



*Integration: The road more
commonly travelled.*

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A lighthearted presentation covering the following topics:

- What is Integration?
- What should you consider?
- What are some of the options?
 - Examples



“What is Integration?”

“Integration is a process of combining or accumulating.”

(Wikipedia)

“To form, coordinate, or blend into a functioning or unified whole.”

(Webster’s)

Integration is becoming more and more mainstream....

... actually, there is (and should be) an expectation to have “touch points” available for integration purposes.

In GIS, integration generally involves meshing together spatial and/or attribute data into a homogeneous dataset.

As GIS becomes a core component of the enterprise landscape, the need to integrate GIS with other “traditional” enterprise applications is becoming much more common.

“So I want to integrate, now
what?”

“What are you trying to do?”

- Business Process Integration
- Data Integration
- Something else?

“What do you need?”

- One way
- Bi-directional
- Aggregation

“What other factors do I need to consider?”

- Latency
- Performance
 - Data structure/quantity
 - Transaction load



“One Source”

The “One Source” philosophy states:

“We must provide efficient access to information while attempting to consolidate and eliminate data redundancy and duplication whenever possible.”



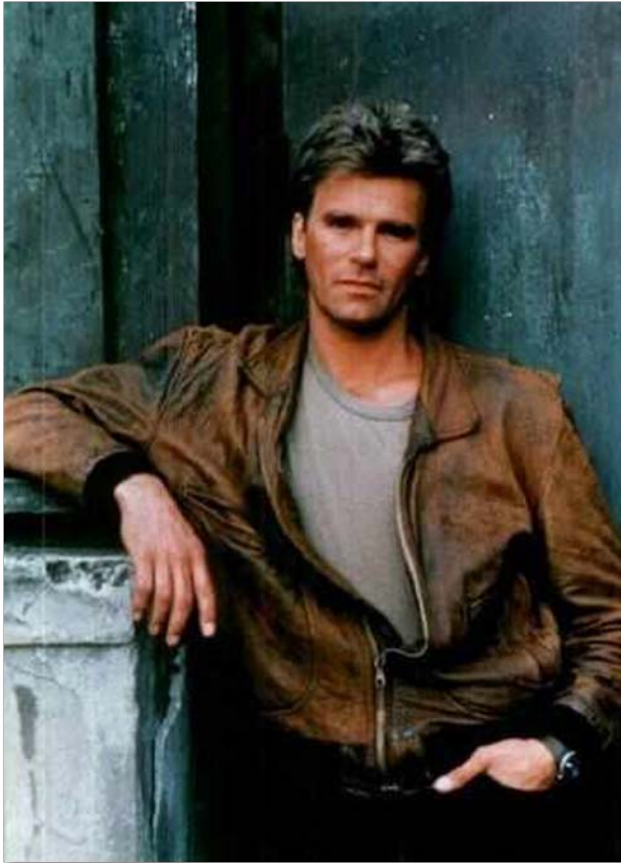
At the Township of Langley, the “One Source” philosophy is helping drive our integration needs and requirements.

“What are my options?”

- “Duct tape and rubber bands”
- RDBMS
- Application integration
- Enterprise integration

“Duct tape and rubber bands”

Do whatever it takes...



As long as you have:

- A full pack of bubble gum
- Swiss army knife
- A license of Access and/or Excel

You can make anything happen!

RDBMS

Leverage capabilities of the RDBMS to perform integration at the data level.

RDBMS - Example

Requirement:

1. Leverage property information stored within the Land Management System inside the GIS system.
2. Minimize duplication if possible

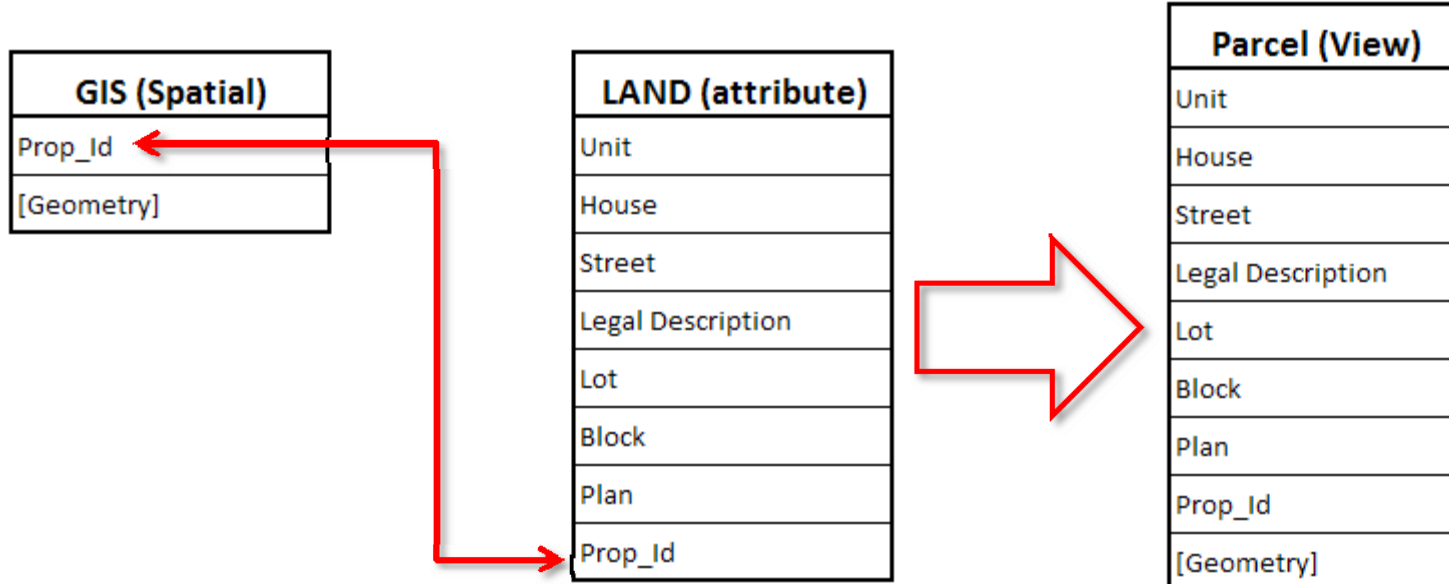
RDBMS - Example

Solution:

Perform a “join” at the database level to aggregate information stored in the GIS and the land management system.

RDBMS - Example

Solution:



RDBMS - Example

Solution:

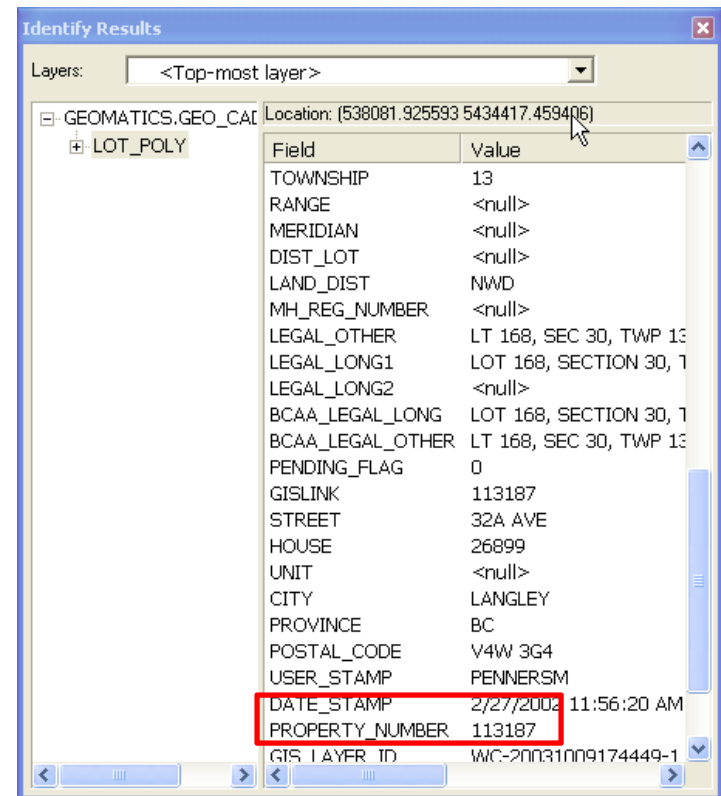


geo source[®]
LANGLEY MAPS • DATA

Layers Query Tools Info

Property Information

Property Num.:103640
Folio:0150811020
Unit Number:
House Number:20452
Street:80 AVE
Postal Code:V2Y 1X6
Service Card:None
Legal Plan:** 72492
[Details](#) [Show Map](#)



Identify Results

Layers: <Top-most layer>

Location: (538081.925593 5434417.459406)

[-] GEOMATICS.GEO_CAD

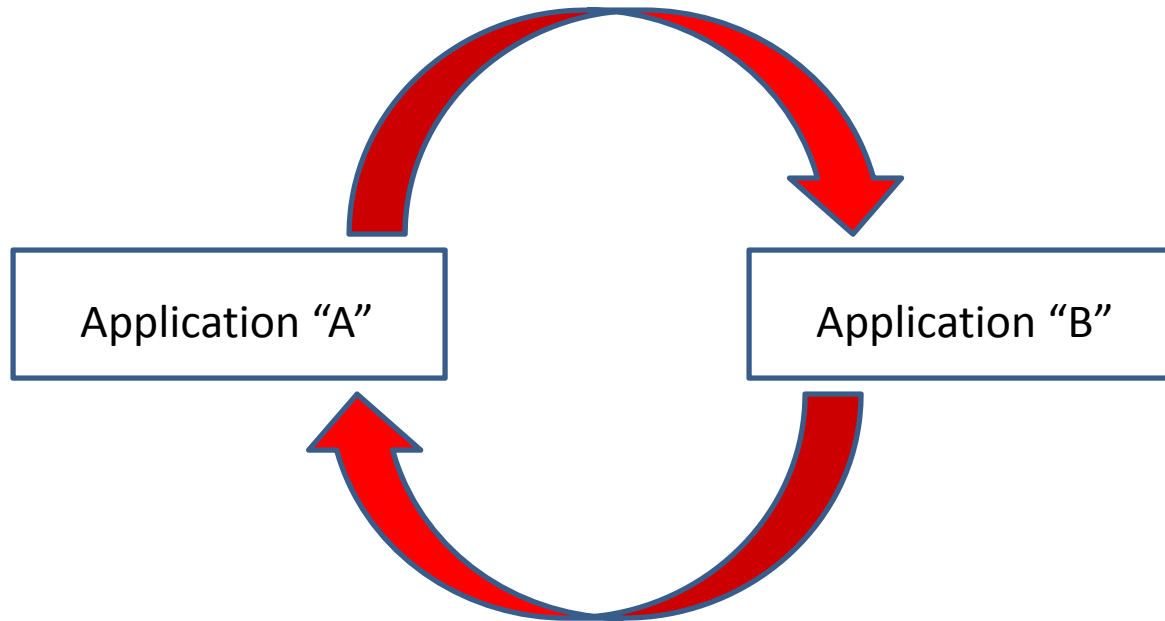
[+] LOT_POLY

Field	Value
TOWNSHIP	13
RANGE	<null>
MERIDIAN	<null>
DIST_LOT	<null>
LAND_DIST	NWD
MH_REG_NUMBER	<null>
LEGAL_OTHER	LT 168, SEC 30, TWP 13
LEGAL_LONG1	LOT 168, SECTION 30, T
LEGAL_LONG2	<null>
BCAA_LEGAL_LONG	LOT 168, SECTION 30, T
BCAA_LEGAL_OTHER	LT 168, SEC 30, TWP 13
PENDING_FLAG	0
GISLINK	113187
STREET	32A AVE
HOUSE	26899
UNIT	<null>
CITY	LANGLEY
PROVINCE	BC
POSTAL_CODE	V4W 3G4
USER_STAMP	PENNERSM
DATE_STAMP	2/27/2003 11:56:20 AM
PROPERTY_NUMBER	113187
GIS_LAYER_ID	WC-20031009174449-1

Application Integration

Leverage capabilities of a particular application or development environment to integrate at the application level.

Application Integration - Challenges



One challenge is the inherent system boundaries...
...as long as the vendor has provided the “touch point”

Application Integration - Options

Many options provided by the operating system for Inter-process Communication (IPC):

- COM
- Windows messaging
- DDE
- Etc.

... All are accessible using a number of development environments

Application Integration - Example

Requirement:

1. Utilize GIS functionality within the Land Management System
2. Leverage existing web-mapping tool to minimize the need for end-user training

Application Integration - Example

Solution:

Leverage application level integration touch-points to integrate existing web-mapping tool with the Land Management System.

Application Integration - Example

Solution:

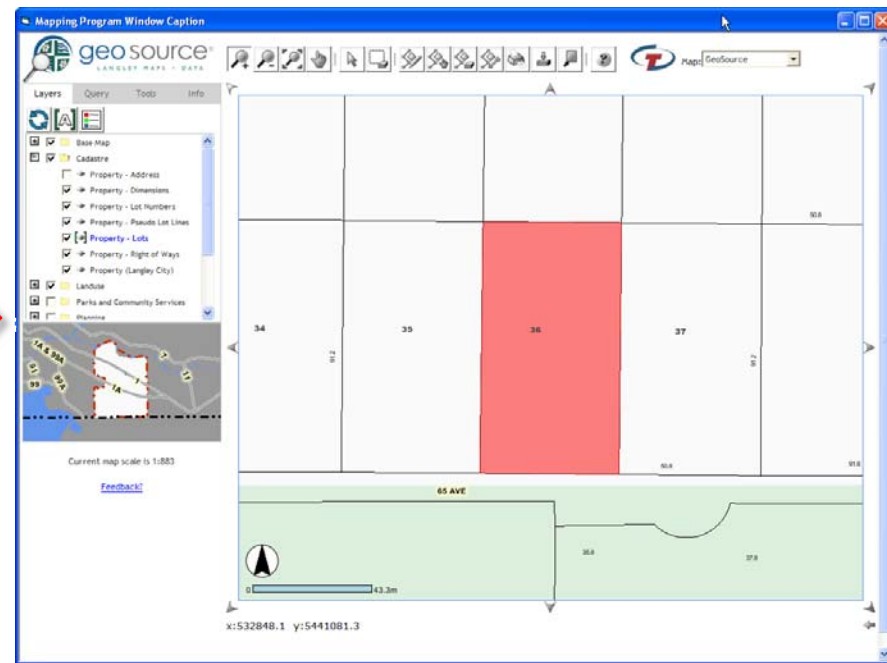
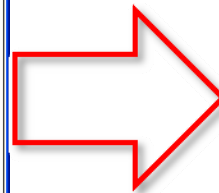
Land Inquiry - 0446623002: (65 AVE 24315)

Application Edit Options Tools Reports

LAND Street*House 65% %

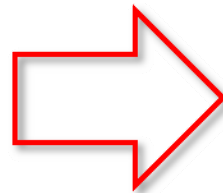
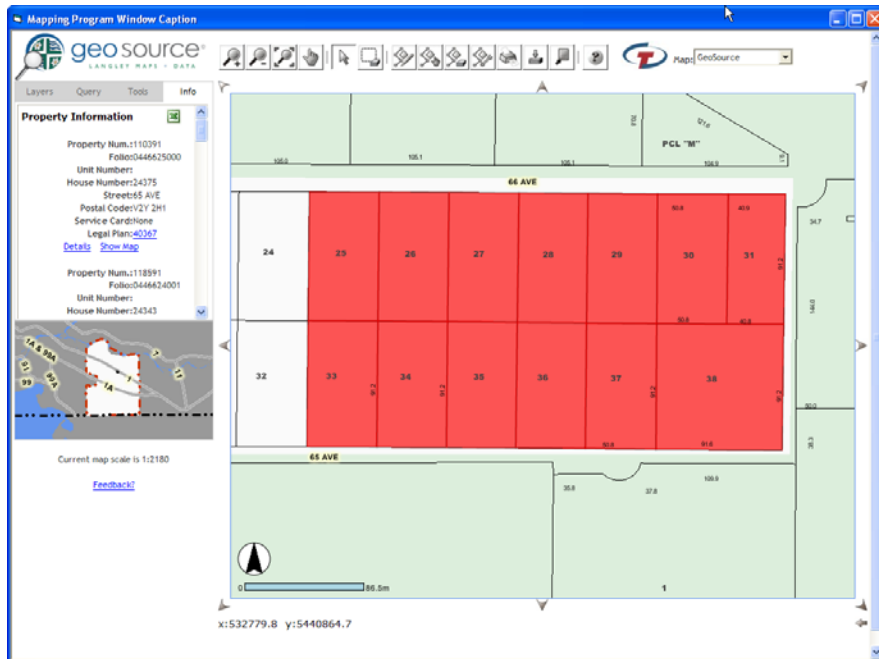
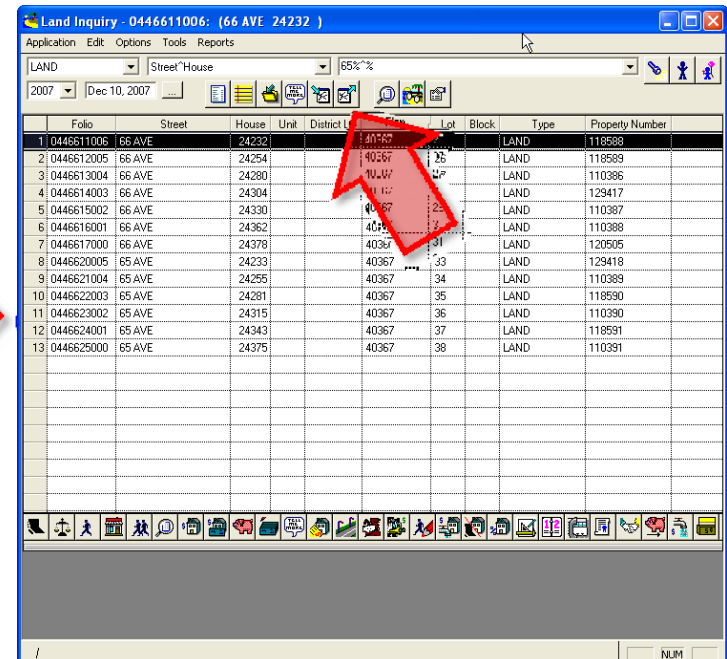
2007 Dec 10, 2007

Folio	Street	House	Unit	Lot	Block	Type	Property Number
39	0446621004	65 AVE	24295	267		LAND	110389
40	0446622003	65 AVE	24281	267		LAND	118590
41	0446623002	65 AVE	24315	267		LAND	110390
42	0446624001	65 AVE	24343	267		LAND	118591
43	0446411008	65 AVE	24352	267		LAND	110377
44	0446625000	65 AVE	24375	40367		LAND	110391
45	0131818069	65B PL	19604	70758		LAND	103053
46	0131818078	65B PL	19605	70758		LAND	114992
47	0131818050	65B PL	19608	70758	26	LAND	103052
48	0131818087	65B PL	19609	70758	29	LAND	102054
49	0131818041	65B PL	19612	70758	25	LAND	114991
50	0131818032	65B PL	19616	70758	24	LAND	127223
51	0131818023	65B PL	19620	70758	23	LAND	103051
52	0131818096	65B PL	19621	70758	30	LAND	127224
53	0131820001	65B PL	19625	71381	1	LAND	114993
54	0131818014	65B PL	19628	70758	22	LAND	130828
55	0131820010	65B PL	19629	71381	2	LAND	103055
56	0131820038	65B PL	19637	71381	4	LAND	103056
57	0131820047	65B PL	19641	71381	5	LAND	103057
58	0131820056	65B PL	19645	71381	6	LAND	114994
59	0131818005	65B PL	19646	70758	21	LAND	103050
60	0131820065	65B PL	19649	71381	7	LAND	103058



Application Integration - Example

Solution:

	Folio	Street	House	Unit	District	Lot	Block	Type	Property Number
1	0446611006	66 AVE	24232			40367		LAND	118588
2	0446612005	65 AVE	24254			40367	26	LAND	118589
3	0446613004	65 AVE	24280			40367	27	LAND	110386
4	0446614003	65 AVE	24304			40367	28	LAND	129417
5	0446614003	65 AVE	24330			40367	29	LAND	110387
6	0446616001	65 AVE	24362			40367	30	LAND	110388
7	0446617000	65 AVE	24378			40367	31	LAND	120505
8	0446620005	65 AVE	24233			40367	33	LAND	129418
9	0446621004	65 AVE	24255			40367	34	LAND	110389
10	0446623003	65 AVE	24281			40367	35	LAND	118590
11	0446623002	65 AVE	24315			40367	36	LAND	110390
12	0446624001	65 AVE	24343			40367	37	LAND	118591
13	0446625000	65 AVE	24375			40367	38	LAND	110391

Application Integration - Example

What's happening under the hood?

- Windows messaging
- HTTP POST
- Database operations

Enterprise Integration

Leverage inherent capabilities of a enterprise architecture or middleware to perform required integration.

Enterprise Integration - Explanation

Lengthy and complicated topic...

... if you thought we had too many acronyms
and confusing terminology before...



Enterprise Integration - Explanation

ESB

Federated

SOAP

Queue

Middleware

Synchronous

Yikes!!

REST

Messaging

Mediated

Asynchronous

SOA

Enterprise Integration - Explanation



Holy SOAP Batman!

I can't access my WSDL,
the ESB does not want to
respond and it appears
that my Middleware
might have failed!

Enterprise Integration - Explanation



You are freaking me out
Robin!

WSDL, ESB and your
Middleware – do I need
to drive you to the
doctor?

Enterprise Integration - Explanation

In a nutshell:

- There is a real paradigm shift occurring in how we view the enterprise; integrating systems is a requirement.
- GIS will play even a more important role on the enterprise landscape in the years to come.

Enterprise Integration - Explanation

Just one of the many new advancements helping enable enterprise integration...

Service-Orientated Architecture (SOA):

SOA establishes an architecture from which applications expose methods (building blocks) for other enterprise applications.

Enterprise Integration - Options

Other integration options available:

- BizTalk
- SQL Server Integration Services (SSIS)
- Vendor specific (Web services, etc.)
- Too many to list!

Enterprise Integration - Example

Requirement:

Implement integration between the following systems:

- Municipal business license database
- Regional land inventory database
- Motor vehicles database
- Police mainframe



Horatio says:
“Integration is cool!”

Enterprise Integration - Example

“By correlating all owners of dog grooming businesses that recently obtained a class 4 drivers license we determined that the killer has brown hair and lives in a 2 bedroom condo within two kilometers of a freeway onramp – now only if we had a GIS...”

Enterprise Integration - Example

Requirement:

Need to access images in catalog system directly inside other corporate systems

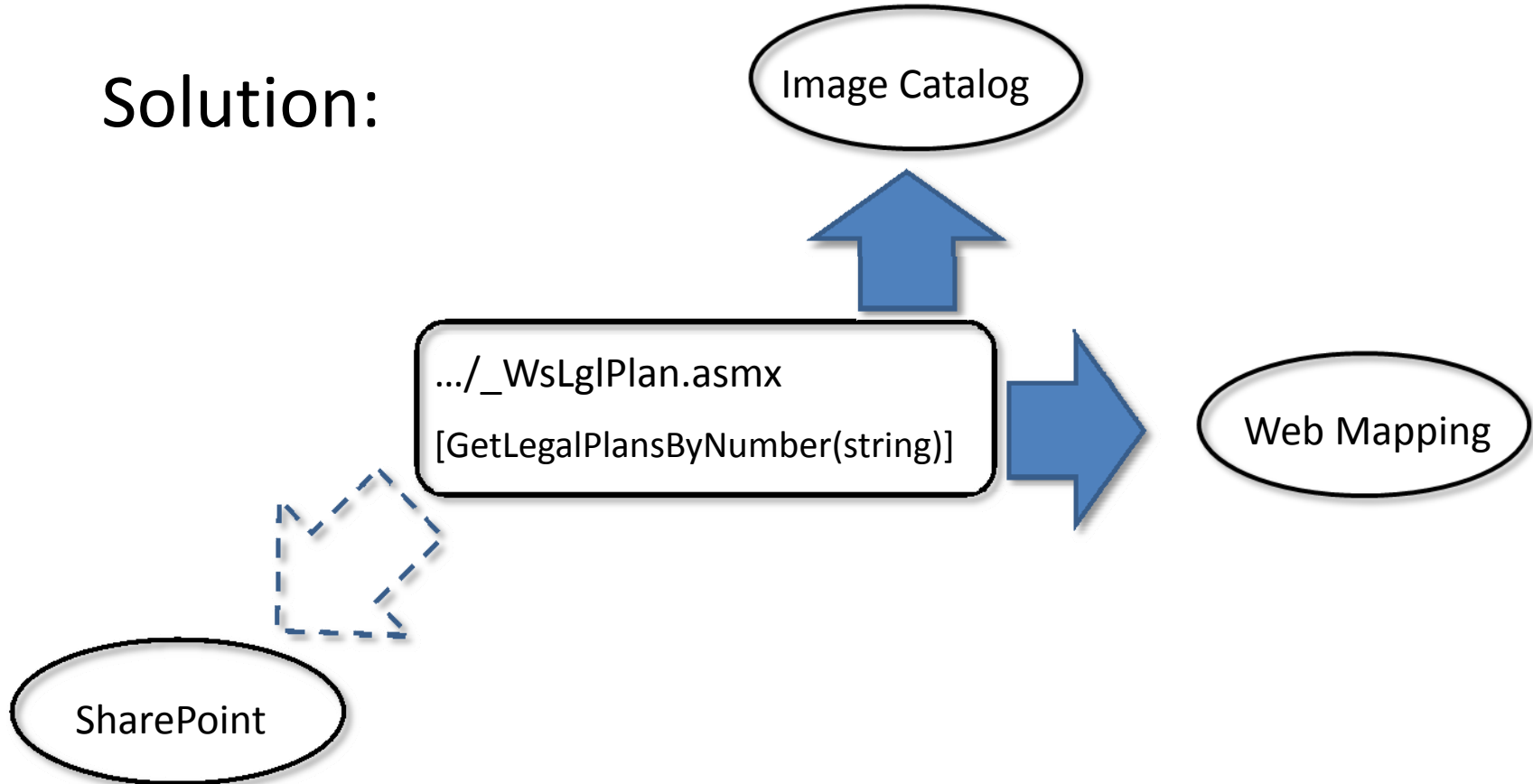
Enterprise Integration - Example

Solution:

Encapsulate business logic for image search inside of a web service and leverage that functionality in other enterprise applications.

Enterprise Integration - Example

Solution:



Enterprise Integration - Example

GeoSource : Docs


Building Department | Geomatics Services | Legislative Services

Geomatics - Legal Plans
Please provide the required criteria:

Legal Plan Number:

Id	Full Plan Number	Legal Type	Legal Number	
1155	LMP905	LMP	905	<input type="button" value="View Legal Plan"/>
12129	LMP905	LMP	905	<input type="button" value="View Legal Plan"/>
23103	LMP905	LMP	905	<input type="button" value="View Legal Plan"/>
34077	LMP905	LMP	905	<input type="button" value="View Legal Plan"/>

Need help? Contact Geomatics



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LANGLEY MAPS + DATA

Layers Query Tools Info

Property Information

Property Num.:130413
Folio:2130711110
Unit Number:
House Number:6920
Street:206 ST
Postal Code:V2Y 1R2
Service Card:[View](#)
Legal Plan:[6351](#)
[Details](#) [Show Map](#)

.../_WsLglPlan.asmx

[GetLegalPlansByNumber(string)]

In Summary:

- Technology is continuing to evolve.
- Integration is becoming a requirement.
 - GIS vendors are helping with this.
- Plan your integrations carefully.
 - Try to think modular/ think big picture.
- We are only just beginning...

Township of
Langley



Est. 1873

Thanks!