



Expand your view

ONE RESILIENT DATA PLATFORM

ACROSS EMERGENCY SERVICES,
AUSTRALIA WIDE

SURROUND
.....



INTRODUCTION

2019 - 2020 BUSHFIRES

Unprecedented. 24 million hectares burnt. Tragically 33 people lost their lives and over 3,000 homes were destroyed. 3 billion animals perished. National financial impact estimated to be in excess of \$10 billion.

Prepare Australia

Bushfires, floods, cyclones and draught are some of the naturally occurring rapid onset events that result in destruction of property, loss of life and significant impact to the community, the economy and the country.

Climate change exacerbates the possibility of more extreme weather events playing a role in the emergency management threat landscape in Australia and around the world.

The 2020 Royal Commission report into National Natural Disaster Arrangements focussed on what actions the state and territory agencies and organisations could take to be more resilient and better address the preparation for, response to and recovery from more frequent, more severe, compounding natural disasters.

DATA STRATEGY FOR FEDERAL AGENCIES

With changing weather patterns, the need for a federally-mandated, nationally co-ordinated data fabric that provides real-time early warning systems, live intel, and situational data concerning an evolving emergency situation is a national priority.

According to the RCNDA (Royal Commission into National Disaster Arrangements), the vision for an effective national approach includes a clear, robust and accountable system capable of both providing a comprehensive understanding of, and responding to, the aggregated risks associated with mitigation, preparation for, response to and recovery from natural disasters.

Such a system must have unbroken linkages in place from the highest levels of government to individuals in the community; provide decision makers with timely, consistent and accurate information; be structured for decisions to be made at the most appropriate level; allow decision makers to understand and mitigate all risks so far as reasonably practicable; enable stakeholders to understand the residual risk and inform others so that they may take appropriate actions; and it must be resourced to fulfill these functions*.

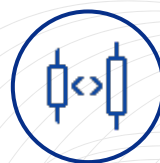
Key challenges identified by the Royal Commission:



INTEROPERABILITY



INCONSISTENCIES



DATA SILOS



STANDARDISATION



HARMONISATION



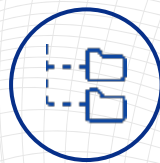
DATA SHARING



DATA ANALYSIS



INTER JURISDICTION



INTEGRATION



surround

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What if every member of your team and supporting organisations had access to critical data? Helping them to collate information, assess risks based on live data, analyse in real time, prepare data driven response plans and warnings, provide dynamic data driven situational updates and respond to an evolving situation seamlessly. SURROUND gives you and your stakeholders a shared jurisdictional view and toolset for the digital landscape.



Connect and
harmonise
emergency
services data

A wealth of data sits in different Federal government agencies which can be connected, enriched, harmonised, integrated, and spatially enabled at scale so your stakeholders have a single national view of the emergency services landscape.

EMS Emergency Management Solutions by Surround

PREPARE. PREVENT. PROTECT.

The SURROUND Technology Offering (STO) is a proven industrial-strength platform that enables all knowledge sources to be connected & queried textually and/or visually.

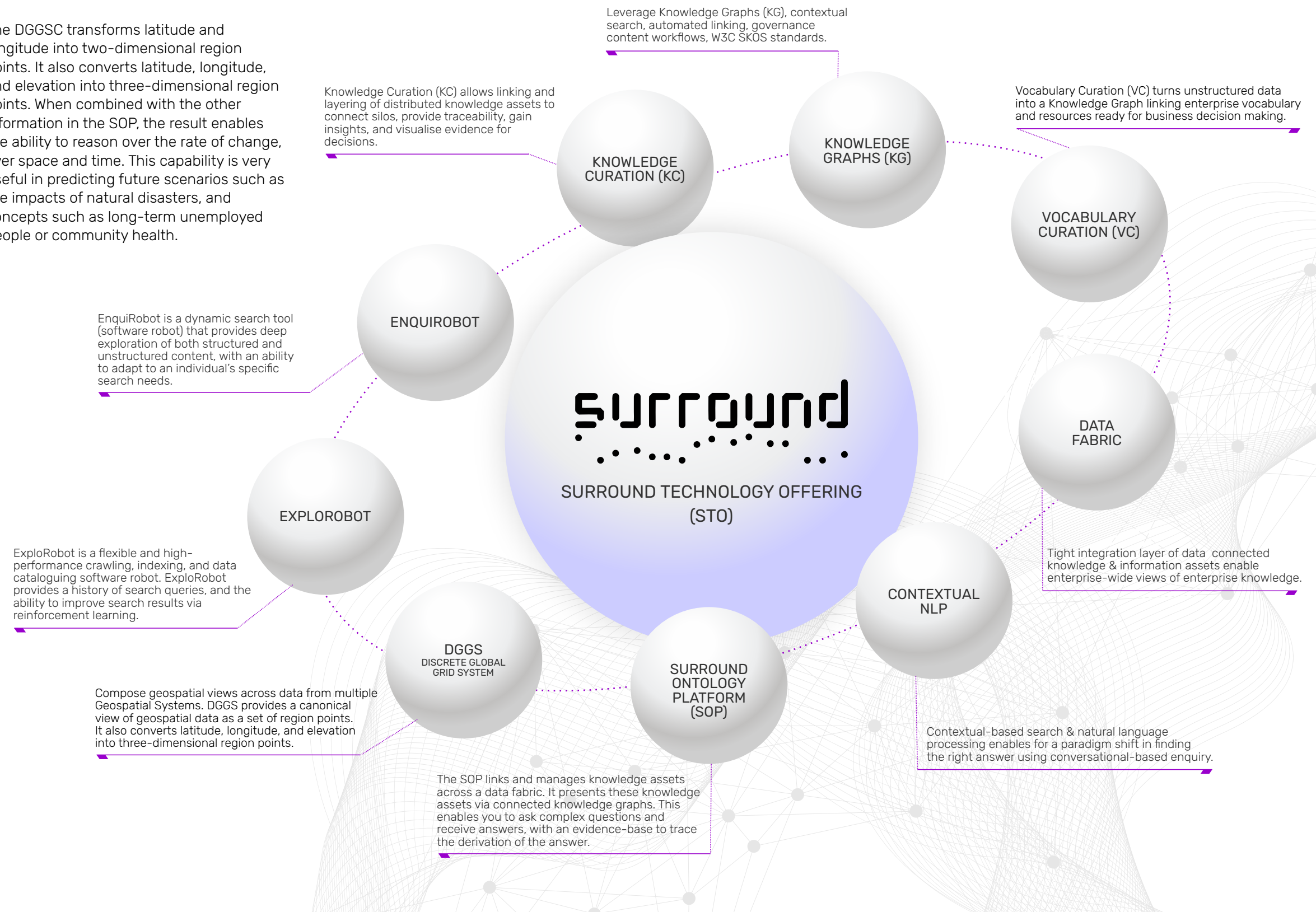
The STO combines semantic data enrichment and machine learning and applies open standards to help organisations make sense of complex data at scale. We do this by enabling agencies to locate, connect, harmonise, visualise, and search over connected data, drawing on our pioneering solutions, deep expertise, and rich IP. We 'make the complex simple, consumable, and scalable' through the STO.

We call this explainable decision-making through enriched data management.

Key platform benefits include:

- Scenario creation and planning – This technique is used to figure out what decisions to make. Working within a spectrum, you can formulate testable scenarios and apply them to both evidence obtained in the past, and to future (projected) evidence. You can then evaluate the trade-off for each scenario in order to make the optimal decision.
- Provenance is at the heart of SURROUND's Platform. This 'chain of trust' delivers traceability and accountability for your critical information and functions:
 - a. Capture of the detail of any constraint violations associated with the information sourced.
 - b. Improved discovery of knowledge across domains, including visualisation for the discovery process and its results.
 - c. Navigation across information, including dependencies, lineage, and impact.
- The Discrete Global Grid System (DGGS) Converter (DDGSC). The DGGS provides a canonical view of geospatial data as a unified multidimensional grid.

The DGGSC transforms latitude and longitude into two-dimensional region points. It also converts latitude, longitude, and elevation into three-dimensional region points. When combined with the other information in the SOP, the result enables the ability to reason over the rate of change, over space and time. This capability is very useful in predicting future scenarios such as the impacts of natural disasters, and concepts such as long-term unemployed people or community health.



EMERGENCY SERVICES

WHO IS IMPACTED

SURROUND's cutting-edge solutions help save lives and enable Emergency Services with linked information when responding to a crisis.

If data is not connected or unavailable to Australia's Emergency Services network and stakeholders, it is not available for decision making. Silos form due to disconnected data streams. Broken links retard information delivery (too little, too late). Interoperability issues further limit the ability to respond. Inconsistencies across unlinked data renders informed decision-making anemic. The confluence of factors detailed above results in an inability to quickly collate, analyse and respond to an emerging situation, lack of preparedness, coordination and cooperation. But most complex of all it exacerbates the already fraught communication challenges faced by states and jurisdictions.

Emergency Management Solutions Matrix

SOLUTIONS	GOVERNMENT MINISTER	PEAK EMS BODIES	NATIONAL COMMITTEE	FEDERAL AGENCY	STATE GOVERNMENT	EMERGENCY SERVICES	FIRST RESPONDER	TRIPLE 000
Knowledge Graphs	●	●	●	●				
Gov. KG	●	●	●	●	●			
Knowledge Curation	●	●	●	●	●			●
Vocabulary Curation	●	●	●	●	●			●
Language Curation		●	●	●	●			●
Contextual NLP		●	●	●	●			●
ExploRobot		●	●	●	●	●	●	●
SortRobot		●	●	●	●	●	●	●
EnquiRobot		●	●	●	●	●	●	●
Error Checking		●	●	●	●	●	●	●
DGGS		●	●	●	●	●	●	●
Data Fabric	●	●	●	●	●	●	●	●
SURROUND Ontology Platform (SOP)	●	●	●	●	●	●	●	●

How does SURROUND bring resilience to Emergency Management?

SINGLE UNIFIED VIEW

The STO enables State and local emergency management teams to harness actionable intel, and analyse and respond to a crisis, thanks to a single unified view of crisis-related data points. The STO serves as an integrated layer (fabric) of data and connecting processes. Linking knowledge assets across a data fabric enables the user to ask complex questions and receive answers, while having the ability to trace the derivation of the answer. It presents these knowledge assets via connected knowledge graphs, thereby creating linked knowledge graphs that can be used as one integrated knowledge repository.

SURROUND's Knowledge Curation (KC) allows commonwealth agencies to link and layer distributed knowledge assets to connect siloes, provide traceability, gain insights, and visualise evidence for decisions. Knowledge-as-a-Service (KaaS) gives you multi-dimensional contextual awareness in real time to effortlessly address complexity in emergency management.

The STO integrates a suite of products that can be tailored for different needs.

USE CASE:

Data Harmonisation

We can help government agencies to respond to a climate crisis like a flood or bush fire by bringing together different data sets such as weather feeds location data, and emergency services asset data, etc. We harmonise all of these data points in real time to provide a 'first responder' with actionable intel on his device. The ability to scale this and yet provide granular 'per square foot' data makes SURROUND a 'go-to' solution when dealing with complex data sets, data concepts and data relationships.

CASE STUDY

IDENTIFY. COLLECT. CONNECT.

Evidence based decision making, requires the right information at the right time. SURROUND helped Geoscience Australia and the ACS respond to the 2020 Royal Commission by delivering crucial data solutions & mission critical services.

Climate and Resilience Services, Australia

The Australian Climate Service (ACS) was set up in 2021 by the Australian Government as part of its response to the 2019 Bushfires and the Royal Commission that followed. One of the ACS partners, Geoscience Australia brought in SURROUND Australia to deliver crucial data solutions needed for the ACS to become operational by July 01, 2021.

THE ASK: The focus was on delivering socioeconomic, demographic data and information products that contribute to decision making.

- Developing data service enablers which assist with spatial enablement of data (geo-coding, use of geographies, DGGs and GeoSPARQL) and simplifying users' ability to work with and understand metadata & data.
- A mix of a set of 'ready to go', pre-packaged products, new product variations through spatial enablement, or new multi-purpose data integrations.
- Provision of ontological models, technical documentation, and other developed reference materials.

THE RESPONSE: SURROUND delivery and implementation services included:

- Creating ontologies for 10 data sets using core ontological models defined through the foundation base and location index project.
- Building the registries of the 10 data sets.
- Building OGC linked data APIs for the data sets with created ontological models.
- Building the visualisation and analyses dashboard for the defined set of linked data sets and services.
- Support and maintenance services for this successful cloud-delivered project included network and associated infrastructure and software applications.

Use Case:

- Introduction: I'm a senior executive who is required to decide the best distribution of resources to respond to a natural disaster scenario and require a lot of information to inform decisions.
- Scenario: Weather conditions indicate expanding area of disaster impact. Weather variability is high. There is limited resources available to respond within the disaster impact area.
- Outcome: Distribute disaster response efficiently so as to deliver maximum relief.

Preconditions

- Linked information providing coverage of multiple interconnected disaster variables, including weather, location, demographics, resource availability, and likely impact to inform decisions.
- Ontology models of the domains to the extent that all information is classified.
- Ability to ingest and link the information across domains using the ontology models.

Postconditions

- Linked information that is easy to navigate and query that informs decisions and effectively respond to the natural disaster.
- Understanding of the provenance of information.
- Capture of the detail of any constraint violations associated with the information sourced.
- Improved discovery of knowledge across domains including visualisation for the discovery process and its results.
- Navigation across information including dependencies, lineage and impact.



Australian Government
Geoscience Australia

Geoscience Australia is Australia's pre-eminent public sector geoscience organisation and the nation's trusted advisor on the geology and geography of Australia.



National View

ABOUT SURROUND

Our vision is to solve the world's most complex data and metadata management problems ethically to achieve real world outcomes for society.

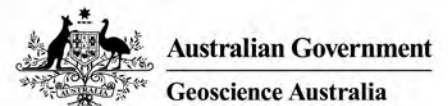
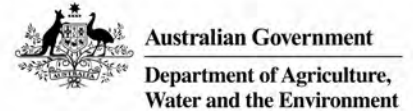
SURROUND is an Australian technology company that develops advanced software systems and supplies consulting services. Our forté is in working with complex, multi-dimensional data. Collectively we have over a century of software and data architecture, design and operations experience. Our staff include seasoned veterans of Australian government, IT and international technology giants as well as internationally-renowned Semantic Web, spatial data and machine reasoning and conceptual modelling experts.

SURROUND's core mission is to provide value to our customers and the broader citizen community by providing government agencies and business with cost-effective solutions which address and solve organisational complexity. Our solutions leverage global standards and world-class algorithms in the design of generic or customised solutions as required.

Find out more about us
surroundaustralia.com



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