

Siemens PLM Connection

Search and Query Enhancements in
Teamcenter

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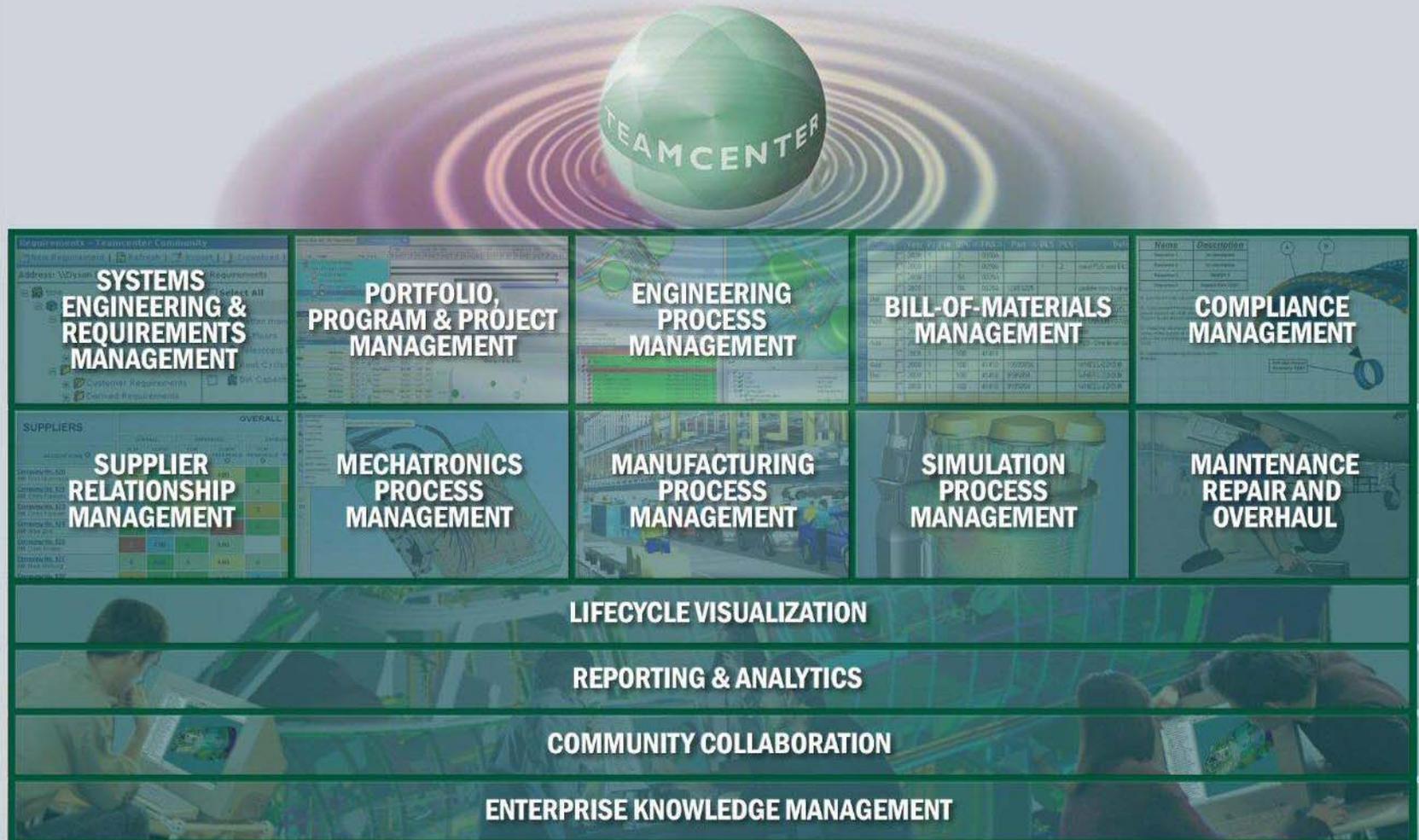
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Teamcenter Digital Lifecycle Management Solutions



Enterprise Knowledge Management

Objective

- This session will cover several topics on searching in Teamcenter including the search interface, the Query Builder, and full text search capabilities.

Outline

- Search Panel UI
- Query Results as Tree
- Full Text Search using IDOL



Search Panel Redesign

Redesign current search panel interface in Teamcenter Clients

- Improve usability and simplify UI design
- Similar changes in both Rich and Web clients as much as possible

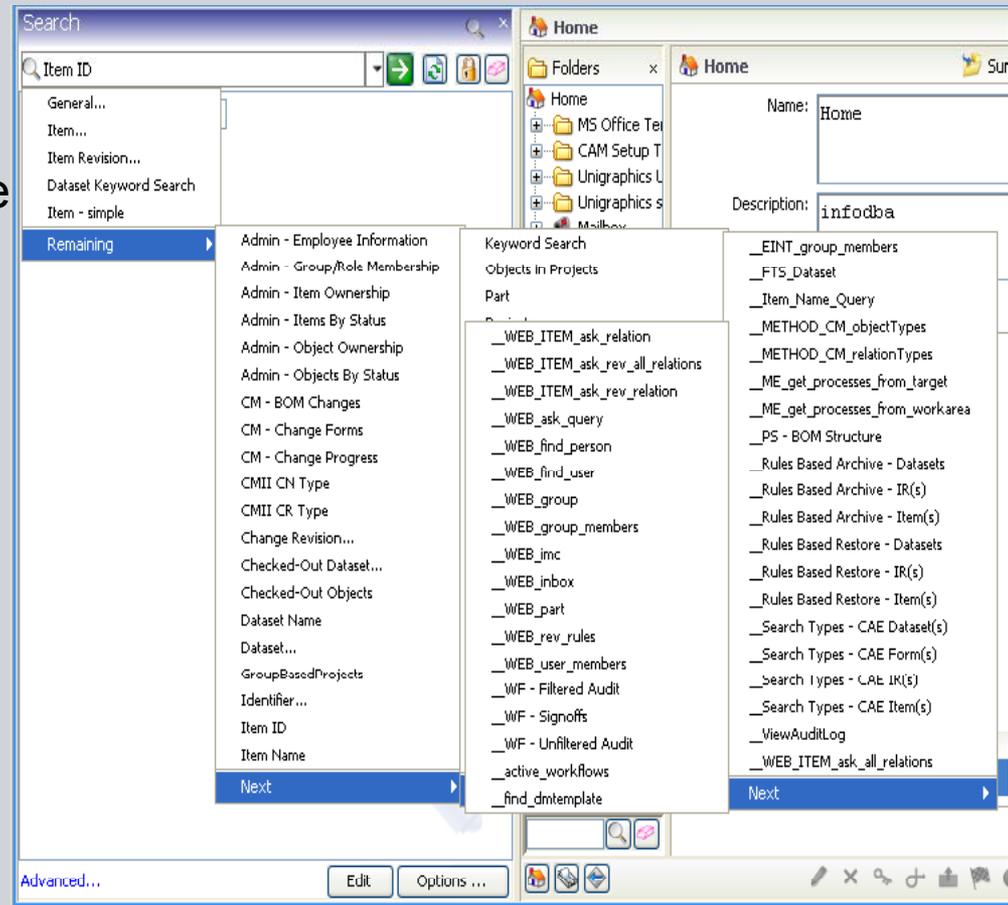
New entry points to search:

- Search History
- My Saved Searches

Problems in the old Search Panel

Awkward multi-level cascading menus: Around 80 saved queries are arranged as cascading menus. Selecting a query from the list is hard

Select only from system defined searches



Problems in the old Search Panel (Contd.)

No mechanisms to access the most frequent or last search easily.

There is no notion of Default Search

Action Buttons are loosely arranged at both top and bottom

LOV fields are not aligned

No options to manage the Search History or My Saved Searches

Some terminology

No	Term	Definition
1	Query Builder	Teamcenter Application used to define the queries
2	Saved Query	An object persisted in Teamcenter to reflect the queries defined in the Query Builder
3	Query	Same as "Saved Query"
4	Query Form	When users execute a Query, they are presented with a form which typically contains some "name-value" pairs. The "value" may sometimes contain a default value. This form is called a "Query Form". "Query Form" is context free and is generic (will not refer to user entered values at a given instance)
5	Criteria Form	Same as "Query Form"
6	Criteria	While executing a Query, the query form contains the fields (some with default values). Users can either accept these default values or enter new values in these fields. The collection of these fields and the values is called "Query Criteria". Such "Query Criteria" always refer to the user entered values at a given instance.
7	Search	Same as "Saved Search"
8	Saved Search	When users execute a Query, they usually fill out the criteria on the Query Form. Once the Query Form is filled out, the user may wish to save those criteria for later reuse (thus saving them from the effort of entering the criteria again). Once saved, it becomes a "Saved Search". Thus, "Saved Search" refers to (Query AND Criteria). Note that "Saved Search" does NOT refer to the results or outcome of executing a query. "Saved Searches" can be generated in two ways (1) User saves explicitly (2) The system automatically adds one to the "Search History",
9	Query Results	When users execute a Query, the system may return 0 or more items. The items returned by the system are called "Query Results". Each execution of a given Query may produce different "Query Results".
10	Search Results	Same as "Query Results"
11	Search History	"Search History" indicates the sequence of searches performed by the user. The number of "Saved Searches" in the "Search History" is controlled by the system/user setting.
12	My Saved Searches	Users create "Saved Searches" in a special system folder called "My Saved Searches". The "Saved Searches" can be created in the top level "My Saved Searches" folder or in any other folder (or sub-folder) inside "My Saved Searches"

New Search Panel in Teamcenter 2007

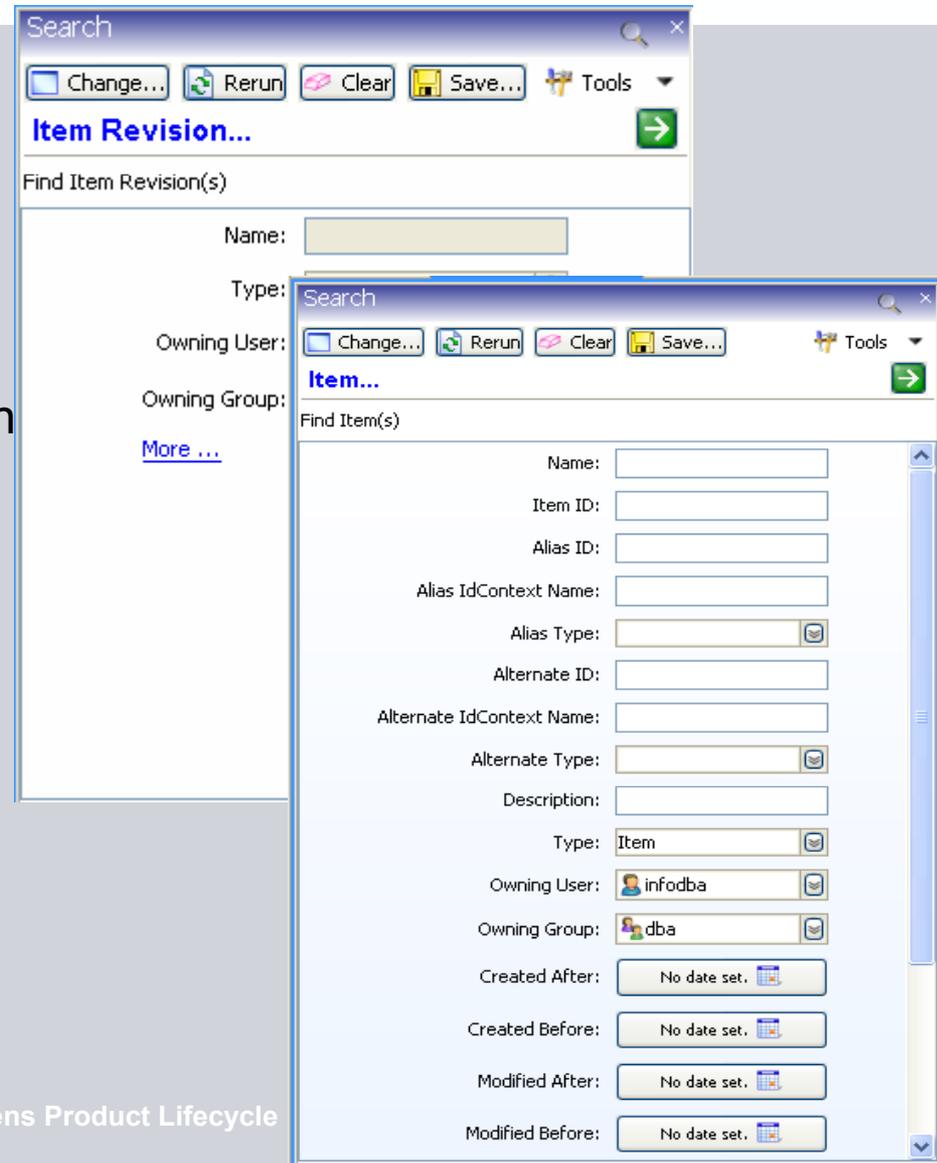
Displays last search run, if any, or Default Search

- OOTB Item ID
- can be user-defined

Change... button opens Change Search Dialog

Save... button opens Save Search dialog

More... link reveals full-length search form with color gradient

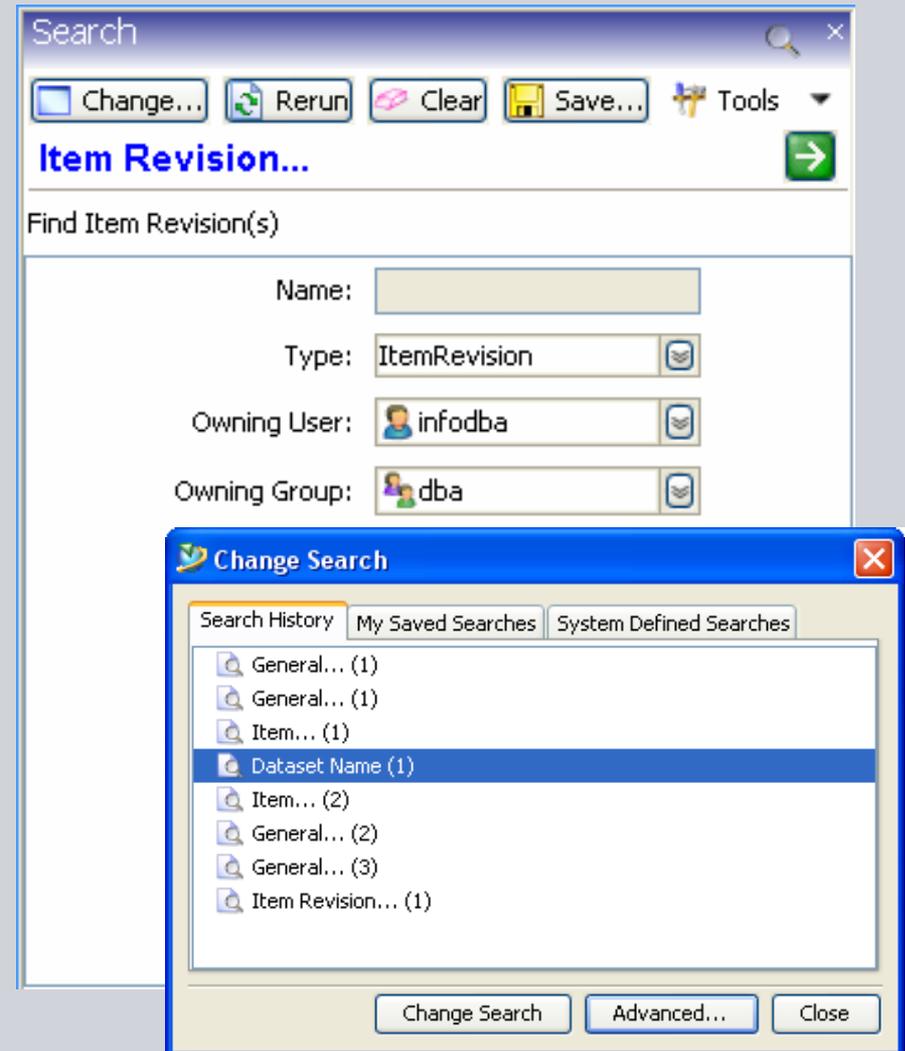


Change Search Dialog

Change... button opens dialog

Allows user to select a search to run, replacing the cascading popup menu

Displays last tab opened during this session, if any, or Search History



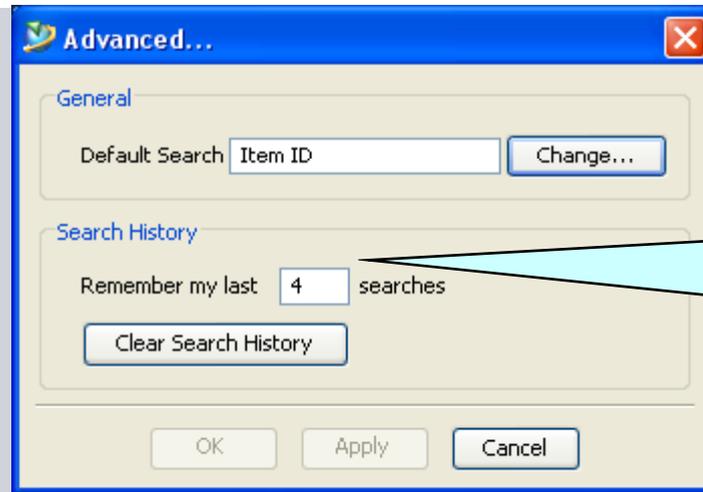
Advanced... and Find Search Dialogs

Advanced... button opens Advanced dialog

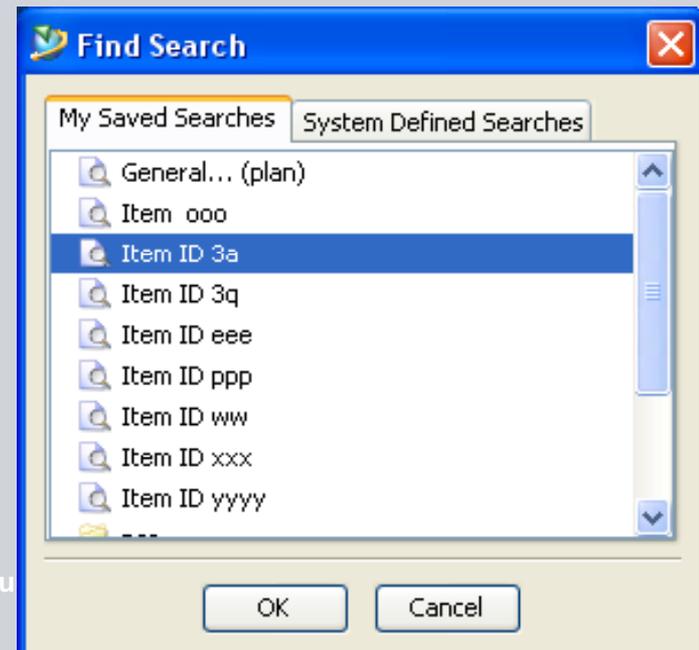
Change number of searches saved in Search history
Clear Search History

Define Default Search

- Change... button opens Find Search dialog to select a new Default Search



How many?



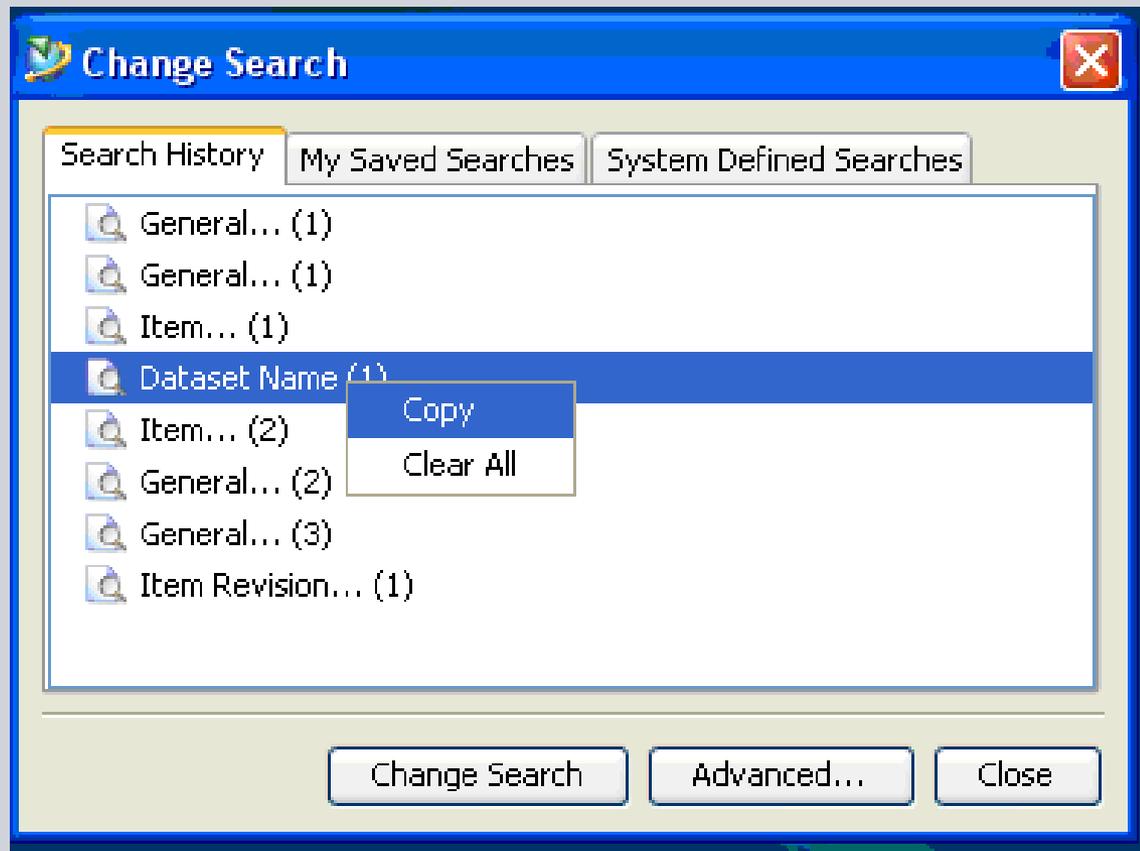
Search History Tab

Displays a defined number of searches run

- Default: 8
- May be user-defined

Context menu options include

- Copy (paste into My Saved Searches)
- Clear All



My Saved Searches Tab

Displays saved searches, in folder view

Custom icon indicates Default Search

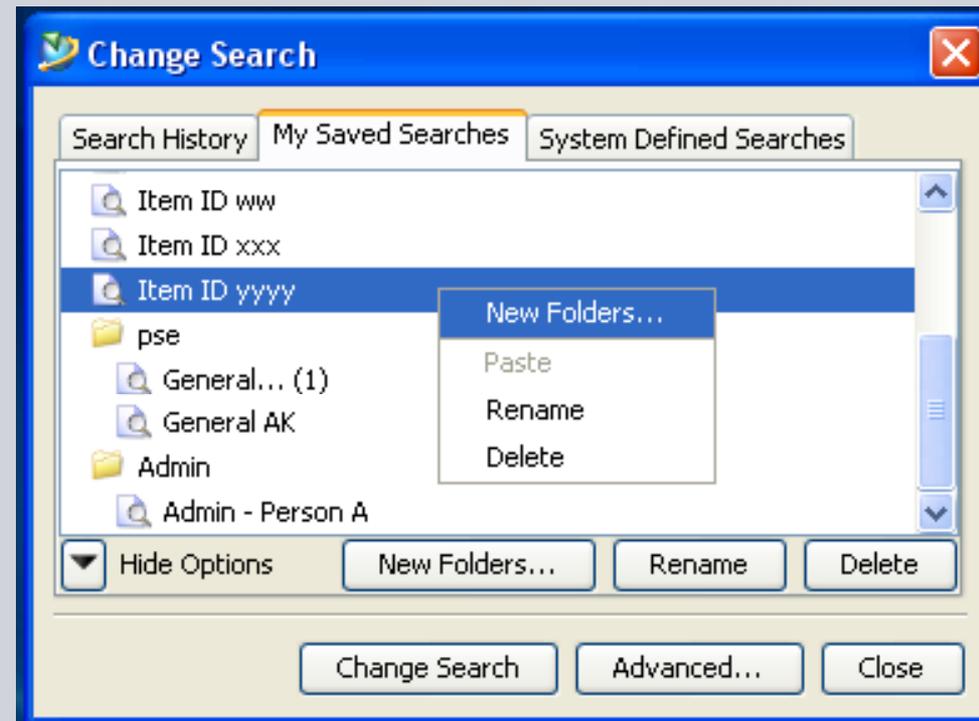
Manage saved searches

- Paste searches copied from Search History

- Rename searches

Manage folders

- New folders
- Nested folders



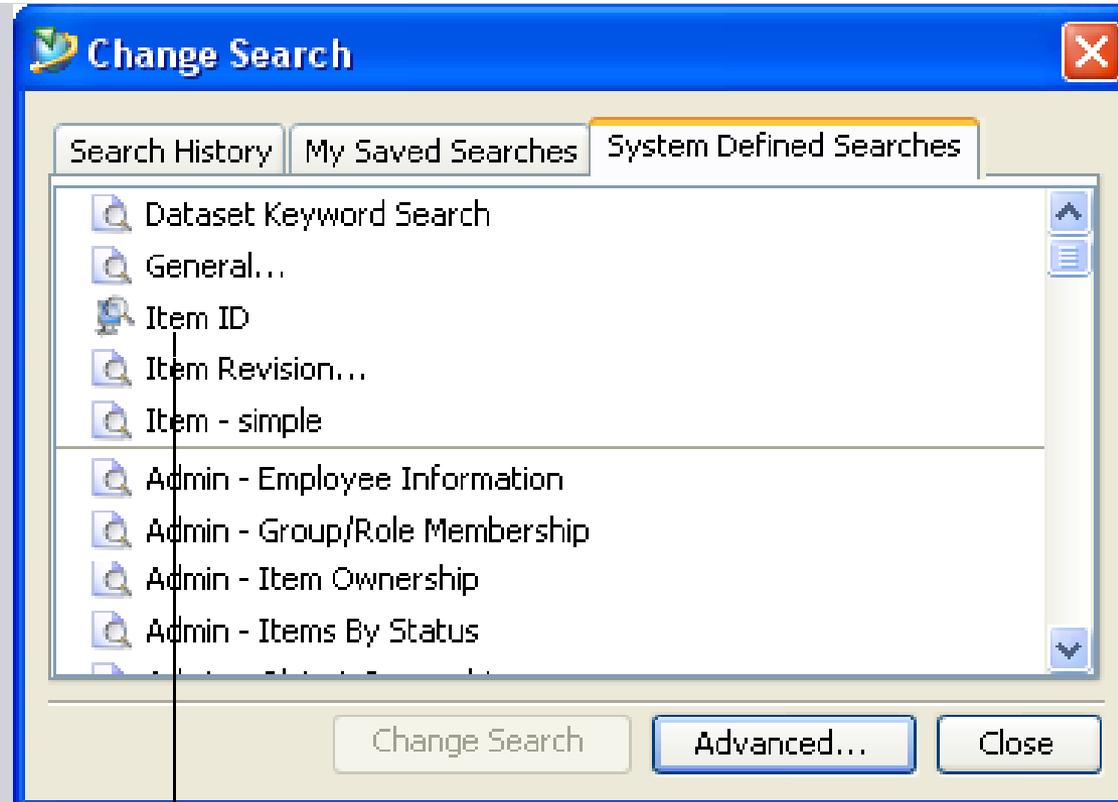
System Defined Searches Tab

Displays System Defined searches created in Query Builder

Custom icon indicates Default Search (Item ID in this slide)

Manage saved searches

- Paste searches copied from Search History
- Rename searches
- Add and remove folders



Item Id.. Is the default now;
Can be changed by the user
through "Advanced.."

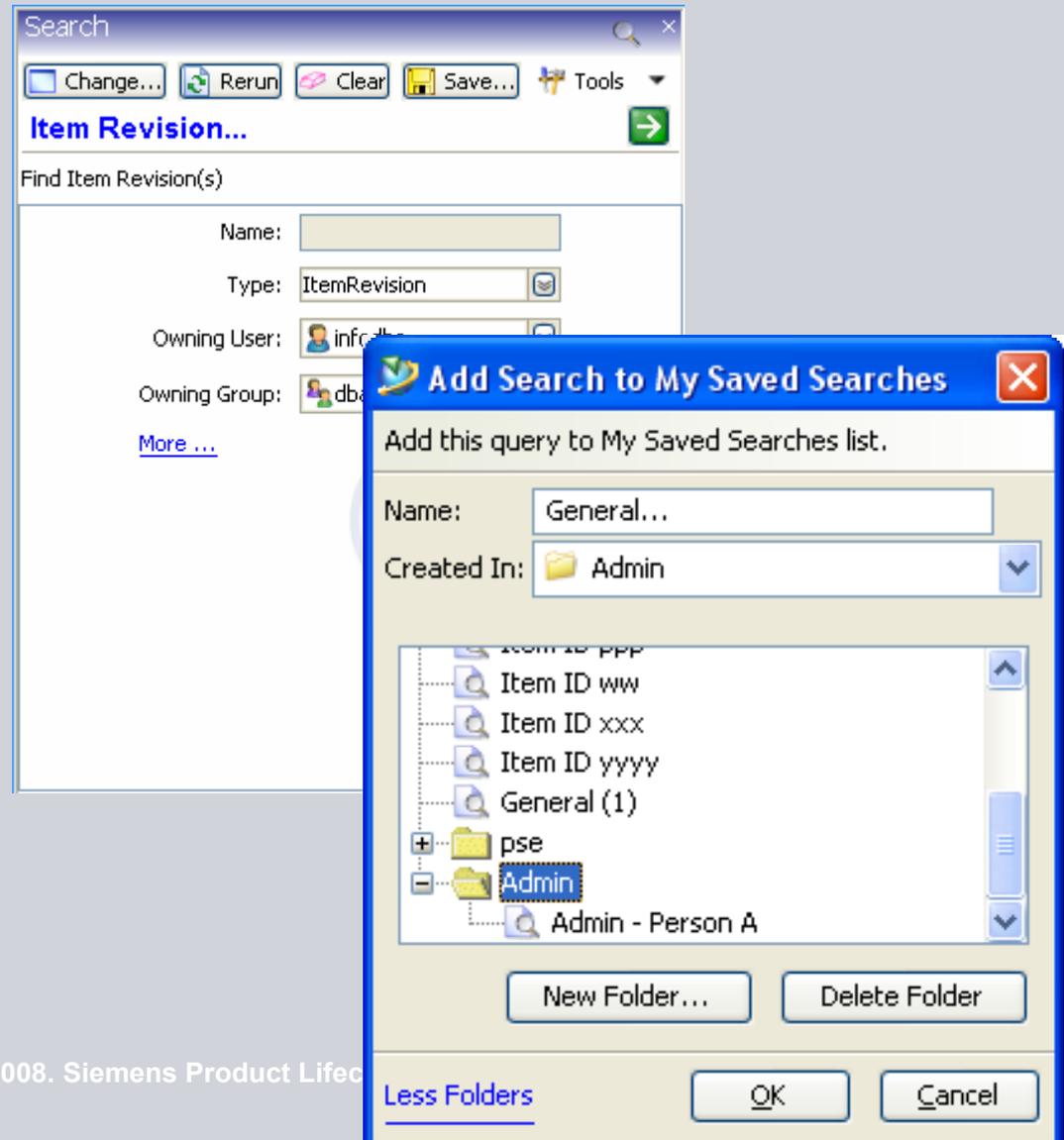
Change Search Dialog

Save... button opens dialog

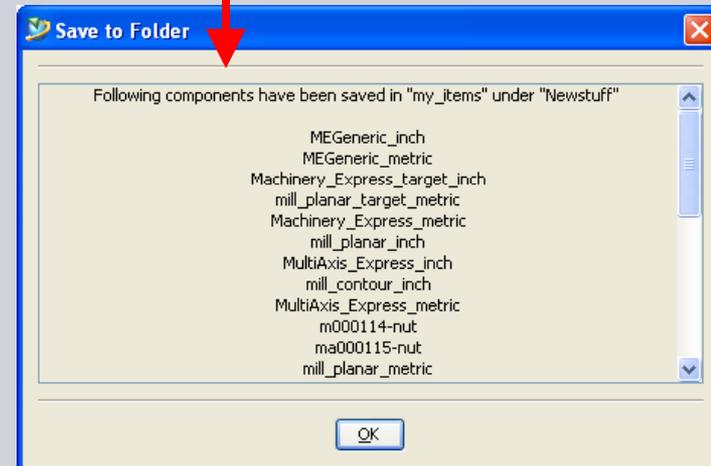
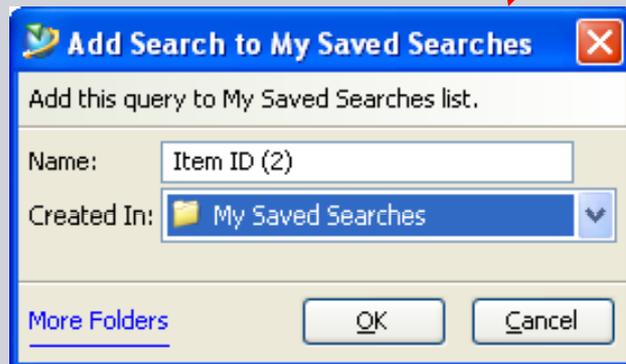
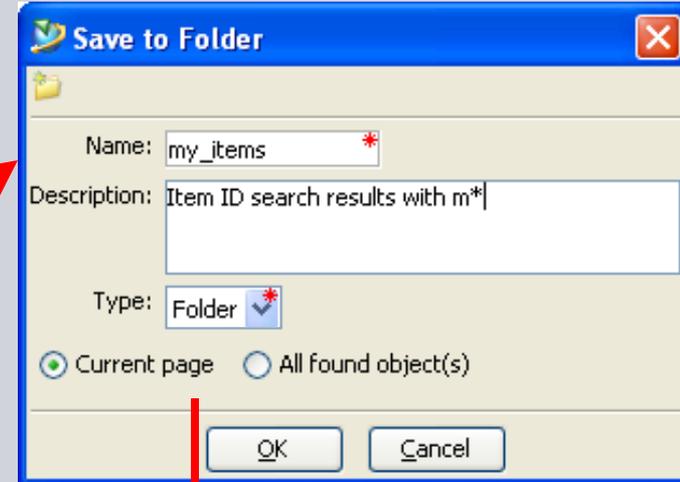
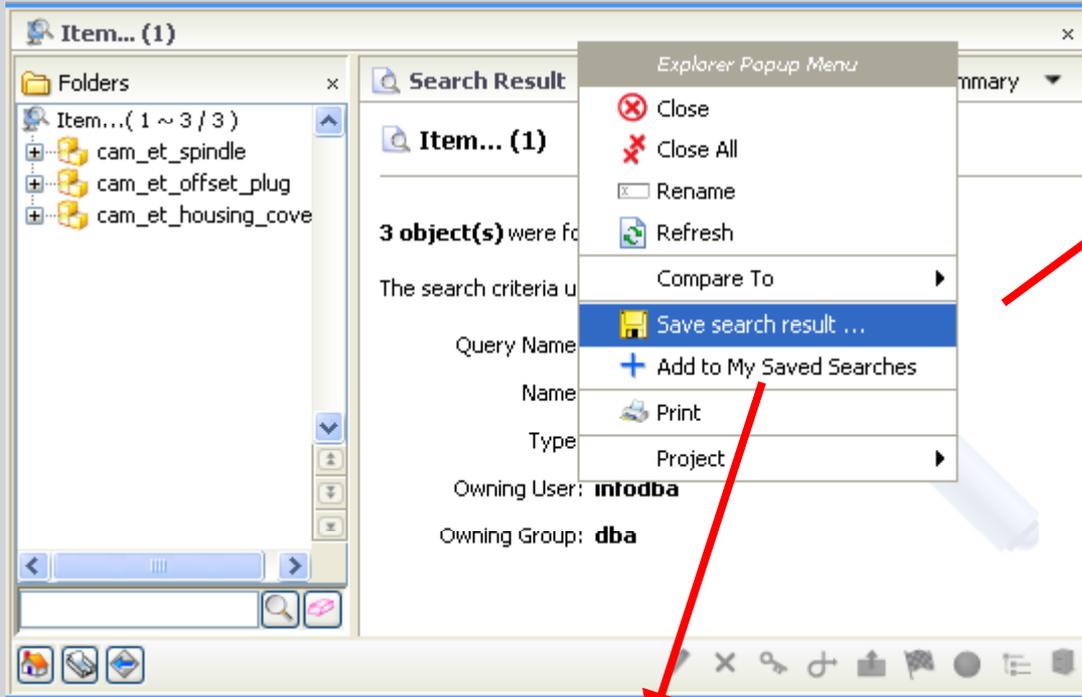
User may add search to My Saved Searches

Default view (Less Folders option in slide) hides folder maintenance options

More Folders view (shown here) allows user to add and delete folders.

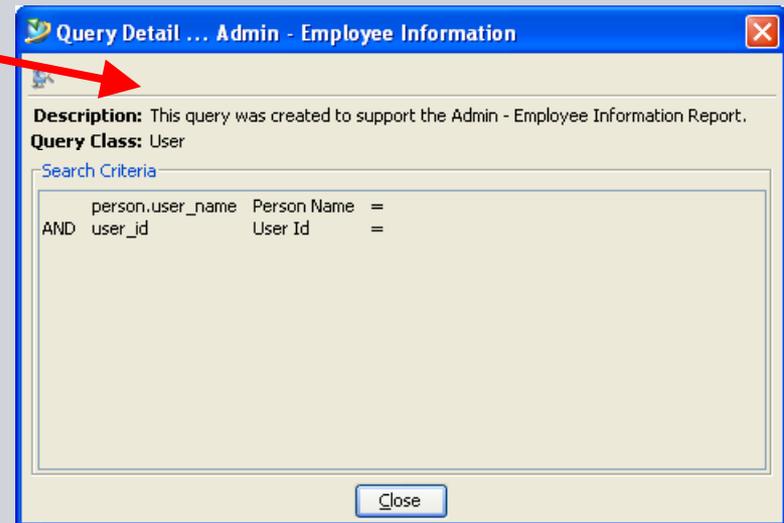
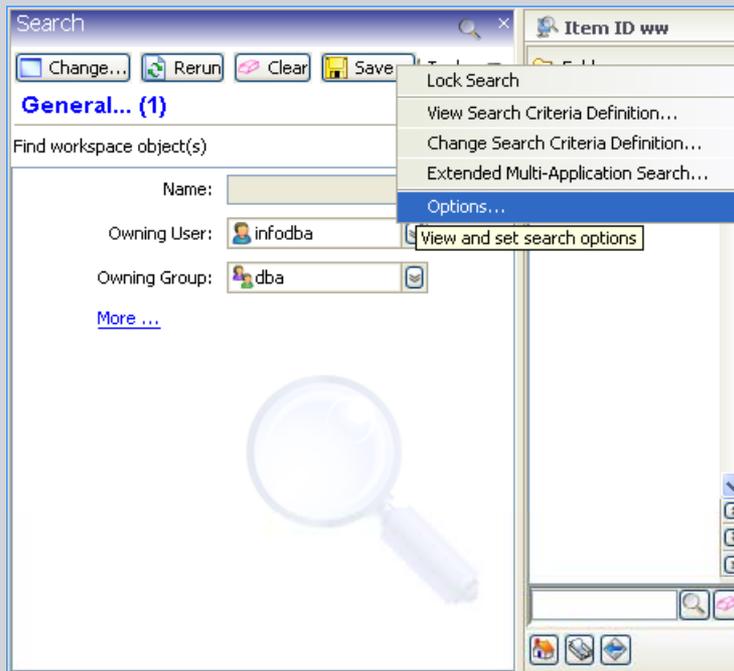


Explorer Popup Menu (Save Search Results / Add to My Saved Searches)



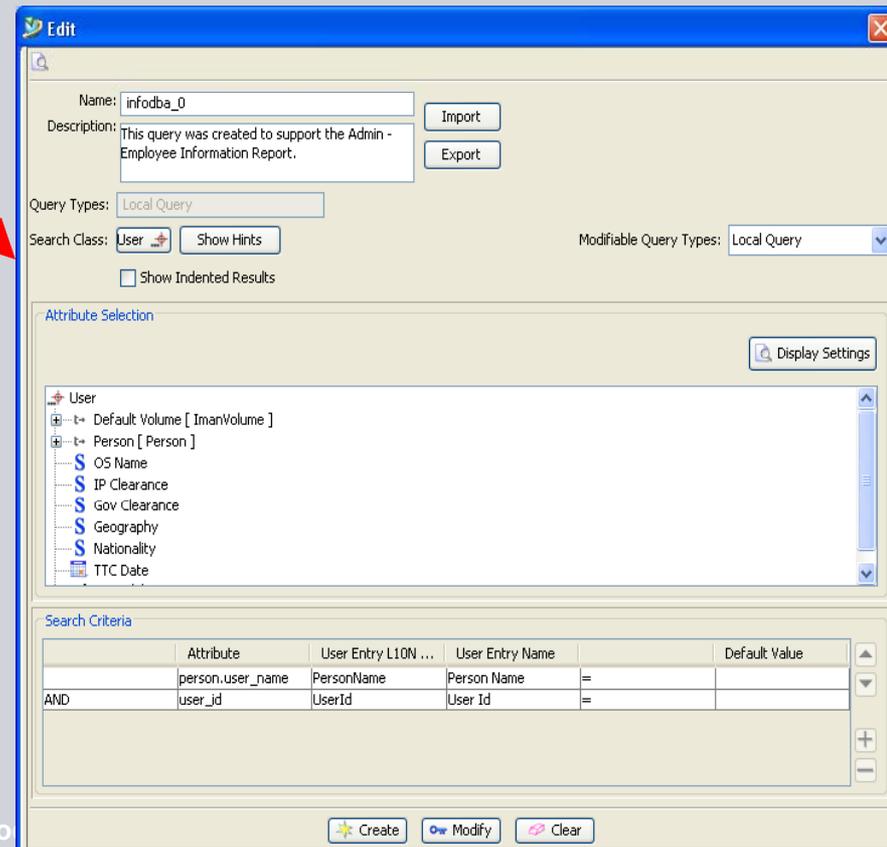
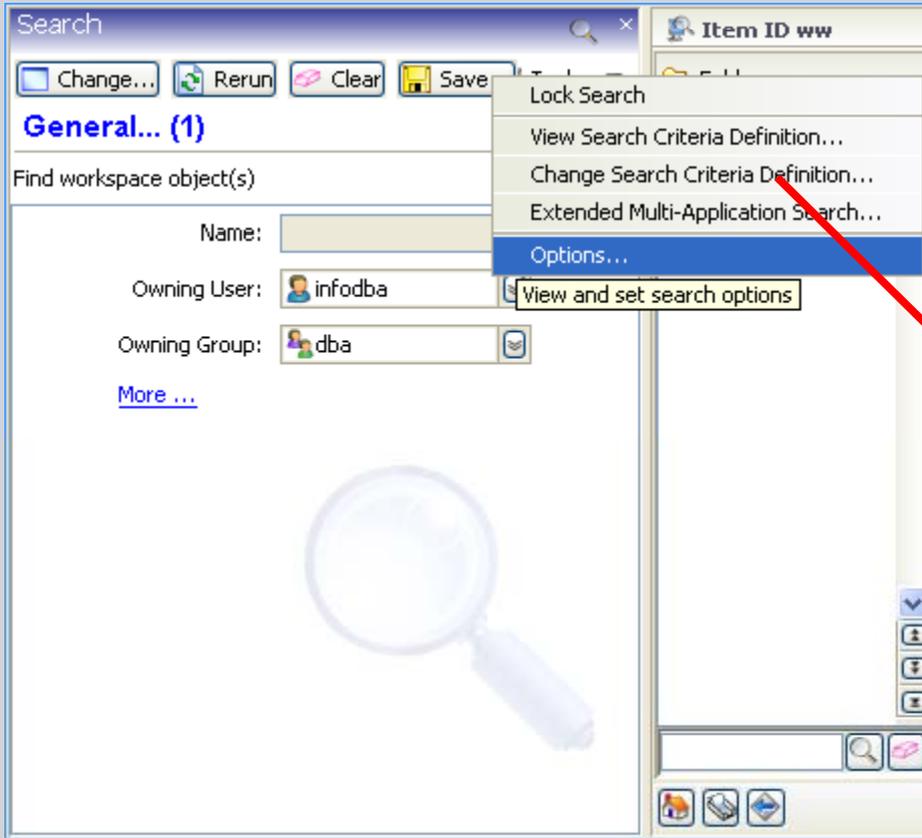
Tools Menu - View Search Criteria Definition

View Search Criteria Definition... opens dialog previously called "Query Details"



Tools Menu - Change Search Criteria Definition

Change Search Criteria... button opens dialog previously called "Edit"



Accessing the past searches and the results

The screenshot displays the Siemens Teamcenter 2007 web interface. The main window is titled "My Teamcenter - Teamcenter 2007" and shows a search results page for a query named "Admin - Employee Information".

Search Interface:

- Search Bar:** Contains the text "Admin - Employee Information".
- Search Criteria:** "Person Name: m*" is entered in a text field.
- Buttons:** "Change...", "Rerun", "Clear", and "Save..." are visible.

Search Results:

- Search Result Panel:** Shows "Admin - Employee Information (1)" and states "60 object(s) were found with this query." It also lists the search criteria used.
- Query Name:** Admin - Employee Information
- Person Name:** m*

Folder List:

- Admin - Employee Information (expanded)
- mail_user00
- mail_user01
- mail_user02
- mail_user03
- mail_user04
- mail_user05
- mail_user06
- mail_user07
- mail_user08
- mail_user09
- mail_user10
- mail_user11
- mail_user12
- mail_user13
- mail_user14
- mail_user15
- mail_user16
- mail_user17
- mail_user18

Open Items Panel:

- Item... (5)
- Item Revision... (2)
- rel_status (6)
- Item... (5)
- Item... (5)
- another ds arv for ws (3)

History Panel:

- 000120-testmanish
- 000006-Carolina Schedule
- DMU1ATopLvlAssy1/A-BoM
- 000123-manish0405_1

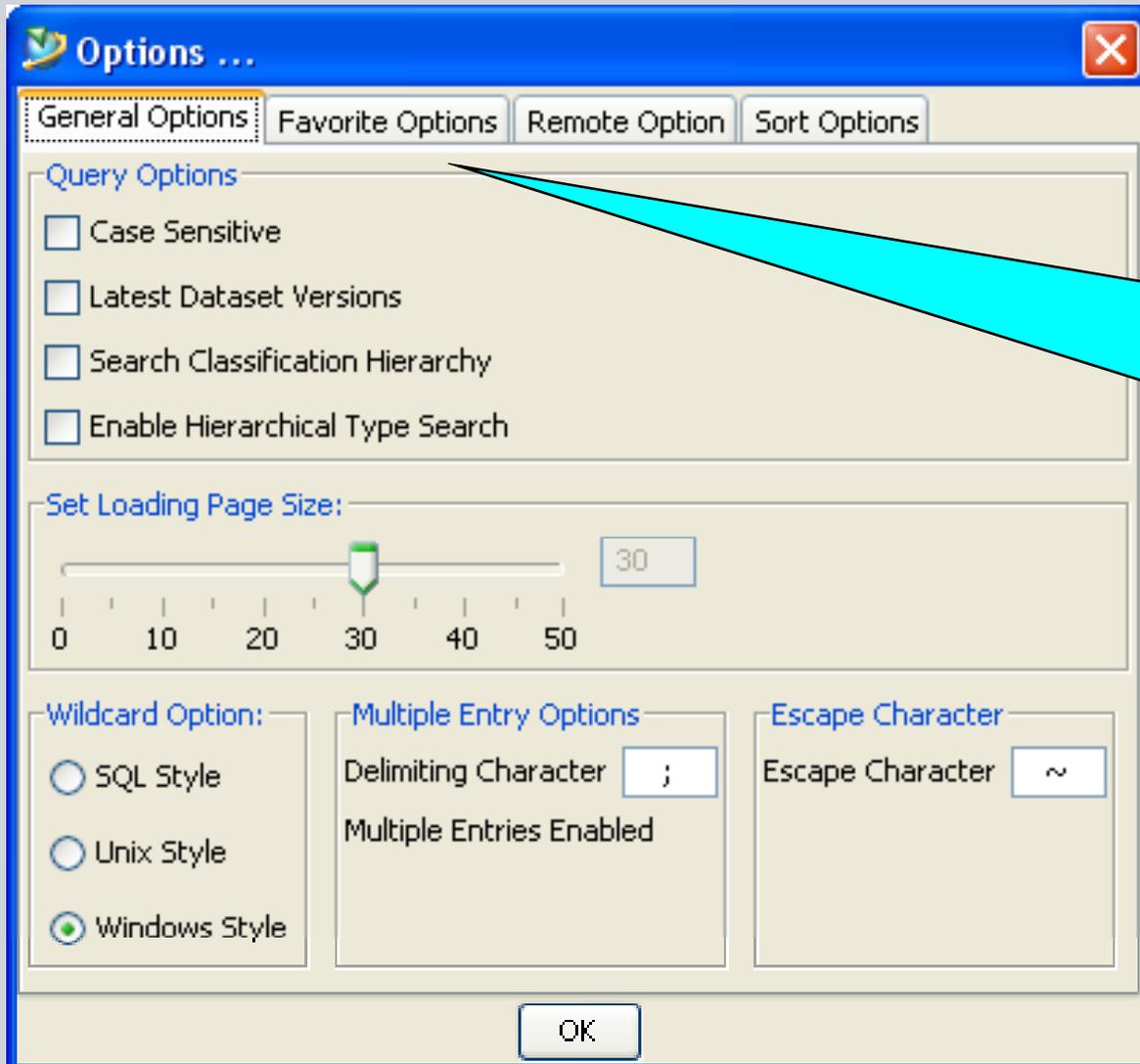
Navigation and Tools:

- Quick Links:** Home, My Worklist, My Saved Searches, My Links.
- Open Items:** Home, My Worklist, 000010-LegoMan, 000090/A-dataset.
- Tools:** Change..., Rerun, Clear, Save...

Footer:

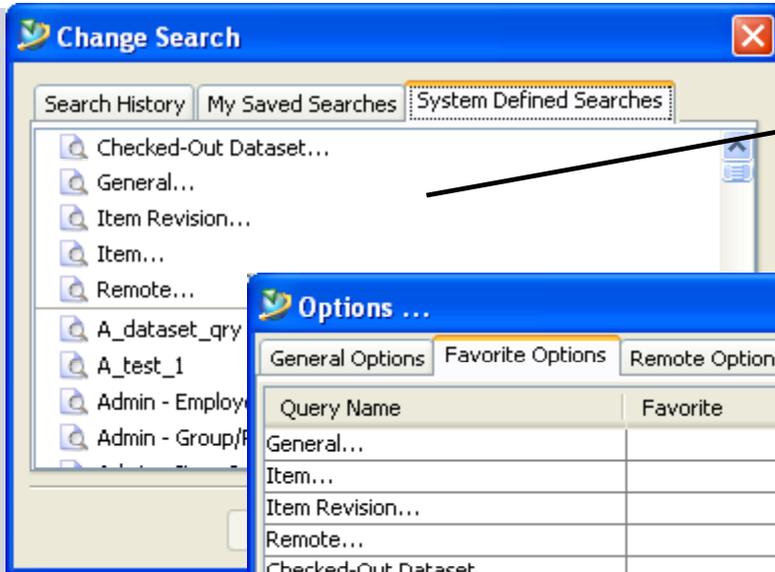
Ready

Tools Menu → Options Dialog

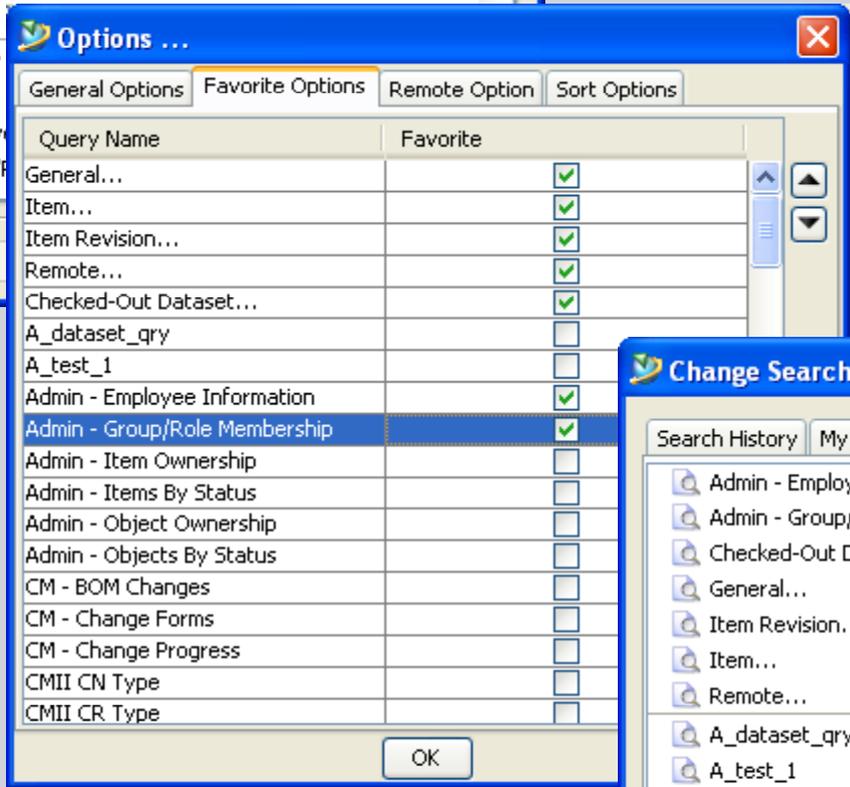


Using “Favorite Options”, one can specify the favorite system defined searches

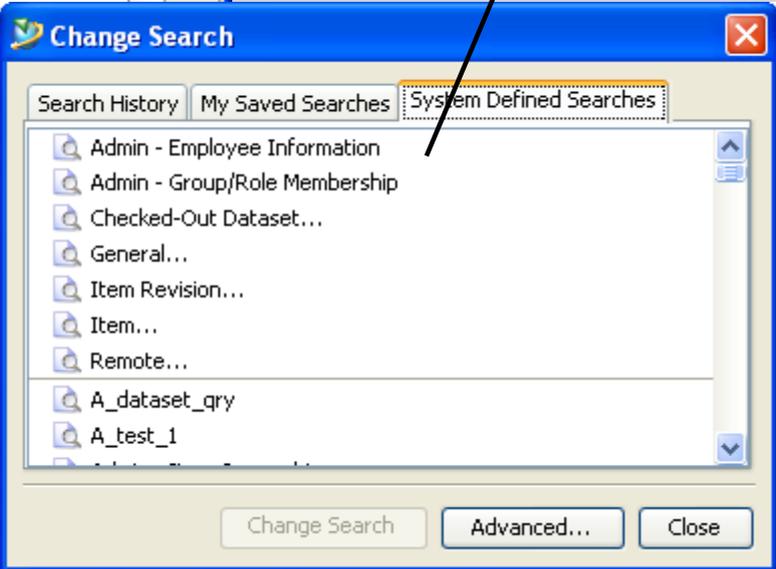
Tools → Options → Favorite Options



Before...



After



Hierarchical or Tree Search Results

Query Builder supports the queries that span across multiple objects
The results of a Saved Query can be shown in two ways:

Flat Model (as exists in Teamcenter so far)

- The attributes from different objects are shown in a flat list – thus visualizing a unified object

Tree Model (newly introduced in Teamcenter 2007)

- The objects and the relationships between these objects are shown in a tree – thus visualizing the context of the objects

Query Builder - Overview

[1] List of all Saved Queries in the system

[2] A Unique Name

[3] Optional Description

[4] Type of Query: Indexed data (Keyword) Or Non-indexed data (Local)

[5] The class of objects to search

[6] A Tree UI to allow selection of classes and attributes

[7] Each line is a search criteria

[8] Options to manipulate clause data

	Attribute	User Entry...	User Entry...		Default Va...
AND	object_name	Name	Name	=	
AND	item_id	ItemID	Item ID	=	
AND	object_desc	Description	Description	=	
AND	object_type	Type	Type	=	Item

Query Builder - Search Criteria / Clauses

The screenshot shows the 'Attribute Selection' pane of the Query Builder. At the top, 'Search Class' is set to 'ItemRevision' and 'Modifiable Query Types' is set to 'Local Query'. A list of attributes is displayed, each with a small icon to its left. Red arrows point from the right-side callouts to these icons: 'Calendar' points to the calendar icon for 'Date Released'; '[>]', '>' points to the right-pointing arrow icon for 'License List'; '[t]', 't' points to the 't' icon for 'Release Status'; 'i, b, S' points to the 'i' icon for 'Version Number'; '<blank>' points to the blank icon for 'Item has Module?'. The list of attributes includes: Name (S), Date Released (Calendar), License List ([>]), Process Stage List ([>]), Description (S), Release Status [ReleaseStatus] (t), IP Classification (S), Type (S), Version Limit (i), Workspace Object Thread [WorkspaceObjectThread] (t), Version Number (i), Used Options [POption] (t), Item has Module? (blank), BOM View Revisions [PSBOMViewRevision] (t), Item [Item] (t), Revision (S), Declared Options [POption] (t), ITCEng_rdv_plmxml_unconfigured (!), ITCEng_rdv_plmxml_configured (!), UG WAVE Positions, UG WAVE Geometry, UG WAVE Part Links, UG Expressions, UG Promotions, and NX Simulations.

Calendar : Date attribute

[>], > : UnTyped POMTag Array reference attribute
**** Will cause a class selection box to pop up ****

[t], t : Typed POMTag (Array or Single) reference attribute
**** Will typically not cause a class selection box to pop up ****

i, b, S : Primitive attribute (integer, String, boolean)

<blank> : Relation reference attribute
**** Will cause a class/attribute selection box to pop up ****

Hierarchical Search Results - Scope

Support “Hierarchical” Search Results in Teamcenter 2007

- Results show multiple levels of objects satisfying search criteria

Search Results	dba	Folder	25-Sep-200
000062-Item1	dba	Item	25-Sep-200
000062/A-Item1	dba	ItemRevision	25-Sep-200
Master 62	dba	MSWord	25-Sep-200
000063-Item2	dba	Item	25-Sep-200
000063/A-Item2	dba	ItemRevision	25-Sep-200
Master 63	dba	MSWord	25-Sep-200
000064-Item3	dba	Item	25-Sep-200
000064/A-Item3	dba	ItemRevision	25-Sep-200
Master 64	dba	MSWord	25-Sep-200

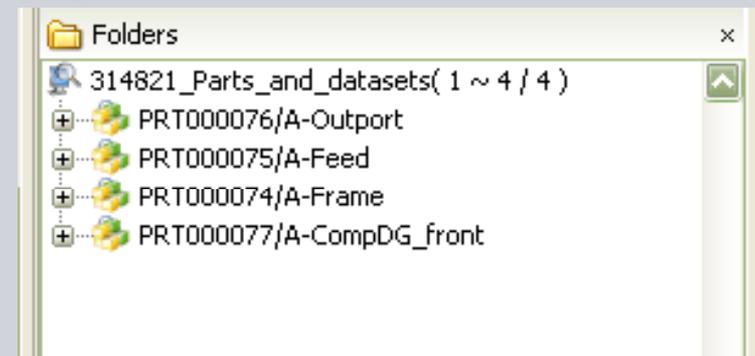
Use Case 1

“I want to see all my Parts that I already have Drawings for”

Problem:

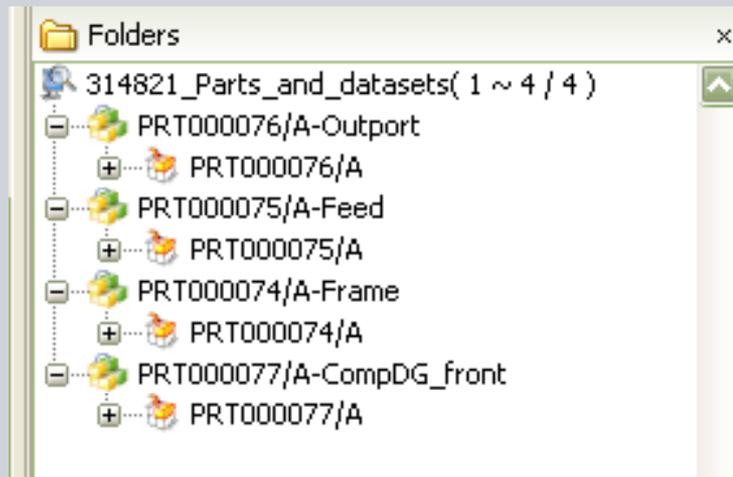
“I wonder if those Drawing were complete?”

Regular search



Solution

Hierarchical search



“Aha... Now I can examine each one and find out...”

Goal 1: Showing elaborate results as needed for analysis

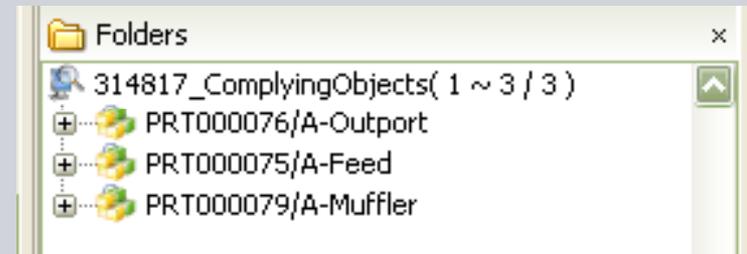
Use Case 2

“I want to see all Parts that comply with Requirements pertinent to ‘Environment’ ”

Problem:

“I don’t want just the Parts.”

Regular search (Parts)



I don’t want just the Requirements.

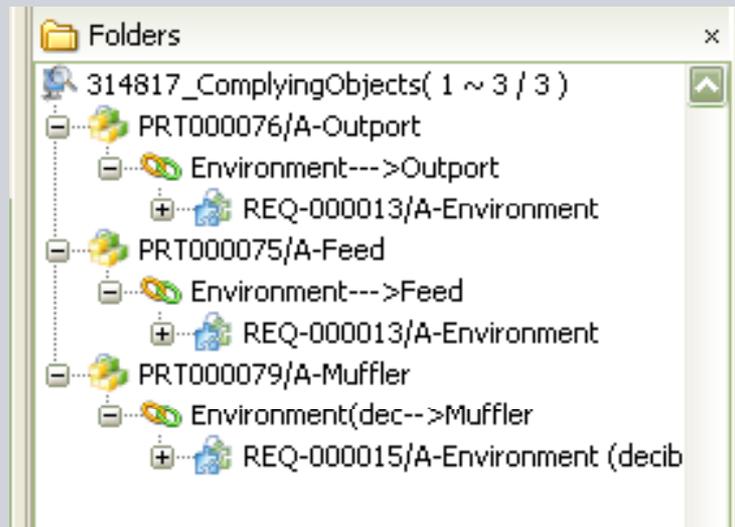
Regular search (Requirements)



I want them in context.”

Solution

Hierarchical search



“Now I know who’s driving these requirements...”

Goal 2: Show results in context and how objects are related

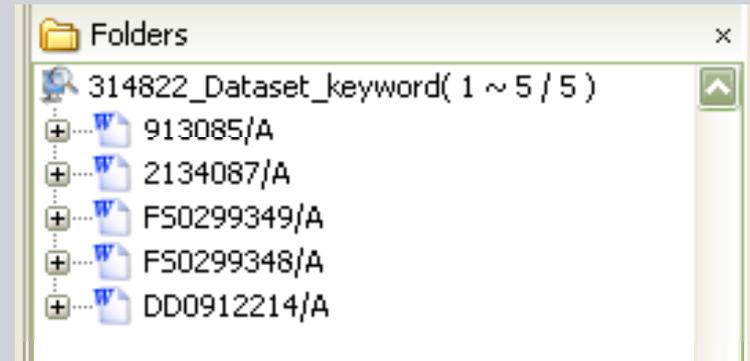
Use Case 3

“I need to send some of my documents on our ‘Automatic Drives’ program for review today”

Problem:

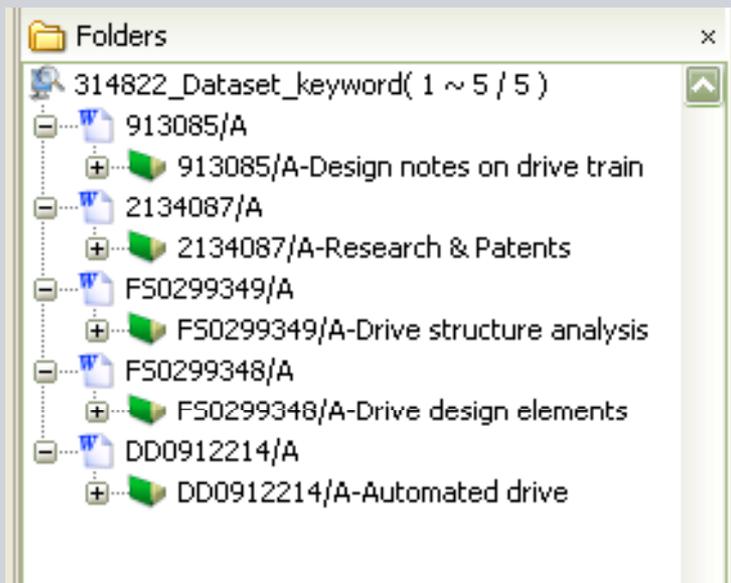
“I used keyword search to locate the datasets. But I can’t expand to the Document Revs - to initiate the process”

Regular keyword search (Datasets)



Solution

Hierarchical search



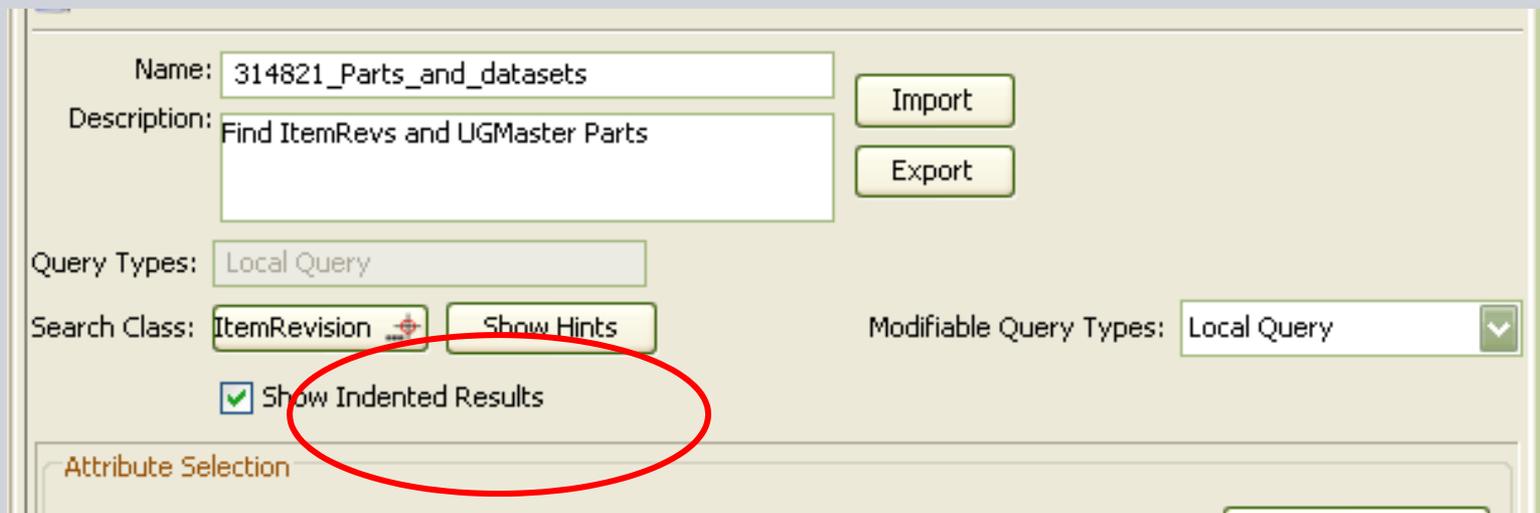
Now I can select the Document Revs that I want and initiate a process..."

Goal 3: Support a mix of keyword search and metadata search

Goal 4: Show in-direct relationships (e.g. Dataset to Item Rev)

How is it done?

Define Saved Searches that match your intent in Query Builder, as usual
Turn on the “Show Indented Results” toggle where applicable



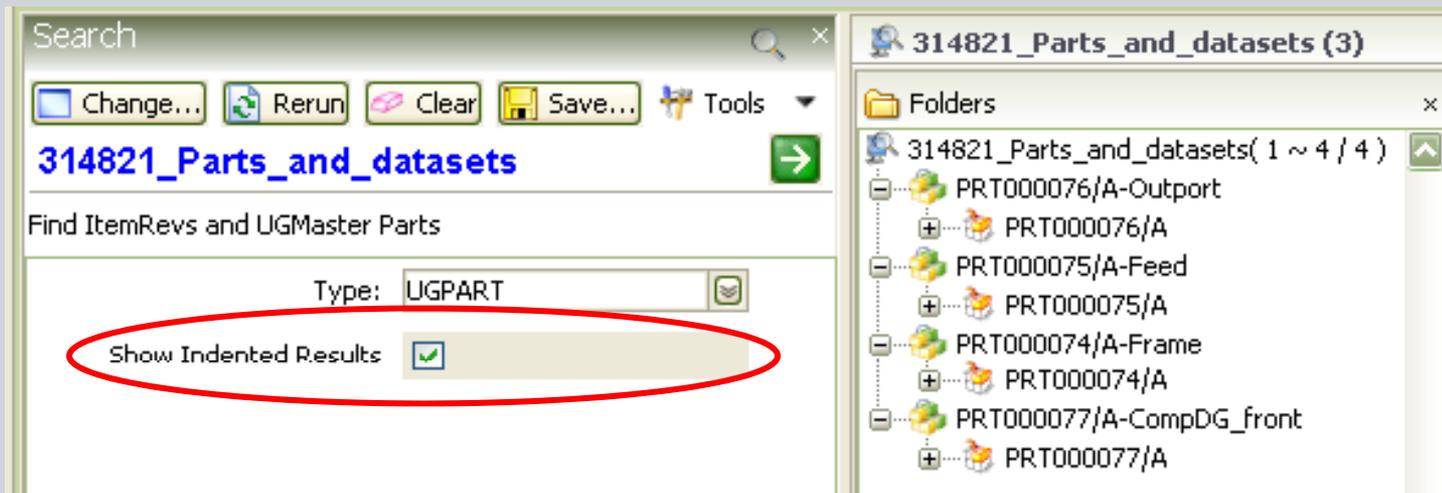
The screenshot shows the Query Builder interface with the following fields and controls:

- Name: 314821_Parts_and_datasets
- Description: Find ItemRevs and UGMaster Parts
- Query Types: Local Query
- Search Class: ItemRevision (with a red cross icon)
- Show Hints: (button)
- Modifiable Query Types: Local Query (dropdown menu)
- Show Indented Results: (circled in red)
- Attribute Selection: (section header)

The Saved Search now “remembers” all the Classes that are navigated in the Search Criteria and their Hierarchical position with respect to the Root Class

How is it done? (contd.)

When you execute the Saved Search, the corresponding sub-level objects are also fetched and displayed with their Hierarchical position reflected
You can choose to turn the Hierarchical Results on or off at execution-time



Full-Text Search with IDOL 7.0

- Teamcenter provides a full text search (FTS) capability that allows user to search for metadata of the objects and documents attached to the datasets.
- FTS works through the integration of third party tool called Autonomy, which is a powerful and sophisticated indexing/searching engine.
- From Teamcenter Engineering V9 onwards, FTS is continuing to support evolving versions of Autonomy (for example: AXE, DRE – Dynamic Reasoning Engine and IDOL - Intelligent Data Operating Layer server).
- Teamcenter 2007 uses Autonomy IDOL server 7.x

What is Difference between Autonomy4.x and IDOL 7.0

FTS with Autonomy 4.x /5.x

- Use standalone importslave exe program for importing/indexing documents.
- Use old IM* and DRE* api which are not being supported.
- Not supported on 64 bit platforms.
- Use multiple autonomy libs (import.lib/dre/lib/aciclient.lib/support.lib)
- Extra work to build shared libraries from Autonomy static libs.

FTS with IDOL 7.0

- IDOL 7.0 is the first release that has full capabilities of IDOL feature/component integration (DiSH, IDOL, FSF, etc).
- Fully supports for 64 bit platforms.
- Conceptual Search and Exact Matching Search
- Replace importslave with Autonomy File Fetch System component.
- Retire old IM* and DRE* api and use only one ootb Autonomy aci API (no need to build shared library).
- Performance improvements are integrated throughout IDOL 7.0 components in both indexing and search.

Conceptual Vs Exact Matching

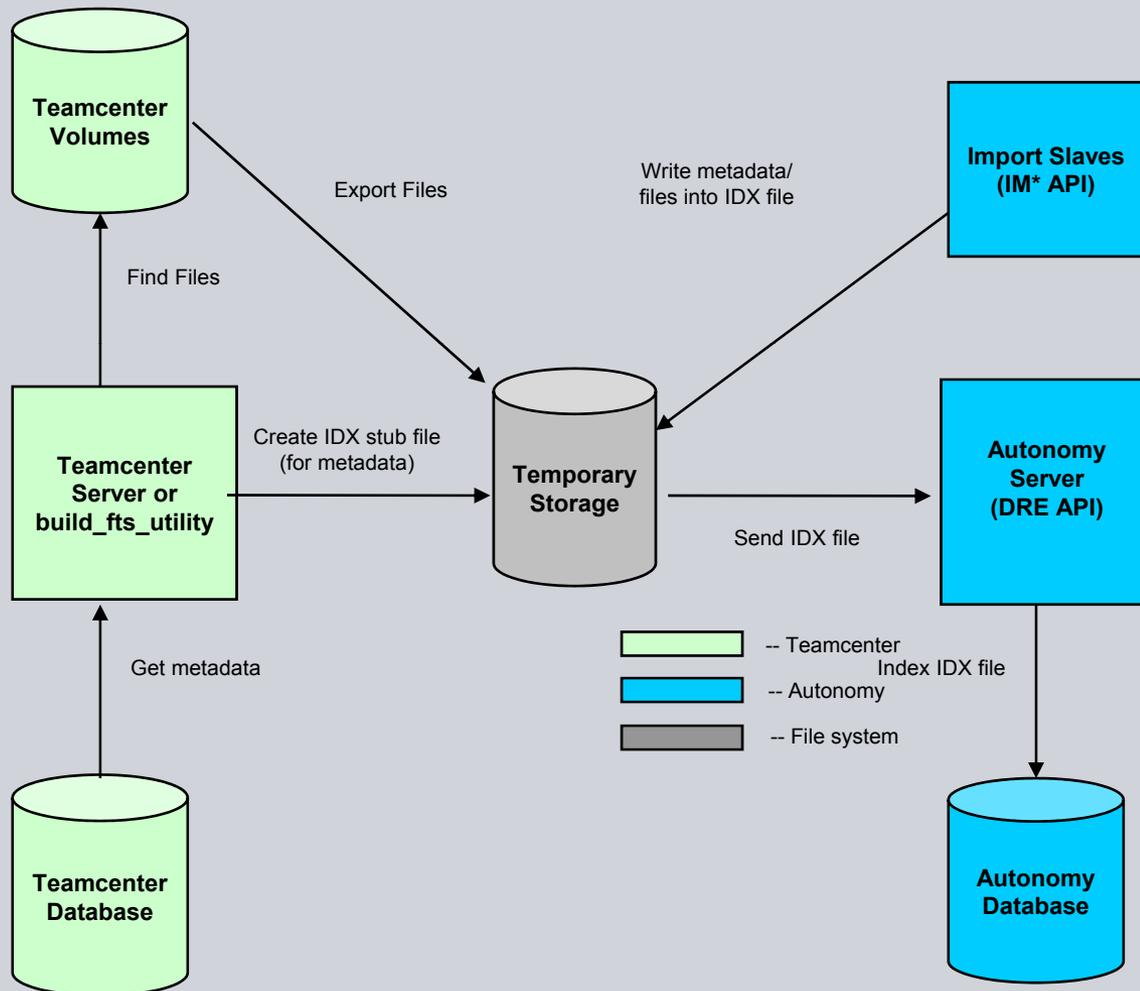
IDOL 7.0 uses advanced pattern-matching technology to conceptually match the queries that consist of a single keyword. It stems the keyword, and then it finds documents that contain words that have the same stem as the keyword.

For example, if you enter the word lovely (without quotes), IDOL server will match this word conceptually, it stems the word to **love** and finds documents that contain words which also stem to **love**, for example, lovely, love, loved, loving and so on.

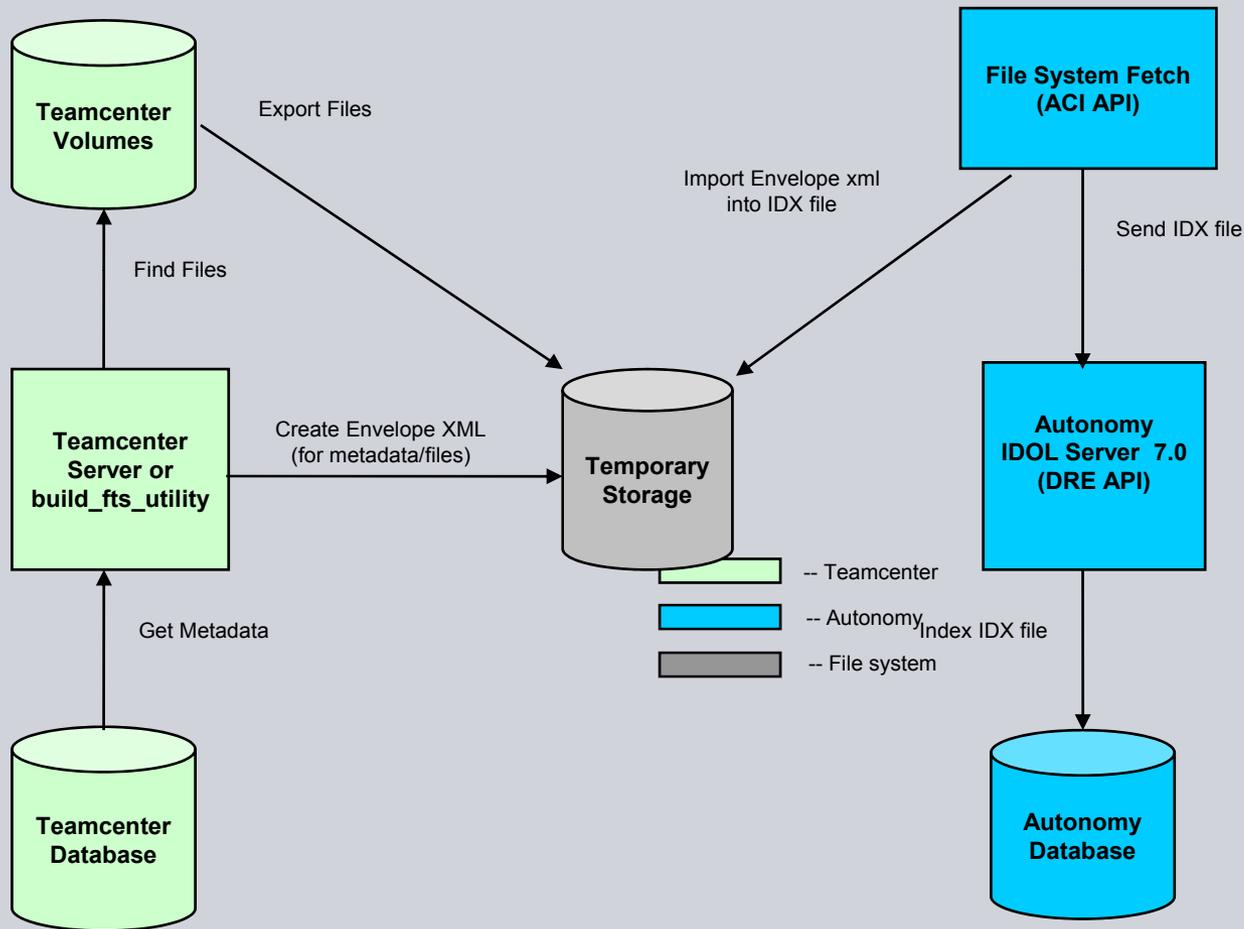
If you want to find documents that contain exact matches of a keyword, you can query for exact matches of keywords by putting the keyword in quotation marks when you execute the query.

For example, if you enter the word **"lovely"** (in quotes), IDOL server does not stem the word, and only finds documents that also contain **lovely**.

Existing FTS with Autonomy 4.x Integration



New FTS with IDOL 7.0 Integration



Three ways of Indexing Data

[1] Real-time indexing using portal interface

By setting TC preference “TCENG_fts_real_time_indexing” to on, whenever user makes any changes (created, updated or deleted) to an indexable WSO, the FTS index will be automatically updated with the latest changes. This maintains the sync between TcEng database and FTS autonomy index database on a real time basis.

[2] Manually re-indexing using portal interface

The user is also provided with a UI interface to manually update the FTS index of a WSO through the portal client.

[3] Batch indexing using build_fts_index command interface

Indexing utility provides Teamcenter Engineering system administrator with command line options such as what object properties to index or what object types to index to build FTS index in a batch mode.



build_fts_index

OOTB FTS Saved Queries

	[1] Keyword Search	[2] Dataset Keyword Search	[3] Dataset... Search
Object Type	All Objects (Datasets, Items, etc.)	Only Datasets	Only Datasets
Type of Query	Keyword Search Query Type	Keyword Search Query Type	Local Query Type
Database used	Autonomy Index Database	Autonomy Index Database	Autonomy Index Database AND Teamcenter Database
What is searched?	Metadata and File Contents	Metadata and File Contents	Metadata and File Contents
Comments			[3] is same as [2] if only "Keyword" is used in the UI.

Note: 1. Index-able types and Index-able properties (metadata) are configurable
 2. All queries are OOTB and are deployed upon Teamcenter installation.

Deployment of FTS (Full Text Search Engine) IDOL 7.0

Teamcenter FTS Install

- Installation prompts
 - New TEM prompts for Autonomy DiSH server and File System Fetch.
- Teamcenter preferences
 - TEM setups Teamcenter FTS database preferences

Autonomy IDOL 7.0 Install

- Autonomy Components
 - TEM Installs three components/services: IDOL server, DiSH license server and File System Fetch connector.
- Autonomy Installed Directories
 - TEM renames components installed. The directory structure and files are different from current install.
- Autonomy Configuration
 - TEM modifies the configurations for each of components specific for IDOL 7.0.

Migration and Upgrade of the Existing Customers

Teamcenter 2007 supports to upgrade FTS and Autonomy from Teamcenter previous versions.

- Upgrade from Teamcenter 2005/2005 SR1
 - The existing customers can migrate the indexed data from old autonomy database into new IDOL 7.0 index database by using Autonomy export/import commands.
- Upgrade and Migration from other Teamcenter versions (V9.x)
 - 1. Upgrade process will save old dre autonomy and create a new Autonomy IDOL 7.0 instance.

2. After the upgrade, customers need to ‘reindex” their Teamcenter data into IDOL 7.0 database by using the Teamcenter utility “build_fts_index”.

Other Enhancements...

Query Services are exposed as SOA services

- Get a list of queries
- Describe a query
- Execute a query

Enhancements in reducing the chattiness (4-tier compliant) and loading/caching of LOVs

Documentation / Hints Enhancements

- I want to find <something>. How do I define a query?
- I defined a query. But it is not working. Can you help?

Query SOAs are used by TcRA (reporting)
And by NX.

Summary

- This session has covered several topics on Query / Search enhancements in Teamcenter 2007.
- Key Takeaway 1:
 - Search Panel UI Enhancements
 - Search History, Default Searches, My Saved Searches..
- Key Takeaway 2:
 - Query Results as Tree
 - Boolean flag to support this new functionality
- Key Takeaway 3:
 - Full Text Search using IDOL

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