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LIST OF ABBREVIATIONS

EIA	European Interoperability Architecture
Cart	Cartography
EIF	European Interoperability Framework
EFIR	European Federated Interoperability Repository
EIRA	European Interoperability Reference Architecture
GUI	Graphical User Interface
TES	Trans-European System

1. INTRODUCTION

1.1. Context

The European Interoperability Architecture action (hereafter referred to as the EIA project) is part of the ISA programme, and it aims at developing, together with the Member States and the relevant European Commission departments, a joint vision for an Interoperability Architecture for European public services. The main work products of the action are:

- The European Interoperability Reference Architecture (EIRA), a reference architecture for classifying and organising the most salient building blocks, relevant to interoperability, used in the delivery of digital public services.
- The Cartography (Cart), a mapping of existing solutions to the Building Blocks of the EIRA.

A draft version of the two work products has been delivered at the end of the first phase of the project, September 2013. The second phase aims at finalising and validating the two work products. In particular, one of the goals of the project is to develop a business intelligence/dashboarding tool to implement the Cart in an interactive way. The tool will aggregate and filter the information according to different criteria, and will support the search and discovery of solutions via a user-friendly graphic user interface (GUI).

1.2. Scope and objective

The scope of this document is nested inside the project's scope of the action 2.1 – European Interoperability Architecture. This user guide aims to provide underpinning operational knowledge to exploit the Qlickview dashboard for Cart that maps existing solutions to the architectural building blocks of the EIRA. This interactive dashboard enables the user to navigate through the EIRA and to search for associated solutions.

This user guide shows how the user is able to discover the existing solutions, which could be re-used for designing a new system or to enable interoperability with Member States and/or European Union Institutions. The guide details the functions associated with the tool and how to use the dynamic features created to facilitate the interpretation of the reference architecture.

In the current version of the tool, the dashboard maps the metadata of the building blocks with the different active elements represented in the user interface. A next objective of the tool is that the interoperability requirements are shown as metadata of the building block. This objective is not in scope of this version of the tool, but it could bring additional value in a successive phase of the action.

1.3. Target audience

The user guide will be made available to the stakeholders of the EIA project and to the potential users of the European Interoperability Reference Architecture and the Cartography.

2. EIRA OVERVIEW

2.1. User interface

The first tab (home view, called EIRA overview) of the Cartography tool is based on the European Interoperability Reference Architecture. Hence, all the different views in the EIRA are represented as the user interface for the EIRA overview tab. This representation has only an illustrative purpose, to provide the user with a quick look on the different EIRA views. The zoomed views are included in the tool (cf. section 3 Zoomed view – Different views of the EIRA), and allow the user to discover the desired building blocks and to search for interoperable solutions.

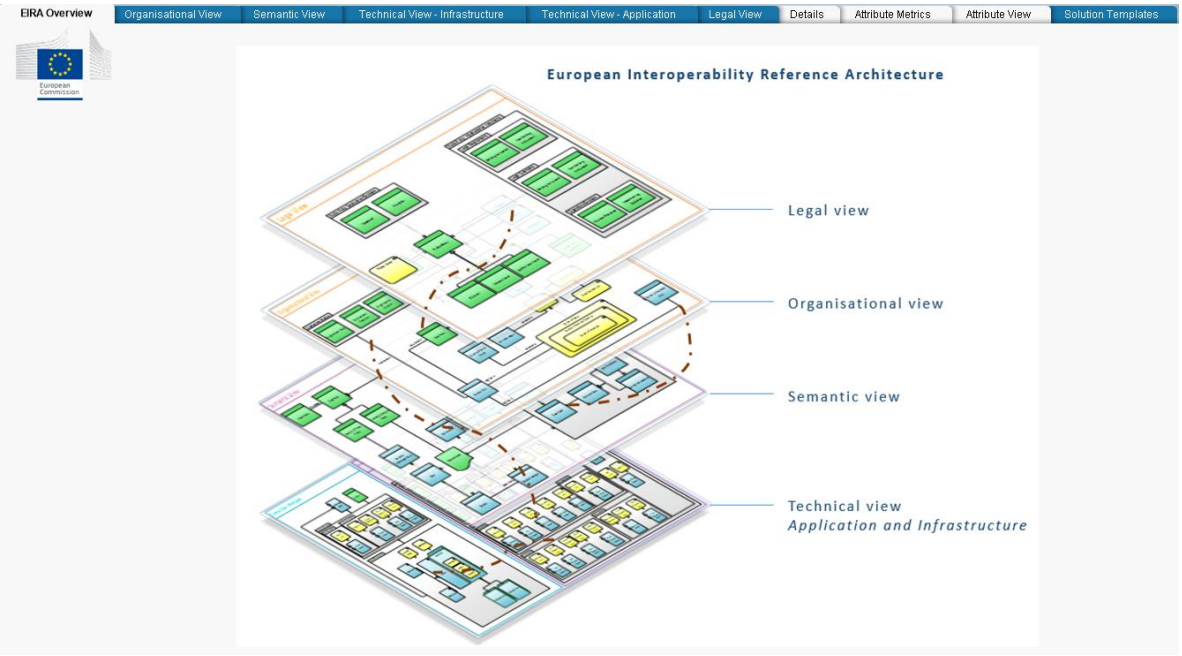


Figure 1 – User interface of the EIRA overview tab

2.2. Functionalities

Active elements	**The user is able to click on the names of the different views** The user is able to navigate through the Cart tool via the active elements in the user interface.

Table 1 – Overview functionalities of the EIRA overview

2.2.1. Function 1 – Active Elements

The user interface of the 'EIRA overview' tab consist of the layered view of the EIRA. Each view contains the building blocks belonging to the related interoperability level. The EIRA overview integrates the different views as active elements. By clicking the name of the desired view, the tool will open the corresponding zoomed view. In that view, the user will be able to build a selection query to search for existing interoperability solutions.

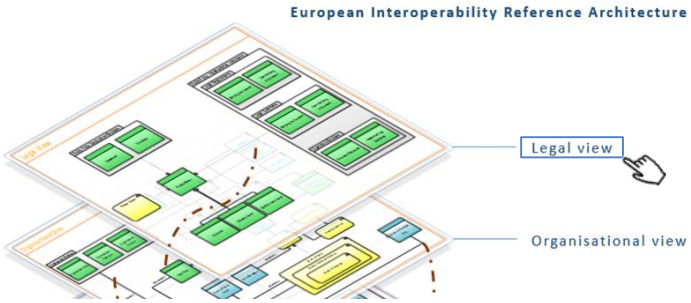


Figure 2 – Preview of the use of active elements on the EIRA overview

3. ZOOMED VIEW – DIFFERENT VIEWS OF THE EIRA

3.1. User interface

From the EIRA overview, the user is able to zoom into the different views of the EIRA. Each view represents a subset of building blocks and relationships related to that interoperability level. The functionalities and descriptions given in this section are generic and thus applicable for each zoomed view:

- legal view,
- organisational view,
- semantic view
- technical view – application,
- technical view – infrastructure.

Furthermore, on the top of the screen a legend (see (1) in Figure 3 below) is displayed, which briefly explains the meaning of the colours. The descriptions of the colours (coming from the Archimate 2.0 modelling notation[1]) is presented below:

- *blue: active structure elements*
  An active structure element is defined as an entity that is capable of performing behaviour.
- *yellow: behavior elements*
  A behavior element is defined as a unit of activity performed by one or more active structure elements.
- *green: passive structure elements*
  A passive structure element is defined as an object on which behavior is performed.
- *pink: motivation extensions*
  This category includes the actual motivations or intentions – i.e., goals, principles, requirements, and constraints – and the sources of these intentions; i.e., stakeholders, drivers, and assessments.

Besides the active elements and the legend, the user interface displays a query builder (2), buttons (3 and 4), and a search box (5). These functionalities are further explained below in section 3.2.

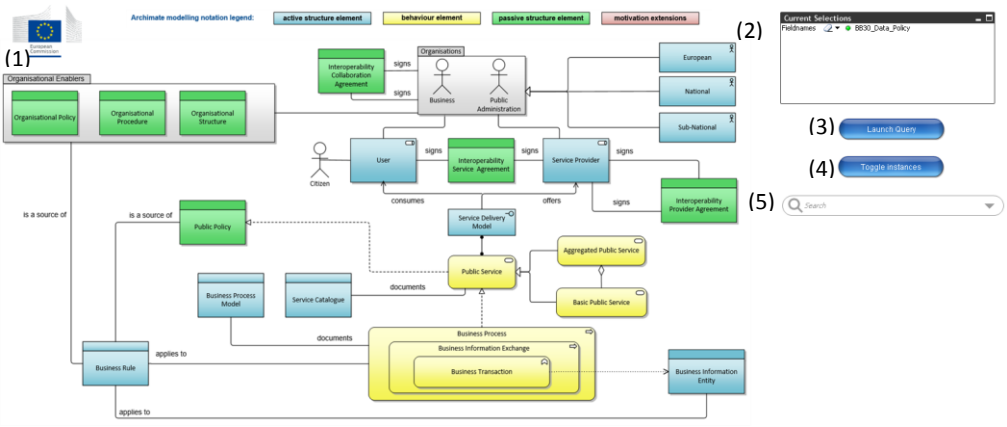


Figure 3 – User interface of the EIRA zoomed view (organisational view)

[1] http://pubs.opengroup.org/architecture/archimate2-doc/chap02.html, section 2.2

3.2. Functionalities

Active elements for building the selection query	The user is able to click on the building blocks to build the query; these elements are implemented as active elements in the user interface.
Hover over	The user is able to retrieve additional information while hovering over a building block or relationship.
Query builder (2)	The user is able to see its current selection of building blocks used to build the desired query. Furthermore, via the query builder the query can be (a) modified (add/remove elements), or it can be (b) cleared.
Launch query (3)	The user is able to execute the query and retrieve the interoperability solutions that are mapped to the selected building blocks.
Toggle instances (4)	The user is able to view the instances of the data selection (based on the filter) mapped on the user interface.
Search functionalities (5)	The user is able to search for specific building blocks of the EIRA.

The number between brackets (e.g. (2)) refers to the number displayed on the preview of the user interface, see Figure 3 above.

Table 2 – Overview functionalities of the zoomed views

3.2.1. Function 1 – Active elements for building the selection query

The zoomed views in the Cart tool represent the different views of the European Interoperability Reference Architecture. Each of the zoomed view displays the set of related building blocks in the user interface, which are active (clickable) elements on their own.

By clicking on an active element, the user is able to add that specific building block to the search query. The user is able to easily extend the search query by clicking on any additional desired building blocks. Once the user has selected the desired building blocks, the query can be launched to retrieve all solutions that have been mapped with those elements.

The user is also able to deselect a building block from the query, by clicking a second time on the specific active element in the user interface.

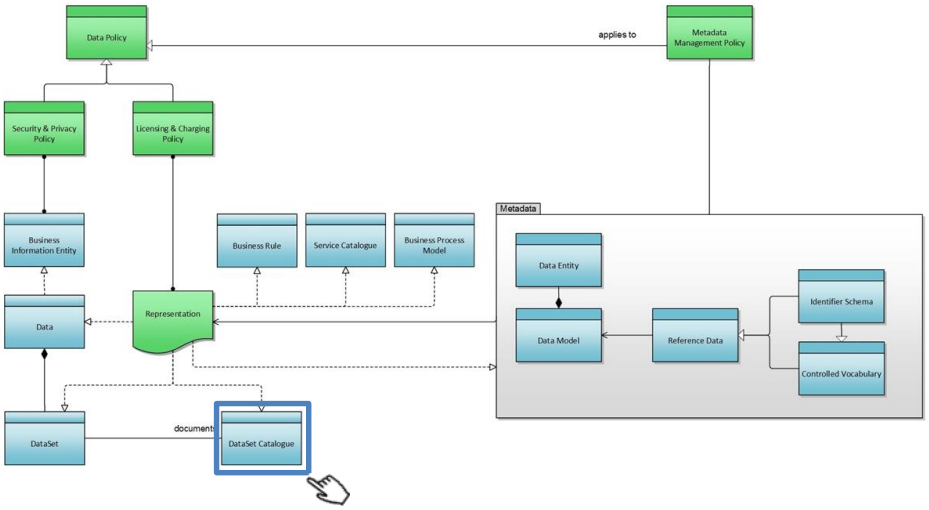


Figure 4 – Preview of the use of active elements in the zoomed views (semantic view)

3.2.2. Function 2 – Hover over

The hover over functionality is provided in the tool to display extra information on the building blocks. While looking at the diagram, the definitions of the building blocks can be unclear. Therefore, the information box will typically include the descriptive explanation of the building block.

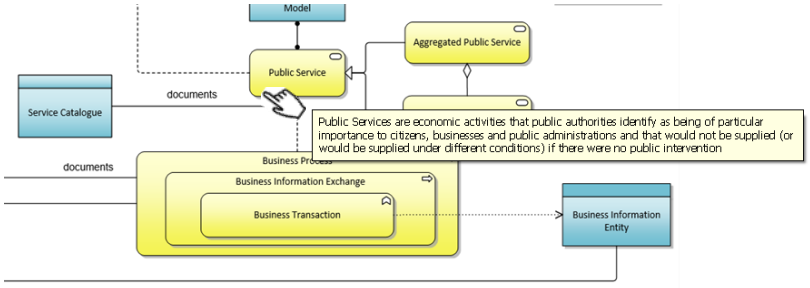


Figure 5 – Preview of the hover over function

3.2.3. Function 3 – Query builder

The query builder is a convenient section in the user interface, which displays the current selection of building blocks of the user. The main purpose of the query builder is to track the current selection and validate the query before launching it.

The query builder will display the selected elements as followed:

- Fieldnames: representing all the selected building blocks from the EIRA (via the user interface / query builder / search functionality).
- Additional rows: the query builder will add a new row per filter that is active in the current selection of the tool. On Figure 6 below, the example contains two additional filters. One filter is active on the Trans European Systems (TES); the user wants only to retrieve the data for the 'ECAS' system. A last filter is set on the values for the public services; only the data linked with the 'provision of an identity management platform' will be displayed.

The green dot that is displayed in the query builder will be reused throughout the Cart tool. It indicates that a filter is active on the data (in this case 3 filters).

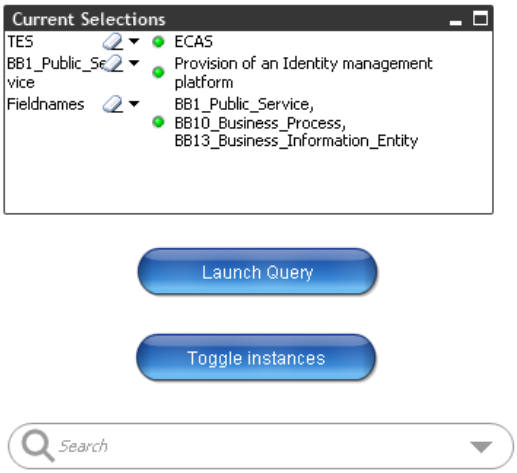


Figure 6 – Preview of the query builder, buttons and search box

Currently the query builder is foreseen to show at maximum nine fieldnames by their full name. As soon as the user has selected more than nine building blocks, the query builder will display the number of selected building blocks (see figure below).

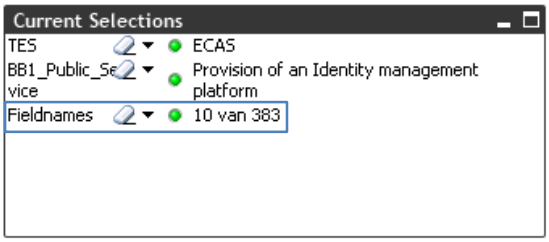


Figure 7 – Preview of the query builder with more than nine fieldnames

Furthermore, the query builder offers two additional functionalities to the user: (a) adding or removing new elements, (b) clearing the current selection.

(a) Adding or removing new elements via the query builder

The user is able to select / deselect building blocks via a dropdown list, displaying all active elements in the user interface of all views, in the query builder. The user can trigger the dropdown list by clicking the black arrow next to fieldnames (see Figure 8 below). The current selection of building blocks will be displayed in green, the not included elements are greyed out.

By default, the user can only select one building block with a single click. This means that the current selection will be cleared if a new building block is selected. Multiple building blocks can be selected by holding the “Ctrl” key on the keyboard and clicking on all the desired elements. On the release of the “Ctrl”-key, the query will be updated. Another possibility is to select a range of building blocks; the user needs to hold the left-mouse button and select all the needed elements.

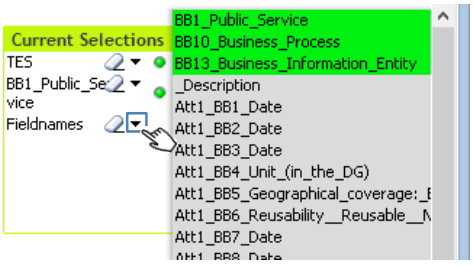


Figure 8 – Preview of the query update functionality via the query builder

By clicking on one of the active filters (i.e. TES or BB1_Public_Service), the user is able to adjust the filtered values. A list of potential values for the filter are shown.

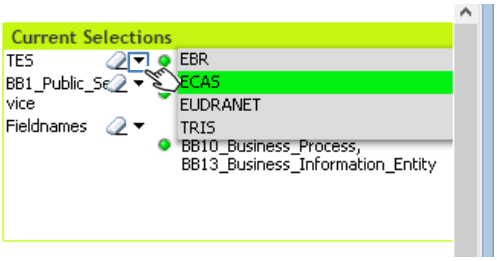


Figure 9 – Preview of the filter update functionality via the query builder

(b) Clearing the current selection query or active filters

Each query, displayed in the query builder, can contain different sections (active filters, and the selection of building blocks). The user is able to remove each separate section by one click on the "eraser"-icon in the query builder (see Figure 10 below).

In the example given below, the filter on the Trans European System (i.e. only ECAS) will be removed when the user clicks on the icon.

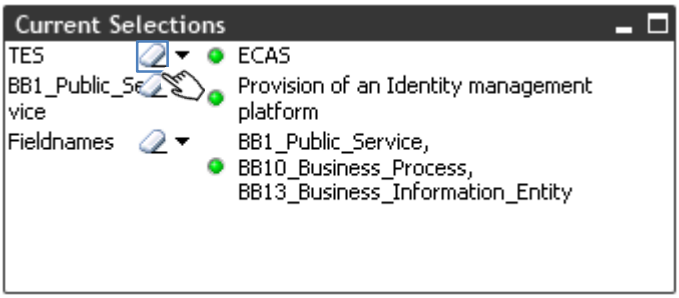


Figure 10 – Preview of the clear functionality via the query builder

3.2.4. Function 4 – Launch query

The "launch query" functionality greatly simplifies the process of extracting data mapped with a set of building blocks. When the user clicks on the "launch query" button (see Figure 6 above), it executes the query based on the set of building blocks that is selected within the query builder.

Once the user clicks on the button, the Cart tool will open a new tab 'Details' (cf. section 4 Output view – Launching queries). This tab will display all the solutions that are mapped with the chosen building blocks of the query.

3.2.5. Function 5 – Toggling instances

This functionality enables the user to see the solutions, retrieved in the details tab (cf. section 4 Output view – Launching queries), mapped with the building blocks in the zoomed view of the EIRA. This functionality is only advised when a filtering is performed (cf. section 4.2.6 Function 6 – Filtering) and the number of values has been reduced to a minimum number of results (preferable one specific result/row).

In order to see the instantiation, the user has to navigate to a zoomed view, and click on the "Toggle instances" button underneath the query builder. Information boxes will appear on top of the EIRA view (see figure below). Whenever multiple results are mapped with a certain building block, then a navigation box (green) is displayed on the right side of the information box (see arrow in Figure 11 below).

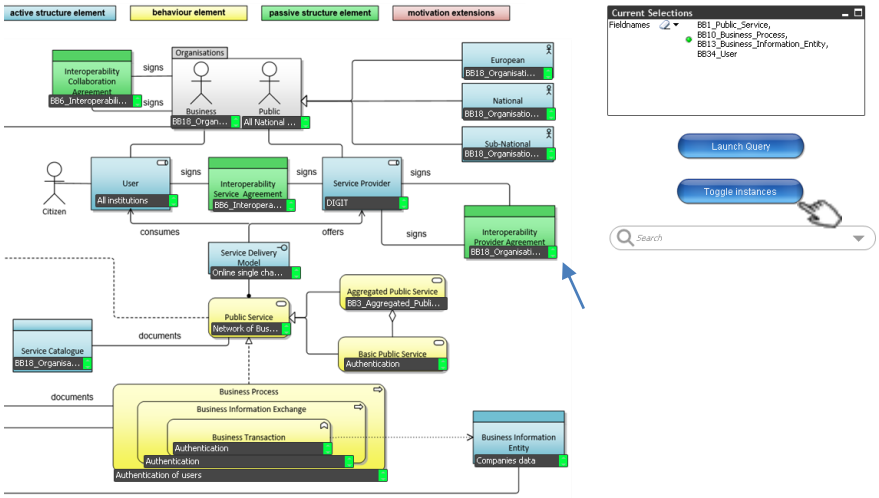


Figure 11 – Preview of the instantiation functionality in the zoomed views

The user is able to enlarge the box if it is too small to display the complete result. By navigating towards the one of the edges of the box, the pointer will then change into a slider. The user is at that point able to hold the border and drag it to enlarge the window to the preferred size (see Figure 12). This functionality will be available for each object in the user interface of the Cart tool.

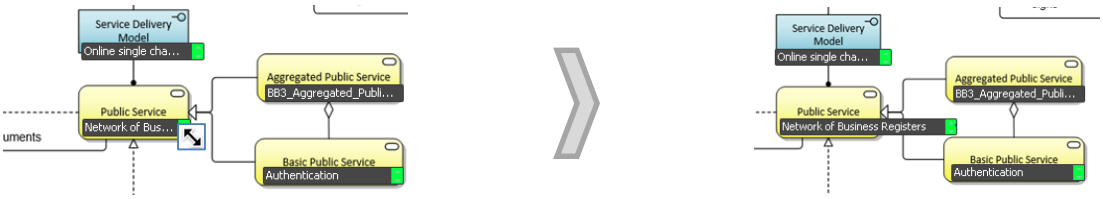


Figure 12 – Preview of enlarging the information boxes in the user interface

3.2.6. Function 6 – Search functionalities

The search tool allows the user to search only for specific building blocks. As soon as the user starts typing in the text box, the search engine suggest a number of search results in a drop down list.

Once the user selects the preferred search result, it will be instantly added to the query builder.

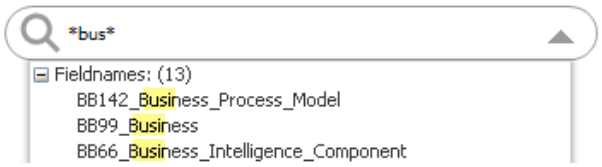


Figure 13 – Preview of the search functionality

The search queries in the text box allows the use of wildcards;

* The asterisk symbol indicates that zero, one or more characters can be positioned on the place of the asterisk.

E.g. *bus*, indicates that other characters can come in front and after the 'bus'. The results will display all possibilities where 'bus' occurs; e.g. BB142_Business_Process_Model.

? The question mark symbol represents exactly one character in that position.

E.g. BB142_Business_P??????_*, indicates that there are exactly four characters in between the 'p' and the '_'. After the '_' is an asterisk, meaning that other characters could occur after the underscore. For example, the 'p' can stand for 'process' or 'possess'

4. OUTPUT VIEW – LAUNCHING QUERIES

4.1. User interface

The output view will be shown when the user launches the query on one of the zoomed views. This view will provide the user with all the values (solutions) that are mapped with the building blocks, selected in the query.

Similarly to the zoomed view, the output view consists of different elements (see indication on Figure 14):

- Building block selection area (1);
- Search engine (2);
- Buttons (show comments (3), clear all (4));
- Output table (5).

By default, the Trans European Systems are displayed in the first column of the output table. However, the user has the possibility to organize the query results in the way he/she prefers, in order to facilitate the interpretation of the building blocks selection.

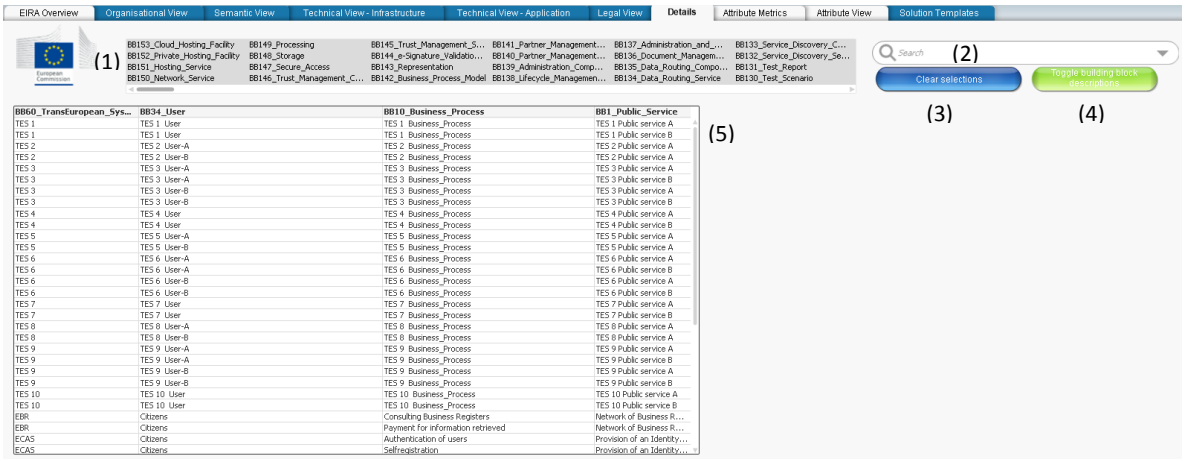


Figure 14 – User interface of the output view

4.2. Functionalities

Update selection query (1)	The user is able to add / remove building blocks of the EIRA from the executed query.
Search functionalities (2)	The user is able to search for (a) specific building blocks or relationships of the EIRA, (b) specific solutions that are mapped with the building blocks or relationships of the EIRA, (c) attributes of the specific building blocks and its instantiations.
Clear the current selection query (3)	The user is able to remove the current selection query and filters by one click.
Show extra information on the retrieved data (4)	The user is able to retrieve extra information of the Trans European System.

Drag & drop (5)	The user is able to drag and drop the columns in the preferred order to preview the retrieved data on the solutions.
Filtering (5)	The user is able to filter the data by means of a specific selection or a multiselection of values mapped to the building blocks.

The number between brackets (e.g. (2)) refers to the number displayed on the preview of the user interface, see Figure 14 above.

Table 3 – Overview functionalities of the output view

4.2.1. Function 1 – Update selections

The user is able to update the selection query by selecting the building blocks in the selection menu on the top of the user interface (see (1) in Figure 14 above). By default, the user can only select one building block with a single mouse click. However, a multi-selection of building blocks can be performed by holding the "Ctrl" on the keyboard (similarly like selecting items via the query builders, cf. 3.2.3 Function 3 – Query builder).

All the building blocks highlighted in green are part of the selection. The deletion of items from the output list is not definitive and the user can easily retrieve a building block by clicking on it once again.

Figure 15 – Preview of the query update functionality in the output view

A second possibility to update the query, is by using the "Shift"-key for selecting multiple building blocks. In combination with mouse clicks, it allows the user to point the start and the end of the selection. All elements in between the starting and ending building block, will be captured within the new selection. When the user releases the shift button, the new selection will be activated. A preview is shown in the figure below.

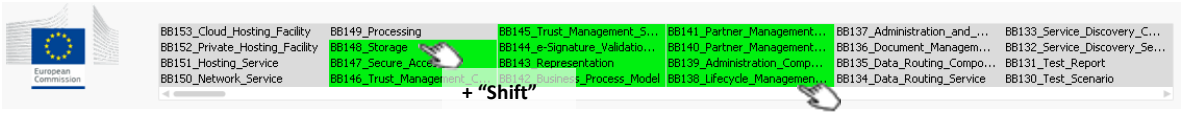


Figure 16 – Preview of the query update functionality with the use of the "shift"-key

Another possibility to update the query is to navigate back to the zoomed views of the EIRA. Hence, the user is able to re-build the query via the user interface or via the query builder. The current selection of building blocks is kept while navigating through the different tabs of the Cart tool. The navigation can be done via the buttons "Back to … view" (… meaning the specific view) or by selecting the corresponding tab on the top (see the figure below).

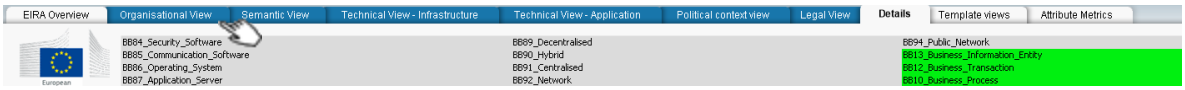


Figure 17 – Preview of the navigation functionality towards the zoomed views

4.2.2. Function 2 - Search functionalities

The search tool allows the user to search for (a) specific building blocks, (b) specific solutions that are mapped to the building blocks of the EIRA, (c) attributes of the specific building blocks and its instantiations. Unlike in the zoomed view, the user is in this view able to search for actual solutions

via the search functionality. As soon as the user starts typing in the text box, the search engine suggest a number of search results in a drop down list.

The results are categorised according to the type of result:

(a) the specific building blocks are added in the fieldnames section of the query builder;

(b) separate sections will be created per building block and its instantiation of it (i.e. existing solution); and

(c) attributes of the specific building blocks and its instantiations (i.e. naming convention starts with “Att”.

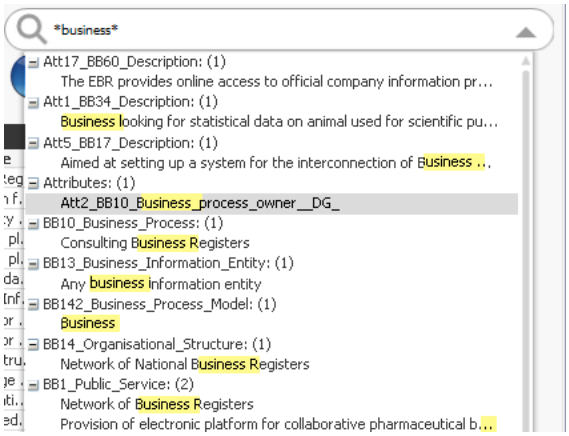


Figure 18 – Preview of the search functionality in the details view

Once the user selects a value from the available search results, the query will be updated instantly. By default, the query will be cleared and use only the selected value. If the user wants to keep the current selection (i.e. query), then the user needs to use the “Ctrl”-key and a new criteria will be added in the query builder.

The search box can be found next to the building block selection area, see (2) in Figure 14 above.

4.2.3. Function 3 – Clear the current selection query

A blue button on top of the screen is provided to the user, in order to clear the current selection of building blocks. This button, called ‘Clear Selection’, will remove all elements from the selection query, including the data filters that are active.

This button can be found underneath the search box, see (2) in Figure 14 above.

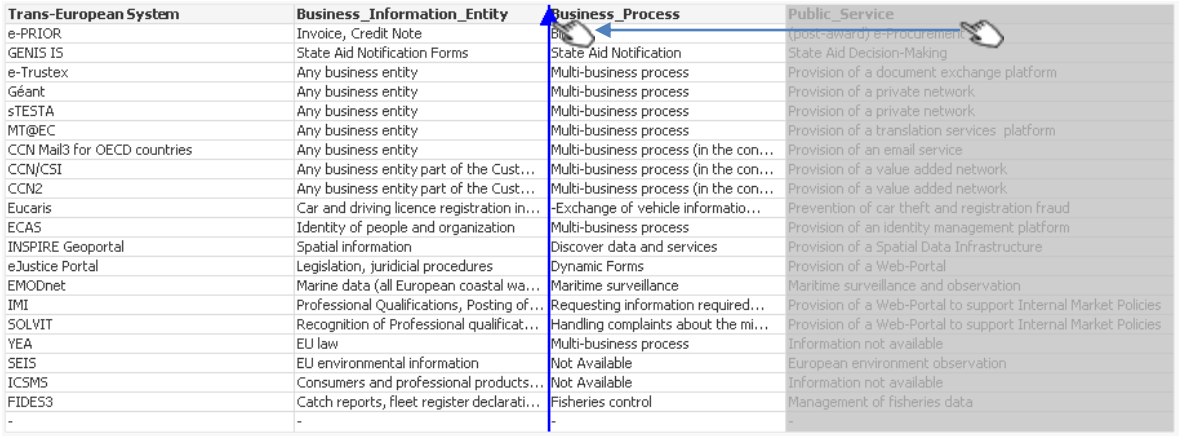
4.2.4. Function 4 – Show extra information on the retrieved data

A green button on top of the screen is provided to the user, in order to retrieve extra information on the selected building blocks. This button, called “Show comment”, will show an additional table providing the definitions of the building blocks. This is the same information that is displayed on the user interface when the user hovers over a particular active element.

Figure 19 – Preview of showing extra information of the Trans European System

4.2.5. Function 5 – Drag & drop

The drag and drop function enables the customization of the output table where the user can drag and drop columns. The user presses and holds down the left-mouse button to grab the column, drags the column to the desired location and releases the button to drop the column. This is helpful to organize the retrieved data in a preferred order to facilitate their interpretation.

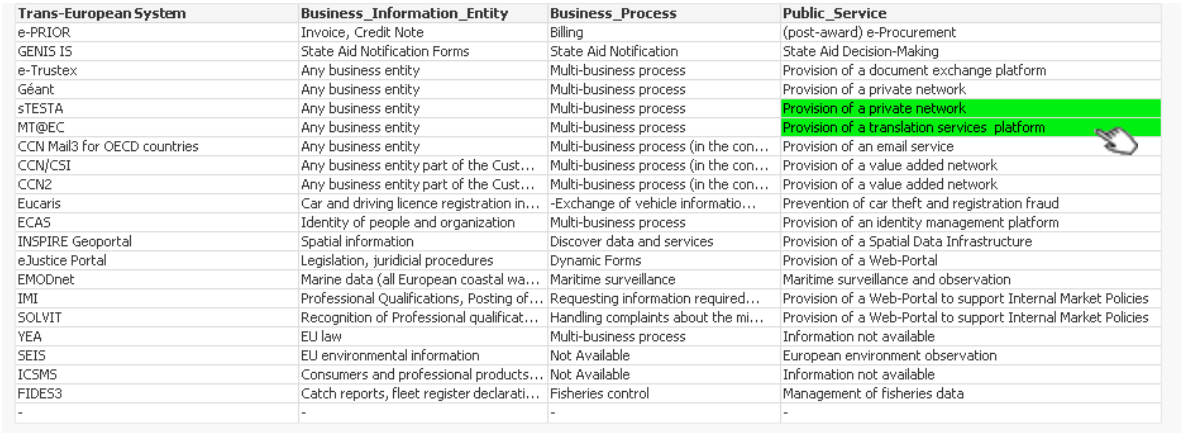


Trans-European System	Business_Information_Entity	Business_Process	Public_Service
e-PRIOR	Invoice, Credit Note	Bi	(post-award) e-Procurement
GENIS IS	State Aid Notification Forms	State Aid Notification	State Aid Decision-Making
e-Trustex	Any business entity	Multi-business process	Provision of a document exchange platform
Géant	Any business entity	Multi-business process	Provision of a private network
sTESTA	Any business entity	Multi-business process	Provision of a private network
MT@EC	Any business entity	Multi-business process	Provision of a translation services platform
CCN Mail3 for OECD countries	Any business entity	Multi-business process (in the con...	Provision of an email service
CCN/CSI	Any business entity part of the Cust...	Multi-business process (in the con...	Provision of a value added network
CCN2	Any business entity part of the Cust...	Multi-business process (in the con...	Provision of a value added network
Eucaris	Car and driving licence registration in...	-Exchange of vehicle informatio...	Prevention of car theft and registration fraud
ECAS	Identity of people and organization	Multi-business process	Provision of an identity management platform
INSPIRE Geoportal	Spatial information	Discover data and services	Provision of a Spatial Data Infrastructure
eJustice Portal	Legislation, juridicial procedures	Dynamic Forms	Provision of a Web-Portal
EMODnet	Marine data (all European coastal wa...	Maritime surveillance	Maritime surveillance and observation
IMI	Professional Qualifications, Posting of...	Requesting information required...	Provision of a Web-Portal to support Internal Market Policies
SOLVIT	Recognition of Professional qualificat...	Handling complaints about the mi...	Provision of a Web-Portal to support Internal Market Policies
YEA	EU law	Multi-business process	Information not available
SEIS	EU environmental information	Not Available	European environment observation
ICSMS	Consumers and professional products...	Not Available	Information not available
FIDES3	Catch reports, fleet register declarati...	Fisheries control	Management of fisheries data
-	-	-	-

Figure 20 – Preview of the drag and drop functionality

4.2.6. Function 6 – Filtering

The filtering functionality allows the user to create specific reports, which are filtered according to parameters. The filters can simply be applied by selecting one or more values in the retrieved data within a column by choice.



Trans-European System	Business_Information_Entity	Business_Process	Public_Service
e-PRIOR	Invoice, Credit Note	Billing	(post-award) e-Procurement
GENIS IS	State Aid Notification Forms	State Aid Notification	State Aid Decision-Making
e-Trustex	Any business entity	Multi-business process	Provision of a document exchange platform
Géant	Any business entity	Multi-business process	Provision of a private network
sTESTA	Any business entity	Multi-business process	Provision of a private network
MT@EC	Any business entity	Multi-business process	Provision of a translation services platform
CCN Mail3 for OECD countries	Any business entity	Multi-business process (in the con...	Provision of an email service
CCN/CSI	Any business entity part of the Cust...	Multi-business process (in the con...	Provision of a value added network
CCN2	Any business entity part of the Cust...	Multi-business process (in the con...	Provision of a value added network
Eucaris	Car and driving licence registration in...	-Exchange of vehicle informatio...	Prevention of car theft and registration fraud
ECAS	Identity of people and organization	Multi-business process	Provision of an identity management platform
INSPIRE Geoportal	Spatial information	Discover data and services	Provision of a Spatial Data Infrastructure
eJustice Portal	Legislation, juridicial procedures	Dynamic Forms	Provision of a Web-Portal
EMODnet	Marine data (all European coastal wa...	Maritime surveillance	Maritime surveillance and observation
IMI	Professional Qualifications, Posting of...	Requesting information required...	Provision of a Web-Portal to support Internal Market Policies
SOLVIT	Recognition of Professional qualificat...	Handling complaints about the mi...	Provision of a Web-Portal to support Internal Market Policies
YEA	EU law	Multi-business process	Information not available
SEIS	EU environmental information	Not Available	European environment observation
ICSMS	Consumers and professional products...	Not Available	Information not available
FIDES3	Catch reports, fleet register declarati...	Fisheries control	Management of fisheries data
-	-	-	-

Figure 21 – Preview of the filtering functionality: Step 1 Selection of the values

Once the user releases the mouse click, the filtering on the data will be executed. A green dot will be displayed next to the column title where the filter is activated.

Trans-European System	Business_Information_Entity	Business_Process	Public_Service
Géant	Any business entity	Multi-business process	Provision of a private network
sTESTA	Any business entity	Multi-business process	Provision of a private network
MT@EC	Any business entity	Multi-business process	Provision of a translation services platform

Figure 22 – Preview of the filtering functionality: Step 2 Executed filtering

To undo the filtering, the user needs to click on the values where the filter is applied (see green dot) or by clicking on the “eraser”-icon for that filter in the query builder (cf. section 3.2.3 Function 3 – Query builder above).

Once the retrieved data is reduced to a minimal number of rows (preferable only 1 result), then the user is able to toggle the instances in the user interface. Meaning that the result in the table are mapped with (and displayed next to) the corresponding building blocks and relationships in the zoomed views of the EIRA.

5. SOLUTION TEMPLATE VIEW

5.1. User interface

A solution architecture template represents is a sub-set of the building blocks of the EIRA, which focuses on the most salient building blocks needed to address a particular interoperability need.

The data, which is mapped with the building blocks, represents the existing and reusable solutions that can be of support for the specific situation.

These template views can be used for:

(1) retrieving standard data that is needed on regular basis in a quick and simple way;

(2) representing a number of building blocks that are impacted in a particular situation (e.g. new public policy that potentially impacts the IT landscape of Member States).

These template views avoids that one or multiple users have to build a particular search query on their own, or multiple times. In the second case (2), the template view could be distributed to the involved stakeholders. They will be able to consult the default columns in order to discover impacted building blocks and they can design new solutions, discover existing solutions or align their solutions to the interoperability need/challenges.

The user interface of the solution template includes different elements (see indication on Figure 23 below):

- Selection area to select the solution architecture template and the zoomed view (1);
- Graphical User Interface, representing a zoomed view of the EIRA (2);
- Query builder (3);
- Output table (4); and
- Navigate to the Attribute view.

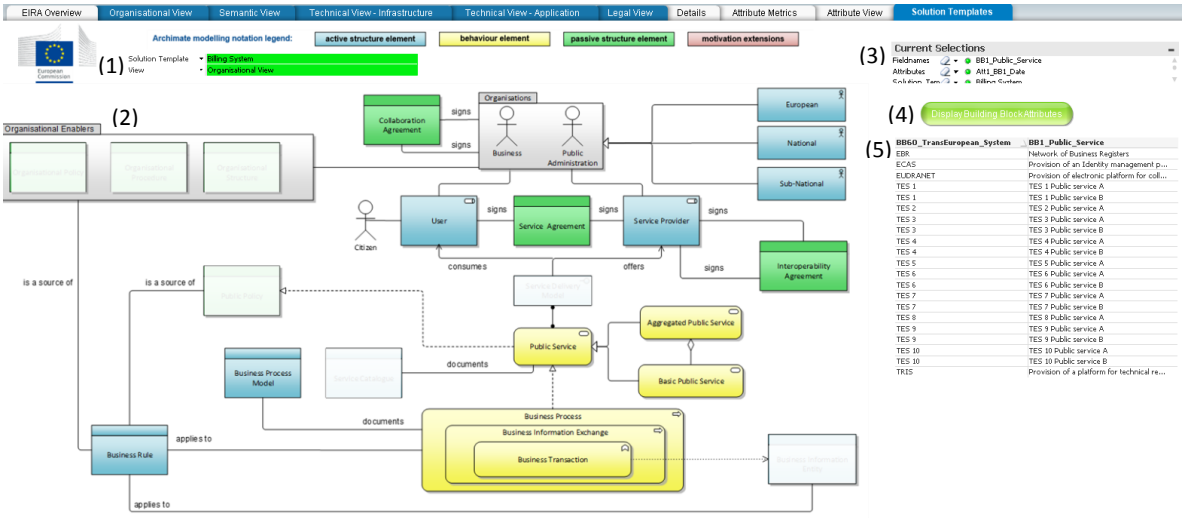


Figure 23 – User interface of the solution template view

A last remark or functionality that is provided by the Cart tool, is that the user is able to keep his selected building block, while navigating from the solution template view to the attribute view. The user is only able to select one building block in both views. After the user selects the preferred

building block, he/she can easily retrieve the reusability information of that building block by navigating to the attribute view.

5.2. Functionalities

Selection area (1)	The user is able to specify the specific case of solution architecture template and the zoomed view of the EIRA for the corresponding template
Active elements for building the selection query (2)	The user is able to click on the building blocks to build the query; these elements are implemented as active elements in the user interface.
Hover over (2)	The user is able to retrieve additional information while hovering over a building block or relationship.
Query builder (3)	The user is able to see its current selection of building blocks that are used to build the desired query. Furthermore, via the query builder the query can be (a) modified (add/remove elements), or it can be (b) cleared.
Navigate to the attribute view (4)	The user is able to navigate to the attribute view, keeping the current selection query of the user.
Filtering (5)	The user is able to filter the data by means of a specific selection or a multiselection of values mapped to the building blocks.

The number between brackets (e.g. (2)) refers to the number displayed on the preview of the user interface, see Figure 23 above.

Table 4 - Overview functionalities of the template view

5.2.1. Function 1 – Selection area

In the top left corner of the user interface, a selection area is made available for the user to select:

- the solution architecture template (first selection bow in Figure 24 below); with
- the specific zoomed view of the EIRA for that specific template (second selection box).

The selected solution templates will highlight the relevant building blocks in the representation of the zoomed view. The other building blocks, which are not relevant, are greyed out and not clickable.

The user is able to show the dropdown menu, by clicking on the black arrow (see Figure 24 below). The following results will be displayed:

- Solution Template:
  - Billing System
  - Information Exchange
- View:
  - Political context view
  - Legal view
  - Organisational view
  - Semantic view

- Technical view – Application
- Technical view – Infrastructure

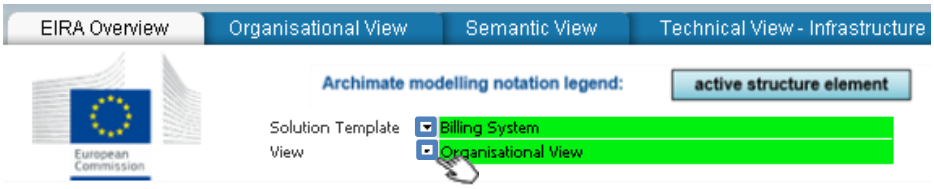


Figure 24 – Preview of the selection area

5.2.2. Function 2 –Active elements for building the selection query

The user interface of the solution architecture templates changes in line with the selected values in the selection area. In the same way as the zoomed views (cf. section 3.2.1 Function 1 – Active elements for building the selection query above). The building blocks are implemented as active elements for the user. However, only the relevant building blocks will be clickable by the user. The greyed out building blocks does not have any value for that solution architecture template and thus not clickable.

Within this view, the intention is to retrieve only the reusable solutions for the selected building blocks. Comparing with the zoomed views of the EIRA, the query builder will only allow the selection of exactly one building block. The user requires only the information of one specific building blocks.

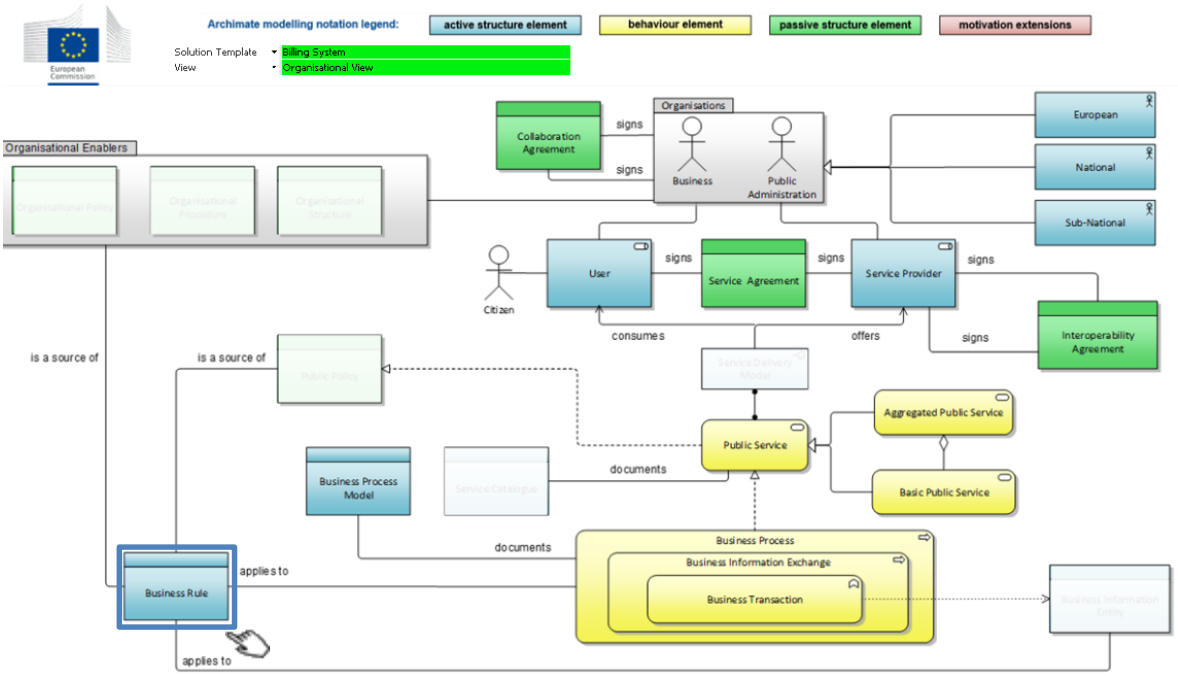


Figure 25 – Preview of the use of active elements on the solution architecture view

5.2.3. Function 3 – Hover over

Similarly as the zoomed views of the EIRA (cf. 3.2.2 Function 2 – Hover over above), the hover over functionalities enables the user to retrieve additional data of the building blocks. If the users keeps the pointer of the mouse over a particular building block, then the definition of that building block will be displayed.

5.2.4. Function 4 – Query builder

The query builder offers the same functionality as in the zoomed views (cf. section 3.2.3 Function 3 – Query builder above), with one exception; the user should only select one building block in the solution architecture template.

The query builder will show, by default, two sections: one for the selected case, and one for the selected zoomed view of the EIRA. Whenever the user selects a building block, then the query builder will be updated instantly.

If the user wants to update the current selection, then it is advised to first deselect (by clicking a second time on the active element, or via the "eraser"-icon) the current building block, and then select the new preferred building block.

The functionality of the "eraser"-icon, black arrow, and the green dot are explained in section 3.2.3 Function 3 – Query builder above.

Figure 26 – Preview of the query builder in the solution architecture template

5.2.5. Function 4 – Navigate to the attribute view

The user is able to navigate to the attribute view of the Cart tool. The selection query will be kept in memory while navigating to the other view. The specific building block that is selected will be active in the selection query of the new view.

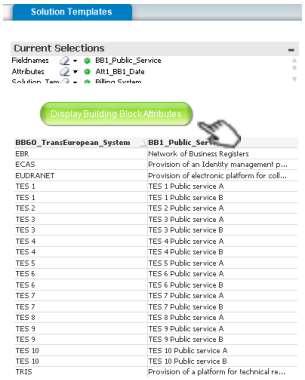


Figure 27 – Preview of the navigation functionality

5.2.6. Function 5 – Filtering

The filter functionality is similar as the one in output view; it allows the user to create specific reports based on the standard data that is displayed (cf. section 4.2.6 above).

The filters can simply be applied by selecting one or more values in the retrieved data within a column by choice. Once the user releases the mouse button, the filtering on the data will be executed. A green dot will be displayed next to the column title where the filter is activated.

To undo the filtering, the user needs to click on the values where the filter is applied (see green dot) or click on the "eraser"-icon next to the section in the query builder (cf. section 5.2.4 Function 4 – Query builder above).

6. ATTRIBUTE VIEW

6.1. User interface

The attribute view is available in the user to retrieve additional data about a particular building block. Additional data is captured from the TES as attributes. The user is only able to select one particular building block, and the preferred attributes that will be shown in the output table.

As mentioned before in section 5 Solution template view, the attribute view is linked with the solution template view. This implies that whenever the user activates or updates the query in one view, then the same building block will be selected in the other view.

The user interface of this tab contains a number of different elements:

- Button to clear the current selection (1);
- Selection area to choose the building block and its attributes (2); and
- Output table (3);

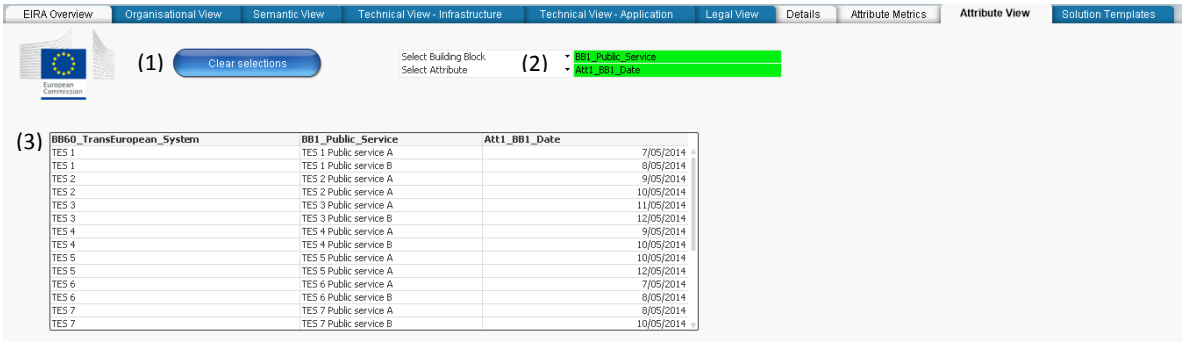


Figure 28 - User interface of the attribute view

6.2. Functionalities

Clear current selection (1)	The user is able to clear the current selection in one click.
Select the specific building blocks and its attributes (2)	The user is able to select the specific building blocks about which attribute values are needed and the specific attributes that will be displayed.

The number between brackets (e.g. (2)) refers to the number displayed on the preview of the user interface, see Figure 28 above.

Table 5 - Overview functionalities of the template view

6.2.1. Function 1 – Clear current selection

On the top of the user interface (see (1) in Figure 28 above), a blue button is displayed to reset the current selection that is made in the attribute view or in the solution template view. The selection of building blocks and its attributes will be undone.

6.2.2. Function 2 – Select the specific building blocks and its attributes

On the top of the user interface, a selection area is made available for the user to select:

- The preferred building block;
- The attributes with additional information on that building block.

Via the two dropdown lists, the user is able to execute the query. The user can only select one building block per query. The output table will be updated instantly when a new value is selected.

As mentioned before, the building block selected in the first dropdown list will be aligned with the active selection query in the solution template view.

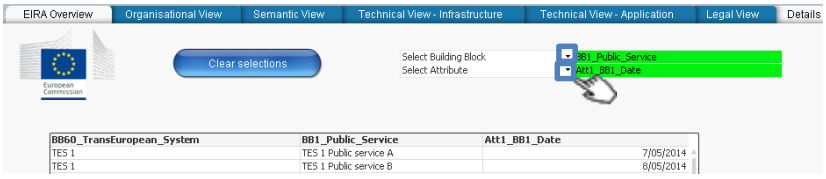


Figure 29 – Preview of the selection area in the Attribute view

7. ATTRIBUTE METRICS

7.1. User interface

The attribute metrics tab is a dashboard for analytical purposes. The dashboard shows the reusability information at the present moment and over time of the building blocks. The user interface contains a number of different elements:

- Data range selection (1);
- Diagrams (pie chart and histogram) (2); and
- Selection area (3).

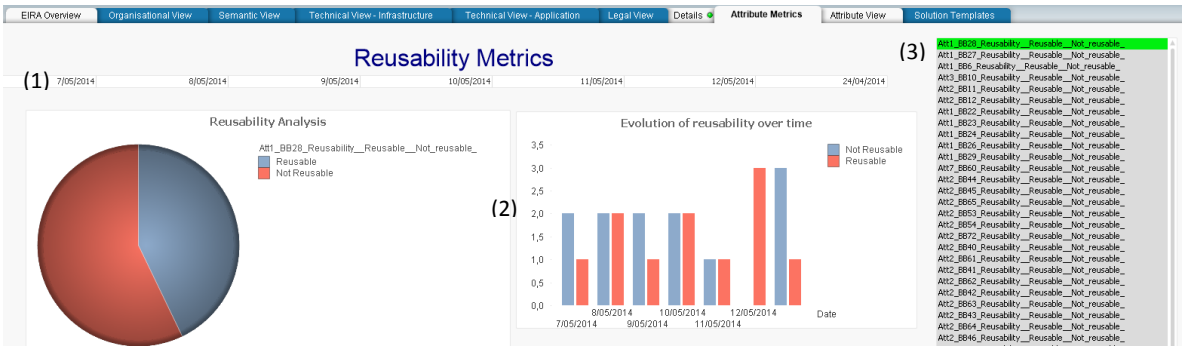


Figure 30 – User interface of the attribute metrics

7.2. Functionalities

Date range (1)	The user is able to select the data range to filter the data that is applicable for a specific timing.
Active elements as filters on the data (2)	The user is able to use the active elements in the user interface, to filter the data.
Selection of the building blocks (3)	The user is able to select the building blocks which need to be taken up in the analysis of the reusability.

The number between brackets (e.g. (2)) refers to the number displayed on the preview of the user interface, see Figure 30 above.

Table 6 - Overview functionalities of the template view

7.2.1. Function 1 – Date Range

Via the data range section, the user is able to retrieve the reusability information of a (set of) building block(s) for a specific date or range of dates. The different dates are implemented as active elements at the top of the user interface. The user is able to select the specific date range by:

- A single click: this will filter the information for one specific timing;
- Dragging a range of dates: the user can hold the mouse button to select multiple dates at once;
- Selecting the range via “Shift”-key: the user can select the starting date, press shift and select the end date. The dates the start and the end dates will be added to the filter.
- Selecting the range via “Ctrl”-key: the user can select a number of dates by holding the “Ctrl”-key. Whenever the user releases the key, the filter will be activated.

To undo the date filter, the user has to deselect the values by clicking a second time on the highlighted dates (green).

Figure 31 – Preview of the date range selection functionality

7.2.2. Function 2 – Active elements as filters on the data

The elements presented in the dashboard (i.e. pie chart, histogram, and legends) are integrated as active elements. The user can use all objects as triggers to filter the data. Each element can be clicked on to filter the data as preferred.

As an example, the user can click the blue part in the pie chart, to retrieve all information on the reusability of that building block. The pointer of the mouse changes to a cross when the user hovers over an active element.

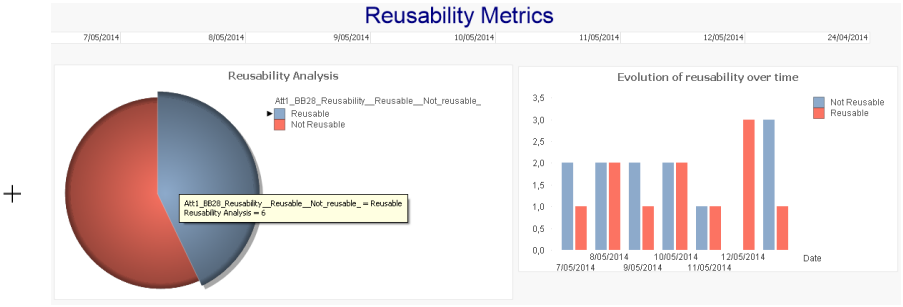


Figure 32 – Preview of the active elements

7.2.3. Function 3 – Selection of the building blocks

The final element of the user interface provides the user the ability to select the reusability attribute of the preferred building block. Whenever the user selects new value(s), the dashboard will update instantly.

Similarly to the detail view, this selection area supports (1) the “Ctrl”-key functionality to select a number of building block’s attributes, (2) the “Shift”-key functionality to select a range of building block’s attributes, and (3) the range selection by selecting all building block’s attributes while holding the left-mouse button.

Figure 33 – Preview of the selection area of building blocks