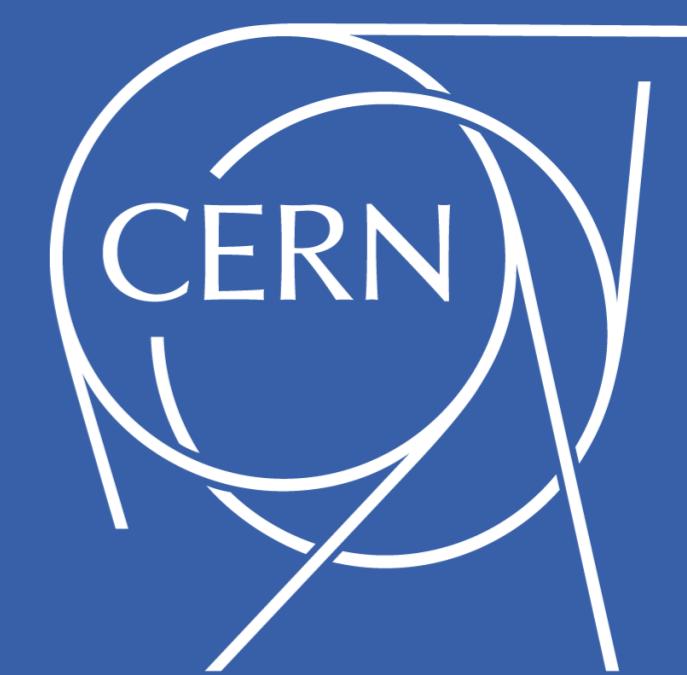


# VISUALISATION OF REAL-TIME FRONT-END SOFTWARE ARCHITECTURE (FESA) DEVELOPMENTS AT CERN

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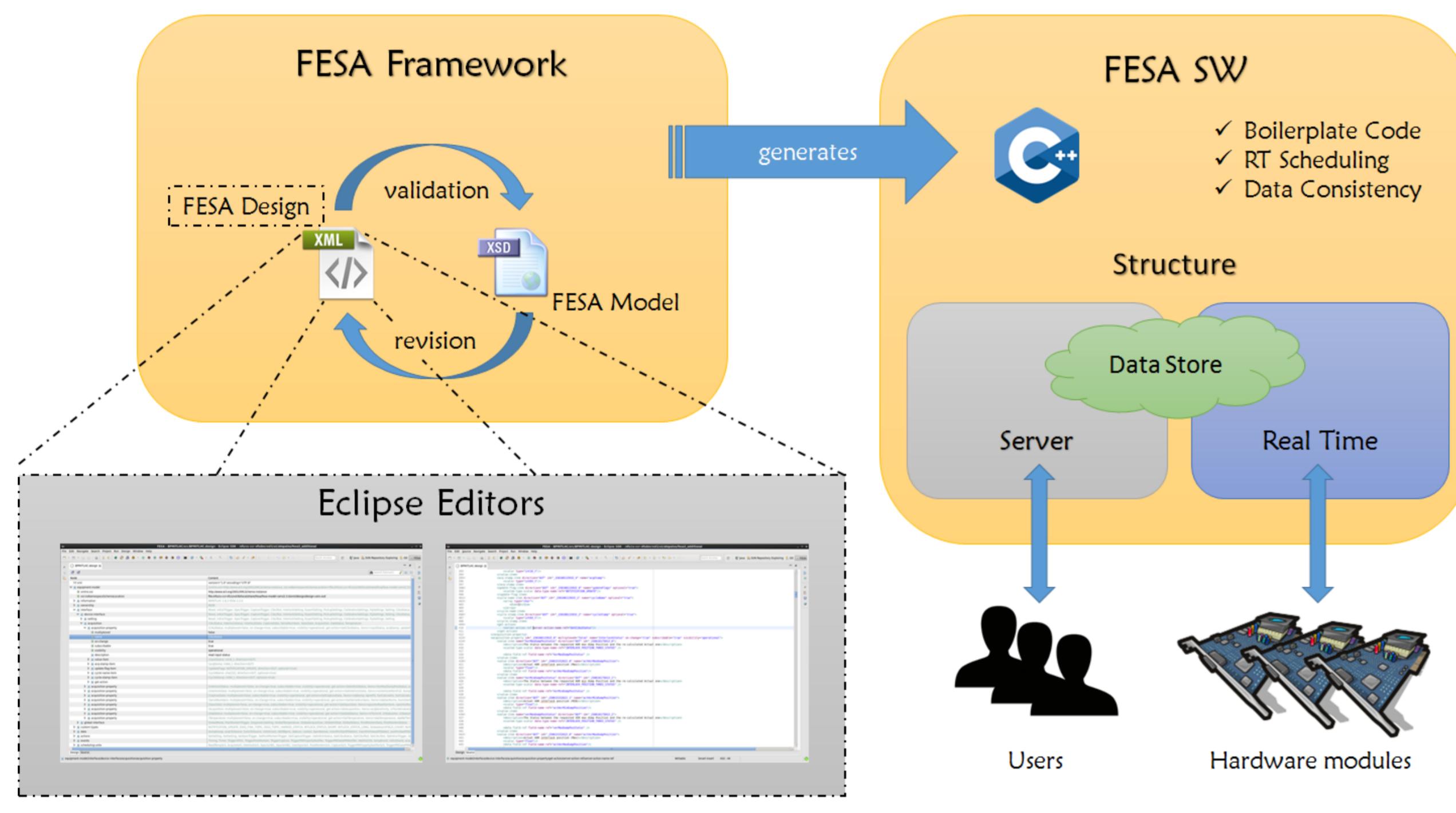


## Introduction

This poster presents a structured graphical representation of the software developed with the FESA framework. In addition, it demonstrates a GUI that facilitates editing to make the resulting graph cleaner and more user-friendly.

## FESA

- A framework for real-time software development.
- Integrated in Eclipse IDE.
- Software design is stored in an XML document.
- Generated C++ boilerplate code.
- Resulting software is structured in three major segments:
  - Server – software API.
  - Real-Time – hardware access.
  - Data Store – shared, internal data model.

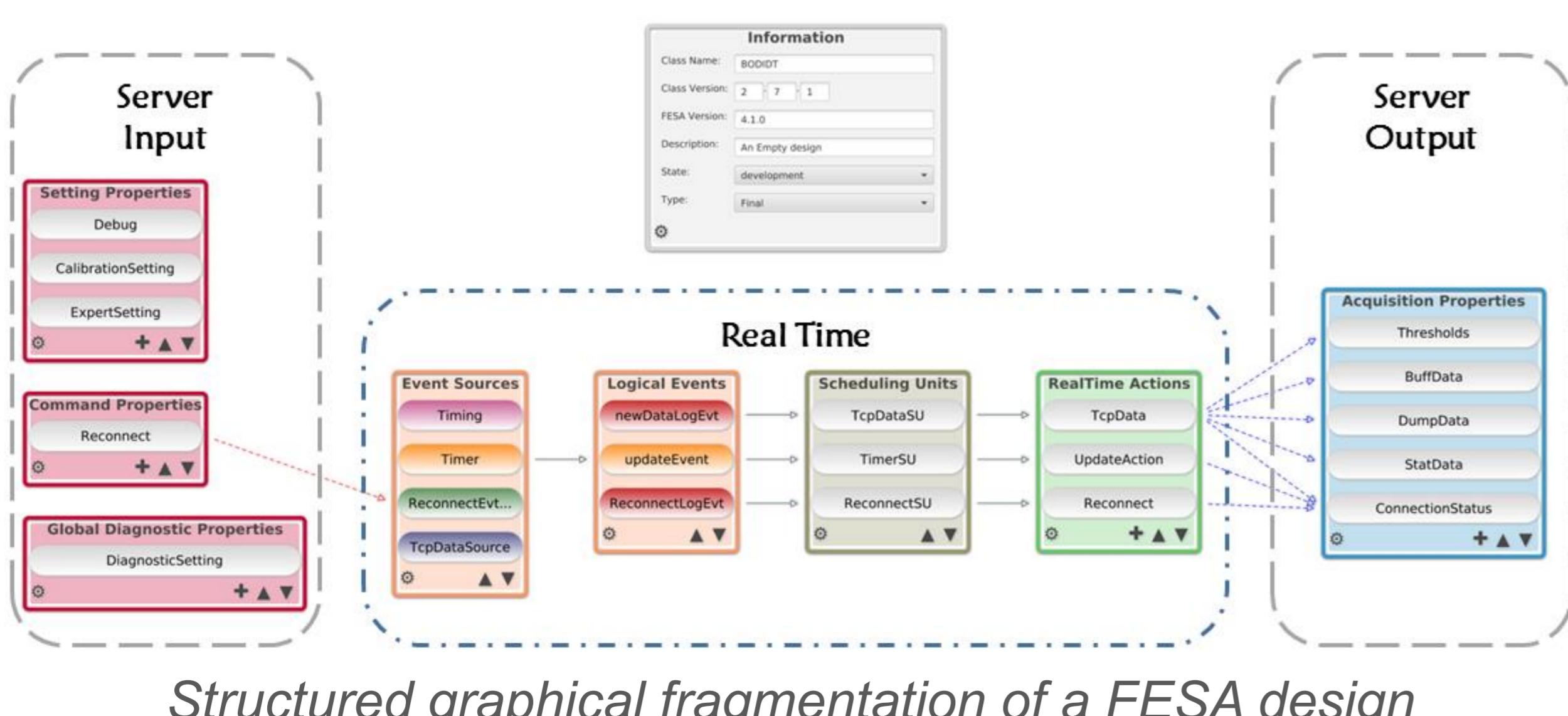


Software development with the FESA framework

## Graphical Representation of a FESA Design

Visualising a FESA-design in a graph benefits from:

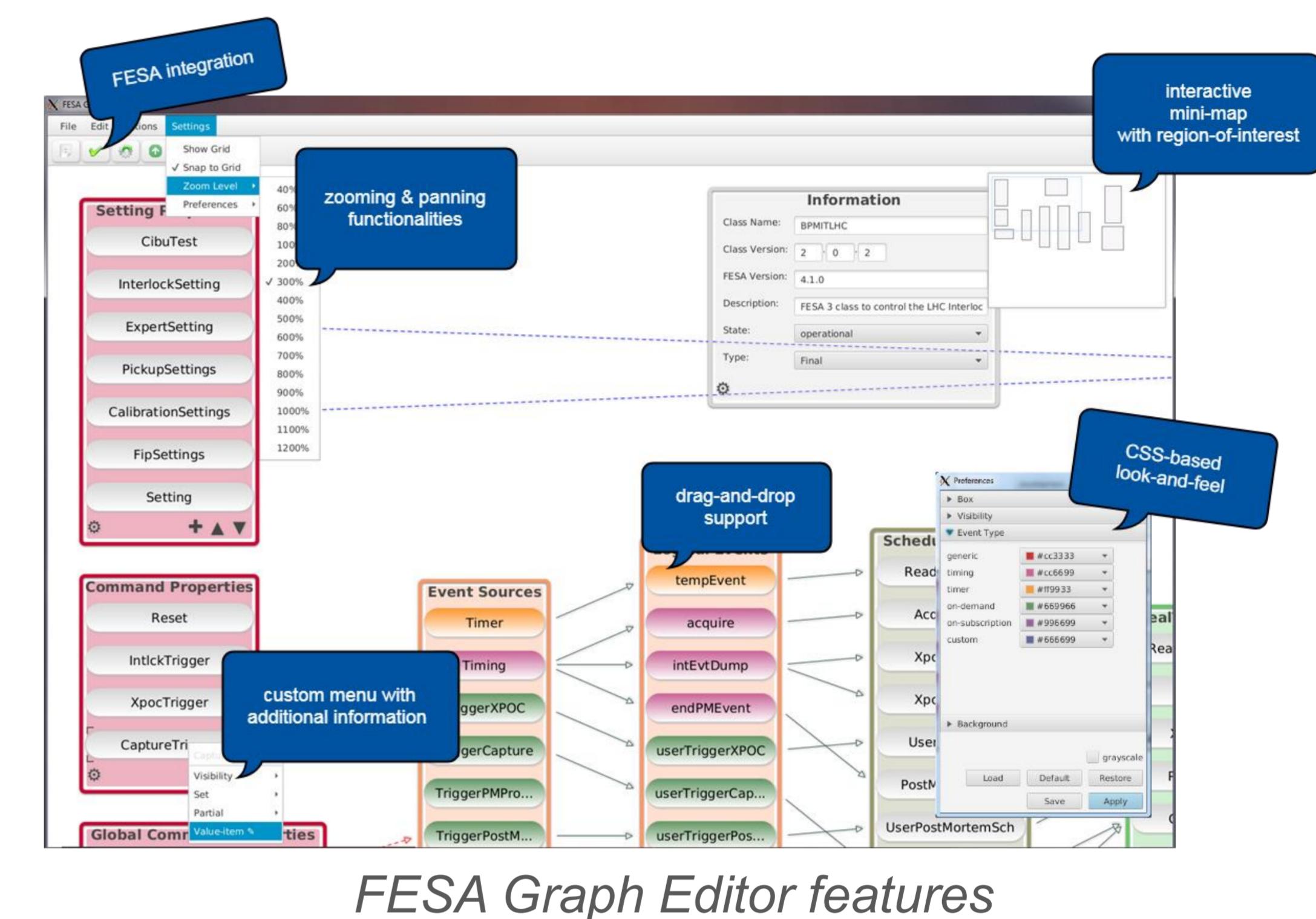
- a structured fragmentation grouping the elements from the different parts.
- a clean, yet descriptive overview, hiding internal details, while emphasising its public API.
- quick error detection as the association between the logical groups are visible in the form of arrows.



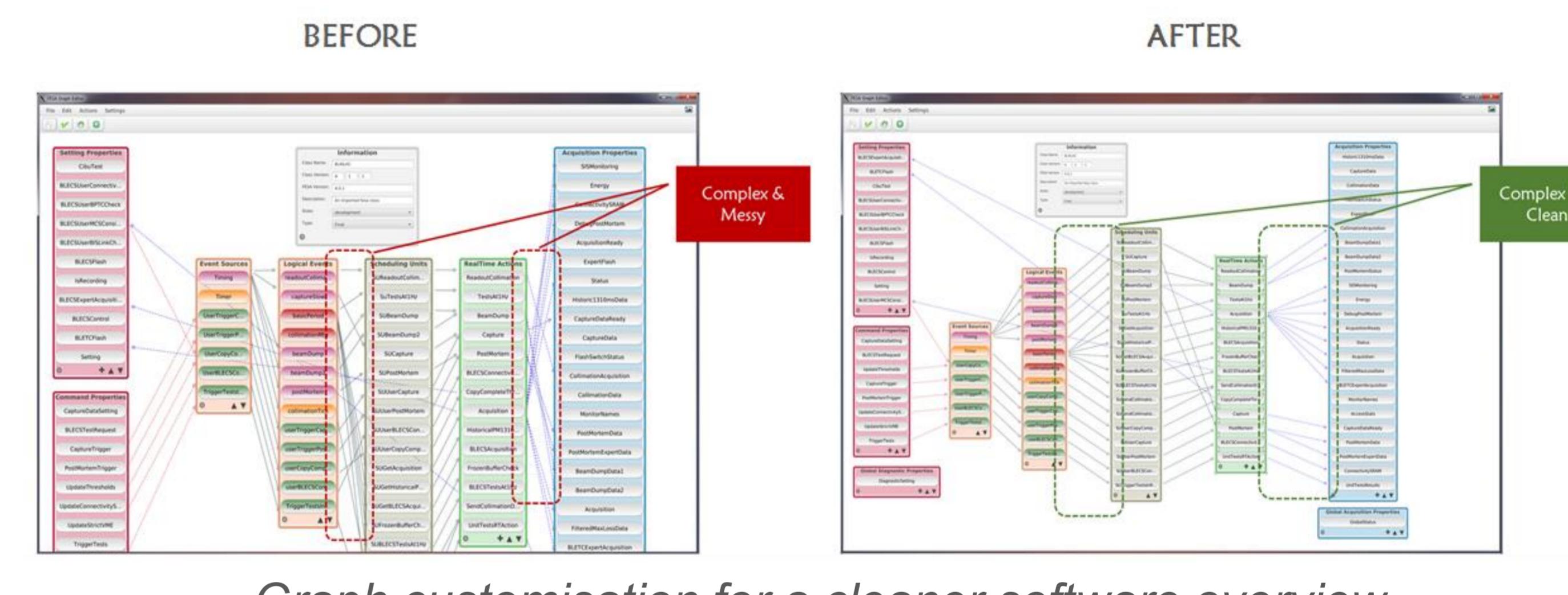
Structured graphical fragmentation of a FESA design

## FESA Graph Editor

FESA Graph Editor is an interactive, stand-alone, JavaFX application that eases the transformation of a FESA-design document to its graphical depiction.



FESA Graph Editor features



Graph customisation for a cleaner software overview

## DATA STORE SUMMARY

The *Data Store* is summarised in classified tables for better readability and it can be made visible on demand, when the internal details of the design are required.

Tab organisation of the field categories												
Custom cell components according to the field types												
name	persistent	multiplexed	data-consistent	type	dim1	dim2	USI	Exp	true	false	default	description
bool_field				bool	FIRST_DIM_SIZE	SECOND_DIM_SIZE			true		This is my boolean field	
byte_2D_array_field				uint8_t								This is my byte 2D array field
double_2D_array_field				double								This is my double 2D array field
float_array_field				float								This is my float array field
enum_field				int32_t								This is my enum field
float_field				float								This is my float field
int_field				int8_t								This is my second field
long_field				int32_t								This is my long field
short_field				int8_t								This is my first field
string_field				string								This is my string field
uint_field				uint8_t								This is my unsigned int field
unc_field				uint32_t								This is my unsigned long field
ulong_2D_array_field				uint64_t								This is my unsigned long 2D array field
ushort_field				uint16_t								This is my unsigned short field

Data Store summary in classified tables

## Conclusion

- A structured, pictorial fragmentation of a FESA-design benefits from the effortless overview of the software.
- A graphical application with in-built editor allows the graph customisation, resulting in a cleaner illustration.
- The integration of the framework into the application is highly promising for producing a complete visual layout tool.