REDALERT

Real-time Early Detection and Alert System for Online Terrorist Content based on Natural Language Processing, Social Network Analysis, Artificial Intelligence and Complex Event Processing

Research & Innovation for Secure Societies

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Project Fact Sheet

Real-time Early Detection and Alert System for Online Terrorist Content based on Natural Language Processing, Social Network Analysis, Artificial Intelligence and Complex Event Processing

- **Project ID:** 740688
- **Start:** 01-06-2017
- **End:** 31-05-2020
- **Budget:** 5,064,437.5 Euros
- **Project Coordinator*:*** Monica Florea - SIVECO Romania
- **Research and innovation action**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 740688

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Objective

Provide a complete toolkit for LEAs to collect, process, visualize and store online data related to terrorist groups, whether related to propaganda, fundraising, recruitment and mobilization, networking, information sharing, planning/coordination, data manipulation and misinformation.

Cover a wide range of social media channels, in particular new targeted channels, which are increasingly used by terrorist groups to disseminate their content.

Allow LEAs to take coordinated action in real-time while preserving the privacy of citizens.

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Fighting Terrorist Cyber Propaganda(1)

Social media providers are ***determined*** to fight ***terrorist propaganda*** *on their platforms.*

There is ***no specific tool*** for identifying terrorist content on the Internet and social media tailored to LEAs' needs.

LEAs must rely on proprietary spam-fighting tools, user reports and human analysis in order to detect accounts promoting terrorism.

An update on our efforts to combat violent extremism

Thursday, August 18, 2016 | By Twitter (@twitter) [16:06 UTC]

Earlier this year, we announced we had suspended more than 125,000 accounts since mid-2015 for violating our longtime prohibition on violent threats and the promotion of terrorism and shared the steps we are taking as a company to combat this content. Since that announcement, the world has witnessed a further wave of deadly, abhorrent terror attacks across the globe. We strongly condemn these acts and remain committed to eliminating the promotion of violence or terrorism on our platform.

Policy
@policy

Follow

Since mid-2015, we have suspended over 125,000 accounts for threatening or promoting terrorist acts. Read more here: blog.twitter.com/2016/combating...

9:17 PM - 5 Feb 2016

Combating Violent Extremism | Twitter Blogs
Like most people around the world, we are horrified by the atrocities perpetrated by extremist groups. We condemn the use of Twitter to
blog.twitter.com

1,018 889

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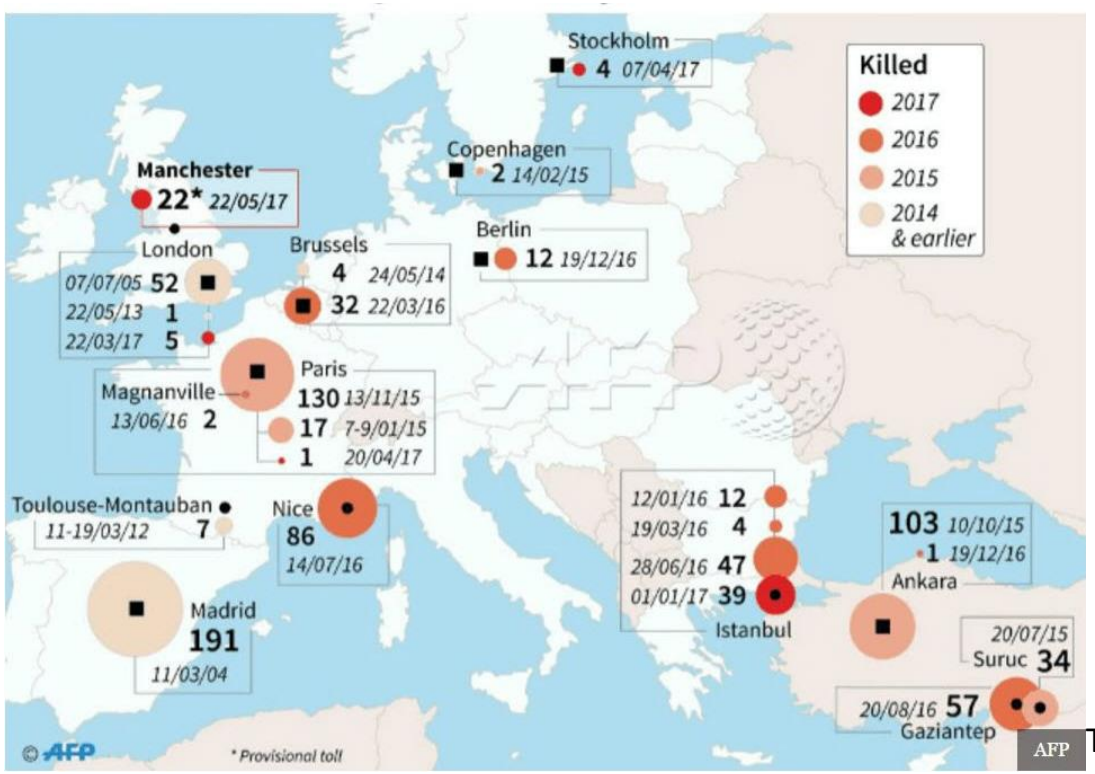
Fighting Terrorist Cyber Propaganda(2)

- 1 terror attack attempted **every 9 days** in Europe in 2017
- Perpetrators were **radicalized** individuals recruited via **online** communication channels and **social media**



Terror attacks in Europe and Turkey - Source: AFP (not including London June 3rd attack)

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Social media, friend or foe?

Extremist and terrorist groups use the Internet for a myriad of purposes including psychological warfare, propaganda, fundraising, recruitment and mobilization, networking, information sharing, planning/coordination, data manipulation and misinformation.

All active terrorist groups have established at least one form of presence on the Internet and most of them are using several formats of online platforms!

Therefore, online content monitoring and analysis is a critical part of almost every national security investigation.

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Mission

- You cannot wage a traditional war against terrorists, but a key to fighting terrorism is ***good intelligence based on big data analysis***
- The only way to protect the citizens and apprehend terrorists before they execute their plans is to ***know what they are planning in advance***
- It is also essential to ***detect cyber propaganda*** in order to fight radicalization
- The only way to ***protect vulnerable individuals*** is to identify, monitor and counteract online media channels used in terrorist cyber propaganda

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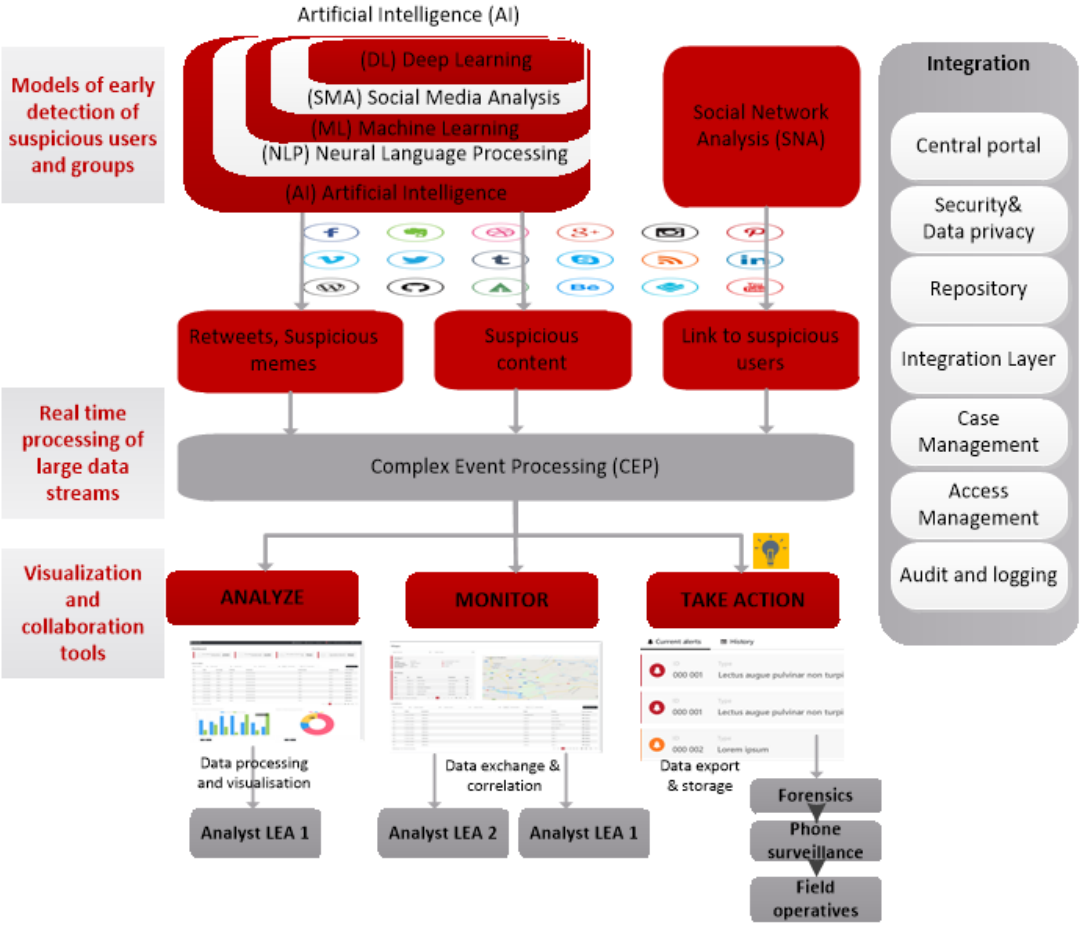
Innovation-RIA

RED-Alert combines AI methods with SNA and NLP technologies to detect anomalies in content production, content nature, content spread in order to provide ***early detection of terrorist activities***.

The input from AI, SNA, SMA and NLP technologies will be fed into a CEP engine to predict potential threat areas based on content production patterns, allowing the LEAs to ***analyse, monitor or take action on online terrorist content.***



Research projects tackling clearly *defined challenges*, which can lead to the development of *new knowledge or a new technology*.

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Meet the partners

15 partners from 7 countries

5

Law enforcement agencies

Ministerio Del Interior - Guardia Civil from Spain **(GUCI)**
Ministry Of Public Security - Israel National Police **(MOPS-INP)**
Metropolitan Police Service from UK **(SO15)**
Protection and Guard Service from Romania **(SPP)**
Protection and Guard Service from Republic of Moldova **(SPPS)**

1

Industrial partner

SIVECO Romania **(SIV)**

4

SME innovation champions

Intu-View Ltd **(INT)**
Usatges Bcn 21 Sl **(INSKT)**
Maven Seven Solution Technology **(MAV)**
Information Catalyst for Enterprise Ltd **(ICE)**

1

Regulatory association

Malta Information Technology Law Association **(MITLA)**

4

Research/academic organizations

Interdisciplinary Center Herzliya **(ICT)**
Eotvos Lorand Tudomanyegyetem **(ELTE)**
City University Of London **(CITY)**
Birmingham City University **(BCU)**

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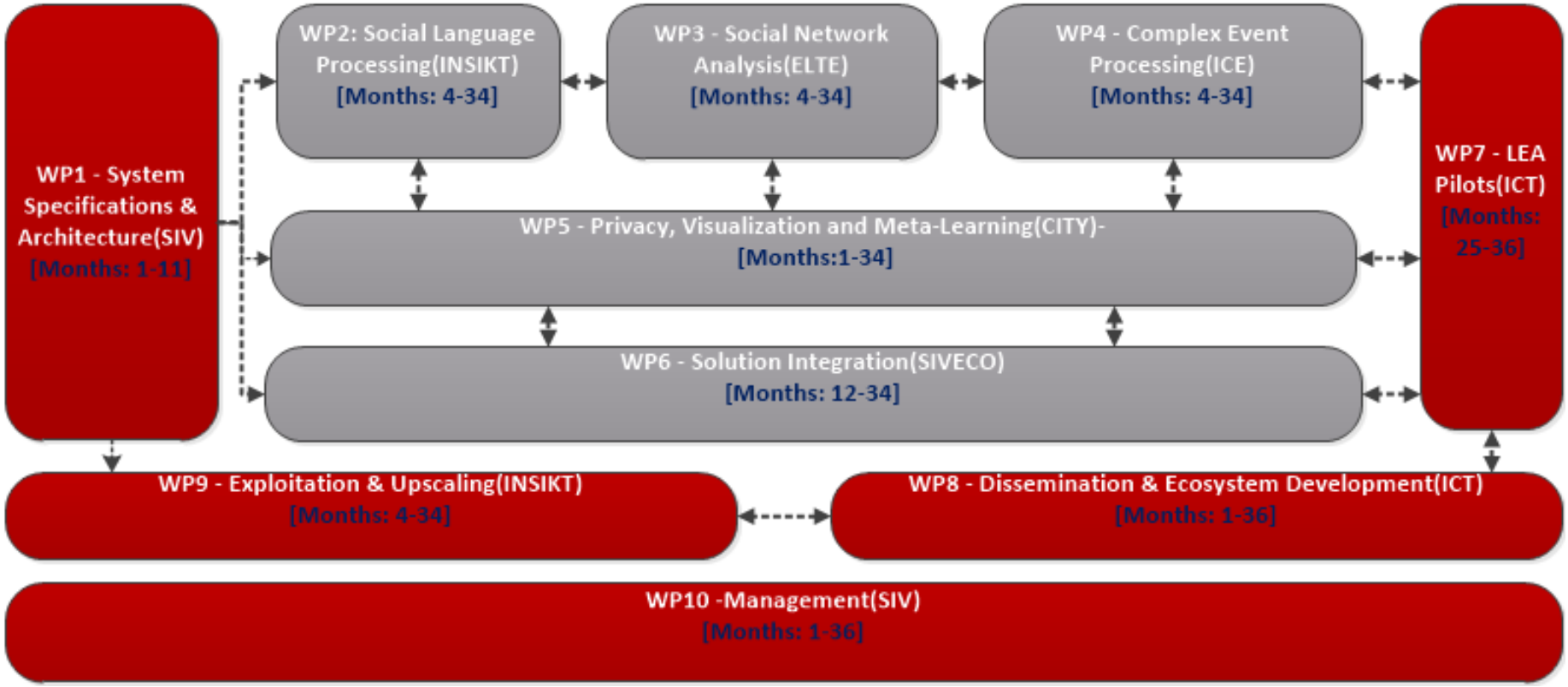
Project phases



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Pilots and their location

SO15, UK

RED-Alert solution will be used in accordance with RIPA on real social intelligence but during the trials, we will not be targeting known subjects of interest. The analysts under the guidance of the research & development manager will set the software with specific keywords and languages that will assist in identifying key individuals and associate networks in real time.

SPPS, Republic of Moldova

After the implementation, the solution will be tested in real environment in SPPS daily missions. One of the workstations will handle existing classified intelligence system and the other one will process the RED-Alert information, so the solution does not jeopardize the SPPS classified network.

SPP, Romania

The pilot will deploy the solution in the main SPP facility. Test the full capacity, the efficiency, usability and accuracy of the RED-Alert tool, intelligence analysts will test it in parallel with existing tools.

GUCI, Spain

The pilot will deploy the solution in the Intelligence Service of the Guardia Civil Headquarters. GUCI will be able to apply RED-Alert pilot for the analysis of the propaganda, funding and recruitment impact of terrorist elements. The pilot will encompass several teams from different GUCI units, whose analysts will have access to the RED-Alert system software in order to improve our fight against crime and terrorism. The pilot will seek to use the RED-Alert software to improve our investigations in real time.

MOPS INP, ISRAEL

One of the workstations will handle existing classified intelligence system and the other one will process the RED-Alert information, so the solution does not jeopardize the INP classified network. The outputs from one system will be used as inputs for the other system. The RED-Alert pilot will start gradually to process the information stored in INP existing databases, related to terrorist activities, groups or persons.

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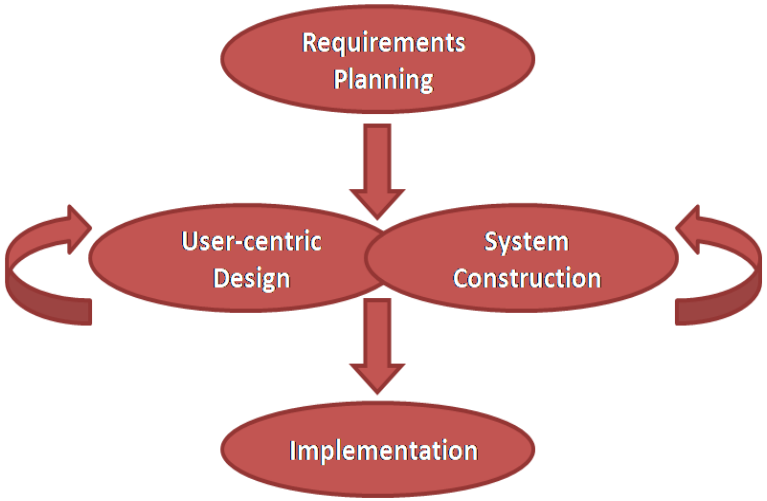
RAD(Rapid Application development) Methodology

- Initial phase of ***Requirements Analysis*** together with Technical Specifications ***Architecture*** was performed during ***WP1 "System Specifications & Architecture"*** **.**
- ***WP6 "Solution Integration"*** is covering also the ***User-Centric Design*** and ***System Construction*** phases of RAD, involving several iterations where end-users interact with developers to design models and build prototypes. It also involves performing system integration and testing activities to ensure that components work well together, as designed.
- The final release is planned after solution deployment, pilots execution, and user feedback that will be performed in WP7 ***"LEA Pilots"***, covering the ***Implementation*** phase of RAD.



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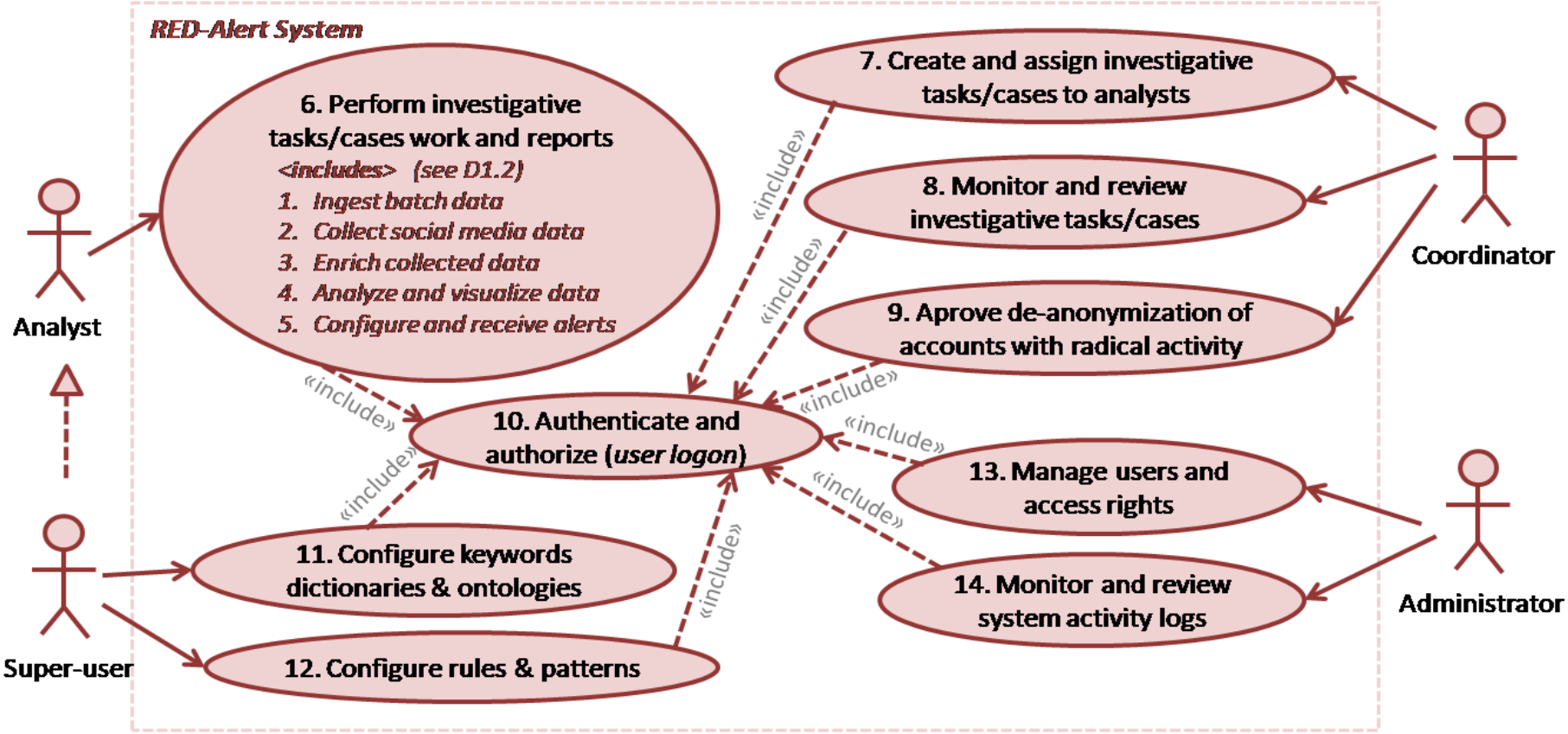
Main use cases



✓ ***Analyst*** *- Main users of the RED-Alert system, involved in data gathering, various types of analyses, perform case work and produce reports .*

✓ ***Coordinator*** *- Distributes tasks to analysts, monitors and reviews their work.*

✓ ***Super-user*** *- Input keywords access harder to use or high responsibility functionalities.*

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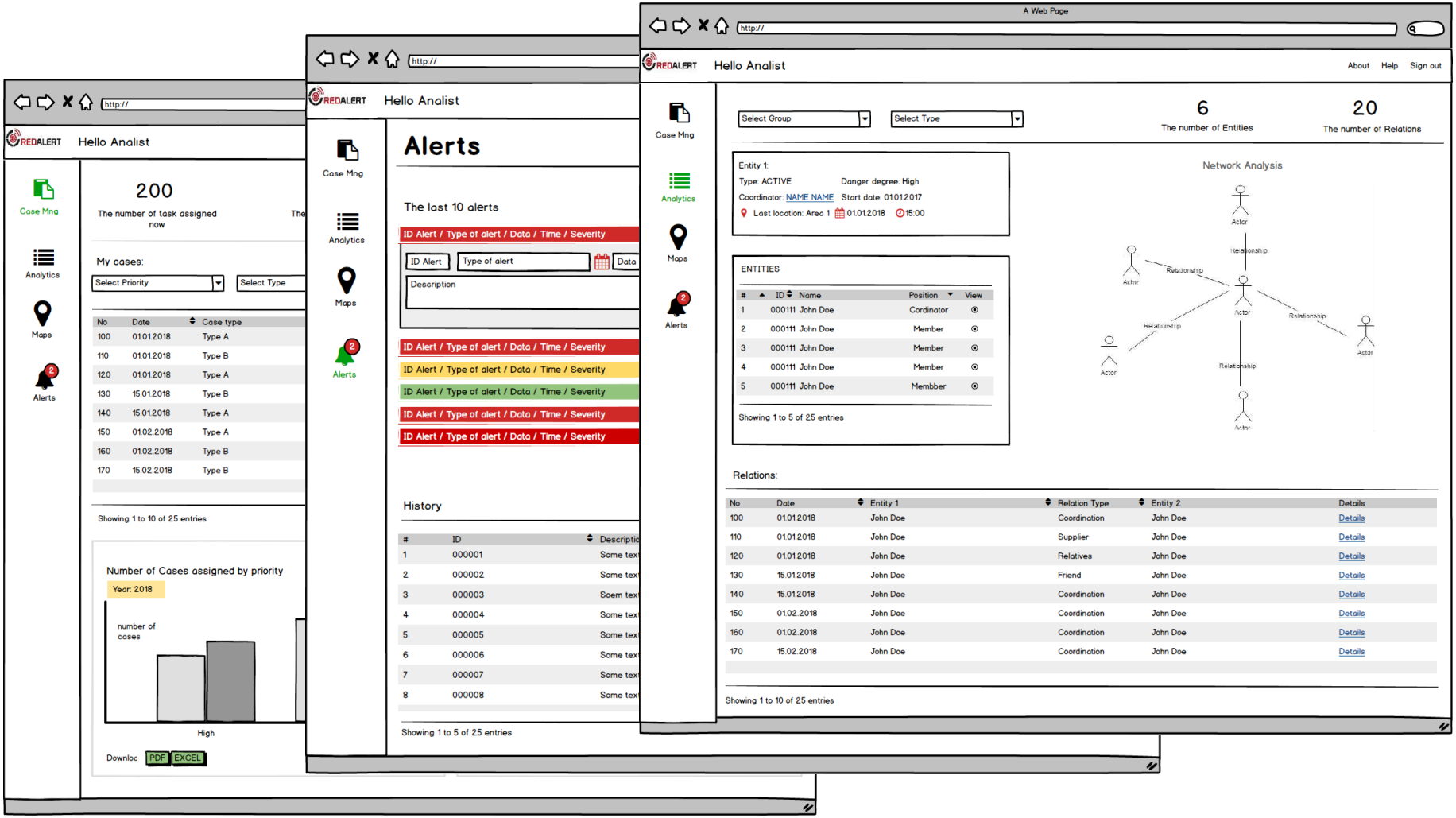
RED-Alert central solution Interfaces



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Social Network Analysis(SNA)

- Algorithms are being implemented for
  - revealing hierarchical structures from flat datasets. The resulting solutions of Social Network Analysis construct new networks from input data: either from co-occurrence statistics or from directed networks containing loops;
  - revealing hierarchical structures from flat datasets.
- Quantitative measures are calculated for characterizing the similarity of any network to an ideal hierarchical structure.
- Construct new networks from input data from:
  - co-occurrence statistics or
  - directed networks containing loops.

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Complex Event Process (CEP)

- Specific CEP (Complex Event Processing) applications are being implemented for the RED-Alert scenarios / use-cases.
- Event patterns are being developed by two methods:
  - By domain experts;
  - By ML techniques.
- The implemented mini-CEPs are able to query past events and to handle the querying results, so it is able to compare current and historical states and to reason over time and space, which are two current limitations of existing semantic CEP tools.

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Privacy, Visualization and Meta-Learning

- ***Anonymization tool*** takes as input all incoming data and removes the possibility of an individual from being identified from the anonymized data byusing a combination of well-known privacy defenition such as :
  - k-anonymity;
  - t-closeness;
  - l-diversity and
  - differential privacy.
- ***Visualization tool*** provides a platform for a graphical representation of a social network.
- In order to keep the tool adaptable to newly identified words and network dynamics, the ***meta learning*** tool developed under this WP triggers regular updates thus improving the efficiency of the RED-Alert solution.

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Social Language Processing

- NLP features to process the texts and output categorization models based on
  - Linguistic features that are extracted include a wide range of features that are automatically learned from analysis of the training corpora;
  - Ontological features are the disambiguated ontological instances that are linked to lexical features and determine the precise meaning of the lexical feature.
- Automatic classifier feature to identify dangerous messages
- SMA tool that covers next features:
  - Separation of audio elements into speech, music and events (such as gunfire, explosions, crowd noises);
  - Extraction of speech audio for input into speech to text engines, and
  - Extraction and identification of image and video scene elements such as logos, flags, weapons, faces.

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Integration component

- Integrates all the SLP, CEP, Data Visualization, Data Privacy , Machine Learning components and includes:
  - Main System User Interface;
  - User Identification and Access Management;
  - Collaborative Workflow/Case Management, offering process management features and tools for both business users and developers;
  - Application Integration Services;
  - System Interoperability Services;
  - Centralized Audit and Logging.

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Data Privacy

- Processing of personal data within a law enforcement context brings with it a number of **regulatory challenges**
- RED-Alert has brought MITLA (IT law association) as consortium partner as well as Electronic Frontier Foundation (a leading data privacy advocate) as advisory board member

General Data Protection Regulation

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Dissemination

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Thank you for your attention!

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Software that matters

ICE Information Catalyst
Services Data Software

INSIKT INTELLIGENCE

IntuView

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connecting knowledge

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E·L·T·E

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ICT International Institute for Counter-Terrorism
With the Support of Keren Daniel

METROPOLITAN POLICE
TOTAL POLICING
SO15 COUNTER TERRORISM COMMAND

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