

Best Practices for Integrating FME and Oracle Spatial



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Agenda

- Advantages and disadvantages of normalization
- Mapping data to the database schema
- Spatial indexes

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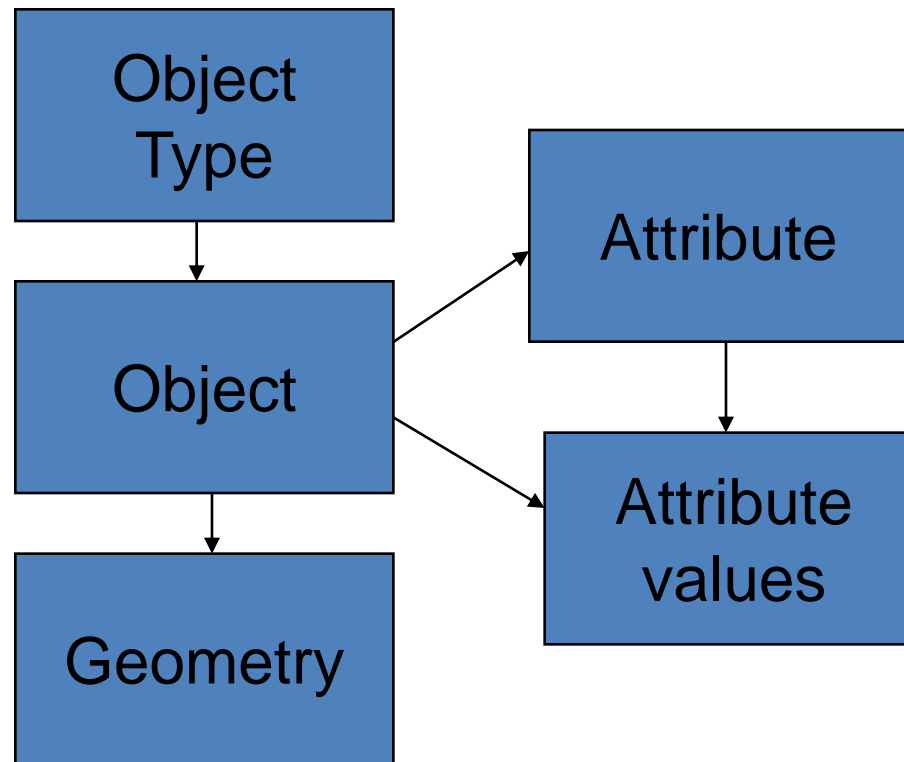
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Definition (Wikipedia):

Database normalization, sometimes referred to as *canonical synthesis*, is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies.

- Used to reduce storage space
- Enhancement of maintenance
- Easy to update data
- Hard to insert or retrieve data

Database schema



Example of a road object:

- Object Type(1): Road
- Object(1): Main street
- Geometries(2): Polygon and centerline
- Attributes(4): Name; Number_of_lanes; Surface; Used_by
- Attribute Values(6): Main street; 2; brick; Cars, Bicycles, Pedestrians

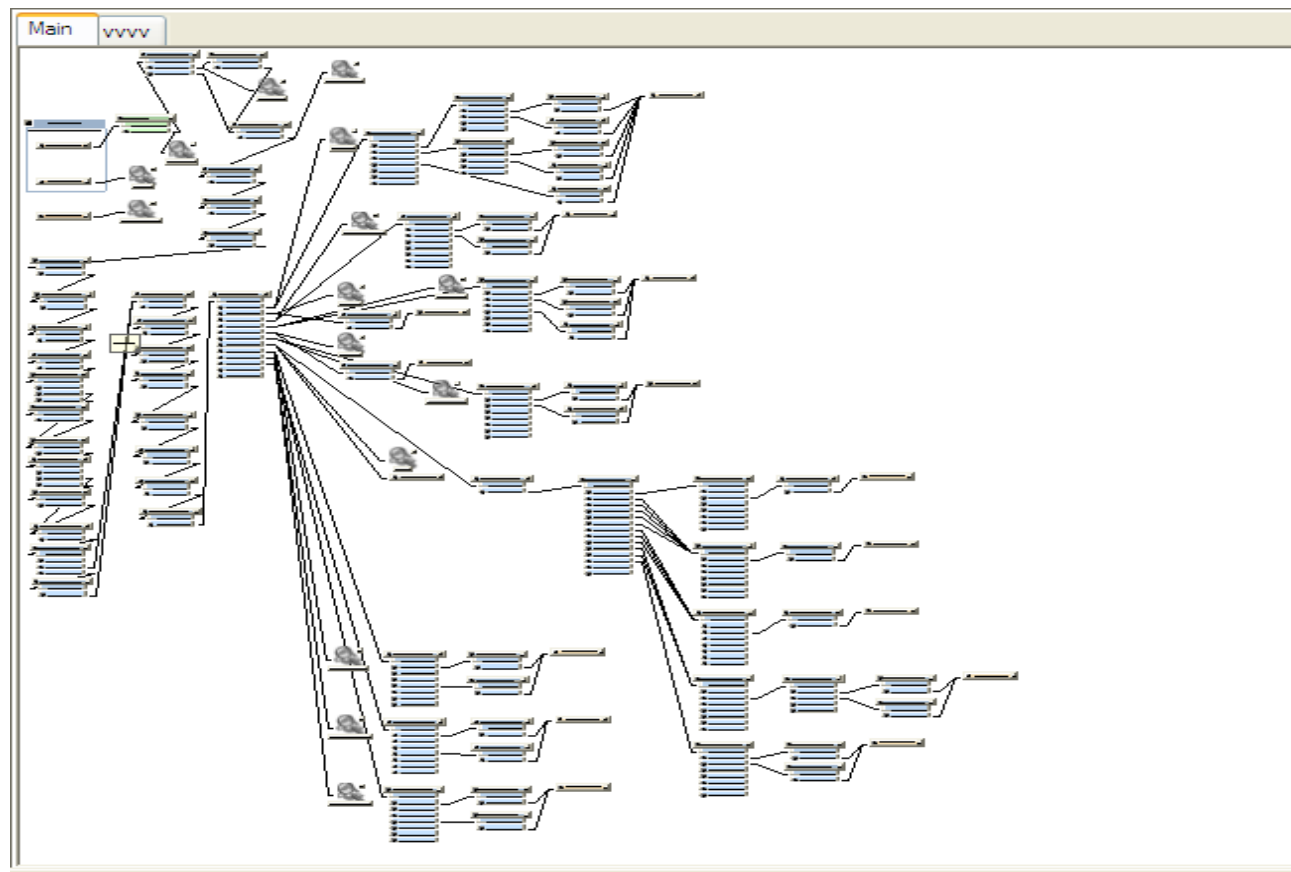
Example: query restrictions

- Location (window or polygon)
- Object Types
- Date on object, geometry, attribute, attribute value
- Additionally all geometries outside window with relation to geometry inside window with respect of other all restrictions

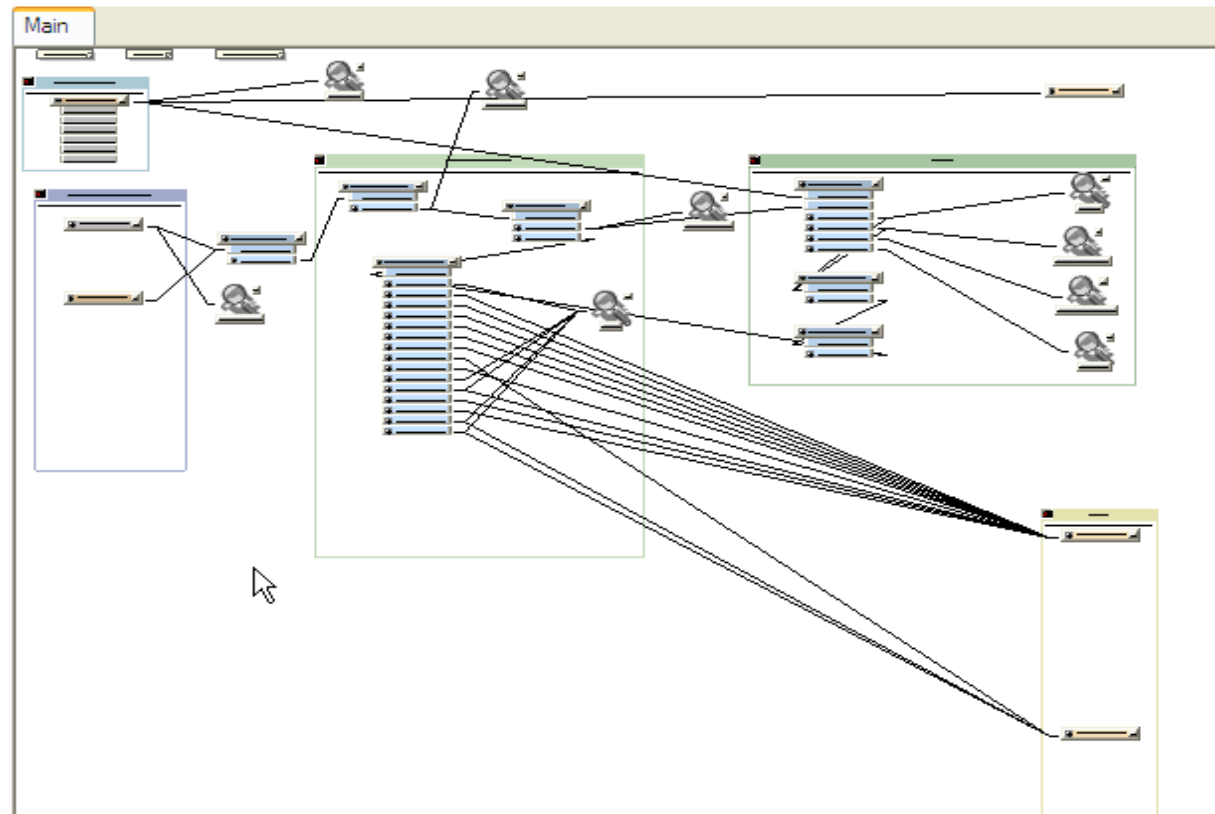
Example: results

- Complex query to retrieve data
- Complex FME Workbench to process data
- Poor performance
- High memory cost

FME Workbench for GML export



Custom datasets (fds)



Example: solution denormalization

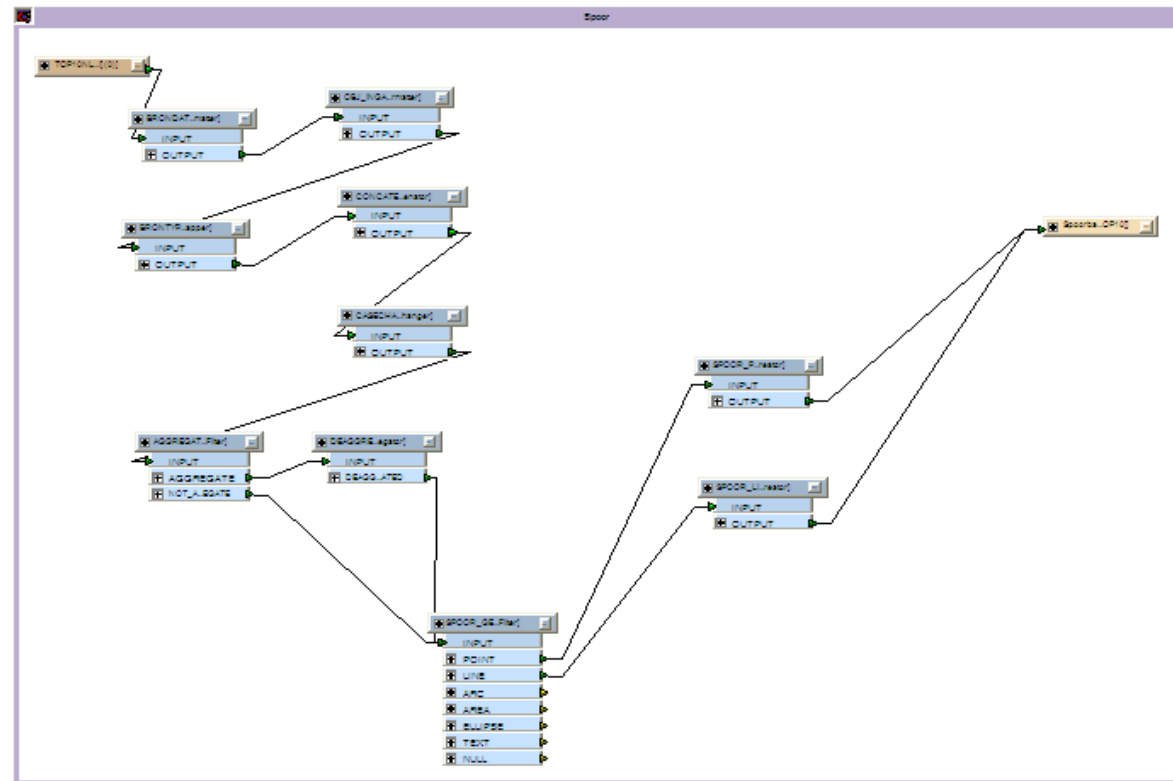
Datawarehouse model with:

- 1 table per object type
- 1 record per object

Future enhancements:

- Spatial partitioning
- Tables with active data and tables with historical data

FME Workbench bookmark for Rail GML export



Example: final result

- Easy to understand datamodel
- Very simple queries
- Limited functionality in FME Workbench (clipping of geometries)
- Performance up to 20 times better
- Less memory for FME required

Conclusion:

When using (Oracle) database as source of data, you should consider:

- Data storage structure
- Functionality in database, query or FME
- What database functionality to use: partitioning, normalization, indexes
- ***"Normalise till it hurts. De-normalise till it works"***

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FME and Oracle Spatial

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Woz-object

Woz-objectnummer	21300000349	Ingangdatum	01/01/2008
Adres	BURGENMEESTER DE WUSLAAN 26	Einddatum	01/01/2009
Postcode/Woonplaats	6971CD Brunnen	Peiljaar	01/01/2007
Lokaleomschrijving			

Detail informatie

Datum Stufax	28/03/2008
Soort-object-code	vrijstaand - woning
Percentage gereed	100
MUTS-voorzieningen	
Lift aanwezig	nee
Monument	geen monument / onbekend
Suikerend	nee
Grondoppervlakt	503 m²
Woning	n3

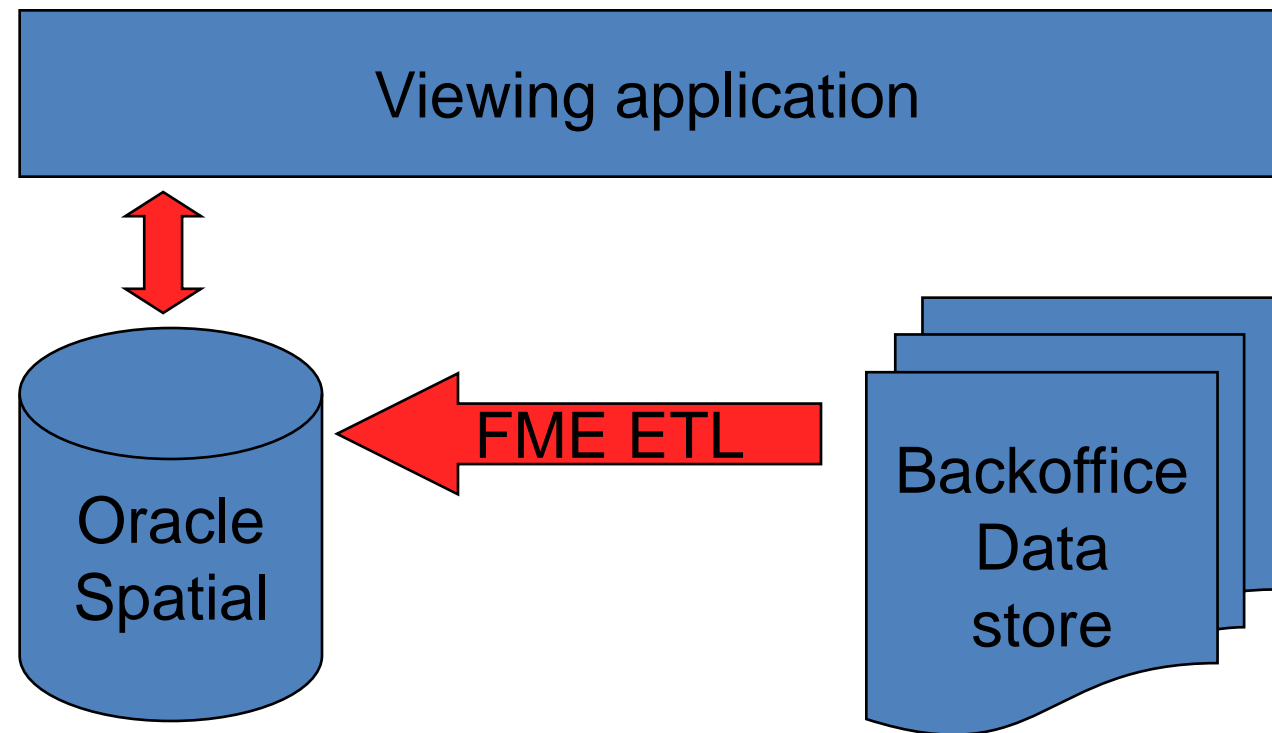
Taxatie gegevens

Getaxeerde waarde	427000 EUR	Groeps-aanduiding	V0000377	Code gebouwd	0 gebouwd
Vastgestelde waarde	427000 EUR	Gebatteerd voorschrift	W waarde in het economische verkeer	Gebruiks-code	10 woning dienend tot hoofdverblijf
OZB-waarde	427000 EUR	Taxateur	VI	Grond opp	503
OZB-vrijstelling		Inpandige opname	nee	Tax. opp	0
Ind. ligging		Datum taxatie	07-07-2007	ingangs-datum	01-01-2008

Onderdelen voor onderbouwing taxatie WOZ-object

Aanduiding onderdeel	005001	Onderdeelomschrijving	1100 Woning				
Taxatiecode	Geen berekening						
Waarderingvoorschrift	W	Renoveerbaar	1990	Aantal stuks	0	Versuiderings factor	0
Onzeftbelasting	onbelaste levering	Renovatie percentage	0	Waarde per stuk	632	Invoed economische versuidering	0
Groepsaanduiding		Kwaliteit	voldoende	Huurwaarde per m²	0	Invoed bouwwijze	0
Waarde onderdeel	284400	Onderhoudstoestand	voldoende	Huurwaarde	0	Invoed doelmatigheid	0
Vrijstelling OZB		Doelmatigheid		Kapitaaldefactor	0	Invoed gebruikskosten	0

Stroomlijn: schema

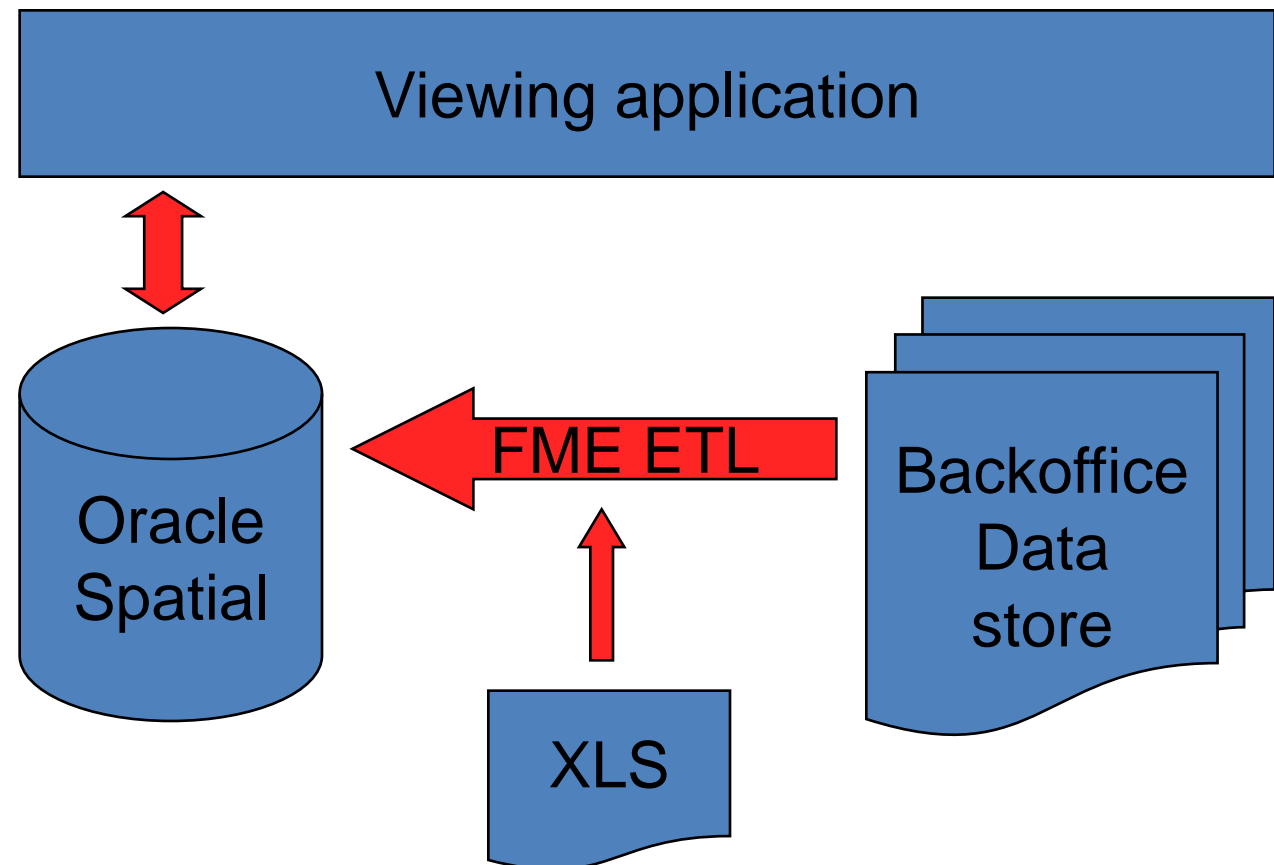


Example: MicroStation backoffice

Levelbook:

- Level 1-7: Buildings
- Level 11-13: Roads
- Level 16-17: Railroad
- Level 20-29: Land use parcels
-
- Easy FME mapping but what if

Schema change



Schema change

- XLS file with level to table mapping
- JOINER transformer
- Fanout on table name

- No FME Workbench change
- XLS change performed by customer

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- **Spatial indexes**

Spatial indexes

- Large datasets
- Update index per statement
- Loss of performance

Better performance with:

- Drop index
- Convert data to Oracle tables
- Recreate index

Thank You!

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- Questions?
- For more information
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 - Vicrea Solutions: www.vicrea.nl