



## The Data Automation Module

---

February 2017

All rights reserved.

**This document may be copied or stored without restriction of any kind only as a whole.**

Otherwise, no part of this document may be copied or processed in any way, electronically, photographically, mechanically or otherwise, and no such part may be stored in any database without written consent from GPM SYSTEMY Sp. z o.o.



## Contents

1. Introduction.....	3
Automation of Data Entry with the Automation Module .....	5
Data sources management .....	6
Mappings editor.....	7
Calculation process.....	7
The benefits of automation module.....	7
Terms and Examples .....	8
Report cell types – primary and calculated cell.....	8
Mapping data from sources to the report cells.....	9
Data sources for mappings.....	10
Mapping language .....	11

## 1. Introduction

The aSISt base module is used for data entry and XBRL reports reconciliation and submission. The general task of aSISt is to generate XBRL reports which is a final stage in the reporting process.

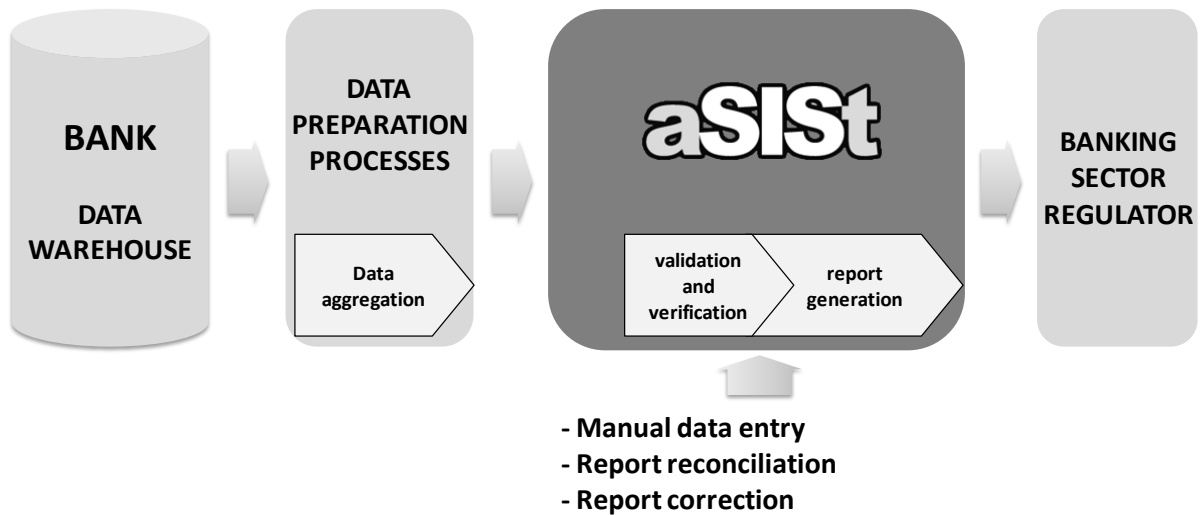


Picture 1. Standard scheme of the reporting process

The base module has a number of interfaces which enable the user to import data from the previously prepared sets. However, the structure of the sets must be strictly compatible with the structure of the report:

- the structure of the sets has to match exactly the structure of the report,
- each cell in the report must have only one assigned position in the previously prepared data source.

The attempt to meet these requirements is both an arduous and time-consuming task. Moreover, the process of collecting data from bank systems very often consists of several stages.



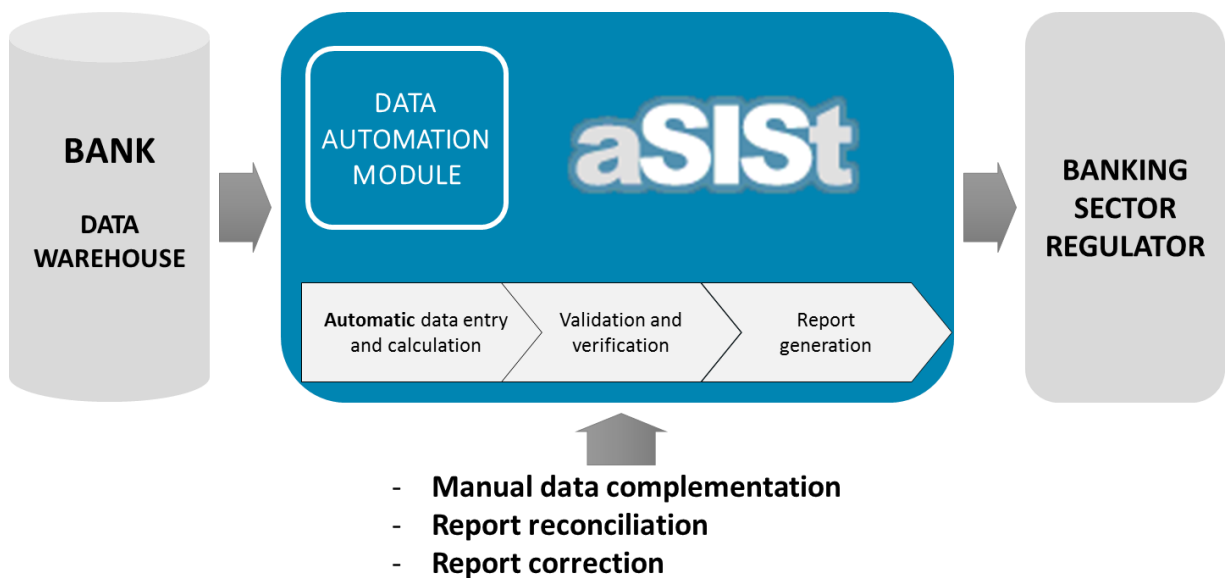
Picture 2. Reporting process – current situation

The process of data preparation is time-consuming and has to be repeated during each accounting period.

Manual data preparation increases the risk of mistakes which are hard to predict and prevent in the future processes.

A suitable solution to this problem is **the DATA AUTOMATION MODULE** - an additional functional module in aSISt.

The automation module provides a mechanism for automatic calculation of values from multiple sources.



Picture 3. Reporting process – aSISt with the automation module



Owing to the automation module, aSISSt provides a variety of flexible ways of data processing which require no adjustments to the form and shape of the data sources. The user saves a lot of time and avoids additional preprocessing and aggregation of data. Once discovered inconsistency can be easily eliminated from the process and will not be repeated.

## Automation of Data Entry with the Automation Module

Often happens that banks are not able to prepare data which should be entered into the report because:

- there are too many clients to analyze and select from
- there are many data sources with different structures
- the process of data preparation is too time- and material-consuming

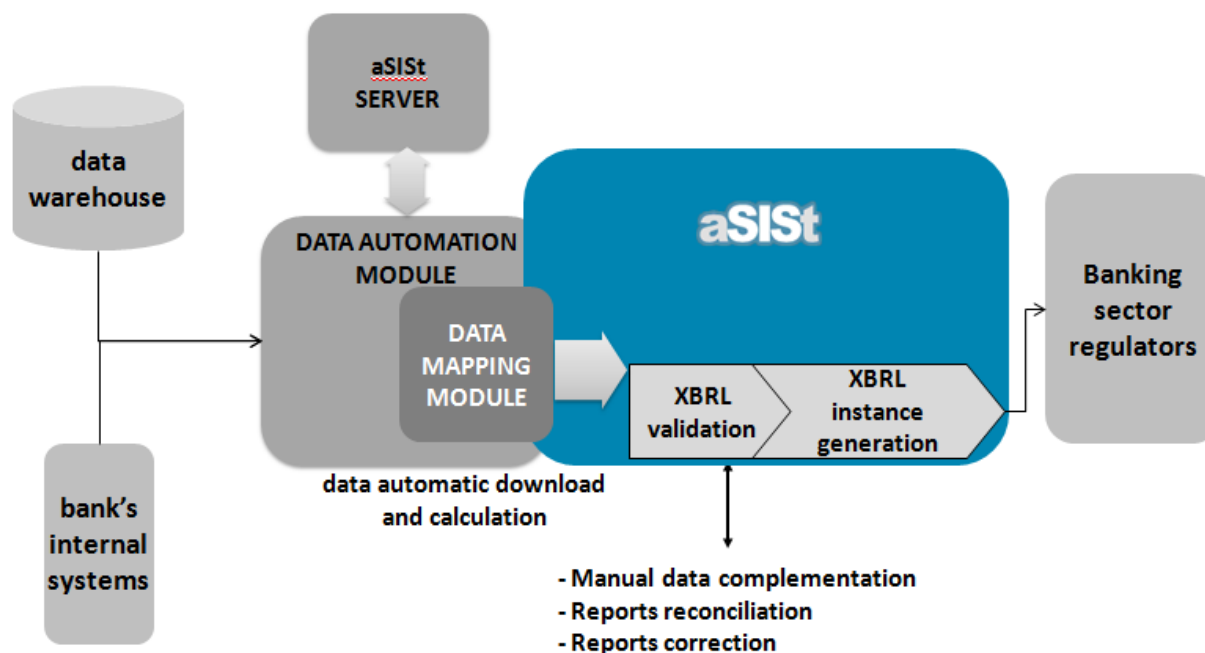
An alternative to importing data from file is the method of automatic and active data fetching, its calculation and entry with the use of automation module. The advantage of this solution is the automation of several operations which normally would have to be carried out in Excel or manually.

**aSISSt with Data Automation Module provides a full service of data and report preparation.**

The solution makes it possible to analyze, process, aggregate or select millions of data from different sources. Data Automation Module includes ETL processor which manages the complicated multistage calculation. Data provided by ETL processor are easily entered into aSISSt with data Mapping Module.

Processes in ETL are individually defined and include verification steps which help banking staff to control the process.

All the elements of individual data automation process are presented in aSISSt and can be maintained by bank's staff.



Picture 12. Report data input process with use of the Data Automation Module

Once the automation process is defined reporting process includes:

- Reporting period opening
- Automatic data MAPPING with ETL usage and calculating
- Manual data completion (if needed)
- Data reconciliation against additional data (e.g. GL reports)
- Verification according to the taxonomy
- Report generation and transmission

The Data Automation Module consists of several components:

- Data sources management
- Mappings management
- Mappings editor
- Calculation process

All of them are described in details below.

## Data sources management

Data source represents external tables containing data used to calculate values in the report.

Data source types include:

- CSV flat-files,
- XLS tables,
- XLS non-tabular files,

- direct database connection,
- inner data source (other report from aSIS)

The definition of data sources can be exported and imported, therefore the process of mapping preparation can be run independently from day-to-day report preparation.

For Automation Module in cases of defining ETL process the usable data sources are as follows:

- CSV flat-files from back-office system,
- CSV files prepared manually,
- direct database connection.

### Mappings management

This module allows to define many sets of mappings. The user may employ several sets simultaneously to:

- manage different types of mappings,
- aggregate data from multiple sources – e.g, different systems during accounting systems replacement,
- consolidate reports – map the reports and the consolidation adjustments.

It is possible to save subsequent versions of mappings to create archives.

### Mappings editor

The mappings editor is one of the integral components of the automation module. It allows to save, edit and delete the mappings as well as to export and import the mapping sets to and from the external files.

Mapping is a description of the source data transformation into a separate report cell. Transformation may include data aggregation, calculation and integration from many data sources.

### Calculation process

Fetching data by mappings is an additional function of aSIS. It initiates the process of automatic calculation and entering values into the report cells. The automation module provides similar variants of values entry as the base module import function does – it means that the user may for example overwrite all the mapped cells, overwrite only the empty cells, etc.

From user's point of view there is no difference in calculation process between fetching data by mappings with or without ETL process. Each time there is one step required: selecting "Fetching data by mappings" from aSIS's menu.

### The benefits of automation module

The automation module, owing to its optimally adjusted functionality, offers a variety of benefits:

- it may be used both as a basic or an additional data entering tool – the automation module is very functional and may be applied to all reports (taxonomies), both to entire reports as well as to their specific parts,
- it provides the highest performance of data entry from sources generated straight by banking systems,
- it enables the aggregation of data from many sources to one cell in the report and an immediate calculation of its value,
- it precisely selects from data sources only the values that exactly match the conditions specified by the user and therefore it eliminates the risk of inconsistencies and data loss which may occur by mistake in manual processing - the mapping language allows to use many aggregate functions and selectors at the same time,
- it automatically calculates every report cell selected by the user, thus it helps to avoid many mistakes which occur in manual calculations,
- it provides the standardization of the process of automatic data entry into report – the automation module is a specialized tool designed particularly for this purpose,
- it gives the possibility of introducing changes to once defined mappings by overwriting,
- it is suitable also for data entry and calculation in list forms,
- it saves time and lowers the costs of reporting process.

## Terms and Examples

### Report cell types – primary and calculated cell

	Wartość
T 01.1	
Assets	<b>A=B+C</b>
Financial assets, Cash and cash equivalents	<b>B</b>
Cash and cash equivalents, Cash on hand	<b>C</b>
Assets, Financial assets, Cash and cash equivalents, Cash balances at central banks	
Assets, Financial assets, Cash and cash equivalents, Other demand deposits and cash equivalents	
Assets, Financial assets, Held for trading	
Assets, Financial assets, Held for trading, Derivatives	
Assets, Financial assets, Held for trading, Equity instruments	
Assets, Financial assets, Held for trading, Debt securities	
Assets, Financial assets, Held for trading, Loans and advances	
Assets, Financial assets, Designated at fair value through profit or loss	
Assets, Financial assets, Designated at fair value through profit or loss, Equity instruments	
Assets, Financial assets, Designated at fair value through profit or loss, Debt securities	
Assets, Financial assets, Designated at fair value through profit or loss, Loans and advances	
Assets, Financial assets, Available-for-sale	
Assets, Financial assets, Available-for-sale, Equity instruments	
Assets, Financial assets, Available-for-sale, Debt securities	
Assets, Financial assets, Available-for-sale, Loans and advances	

Example 1. Primary cells (independent) and calculated cells (dependent)



Primary cells: B and C

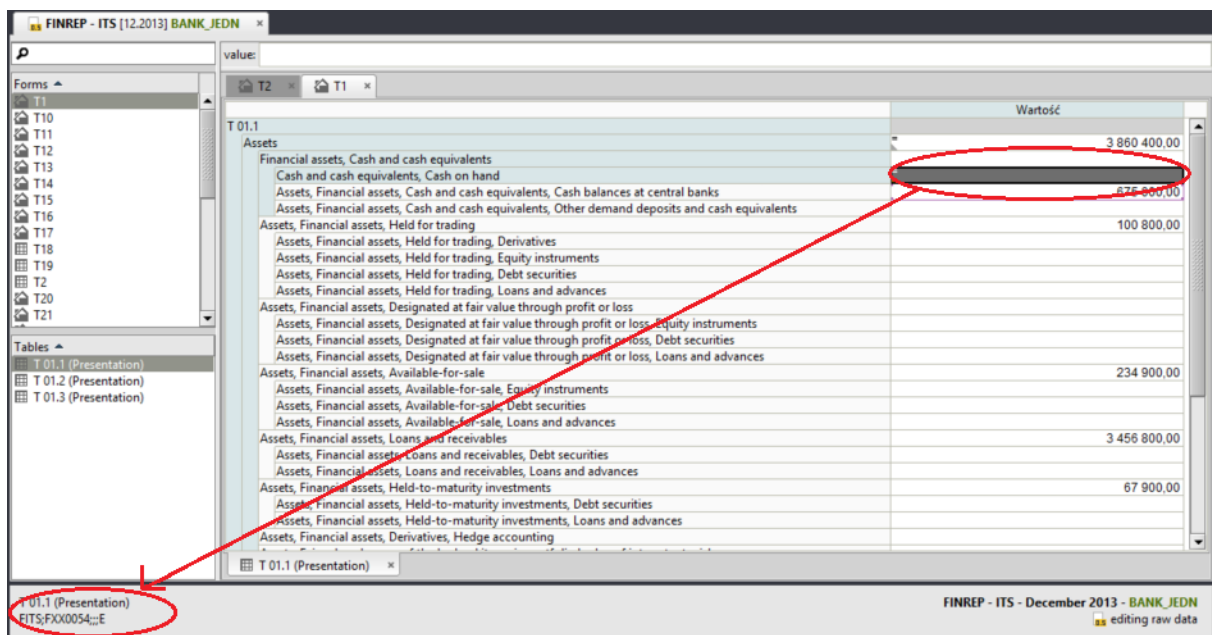
Calculated cell: A

**Primary cells** have to be entered by the user.

**Calculated cells** are defined by validation rules and calculations (e.g. components sum). They do not have to be entered by the user as they are calculated automatically.

## Mapping data from sources to the report cells

Every cell in the report has a unique ID determined by XBRL format which is required by the banking sector regulator.



The screenshot shows a financial report interface for 'FINREP - ITS [12.2013] BANK\_JEDN'. The main table displays various asset categories and their values. A red oval highlights the cell ID '01.1 (Presentation) FITS:FOX0054;:E' in the bottom left corner. Another red oval highlights the value '3 860 400,00' in the 'Wartość' column for the 'Assets, Financial assets, Cash and cash equivalents' row. A red arrow points from the highlighted cell ID to the highlighted value.

	Wartość
T 01.1	3 860 400,00
Assets	
Financial assets, Cash and cash equivalents	3 860 400,00
Cash and cash equivalents, Cash on hand	
Assets, Financial assets, Cash and cash equivalents, Cash balances at central banks	676 800,00
Assets, Financial assets, Cash and cash equivalents, Other demand deposits and cash equivalents	
Assets, Financial assets, Held for trading	100 800,00
Assets, Financial assets, Held for trading, Derivatives	
Assets, Financial assets, Held for trading, Equity instruments	
Assets, Financial assets, Held for trading, Debt securities	
Assets, Financial assets, Held for trading, Loans and advances	
Assets, Financial assets, Designated at fair value through profit or loss	
Assets, Financial assets, Designated at fair value through profit or loss, Equity instruments	
Assets, Financial assets, Designated at fair value through profit or loss, Debt securities	
Assets, Financial assets, Designated at fair value through profit or loss, Loans and advances	
Assets, Financial assets, Available-for-sale	234 900,00
Assets, Financial assets, Available-for-sale, Equity instruments	
Assets, Financial assets, Available-for-sale, Debt securities	
Assets, Financial assets, Available-for-sale, Loans and advances	
Assets, Financial assets, Loans and receivables	3 456 800,00
Assets, Financial assets, Loans and receivables, Debt securities	
Assets, Financial assets, Loans and receivables, Loans and advances	
Assets, Financial assets, Held-to-maturity investments	67 900,00
Assets, Financial assets, Held-to-maturity investments, Debt securities	
Assets, Financial assets, Held-to-maturity investments, Loans and advances	
Assets, Financial assets, Derivatives, Hedge accounting	

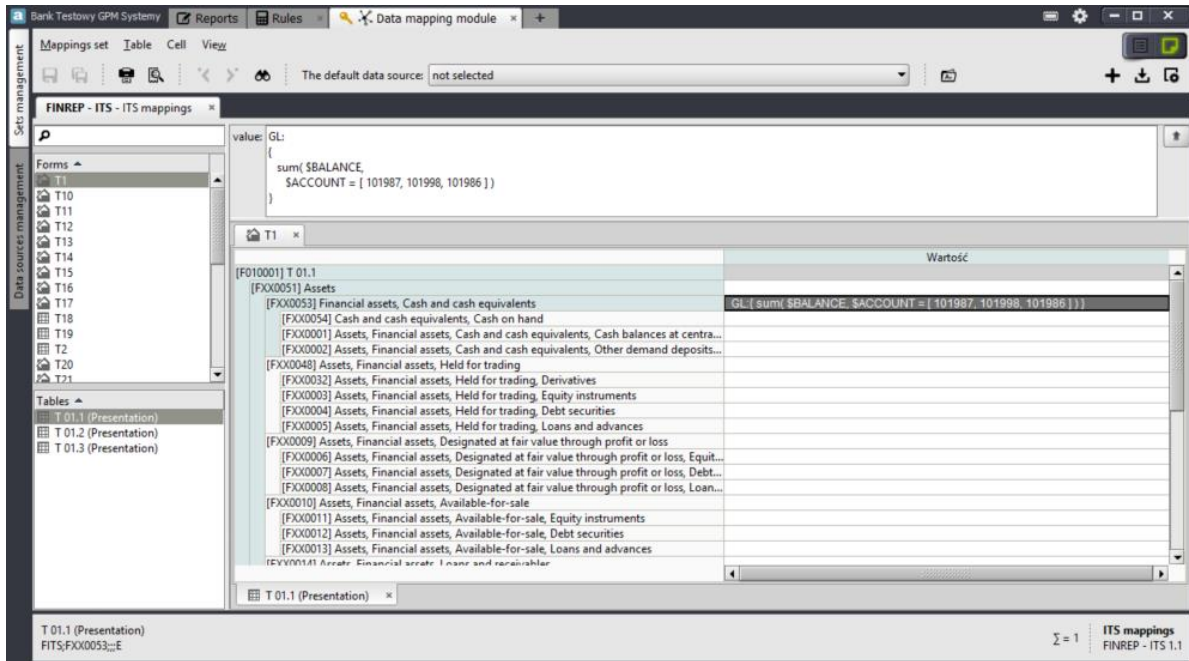
Example 2. Cell ID in the report

However, banks in their systems use different types of attributes such as chart of accounts, numbers, accounts attributes, customers attributes, etc.

**The mapping is, more or less, a link between a specified set of attributes of data source and cell in the report.**

The significance of the ID in the reporting process is not important for aSIS users. The task of linking attributes with cells and cells with the ID is taken over by aSIS.

The **automation** module presents mappings in the report table form just as in the aSIS base module. This makes their creation much easier and their management and edition more accessible.



**Example 3. The automation module window with exemplary mapping**

### Data sources for mappings

Mapping fetches data from any source the structure of which matches the criteria listed below:

1. In case of XLS files, files may have any structure and may be used in mappings by cell addresses (i.e. A4, C5).
2. The source is a table which means that all records (rows) have the same structure and the data source is the combination of the records.
3. The table has a headline row which identifies the columns of the table.
4. The data source has one of the following formats: CSV, file XLS [MS Excel format] or
5. A table which is a result of SQL query.

	A	B	C	D	E
1	ACCOUNT	NAME	BALANCE	REVISION	
2	101978	Cash EUR	150 000	27 000	
3	101787	Cash USD/EUR	5 000	2 000	
4	101789	Cash GBP/EUR	10 000	7 000	
5	101797	Cash CHF/EUR	25 000	1 000	
6					
7					



#### Example 4. Exemplary source of data GENERAL\_LEDGER

The table which is the source of data may be composed of any content, e.g.:

- the table may contain unlimited number of rows and columns
- columns and rows may have any name
- the source file may have any name.

The source may then be any table created in any way, for example a table exported from the main system or created manually.

### Mapping language

The essential element of mapping language is mapping expression as in the form presented below:

***SOURCE\_NAME : { aggregates function (calculation on the selected records of data , selector ) }***

where:

- *source name* – defines a table which contains required data,
- *aggregates function* – an arithmetical operation on a series of records, e.g. “sum”,
- *record of data* – a row in the table of data,
- *selector* – a filter which applies the conditions to data selection.

The columns of the data source are indicated by a special mark “\$”.

### A simple mapping example:

**GL : { sum ( \$BALANCE , \$ACCOUNT = [101987, 101998, 101986] ) }**

Which reads as follows:

- for the data source GL (**GENERAL\_LEDGER**)
- it aggregates (**sum**)
- the values from the **BALANCE** column
- for records which in the **ACCOUNT** column have numbers 101987, 101998 and 101986.

Mapping expressions link the attributes of the report with an expected calculation of the data set selected from the source. Summarizing, mapping expressions describe mappings.



value: GL:

```
{
  sum( $BALANCE,
    $ACCOUNT = [ 101987, 101998, 101986 ] )
}
```

	Wartość
[F010001] T 01.1	
[FXX0051] Assets	
[FXX0053] Financial assets, Cash and cash equivalents	GL { sum( \$BALANCE, \$ACCOUNT = [ 101987, 101998, 101986 ] ) }
[FXX0054] Cash and cash equivalents, Cash on hand	
[FXX0001] Assets, Financial assets, Cash and cash equivalents, Cash balances at centra...	
[FXX0002] Assets, Financial assets, Cash and cash equivalents, Other demand deposits...	
[FXX0048] Assets, Financial assets, Held for trading	
[FXX0032] Assets, Financial assets, Held for trading, Derivatives	
[FXX0003] Assets, Financial assets, Held for trading, Equity instruments	
[FXX0004] Assets, Financial assets, Held for trading, Debt securities	
[FXX0005] Assets, Financial assets, Held for trading, Loans and advances	
[FXX0009] Assets, Financial assets, Designated at fair value through profit or loss	
[FXX0006] Assets, Financial assets, Designated at fair value through profit or loss, Equit...	
[FXX0007] Assets, Financial assets, Designated at fair value through profit or loss, Debt...	
[FXX0008] Assets, Financial assets, Designated at fair value through profit or loss, Loan...	
[FXX0010] Assets, Financial assets, Available-for-sale	
[FXX0011] Assets, Financial assets, Available-for-sale, Equity instruments	
[FXX0012] Assets, Financial assets, Available-for-sale, Debt securities	
[FXX0013] Assets, Financial assets, Available-for-sale, Loans and advances	
[FXX0014] Assets, Financial assets, Loans and receivables	

T 01.1 (Presentation)

Σ = 1 ITS mappings  
FINREP - ITS 1.1

**Example 5. The structure of mapping expression**

Another example of the calculation of data records:

GL : { sum ( \$BALANCE - \$VALUE\_ADJUSTMENTS , \$ACCOUNT = [101987, 101998, 101986]) }

The above means that for records, which in the ACCOUNT column have numbers 101978 and 101787, values in BALANCE column minus values in VALUE\_ADJUSTMENTS column are aggregated.

Mapping allows to use many conditions in one expression and to combine them with one of the logical operators, for example:

**AND** - condition1 && condition2

**OR** - condition1 || condition2

This may be useful in a situation when a few conditions need to be applied to one source of data.

For the exemplary data source presented below, there are listed values (the VALUE column) of revision of several accounts (the ACCOUNT column) within several months and it is indicated whether they have been accepted or not for accounting (the ACCEPTANCE column).

	A	B	C	D	E	F
1	CODE	ACCOUNT	NAME	VALUE	ACCEPTANCE	
2	Rev/CHF/February/01	101797	change	1 000	YES	
3	Rev/GBP/February/02	101789	change	4 000	YES	
4	Rev/EUR/April/01	101978	change	2 000	YES	
5	Rev/EUR/May/01	101978	change	12 000	YES	
6	Rev/EUR/May/02	101978	change	8 000	YES	
7	Rev/GBP/May/03	101789	change	3 000	YES	
8	Rev/EUR/May/04	101978	change	6 000	NO	
9	Rev/EUR/September/01	101978	change	-1 000	NO	
10	Rev/USD/September/02	101787	change	2 000	NO	
11						

**Example 6. Exemplary source of data – V\_A (VALUE\_ADJUSTMENTS)**

Exemplary situation - to obtain the value of revision for EUR (account 101978) which has been already accepted, the mapping expression needs to include two conditions:

**V\_A : { sum( \$VALUE , \$ACCOUNT = 101978 && \$ACCEPTANCE = YES ) }**

One mapping may include any number of data sources combined. That allows the user to calculate one cell in the report from many records of one source as well as from many records of many sources.

For example (tables 4 and 6) to obtain the value for EUR ‘account 101978’ reduced by ‘accepted for accounting revisions’, the mapping would be as follows:

**GL : { sum ( \$BALANCE , \$ACCOUNT = 101987 ) }**  
**- V\_A : { sum ( \$VALUE , \$ACCOUNT = 101987 && \$ACCEPTANCE = YES ) }**

The screenshot shows a software interface with a mapping editor at the top and a table of financial assets below. The mapping editor displays the following code:

```

value: GL:
{
  sum( $BALANCE,
    $ACCOUNT = 101987 )
}
-
V_ADJUSTMENTS:
{
  sum( $VALUE,
    $ACCOUNT = 101987 && $ACCEPTANCE = YES )
}

```

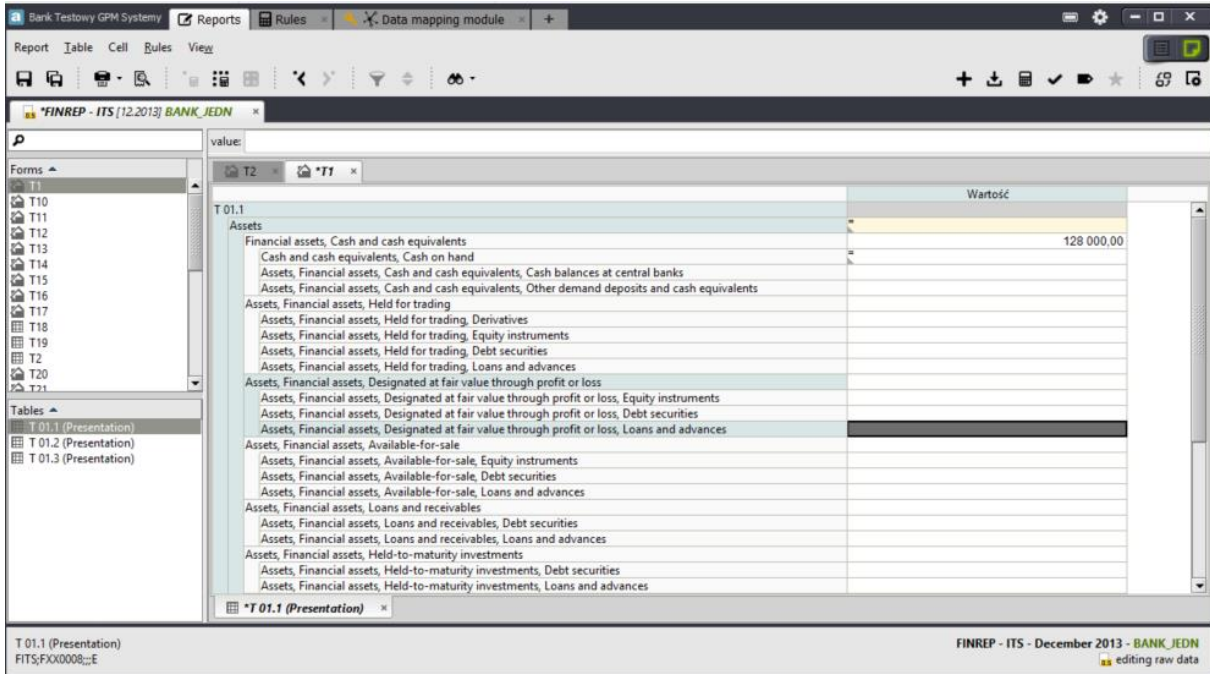
The table below shows a list of financial assets with columns for account codes and descriptions. The 'Wartość' (Value) column contains the mapping expression: `GL: { sum( $BALANCE, $ACCOUNT = 101987 ) } - V_ADJUSTMENTS: { sum( $VALUE, $ACCOUNT = 101987 && $ACCEPTANCE = YES ) }`. The table includes rows for various asset categories like 'Financial assets, Cash and cash equivalents', 'Cash and cash equivalents, Cash on hand', and 'Assets, Financial assets, Held for trading'.

**Example 7. Mapping from two separate data sources**

And the result for the tables from examples 4 and 6 are following:

$$150\,000 - (2\,000 + 12\,000 + 8\,000) = 128\,000$$

(balance) – (adjustments)



	Wartość
T 01.1	
Assets	
Financial assets, Cash and cash equivalents	
Cash and cash equivalents, Cash on hand	128 000,00
Assets, Financial assets, Cash and cash equivalents, Cash balances at central banks	
Assets, Financial assets, Cash and cash equivalents, Other demand deposits and cash equivalents	
Assets, Financial assets, Held for trading	
Assets, Financial assets, Held for trading, Derivatives	
Assets, Financial assets, Held for trading, Equity instruments	
Assets, Financial assets, Held for trading, Debt securities	
Assets, Financial assets, Held for trading, Loans and advances	
Assets, Financial assets, Designated at fair value through profit or loss	
Assets, Financial assets, Designated at fair value through profit or loss, Equity instruments	
Assets, Financial assets, Designated at fair value through profit or loss, Debt securities	
Assets, Financial assets, Designated at fair value through profit or loss, Loans and advances	
Assets, Financial assets, Available-for-sale	
Assets, Financial assets, Available-for-sale, Equity instruments	
Assets, Financial assets, Available-for-sale, Debt securities	
Assets, Financial assets, Available-for-sale, Loans and advances	
Assets, Financial assets, Loans and receivables	
Assets, Financial assets, Loans and receivables, Debt securities	
Assets, Financial assets, Loans and receivables, Loans and advances	
Assets, Financial assets, Held-to-maturity investments	
Assets, Financial assets, Held-to-maturity investments, Debt securities	
Assets, Financial assets, Held-to-maturity investments, Loans and advances	

**Example 8. The result of mapping data from two different data sources (tables 4 and 6)**

For more information on business or technical matters, please contact us:

**GPM SYSTEMY LTD**

ul. Kiemliczów 9/4  
54-513 Wrocław

Phone: +48 504 207 613 / +48 515 128 933  
email: [info@gpm-systemy.com](mailto:info@gpm-systemy.com)

[www.gpm-systemy.com](http://www.gpm-systemy.com)