Next Generation CBRN Information Management as a Service

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Riskaware Experience Overview

CBRN Defence
- Outdoor and indoor transport and dispersion modelling and simulation
- Hazard effects modelling and simulation
- Sensor data fusion and event reconstruction
- Optimal sensor placement modelling
- Biosurveillance information fusion
- CBRN model integration, framework design and standards specification.

Environmental Modelling
- Oil slick modelling and source estimation

Information and Data Analytics
- Geographic Information Systems
- Open source intelligence data analysis
- Military personnel injury mapping and analysis
- Military logistics planning and resilience

Cyber Resilience
- Cyber-mission impact and risk analysis
- Cyber Vulnerability Investigation (CVI)
- Mission \ Business cyber vulnerability tools

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What is CBRN Information Management

- CBRN Information Management provides:
  - Assist with effective deployment of resources
  - Fusion of sensor data to provide more complete situational awareness
  - Forecasting of hazard and effects to enable effective mitigation planning
  - Management and coordination of response
  - What-if scenario analysis
  - Support to CBRN training (including immersive and augmented reality training)

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EUROSIM CBRN INFORMATION MANAGEMENT SYSTEM

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EuroSIM CBRN Objective

To develop the next generation of CBRN information management system that will:

"Enable a diverse user community to have access to military developed and validated CBRN modelling and simulation technologies through the provision of a flexible and cost effective web-based service provision"

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EuroSIM CBRN Objective

- EuroSIM CBRN aims to leverage:
  - Riskaware's experience in developing world leading CBRN hazard prediction capabilities for Dstl and the UD DoD
  - Opportunity for exploitation of Dstl CBRN capabilities
  - Emergence and affordability of new enabling technologies (MASaaS, Cloud Hosting)
  - Accessibility of emerging space-based data
    - Enable the rapid stand-up of the capability

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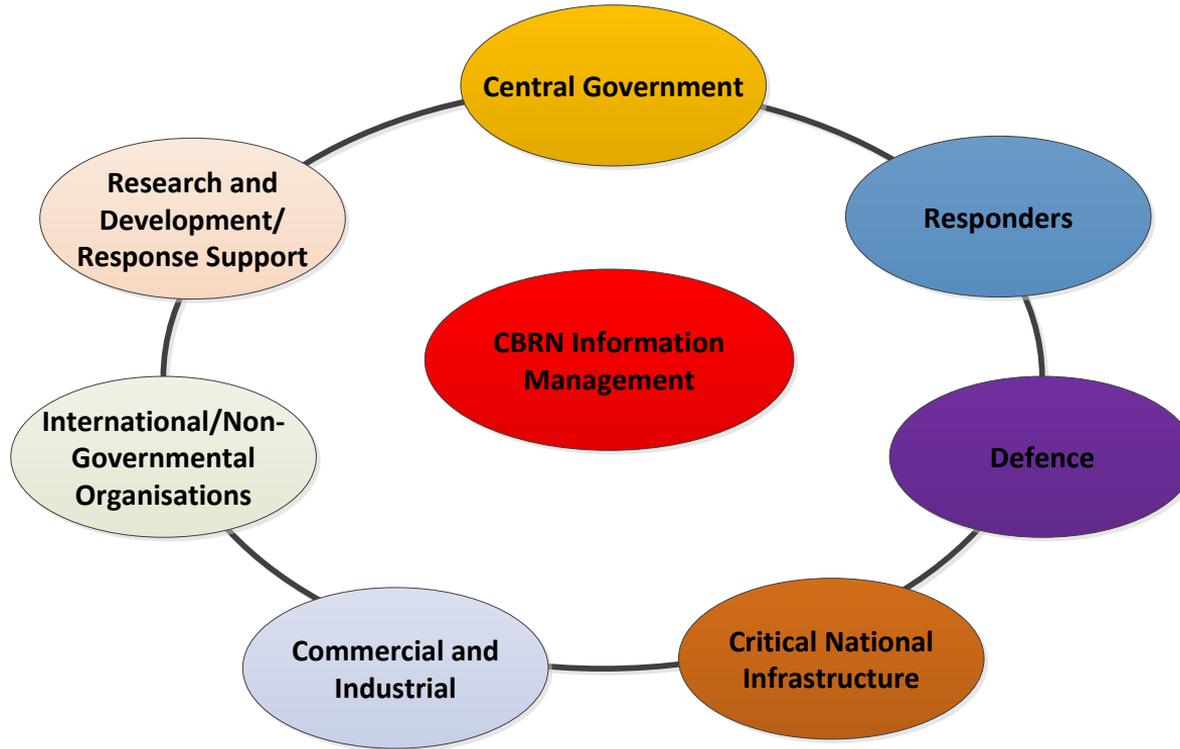capability through technology

Project Core Activities

- User requirements capture and documentation
  - Stakeholder analysis and engagement
  - Use Case analysis
- Service and system definition
  - Design and technical viability
  - System concept demonstrator development
  - User requirements validation
- Economic and non-economic viability analysis
  - Roadmap and recommendations

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Predicting and warning of hazard areas from CBRN incidents

USER REQUIREMENTS REVIEW

ThalesAlenia
Space

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Stakeholder Analysis

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Stakeholder Engagement

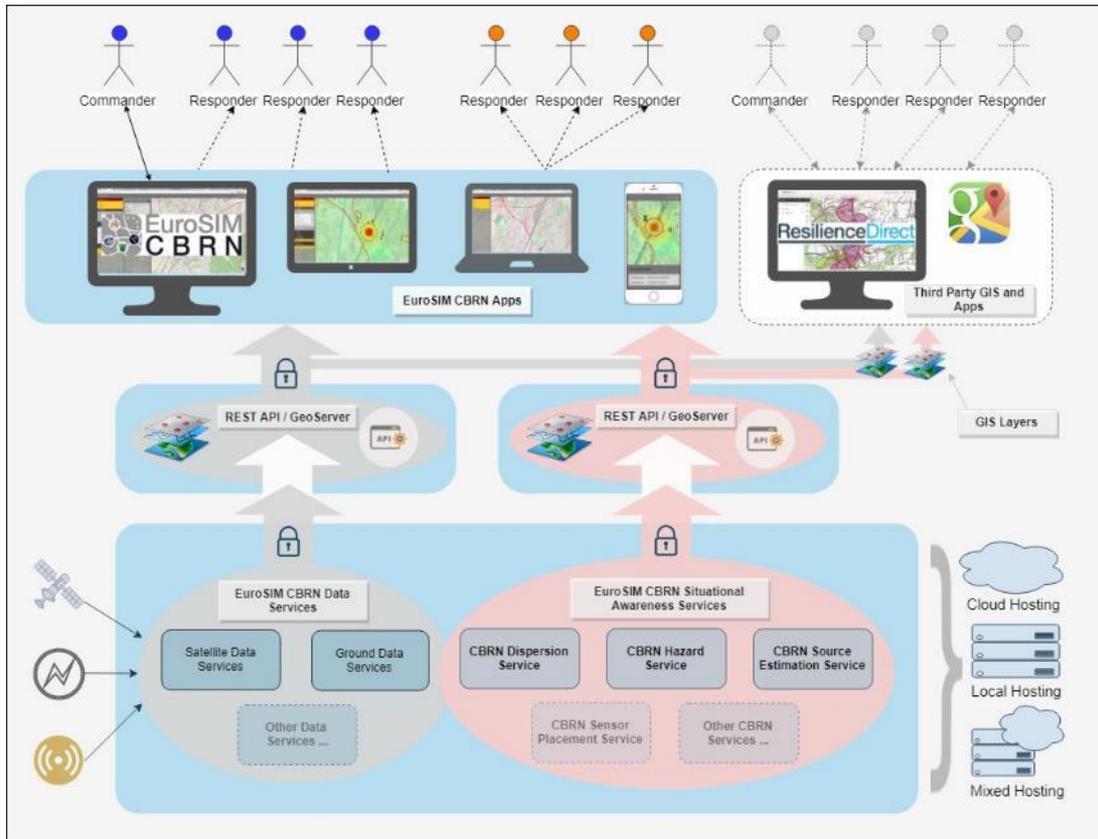| Organisation	Stakeholder Group	Country
Emergency Planning Organisation	Responder	UK
Insurance Company	Commercial	UK
Police Organisation	Emergency Response	International
Emergency Planning Organisation	Emergency Response	UK
EU CBRN CoE Initiative	Research and Development	EU
Resilience Forum	Emergency Response	UK
Emergency Planning Organisation	Emergency Response	UK
Spanish Police Department	Emergency Response	Spain
International Aid Organisation	NGO	International
International Security Provider	Commercial	UK and International
Government Health Department	Central Government	UK
Defence Solutions Provider	Commercial	UK
Fire Service Department	Emergency Response	Poland
European Defence Agency Member State Experts	Defence	EU
Government Defence Department	Defence	UK
Ploughshare Innovations	Commercial	UK
EDA Member State CBRN representative	Defence	France
University Department	Research and Development	UK

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Stakeholder Engagement Summary

- Majority do not have CBRN Information Management capability
- All showed enthusiasm for the proposed system
- Different stakeholders showed interest in different elements of proposed system
- Common **situational awareness** and **predictive hazard modelling services** on desktop and hand held devices seen as a significant benefit
- Important to integrate with existing systems where available
- Ability to incorporate existing processes and procedures seen as important
- Provision of **space-based data service** was seen as having far reaching benefits beyond just CBRN

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SERVICE AND SYSTEM DEFINITION

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System Concept Overview

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Situational Awareness and Hazard Prediction Service

- Dstl CBRN capability suite
  - **Urban Dispersion Model** and **Analytic Dispersion Model** (UDM and ADM) - Hazard modelling, including urban areas
  - **Geographic and Environmental Database Information System** (GEDIS) - Geographic Data handling
  - **Source Term Estimation** (STE) – Sensor data fusion and hazard estimation
  - **Urban Sub-System** (USS) – Indoor hazard modelling including indoor / outdoor exchange
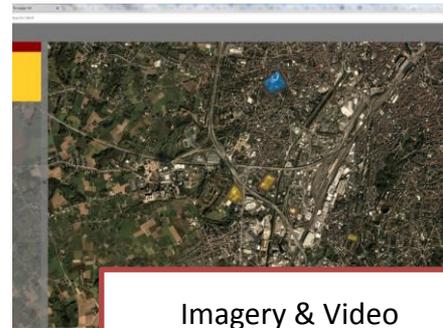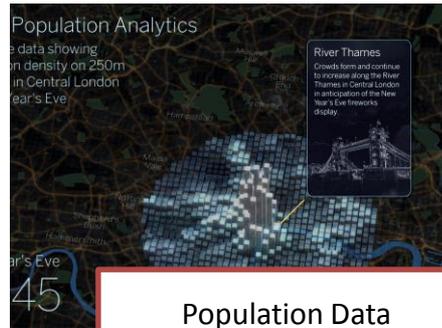 - **Sensor Placement Tool** (SPT) – Optimal sensor placement

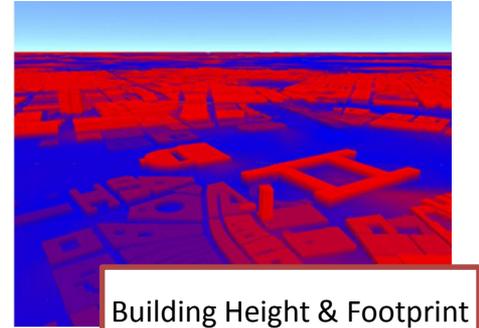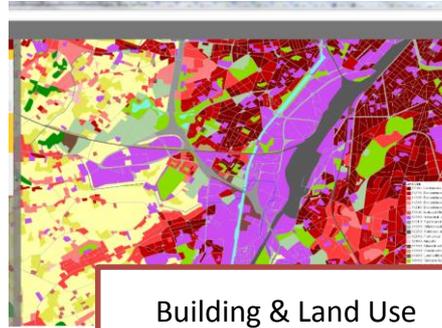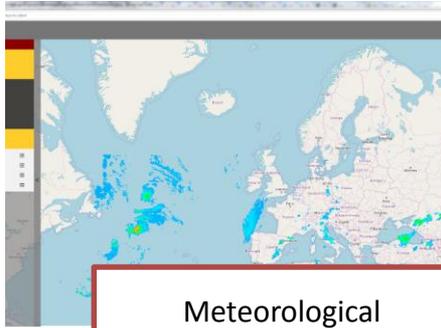**Riskaware**
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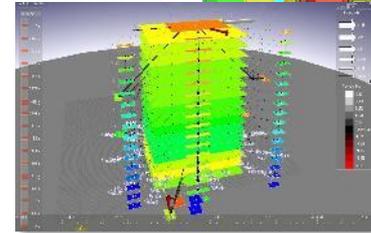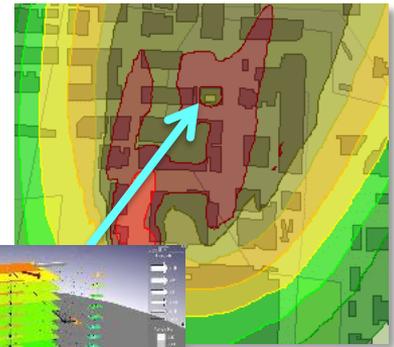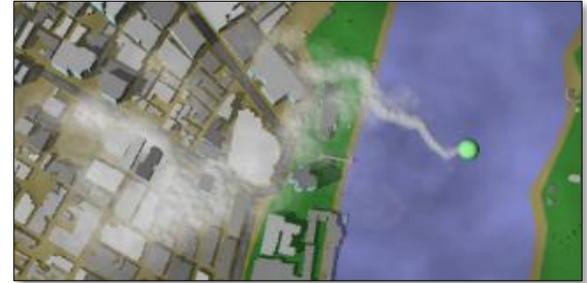
Automated Space-Based Data Service

- Access to latest space data
  - Automatic use of latest data available from satellite
  - Live GPS positioning
  - Potential for almost global area coverage
  - Augmented with user supplied data
- Cloud-based
  - Data is accessible from anywhere
- Non-Geospatial Data
  - Materials property data (inc. toxicology)
  - Intelligence Data
  - Protective equipment/decontamination performance
  - Sensor Data
  - Population Estimates
  - Met sensor and forecast data

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Space Data Examples

Meteorological

Building & Land Use

Building Height & Footprint

Population Data

Imagery & Video

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USER VERIFICATION AND VALIDATION

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Desktop Application

- Designed to be used by a commander (or similar role) from a desktop or laptop computer

- Provides a view of the whole incident

- Data added can be shared or kept private using the privacy controls in the Properties panel

- To aid traceability, data cannot be edited once added, but users can add comments or provide updates

- Every action is recorded taking the burden of "recording responsibility" off of the commander and responders

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Command Room Concept
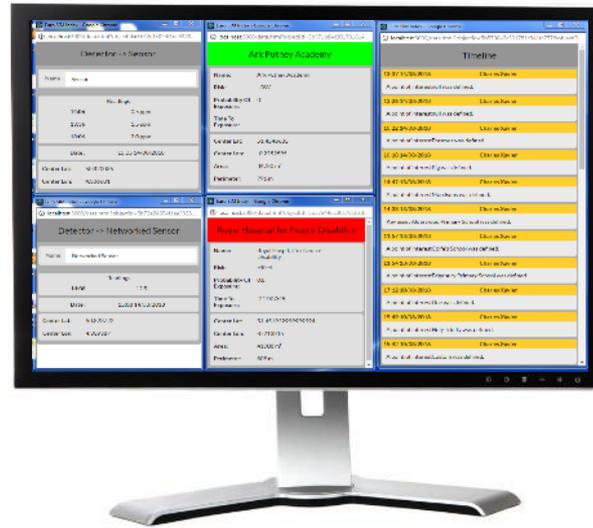
- Incident, Properties and Timeline panel are all expandable and collapsible
- The panels can also be split out in separate windows
  - This is particularly useful for operators with multiple screens

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Mobile App – First Responders

- Dashboard application users can choose to send information to first responders using the mobile app

- First responders would only be able view information sent to them by the commander, allowing them to concentrate on their specific tasks

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CONCLUSIONS AND ROADMAP

What is next for EuroSIM?

- Feasibility study now complete
  - Final review successfully completed and delivered
  - Recommended by ESA and UKSA for Phase 2 Development Funding
  - Substantial support and enthusiasm from stakeholder community

- Secured license to exploit Dstl CBRN technologies to wider markets

- Looking to move forward to the demonstration phase
  - Outline proposal provisionally approved by ESA and UKSA
  - Option for EDA involvement (Brexit dependant)
  - Direct negotiation full proposal in progress

- Development expected to begin in July this year with baseline system ready for pilot trials in early 2020

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Getting Involved

- Looking for volunteers from the Nuclear Security sector to support User Trials
  - Opportunity to shape technology development to ensure it meets your user community needs
  - 6 to 12 months free access to developed technology, including technical support
  - Involvement level to suit your organisation

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QUESTIONS

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