Administrative Boundaries:
Automating the Data Processing Cycle for a Critical National Dataset

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PSMA Australia Limited

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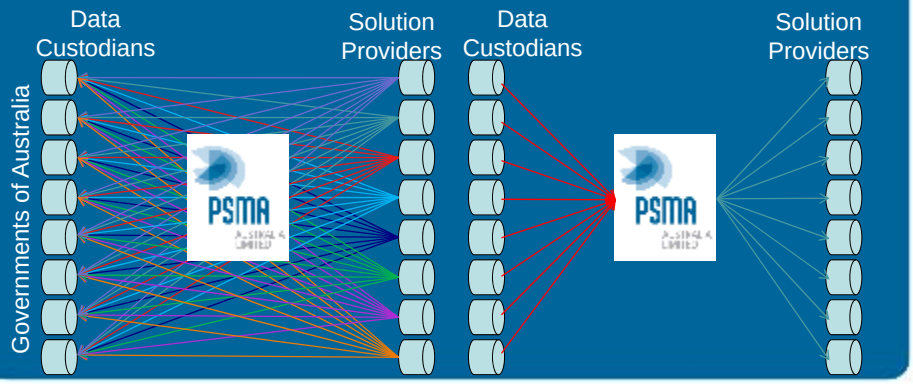
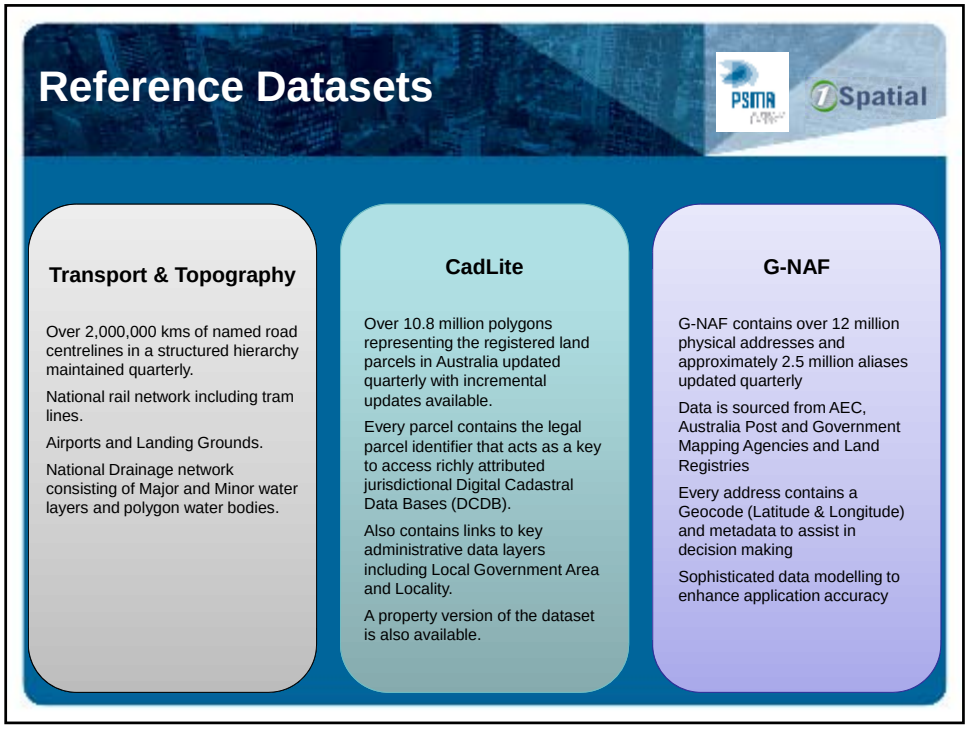
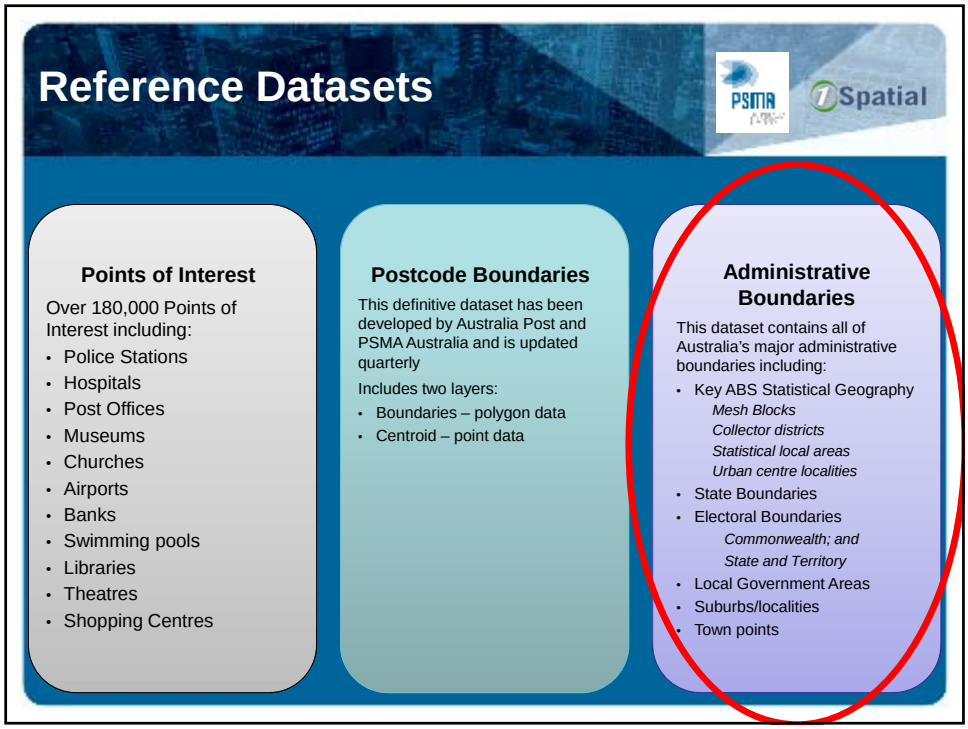



Reference Datasets
PSMA
1Spatial
Transport & Topography
Over 2,000,000 kms of named road centrelines in a structured hierarchy maintained quarterly.
National rail network including tram lines.
Airports and Landing Grounds.
National Drainage network consisting of Major and Minor water layers and polygon water bodies.
CadLite
Over 10.8 million polygons representing the registered land parcels in Australia updated quarterly with incremental updates available.
Every parcel contains the legal parcel identifier that acts as a key to access richly attributed jurisdictional Digital Cadastral Data Bases (DCDB).
Also contains links to key administrative data layers including Local Government Area and Locality.
A property version of the dataset is also available.
G-NAF
G-NAF contains over 12 million physical addresses and approximately 2.5 million aliases updated quarterly
Data is sourced from AEC, Australia Post and Government Mapping Agencies and Land Registries
Every address contains a Geocode (Latitude & Longitude) and metadata to assist in decision making
Sophisticated data modelling to enhance application accuracy

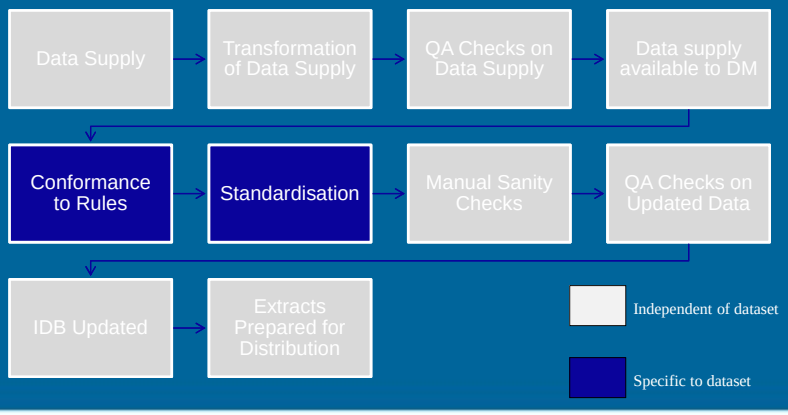

Reference Datasets
PSMA
1Spatial
Points of Interest
Over 180,000 Points of Interest including:
• Police Stations
• Hospitals
• Post Offices
• Museums
• Churches
• Airports
• Banks
• Swimming pools
• Libraries
• Theatres
• Shopping Centres
Postcode Boundaries
This definitive dataset has been developed by Australia Post and PSMA Australia and is updated quarterly
Includes two layers:
• Boundaries – polygon data
• Centroid – point data
Administrative Boundaries
This dataset contains all of Australia's major administrative boundaries including:
• Key ABS Statistical Geography
Mesh Blocks
Collector districts
Statistical local areas
Urban centre localities
• State Boundaries
• Electoral Boundaries
Commonwealth; and
State and Territory
• Local Government Areas
• Suburbs/localities
• Town points

The Case for Change

- Time to Market: Current PSMA Australia release cycle is quarterly.
  - Hierarchical processing required, dependency between datasets
  - Downstream (VAR) processes must be added – further delay
- Processes are not homogeneous: Multiple Data Managers, Work Practices, Standards
- No direct involvement in processing: Over time PSMA Australia was moving further away from understanding the specific processes involved.
- Lack of transparency: Difficult to have confidence in repeatability; particularly in atypical situations.
- Innovation: No incentive to innovate beyond your sphere of influence.
- Metadata: Only at a dataset level and not dynamic.

The Data Management Cycle

The PSMA Australia data management cycle can be represented as a series of processing steps completed by a number of different actors. Including PSMA Australia, a Data Manager and the LYNX Manager.



Why Radius Studio?

- 1Spatial's Radius Studio was selected to provide the "data management " components of the of the supply chain, specifically;
  - Conformance to Rules
  - Standardisation

- Key factors behind the decision;
  - Built on SOA
  - Rich range of functions including;
    - Spatial Rules Engine
    - Metadata Recording
  - Strong Reporting Capability
- Business Rules behind the data maintenance cycle needed to be clearly understood. Major benefit for PSMA Australia.

Administrative Boundaries: Business Rules

BRP	Requirements
1	A contributor object that: • Matches an IDB object spatially, but • Does not match an IDB object spatially, will be: • Updated to match the contributor object's spatial data within the appropriate Administrative Boundaries dataset • This is a changed object.
2	A Contributor object that: • Matches an IDB object spatially, but • does not match an IDB object spatially, will be: • Updated to match the Contributor object's spatial data within the appropriate Administrative Boundaries Dataset. • This is a changed object.
3	A contributor object that: • Does not match an IDB object spatially, and • Does not match an IDB object spatially, will be: • Inserted into the appropriate Administrative Boundaries dataset. • This is a new object.
4	All spatial data will be in the coordinate system "Latitude/Longitude - GDA94"
5	Where the IDB contains spatial data that is no longer in the Contributor data, the spatial data will be retired and archived.
6	Where the IDB contains spatial data that is no longer in the Contributor data, the spatial data will be archived or retired.

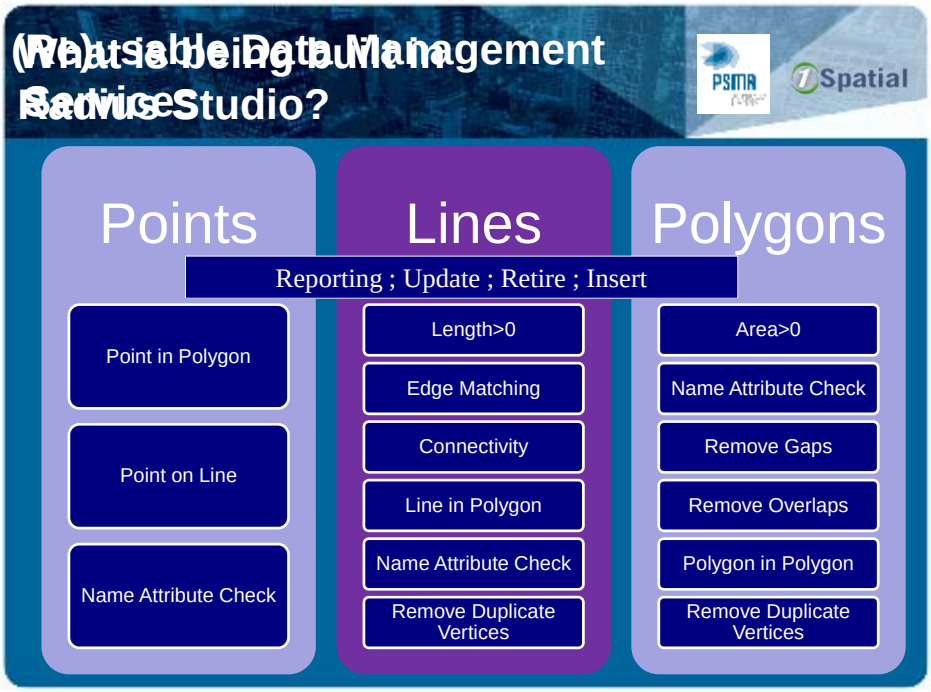
These are the fundamental rules that the data in each dataset must conform to. Typically they are quite logical and should be relatively easy to understand. e.g. adjoining suburbs should not overlap.

L1	Polygons will not overlap.
L2	There will be no voids or slivers between polygons.
L3	All polygons in the Administrative boundaries dataset will have a name.
L4	All polygons will have an area greater than zero.

Each rule is created as a new service inside Radius Studio which can be reused across different contributor supplies, themes etc.

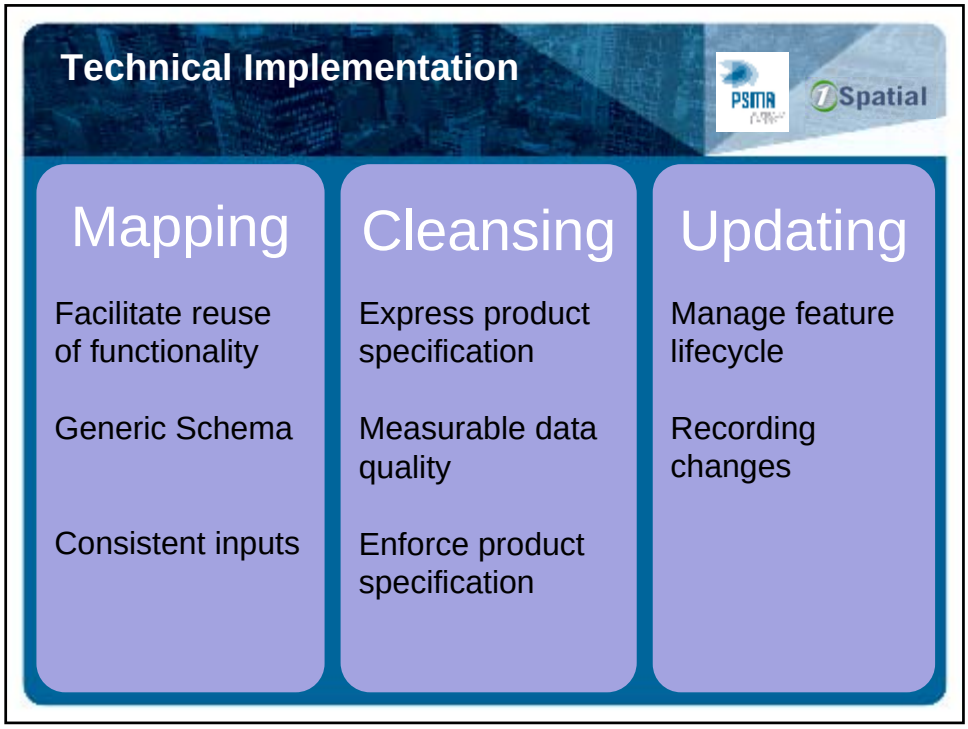
(Re-usable) Data Management Services

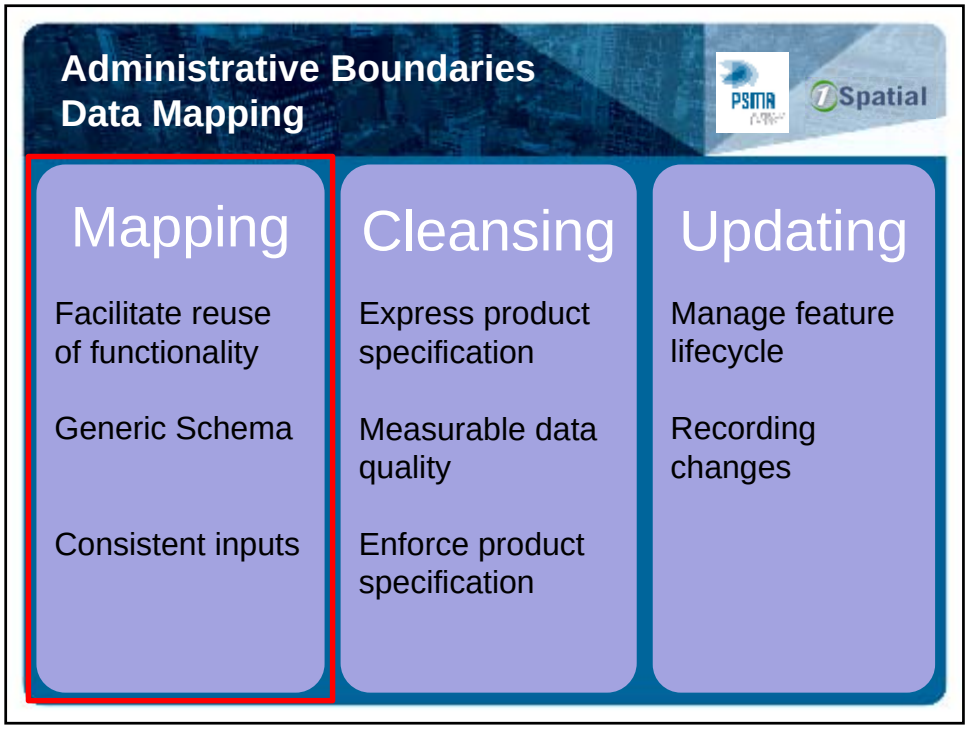
What is being built in Radius Studio?



Technical Implementation
The Challenges

- Automation of Administrative Boundaries Updates
  - Consistent inputs
  - What happens if…
  - Fit within larger data management process
- Minimise duplication of functionality between Contributors and also between Datasets
- Re-usable data management services
- Internal knowledge of datasets & software


Technical Implementation
PSMA
1Spatial
Mapping
Facilitate reuse of functionality
Generic Schema
Consistent inputs
Cleansing
Express product specification
Measurable data quality
Enforce product specification
Updating
Manage feature lifecycle
Recording changes


Administrative Boundaries Data Mapping
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1Spatial
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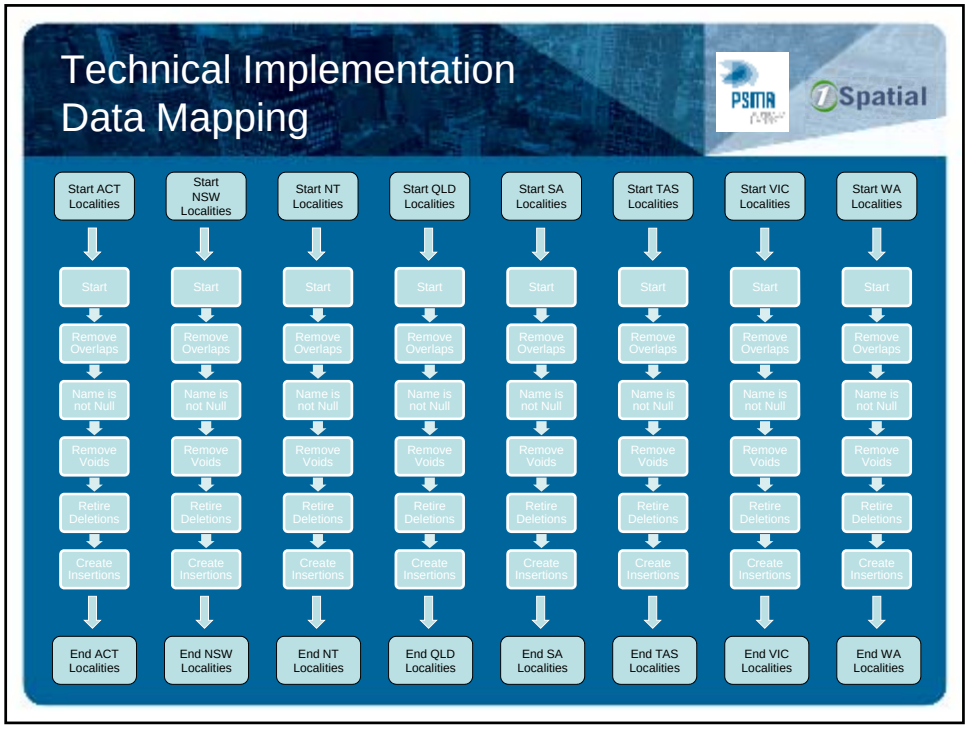
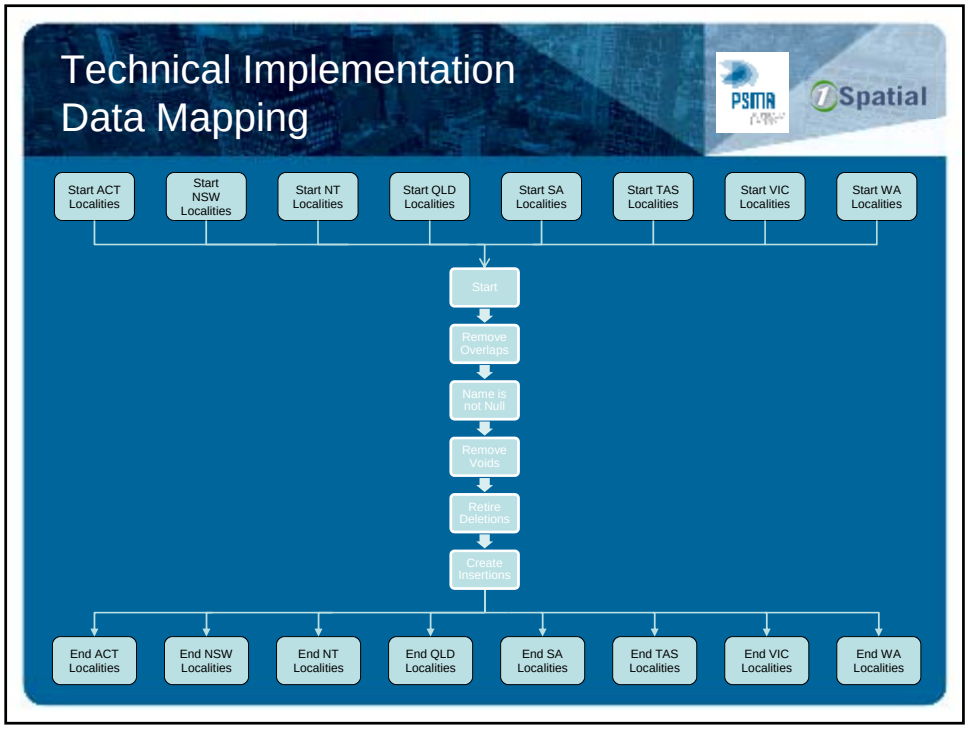

Technical Implementation
Data Mapping
PSMA
1Spatial
Start ACT Localities
Start NSW Localities
Start NT Localities
Start QLD Localities
Start SA Localities
Start TAS Localities
Start VIC Localities
Start WA Localities
Start
Remove Overlaps
Name is not Null
Remove Voids
Retire Deletions
Create Insertions
End ACT Localities
End NSW Localities
End NT Localities
End QLD Localities
End SA Localities
End TAS Localities
End VIC Localities
End WA Localities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Data Mapping
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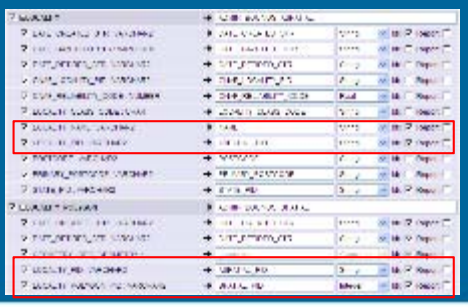
End NSW Localities
End NT Localities
End QLD Localities
End SA Localities
End TAS Localities
End VIC Localities
End WA Localities

Technical Implementation
Data Mapping

Mapping contributor data onto a generic processing schema facilitates functionality reuse across **contributors**

Mapping PSMA data onto a generic processing schema facilitates functionality reuse across **datasets**



Technical Implementation
Data Cleansing

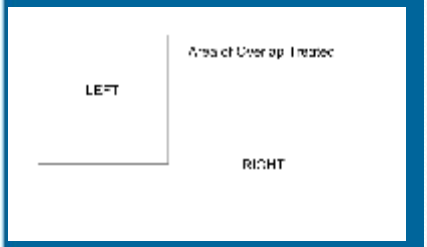
Mapping	Cleansing	Updating
Facilitate reuse of functionality	Express product specification	Manage feature lifecycle
Generic Schema	Measurable data quality	Recording changes
Consistent inputs	Enforce product specification	

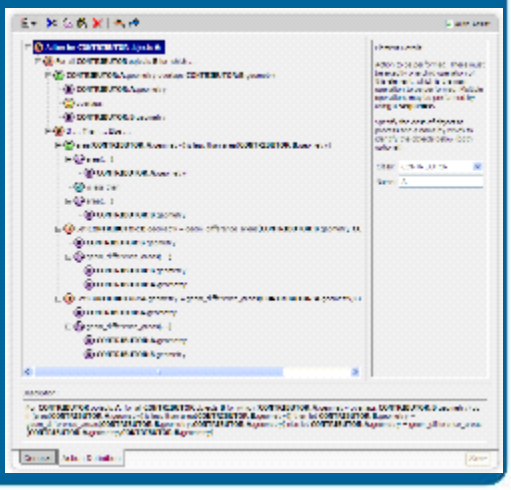
Technical Implementation
Data Cleansing

BR11 – Polygons will not overlap

Technical Implementation
Data Cleansing

"The polygon with the largest area will have the area of overlap removed"





Administrative Boundaries Data Update

Mapping

Facilitate reuse of functionality

Generic Schema

Consistent inputs

Cleansing

Express product Specification

Measurable data quality

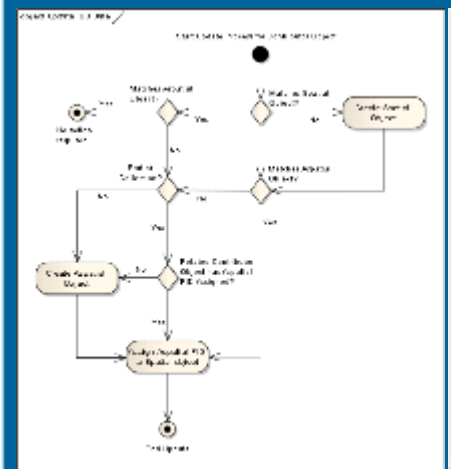
Enforce product specification

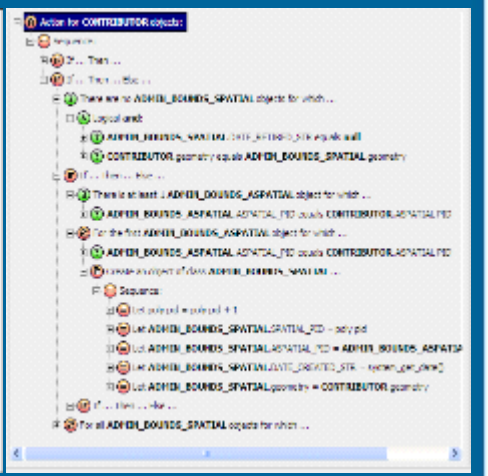
Updating

Manage feature lifecycle

Record changes

Technical Implementation Data Update





The Benefits for PSMA

- Increased understanding of its core business.
- Continued provision of high quality datasets at an increased frequency.
- Increased flexibility to adapt to changing market conditions.
- Increased data quality
- PSMA Australia to have greater control of the processes behind the data creation.
- Standardised data maintenance practices.
- Capability to accept data from non traditional sources.
- Closer relationship with Jurisdictions and other data providers.
- Less labour intensive data maintenance processes.
- International relationships through collaboration on solving continental scale data management challenges.

Questions

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Answers

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