# ELECTRONIC STAFF RECORD

# ESR-NHS0260 – ESR BI External Data User Guide

Information Classification: PUBLIC

| | |
|---|---|
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Approvals:

| | |
|---|---|
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# 1. DOCUMENT CONTROL

## 1.1. CHANGE RECORD

| Date | Author | Version | Change Reference |
|---|---|---|---|
| 12/10/2016 | James Haddon | 0.1 | Initial draft |
| 17/01/2017 | James Haddon | 0.2 | Revised following R33 |
| 23/01/2017 | James Haddon | 0.3 | Updated following review |
| 02/02/2017 | James Haddon | 0.4 | Updated following review |
| 16/02/2017 | James Haddon | 0.5 | Initial approved version |
| 02/03/2017 | James Haddon | 0.6 | Updated following SIT review |
| 31/03/2017 | James Haddon | 0.7 | Updated following further SIT review |
| 05/06/2017 | Chris Holroyd | 0.8 | Updated following pilots |
| 05/06/2017 | James Haddon | 1.0 | Uplifted to final version |
| 22/03/2018 | Chris Holroyd | 2.0 | Updated following R.37 |
| 01/04/2021 | Chris Holroyd | 3.0 | Annual Review |
| 01/04/2022 | Matt Madya | 4.0 | Annual Review |
| 12/06/2024 | Chris Holroyd | 5.0 | Annual Review |

## 1.2. REVIEWERS

| Name | Position |
|---|---|
| NHS Development Team | |
| | |
| | |
| | |
| | |

## 1.3. DISTRIBUTION

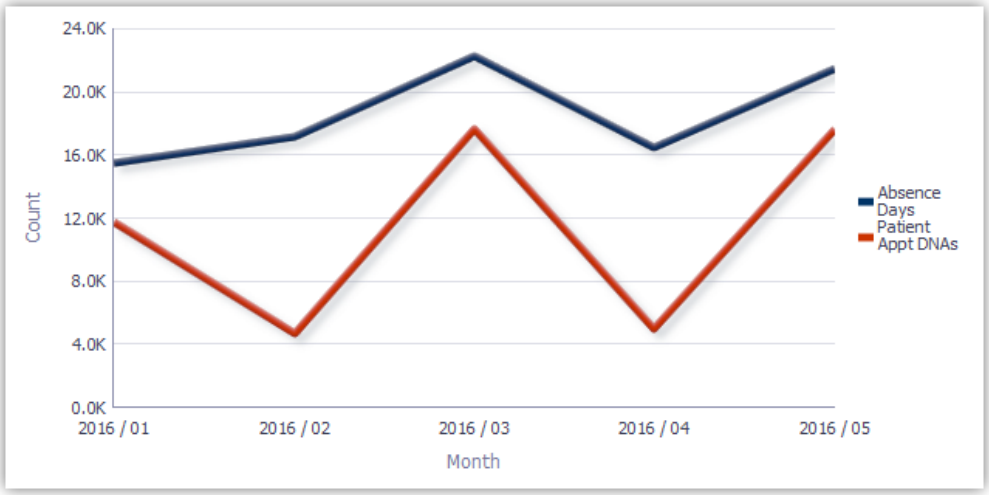
| Copy No. | Name | Location |
|---|---|---|
| 1 | Library Master | Programme Library |
| 2 | | |

# 2. CONTENTS

# 3. OVERVIEW

## 3.1. INTRODUCTION

ESR BI provides the main reporting solution for ESR. It has the ability to report on hundreds of data items, each sourced from ESR to give the NHS a fully flexible and efficient reporting suite. In addition to this, ESR BI has the ability to report on non-ESR data alongside ESR data, to allow organisations to combine their data and pinpoint issues and efficiencies across the service.




The above example shows the absence rate compared with external data – in this example the number of appointments where patients did not attend.

In order to report on this non-ESR data, organisations must first 'load' this data via an interface into ESR BI. From there the data can be combined with regular ESR data (such as workforce or absence).

Note: The interface currently runs on a weekly basis but the frequency may be increased in future.

## 3.2. HOW CAN DATA BE IMPORTED?

To enable access to create and update reports in BI, you must have the BI Administration URP allocated; therefore this functionality is expected to be used by those users with this URP.

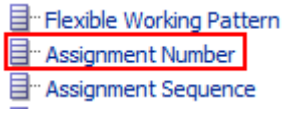
A standard template has been developed and is provided as a guide within this document, which will enable organisations to load aggregated (i.e. summarised) data against one of three different 'objects' in ESR:

1. Assignment
2. Position
3. Organisation

The user should obtain the unique identifiers (i.e. Assignment Number, Position Number or Organisation Number) for any object they wish to load data against, and populate a file with the relevant information within the format defined in this document (the example file is provided later in this document).

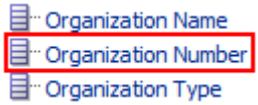
Note: These identifiers can be obtained by running a report from ESR BI or from ESR Discoverer.

Assignment Number:




Position Number:

Organisation Number:



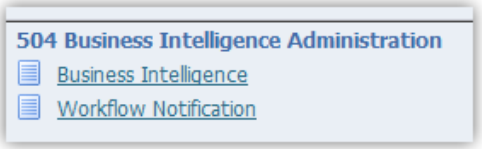
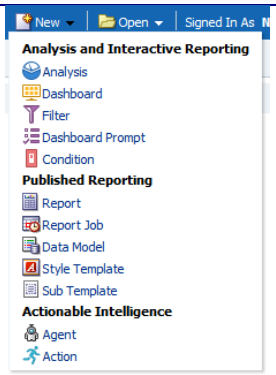
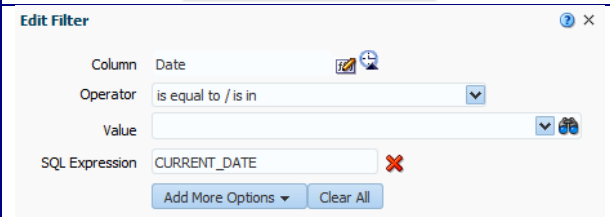
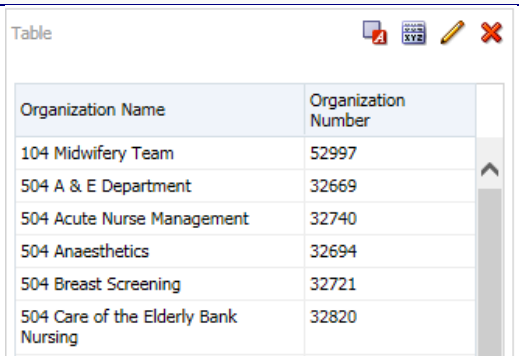

The template allows users to load 10 columns of numeric data, and 10 columns of text data against each object for a specific date. An example set of data is provided below:

| Key Type | Key Value | Record Type | Date | Delete Flag | Decimal1 | Decimal2 |
|---|---|---|---|---|---|---|
| ORG | 123456 | FIN | 20160131 | | 12309.23 | 23 |
| ORG | 123456 | FIN | 20160228 | | 12093.48 | 24 |
| ASG | 475849 | PAT | 20160131 | | 93 | 2 |
| ASG | 475849 | PAT | 20160228 | | 80 | 5 |

**Figure 1 - Example External Data Template**

## 3.3. Obtaining Object IDs

As specified above, aggregated data can be loaded against Positions, Organisations or Assignments. To identify each of these objects uniquely, their number or ID is required. The easiest way to obtain these is from ESR BI itself by following the steps below:

| Step | Screenshot | Description |
|---|---|---|
| 1 |  | Login to ESR BI with the Business Intelligence Administration URP |
| 2 |  | Create a new analysis based on the Human Resource – Workforce Profile Subject Area |
| 3 |  | Add a filter to your analysis to return data as at today's date (or any date you choose) |
| 4 |  | Add the items you need. You can find Organisation Number in the 'Organization' folder, Assignment Number in the 'Assignment' folder and 'Position Number' in the Position folder within the employee folder. |

## 3.4. DATA IMPORT TEMPLATE

The template to load data into ESR BI has been made as generic as possible; this provides flexibility to load data to use in different ways in ESR BI with the drawback that specific column names are not available to correctly identify the data in each column (e.g. Decimal1 in the above example).

Note: Where all 10 Decimal fields are not in use, the columns must be left blank in the file and text entered from column P onwards. If in doubt, please see the example excel file embedded within this guide (section 3.6.4).

The template is designed as below:

| Data Item | Data Format | Comments |
|---|---|---|
| Key Type | X(3)* | String – Identifier for key i.e. Org for Organisation Number |
| Key Value | X(15)* | Numeric ID - Organisation, Position or Assignment Number |
| Record Type | X(3)* | String – A three letter code i.e. FIN for Finance data |
| Date | F(10)* | Date – The date by which the entry will be reported<br>YYYYMMDD |
| Delete Flag | X(1) | Set to Y to delete a previously loaded record<br>Can be null. |
| Decimal 1 | N(10,2) | |
| Decimal 2 | N(10,2) | |
| Decimal 3 | N(10,2) | |
| Decimal 4 | N(10,2) | |
| Decimal 5 | N(10,2) | |
| Decimal 6 | N(10,2) | |
| Decimal 7 | N(10,2) | |
| Decimal 8 | N(10,2) | |
| Decimal 9 | N(10,2) | |
| Decimal 10 | N(10,2) | |
| Text Attribute 1 | X(100) | |
| Text Attribute 2 | X(100) | |
| Text Attribute 3 | X(100) | |
| Text Attribute 4 | X(100) | |
| Text Attribute 5 | X(100) | |
| Text Attribute 6 | X(100) | |
| Text Attribute 7 | X(100) | |
| Text Attribute 8 | X(100) | |
| Text Attribute 9 | X(100) | |
| Text Attribute 10 | X(100) | |

The key fields are described below:

- Key Type – This should be populated with the letters ORG, ASG or POS depending on which object data is being loaded against. For example data being loaded against an organisation would be populated with ORG. This field is mandatory and if not completed, the record will be rejected.
- Key Value – This is the unique ID for the object referenced in the Key Type field. For example if key type is set to ORG, then the Key Value field should be populated with the Organisation Number. This field is mandatory and if not completed, the record will be rejected.
- Record Type – A field to help users categorise data in the template, and for eventual reporting in ESR BI. This should be 3 letters only. For example if you are loading finance data, you may choose FIN to categorise the data in that row.
- Date – The date for which this data should be loaded in the format YYYYMMDD. For example if we wanted to load monthly finance data against objects in ESR, we could choose the last date of each month to load the data against. For January 2017 this would be 20170131.
- Delete Flag – A field to be populated with 'Y' if this template is being loaded to delete records from ESR BI. Only the Key Type, Key Value, Record Type and Date fields need to be populated alongside the delete flag to delete the data.

Note: The unique identifiers in the template are Date, Key Identifier and Key Type. If you load a record with the same IDs twice, all values will be overwritten with new values. For example if the following record was loaded:

| Key Type | Key Value | Record Type | Date | Delete Flag | Decimal1 | Decimal2 | Decimal3 | Decimal4 |
|---|---|---|---|---|---|---|---|---|
| ORG | 123456 | FIN | 20160131 | | 12309.23 | 23 | 24 | 11.2 |

Then the following week the below record was loaded

| Key Type | Key Value | Record Type | Date | Delete Flag | Decimal1 | Decimal2 | Decimal3 | Decimal4 |
|---|---|---|---|---|---|---|---|---|
| ORG | 123456 | FIN | 20160131 | | 12309.23 | 23 | | |

The second record is what would be returned in ESR BI (i.e. Decimal3 and Decimal4 would be blank) since the same three key values were used.

Note; Column headings should not be included within the file submitted, they are included here for illustration purposes only. If in doubt, please see the example excel file embedded within this guide (section 3.6.4).

## 3.5. RESTRICTIONS

The following rules should be followed to ensure your file will be processed by ESR BI in the interface:

1. Each file **should not exceed 30,000 rows**
2. Personally identifiable information should not be entered into the template (including patients, customers or staff). Data should be aggregated where possible.
3. Symbols should not be used (including @&*; etc). Where symbols are encountered, these will be replaced with an underscore ('_') when imported into ESR BI.

If the file does not meet the standards above, it will be rejected, following the process described in section 3.9

## 3.6. TEMPLATE FORMAT

Once the template has been completed it needs to be output into CSV format with a very specific filename. For security and consistency reasons, the file must also contain a 'header' and 'trailer' which contain specific pieces of information to allow consistency to be checked before loading into ESR BI.

The header and trailer are simply additional 'rows' in the file in which additional information can be provided.

### 3.6.1. File Name

The files need to be named in a consistent manner so as to accommodate the identification of disparate source systems and to assist in the support of the interface. The format of the name is:

BI_vvv_xxx_yyyymmdd_uuuuuuuu.DAT

| Letters | Description |
|---|---|
| BI | Main file/system type identifier (fixed) |
| vvv | Trust Identifier (VPD) e.g. 210 |
| xxx | Secondary file type identifier e.g. PAS, FIN, GEN |
| **yyyymmdd** | **Date the file is created/submitted e.g. 20160721** |
| uuuuuuuu | An 8 char id used to ensure all filenames are unique. Unless otherwise advised this should be an incremental file sequence number, starting from 00000001. **Please note:** This sequence must be incremented for each load – use of the same number on the sequence will result in the file being rejected. |

An example filename could be:
BI_210_PAS_20160927_00000001.DAT

### 3.6.2. File Header

The file must contain a header record with the following information:

| Data Item | Data Format | Comments |
|---|---|---|
| Record Type | F(3) * | Type of record Fixed value of 'HDR' |
| File Name | X(40)* | The name of this file |
| Creation Stamp | F(15) * | File creation Timestamp. Format YYYYMMDD HH24MISS |

* Mandatory field

### 3.6.3. File Trailer

The file must contain a trailer record with the following information:

| Data Item | Data Format | Comments |
|---|---|---|
| Record Type | X(3)* | Fixed value 'TRL' |
| Record Count | N(10)* | Number of records in the file including the header and trailer records. |

* Mandatory field

### 3.6.4. Example Files

Example files are provided here for users to compare their information against. These files should not be transferred over the interface – they are examples only.

1) This file is in the correct format however it has not yet been renamed to the correct extension (.DAT). This enables the file to still be opened in Excel to review. Once the file is in this format, the file simply needs to be updated to include the correct extension and can then be loaded through the interface.

BI_123_XXX_201610
19_00000001.csv

2) This file is the same as the above CSV file, however it has been correctly renamed to the .DAT extension, and therefore no longer opens correctly in Excel.


## 3.7. Initial Implementation and File Transfer

Once a file has been created and is ready to load, the file can be sent for loading to the NHS ESR Systems Integration Team via a dedicated secure FTP (sFTP) account.

The first step for an organisation wishing to implement an FTP connection to ESR is to log an SR with IBM Support. Appropriate account (user & password), IP Address and other details will not be issued or acted upon without this. More details on setting up the FTP connection will be provided to you on the SR

Once an SR has been logged, the user will be asked to provide a designated contact to receive notifications from the hub regarding the processing of any submitted files.

Inbound files will be validated on the NHS Hub, and will be rejected if any of the following apply:

- The file extension is not .DAT;
- The contents of the file are not identified as text in csv format;
- The row count figure in the file footer entry does not match the actual row count;
- The row count figure in the file footer entry exceeds 30,000;
- The file name is not in the correct format.

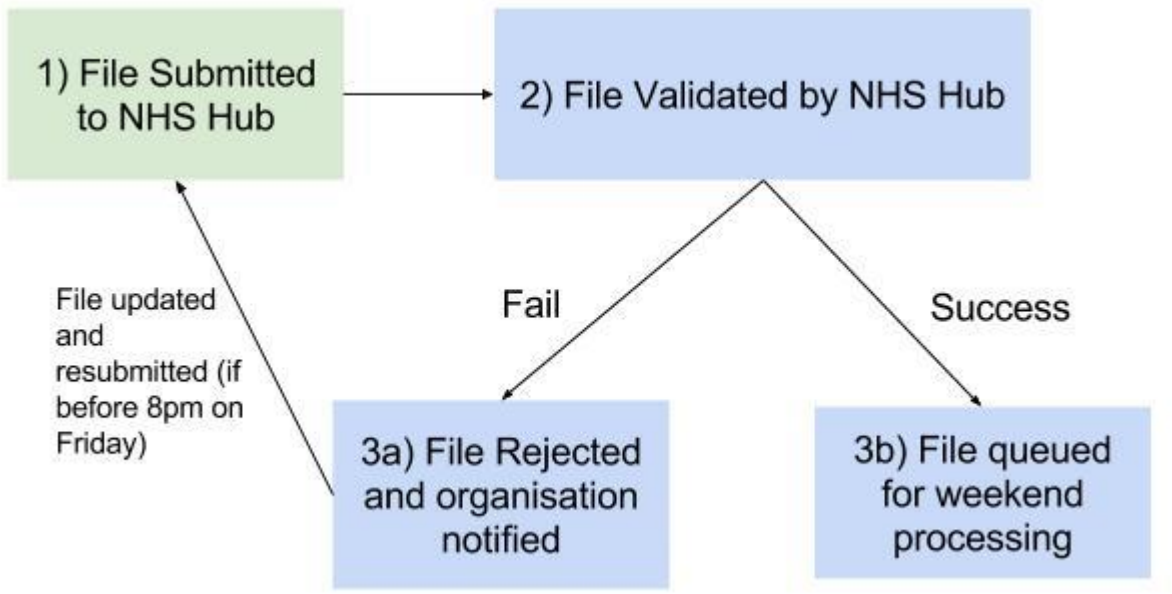
Once the file has been validated, it will be queued for processing into ESR BI for the weekend run. Organisations should make sure their files are submitted well in advance of CoB on Fridays to allow validation and re-submission of files if required.

## 3.8. Testing

In instances where this is a new process for organisations, users may wish to ‘test’ the functionality before using it on a production scale. Organisations can do this by loading a small amount of data using the interface process and ‘testing’ the data once it has arrived in ESR BI. After ‘testing’ is complete, simply load the file through the interface again with the ‘Delete’ column populated to remove the data from ESR BI.

## 3.9. Success / Failure Handling

When files are submitted to the interface (Process 1 in the illustration below), the file will be validated (a short time after being submitted) by the NHS Hub (Process 2 in the illustration below) before being sent to ESR BI. Where a file has been rejected by the NHS Hub during the week (process 3a in the illustration below), the file can be corrected and re-submitted to be revalidated. The ESR BI interface runs once per week at the weekend – therefore we advise users to submit a file early in the week where possible to allow for any validation rejections and resubmissions before the BI interface weekend run. Any files submitted **after 8pm** on Friday will not be processed until the following week.




After the file has been submitted and successfully validated by the NHS Hub, the file will be transferred to IBM for processing into ESR BI (process 3b in the illustration above). If there is a problem with the file and the process fails to import the data into ESR BI, then an error will be communicated back to the NHS Central Team who will in turn contact the designated contact for your organisation.

### 3.9.1. NHS Hub Validation Errors

Where a validation error has occurred (on the NHS Hub) using validation rules in section 3.4 3.5 and 3.6, the following email will be sent to the relevant contact at the organisation (nomination of the contact is undertaken during implementation of this process, as described in section 3.7) :

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210

File BI_210_FIN_20170123_00000103.DAT has been processed on the NHS Interface
Hub at 2017/02/07 14:10:44
Target file BI_210_FIN_20170123_00000103.DAT generated
 Recs Read   : 1317
  Recs with Errors: 4 *** Error records have been dropped and will not be
forwarded to ESR ***
  Recs with Warnings: 17
  Recs Written: 1313
Validation file BI_210_FIN_20170123_00000103_V.DAT is available for collection
by VPD 210 using 'Secure FTP'.
This gives details of errors and warnings on a record by record basis.

The target file of 1313 records (including Header & Trailer) has been forwarded
to ESR for BI Load Processing.


Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net
If you wish to change the email contact details, please log a Service Request
(SR) via the ESR Service Desk for the attention of the NHS Interface Team.
================================================================================
```

### 3.9.2. NHS Hub Confirmation

Where validation has been successful, the relevant organisation contact will receive the following email to confirm the file has now been forward to IBM for processing into ESR BI:

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210

File BI_210_PAS_20160927_00001234.DAT has been processed on the NHS Interface
Hub at 2016/10/31 11:36:06 Target file BI_210_PAS_20160927_00001234.DAT
generated
  Recs Read   : 659
  Recs Written: 659
BI_210_PAS_20160927_00001235_V.DAT is available for collection by VPD 210 using
secure FTP.
This gives details of errors and warnings on a record by record basis, if any.



Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net If you wish to change the email contact details, please
log a Service Request (SR) via the ESR Service Desk for the attention of the
NHS Interface Team.
================================================================================
```

### 3.9.3. BI Load Errors

Where the file has passed validation and been sent to IBM for processing, but a subsequent error has occurred in loading the data into BI, the following email will be received by the organisation contact:

```
================================================================================
NHS Interface Hub External Data & BI Inbound Processing for 210

File BI_210_PAS_20160927_00001234.DAT has been processed and uploaded
SUCCESSFULLY into BI  at 2017/10/31 11:36:06.

File BI_210_PAS_20160927_00001234.DAT has been REJECTED in BI at 2017/10/30
11:56:06.

Please do not reply to this e-mail address as it is not monitored

If you have received this e-mail in error please forward it to:
esr.interfaces@nhs.net If you wish to change the email contact details, please
log a Service Request (SR) via the ESR Service Desk for the attention of the
NHS Interface Team.
================================================================================
```

### 3.9.4. BI Load Success

Where no error has occurred, users should expect to see their data in ESR BI following the weekend run. Where the file was not loaded due to validation problems, the organisation should update the files to resolve any validation issues and re-submit the updated file as required. **Important: The same name cannot be used for the updated file.**

### 3.9.5. Confirmation Files

A Text file will be made available to the organisations via FTP which provides them with details about the file transfer and details of where and what errors have occurred if applicable.

The naming convention of the file will follow that of the original inbound file
BI_210_PAS_20160927_00001235_V.DAT (where ‘V’ stands for Validation)
The format of the file will be as follows:

## Validation File Header

| Ref. | Data Item | Data Format | Comments |
|---|---|---|---|
| BV_HDR01 | Record Type | F(3) + | Type of record Fixed value of 'HDR' |
| BV_HDR02 | File Name | X(40)+ | The name of this file |
| BV_HDR03 | Creation Stamp | F(15) + | File creation Timestamp. Format YYYYMMDD HH24MISS |
| BV_HDR04 | Inbound Filename | X(40)+ | Corresponding inbound file name |
| BV_HDR05 | Inbound Creation Stamp | F(15) | File creation Timestamp of corresponding inbound file. Format YYYYMMDD HH24MISS |

## Validation File record Outcome

| Ref. | Data Item | Data Format | Comments |
|---|---|---|---|
| BV_REO01 | Record Type | F(3) + | Type of record Fixed value of 'REO'. One REO to be produced for each inbound record (except HDR & TRL) |
| BV_REO02 | Outcome Code | X(1)+ | Outcome of the load process - 'S' (Successfully validated), 'W' (Validated but with Warnings, as per following recs), 'E' (Not validated due to Errors as per following recs) |
| BV_REO03 onwards | Inbound Record reflection | X(size of the inbound record) | Field by field reflection of Inbound Record |

## Validation File Warning Detail

| Ref. | Data Item | Data Format | Comments |
|---|---|---|---|
| BV_WAR01 | Record Type | F(3) + | Type of record Fixed value of 'WAR'. One record for each Warning Message for the preceding REO record. |
| BV_WAR02 | Warning Message | X(150) | Warning message e.g. 'Field 7 contains invalid characters which have been replaced by underscore characters' |

## Validation File Error detail

| Ref. | Data Item | Data Format | Comments |
|---|---|---|---|
| BV_ERR01 | Record Type | F(3) + | Type of record Fixed value of 'ERR'. One record for each Error Message for the preceding REO record. |
| BV_ERR02 | Error Message | X(150) | Error message e.g. 'Invalid Key of Type ORG, record rejected' |

## Validation File Trailer

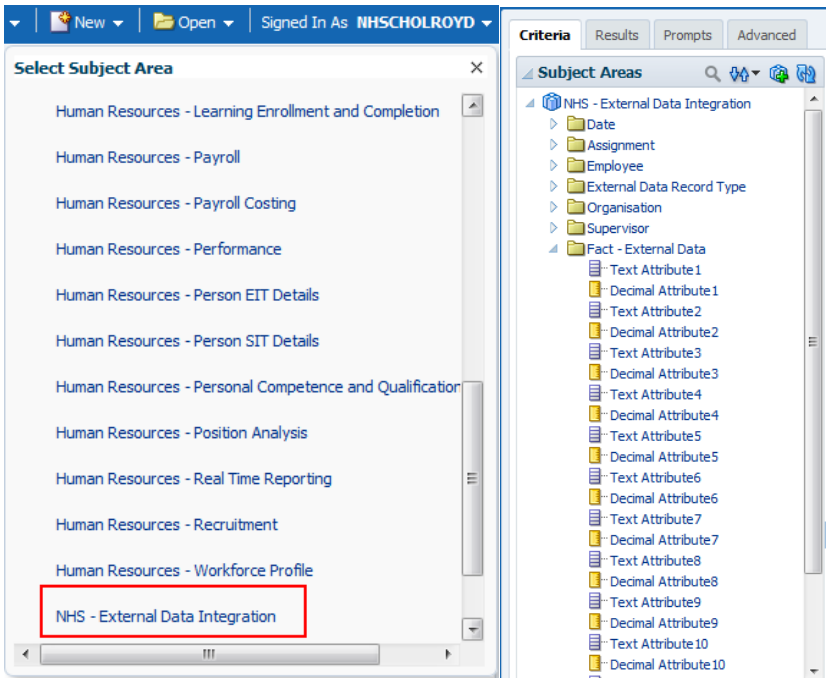
| Ref. | Data Item | Data Format | Comments |
|---|---|---|---|
| BV_TRL01 | Record Type | F(3) + | Type of record Fixed value of 'TRL' |
| BV_TRL02 | Record Count | N(10)+ | Number of Records in this file including HDR & TRL |
| BV_TRL03 | Validation Record Count | N(10)+ | Number of Records in corresponding inbound file excluding HDR & TRL |
| BV_TRL04 | Validation Record Success Count | N(10)+ | Number of Records in corresponding inbound file which have been validated fully successfully (number of REO,S records in this file) |
| BV_TRL05 | Validation Record Warning Count | N(10)+ | Number of Records in corresponding inbound file which have been validated with warnings (number of REO,W records in this file) |
| BV_TRL06 | Validation Record Error Count | N(10)+ | Number of Records in corresponding inbound file which have not been validated due to errors (number of REO,E records in this file) |
| BV_TRL07 | Total Warning Count | N(10)+ | Number of Warning messages (number of WAR records in this file) |
| BV_TRL08 | Total Error Count | N(10)+ | Number of Error messages (number of ERR records in this file) |

An example confirmation file is provided below:

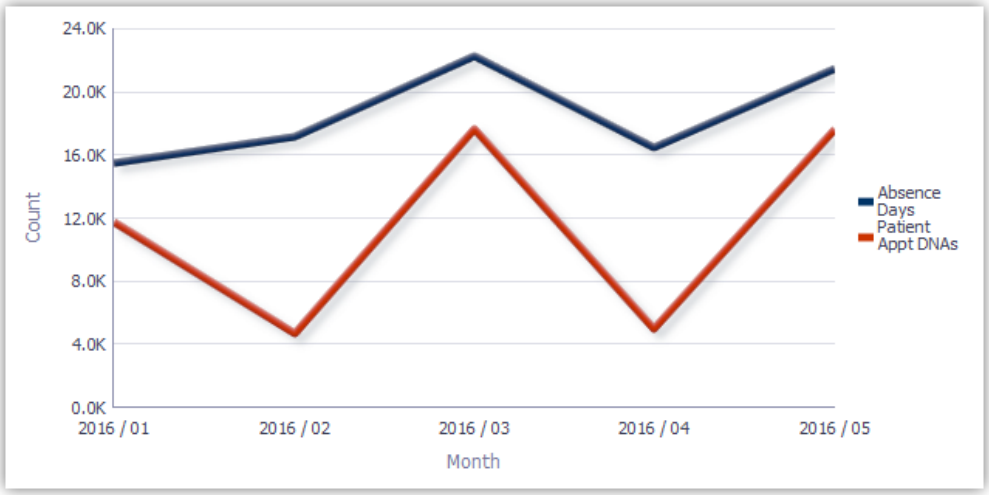
| | | | | | |
|---|---|---|---|---|---|
| HDR | BI_308_FII | 20170302 | BI_308_FII | 20170223 | 120000 |
| REO | E | ASG | | FIN | 20170223 |
| ERR | Mandatory field [Key Value] is empty | | | | |
| REO | S | POS | 12345 | FIN | 20170223 |
| REO | S | ORG | 5645745 | FIN | 20170223 |
| REO | S | ASG | 456745 | FIN | 20170223 |
| REO | S | POS | 345 | FIN | 20170223 |
| REO | S | ORG | 6 | FIN | 20170223 |
| REO | S | ASG | 456 | FIN | 20170223 |
| REO | S | POS | 7546 | FIN | 20170223 |
| REO | S | ORG | 546 | FIN | 20170223 |
| TRL | 12 | 10 | 8 | 0 | 1 |

# 4. USING THE DATA IN ESR BI

A subject area is available within ESR BI which contains the external data loaded via the above process. The subject area also contains key pieces of data from ESR to include alongside the external data where required.




Since this solution is generic to allow all types of information to be used in ESR BI, it is not possible to 'join' the subject areas with any other subject areas. If other pieces of information are required to measure against the data imported via this solution, a 'Set Operation' or 'Union' type query should be used to return data from other subject areas in combination with the external data.




More instructions on how to use unions or set operations are available on the ESR Hub.