MAXIMO INSPECTIONS DEEP DIVE

Presenters: Stephen Hume BPD Zenith, Vinicius Garmatz IBM

Agenda

1. **How to (further) integrate Inspection Data into core Maximo**
2. **Migration of Inspection Forms from one Maximo to another**
3. **Creation of Inspection Forms using the MIF**
4. **Understand the Inspection Database Tables**
5. **Write an Inspection Result BIRT Report**
6. **Keep Work Orders and Inspections in sync with an automation script**
7. **Modify the automation script to create Work Orders from Inspections**
8. **Create and Inspection Result tab in the Work Order Application**
9. **Understand some performance guidelines and best practices**
10. **How to link inspections to Inventory Receiving**
11. **Hear from the IBM Architect about the future of Inspections**

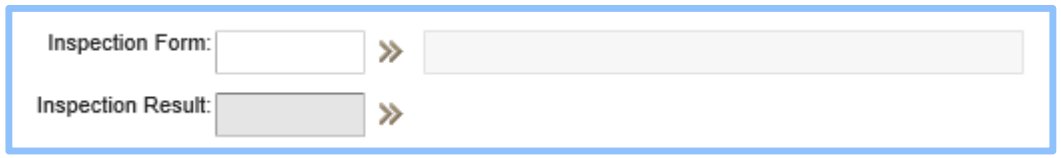
Stephen Hume

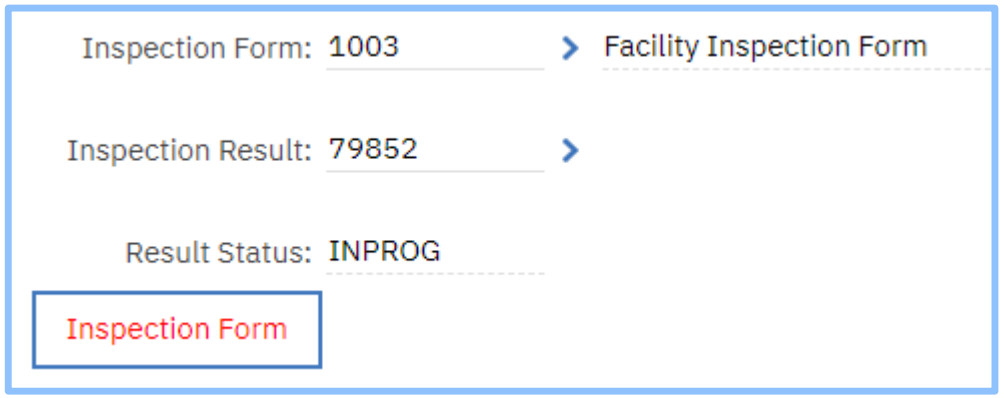
Stephen has been working with IBM Maximo for over ten years in a variety of industries (Oil and Gas, Utilities). He has taught Maximo courses to end users for both Technical and Functional audiences and chairs the MaxTECH User Group.

Integration into Maximo

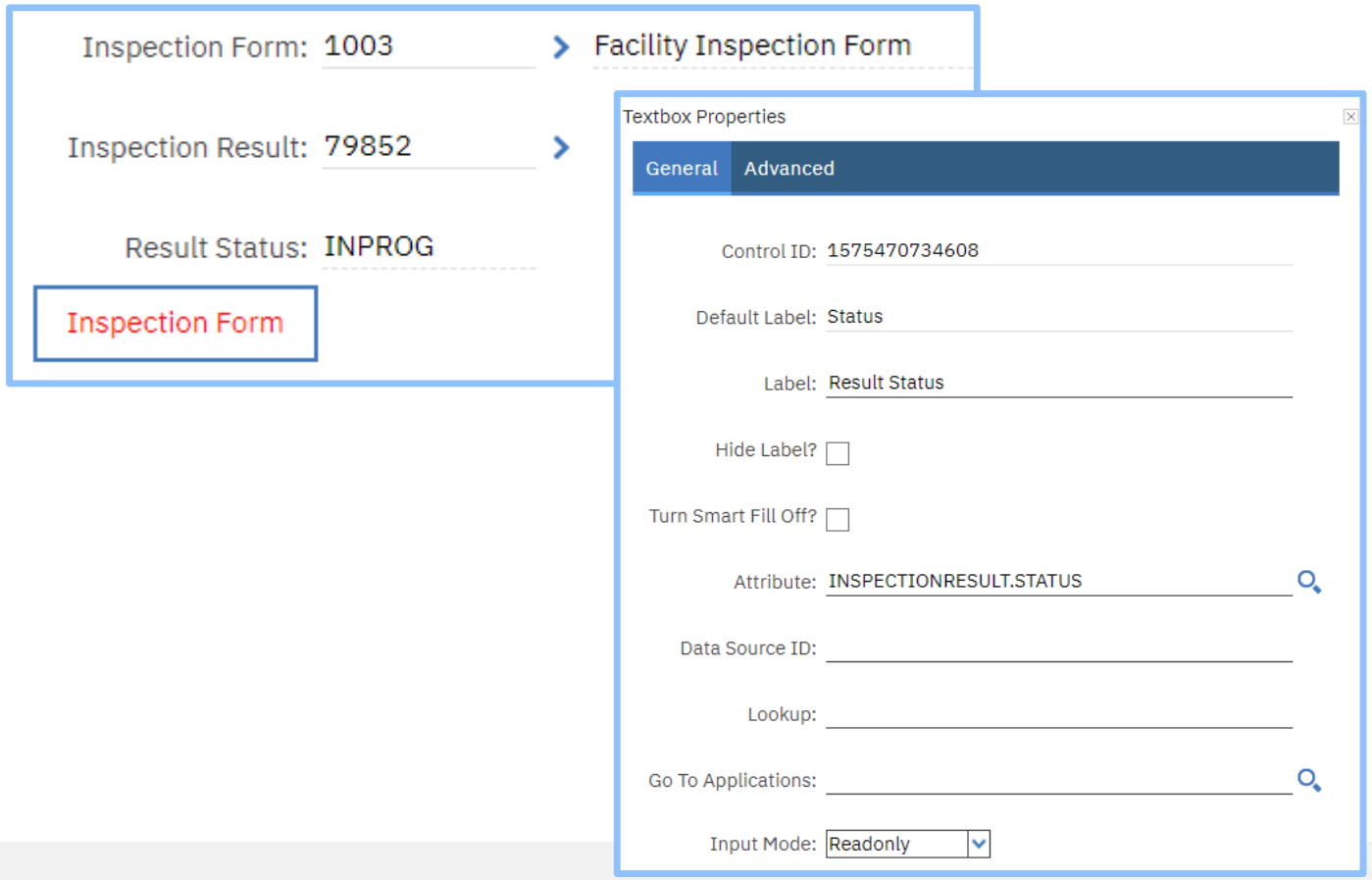
Further Integrating Inspections into Maximo in Work Order Tracking Application

- Display Inspection Result Status in Work Order
- Add pushbutton to Navigate to the Inspection Form

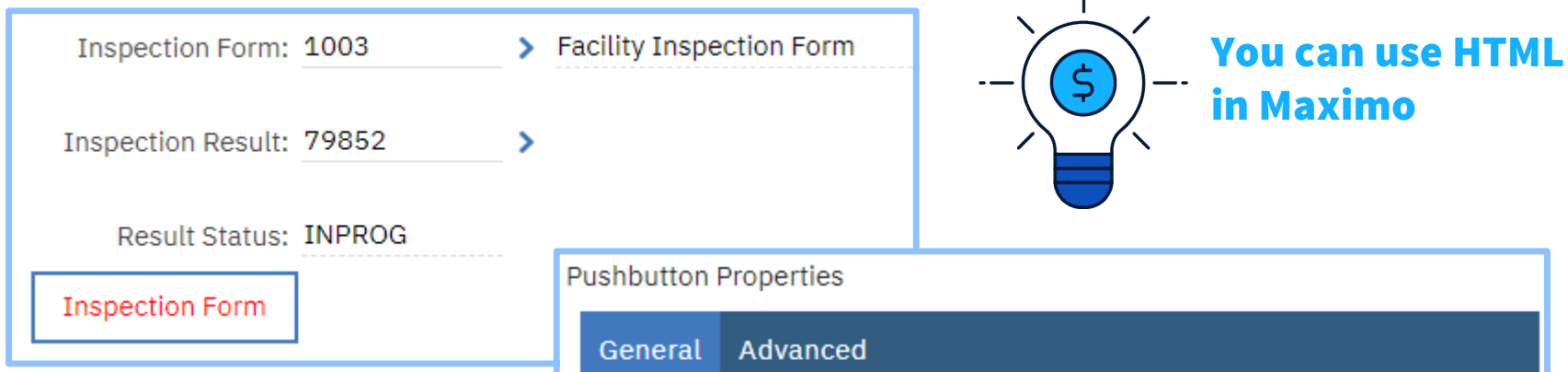




Integration into Maximo



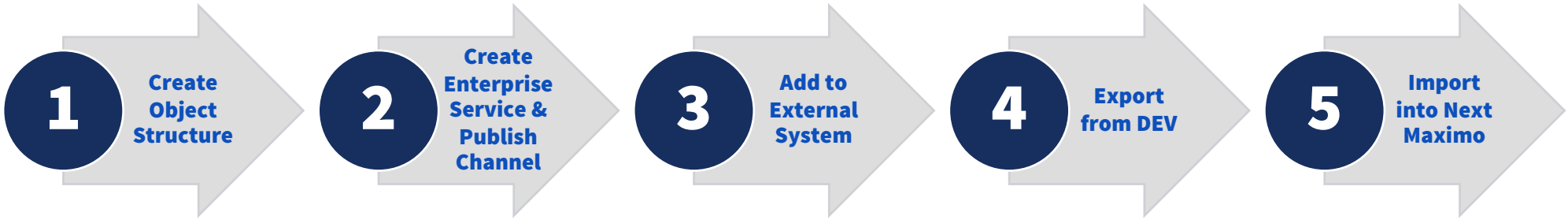
Integration into Maximo



You can use HTML Tags in labels in Maximo

Migration of Inspection Forms

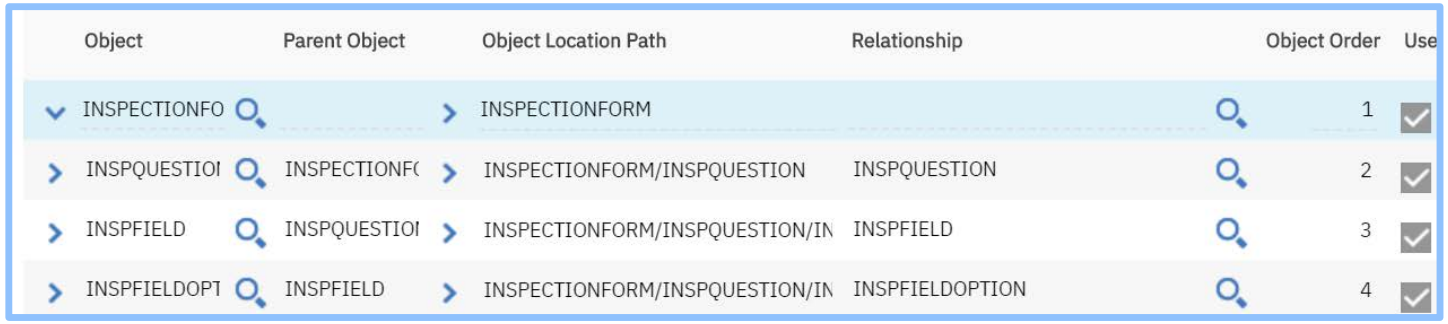
On a recent project, we needed to move the Inspections forms that were created in the DEV environment into the PROD Maximo system. With over 500 questions in the form, it was *NOT* desirable to manually input the form into each Maximo en route to production.



Migration of Inspection Forms

1

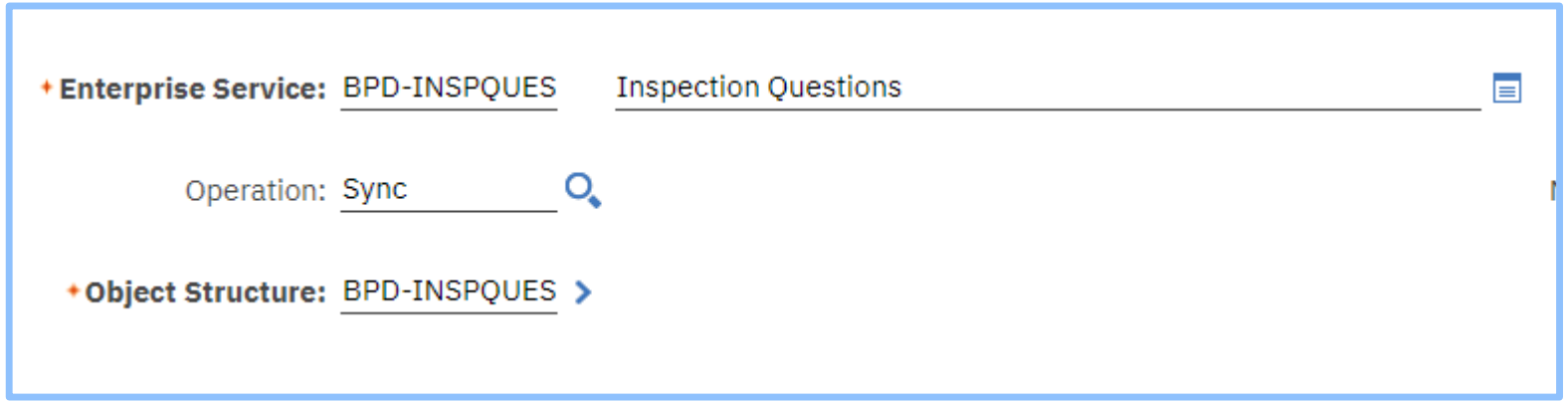
Create Object Structure
BPD-INSPQUESTIONS
Four Objects:
INSPECTIONFORM
INSPQUESTION
INSPFIELD
INSPFIELDOPTION

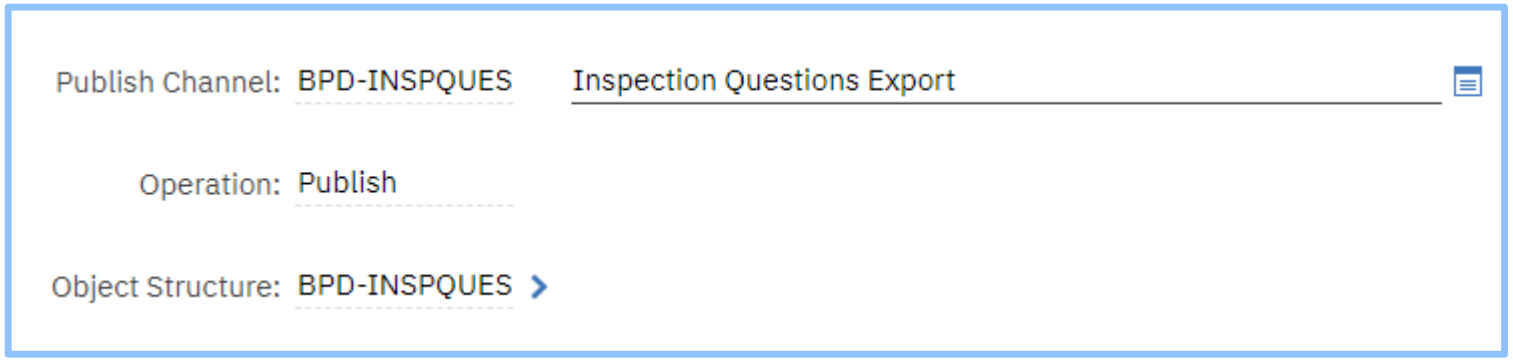


Migration of Inspection Forms

2

Create Enterprise Service and Publish Channel

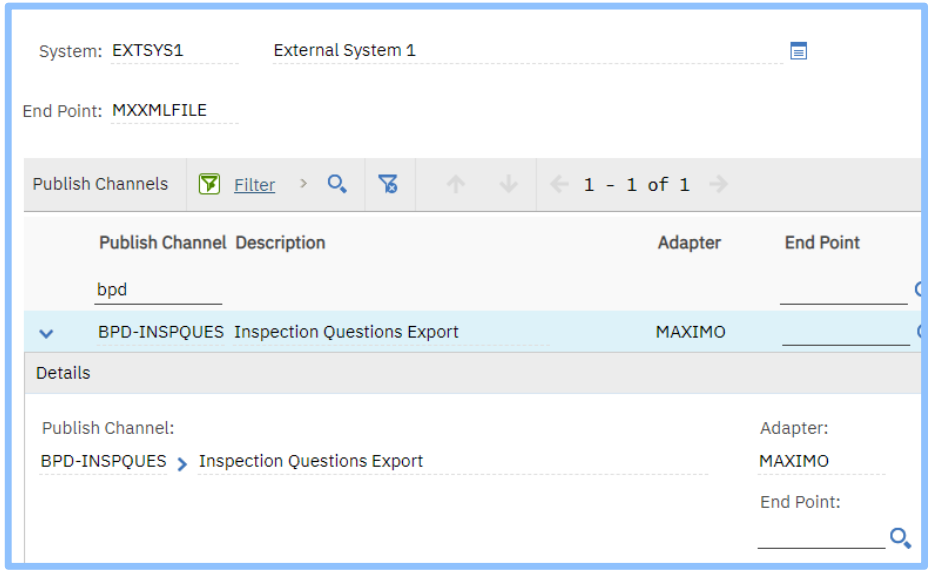


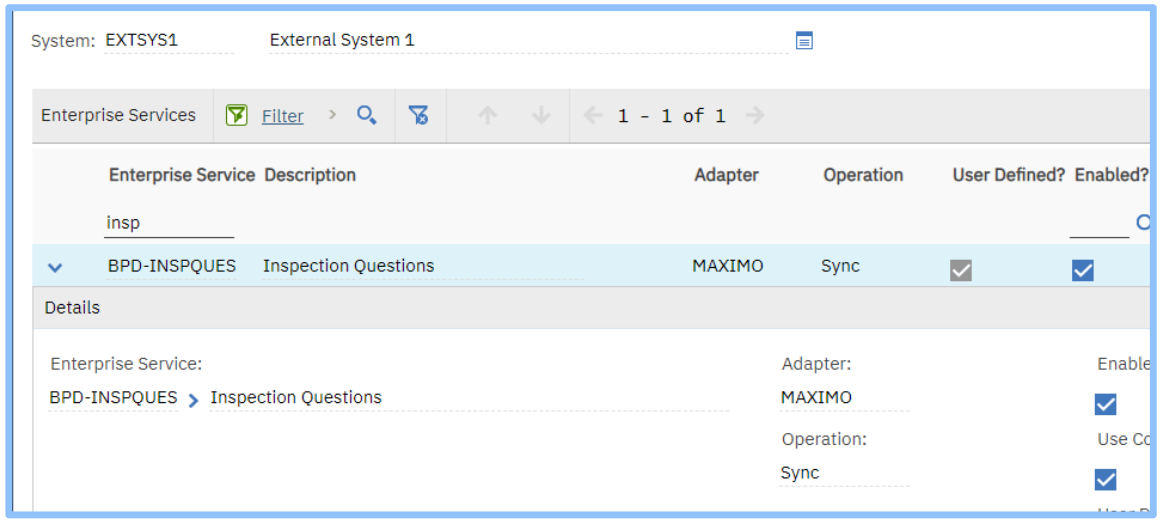


Migration of Inspection Forms

3

Add to External System EXTSYS1





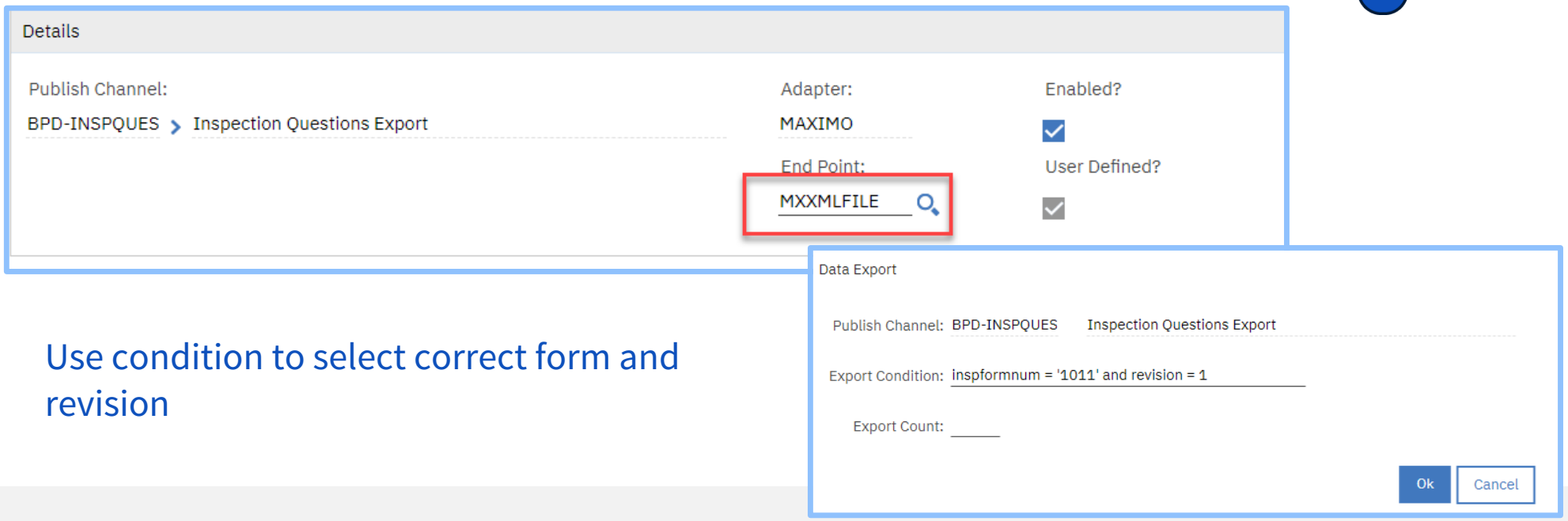
Make sure to click ENABLED for both

Migration of Inspection Forms

4

Export from Development

You need to select an endpoint



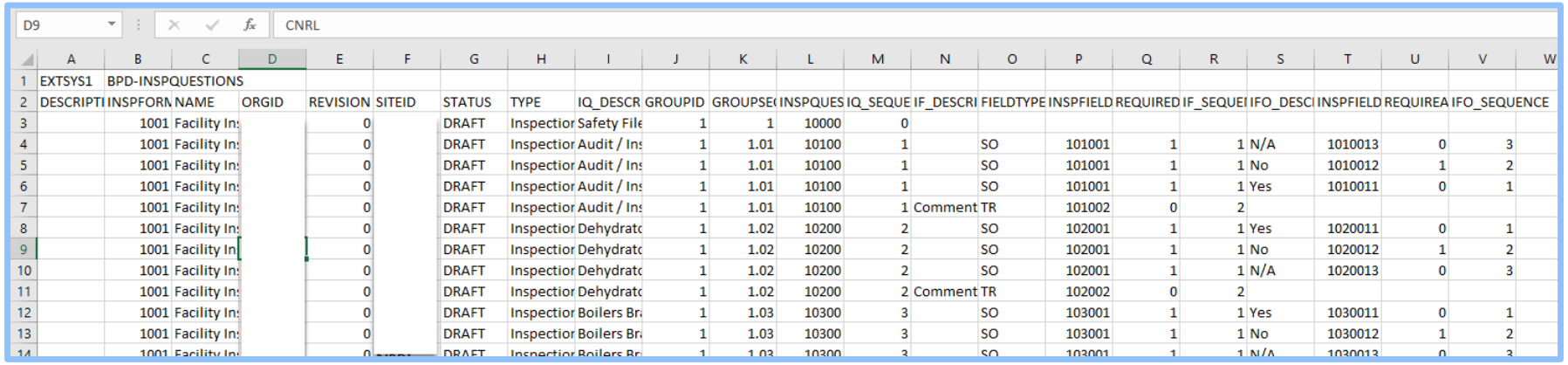
Use condition to select correct form and revision

Migration of Inspection Forms

4

Once export is completed, the flat file will be in the folder associated with the endpoint. This folder will reside on the Maximo Server.

Export from Development



D9 CNRL

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	EXTSYS1	BPD-INSPQUESTIONS																					
2	DESCRIPTI	INSPFORM	NAME	ORGID	REVISION	SITEID	STATUS	TYPE	IQ_DESCR	GROUPID	GROUPSEC	INSPQUES	IQ_SEQUE	IF_DESCRI	FIELDTYPE	INSPFIELD	REQUIRED	IF_SEQUEI	IFO_DESCI	INSPFIELD	REQUIREA	IFO_SEQUENCE	
3		1001	Facility In		0		DRAFT	Inspectior	Safety File	1	1	10000	0										
4		1001	Facility In		0		DRAFT	Inspectior	Audit / Ins	1	1.01	10100	1		SO	101001	1	1	N/A	1010013	0	3	
5		1001	Facility In		0		DRAFT	Inspectior	Audit / Ins	1	1.01	10100	1		SO	101001	1	1	No	1010012	1	2	
6		1001	Facility In		0		DRAFT	Inspectior	Audit / Ins	1	1.01	10100	1		SO	101001	1	1	Yes	1010011	0	1	
7		1001	Facility In		0		DRAFT	Inspectior	Audit / Ins	1	1.01	10100	1	Comment	TR	101002	0	2					
8		1001	Facility In		0		DRAFT	Inspectior	Dehydratc	1	1.02	10200	2		SO	102001	1	1	Yes	1020011	0	1	
9		1001	Facility In		0		DRAFT	Inspectior	Dehydratc	1	1.02	10200	2		SO	102001	1	1	No	1020012	1	2	
10		1001	Facility In		0		DRAFT	Inspectior	Dehydratc	1	1.02	10200	2		SO	102001	1	1	N/A	1020013	0	3	
11		1001	Facility In		0		DRAFT	Inspectior	Dehydratc	1	1.02	10200	2	Comment	TR	102002	0	2					
12		1001	Facility In		0		DRAFT	Inspectior	Boilers Br	1	1.03	10300	3		SO	103001	1	1	Yes	1030011	0	1	
13		1001	Facility In		0		DRAFT	Inspectior	Boilers Br	1	1.03	10300	3		SO	103001	1	1	No	1030012	1	2	
14		1001	Facility In		0		DRAFT	Inspectior	Boilers Br	1	1.03	10300	3		SO	103001	1	1	N/A	1030013	0	3	

Note: Not all of the exported columns of data will be needed, many will contain null data and the columns can be deleted.

Migration of Inspection Forms

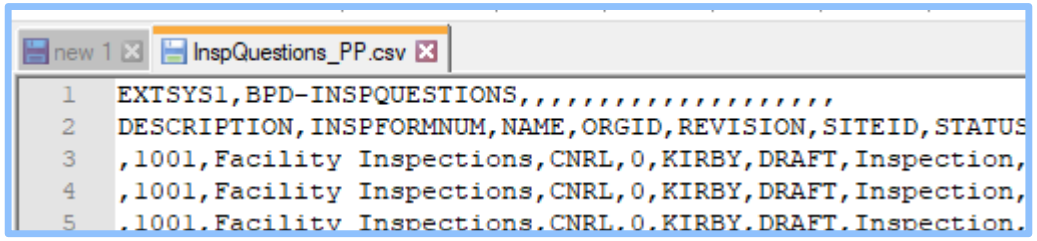
5

Import into Next Maximo

Edit the .CSV file which was created by the export to delete unneeded columns.

Once you have edited the .CSV with excel, you need to be sure to save it as a .CSV file again.

Then you need to edit it with a text editor such as NOTEPAD or NOTEPAD++ to remove characters on the first line.



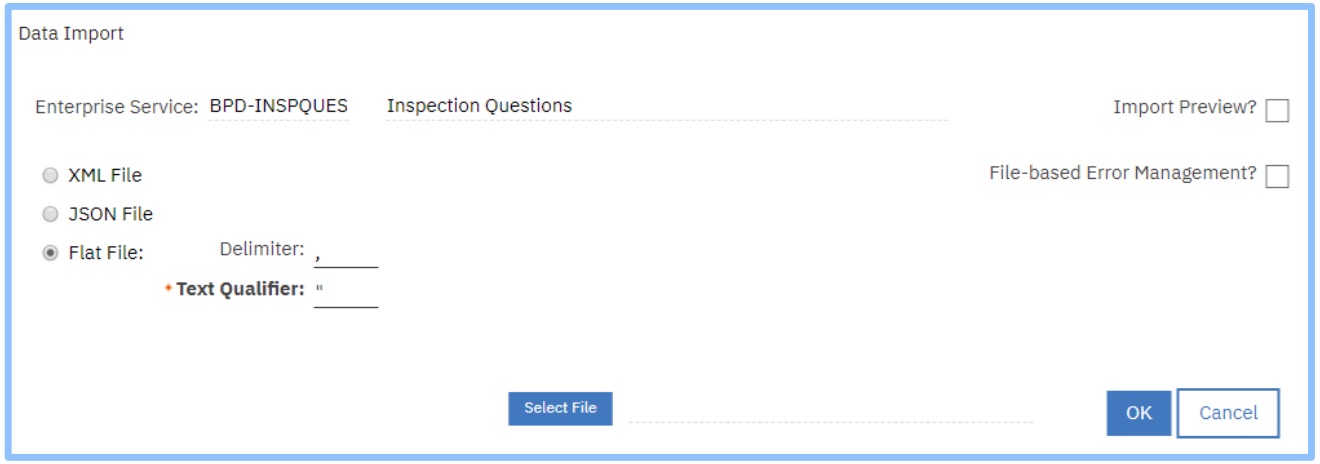
You need to delete all of the commas on the first line after the BPD-INSPQUESTIONS then save the file before attempting to import into another Maximo System.

If you do not do this, the file will cause an error when you try to import it.

Migration of Inspection Forms

5

Import into Next Maximo



Once the file is prepared and saved, you can then import it using the Data Import functions of extsys1.

You can do an import preview first if you want to ensure there will be no errors.

If you do the import, you can then check the Message Reprocessing Queue to ensure that none of the records caused an error to occur.

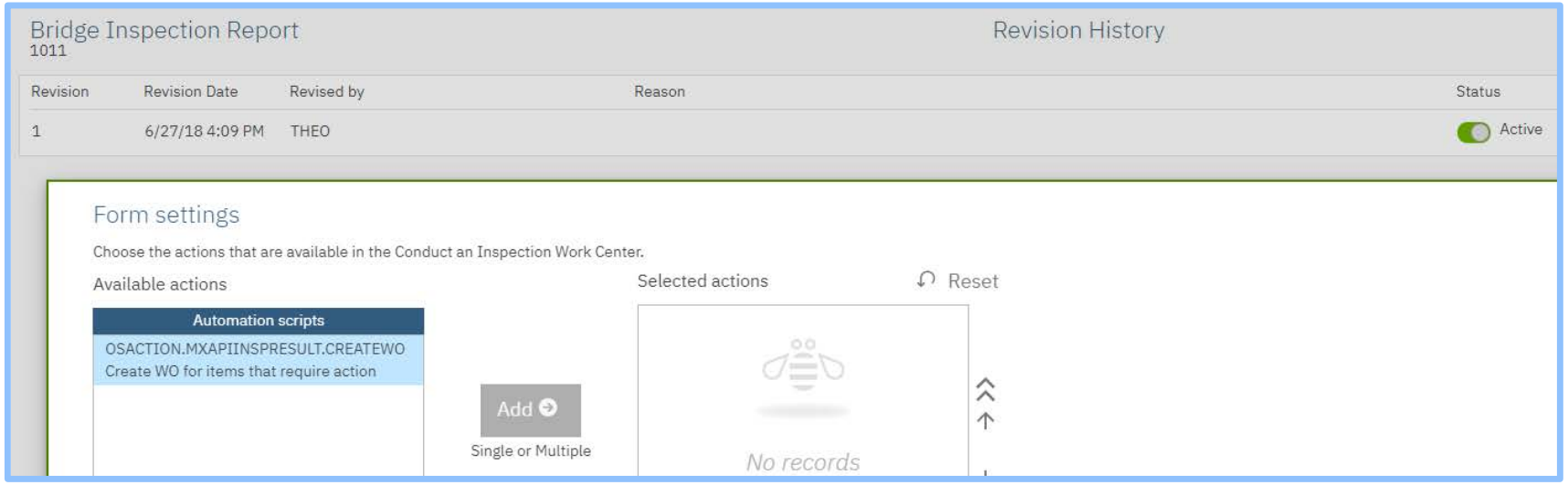
Migration of Inspection Forms

During development, it may become necessary to delete an Inspection Form and any results associated with that form. Here is the SQL to do just that! You need the form number and revision that you wish to delete.

```
delete from inspfieldresult where inspformnum = '1001';
delete from inspresultstatus where resultnum in (select resultnum from inspectionresult where
inspformnum = '1001');
delete from inspectionresult where  inspformnum = '1001';
delete from inspfield where inspformnum = '1001' and revision = 2;
delete from inspfieldoption where inspformnum = '1001' and revision = 2;
delete from inspfield where inspformnum = '1001' and revision = 2;
delete from inspformscript where inspformnum = '1001' and revision = 2;
delete from inspquestion where inspformnum = '1001' and revision = 2;
delete from inspectionformstatus where inspformnum = '1001' and revision = 2;
delete from inspectionform where inspformnum = '1001' and revision = 2;

commit;
```

Migration of Inspection Forms

Once the form is loaded into Maximo, it is necessary to update the form settings to chose the automation script to generate Work Orders for failed questions. This cannot be done for an active form, so you will need to revise the form if only to select the automation script.



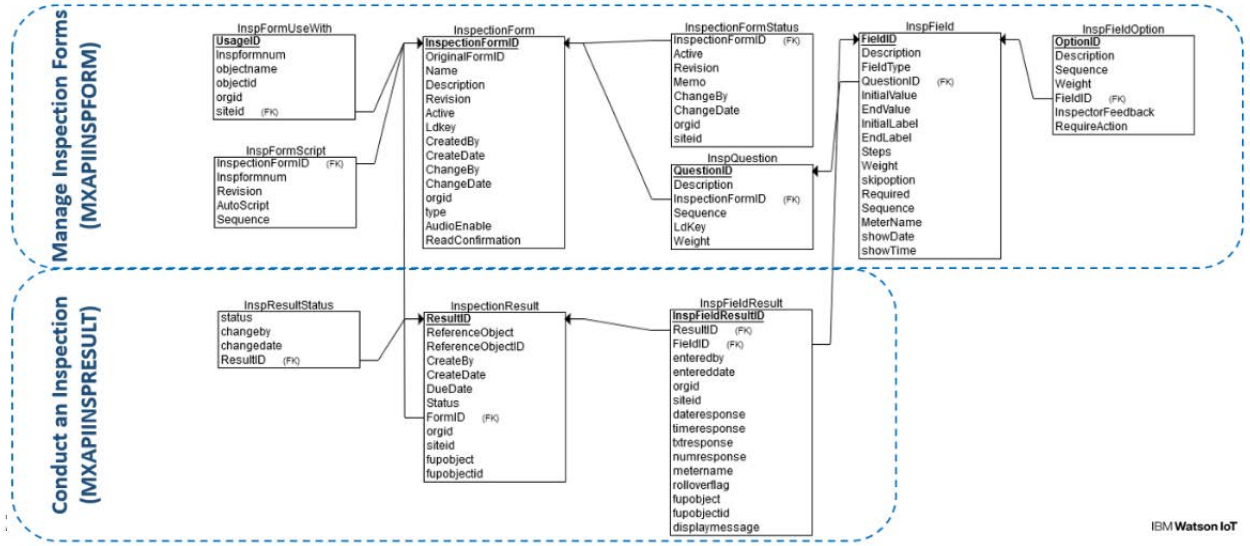
Creation of Forms Using MIF

You can use this export/import feature of the MIF and the same object structures to create a new form in the same Maximo. You just need to edit the exported data, select a new form number, description, revision and make sure all records are populated with this new information.

You can also modify/add/remove questions before doing the import.

This would allow you to create a new form with potentially hundreds of questions in a fraction of the time it would take to manually create it.

Inspection Database Tables



This is a high-level entity relationship diagram comes from IBM (link below).

Each form can have one or many questions.

Each question can have one or many Fields.

Each field can have one or many Field options depending on the type of Field.

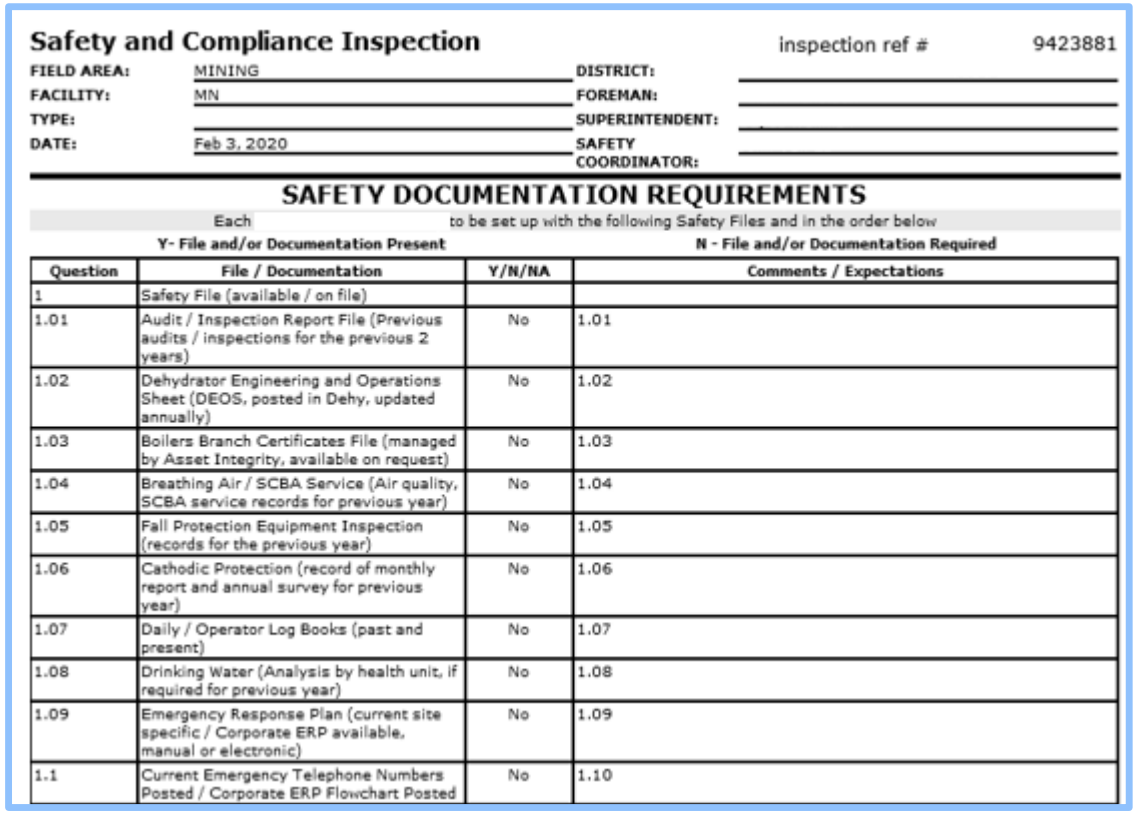
https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/02db2a84-fc66-4667-b760-54e495526ec1/page/Entity%20Relationship%20model%20for%20Inspection%20apps

Inspection Database Tables

Sample SQL to extract an Inspection Result from the system:

```
select inspectionresult.resultnum, inspectionresult.createdate, inspectionresult.createdby, inspectionresult.asset,
inspectionresult.location, inspectionresult.status, inspectionform.name, inspectionform.revision, inspquestion.groupseq,
inspquestion.description as description_question, inspfield.description as description_field, inspfield.inspformnum,
inspfield.inspquestionnum, inspfield.inspfieldnum, inspectionform.orgid,
inspfieldresult.txtresponse
from
inspquestion, inspectionresult, inspectionform, inspfield, inspfieldresult
where
inspectionresult.inspformnum = inspectionform.inspformnum and inspectionresult.revision = inspectionform.revision
and inspectionresult.orgid = inspectionform.orgid
and inspectionform.inspformnum = inspquestion.inspformnum
and inspectionform.orgid = inspquestion.orgid and inspectionform.revision=inspquestion.revision
and inspquestion.inspquestionnum = inspfield.inspquestionnum
and inspfieldresult.RESULTNUM = inspectionresult.resultnum and inspfieldresult.INSPQUESTIONNUM = inspfield.INSPQUESTIONNUM
and inspectionform.inspformnum = inspfield.inspformnum and inspectionform.orgid = inspfield.orgid
and inspectionform.revision=inspfield.revision
and inspectionresult.resultnum = 1007
order by groupseq;
```

Inspection Result Report



Safety and Compliance Inspection inspection ref # 9423881

FIELD AREA:	MINING	**DISTRICT:**	
FACILITY:	MN	**FOREMAN:**	
TYPE:		**SUPERINTENDENT:**	
DATE:	Feb 3, 2020	**SAFETY COORDINATOR:**	

SAFETY DOCUMENTATION REQUIREMENTS

Each to be set up with the following Safety Files and in the order below

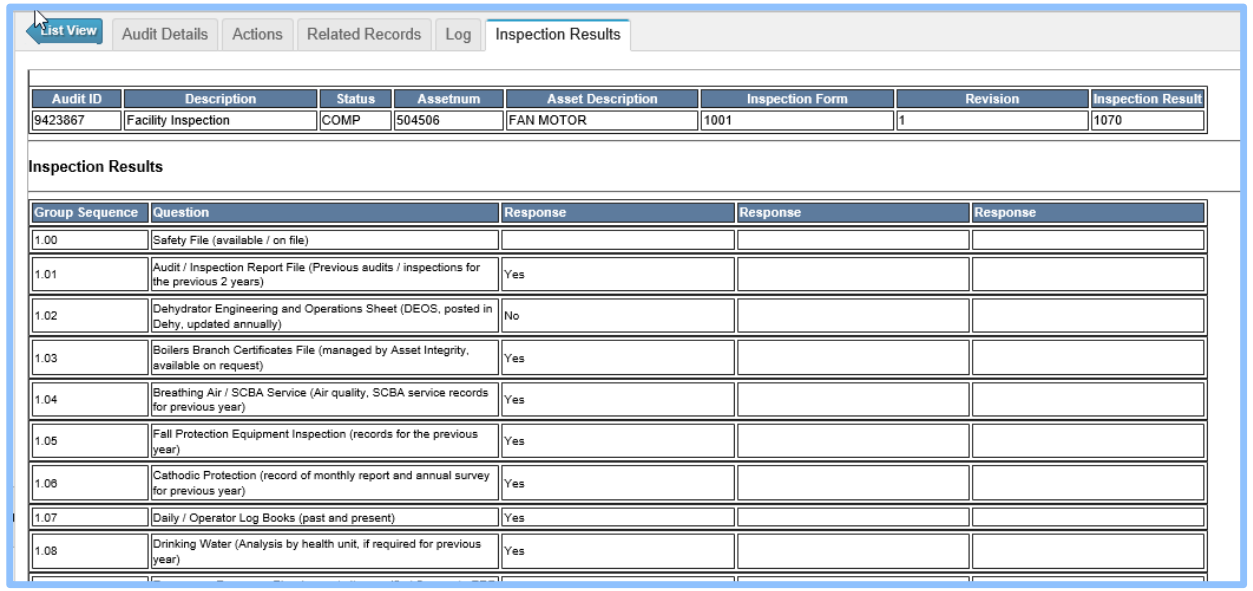
Y- File and/or Documentation Present **N - File and/or Documentation Required**

Question	File / Documentation	Y/N/NA	Comments / Expectations
1	Safety File (available / on file)		
1.01	Audit / Inspection Report File (Previous audits / inspections for the previous 2 years)	No	1.01
1.02	Dehydrator Engineering and Operations Sheet (DEOS, posted in Dehy, updated annually)	No	1.02
1.03	Boilers Branch Certificates File (managed by Asset Integrity, available on request)	No	1.03
1.04	Breathing Air / SCBA Service (Air quality, SCBA service records for previous year)	No	1.04
1.05	Fall Protection Equipment Inspection (records for the previous year)	No	1.05
1.06	Cathodic Protection (record of monthly report and annual survey for previous year)	No	1.06
1.07	Daily / Operator Log Books (past and present)	No	1.07
1.08	Drinking Water (Analysis by health unit, if required for previous year)	No	1.08
1.09	Emergency Response Plan (current site specific / Corporate ERP available, manual or electronic)	No	1.09
1.1	Current Emergency Telephone Numbers Posted / Corporate ERP Flowchart Posted	No	1.10

Sample BIRT Report created for recent Inspection project.

This is a detailed report that can be run by users for a specific Inspection Work Order.

Inspection Result Report



Audit ID	Description	Status	Assetnum	Asset Description	Inspection Form	Revision	Inspection Result
9423867	Facility Inspection	COMP	504506	FAN MOTOR	1001	1	1070

Inspection Results

Group Sequence	Question	Response	Response	Response
1.00	Safety File (available / on file)			
1.01	Audit / Inspection Report File (Previous audits / inspections for the previous 2 years)	Yes		
1.02	Dehydrator Engineering and Operations Sheet (DEOS, posted in Dehy, updated annually)	No		
1.03	Boilers Branch Certificates File (managed by Asset Integrity, available on request)	Yes		
1.04	Breathing Air / SCBA Service (Air quality, SCBA service records for previous year)	Yes		
1.05	Fall Protection Equipment Inspection (records for the previous year)	Yes		
1.06	Cathodic Protection (record of monthly report and annual survey for previous year)	Yes		
1.07	Daily / Operator Log Books (past and present)	Yes		
1.08	Drinking Water (Analysis by health unit, if required for previous year)	Yes		

It is also possible to add a tab to the Work Order application to display Inspection results in real-time to the end user.

This allows the user to view the Inspection results for the Work Order, without having to navigate to the Inspection Work Center.

Detailed instructions to implement this solution can be provided! Contact BPD Zenith for instructions.

Synchronize WOs and Inspections

There are a few synchronization points that might be required for Work Orders and Inspections.

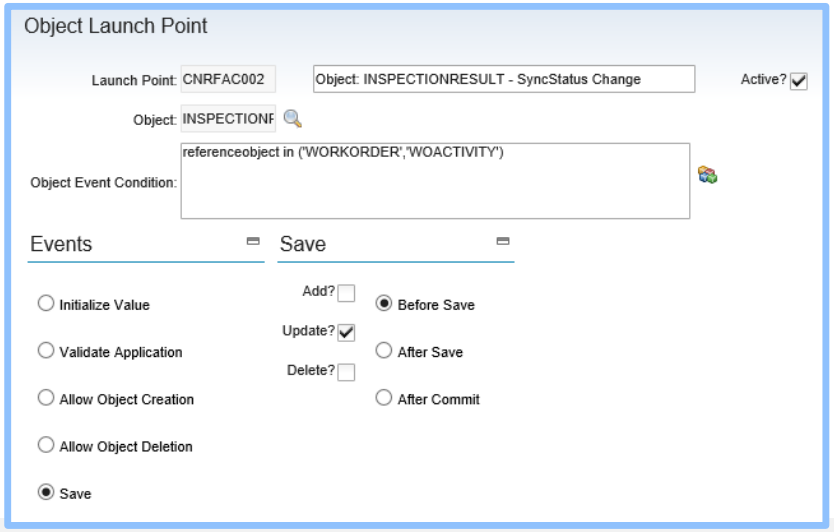
1. Once an Inspection is completed you might want the Work Order to also have a *Completed* status.
2. Once the Inspection is set to *In Progress*, you might wish the Work Order to also be set to *In Progress*.
3. If the Location or Asset changes on the Work Order, you might wish the Inspection to be updated with the new Location/Asset information.

Synchronize WOs and Inspections

```
from psdi.server import MXServer
from psdi.mbo import MboConstants

woSet = mbo.getMboSet("WORKORDER") ;
wo = woSet.getMbo(0) ;

# do not set to INPRG to allow location changes
#if mbo.getString("STATUS") == "INPROG" and wo.getString("STATUS") !="INPRG" and wo.getString("STATUS") !="COMP" :
#  wo.changeStatus("INPRG", MXServer.getMXServer().getDate(), "auto updated based on Inspection Result", MboConstants.NOACCESSCHECK)

if mbo.getString("STATUS") == "COMPLETED" and wo.getString("STATUS") != "COMP" :
  wo.changeStatus("COMP", MXServer.getMXServer().getDate(), "auto updated based on Inspection Result", MboConstants.NOACCESSCHECK)
```

Automation script for the INSPECTIONRESULT Object.

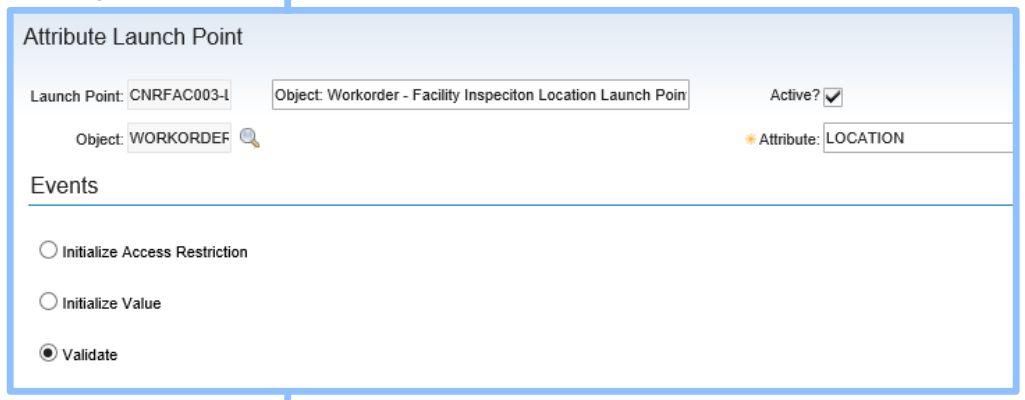
Launchpoint only runs for Inspections related to Work Orders or activities.



Synchronize WOs and Inspections

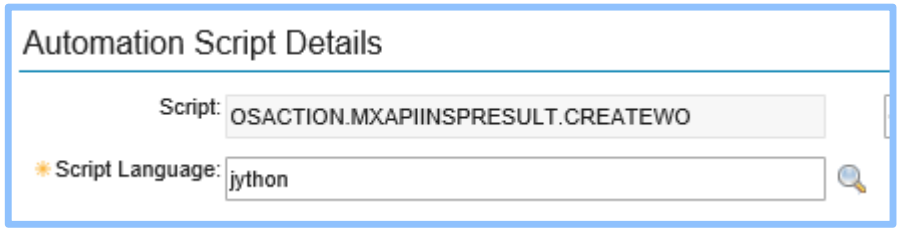
Source Code:

```
    Created by: Stephen Hume

    This script performs the following functions:
        - If this is a facility inspection work order and the location changes update the inspection and inspection results
"""
# Imports
from psdi.app.common import DateUtility
from psdi.mbo import MboConstants
from psdi.server import MXServer

# Initialise variables
attributename = mbovalue.getName()

if attributename == "LOCATION" and mbo.getString("WORKTYPE") == "FI":
  locn = mbo.getString("LOCATION")
  asst = mbo.getString("ASSETNUM")
  inspresultSet = mbo.getMboSet("INSPECTIONRESULT")
  inspresult = inspresultSet.getMbo(0)

  if locn is not None and inspresult is not None:
        inspresult.setValue("LOCATION",locn,MboConstants.NOACTION and MboConstants.NOACCESSCHECK)
        inspresult.setValue("ASSET",asst,MboConstants.NOACTION and MboConstants.NOACCESSCHECK)
```



Automation script for the workorder location attribute.
If the Location changes, the Location and Asset for the Inspection will be updated.
Once the Inspection is completed, the Work Order is also set to COMP status so Location can no longer be changed.

Understand the Script to Create WOs



For Maximo version 7.6.0 and up, IBM provides an automation script which will generate Work Orders or Tasks when Inspection Questions are identified as requiring action.

```
print "=============== EXECUTING CREATE WO SCRIPT ===============";
planned = False;
if (mbo.getString("REFERENCEOBJECT")=="WORKORDER" or  mbo.getString("REFERENCEOBJECT")=="WOACTI
 planned = True;
else:
 planned = False;
# iterate through the responses
resultSet = mbo.getMboSet("INSPFIELDRESULT");
for i in range(0,resultSet.count()):
 currentResult = resultSet.getMbo(i);
 # on the current response, check if it requires action (relationship INSPFIELDRESULTACT search
 requireActionSet = currentResult.getMboSet("INSPFIELDOPTIONACT");
 requireAction=False;
 if requireActionSet.count()>0:
  requireAction=True;
 if requireAction:
```

The out-of-the-box script may require some modifications, depending on business rules and automation script standards.

Understand the Script to Create WOs

The key thing to understand is that the automation script is written to create a single Work Order with a task for each Failed Inspection Question (which requires an action) for Unplanned Inspections.

The Work Orders that are created for Planned Inspections will be considered follow-up Work Orders for the original WO that was linked to the Inspection.

For Unplanned Inspections, the script will create a single Work Order, with a Task for each Inspection Question which requires an action.

Understand the Script to Create WOs

This was modified for one client to do the following:

Instead of creating Work Orders or tasks for as follow-up, they wanted the script to create action tracking records instead (PLUSGACT), and to create a separate action record for each Inspection Question that requires an action.

They are not planning to allow Unplanned Inspections, however the script was modified to also create individual action records instead of a single Work Order with multiple tasks.

If you would like to see an example of the fully modified automation script, let us know

Inspection Result Tab

This was already covered in the Reporting section of this presentation.

The image to the left is a screenshot from a custom application which has been created at one of our clients (by themselves) to allow viewing of all Inspection results.

Performance Guidelines & Best Practice

If your Inspection forms have 100 + questions, then performance may become an issue.

There are a few things you can do to mitigate these issues:

1. The IBM team is always working on improving the performance of the Inspection Work Center. There are several patches available that will improve the load time for an Inspection form and improve the response time when working with the Forms Designer.

Be sure to contact IBM or your partner to receive these patches.

Performance Guidelines & Best Practice

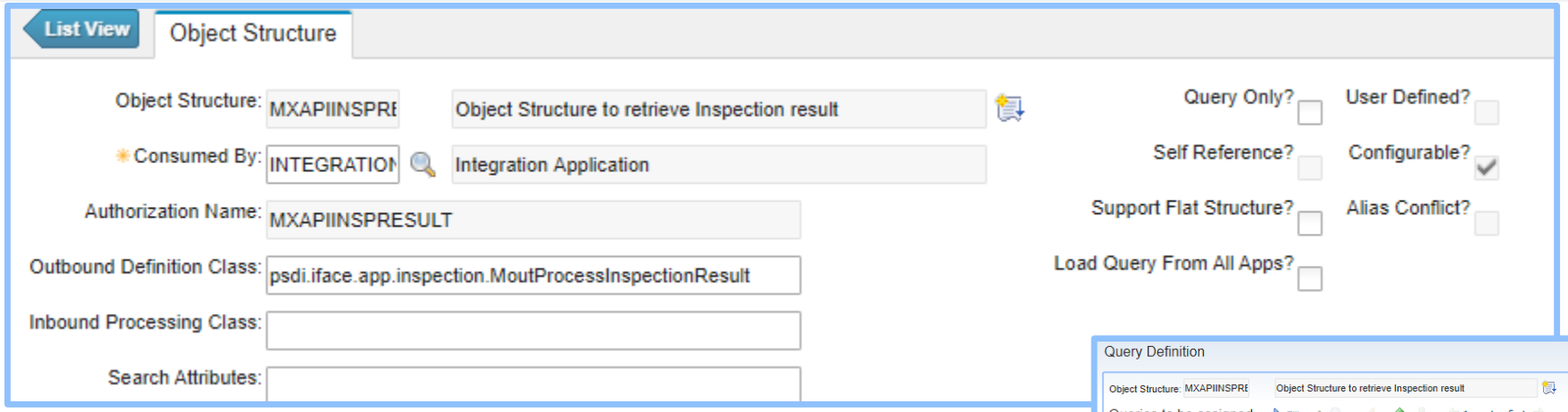
2. The second thing you can do is to modify the Query used when a person first connects to the Inspection Work Center to conduct an Inspection.

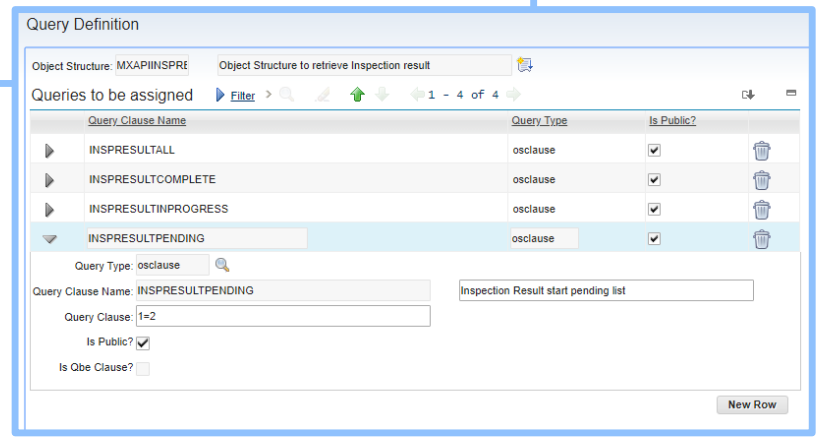
Even if they have navigated from a Work Order to conduct or view an Inspection, the user is first taken through the Inspection portal which lists all the Pending Inspections. This list can take some time to load.

If you have an impatient user, you risk them clicking on one of the Pending Inspections instead of waiting for their specific Inspection to load.

In order to get around this, you can modify the Query that is used to display no Pending Inspections.

Performance Guidelines & Best Practice





Go to the MXAPIINSPRESULT Object Structure then select Query Definition.
Expand the query for INSPRESULTPENDING and change the Query Clause to 1=2

That way, no Inspections will be displayed when the user connects to the Inspection Work Center and there is no risk they will click on one inadvertently.

Link Inspections to Receiving

IBM has provided information about how to link the Inspections Work Center to Inventory Receipts.

Here is a link to that information:

https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/02db2a84-fc66-4667-b760-54e495526ec1/page/d94bd6fb-c479-47b9-aa7d-e6b02e14cfa7/version/0437e274-caa4-4f9d-ac73-443179f499a9

IBM Maximo Inspections Roadmap

Vinicius Garmatz from IBM will now provide a sneak peek into the IBM Roadmap for the Inspections Work Center.

THANK YOU

For attending the first-ever MaxTEACH Session.

Stephen Hume

stephen.hume@bpdzenith.com

+1 (403) 464-5779

Vinicius Garmatz

vgarmatz@br.ibm.com

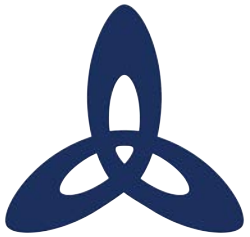
Join the MaxTECH community on Linked In

MAXTECH

THANK YOU!

Thank you for attending the first ever MaxTEACH Session on Maximo Inspections.

MAXTECH



Ask us a technical question:

maxtech@bpdzenith.com

www.bpdzenith.com/maxtech

MaxTECH is the first ever dedicated Maximo Technical User Group aimed at Maximo Administrators, Developers and Technical Support staff.

It is a great place for users to ask and answer technical questions, learn from each other, collaborate and help improve Maximo in your organization.

MaxTECH was founded in 2017 by BPD Zenith and is chaired by Maximo Consultant Stephen Hume. We host several events every year (Calgary, St. Louis, MaximoWorld, Houston, MUWG, Northern California MUG, Maximo UK & Ireland User Group) including digital events.

MaxTEACH is a free online user group designed to go in depth into a Maximo topic.

CONTACT US

Stephen Hume

stephen.hume@bpdzenith.com

+1 (403) 464-5779

Vinicius Garmatz

vgarmatz@br.ibm.com

Join the MaxTECH community on Linked In

MAXTECH