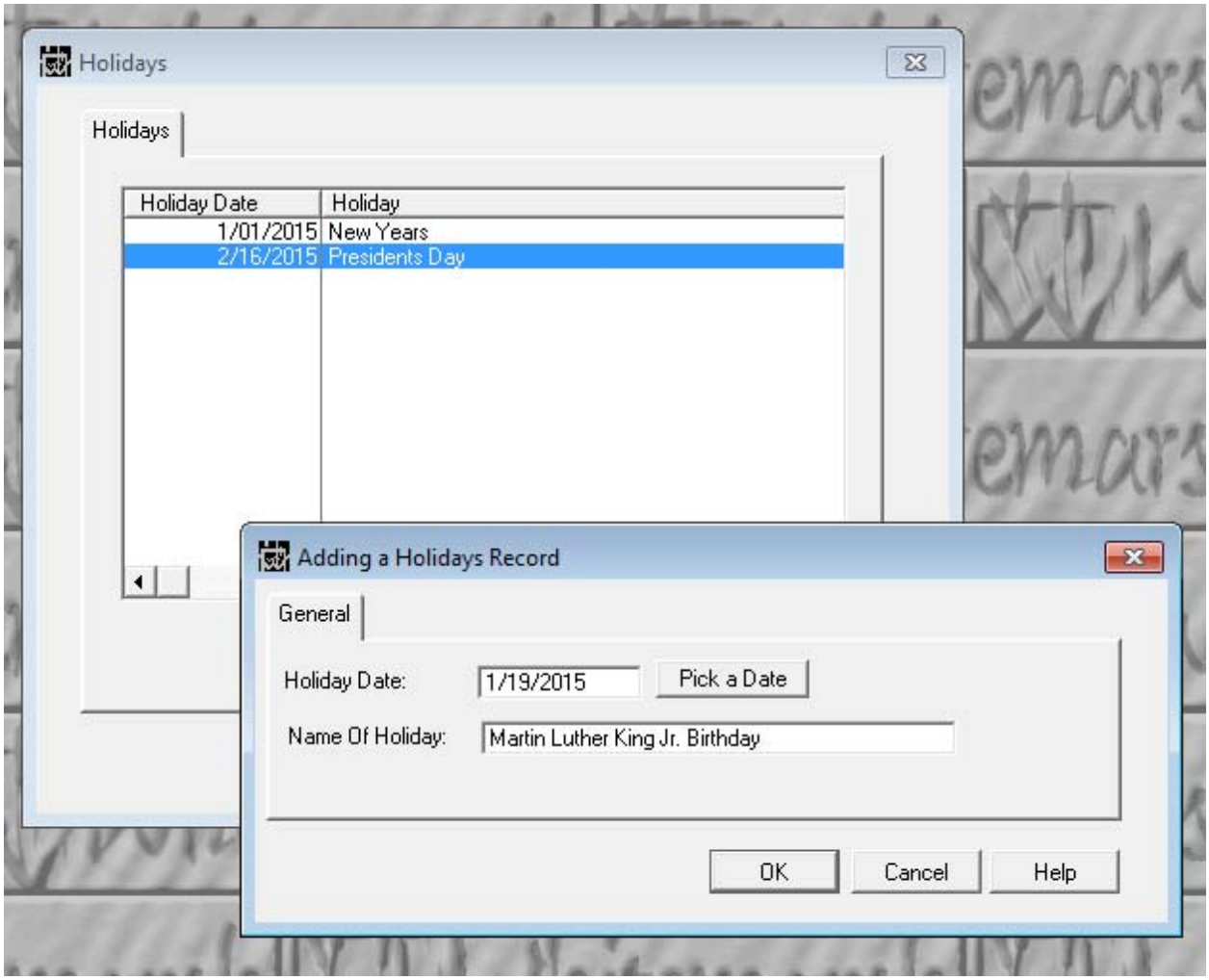

Figure 179. Holiday Update Process.

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5.9.3 Contract Roles

A contract role is a short hand title representing the overall nature of the activities that a person performs on a contract. A typical list is contained in Figure 180. Additional roles could include for example, Accountant, Auditor, and the like. New or updated Contract Roles are created by pressing the Insert or Change buttons. Figure 181 then materializes.

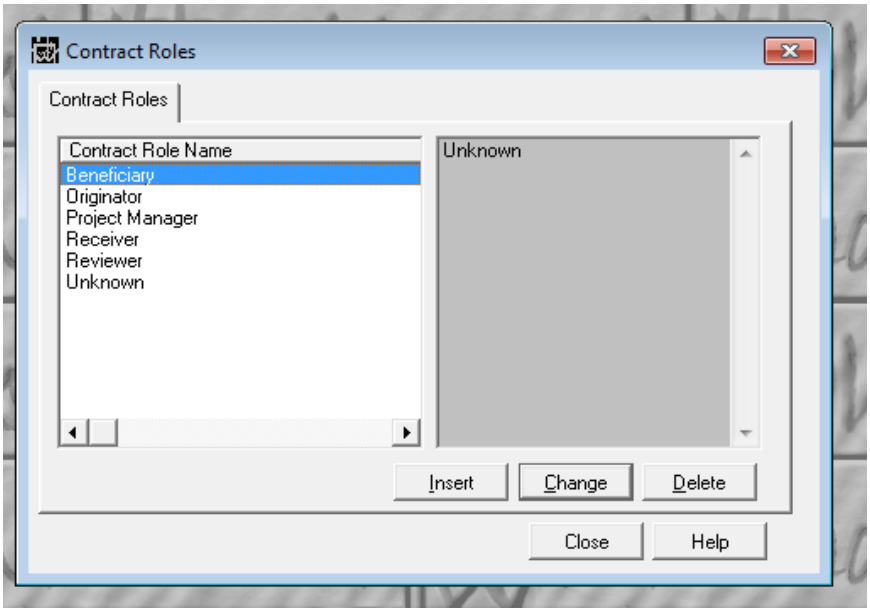

Figure 180. Control Roles Process.

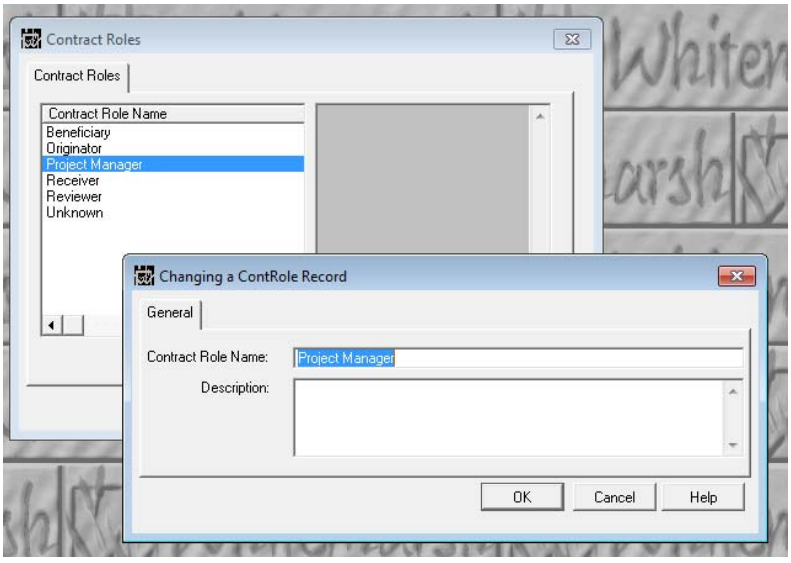

Figure 181. Contract Role Update Process.

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5.9.4 Role Types

A Role Type is the name that is assigned to a collection of Project Deliverable Person Skill Levels. Figure 182 presents a set of typical Role Types. In contrast to Control Roles, where the person is performing an activity related to a contract, Role Types are associated with persons performing work on a particular Project Deliverable. New or updated Role Types are created by pressing the Insert or Change buttons. Figure 131 then materializes

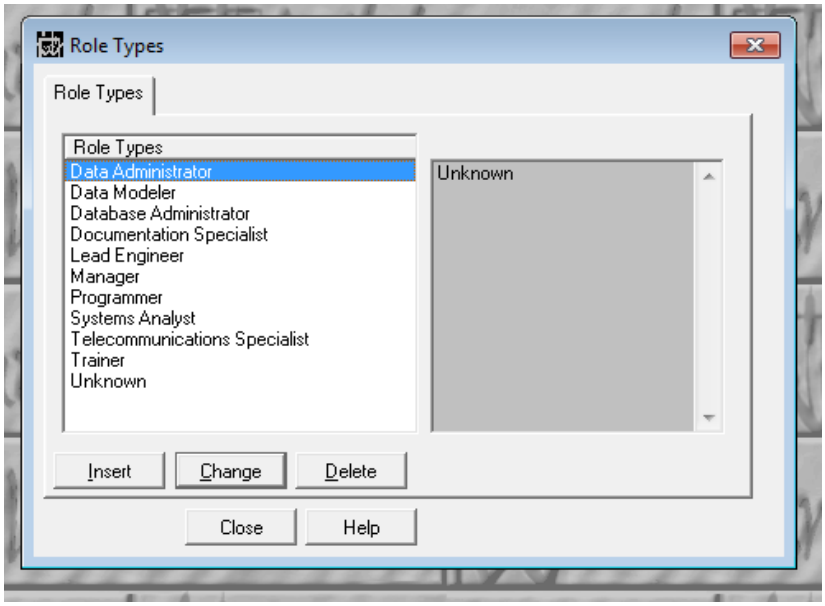

Figure 182. Role Type Process.

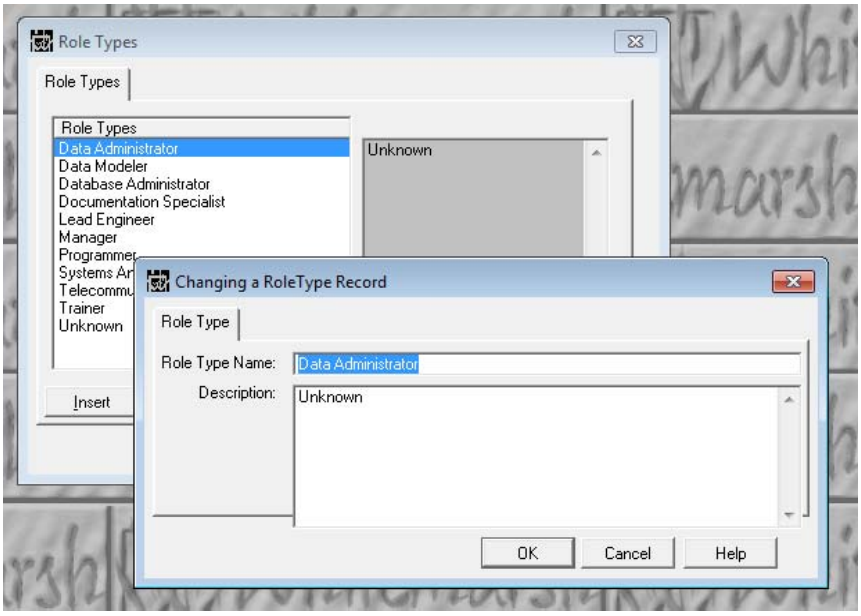

Figure 183. Role Type Update Process.

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5.9.5 Skill

A skill is a capability that is able to be performed by a person on a specific Project Deliverable. In the context of Whitemarsh Project Management, a person may possess multiple skills, and for each assigned skill, their level of performance may be assessed differently and be assigned to different Project Deliverables. A person can be assigned to a Project Deliverable multiple times. In one skill based role, the person may be an architect with a high skill level, and a programmer on that same Project Deliverable with a lower Skill Level. Figure 185 provides a suggested list of skills.

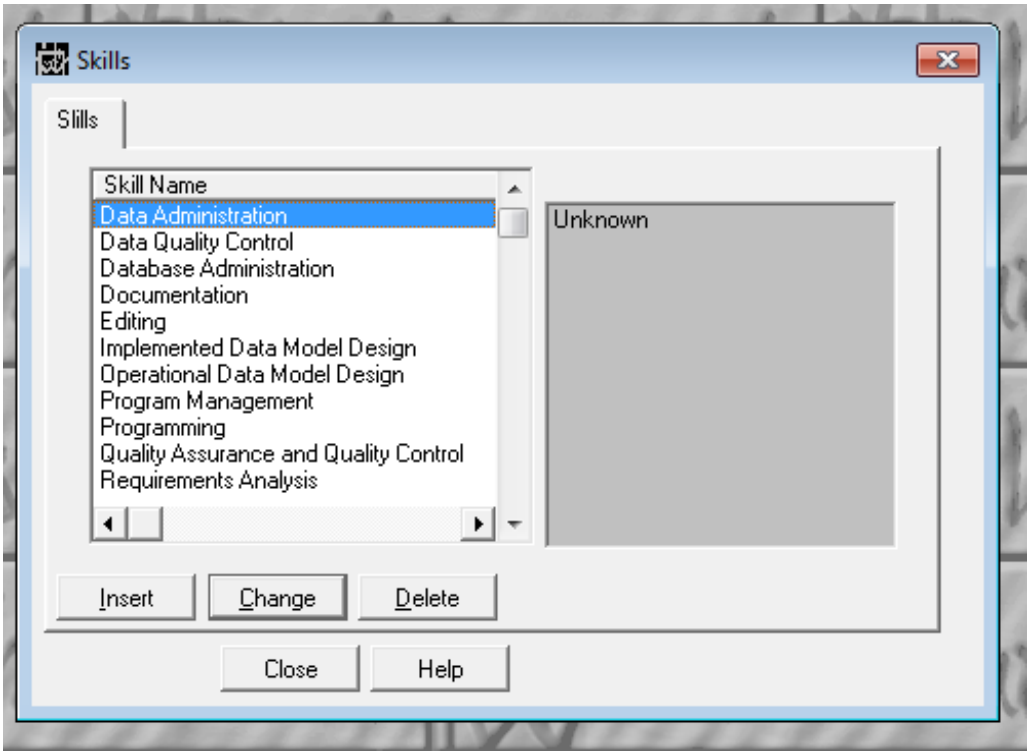

Figure 184. Skill Process.

Figure 185 presents the update screen for Skill that is shown after the Insert or Change buttons are pressed. On this screen, the name and the description should be entered. The description of the skill should focus on the work characteristics that should be able to be performed. In short, the description should be a focused set of job duties in a typical job description.

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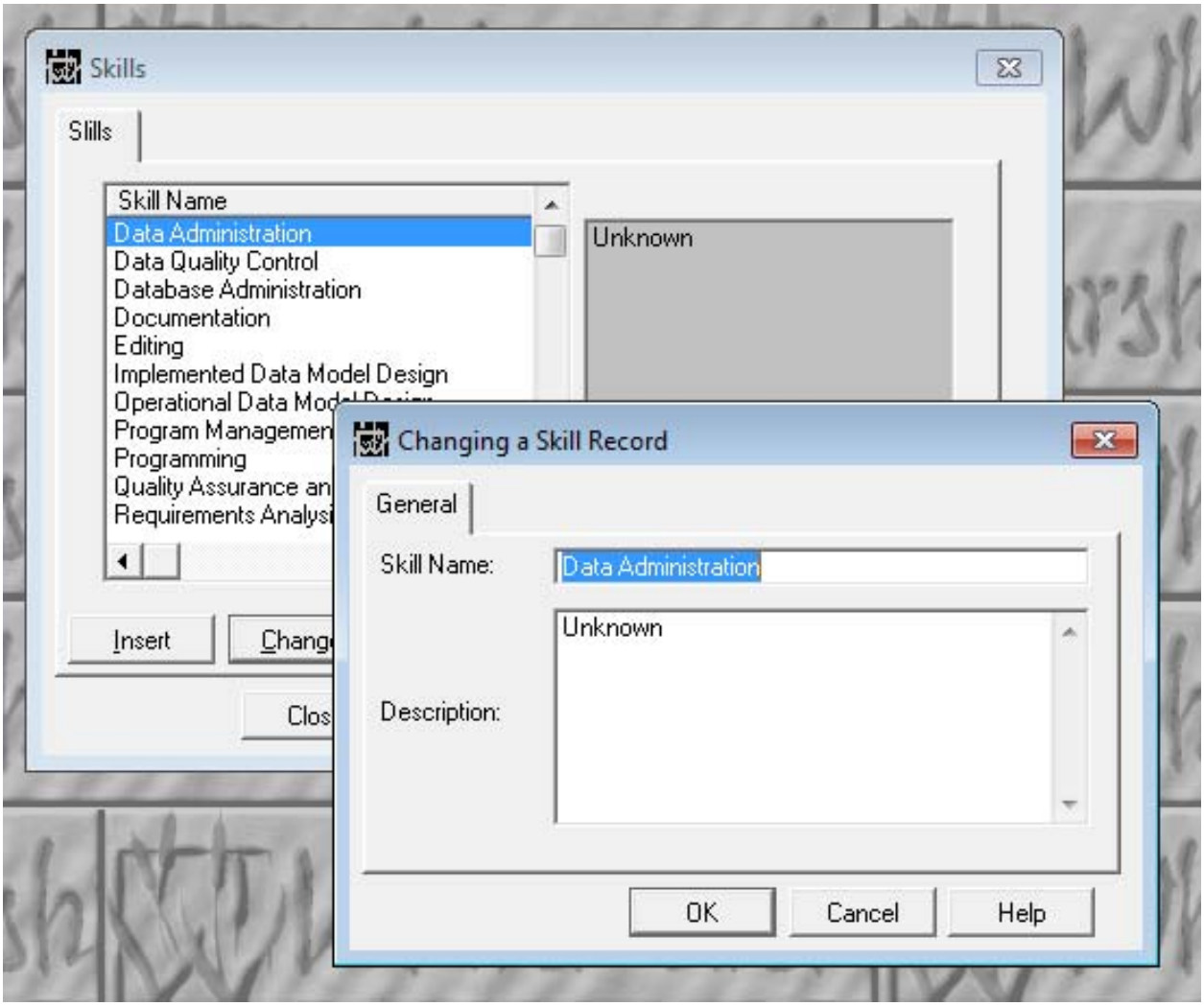

Figure 185. Skill Update Process.

5.9.6 Skill Level Types

A Skill Level Type is the name and description of an assessment of a skill such that the assessment name and description is independent of the particular skill. Figure 186 depicts a typical set of Skill Level Types. The relative level of the performance effect of the Skill Level Type is not contained in this screen. Rather it is contained in the Skill Level screen. That is because there may be different levels of effects depending on the particular Skill.

Figure 187 shows the creation or update screen for Skill Level Types. The Skill level type name is entered along with a description of the Skill Level Type. What ultimately distinguishes one

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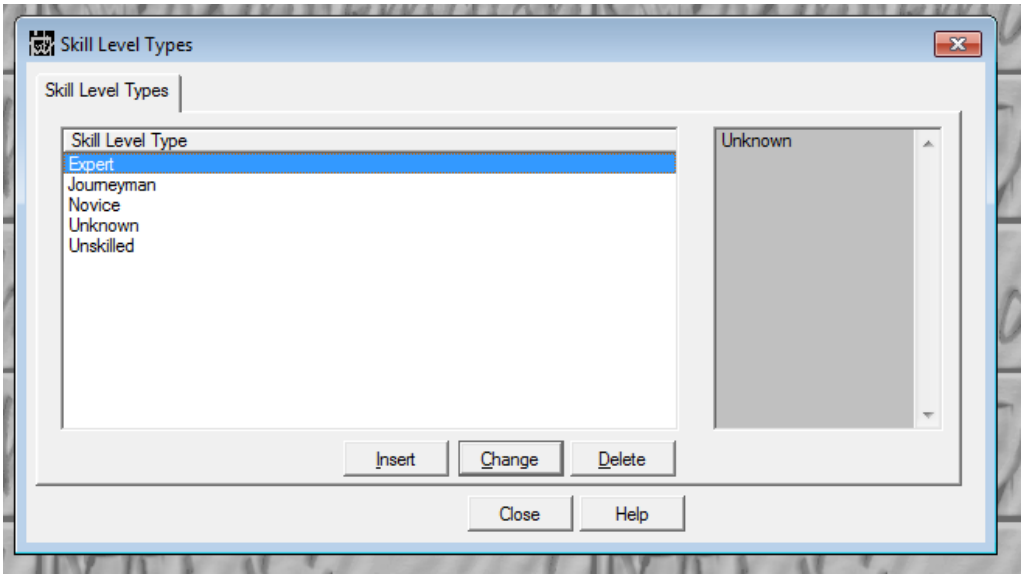

Figure 186. Skill Level Type Process.

Skill Level Type from another for a particular Skill is contained in the Skill Level screen. It is important to distinguish one Skill Level Type from another in the description.

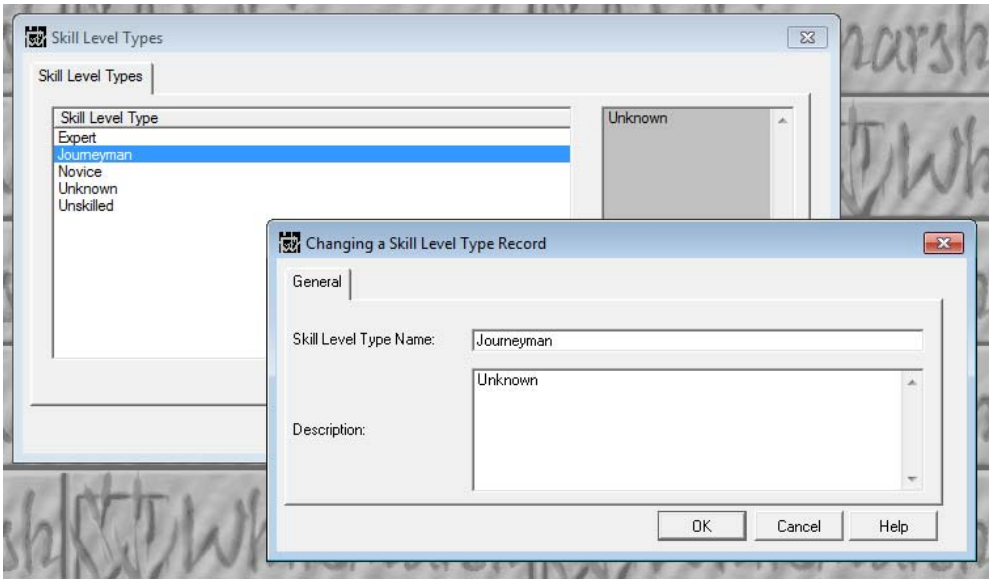

Figure 187. Skill Level Type Update Process.

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5.9.7 Skill Level Assignments

Skill Level Assignments are the association of a performance effect on the Deliverable Template's unit effort hours. The screen for assigning the effect is presented in Figure 188. The assignment process starts with tagging one item in the left browse. One or more items then tagged in the right browse. Once tagged, the Build button is pressed. The result of the assignment is presented in the Skill Level Assignments browse.

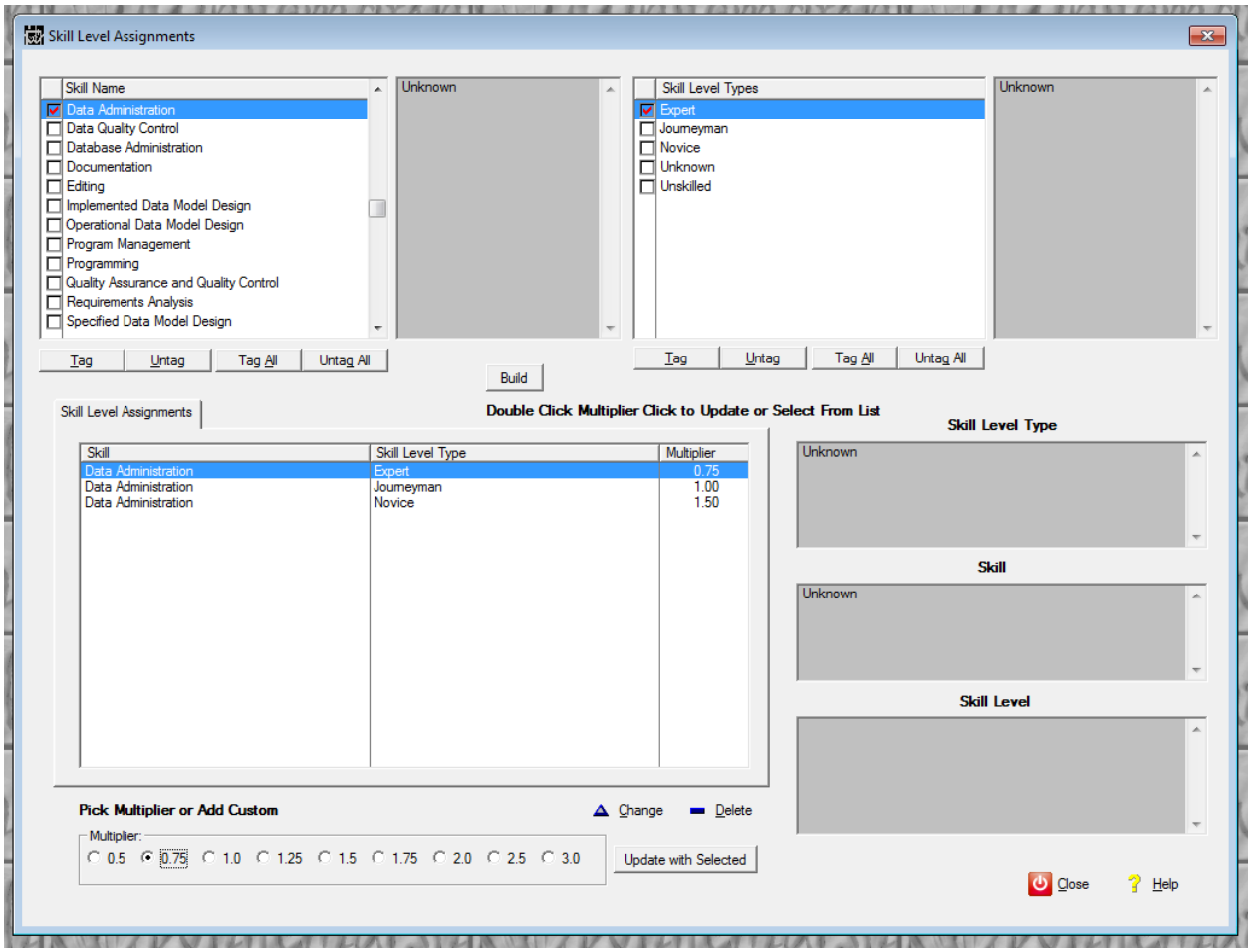

Figure 188. Skill Level Assignment Process.

Once the assignment is completed, the effect on the unit effort hours for the Skill Level can be individually assigned. Select the specific Skill Level and then press one of the radio buttons on the bottom of the screen and then press the Update with Selected Screen. To add a custom value for the multiplier, press the Change button. The column, Multiplier, opens up to add a precise value.

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To get a better perspective of the assignments, click the Multiplier column header. The Skill Level records are sorted in either an ascending or descending. The other columns in the browse can be clicked to sort the assignment records as well.

5.9.8 Skill Levels

The Skill Levels screen presents a union of the three tables, Skill, Skill Level Types, and Skill Levels. This is shown in Figure 189. Each of the column headers is able to be clicked to sort the records.

To Add or Change an existing Skill Level record, press the Insert of Change button. Figure 190 is then presented. Note that the Multiplier can be changed directly on this screen. If a zero is placed in the Skill Id field and the Tab key is pressed, a browse for the selection of the Skill is presented. The selection screen is shown in Figure 191.

If a zero is placed in the Sill Level Type Id field and the Tab key is pressed, a browse for the selection of the Skill Level Type is presented. The selection screen is shown in Figure 192.

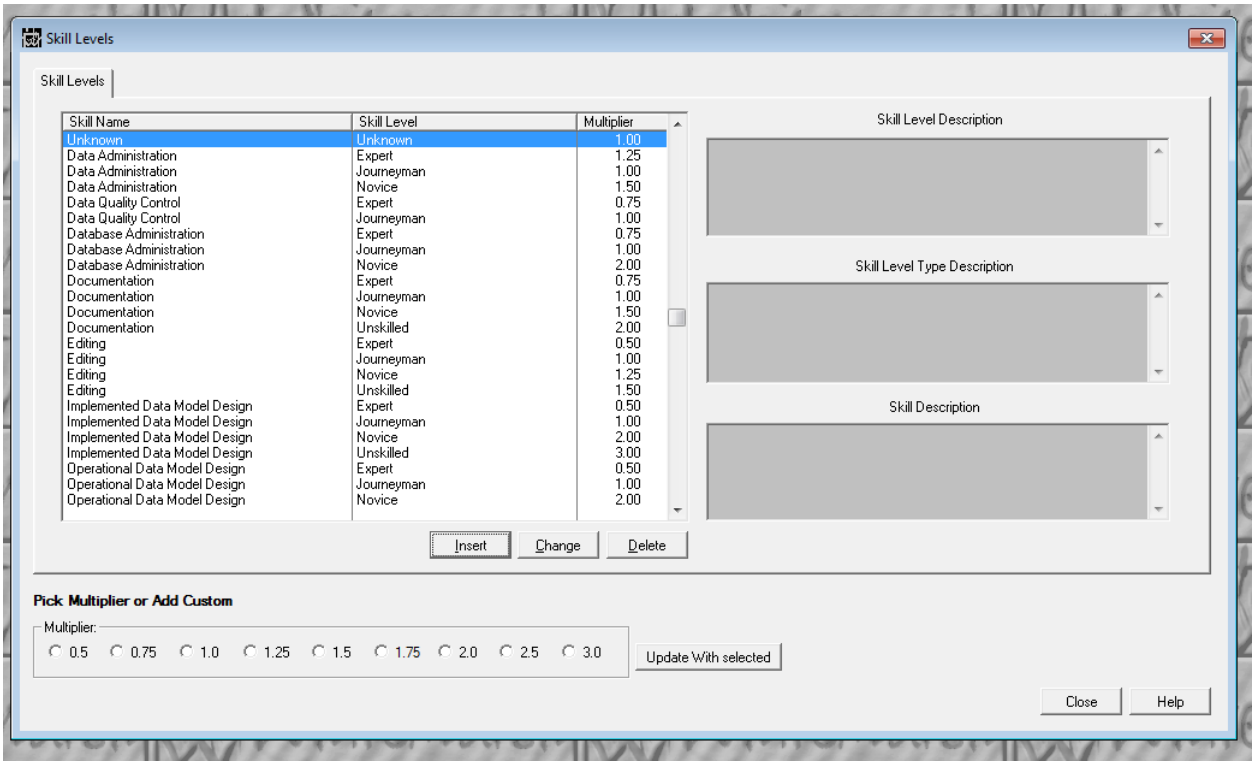

Figure 189. Skill Level Process.

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The Skill Level Multiplier can also be changed by pressing one of the radio buttons on the bottom of the screen and then press the Update with Selected Screen. To add a custom value for the multiplier, press the Change button. The column, Multiplier, opens up to add a precise value.

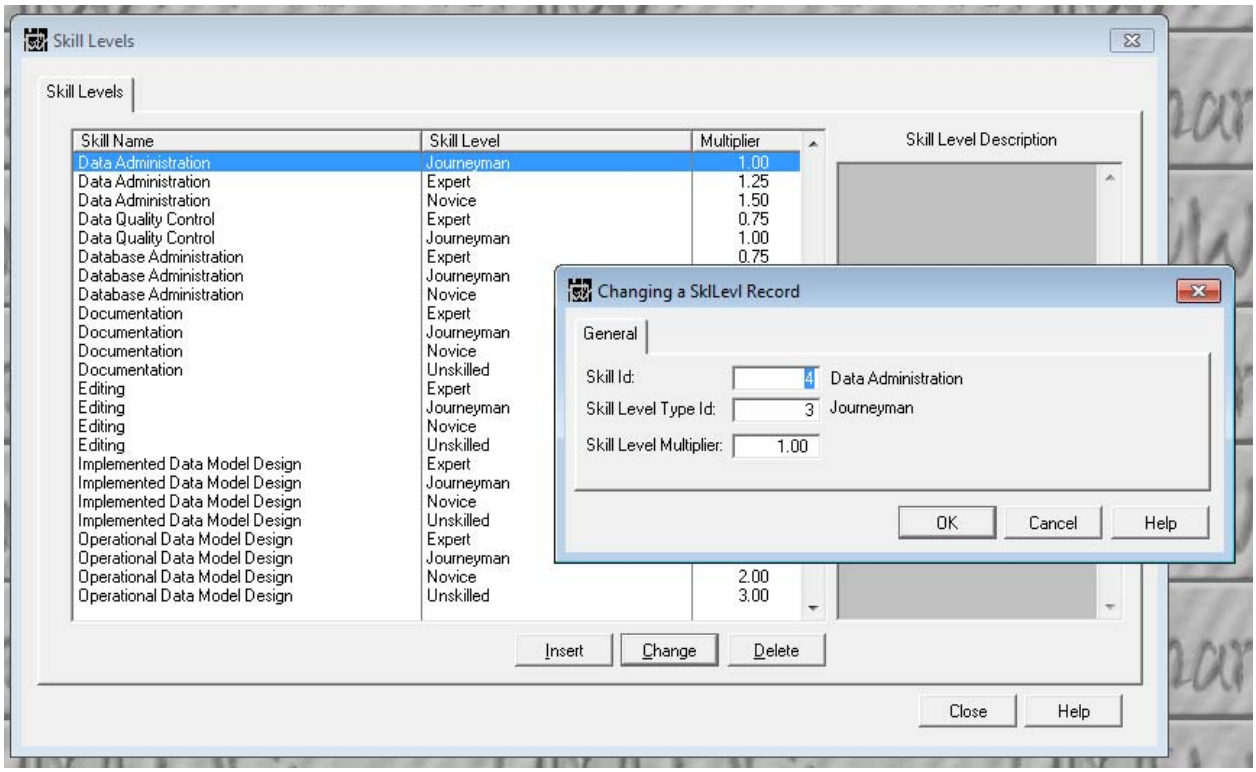

Figure 190. Skill Level Update Process.

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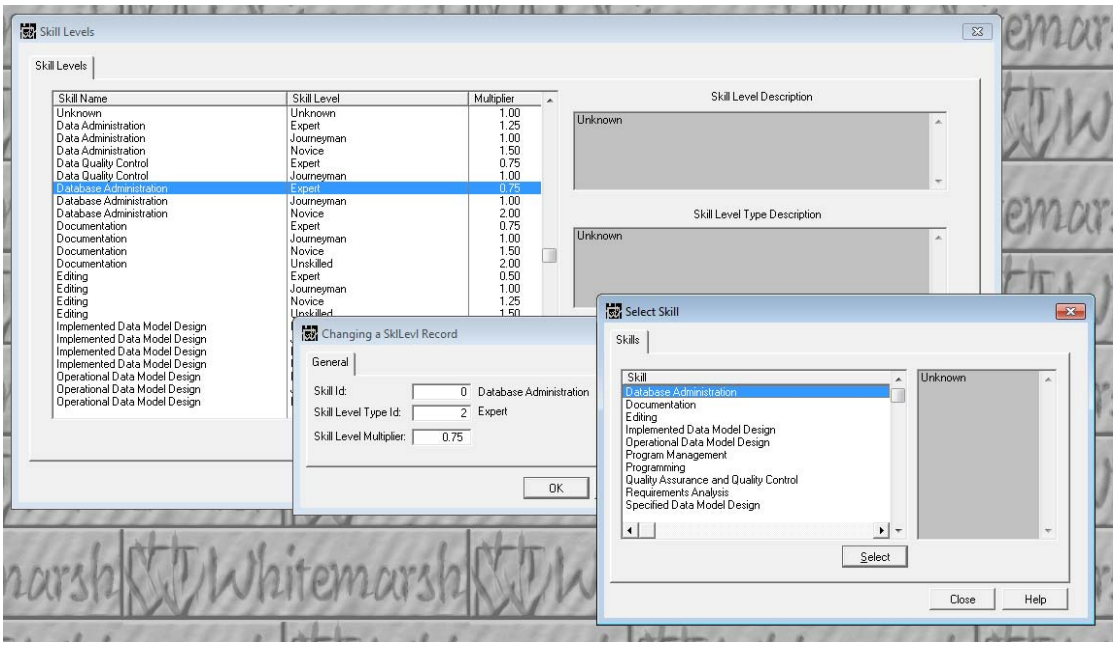

Figure 191. Skill Level Update Process Selection of Skill.

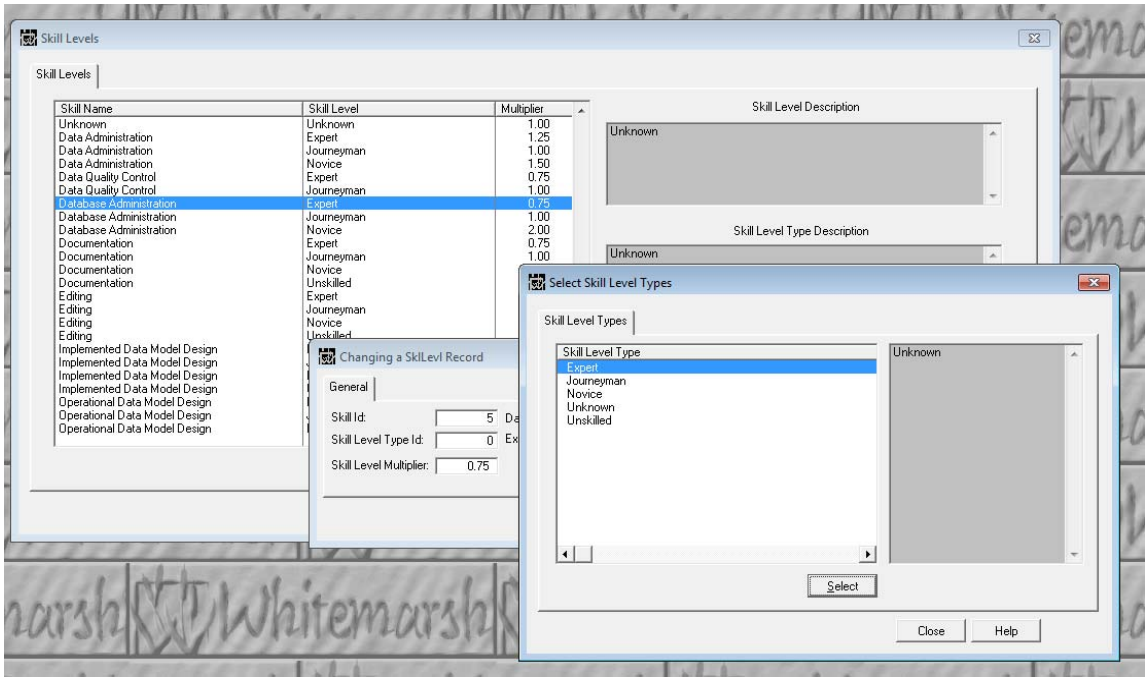

Figure 192. Skill Level Update Process Selection of Skill Level Type.

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5.9.9 Status Types

A status type is an indicator on the state of a given project's overall life cycle. Figure 193 provides an example set. As can be seen in this example set, the statuses have a sequence that generally indicates the sequence of states along the life cycle.

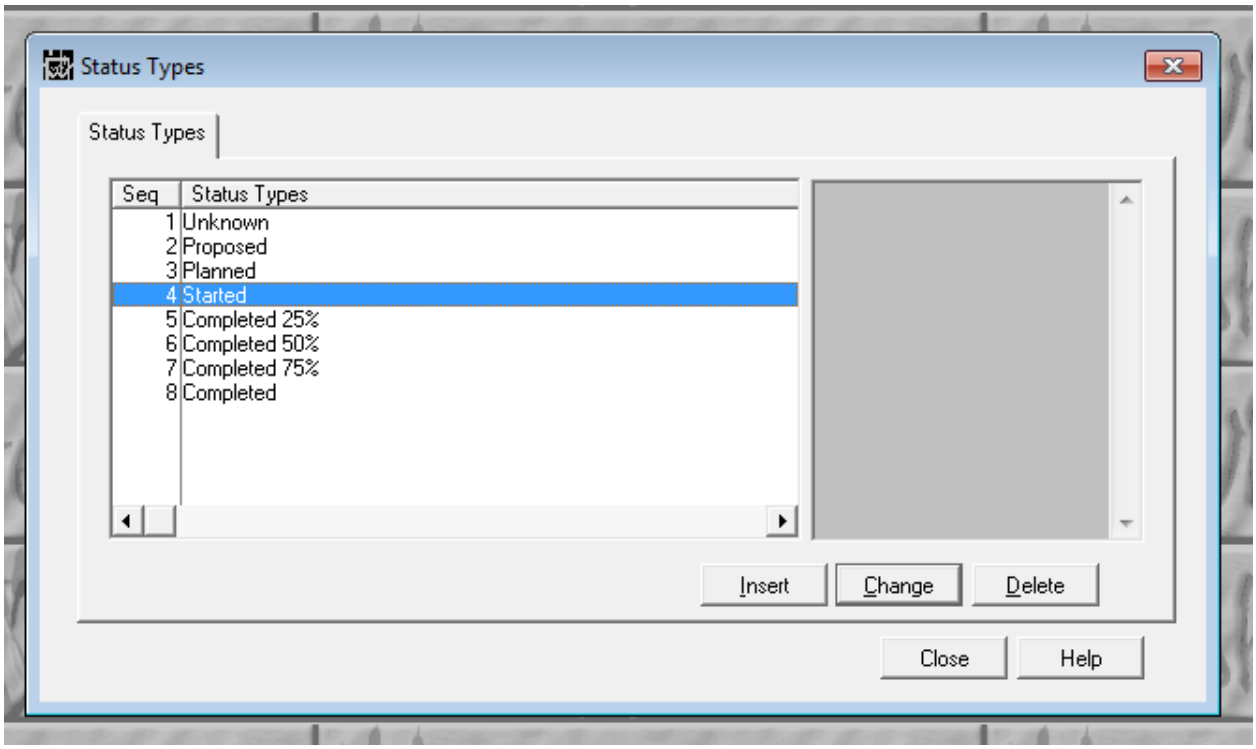

Figure 193. Status Types Process.

Figure 194 presents the screen for adding or changing a given status. The status can be named and described. The purpose of the description is to set out the meaning of the state in a manner that is distinguishable from other statuses.

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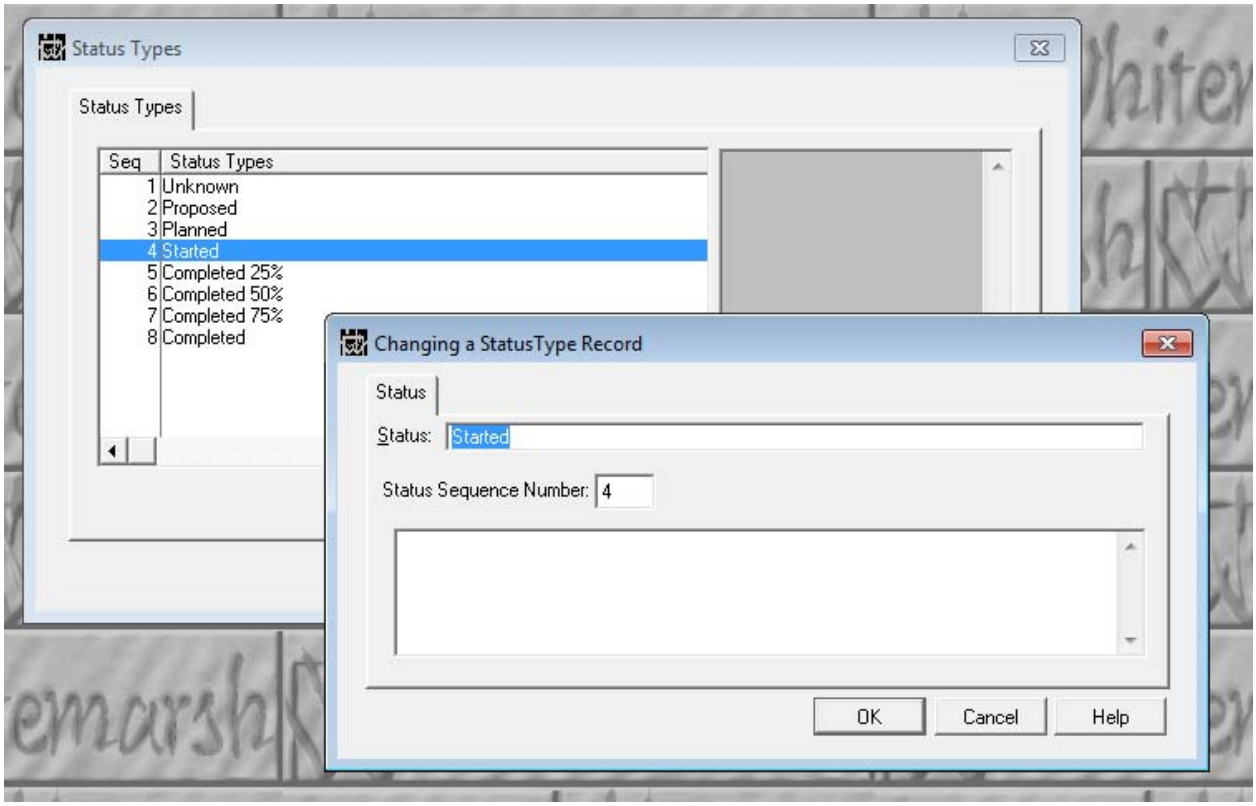

Figure 194. Status Type Update Process.

5.9.10 Import Reference Data

Certain of the reference data is more suitable for CSV importing than others. The menu structure supporting the importation of reference data is presented in Figure 195. The reference data that can be imported are:

- Contract Role
- Holidays
- Role Types
- Skill Level Types
- Skills
- Work Environment Factor Types
- Work Environment Multiplier Types
- Work Environment Factors.

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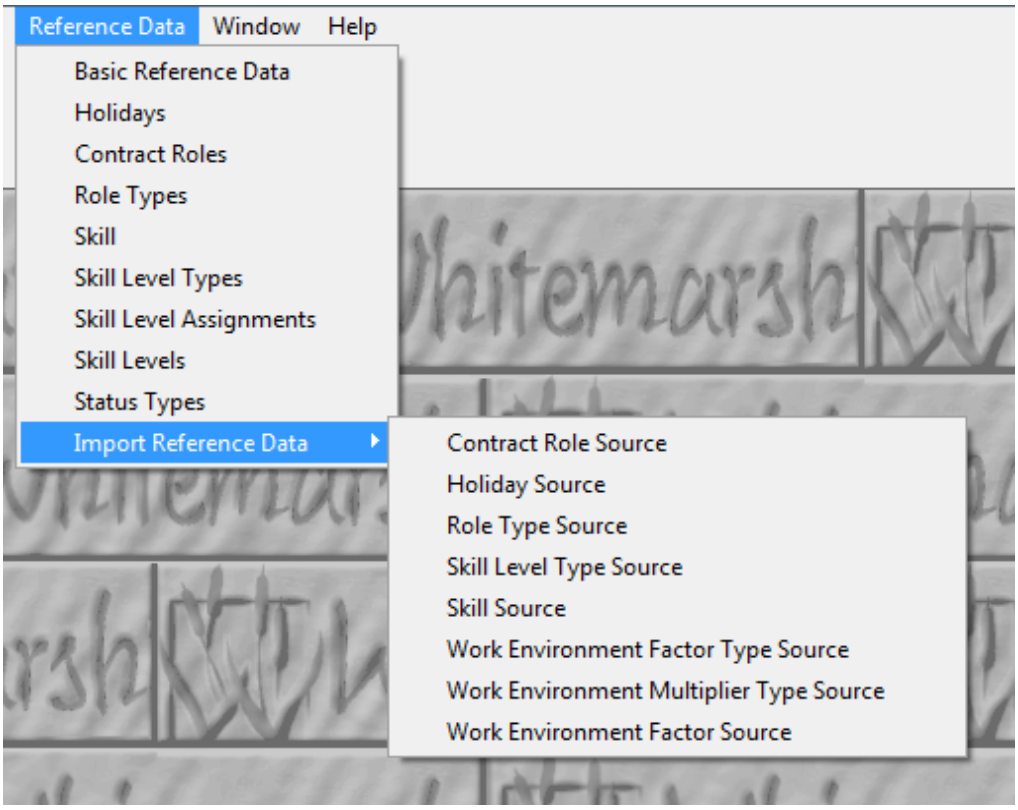

Figure 195. Reference Data Importing Process.

The process for importing reference data is the same for all the different types (all of the subsections of Section 5.9.10).

The import window, for example, the window in Section 5.9.10.1 contains the following:

Select Import File	This is the button to select the name of the file containing the CSV file.
View Import File	This is the button to then view the CSV file.
Log Import Radio	Y or N for whether the input statements should be logged.
View Log File	This is the button for viewing the log file that contains logging messages
Clear Log File	This button is for clearing out any log messages that were previously created.
Import	This is the button that accomplishes the import.
Input File Name	This is the name of the CSV source file name that contains the source data.

Table 7. Button-based Processors for Reference Data Importing.

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5.9.10.1 Contract Role Source

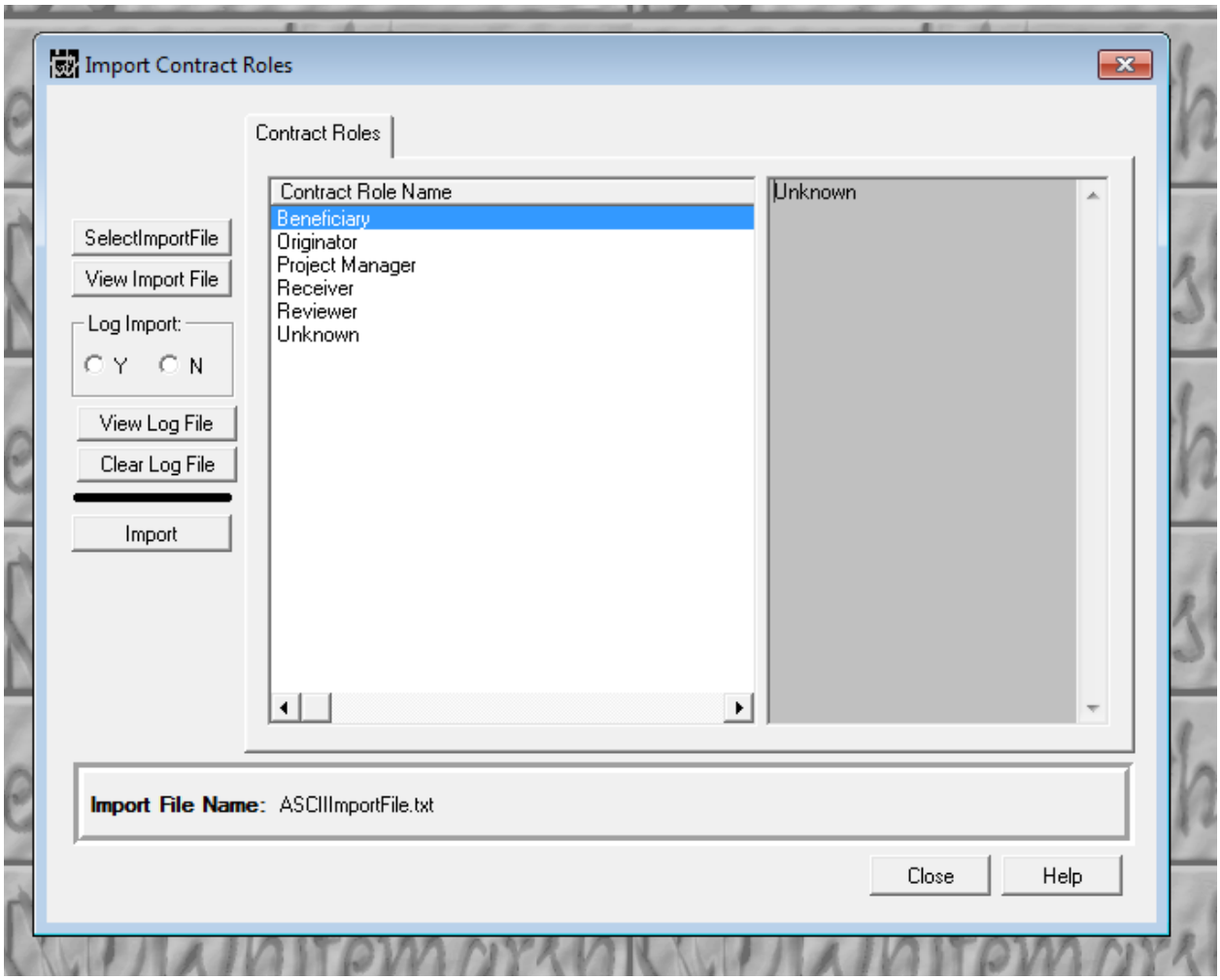

Figure 196. Work Environment Factor CSV Import Process.

```
2,Receiver
3,Originator
4,Reviewer
5,Beneficiary
```

Figure 197. Contract Role Source CSV.

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5.9.10.2 Holiday Source

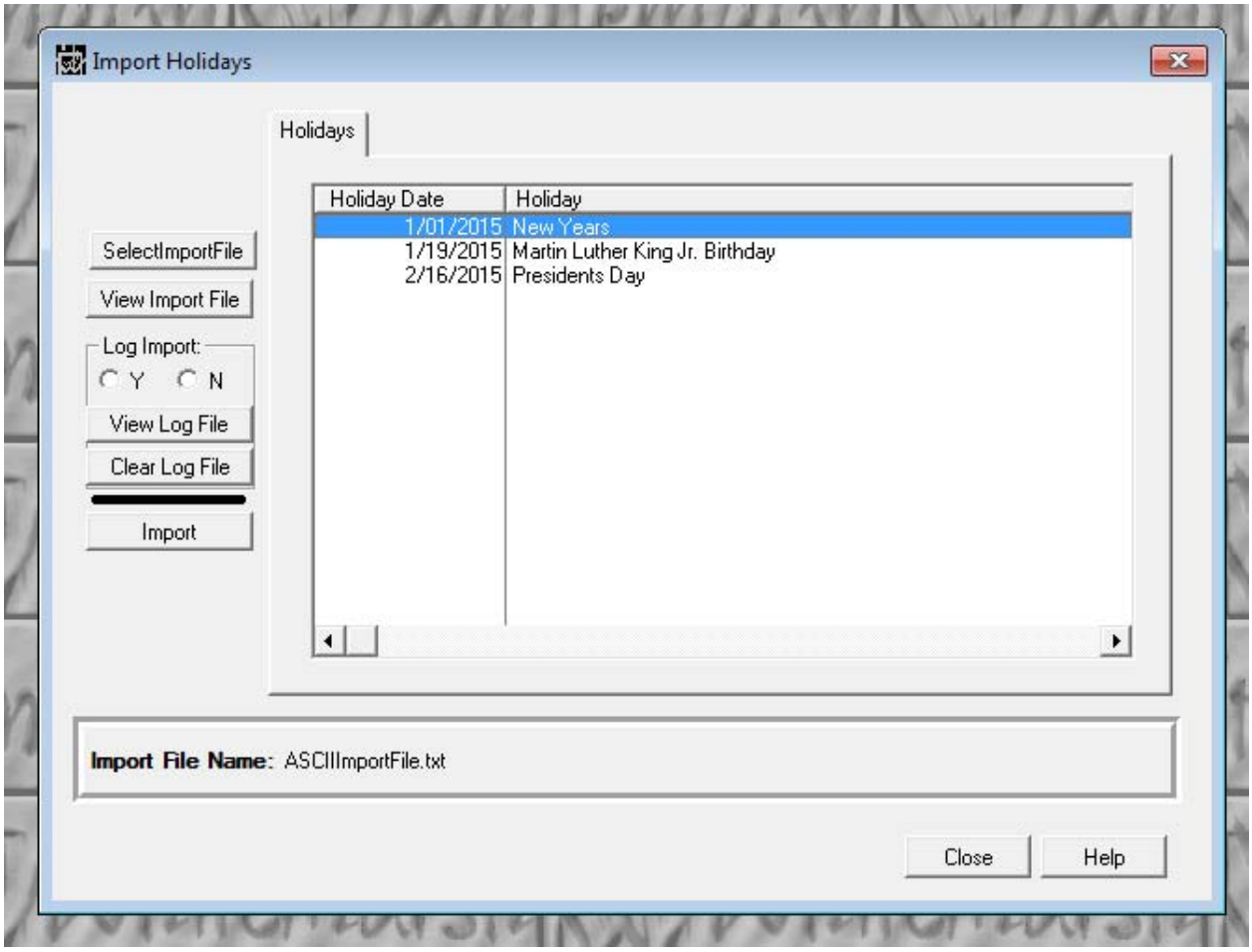

Figure 198. Work Environment Factor CSV Import Process.

```
2,New Year,01/01/2014
3,Memorial Day,05/31/2014
4,Independence Day,07/04/2014
5,Labor Day,09/01/2014
6,Columbus Day,10/13/2014
7,Veterans Day,11/11/2014
8,Thanksgiving Day,11/27/2014
9,Christmas Day,12/25/2014
10,Martin Luther King Day,01/20/2014
11,Presidents Day,02/17/2014
```

Figure 199. Holiday Source CSV File.

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5.9.10.3 Role Type Source

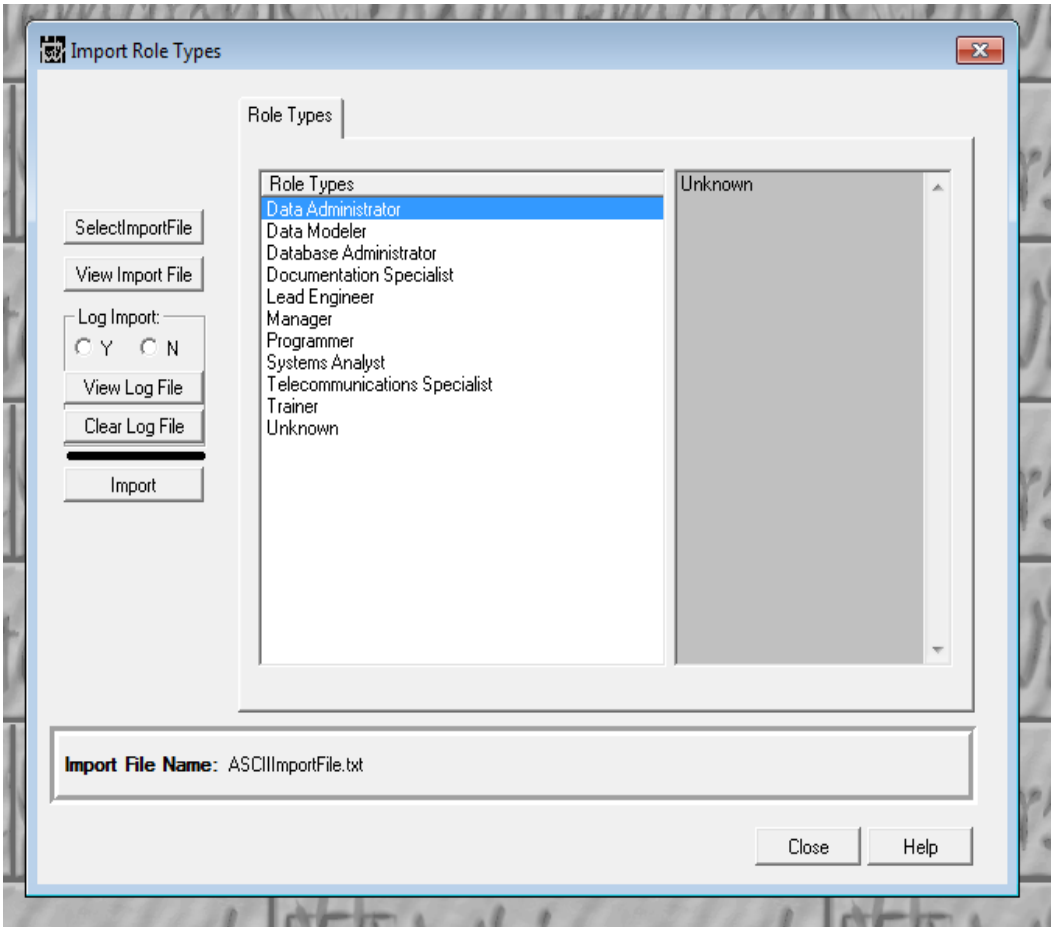

Figure 200. Work Environment Factor CSV Import Process.

```
2,Systems Analyst
3,Data Modeler
4,Data Administrator
5,Database Administrator
6,Programmer
7,Documentation Specialist
8,Trainer
9,Telecommunications Specialist
10,Lead Engineer
11,Manager
```

Figure 201. Role Type Source CSV File.

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5.9.10.4 Skill Level Type Source

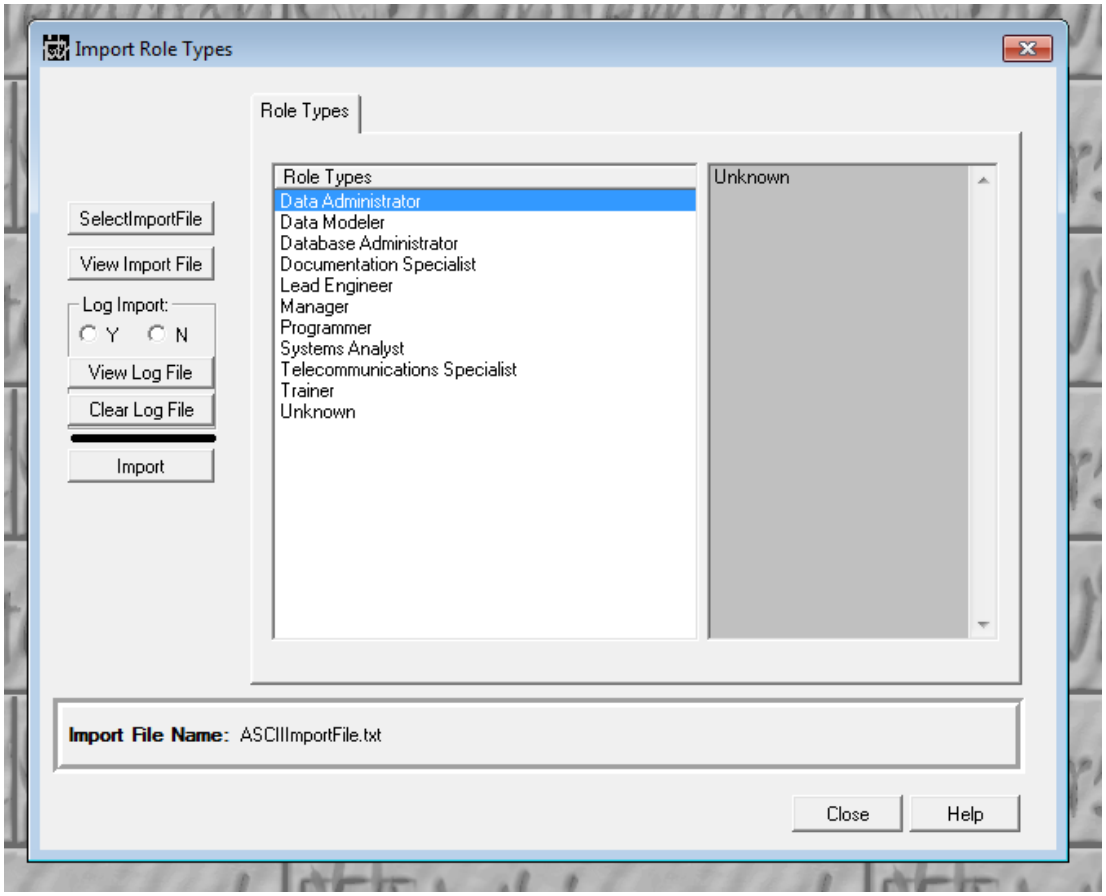

Figure 202. Work Environment Factor CSV Import Process.

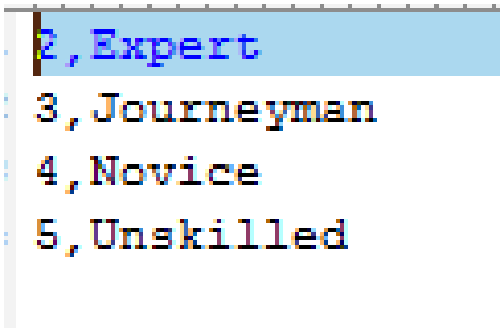

Figure 203. Skill Level Type Source CSV File.

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5.9.10.5 Skill Source

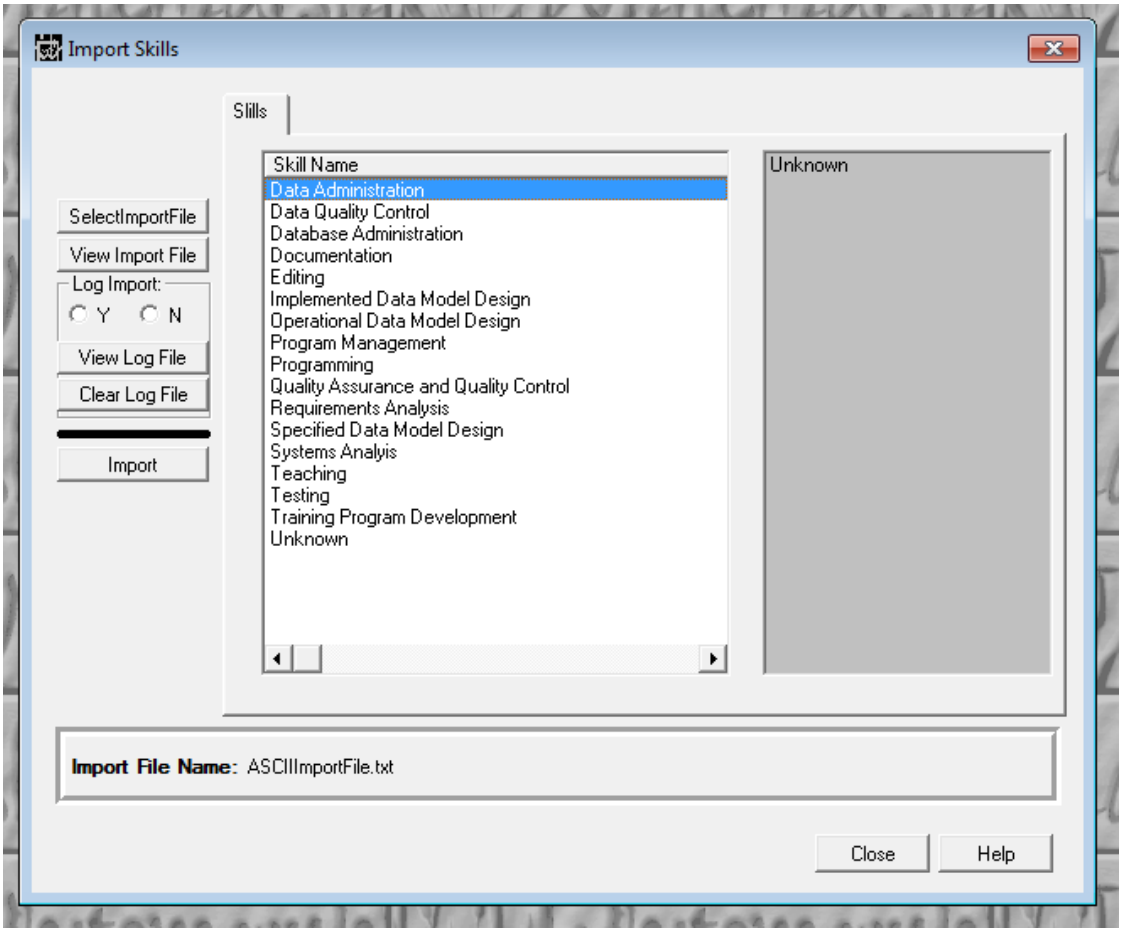

Figure 204. Skill Source CSV Import Process.

```
2,Systems Analyis
3,Specified Data Model Design
4,Data Administration
5,Database Administration
6,Programming
7,Editing
8,Training Program Development
9,Data Quality Control
10,Documentation
11,Implemented Data Model Design
12,Operational Data Model Design
13,Quality Assurance and Quality Control
14,Requirements Analysis
15,Teaching
16,Testing
```

Figure 205. Skill Source CSV File.

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5.9.10.6 Work Environment Factor Type Source

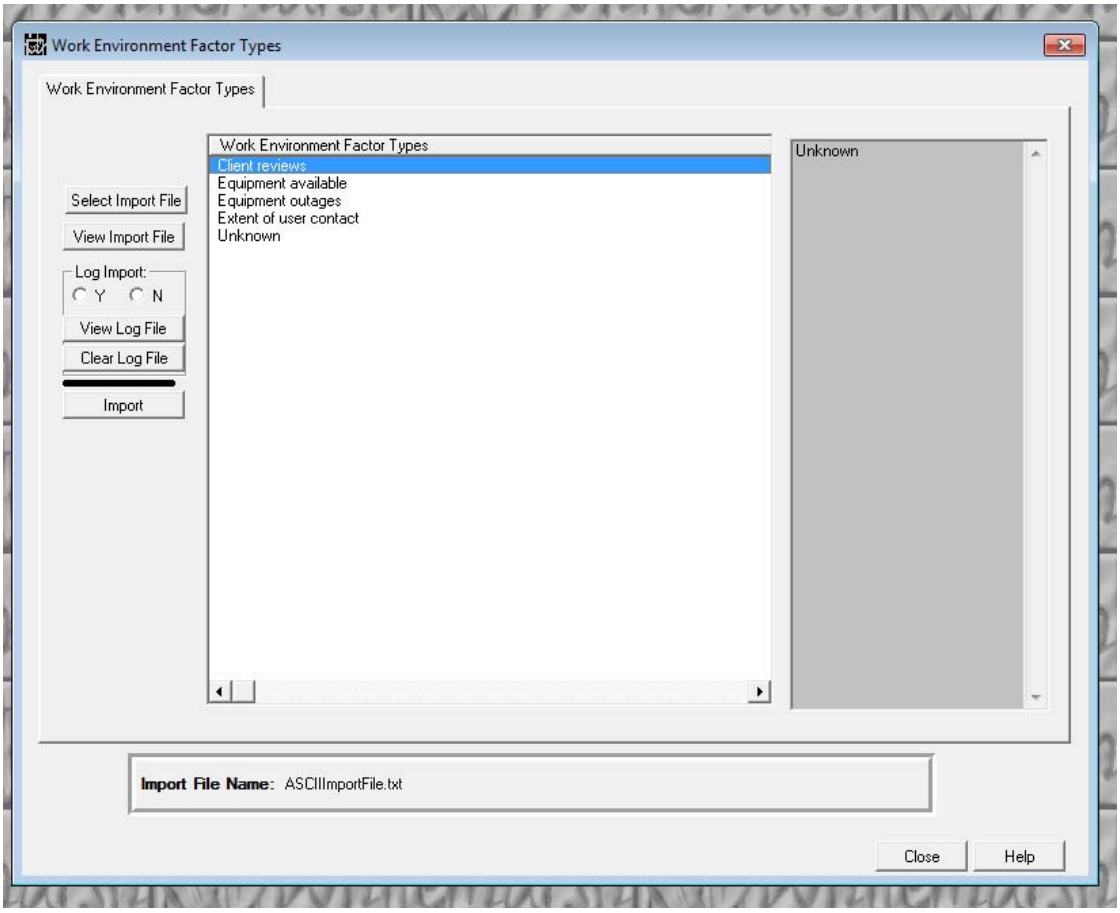

Figure 206. Work Environment Factor Type CSV Import Process.

```
2,Client reviews
3,Equipment available
4,Equipment outages
5,Extent of user contact
```

Figure 207. Work Environment Factor Type CSV File.

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5.9.10.7 Work Environment Multiplier Type Source

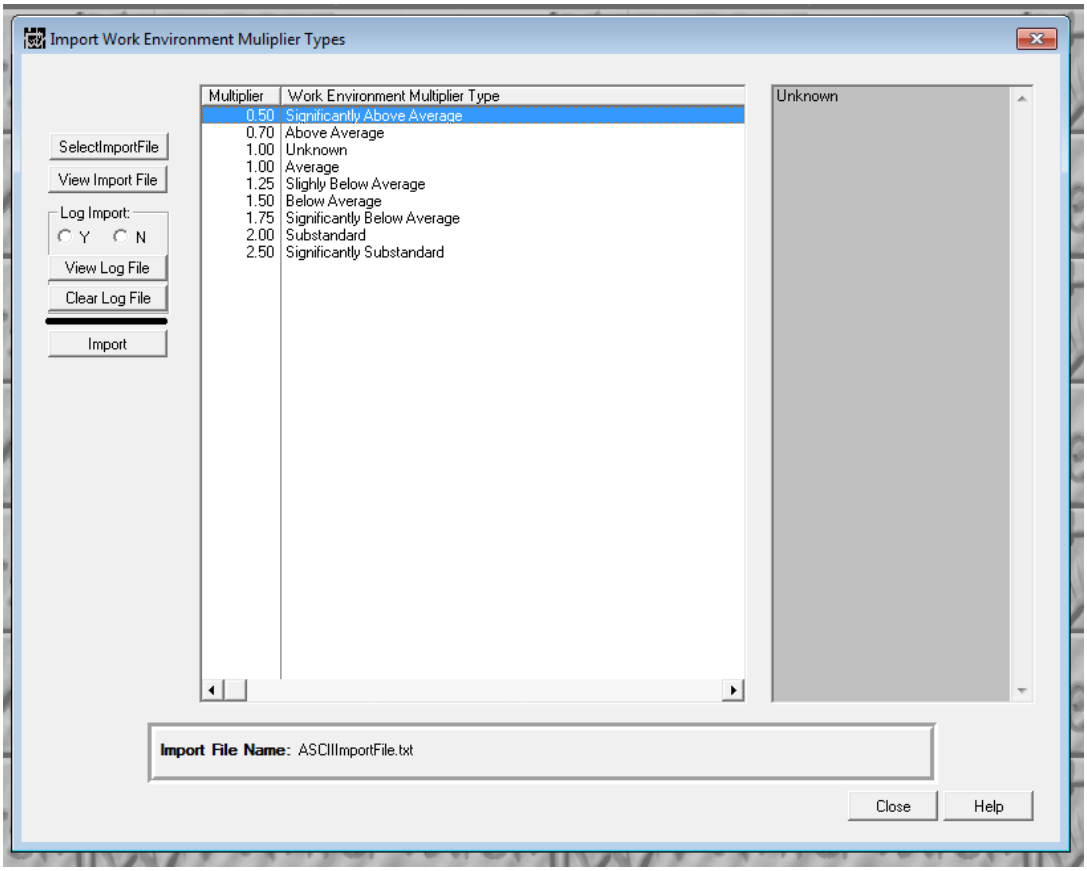

Figure 208 Work Environment Multiplier Type CSV Import Process.

```
2,0.50,Significantly Above Average
3,0.70,Above Average
4,1.00,Average
5,1.25,Slighly Below Average
6,1.50,Below Average
7,1.75,Significantly Below Average
8,2.00,Substandard
9,2.50,Significantly Substandard
```

Figure 209. Work Environment Multiplier Type CSV File

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5.9.10.8 Work Environment Factor Source

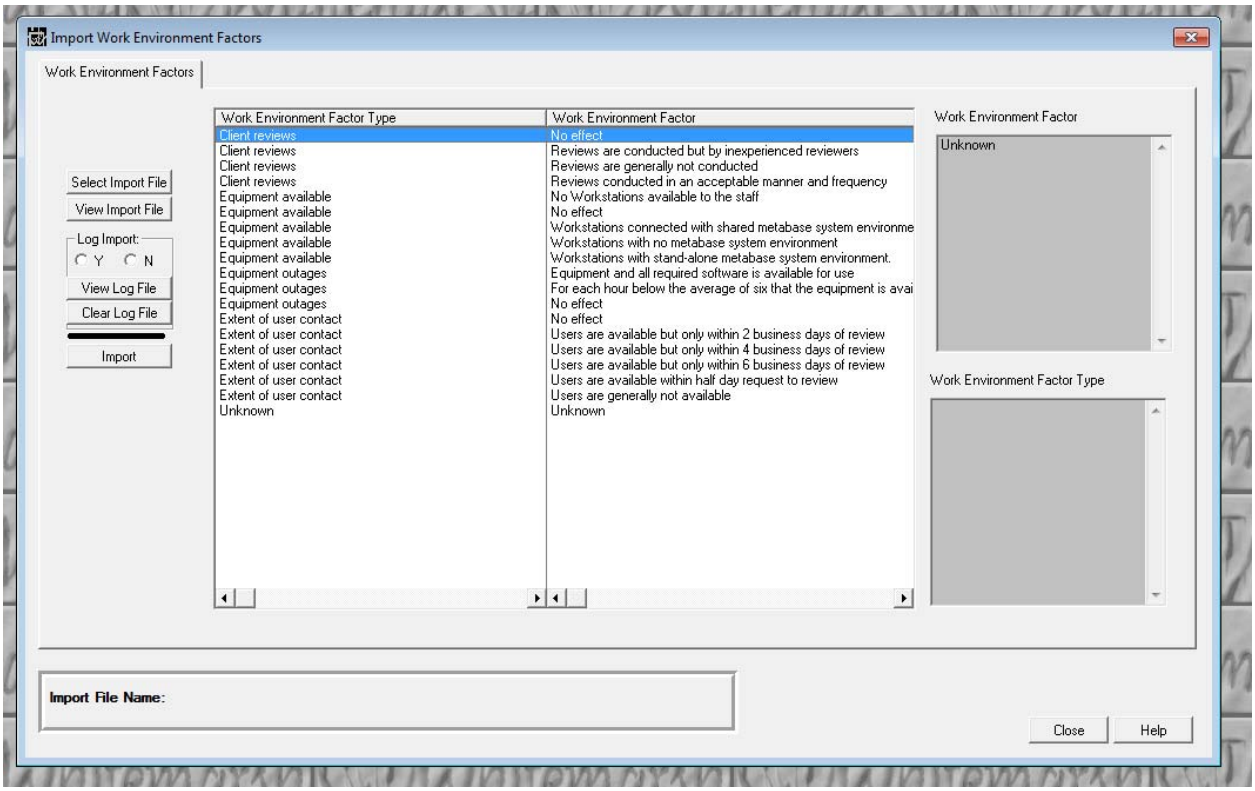

Figure 210. Work Environment Factor CSV Import Process.

```
2,Client reviews,No effect
3,Client reviews,Reviews, that is, walk thru's are conducted by the client as needed
4,Client reviews,Reviews are conducted but by inexperienced reviewers
5,Client reviews,Reviews are generally not conducted
6,Client reviews,No effect
7,Client reviews,Workstations connected with shared metabase system environment
8,Client reviews,Workstations with stand-alone metabase system environment.
9,Client reviews,Workstations with no metabase system environment
10,Equipment available,No Workstations available to the staff
11,Equipment outages,No effect
12,Equipment outages,If the equipment and all required software is available for use
13,Equipment outages,For each hour below the average of six that the equipment is available
14,Extent of user contact,No effect
15,Extent of user contact,If the users are available within half day request to review
16,Extent of user contact,If users are available but only within 2 business days of review
17,Extent of user contact,If users are available but only within 4 business days of review
18,Extent of user contact,If users are available but only within 6 business days of review
19,Extent of user contact,If users are generally not available
```

Figure 211. Work Environment Factor CSV File.

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