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Spatially Enabling
Australia and New Zealand

Project 3.02 | Supply Chains
Automating Local Government Spatial Transactions

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Landgate, WA; Department of Environment and Primary Industries, Victoria; ANZLIC; PSMA

Objectives Automating Local Government Spatial Transactions with State Government

Outcomes Automated and semi-automated workflow and supply chain generation

Introduction

Geospatial data sharing is becoming more and more important in Spatial Infrastructures (SI) as huge amounts of data are supplied by a variety of organisations, stored in different formats, and managed at different user levels. The increased dependencies on timely spatial data have identified the need to consider improving supply chains for spatial data from local government authorities through to the Commonwealth. Typically spatial data is acquired at the local level and combined to form State/Territory level datasets and finally Commonwealth level datasets which are an aggregation. This research aims to provide a self service mechanism for local government spatial transactions with state government in the spatial industry through the use of Semantic Web and Linked Data technologies. This addresses need for more seamless spatial data supply chain operations.

Research Issues

To improve the supply chain as an integrated component

To build conceptual supply chain data models and automate the processes.

How best to minimize the steps in value chains. Thus, promoting human efforts to higher levels.

How the semantic web and linked data techniques can be used to manage the generation and update of complex multiple level supply chains for spatial data?

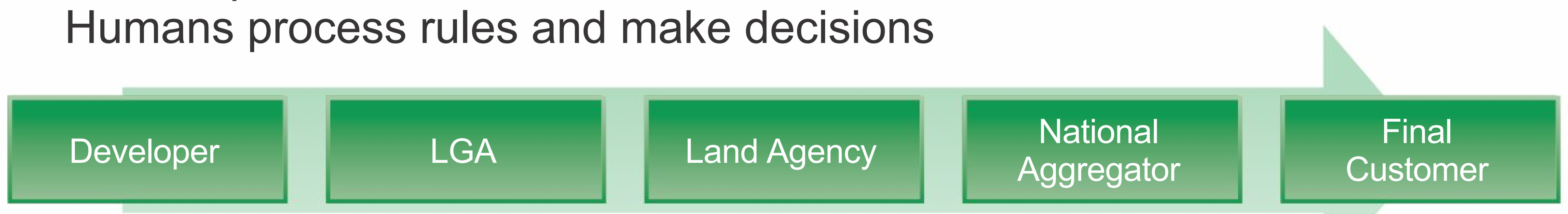
Spatial Data Supply Chain

Current Supply Chain
- Lack of automation
- Restrictive policy
- Inflexible outputs

Applied Research
- Transaction-based self service
- Machine readable processes
- Critical path analysis

Current Spatial Transactions with in Government

Current processes are manual
Humans process rules and make decisions



Characteristics

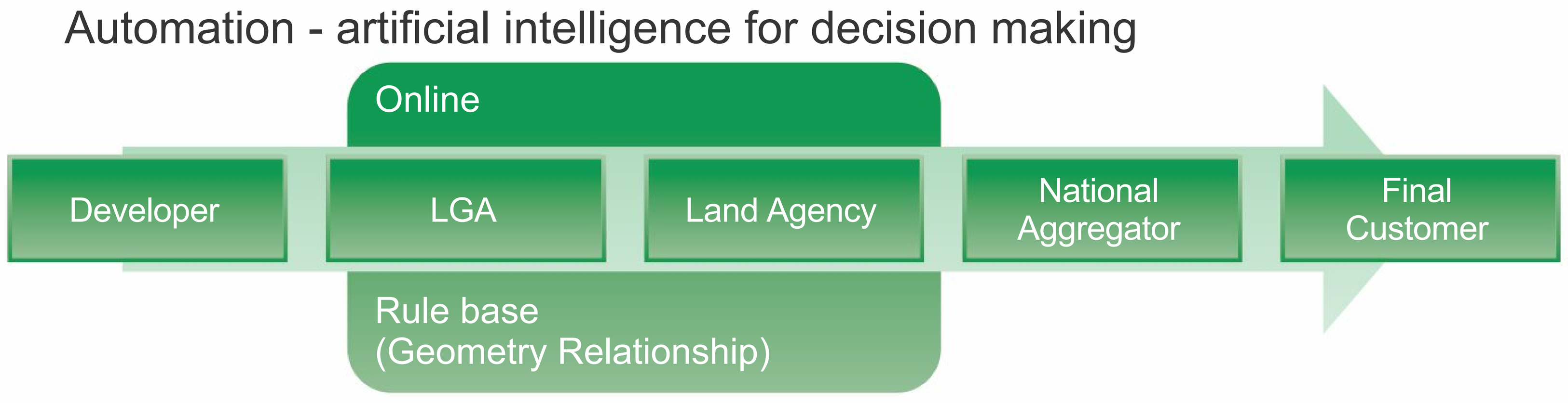
Phone/fax
Email

Delays/backlogs
Customer Frustration

Limited human recourses

This Research

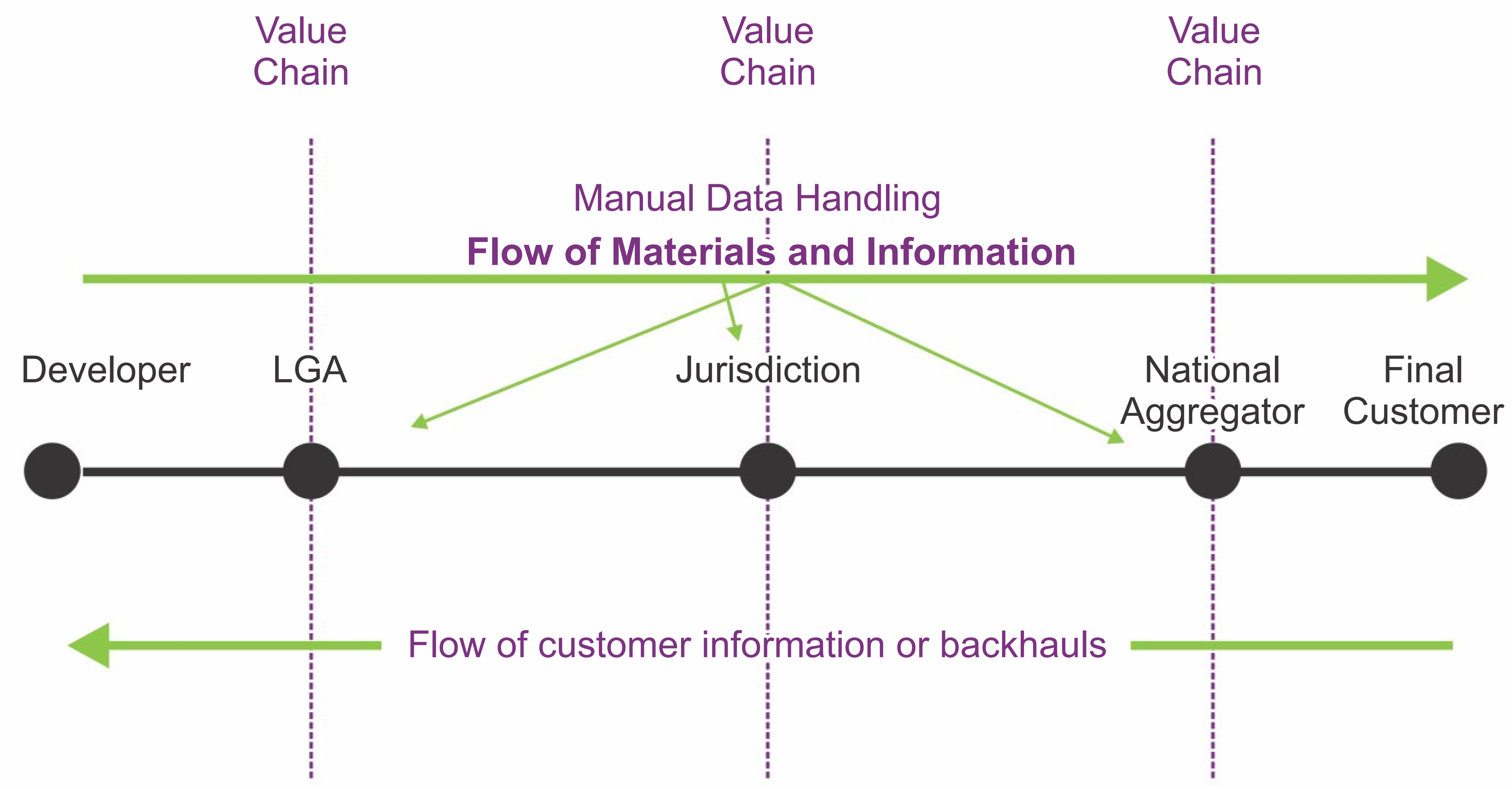
Self-Service
Automation - artificial intelligence for decision making



Characteristics

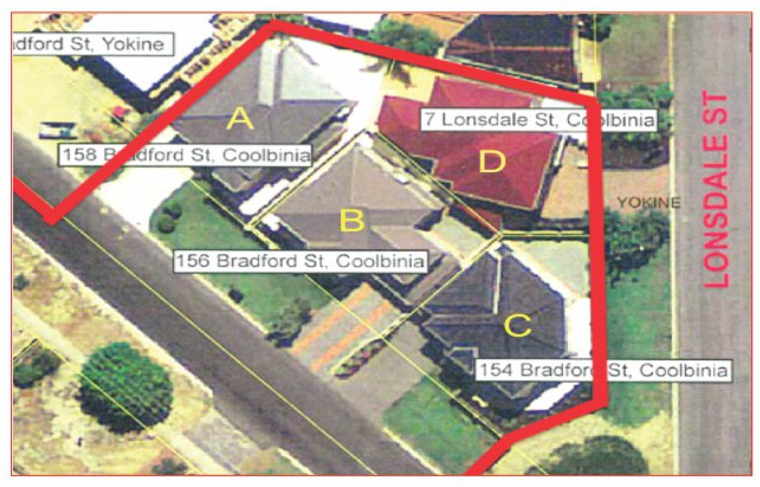
Reduce transaction time
Limited human recourses

The Primary Supply Chain



Database -v- Ontology

Facts/data: (from DB or RDF/OWL)
Coolbinia: Existing suburb
Yokine: Existing suburb
Bradford St: Existing Road in Coolbinia
Lonsdale St: Existing Road in Yokine
A: Proposed Plot
B: Proposed Plot
C: Proposed Plot
D: Proposed Plot
Bradford St ≠ Lonsdale St



Rules (DL from Policies etc.):
Adopt plot(a):
- Proposed Plot(a)
- Existing Road(x)
- Existing Suburb(y)
- Frontage(a,x)
- Frontage Locality(x,y)

Results:

Adopt plot(A): TRUE
Existing Road(Bradford St): TRUE
Existing Suburb(Coolbinia): TRUE
Frontage(A, Bradford St): TRUE
Frontage Locality
(Bradford St, Coolbinia): TRUE

Adopt plot(D): FALSE
Existing Road(Lonsdale St): TRUE
Existing Suburb(Coolbinia): TRUE
Frontage(D, Lonsdale St): TRUE
Frontage Locality
(Bradford St, Coolbinia): FALSE

Summary: This study uses Semantic Web, Artificial Intelligence and Linked Data Technologies to enable automated spatial transactions on a central database. The case study develops a methodology to enable Local Government Authorities to transact with a State Government Agency (Landgate and DEPI) in an online environment for administrative boundary changes, and road and place name changes. The State Government Agency business rules are encoded using semantic web and artificial intelligence. The code, and thus the evidenced-based decision making process, is transparent to the user. The concept is based on an automated transaction Management (ATM) approach; where the result of a transaction, such as a boundary change, results in an accurate and allowable spatial database transaction. The approach can be universally applied to other spatial transactions within spatial data supply chains in a Spatial Infrastructure.

Curtin University · Landgate · University of Canterbury · ANZLIC the Spatial Information Council · Department of Environment and Primary Industries, Victoria · 43pl · Australian Government Department of Industry · Business Cooperative Research Centres Program