Metadata Management Tutorial

Data Governance Enforcement Using Meta Integration® Metadata Management (MIMM)

Version 9.1.0 (8/25/2017)

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1 Introduction

The need for more sophisticated and precise metadata management is a growing concern for most large organizations. Nearly all components that comprise modern information technology, from CASE tools, ETL engines, Warehouses, BI, EAI environments, as well as metadata repositories, contain, and often derive their processing from, metadata. The metadata for these environments is distributed and duplicated, often times active, and generally represented in a variety of methodologies, depending upon the underlying technology they represent.

Meta Integration® Metadata Management (MIMM), provide strikingly expansive set of capabilities in many facets of metadata management, including:

- Business Glossary
- Data Governance
- Metadata comparison, integration, and mapping
- Version and configuration management
- Data life cycle related metadata management
- Lineage and impact analysis
- Enterprise architecture development, management and deployment.
- Data documentation
- Data Mapping Specifications, design and forward-engineering

This document is the culmination of more than fifteen years of experience in supporting the enterprise metadata management and integration requirements of numerous clients. It presents in detail and with supporting tutorials metadata management process and methods, best practices, as well as, many strategic scenarios that leverage the Meta Integration® Metadata Management (MIMM) suite. These examples are comprehensive and directed at real-world examples tied to business-oriented goals and return on investment. In all, anyone who completes the exercises in this document should find it straight-forward to implement and deploy an effective and comprehensive metadata management environment.

Disclaimer

Some of the features detailed in this document may not apply and/or be available for the particular Meta Integration® Metadata Management (MIMM) edition you may have.

1.1 How to use this document

It is certainly possible to skip through the tutorials, and thus simply glean an "management-level understanding" of Meta Integration® Metadata Management (MIMM) and its use within a metadata management environment. However, it is not recommended that one try to skip parts of the tutorials and then try to go through later parts. When following through the tutorial sections, it is very important to respect the order of the steps (and the order sections/labs within each section). The results of preceding tutorials are re-used and built upon in each successive lesson.

In addition, it is important to ensure complete understanding of the conceptual background provided in the sections leading up to and supporting the tutorial material. Thus, one should not simply jump into the tutorials with carefully reviewing the concepts presented in that section.

As this document include hand-on tutorials, a great deal of specificity is required. This detail includes specifying particular CASE, ETL, BI, etc., vendor's tools. While Meta Integration® Metadata Management (MIMM) environment itself is capable of working with over 100 different versions of third-party tools (see http://www.metaintegration.net/Products/MIMB/SupportedTools.html), it is necessary for the clarity conciseness of the tutorials to limit the cadre of tools that will be referred to. Please note that it is not necessary to have these tools on-hand to get the full benefit of the tutorials. Remember also, though you may intend to use Meta Integration® Metadata Management (MIMM) suite of tools with many of the supported third-party tools not specified in the tutorial, it is still quite valuable to learn the processes, methods and best practices presented here. Then one may reuse what one has learned and apply that knowledge and skill to the particular set of tools that are critical to one's own enterprise.

1.2 Conventions used in the tutorial

The following font conventions will be used throughout the tutorial.

- User Interface item – New
- Submenu item – New › Folder
- Terminology item – *model content* item
- Name or label reference – Accounts Payable

2 Advanced Business Glossary Workflow

In order to ensure that the business glossary is accurate, up-to-date, available to all who need access to it and integrated properly with the rest of the metadata in the repository, Meta Integration® Metadata Management (MIMM) also provides a robust collection of Data Governance tools and methodologies. The Meta Integration® Metadata Management (MIMM) business glossary provides a very flexible workflow and publication process that may alternatively be quite sophisticated or quite simple depending upon one's needs. In addition, one may maintain any number of business glossaries, each with different workflow and publication characteristics.

Meta Integration® Metadata Management (MIMM) separates the publication process (making the correct terminology available to the proper environments) from the term status/approval process. This is a very important distinction and means one can avoid complex publication hassles and potential roll-backs. It is in fact managed by the same robust version and configuration management capabilities built into Meta Integration® Metadata Management (MIMM) and seen in earlier chapters. We will see how we take advantage of these capabilities to support the workflow and in particular publication process.

2.1 Overview of the advanced business glossary features

2.1.1 Glossary Workflow

By default, a business glossary will have no workflow requirement (including no approval process). In this simple state changes made to the business glossary are reflected immediately throughout the system. This is a very useful mode for organizations that dod not want the complexity of a workflow process. It is also useful for other organizations when they are first building and populating a business glossary and related semantic mappings.

The Meta Integration® Metadata Management (MIMM) also provides a very flexible and complete set of possible workflow and publication processes that one may employ. Choose these processes carefully, as once selected they cannot be undone or changed.

When your company would like to have a formal glossary development process that involves multiple users you can enable the glossary workflow. The workflow is based upon a common sequence of glossary activities around term proposal, review, acceptance, publishing and depreciation. It is a flexible process that can be customized to require only publishing activity, approval with or without review, approval and review by one or multiple users, etc.

2.1.2 Workflow Roles

A user with the Administrator security role can enable the workflow and assign the following workflow roles to Categories:

- Editor
- Reviewer
- Approver
- Publisher

A workflow role can be assigned to users and applies to all terms in the category. A Category inherits all user-to-role assignments from the parent category and can have additional ones.

2.1.3 Stewards

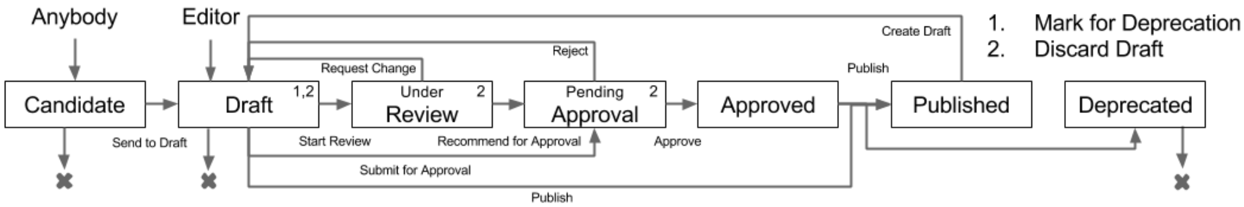
Stewards are users or groups of users who are assigned as point of contact to answer questions for specific terms or entire categories. They have no special workflow role assignments based upon their stewardship assignment.

Stewards are also the users (and groups of users) who are kept updated with workflow status reports on terminology that they are stewards of and if a category is flagged for notification.

2.1.4 Workflow process options

The workflow process applies to terms, but not categories. All changes to Categories made in the Manager UI are immediately visible (published) in the Explorer UI. When the workflow is enabled you cannot delete a category that has published terms.

The most complete workflow possible is in the diagram below:



You can enable the workflow when you create the glossary or after. You cannot disable the workflow after it has been enabled.

2.1.5 Term management dashboards

Workflow driven search criteria are available allowing one to efficiently organize terms and identify what requires action at any given time. These include:

- Show all my candidate terms
- Show all my draft terms
- Show all terms under my review
- Show all terms pending my approval
- Show all term ready for me to publish

2.1.6 Workflow transition buttons

When working with individual terms which are at some point in the workflow process, workflow transition buttons prompt you with possible actions, e.g., if a term is in Draft status, then the action icons would include:

- Start Review
- Submit for Approval
- Mark for Deprecation
- Discard

2.1.7 Versions

The business glossary is one of the content types Meta Integration® Metadata Management (MIMM) supports. As a content, it can have multiple versions. You can employ different business glossary workflow strategies that involve one, two and multiple versions of the glossary. Here are some options:

- Simple - single version
- Dev vs. Prod - development and published versions
- Snapshots - historical versions

The business glossary may be part of your lineage, will appear in the repository panel, and when you open a business glossary you will presented with a different UI than for other (harvestable) models.

2.1.8 Categories

A business glossary is organized into categories, which may then contain terms or other categories. Categorization can help with:

- Subsetting by subject matter or organizational structure
- Managing stewardship assignments (at the category level)

2.1.9 Relationships

Terms may be cross-linked in a wide variety of relationship types, including:

- Synonyms
- See Also
- More General
- More Specific
- Contains
- Contained By
- Represents
- Represented By

Simply edit a specific term to do so.

2.1.10 Flexible and optional workflow process

The business glossary provides a comprehensive yet flexible and even option draft and candidate based edit/review/approve process (workflow). This workflow involves users with Editor, Reviewer or Approver responsibilities. Anyone with Administrator security role to the configuration may assign these workflow roles to users by setting these roles at the category level. This may be done for groups of users as well as individual users.

In addition, the process of publication is idependent of the rest of the optional workflow steps. Publication of a draft of a term in the glossary means that this new version is now visible to users in the Metadata Explorer UI. In this way, one has full control over publication and dissemination of terms independently of where they are in the workflow process.

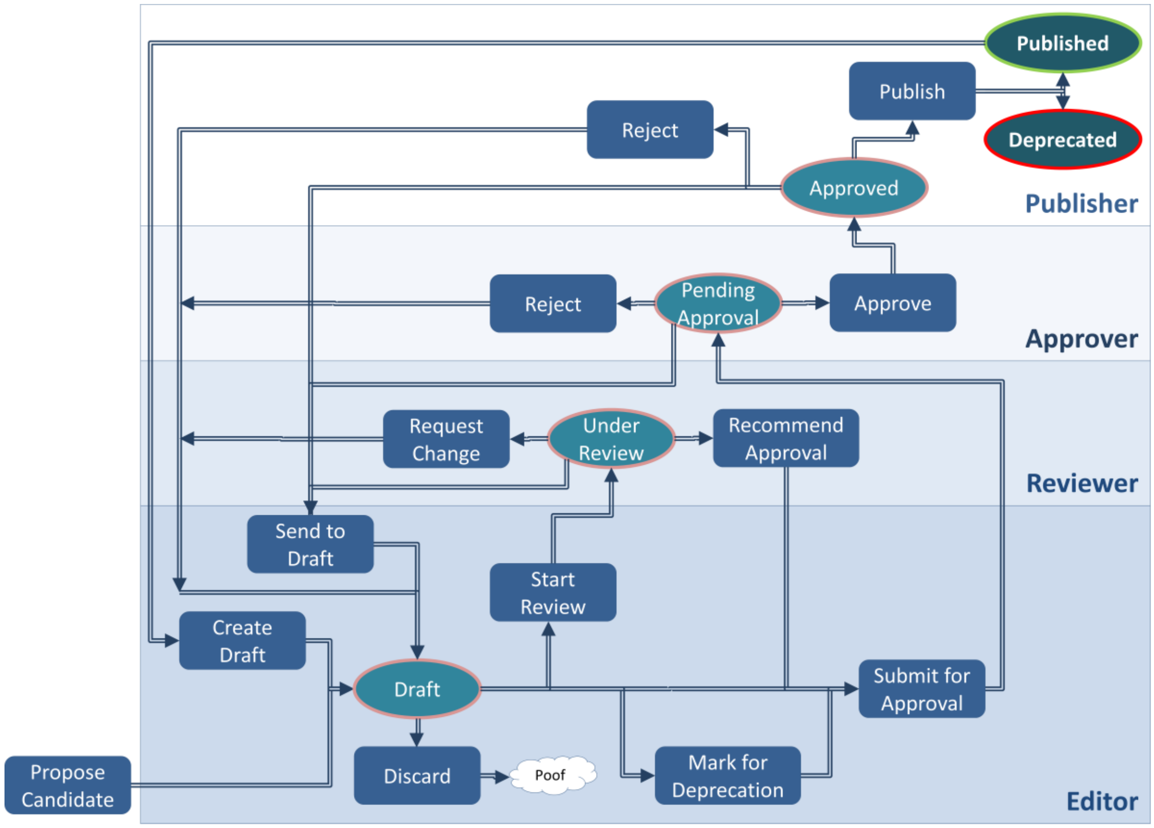


Figure 1 - Complete Workflow diagram

Table of business glossary term publication status possible values:

Publication Status	Description
New Term	Candidate draft term before it is first published
Published Term	Term that has been publised and the non-draft properties are visibile on the Metadata Explorer UI
Deprecated Term	Term that has been deprecated after having been a published term. It is not longer visible on the Metadata Explorer UI

Figure 2 - Term workflow status table

Status may be assigned term by term, or at the category level (all terms contained within).

In addition, the Metadata Explorer UI only shows assets which are in Approved status, while the Metadata Manager UI allows one to search for assets by status and steward. For example:

- An *Approver* can list assets that are ready for approval, with the Reviewed status.
- An *Editor* can list assets assigned to her/him as *Steward* that are in draft mode, Candidate status.
- A *Reviewer* can list assets in a particular category or the whole Business Glossary that are under development, with Candidate status.

Basic Rules:

- You can edit Candidate assets only.
- An *Editor* can submit an asset for approval by setting its status to Reviewed.
- An *Editor* can change the status back to Candidate to continue editing an asset.
- Only and *Administrator* can assign a *Steward* to an asset.
- Only an *Approver* or an *Editor* can change and asset's status.

Permission	**View Reviewer**	**Update Editor**	**Administer Approver**
Term Create	No	Yes	Yes
Delete	No	Yes	Yes
Edit Attributes	No	Yes*	Yes*
Assign Steward	No	No	Yes*
Change Status	No	Candidate<->Reviewed	Candidate, Reviewed, Approved
Category Create	No	Yes	Yes
Delete	No	Yes	Yes
Edit Attributes	No	Yes*	Yes*
Assign Steward	No	No	Yes
Domain Create	No	Yes	Yes
Delete	No	Yes	Yes
Edit Attributes	No	Yes*	Yes*
Assign Steward	No	No	Yes
Comment	Yes	Yes	Yes

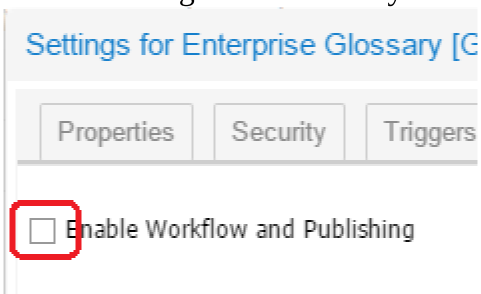
* When a user is steward (or when there is no steward assigned) and the Term is Candidate

Figure 3 - Permissions and role table

2.2 Configuring the Glossary for Workflow

2.2.1 Configure the Glossary

Next, the workflow settings. Go to the Workflow tab and click on the Enable Workflow and Publishing checkbox and you will see the following:



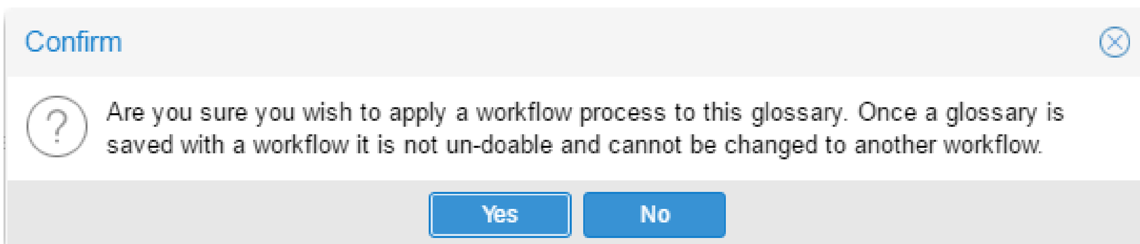


Figure 4 - Enabling Workflow

A dialog box is presented warning you that this is a permanent operation. Once you enable workflow for a glossary it cannot be removed.

Here are the options explained

Option	Description
Allow any user to propose items	Terms may be proposed (creating a draft) by anyone. Otherwise, terms may only be proposed by the by the Editor.
Allow approval of terms	Include workflow steps requiring approval of terms. Otherwise draft terms go straight to approved status
Allow review of terms	If the approval workflow steps are enable in the above option, then this option will also include workflow steps requiring a review process. Otherwise, candidate terms go straight to already reviewed status.
Publish on Approval	Eliminates the requirement to publish where all approved terms are automatically published to the Metadata Explorer UI. Otherwise, approved terms must be published in order to appear in the [MetadataExplorerUI.

Figure 5 - Workflow options

We will leave all the defaults:

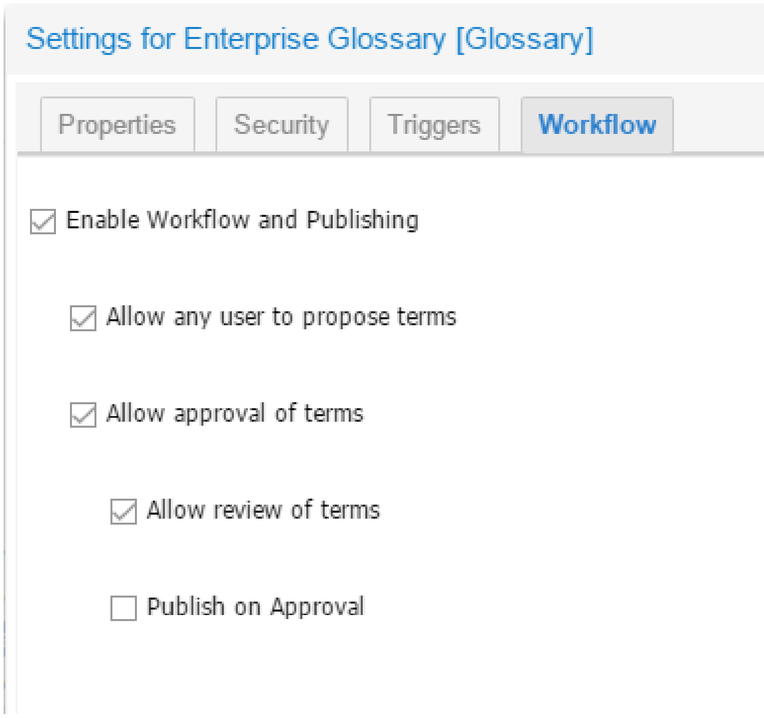


Figure 6 - Workflow settings

And click the Save button.

Basically, the process will be as follows:

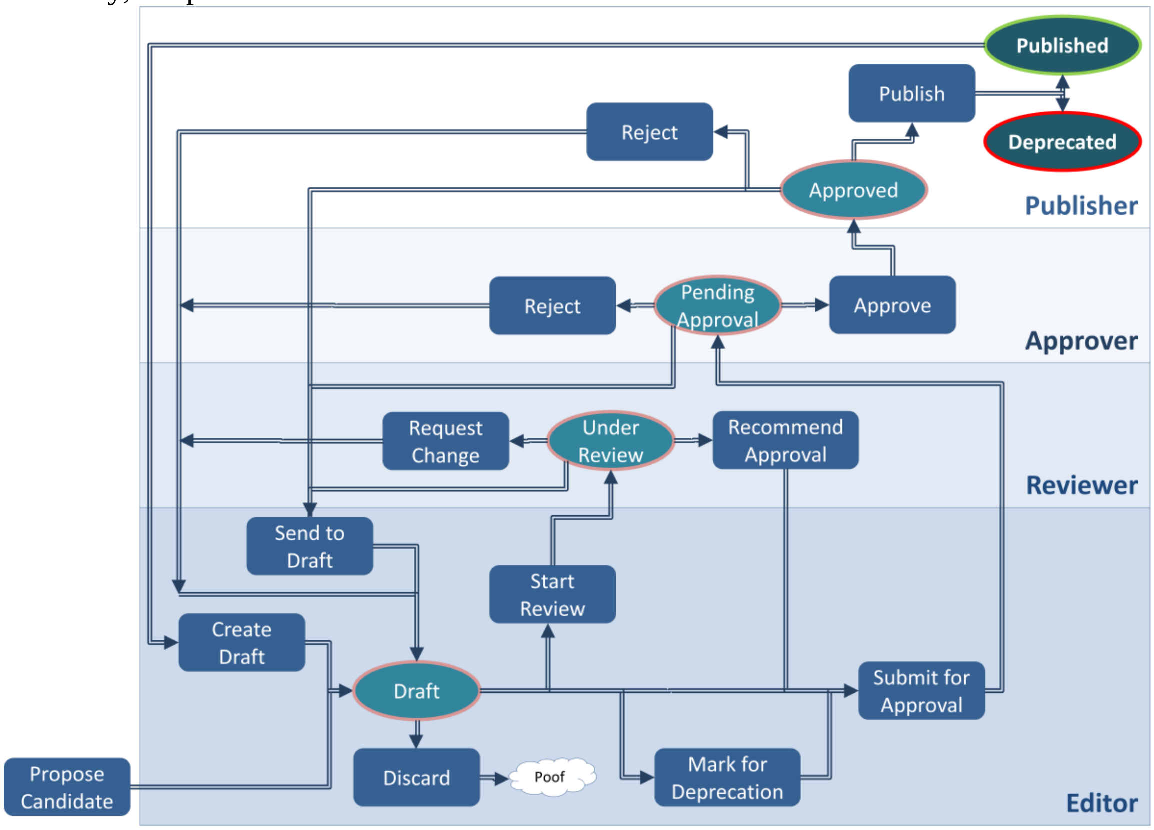


Figure 7 - Complete Workflow diagram

In the above diagram

- The four workflow roles are the horizontal bands
- Activities conducted by each role (expressed in the Metadata Explorer UI as workflow buttons)
- The process flow (arrow lines)
- Draft/Published/Deprecated terms are ovals.

2.2.2 Published configuration version

Finally, we need to manage the Finance configuration to support the two versions of the Enterprise Glossary. Currently, the Development version of the configuration is also the *Published* one.

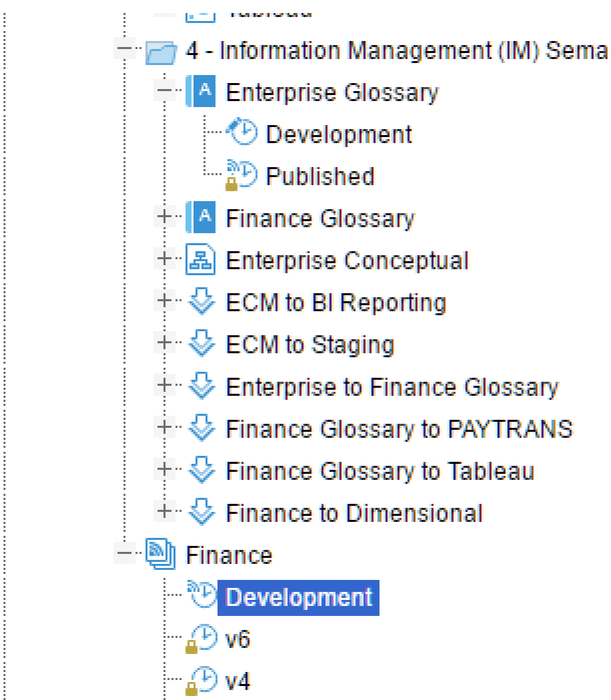


Figure 8 - Finance configuration versions

However, we want the default configuration (*published*) which is assigned to business users by default to be the one that has the Published version of the Enterprise Glossary. Thus, we should create a new configuration version which will be the default or published version and will contain the Published version of the Enterprise Glossary. Then the Development version of the Enterprise Glossary may contain he Development version of the Enterprise Glossary. Both will contain the same versions of all the other models.

So, Create a Copy of the existing Development version of the Finance configuration.

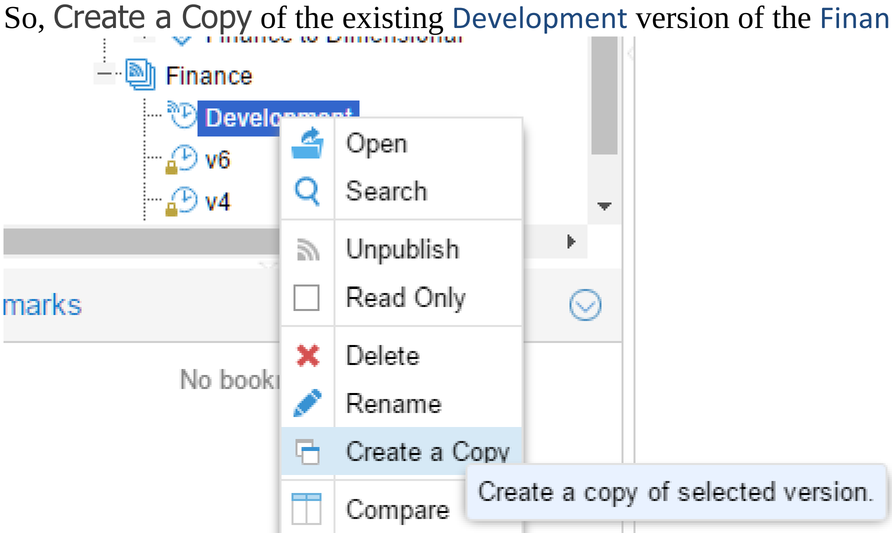


Figure 9 - Create a copy of the configuration

Rename the Development version to v7 and rename the new version to Development.

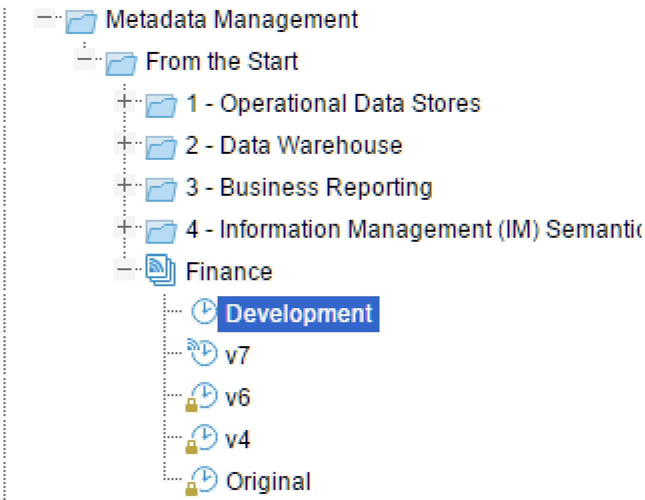


Figure 10 - Rename the versions

Then, open the v7 version of the Finance configuration and drag the Published version of the Enterprise Glossary into the v7 version of the Finance configuration. Build the configuration.

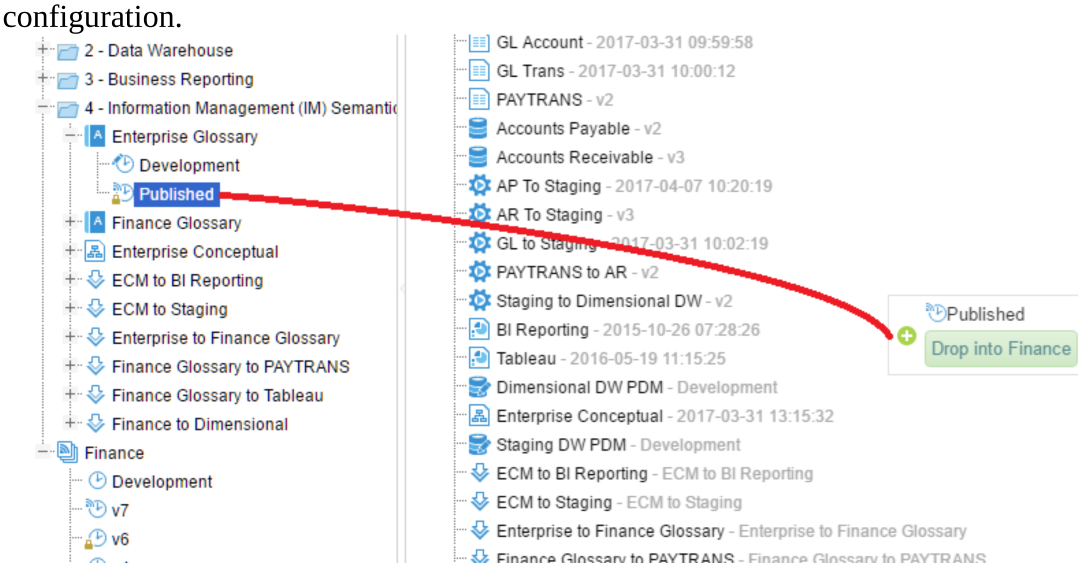


Figure 11 - Drag and drop

Then, open the Development version of the Finance configuration and drag the Development version of the Enterprise Glossary into the Development version of the Finance configuration. Build the configuration.

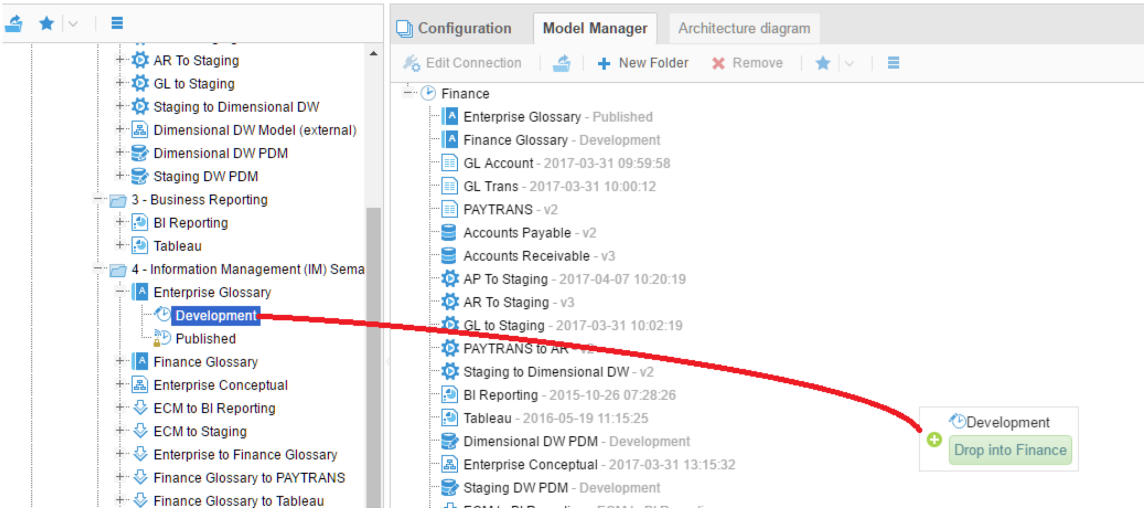


Figure 12 - Drag and drop

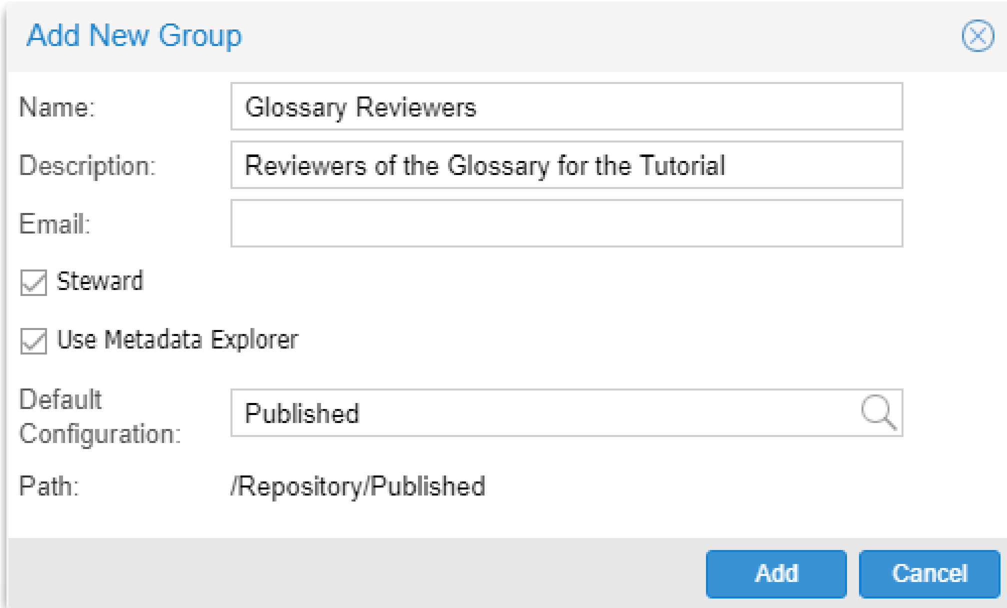
Now, everything else will be performed in the Metadata Explorer UI. Mostly in the Development version of the Finance configuration which contains the Development version of the Enterprise Glossary.

2.2.3 Defining groups to support glossary roles

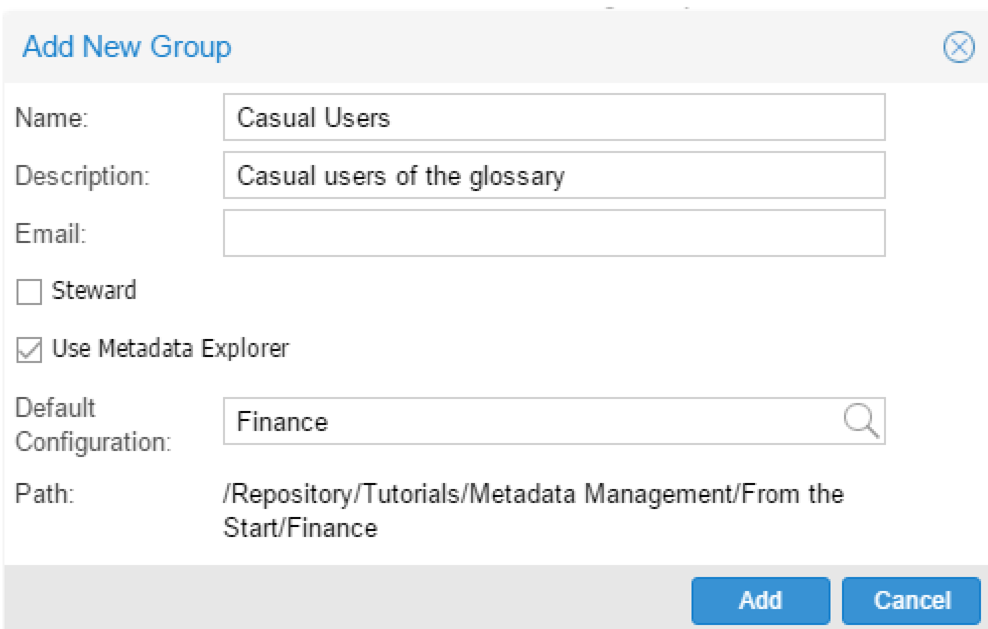
So, let's define four roles:

Group name	Username	Full Name of User	Description	Default Configuration
Glossary Editors	Ed	Edward	Editor of the Glossary for Tutorial	Finance
Glossary Reviewers	Reece	Reece	Reviewer of the Glossary for Tutorial	Finance
Glossary Approvers	Ann	Angela	Approver of the Glossary for Tutorial	Finance
Glossary Publishers	Paul	Paul	Publisher of the Glossary for Tutorial	Finance
Casual Users	Cass Ed Reece Ann Paul	Cassie	Casual user of the Glossary	Finance

Do so again by clicking on Tools➔ Administration➔ Groups and adding all four, e.g.:



User Id	Groups	Logged	Native User	Named License	St..	Session C..
Reece	Glossary Reviewers	No	Yes	No	true	1
Paul	Glossary Publishers	No	Yes	No	true	0
Ed	Glossary Editors	No	Yes	No	true	1
Cass	Casual Users	Yes	Yes	No	fa...	5
Bob	Business Analysts	No	Yes	No	true	0
Ann	Glossary Approvers	No	Yes	No	true	0
Administrator	Administrators	Yes	Yes	Yes	fa...	28



Name ↑	Users	Description	St..	User Interface	Default Configuration
Administrators			fa...	Metadata Manager	
Business Analysts	Bob	Tutorial business analysis group	fa...	Metadata Explorer	Finance
Casual Users		Casual users of the glossary	fa...	Metadata Explorer	Finance
Glossary Approvers	Ann	Approvers of the Glossary for the Tutorial	fa...	Metadata Manager	
Glossary Editors	Bob,Ed	Editors of the glossary in the Metadata Ex...	fa...	Metadata Explorer	Finance
Glossary Publishers	Paul	Publishers of the Glossary for the Tutorial	fa...	Metadata Manager	
Glossary Reviewers	Reece	Reviewers of the Glossary for the Tutorial	fa...	Metadata Manager	

Figure 13 - Create group

Then, go to the Users tab and create the four users and assign each to one of the roles as in the table above:

User Id ↓	Groups	Logged	Native User	Named License	St..	Session C..
Reece	Glossary Reviewers	No	Yes	No	true	1
Paul	Glossary Publishers	No	Yes	No	true	0
Ed	Glossary Editors	No	Yes	No	true	0
Cass	Casual Users	No	Yes	No	fa...	0
Bob	Business Analysts,Glossary Editors	No	Yes	No	true	0
Ann	Glossary Approvers	No	Yes	No	true	0
Administrator	Administrators	Yes	Yes	Yes	fa...	28

Figure 14 - Users

Be sure that they are also Stewards (all except for Casual Users) so they may be notified of changes.

Then right-click on the Enterprise Glossary and select Settings, then go to the Security tab and specify security roles as follows:

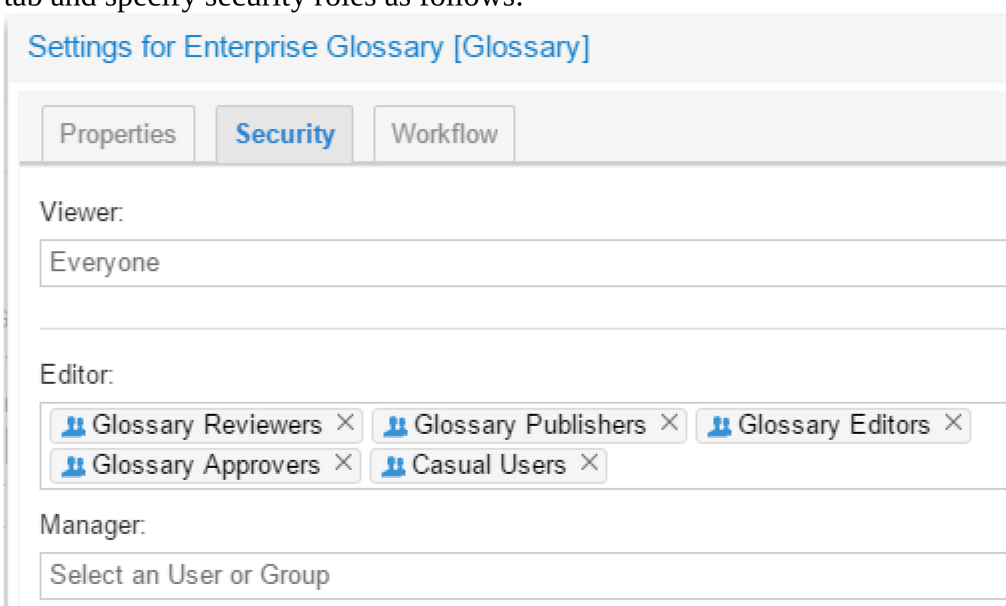


Figure 15 - Security roles on glossary

Note, we have given the Glossary Editor security role to the Business Analysts group and the Casual Users group. We did this so that Bob and Cass can take advantage of the Allow any user to propose terms option.

As a final step so we can see what the average business user will see, let's assign

2.2.4 Workflow Roles

Let's assign workflow roles. Open glossary the Right-click on the Enterprise Conceptual Model category and select Open in Metadata Explorer:

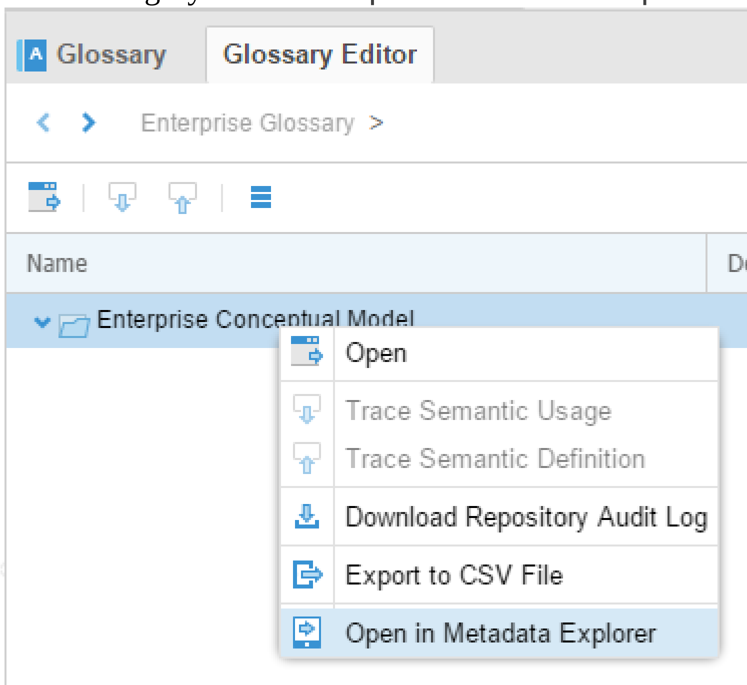
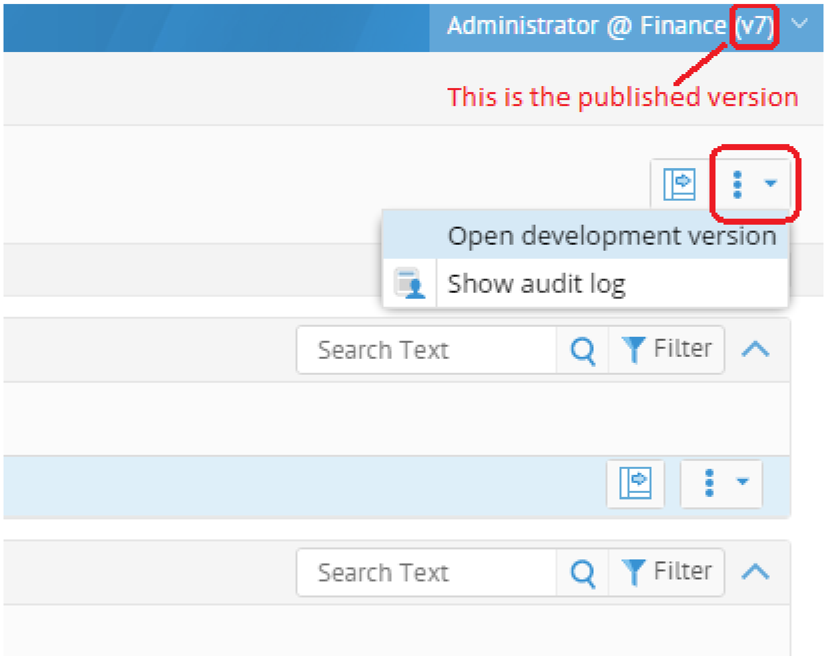


Figure 16 - Metadata Explorer

Now, recall that with workflow enable, the Enterprise Glossary now has two active versions, Published or Development. If you open the Published version, as most users will by default, workflow roles are not assigned. Thus, you must first open the Development version. One may see the version in the header.

Thus, if you are in the Published version, please use the More icon and select Open Development Version:



Finally, click on the More actions icon and select Assign Workflow Roles:

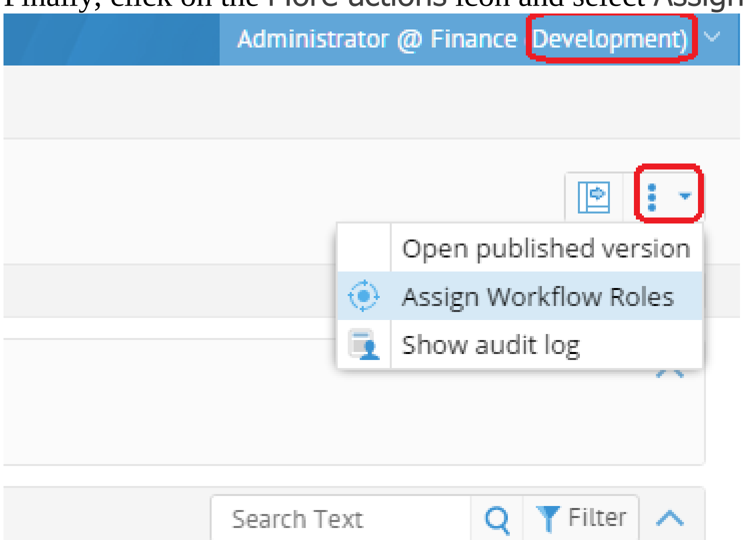


Figure 17 - More actions

And we assign as follows:

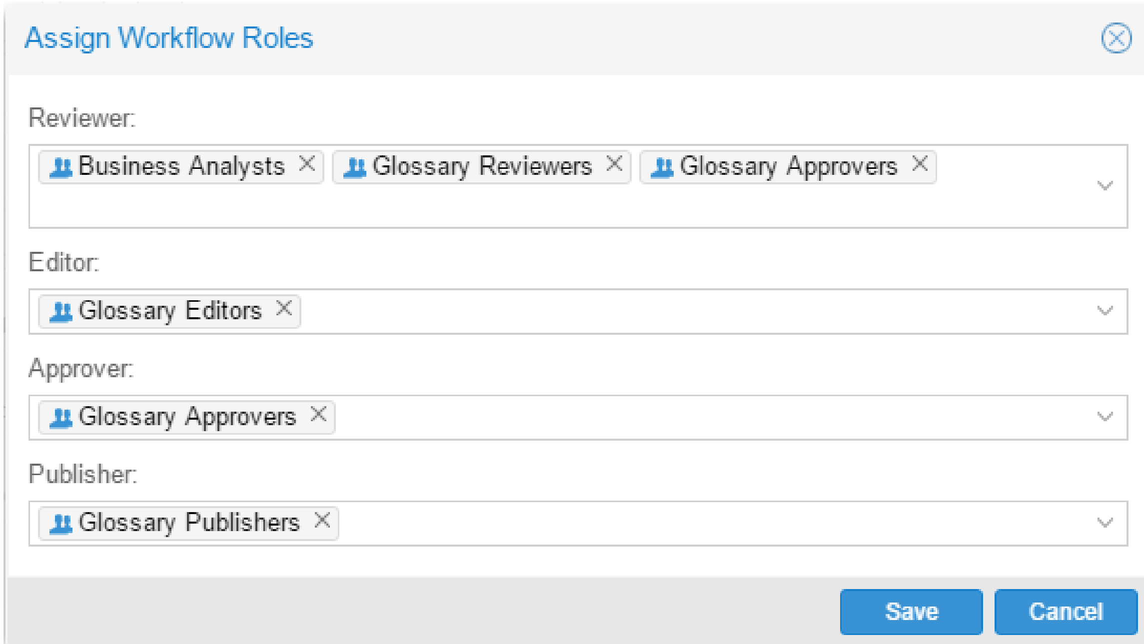


Figure 18 - Assign Workflow Roles

Note, we have assigned groups in most cases, but also the Business Analyst user is also made a reviewer. In addition, the any users who are members of the Approver group will have the Reviewer role.

OK, so let's take a look at some of the glossary workflow steps. In particular, we will again create some good generalizations to unify terminology in this glossary.

2.3 Glossary Workflow

2.3.1 Propose a draft

In a session signed in as Cass, you will be signed in to the Metadata Explorer UI. Search for terms in the Enterprise Glossary only that have "Amount" in the name.

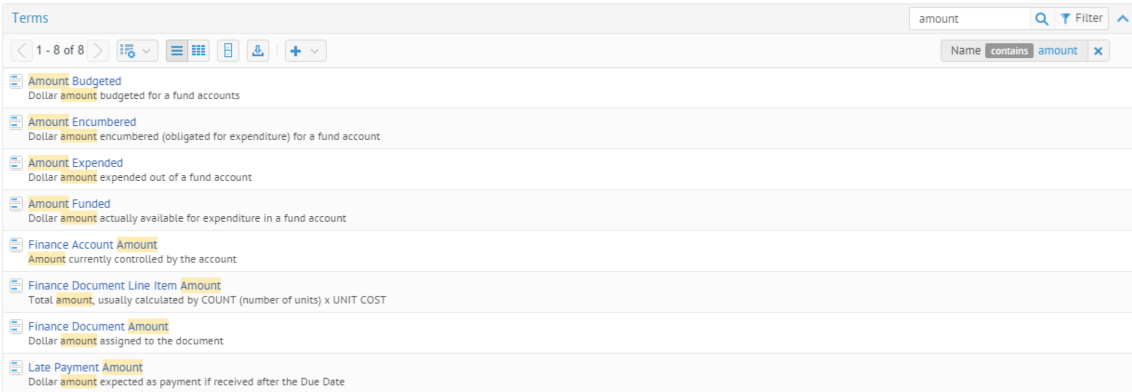


Figure 19 - Terms with "Amount" in the name

Again, we see three groupings:

- General Ledger account amounts
  - Amount Budgeted
  - Amount Encumbered
  - Amount Expended
  - Amount Funded
  - And what should be a generalization but is not defined as one: Finance Account Amount
- Finance document amounts
  - Late Payment Amount
  - Finance Document Amount
  - Finance Document Line Item Amount

Cass proposes to tackle the first generalization: Finance Amount, as a generalization of Finance Account Amount and Finance Document Amount.

So, click on the plus sign in the Terms panel:

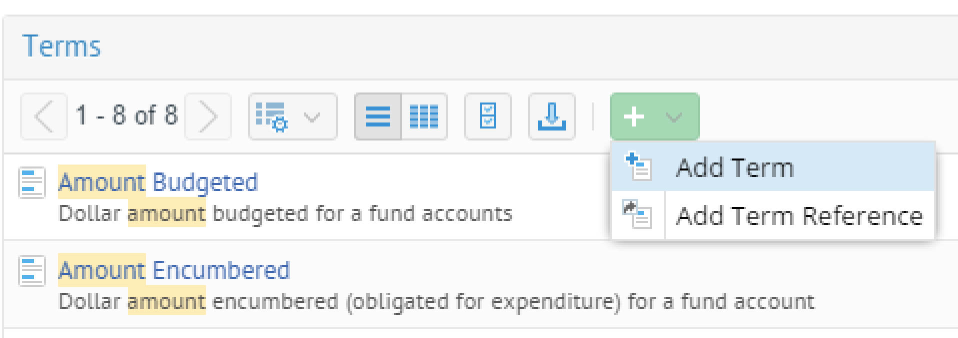


Figure 20 - Add Term

And select Add Term:

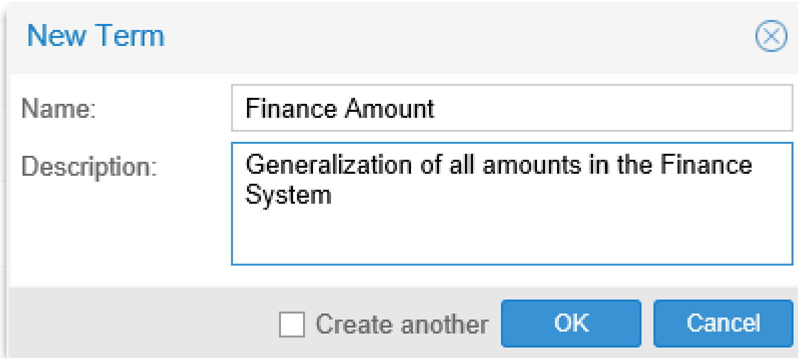


Figure 21 - Finance Amount

Yet, after clicking the OK button, still Finance Amount is not in the list:

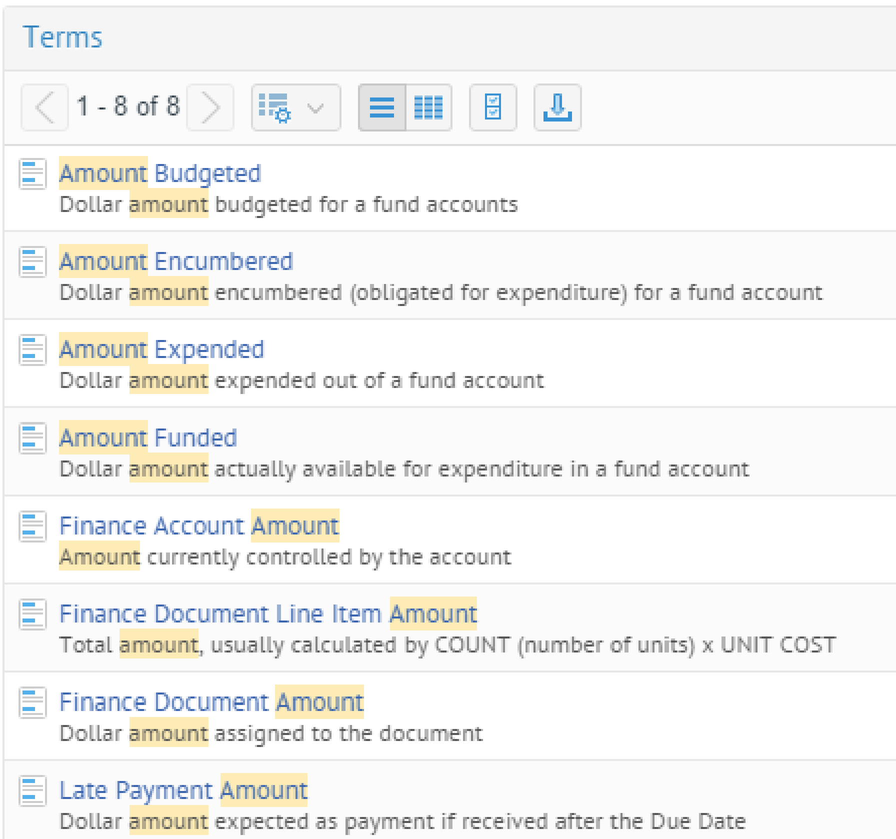


Figure 22 - Finance Amount in the glossary

Now, you might ask, where did it go? This is because you signed in as Cass and Cass get the default or Published version of the configuration which contains the Published version of the Enterprise Glossary.

To see the new term, you must sign in as a user that has access to the Development version of the Finance configuration which that contains the Development version of the Enterprise Glossary.

Before we do this, it is important to note, because of this optional ability to propose draft terminology in the glossary even though it is under workflow means that there is still opportunity for crowd-sourcing extensions to the terminology while existing terms are under tight control.

2.3.2 Edit

Now, to continue to work with this term, we must sign in as a user that has such access, which is Ed.

Note, when you sign in as Ed, you also see the Metadata Explorer UI by default.

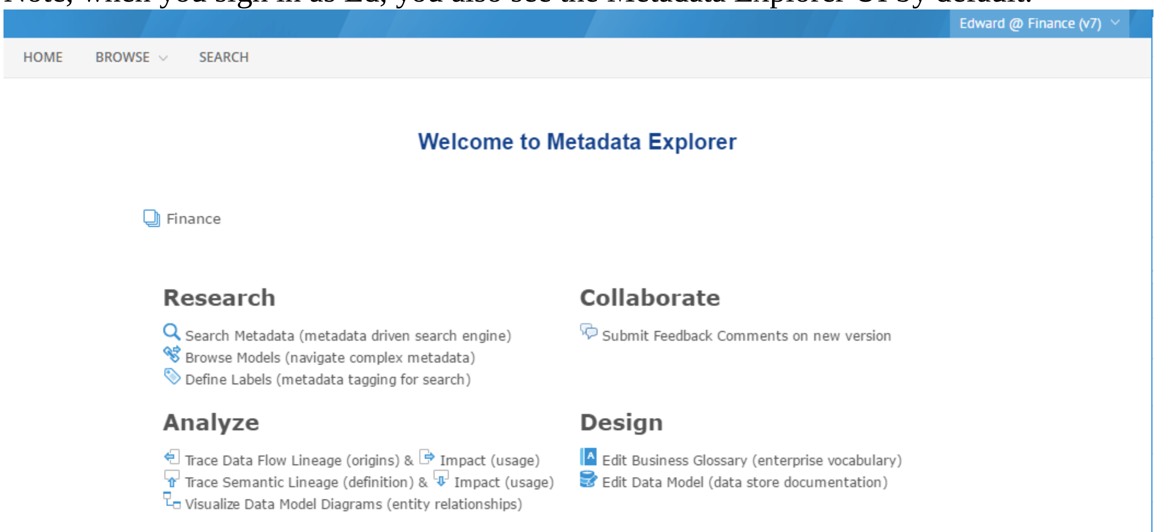


Figure 23 - Explorer UI for Ed

This is because the group he is a member of (Glossary Editors) was assigned a default configuration.

Note also, in the upper right you see Edward @ Finance (v7). This pulldown indicates your current environment, and indicates which user you are signed in as and which configuration and version you are exploring. Thus, Ed, by default, sees the Published version of the configuration. This is again because the group he is a member of (Glossary Editors) was assigned a default configuration and this is the default or published version (v7).

To change configurations, your may right-click on that same pull-down.

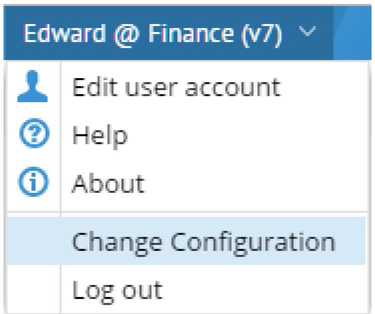


Figure 24 - Pull-down

Select Change Configuration:

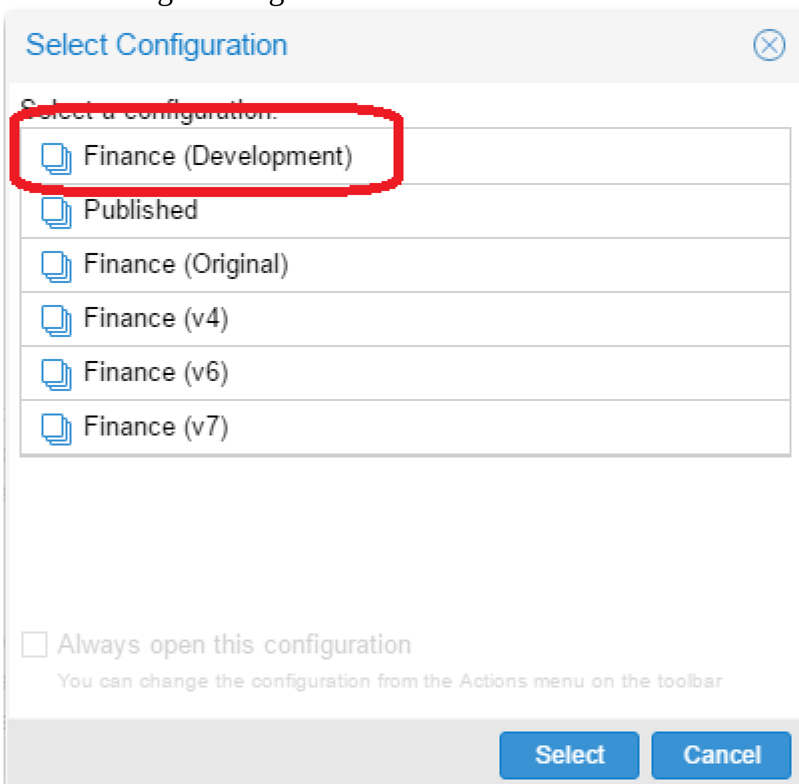


Figure 25 - Change Configuration dialog

Then, pick the Finance (Development) line item.

You may also go to the glossary and use the more actions (⋮) icon and select Open development version:

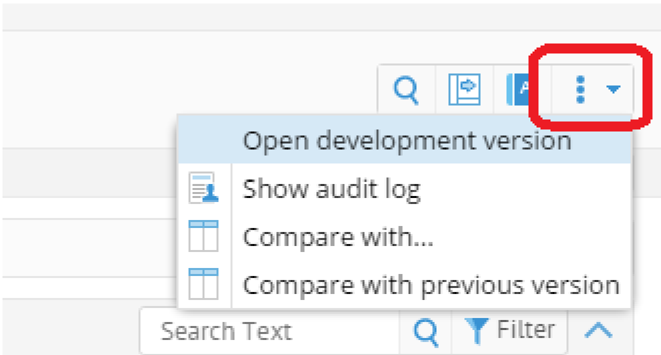


Figure 26 - Open development version

Either way, navigate to the Enterprise Glossary and use the more actions (⋮) icon and select My Workflow Tasks:

Figure 27 - Select option

And we have.

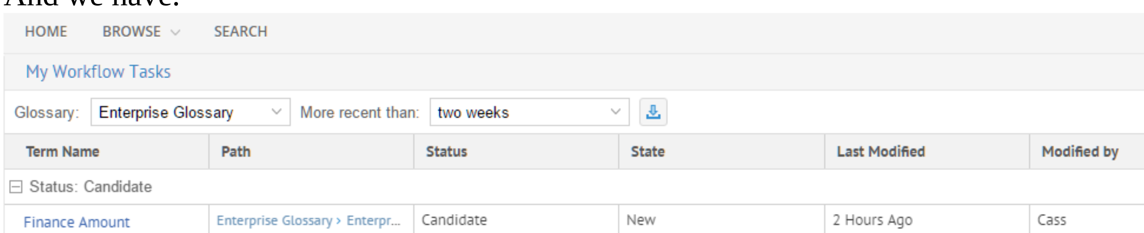


Figure 28 - My workflow tasks

Note, all terms that require Ed's attention are listed here.

Normally, this report is e-mailed to Ed as he is a steward for this terminology and if one set up notification (see online help). However, it is also available here in the UI.

Click on the line item and note the

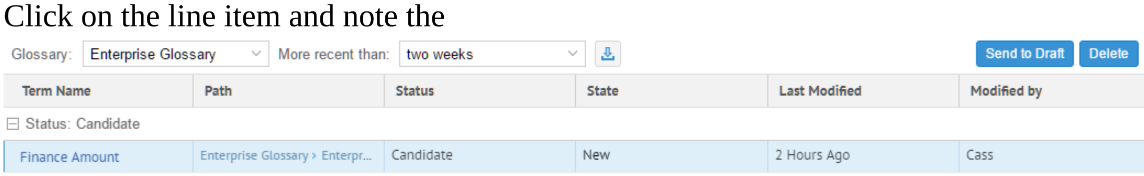


Figure 29 - Select a line

So, let's edit the term, so we click the Send to Draft button.

Provide a comment

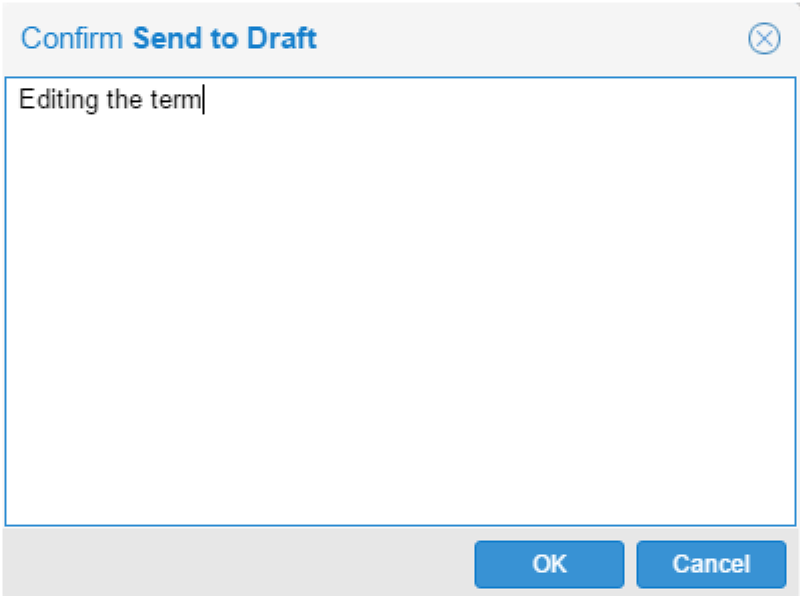


Figure 30 - Provide a comment

And it is in draft mode:

Term Name	Path	Status	State	Last Modified	Modified by
Status: Draft					
Finance Amount	Enterprise Glossary › Enterpr...	Draft	New	Just Now	Ed

Figure 31 - List of terms

Now, click on the Finance Amount term name and we may edit the term:

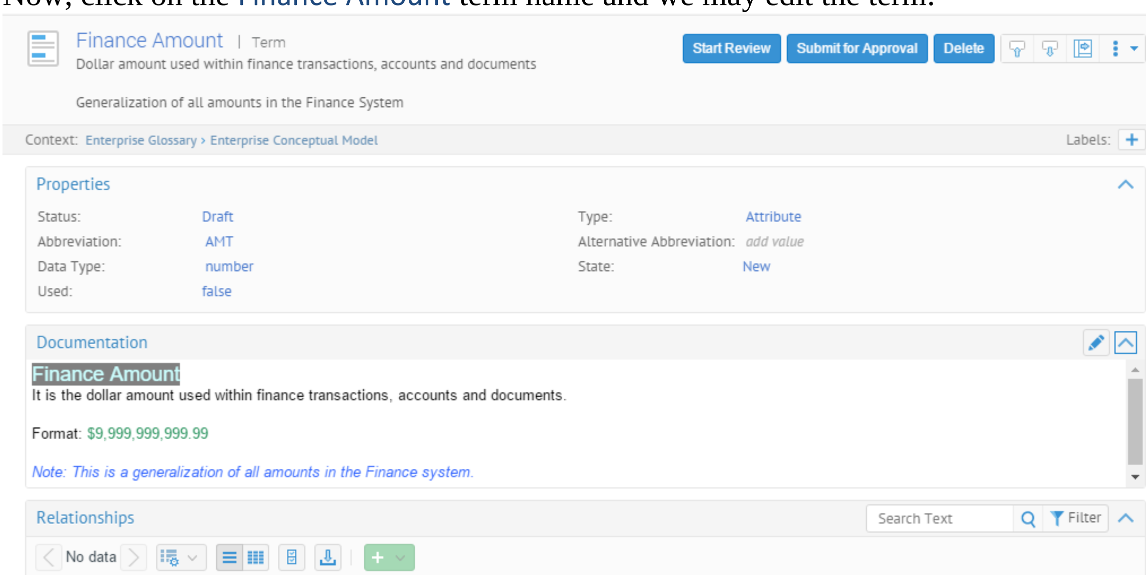


Figure 32 - Edited term

Please make the same edits as above.

Note the workflow options which are defined earlier in this chapter.

Now click the Start Review button.

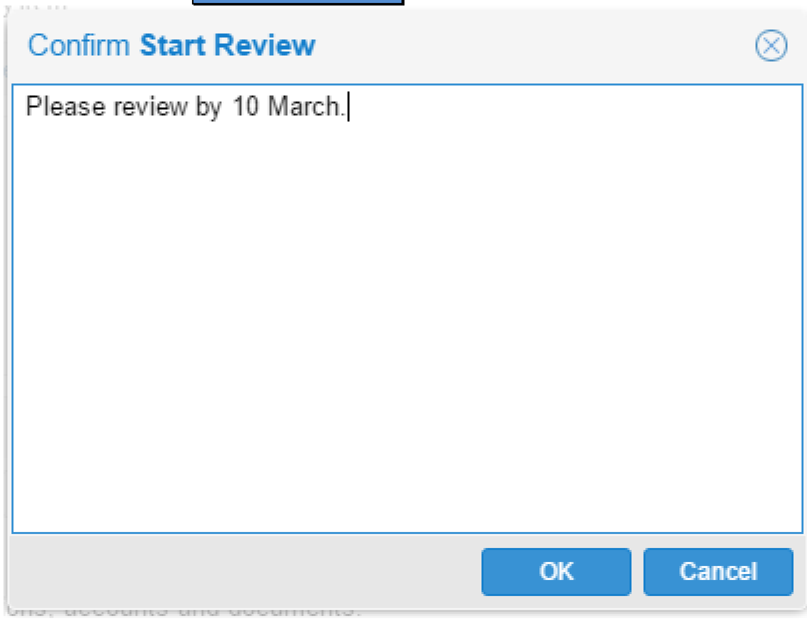


Figure 33 - Comment to reviewers

2.3.3 Review

Now, sign in as Reece (the reviewer). Again, in the upper right you see Reece @ Finance (v7).

You must change configurations to see the new term and changes, so go to the glossary and use the more actions () icon and select Open development version:

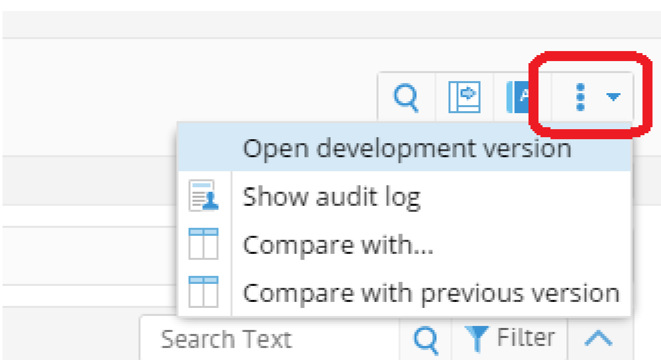


Figure 34 - Open development version

Either way, navigate to the Enterprise Glossary and use the more actions () icon and select My Workflow Tasks:

Figure 35 - Select option

And we have.

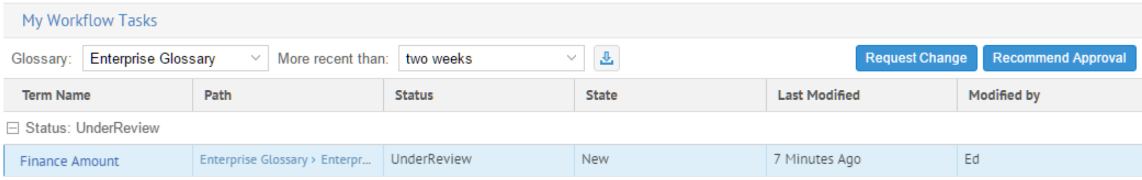


Figure 36 - Workflow Tasks

We could click on the term to review it, but we already know that it is good. So we click the Recommend Approval button.

Provide a comment

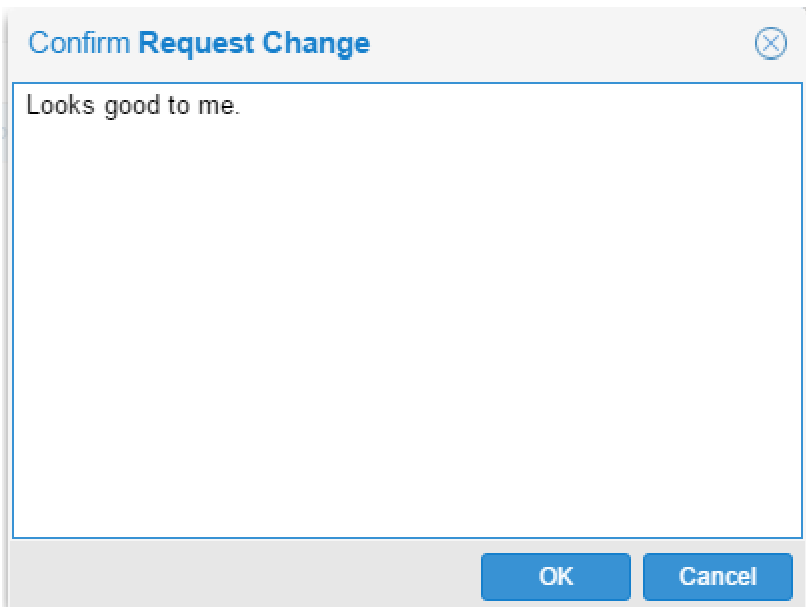


Figure 37 - Provide a comment

And it is ready for approval.

2.3.4 Approve a term

Now sign in as Ann the approver. Be sure to switch to the Development configuration and thus glossary and use My Workflow Tasks.

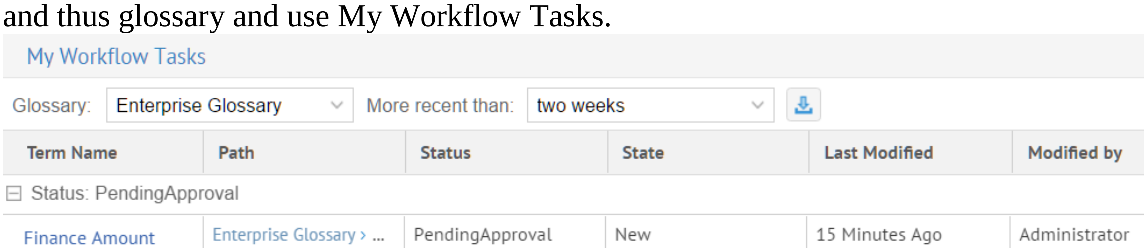


Figure 38 - My workflow tasks as Ann

Click on Finance Amount and click the Approve button.

2.3.5 Publish

So, the term is approved. However, there is still one more step.

Let's return to Cass. Signing in as her and again looking at the list of terms

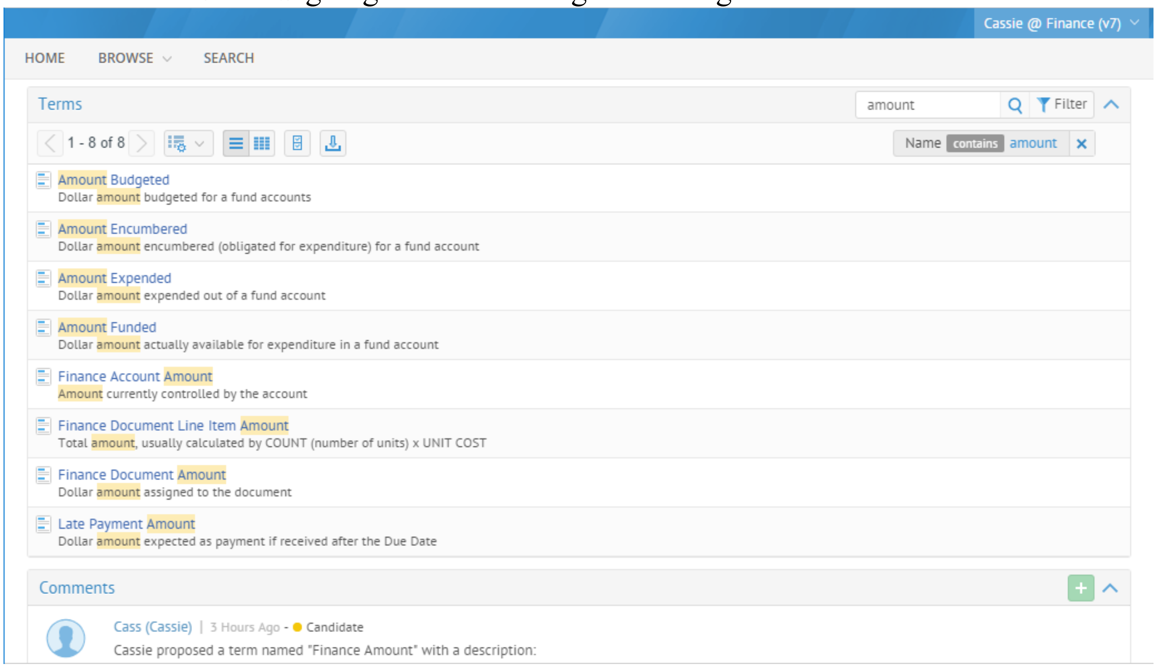


Figure 39 - List of terms

And we still do not see the Finance Amount term even though it is approved. Of course, she only sees the default or published configuration version (v7) and thus the Published version of the Enterprise Glossary. So, how do we publish the changes?

On way would be to do what we did in the [Change Management]() chapter and create a copy of the Development version and place that in the published configuration version.

However, while that is a reasonable process when trying to create a frozen snapshot of your architecture, it is not reasonable each time a term is updated. Instead, one may use the Publish workflow step to migrate the updates over to the Published version of the glossary from the Development version.

To do this, sign in as Paul (the publisher). Be sure to switch to the Development configuration and thus glossary and use My Workflow Tasks.

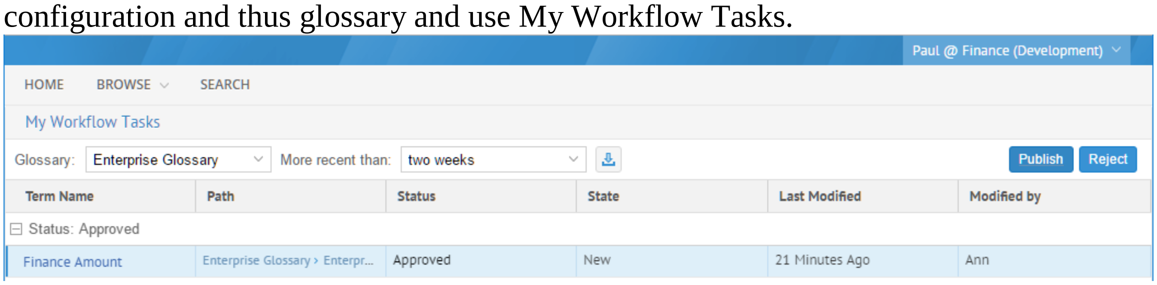


Figure 40 - My workflow tasks as Ann

Click on Finance Amount and click the Publish button. Provide a comment.

Now, let's return to Cass. Signing in as her and again looking at the list of terms

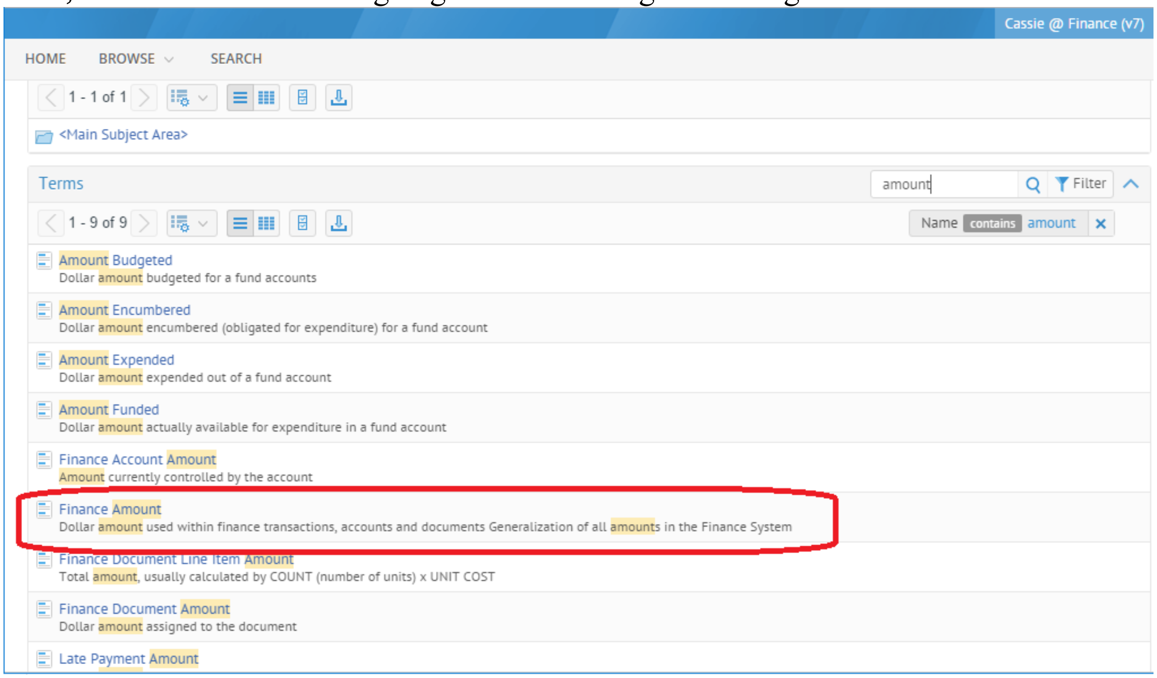


Figure 41 - List of terms

And Cassie can see the new term.