



PNMsoft Knowledge Base

Sequence Admin Guides

Sequence 6 to 7 Upgrade

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Product Version 7.0 and above

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Gold Application Development

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General Document Information

Purpose

The purpose of this document is to describe the best practices for upgrading Sequence 6 to Sequence 7.

Prerequisites

- You should be a Sequence Administrator.
- You should have access to the servers on which Sequence is installed.

Introduction

This document describes how to upgrade from Sequence 6.x to 7.x.

As in any Sequence upgrade, if in the original installation the install wizard created the database, then the upgrade wizard will also upgrade the database.

However, if the database was created manually (by running scripts), then the upgrade wizard will not touch the database, and the database will need to be upgraded manually (by running scripts).

More specifically, this document details the steps to upgrade from version 6.4.4 to 7.7 where the database is upgraded by using scripts.

This document also contains known issues and available solutions.

For more details about Sequence 7.x (such as minimum HW/SW requirements, required accounts, etc.), please refer to the [Sequence 7.x Installation Guide](#).

Important notes:


- Please review the Release Notes for each version released to learn about its features and breaking changes (see: <http://members.pnmsoft.com/Downloads/SitePages/Home.aspx>).
- It is recommended to trial this procedure on a system with a copy of the database from the Production environment.
- When upgrading the database, execution times may vary according to database size.

Upgrade Overview

The upgrade is required for the product (application and database), and in some cases, adjustments to the workflows are required as well.

Product Upgrade Path

Depending on the version currently installed, the qualified upgrade path is:

			
Lower than 6.4.4	6.4.4	7.0	7.1 – 7.3
		7.4	Higher than 7.4

For example, if the current version is 6.3.3, and it needs to be upgraded to 7.7, then it must be upgraded first to 6.4.4, then to 7.4 and then to 7.7.

Note:

- If upgrading from a version earlier than 6.4.4, then the system must be upgraded to 6.4.4 before continuing to version 7.
- Ideally, the application and the database should be upgraded side by side, so the system can be checked after each upgrade:
 - Check that the runtime loads well.
 - Check that the administration site loads well.
 - Check that workflows can be created.
- It is possible (though less recommended) to upgrade the database by scripts (from 6.x to 7.x) and then point a newly installed system to it. In such a scenario, make sure that any custom code is also imported to the new system.

Product Upgrade Stages

Assuming 6.4.4 is installed and in a healthy state, the basic stages are:

1. Pre-upgrade steps
2. Upgrade to 7.4
3. Post 7.4 steps
4. Upgrade to the latest version available
5. Post upgrade steps

Workflows Adjustments

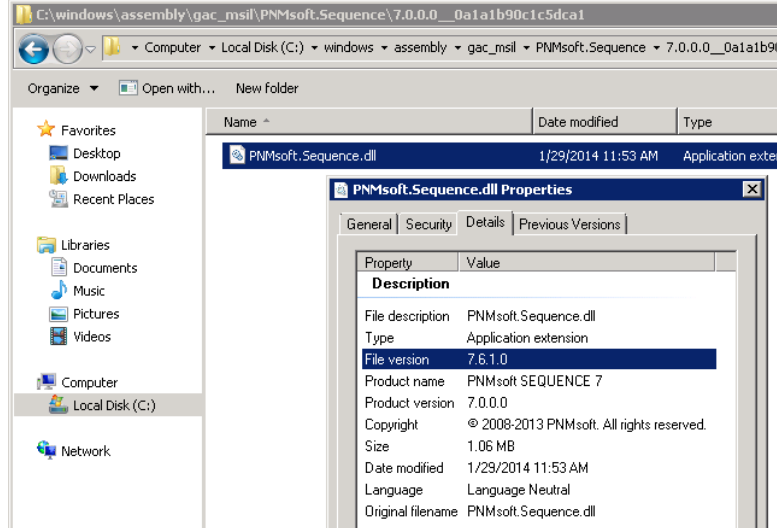
1. Fix database references.
2. Set social features.
3. Amend variables/activities with non-alphanumeric characters.

Pre-Upgrade Steps

1. Download and stage the upgrade files:
 - Upgrade to 7.4
 - <http://members.pnmsoft.com/Downloads/Sequence%20Downloads%20Library/Product/7.4.0/Sequence%207.4.0%20Setup.zip>
 - <http://members.pnmsoft.com/Downloads/Sequence%20Downloads%20Library/Product/7.4.0/Sequence%207.4.0%20DB%20Scripts.zip>
 - Workflow diagram layout fix
 - <http://members.pnmsoft.com/Downloads/Sequence%20Downloads%20Library/Tools%20and%20Addons/TwipsToPixelsConverter.zip>
 - Script to convert tblAddRecord to tblDataModels
 - <http://members.pnmsoft.com/Downloads/Sequence%20Downloads%20Library/Tools%20and%20Addons/ConvertAddRecordsToDataModels.zip>
 - Additional database scripts
 - http://members.pnmsoft.com/Downloads/Sequence%20Downloads%20Library/Tools%20and%20Addons/AdditionalDatabaseUpgradeScripts_6to7.zip
2. Perform the pre-installation steps in the [Sequence 7.x Installation Guide](#):
 - a. Check minimum requirements for hardware and software.
 - b. Check that you have all the required user accounts and passwords.
 - c. If possible, it is recommended to use the original installing account as the upgrading account.
3. Back up the system:
 - a. Copy the Administration site config file.
 - b. Copy the Flowtime site config file.
 - c. Copy the folder 'C:\Program Files\PNMsoft\Shared Resources'.
 - d. Copy the BRS config
 - e. Copy the ADSS config
 - f. Back up the Sequence database
4. *Optional* – Delete unnecessary workflow instances:
 - a. It's recommended to do this on **non-production** environments (e.g. Dev / Test). The reason being, that there might be workflows that are under development, and their instances are still open (in a "pending" state) due to abandoned testing. The BRS service will attempt to redirect them, and may fail (due to workflow design issues). This behavior is expected on non-production environments.
 - b. In order to reduce errors, and to be sure that errors are related to the upgrade and not the design, we recommend to delete such instances.
 - c. To find such workflow instances, use (do this on **non-production** systems):

```
SELECT fldId FROM tblInstanceWorkflows WHERE fldStatus<3 -- get instances of open workflows
EXEC [dbo].[spRT_DeleteWorkflowInstance] @instanceId = 000 --'000' is the workflow instance id
```

5. Confirm that the application and database are on the same version:
 - a. Check the application dll file version:
 - i. Start > run... > C:\windows\assembly\gac_msil
 - ii. Drill down the folder "PNMsoft.Sequence" until you reach the dll file.
 - iii. Right-click and select **Properties> Details tab > File version.**



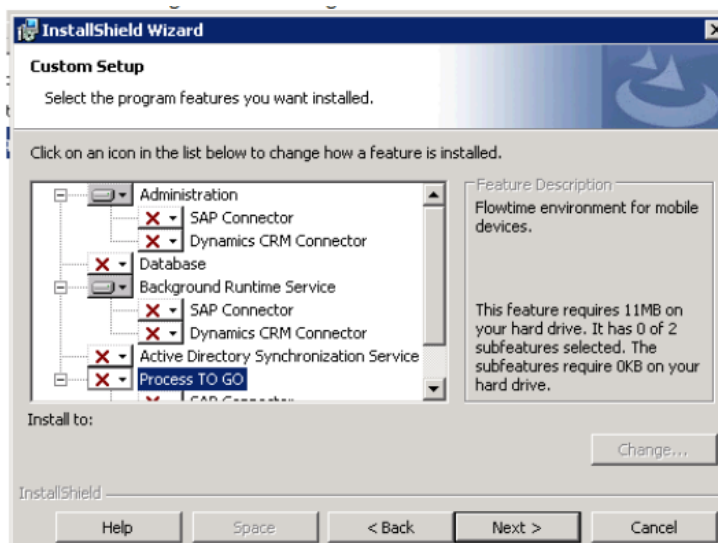
- b. Check the database version:

```
SELECT fldVersion FROM tblCompanyParam
```

- c. The File Version and the database version should be the same.

Upgrade to 7.4

1. Login to the server with the installer account.
2. Stop the BRS and ADSS services.
3. Run IISReset.
4. Run *SequenceKinetics7.4_Setup.exe* as an administrator.
 - a. Since this is an upgrade, most of the settings are populated automatically according to the original install settings.
 - b. In the *Custom Setup* screen, verify which components are installed.
 - c. If the Database feature is deselected (like below), this means that the database will need to be upgraded separately by using scripts.



- d. In the *Database Server* screen, verify that the correct database instance and login ID are selected (these will be used for the connection string in the config file).
 - e. In the *Create Application Pool* screen, verify that the application pool user information is correct.
 - f. In the *Windows Services Logon Information* screen, verify that the BRS/ADSS user information is correct.
 - g. In the *E-mail Settings* screen, verify that the details are correct.
5. In the *Setup Complete* screen, check the option to open the installation log, and save that log file for future reference.
6. Check that the application version is now 7.4.0.
7. If the database needs to be upgraded using scripts:
 - a. Unzip **AdditionalDatabaseUpgradeScripts_6to7.zip** and run the script
 - i. 0-Create GetStorageTime.sql
 - b. Unzip **Database Scripts-Upgrade.zip** and run the scripts in this order:
 - i. 0-Create GetStorageTime.sql (from AdditionalDatabaseUpgradeScripts_6to7.zip)
 - ii. UpgradeSynchronization.sql
 - iii. UpgradeSynchronization_Data.sql
8. Check that the database version is now 7.4.0


```
SELECT fldVersion FROM tblCompanyParam
```
9. Run IISReset.

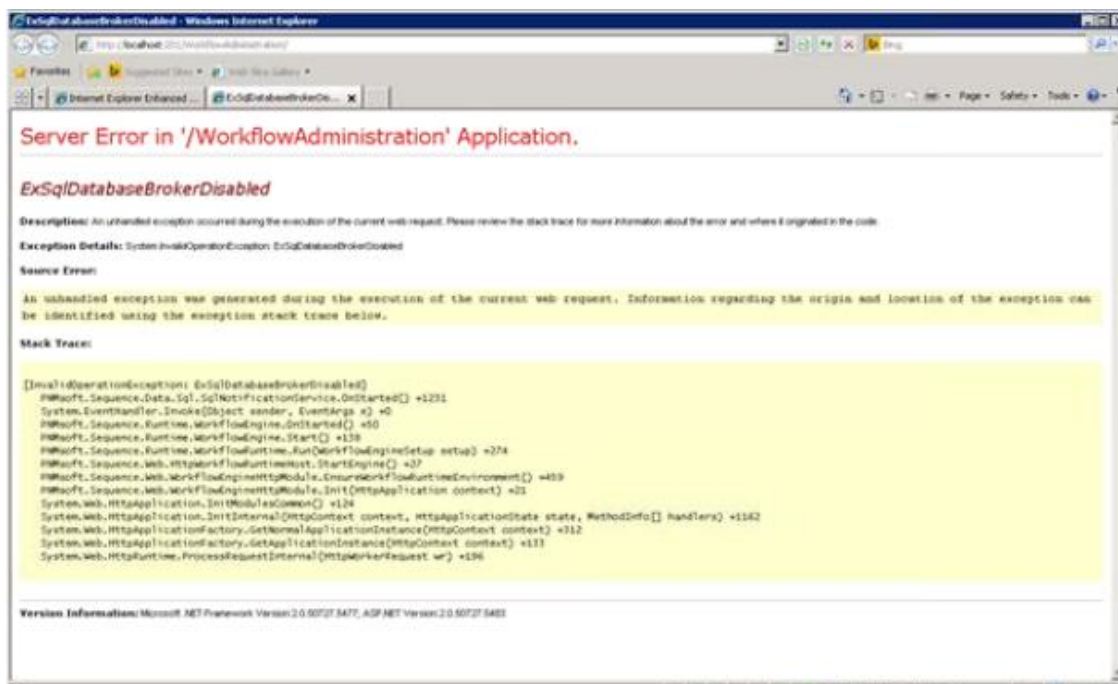
Upgrade to 7.4 – Post Steps

1. Check that the Administration site is loading.
2. If you receive an error, such as: “ExSqlDatabaseBrokerDisabled” (see example below), then:

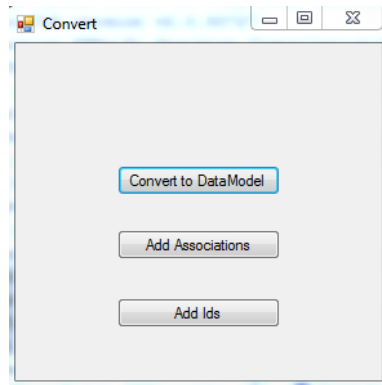
- a. run this SQL command to enable the data broker:

```
ALTER DATABASE SEQUENCE SET ENABLE_BROKER WITH ROLLBACK IMMEDIATE
```

- b. Run IISReset.



3. Browse the Administration site. It should display the existing workflows and general settings.
If it does not, check the config files and verify that the connection string is correct.
4. If the database was upgraded with scripts (not using the installer), run the tool:
ConvertAddRecordsToDataModels as follows:
 - a. Unzip **ConvertAddRecordsToDataModels.zip**
 - b. Backup the database.
 - c. Edit the connection string in the config file to point to the relevant database.
 - d. Run the tool executable.
 - i. Click “Convert to DataModel”, and wait for the completion message.
 - ii. Click “Add Associations”, and wait for the completion message.
 - iii. **DO NOT** click “Add IDs”.



Convert AddRecords to DataModels

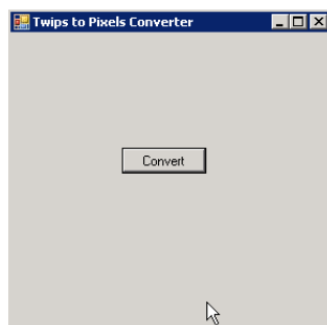
Note: See known issues (#10) for possible errors with this tool.

5. If the database was upgraded with scripts (not using the installer), run the tool **TwipsToPixelsConverter**. This tool is required to adjust the layout of the workflows to the new workflow designer (the App Studio).

CAUTION: This tool can only be run once. If it runs again, then the layout of the workflows is resized to an unusable state (all activities are piled on top of each other at the top-right corner).

Run the tool as follows:

- a. Unzip **TwipsToPixelsConverter.zip**
- b. **Back up** the Sequence database (a MUST).
- c. Edit the database connection string in the tool's config file, so it points to the relevant database.
- d. Open the exe file.
- e. Click the "convert" button once.
- f. Note: Currently the UI may be somewhat confusing - there is no indication of progress/success/failure.
It is recommended to open the profiler to monitor when this tool has completed its job. Usually it takes less than 2 minutes to complete (depending on the size of the database).
- g. Perform a check: open one of the existing workflows for editing. If the layout seems normal, then you're done. If the layout is shrunk, you need to restore the database and run the tool again.



Twips to Pixels Converter

6. Check the Flowtime site.

7. Start the BRS

a. Ensure that it registers correctly in the database:

```
select * from tblOnlineBRSInstances
```

8. Start the ADSS

a. Ensure that it registers correctly in the database:

```
select * from tblOnlineADSSInstances
```

9. Closed Instances Separator – in order to enhance the database archiving and performance abilities, Sequence7 uses dedicated tables for closed instances of workflows and activities.

By default, all closed instances are separated from the open instances and are moved to the “closed” table by the BRS in pre-defined times (the default is between 2am to 4am).

For large databases, it is recommended to run this separation as part of the upgrade procedure, so performance will not be compromised when the system is online.

Alternatively, set the start/end times to off-hours and increase the page size property:

```
<closedInstancesSeparator ... interval="5" pageSize="1000" startAt="02:00" stopAt="04:00" />
```

To move the closed instances to the closed tables now (may take a few hours):

- a. Stop the BRS service.
- b. Backup the database.
- c. *Optional* - check how many closed instances records would be moved after the upgrade.

```
SELECT COUNT(iw.fldId) FROM tblInstanceWorkflows iw
INNER JOIN tblInstanceActivities ia ON iw.fldId=ia.fldInstanceWfId
WHERE iw.fldStatus=3 -- get closed workflows+activities instances
```

- d. Backup the BRS config file.
- e. Open the BRS config file.
- f. Comment out all the listener threads under the node <builtinThreads> except for the “closedInstancesSeparator” thread.
- g. In the closedInstancesSeparator tag, clear the arguments for startAt and stopAt:

```
<closedInstancesSeparator ... interval="1" pageSize="100000" startAt="02:00"
stopAt="04:00" />
```

- h. Start the BRS service.
- i. The BRS should start the separation between open and closed instances.
- j. You may monitor its progress with the profiler tool.
- k. Once completed, put back the original config file and restart the BRS.

Upgrade to 7.7

1. Backup the files and database. Create a snapshot if possible.
2. Stop the BRS and ADSS services.
3. Run IISReset.
4. Run the upgrade .exe as administrator.
 - a. Continue as explained above for 7.4.
5. If the installer was set with the database feature deselected, then the upgrade scripts need to be run manually (in the order they are numbered).
6. Check that the application and database versions are now 7.7.0, using the administration portal
7. Run IISReset.

Upgrade to 7.7 – Post Steps

1. Check that the Administration site loads.
2. Check that Flowtime loads.
3. Start the BRS.
 - a. Ensure it registers correctly in the database:
4. Start the ADSS.
 - a. Make sure it registers correctly in the database:

```
select * from tblOnlineBRSInstances
```

```
select * from tblOnlineADSSInstances
```

Workflow Adjustments

1. Fix database references:

There are several major changes in the product database in version 7. Important changes are:

- The table `tblAddRecords` is converted to `tblDataModels`
- `tblLog` has more fields (captures more details about the process).
- Instance tables are separated to “open” and “closed” tables:

Remained from version 6	Added in version 7
<code>tblInstanceActivities</code>	<code>tblInstanceActivitiesClosed</code>
<code>tblInstanceActivitiesRollback</code>	<code>tblInstanceActivitiesRollbackClosed</code>
<code>tblInstanceWorkflows</code>	<code>tblInstanceWorkflowsClosed</code>
<code>tblInstanceWorkflowsDataPropagation</code>	<code>tblInstanceWorkflowsDataPropagationClosed</code>
<code>tblInstanceWorkflowsRollback</code>	<code>tblInstanceWorkflowsRollbackClosed</code>

Records that relate to workflow instances that are closed (`fldStatus=3`) are moved from the “open” tables to the “closed” tables by the BRS (`closedInstancesSeparator`).

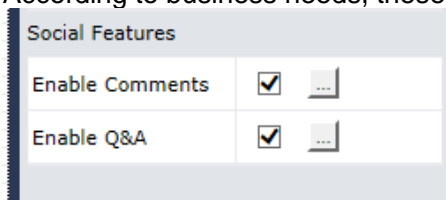
Any workflow that is referencing these tables by **expressions**, custom **stored procedures** or **views**, must be adjusted according to the new database structure.

2. Set social features:

Version 7 enables by default the following features in every workflow:

- Comments
- Questions and Answers

According to business needs, these features can be disabled/enabled in the App Studio::



3. Find variables/activities with non-alphanumeric characters:

Version 7 does not allow special characters in variable and activity names. Version 6 did not enforce that. So it might cause issues after the upgrade.

In order to assess if your system might be subjected to this issue, run the scripts included in the [additional scripts package](#):

- ***Find activities with special characters.sql***
 - Though no functional problem was reported about this, it is recommended to rename the activity name (refer to known issue #7).
 - In case you decide to rename the activity, make sure that other references to it are amended as well.
To find other activities that may reference the changed activity name use this

query:

```
SELECT
    tw.fldName as 'WorkflowName',
    ta.fldName as 'ActivityName',
    ta.fldProperties
FROM tblTemplateActivities ta
inner join tblTemplateWorkflows tw on ta.fldTWfGuid=tw.fldGuid
WHERE CAST(ta.fldProperties AS nvarchar(max)) LIKE N'%name%' -- the name
with the special characters
```

- ***Find Variables with Special Characters.sql***
 - In versions 7.0 - 7.7, web parts may crash if these variables are Visible/Global. In this case we recommend to rename the variable.
 - In versions 7.8 and above, this is a non-issue.

Known Issues

The following is a list of known issues after upgrading from 6.4.4 to 7.7.

Issue #1: Import workflow fails

Some workflow packages may error when trying to import them.

The problem is that the export package contains a form without an activity (a relic from Sequence6).

Fix this as follows:

1. Delete obsolete template forms with the following script, and create a new export package.
 - a. Find records of forms with “bad” templates:

```
-----  
-- get bad template forms  
SELECT *  
INTO #__tempBadTemplateForms  
FROM   tblTemplateForms  
WHERE  fldGuid NOT IN  
(  
  SELECT fldProperties.value('declare namespace pnmsoft="http://pmnsoft.com/sequence/2008/03/metadata";  
                             (/pnmsoft:Properties/pnmsoft:FormRef/pnmsoft:ToId)[1]', 'uniqueidentifier')  
  FROM   tblTemplateActivities  
  WHERE  fldProperties.value('declare namespace pnmsoft="http://pmnsoft.com/sequence/2008/03/metadata";  
                             (/pnmsoft:Properties/pnmsoft:FormRef/pnmsoft:ToId)[1]', 'uniqueidentifier') IS NOT  
  NULL  
)  
AND fldTWfGuid IS NOT NULL  
AND fldTWfGuid <> '00000000-0000-0000-0000-000000000000'  
-----  
-- display bad template forms with the relevant workflow name  
SELECT tw.fldName AS [wf_name], btf.*  
FROM #__tempBadTemplateForms btf  
INNER join tblTemplateWorkflows tw  
ON btf.fldTWfGuid = tw.fldGuid  
ORDER BY tw.fldName  
-----  
-- remove the temp table  
DROP TABLE #__tempBadTemplateForms  
-----
```


b. Delete the “bad” records:

```
-----  
-- backup tblTemplateForms  
select * into __tblTemplateForms_backup_26032014 from tblTemplateForms (nolock)  
-----  
-- delete bad form references from tblTemplateForms  
DELETE  
FROM   tblTemplateForms  
WHERE  fldGuid NOT IN  
(  
  SELECT fldProperties.value('declare namespace  
pnmssoft="http://pnmssoft.com/sequence/2008/03/metadata";  
(/pnmssoft:Properties/pnmssoft:FormRef/pnmssoft:ToId)[1]', 'uniqueidentifier')  
FROM    tblTemplateActivities  
WHERE   fldProperties.value('declare namespace  
pnmssoft="http://pnmssoft.com/sequence/2008/03/metadata";  
(/pnmssoft:Properties/pnmssoft:FormRef/pnmssoft:ToId)[1]', 'uniqueidentifier') IS NOT NULL  
)  
AND fldTwfGuid IS NOT NULL  
AND fldTwfGuid <> '00000000-0000-0000-0000-000000000000'  
-----
```

Issue #2: Message lines break are removed

This issue applies only where messages contain HTML tags.

The default message type in Sequence 6 is **TextMode**, and in Sequence 7 it is **HTML**.

In HTML, line breaks in messages are ignored, and the message is displayed as a single line.

To fix this:

1. Backup the database, and then run the script:
“FixLineBreaksInMessagesAfterUpgrade6to7.sql”

It is available in [AdditionalDatabaseUpgradeScripts_6to7.zip](#)

Issue #3: Links to attachments from Sequence 6 do not work

This is relevant if upgrading to 7.6 or higher.

Root cause related to the “private attachment” feature that was introduced in 7.6.

To fix this:

1. Run this script:

```
BEGIN TRAN
UPDATE tblAttachments
SET fldPublic=1
WHERE fldIActId IN (
    SELECT ia.fldId FROM tblAttachments att
    INNER JOIN tblInstanceActivities ia ON att.fldIActId=ia.fldId
    WHERE fldCreationDate < '2010-12-20 00:00:00.000' -- date of the upgrade
)
COMMIT --rollback
```

Issue #4: Sequence 6 forms advanced combo boxes open up with no data

Advanced combo boxes intermittently open up empty.

To fix this:

1. Add the following location to the Flowtime and Administration web config files:

```
<location path="_layouts/15/ListFieldItems.axd">
    <sequence.engine>
        <authentication enabled="true" impersonate="true" />
    </sequence.engine>
</location>
```

Issue #5: Database upgrade script (UpdateSynchronization_Data.sql) might not complete in reasonable time

The count of records in *tblOrganisation* is high (over 100K), and the script does not complete in a reasonable time (if ever).

The root cause is in an inner join operation inside an update block, which exhausts the database resources.

To fix this:

1. Comment out the “update” block for *tblOrganisation* (lines 1083-1131 in SP7), which re-builds the *fldNumberPath*. Run the script with that block commented out (this takes ~5 minutes to complete).

Also available as “**UpgradeSynchronization_Data_SP7_skip_tblOrganisation.sql**” in [AdditionalDatabaseUpgradeScripts_6to7.zip](#)

2. Run the following script instead of the skipped block:
“**UpgradeSynchronization_Data_SP7_build_tblOrganisation_in_batches.sql**”

Available in [AdditionalDatabaseUpgradeScripts_6to7.zip](#)

Issue #6: Problems with combo boxes with filters in forms

A display bug (#7474) that occurs when configuring the combo box (from the Administration site) – when entering the 'Row Source' of the combo, the 'Table Display Field' and 'Table Sort Field' are missing.

When using a combo-box in a Sequence 6 form/task in Sequence 7, it works fine with each table except for External table (not a lookup table).

Important to emphasize that the process still works and the combo-box displays the correct values.

If you change the values, the process will continue to work fine and apply the changes, but each time you enter to the 'Row Source' it will be empty again.

This issue is pending fix in future releases.

Issue #7: Validation error on activity names with non-alphanumeric characters

The Validation summary may display errors such as below:

✖	LBM ex-Employee Validation	The Workflow Name cannot contain any of the following characters: ' " & # - () : ? < > * + %.	Error
✖	Resolution Details (ex Emp yes)	The Workflow Name cannot contain any of the following characters: ' " & # - () : ? < > * + %.	Error
✖	Split ex-EE Closure	The Workflow Name cannot contain any of the following characters: ' " & # - () : ? < > * + %.	Error

This error can be expected for activities that were created in Sequence 6.x, and it should not affect the functionality of the workflow.

The root cause is that Sequence 7.x doesn't allow non-alphanumeric characters in the activity name (except for underscore) for activities that were created in Sequence 7.x.

Issue #8: Web parts may crash if workflow variables contain non-alphanumeric characters

Web parts (like the process grid) do not display data.

This is expected if a name of a workflow variable that is set to "Visible" contains non-alphanumeric characters.

This issue was fixed in version 7.8. If upgrading to previous versions, rename the workflow variable and fix references to it.

Issue #9: Workflows that are using Client Helper do not work

The httprequests using clienthelper.axd do not work.

The IIS answers with 401 and 404 messages when calling the clienthelper.axd.

The root cause is that Sequence7 blocks uncontrolled queries by default for security reasons.

To fix this:

1. Enable uncontrolled queries in the "appSettings" section in the web.config file of both Administration and Flowtime sites:

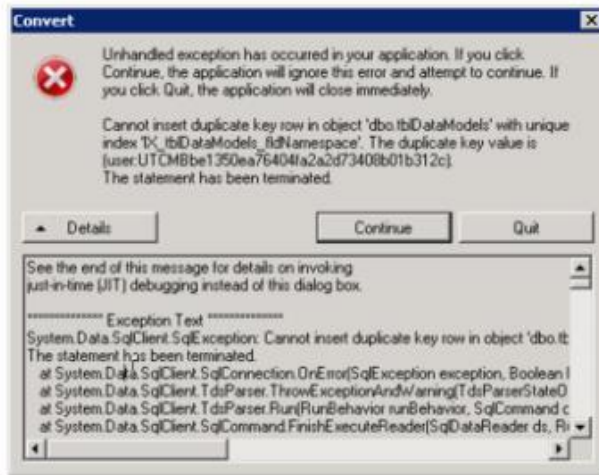
```
<add key="sequence.clientHelper.enableUncontrolledQueries" value="true" />
```

2. Verify that the reference to the client helper exists in both web.config files (under the "handlers" section):

```
<add name="ClientHelper" path="ClientHelper.axd"  
type="PNMsoft.Sequence.Web.ClientHelperHttpHandler, PNMsoft.Sequence.Web,  
Version=7.0.0.0, Culture=neutral, PublicKeyToken=0a1a1b90c1c5dca1" verb="POST,  
GET, HEAD" />
```

Issue #10: Error from ConvertAddRecordsToDataModels

The error “Cannot insert duplicate key...” may occur.



This indicates that there are multiple records in tblAddRecord where the table name is the same but the guid of the table is different.

To fix this:

Run the following query to find the problematic records:

```
select * from tblAddRecord
where fldTableName = 'UTCMBbe13...' -- the table from the error message.
```

Check the results:

1. Multiple records are valid only if the fldGuid is the same on all records of that same UTCMB table.
2. Suspicious fldGuid = '00000000-0000-0000-0000-000000000000'
 - In this case, we need to check that fldfieldName is a valid field name within that UTCMB table.
 - If valid - then set the good guid instead of the 0000...
 - If not valid - then delete this record from tblAddRecord (delete from tblAddRecord where fldGuid='00000000-0000-0000-0000-000000000000').

Also check which workflows/activities are related and might be affected:

```
select tw.fldName, ta.* from tblTemplateActivities ta
inner join tblTemplateWorkflows tw on tw.fldGuid=ta.fldTwfGuid
where CAST ( ta.fldproperties as nvarchar(max)) like
'%UTCMBbe1350ea76404fa2a2d73408b01b312c%' -- the UTCMB table from the error.
```

After fixing tblAddRecord, re-run the conversion tool:

1. Truncate table tblDataModels
2. Run the tool again.