Report Generation With Teamcenter Systems Engineering (TcSE)

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Overview

- Overview of the Search Module
- Different Types of Search
  - Basic Search
  - Intermediate Search
  - Advanced Search
- Export Options
  - Native UI, MS-Word, MS-Excel
- Saving Searches
- Running Saved Searches
Overview of TcSE Search Module

Several Ways to Enter Search Module

- Module Bar, Tools menu, Tool bar, Right-click menu
- The starting point for a search is determined by the method in which the search was activated

Search Module Quick Tour
Entering Search View
## Starting Point for a TcSE Search

<table>
<thead>
<tr>
<th>Module Currently In Use</th>
<th>Command Executed</th>
<th>Active Pane</th>
<th>Starting Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamcenter Systems Engineering or Administration</td>
<td>Search module</td>
<td></td>
<td>Object in navigation tree</td>
</tr>
<tr>
<td>Teamcenter Systems Engineering</td>
<td>Search button on main window toolbar</td>
<td>Navigation tree</td>
<td>Selected node</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Content table</td>
<td>Selected object</td>
</tr>
<tr>
<td>Teamcenter Systems Engineering</td>
<td>Tools menu &gt; Search command</td>
<td>Navigation tree</td>
<td>Selected node</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Content table</td>
<td>Selected object</td>
</tr>
<tr>
<td>Teamcenter Systems Engineering</td>
<td>Search from popup menu</td>
<td>Navigation tree</td>
<td>Object selected in right-clicked pane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Content table</td>
<td></td>
</tr>
</tbody>
</table>

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Search Module Quick Tour

- **Overview screen shot pointing out all key areas.**
  - Open a Saved Search
  - Save this Search
  - New Search
  - Search for string in object name (Basic & Intermediate)
  - Search for string in object text (Basic & Intermediate)
  - Limit search to one or more types/subtypes
  - Execute the search (as shown, saved or not)
  - Search Types/Modes
  - Other Options (defaults shown)
Basic Search

- **Basic Search**
  - Search for a text string in the object name
    - Looks in Name property
  - Search for a text string in the object text
    - Looks in Text property
  - Search one or more object subtypes
    - List of Subtypes automatically updates with those for the selected project
Basic Search

- Search for string in object name (Basic & Intermediate)
- Search for string in object text (Basic & Intermediate)
- Limit search to one or more types/subtypes
Basic Search - Example

Find all requirements with “shall” in the text

- Search for “shall” text string in the object text (Text property)
- Search for all Requirement object types (includes subtypes)
- Note that Case Sensitive is not checked (by default), so it will find “shall” or “Shall”
### Found Requirement type and Paragraph subtype

<table>
<thead>
<tr>
<th>Folders</th>
<th>Number</th>
<th>ROIN</th>
<th>Subtype</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage</td>
<td>2.1</td>
<td>0041</td>
<td>Paragraph</td>
<td>The fuselage shall consist of a floor assembly ...</td>
</tr>
<tr>
<td>Front-end Assembly</td>
<td>2.1.1</td>
<td>0042</td>
<td>Paragraph</td>
<td>The front-end assembly shall include the engine ...</td>
</tr>
<tr>
<td>Cabin Super-Structure</td>
<td>2.1.2</td>
<td>0043</td>
<td>Paragraph</td>
<td>The cabin super-structure shall include the pilot ...</td>
</tr>
<tr>
<td>Wings</td>
<td>2.2</td>
<td>0045</td>
<td>Paragraph</td>
<td>Wing construction shall be conventional consist ...</td>
</tr>
<tr>
<td>Wing-Tip Fuel Tanks</td>
<td>2.2.1</td>
<td>0046</td>
<td>Paragraph</td>
<td>Fuel tanks shall be fitted on each end of the wi ...</td>
</tr>
<tr>
<td>Landing Gear</td>
<td>2.2.2</td>
<td>0047</td>
<td>Paragraph</td>
<td>Landing gear assemblies shall be fitted under the ...</td>
</tr>
<tr>
<td>Assembling the Floor</td>
<td>3.1</td>
<td>0050</td>
<td>Paragraph</td>
<td>The press-formed aluminum components of the ...</td>
</tr>
<tr>
<td>Assembling the Fuselage</td>
<td>3.2</td>
<td>0051</td>
<td>Paragraph</td>
<td>The fuselage shall consist of the front-end ass ...</td>
</tr>
<tr>
<td>Assembling the Wings</td>
<td>3.4</td>
<td>0053</td>
<td>Paragraph</td>
<td>Wings shall be assembled concurrently in a sep ...</td>
</tr>
<tr>
<td>The Wing Assembly</td>
<td>3.4.1</td>
<td>0054</td>
<td>Paragraph</td>
<td>The wing shall consist of an extruded l-beams ...</td>
</tr>
<tr>
<td>Fuel System</td>
<td>3.4.2</td>
<td>0055</td>
<td>Paragraph</td>
<td>Fuel bladders and fuel lines will be installed in e ...</td>
</tr>
<tr>
<td>Fuselage</td>
<td>2.1</td>
<td>0060</td>
<td>Requirement</td>
<td>The fuselage shall consist of a floor assembly ...</td>
</tr>
<tr>
<td>Front-end Assembly</td>
<td>2.1.1</td>
<td>0061</td>
<td>Requirement</td>
<td>The front-end assembly shall include the engine ...</td>
</tr>
<tr>
<td>Cabin Super-Structure</td>
<td>2.1.2</td>
<td>0062</td>
<td>Requirement</td>
<td>The cabin super-structure shall include the pilot ...</td>
</tr>
<tr>
<td>Wings</td>
<td>2.2</td>
<td>0064</td>
<td>Requirement</td>
<td>Wing construction shall be conventional consist ...</td>
</tr>
<tr>
<td>Wing-Tip Fuel Tanks</td>
<td>2.2.1</td>
<td>0065</td>
<td>Requirement</td>
<td>Fuel tanks shall be fitted on each end of the wi ...</td>
</tr>
<tr>
<td>Landing Gear</td>
<td>2.2.2</td>
<td>0066</td>
<td>Requirement</td>
<td>Landing gear assemblies shall be fitted under th ...</td>
</tr>
<tr>
<td>Assembling the Floor</td>
<td>3.1</td>
<td>0069</td>
<td>Requirement</td>
<td>The press-formed aluminum components of the ...</td>
</tr>
</tbody>
</table>
Intermediate Search

- Intermediate Search includes all options for Basic Search + search for additional object property values
  - Additional properties beyond Name and Text
  - One or more properties/values can be searched
Intermediate Search

Specify criteria for Property selected

All Properties for this project

Note that the available criteria changes depending on the type of property (choice, date, numeric, text)
Intermediate Search – Example 1

- Find all Requirement objects with “shall” in the text which are to be verified via Test.

Search for “shall” in the Text

Verification Method = Test

Search for all Requirement object types (includes subtypes)
### Intermediate Search – Results for Example 1

<table>
<thead>
<tr>
<th>Requirement type</th>
<th>Verification Method</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage</td>
<td>Test</td>
<td>The fuselage shall consist of a floor assembly...</td>
</tr>
<tr>
<td>Front-end Assembly</td>
<td>Test</td>
<td>The front-end assembly shall include the engine...</td>
</tr>
<tr>
<td>Cabin Super-Structure</td>
<td>Test</td>
<td>The cabin super-structure shall include the pilot...</td>
</tr>
<tr>
<td>Wings</td>
<td>Test</td>
<td>Wing construction shall be conventional consist...</td>
</tr>
<tr>
<td>Wing-Tip Fuel Tanks</td>
<td>Test</td>
<td>Fuel tanks shall be fitted on each end of the wing...</td>
</tr>
<tr>
<td>Landing Gear</td>
<td>Test</td>
<td>Landing gear assemblies shall be fitted under the floor...</td>
</tr>
<tr>
<td>Assembling the Floor</td>
<td>Test</td>
<td>The press-formed aluminum components of the floor...</td>
</tr>
<tr>
<td>Assembling the Fuselage</td>
<td>Test</td>
<td>The fuselage shall consist of the front-end assembly...</td>
</tr>
<tr>
<td>Assembling the Wings</td>
<td>Test</td>
<td>Wings shall be assembled concurrently in a separate room...</td>
</tr>
<tr>
<td>The Wing Assembly</td>
<td>Test</td>
<td>The wing shall consist of an extruded hollow spar...</td>
</tr>
<tr>
<td>Fuel System</td>
<td>Test</td>
<td>Fuel bladders and fuel lines will be installed in...</td>
</tr>
</tbody>
</table>
Find all Requirement objects with “shall” in the text, verified via Test at the System level.

Note how multiple property search statements are shown here (e.g., Verification Method = Test entered in previous example)
Intermediate Search – Results for Example 2

Verification Method = Test
And
Verification Level = System

<table>
<thead>
<tr>
<th>Folders</th>
<th>Number</th>
<th>ROIN</th>
<th>Subtype</th>
<th>Verification Method</th>
<th>Verification Level</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage</td>
<td>2.1</td>
<td>0060</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>The fuselage shall consist of...</td>
</tr>
<tr>
<td>Cabin Super-Structure</td>
<td>2.1.2</td>
<td>0062</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>The cabin super-structure shall be...</td>
</tr>
<tr>
<td>Wings</td>
<td>2.2</td>
<td>0064</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Wing construction shall be...</td>
</tr>
<tr>
<td>Wing-Tip Fuel Tanks</td>
<td>2.2.1</td>
<td>0065</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Fuel tanks shall be fitted on...</td>
</tr>
<tr>
<td>Assembling the Floor</td>
<td>3.1</td>
<td>0069</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>The press-formed aluminum...</td>
</tr>
<tr>
<td>Assembling the Fuselage</td>
<td>3.2</td>
<td>0070</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>The fuselage shall consist of...</td>
</tr>
<tr>
<td>Assembling the Wings</td>
<td>3.4</td>
<td>0072</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Wings shall be assembled...</td>
</tr>
</tbody>
</table>
Advanced Search

- Create a complex query based on
  - Types/subtypes, properties, relationships, and more
  - Tcl activators can be incorporated as well
- User builds queries directly vs. having the Search module build the queries (Basic and Intermediate)
  - Note: To see the actual query being built in Basic or Intermediate mode, select the Advanced search type
- Advanced Search includes additional panes to allow construction of queries
Advanced Search

Basic Search Pane – same but "Search For Name" and "Containing Text" fields are disabled.

Query View Pane – displays the query as it is being constructed.

Commands for building the query statements (changes based on query statement selected above)
Query Statements – General Info

- SELECT statement is the root node for a query, i.e., it is always the first statement.
- Since each query is a hierarchy, indentation is important
  - Especially the commands: AND, OR, WHERE, FOR EACH, ADD, REMOVE, SORT
  - The “Add Indented” button, when selected, causes a list of valid statement types for child nodes to be displayed
For sibling statements, the user interface does not require that they be in a specific order. However, query statements are processed in the following sequence:

- SELECT statements
- WHERE statements
- SORT statements
- All other subcommands

For multiple SORT statements, the first one indicates the primary sort, the second one indicates the secondary sort, etc.

Although Advanced Search limits choices to those options that are valid at a given time, it does not prevent one from creating a query that is illogical or cannot be executed.
Advanced Search – Example 1

- Find all Requirement objects with “shall” in the text, verified via Test at the System level, with their Test Procedures.

This is the query
Advanced Search – Results for Example 1

Test Procedures linked to requirements

<table>
<thead>
<tr>
<th>Folders</th>
<th>Number</th>
<th>ROIN</th>
<th>Subtype</th>
<th>Verification Method</th>
<th>Verification Level</th>
<th>Verification Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuselage</td>
<td>2.1</td>
<td>0089</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td>The fuselage shall consist</td>
</tr>
<tr>
<td>Cabin Super-Structure</td>
<td>212</td>
<td>0082</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td>The cabin shall consist</td>
</tr>
<tr>
<td>Wings</td>
<td>2.2</td>
<td>0094</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td>Wing construction shall</td>
</tr>
<tr>
<td>Wing-Tip Fuel Tanks</td>
<td>2.2.1</td>
<td>0065</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td>Fuel tanks shall be fitted</td>
</tr>
<tr>
<td>Assembling the Floor</td>
<td>3.1</td>
<td>0069</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td>The press-formed window</td>
</tr>
<tr>
<td>Assembling the Fuselage</td>
<td>3.2</td>
<td>0070</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td>The fuselage shall consist</td>
</tr>
<tr>
<td>Assembling the Wings</td>
<td>3.4</td>
<td>0072</td>
<td>Requirement</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td>Wings shall be assembled</td>
</tr>
<tr>
<td>Test Procedure 1</td>
<td>1</td>
<td>0077</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 2</td>
<td>2</td>
<td>0078</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 3</td>
<td>3</td>
<td>0079</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 4</td>
<td>4</td>
<td>0080</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 5</td>
<td>5</td>
<td>0081</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 6</td>
<td>6</td>
<td>0082</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>In Progress</td>
<td></td>
</tr>
<tr>
<td>Test Procedure 7</td>
<td>7</td>
<td>0083</td>
<td>Test Procedure</td>
<td>Test</td>
<td>System</td>
<td>Verified</td>
<td></td>
</tr>
</tbody>
</table>
Find all “Question” notes that are attached to Manufacturing Requirements which contain the word “shall” in them and are assigned to Albert Einstein.

Find the requirements

For each of those requirements, add the notes

Since all we want is the notes, remove the requirement objects from the search results
Advanced Search – Results of Example 2

<table>
<thead>
<tr>
<th>Folders</th>
<th>Subtype</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer note</td>
<td>Question</td>
<td>The client wants to know more about this.</td>
</tr>
<tr>
<td>feedback from the field</td>
<td>Question</td>
<td>I'm not paying more than $1.50 for that.</td>
</tr>
</tbody>
</table>
Report Export Options

- Native User Interface
  - Examples so far
  - Can use predefined Views
- MS-Word
  - Use Document Templates
- MS-Excel
  - Use MS-Excel Templates
  - Static export or MS-Excel Live
- MS-Visio
  - Use stencils
Reuse same Search Results window or create a new one with each search.

If desired, select a saved View to define columns in the resulting Search Results window.
Things You Can Do From the Search Results

- For any object selected in the Search Results window, you can:
  - Add/remove/rearrange property columns
  - Change the object’s properties (in the window if column displayed, or with Edit Properties dialog)
  - Open (for editing or read-only)
  - Navigate to the object (Go To Object)
  - Rename the object
  - Delete the object
  - Create trace links
  - Export to MS-Excel
  - Export to MS-Word
  - Copy the object’s URL
  - Send email

Several of these you can also do with multiple objects selected at the same time
Select MS-Word as the Output Option

Select the desired Document Template
Report Outputs – MS Word

- Document format is completely tailorable, based on:
  - Document Template
  - Style Sheet
  - Object Templates
  - 1 Document Template
  - 1 Style Sheet per Document Template
  - Multiple Object Templates, mapped to object types/subtypes in the Document Template
  - MS-Word output is a static snapshot
Select MS-Excel as the Output Option, including whether or not you want it to be an MS-Excel Live report.

Select the desired MS-Excel Template.
Report Outputs to MS-Excel

- Spreadsheet format is completely tailorable, based on MS-Excel Template
- MS-Excel Template can include
  - Rules based on levels, relationships, subtypes
  - Which properties are displayed
  - Formatting
  - Additional calculations based on reported data
  - Sorting and filtering
  - Etc.

This indicates this is an MS-Excel Live report. Cells in this spreadsheet are directly connected to the TcSE database.
Define the properties to include in each cell, based on rule to the right.

<table>
<thead>
<tr>
<th>Name</th>
<th>Attachments</th>
<th>Links</th>
<th>Number</th>
<th>ROIN</th>
<th>Type</th>
<th>Create User</th>
<th>Create Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>%Name</td>
<td>(%Attachment)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
<td>(%)</td>
</tr>
</tbody>
</table>

There can be multiple rules. Each can be based on one or more of the following:
- Level (of the object in the native UI output)
- Relationship (complying, defining, etc.)
- Subtype of the object
Saving Searches

- You can save any search (Basic, Intermediate, or Advanced) for future use.
- If you want to use it again, save it.
- Saved search includes the Output format (MS-Word, MS-Excel, etc.).
- Initial save defaults to private (only the creator can see and use it).
  - Project Admin can make it public for others to use.
- Saved reports can also be run from a URL.
  - Report’s URL in Admin module.
  - If you want to run the report from a URL, select this to ensure report always starts at the same place for consistent results.
Running Saved Searches

- Select location where the report should start
  - Reports are generally relative to their starting point, so select the appropriate folder/node in the Navigation Pane
- Tools > Run Report
- Select report from list
- OK to run the report
Summary

- Different Types of Search
  - Basic, Intermediate, Advanced

- Export Options
  - Native UI, MS-Word, MS-Excel

- Saving Searches
  - Includes the query as well as the output format

- Running Saved Searches
  - Private vs. public

- Small taste of TcSE Search Module capability
  - Best way to learn is practice (especially Advanced Search)
Questions???

Thank You

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