VALCRI: Applying Semantic-Web Technologies to Visual Analytics for Criminal Intelligence

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Henrik Eriksson and B.L. William Wong
VALCRI Overview

- EU-funded FP7-SEC project (FP7-IP-608142, 2014–2018)
- Support for semi-automated *criminal-intelligence (police) analysis*
  - Technologies, methods and a demonstrator system for semi-automated criminal-intelligence analysis
- *Visual-analytics approach* to support analysts
  - Finding connections and patterns in large volumes of data
  - Preempting crime and investigating specific cases
- General system requirements
  - Support the human analysts and their work processes
  - Integrate, store, retrieve, analyse, and visualise relevant information
  - Maintain legal, ethical, and security constraints on the data
- Semantic Web back-end technologies
Semantic Web backend services and functionality

Three areas of support:

1. **Information extraction, modelling and integration.** VALCRI uses *OWL ontologies* (extracts and transforms data into RDF triples) in order to make all data accessible to the rest of the system.

2. **Complex event processing.** To monitor streaming data sources, VALCRI uses *RDF stream processing* (RSP) technologies to support semantic complex-event processing.

3. **Data storage and access.** The VALCRI backend integrates an *RDF triple store* with the Elasticsearch framework, and provide data access through a template-based REST service API.
VALCRI Overview

Frontend

Mid-tier

Backend

GUI

View 1

View 2

View 3a

View 3b

Presenter 1

Presenter 2

Presenter 3a

Presenter 3b

Service 1

Service 2

Service 3

Data1

Data2

Data3

Lifecyle Management

Ingester

Sec Enforcement

UDB

REST UDB

Sec Enforcement

Native ESLCM

ObjectStore

TCP/IP MongoDB

MongoDB

Audio/Video Analysis

Textual Analysis

TLS LDAP

LDAP

REST SDB

Sec Enforcement

Native ESLCM

Template Engine

ES lifecycle management

HTTP Fuseki

Native ES

Fuseki

ES

Jetty
Query Templates for Ontology Access
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