

TDP Architectural Sketches



18-juni-2017



Subjects

- Introduction
- General information on the architectural sketches
- Logical TDP Architecture
- Datapipes the elementary building blocks
- Link to generic big data patterns
- Implementation of
 - TDP Express
 - TDP Advanced
 - Reisman use case

Introduction



Introduction Bert Dingemans



- Independent Data Architect and EA Consultant
- Solution architect for the TenneT Data Platform
- Author/Developer of
 - Book Data Architectuur in de praktijk (<https://www.bol.com/nl/p/data-architectuur-in-de-praktijk/9200000027961426>)
 - Web Publication Platform for Sparx EA (<http://wpp.interactory.nl>)
 - Participant in <http://eexpertise.nl>
- Working with EA since version 8 for
 - Datamodeling (classes)
 - XML message modeling
 - ArchiMate 2 & 3 for enterprise architectures and solution architectures
 - Architectural document generation

Introduction TenneT



TenneT is a leading European electricity transmission system operator (TSO), with activities in the Netherlands and in Germany. We strive to ensure a reliable and uninterrupted supply of electricity (99,9999) in our high-voltage grid for some 41 million people. In doing so, we make every effort to meet our stakeholders' needs by being responsible, engaged and connected.

Facts & figures

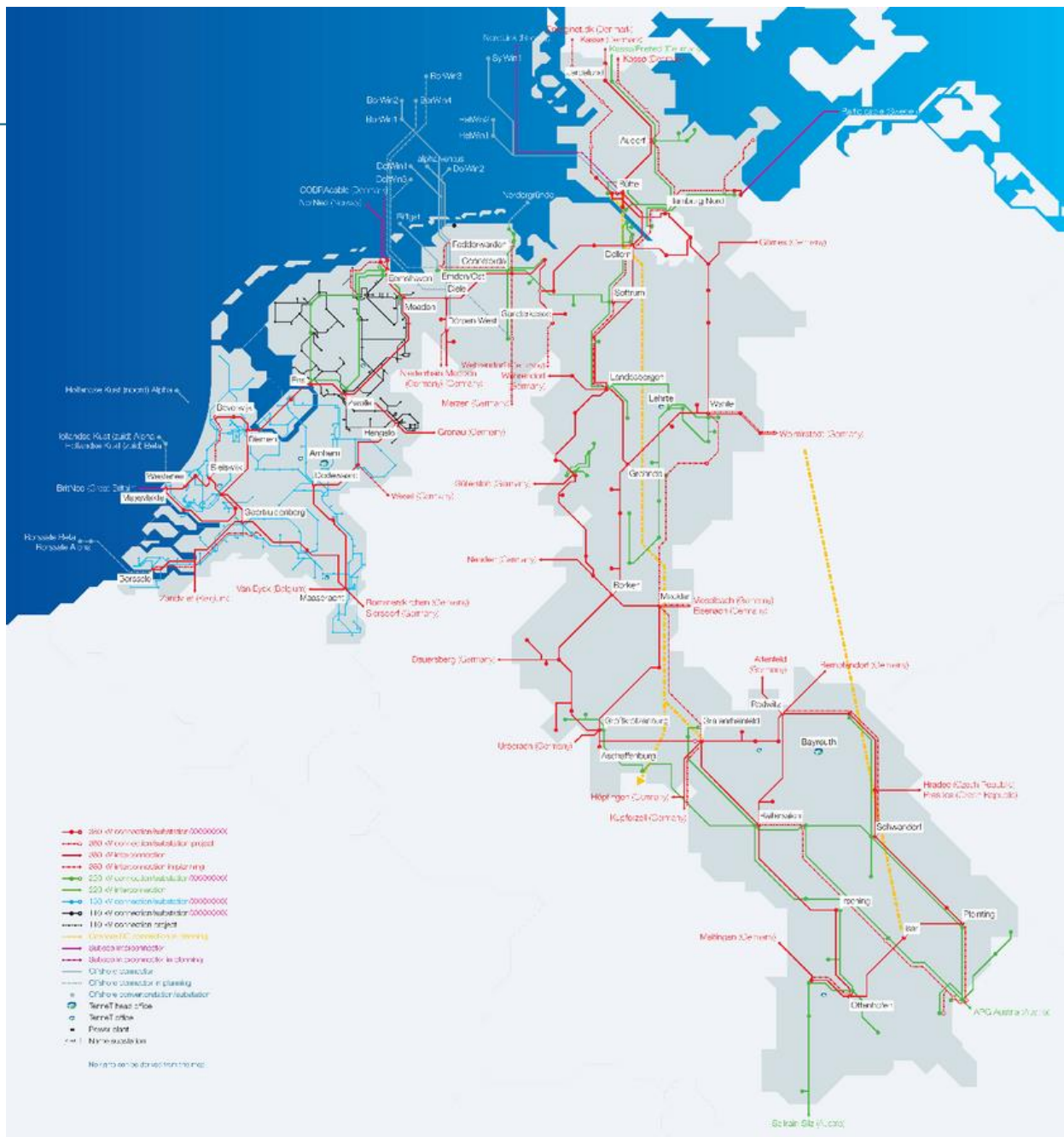


- 3040 employees
- 22573 km Grid
- 15 HVDC stations
- 523 Mln Euro profit
- 1848 Mln Euro investments





Our grid



DTC and TDP

Data Transformation Corporate
TenneT Data Platform

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DTC programme



Explanation

Team tasks

Develop the data space

- *Smart meter data*
- *Production and storage data (incl LV / MV)*
- *Grid planning data (incl MV)*
- *Congestion management data (incl MV)*

- Formally establish vertical leadership position
- Informally, as a front runner, establish horizontal leadership

- a. Define a new market design and develop a direct business model
- b. Lobby for data access and new market design

Improve TenneT's visibility as a data company that creates value for society, as a neutral party

- To support the first work stream, quickly and visibly take responsibility for enabling the change by publishing relevant data in a user friendly manner
- As a second step, create an intelligent energy market platform: a host for the new energy eco system

- c. Build the front end of the intelligent data hub

Build our internal data and analytics capabilities

- *Data and IT governance*
- *Analytics*
- *Infrastructure*

- Run a set of internal business improvement projects with a heavy data component, supported by external specialists, with the aim to enhance our internal capabilities on data governance, data management, analytics, infrastructure

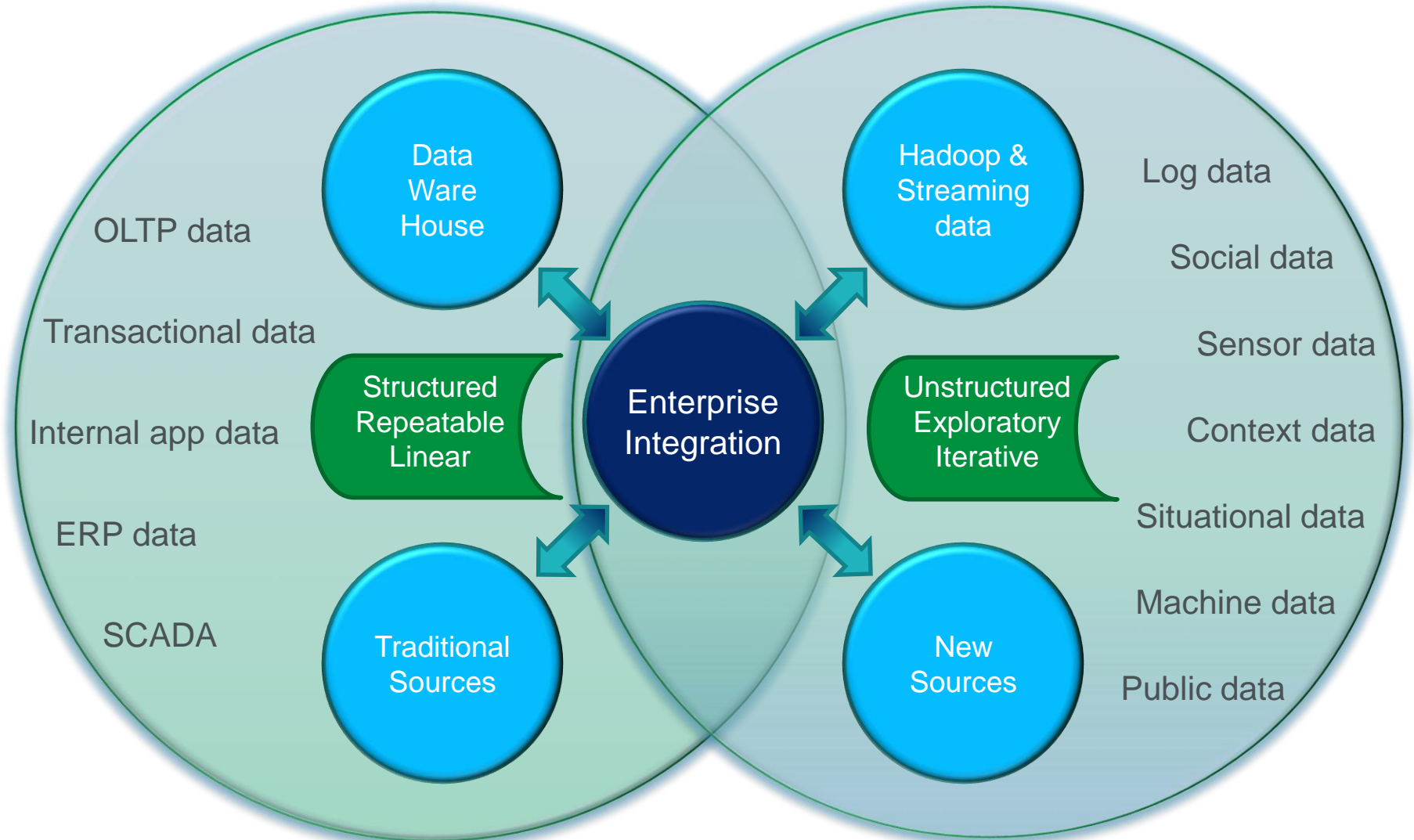
- d. Manage a portfolio of projects
- e. Scout for best practices and partners
- f. Build TenneT Data Platform

Traditional data and big data



Traditional (deployed)

Big data (discovery)

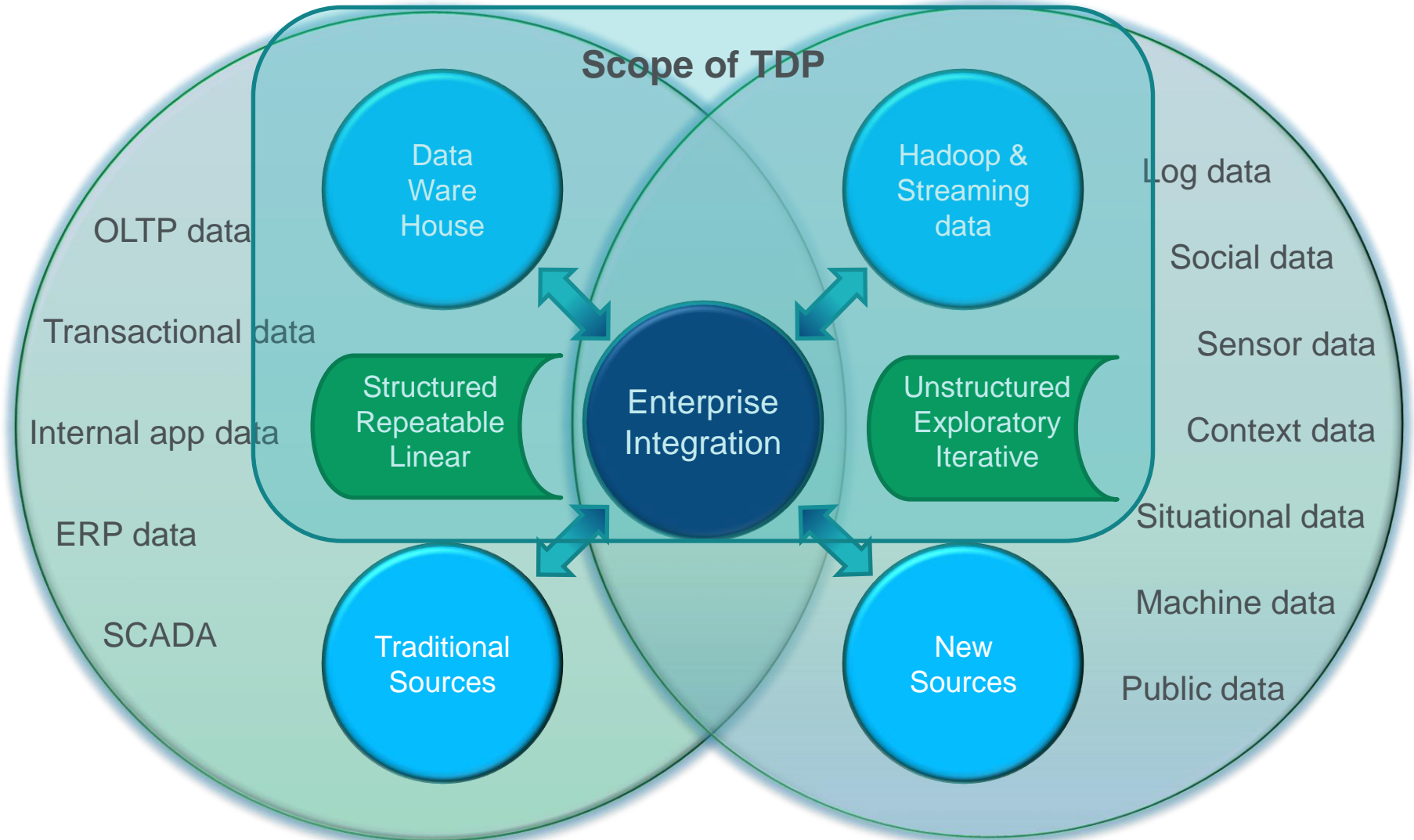


Scope of TDP



Traditional (deployed)

Big data (discovery)

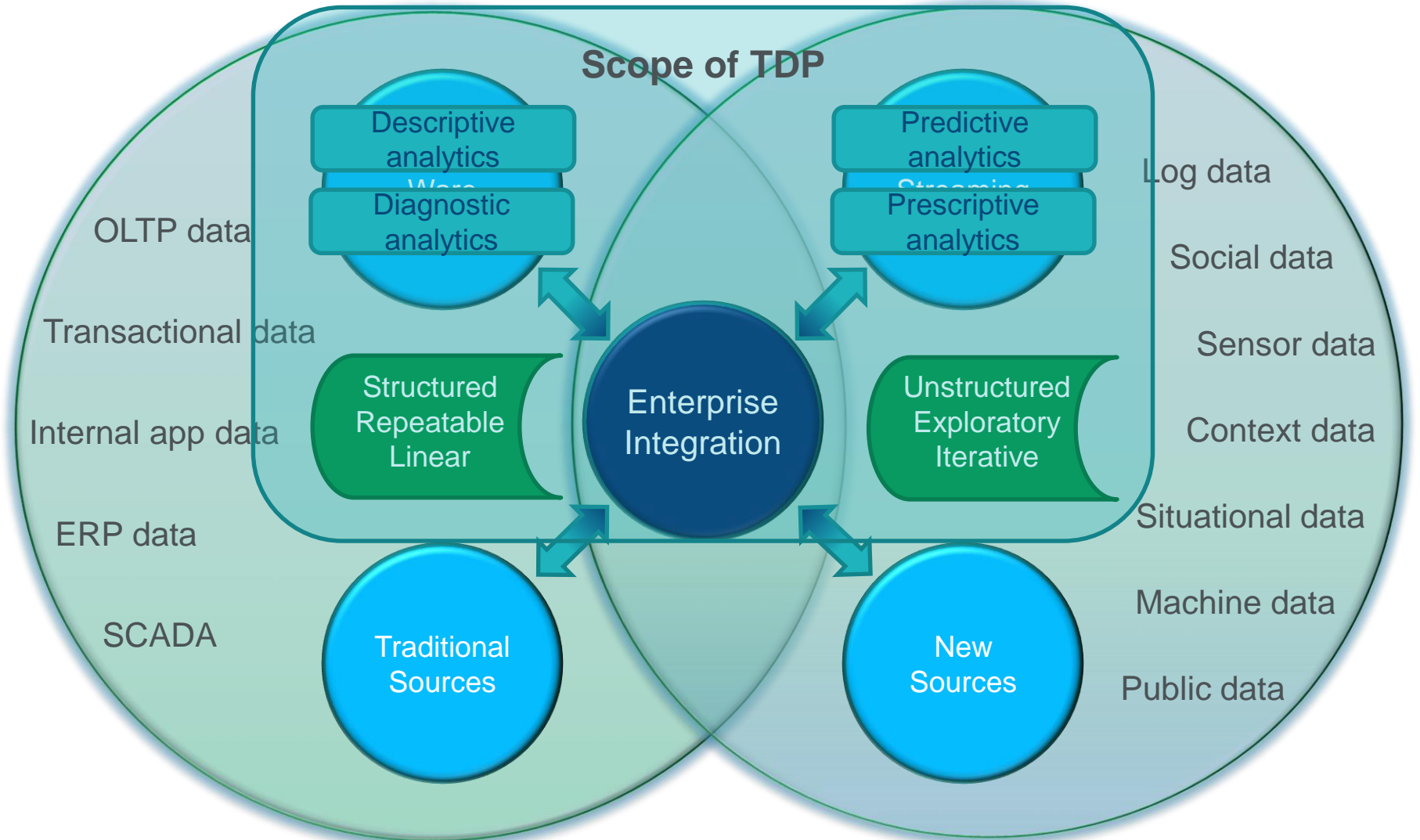


Scope of TDP

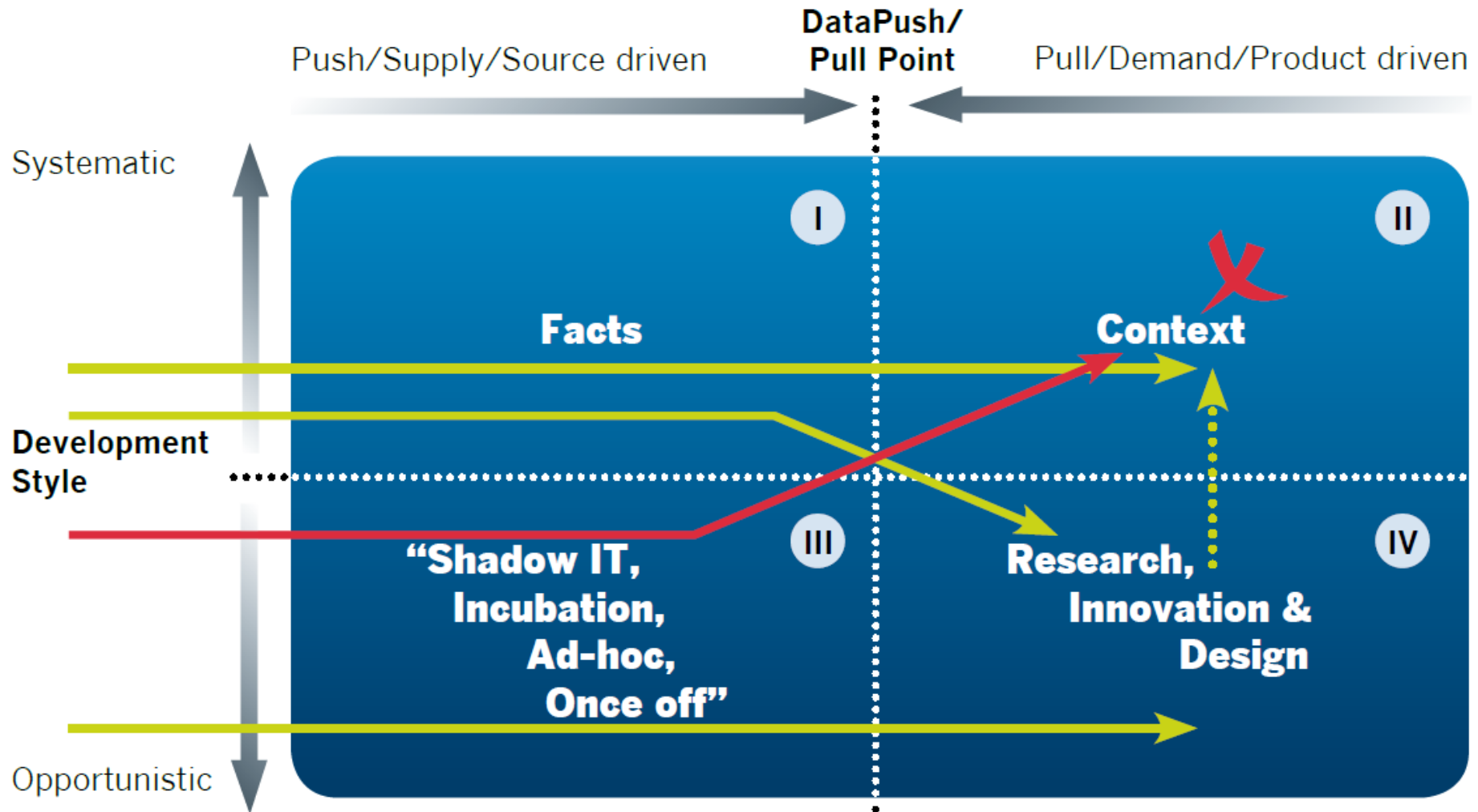


Traditional (deployed)

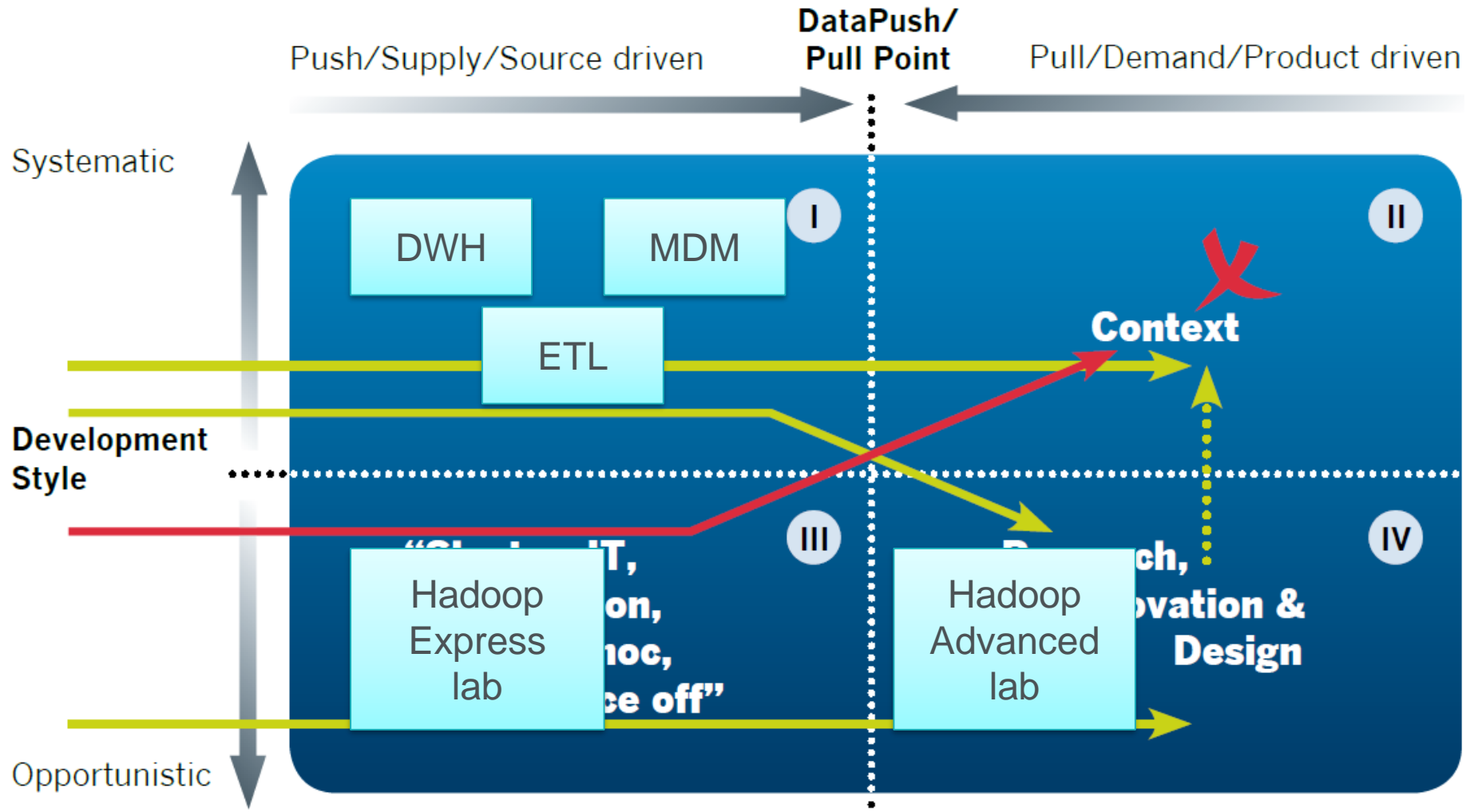
Big data (discovery)



TDP development cf. DAMHOF



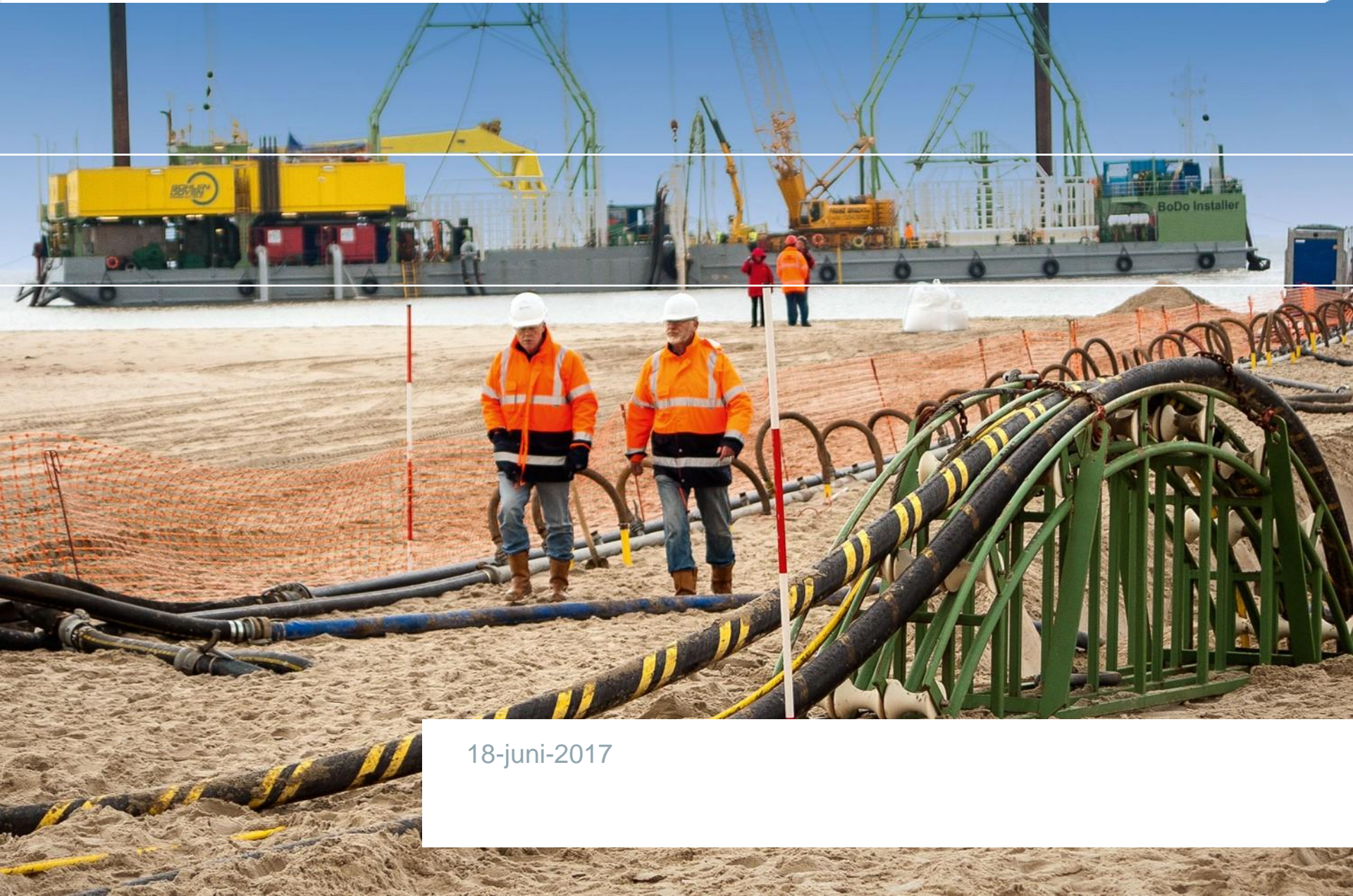
TDP development cf. DAMHOF





General information on the architectural approach

- For the TDP we have a use case driven approach
- We use an agile approach for developing the platform architecture and support the use cases
- Just in Time architecting is necessary for the support of use cases
- We create a layered architecture to support just in time architecting
- We use building blocks for standardisation and modelling speed
- We use ArchiMate as architectural modelling language and UML class diagrams for information modelling
- We use Sparx Enterprise Architect for continuous architecting
- Architectural documents are generated from the EA repository on request



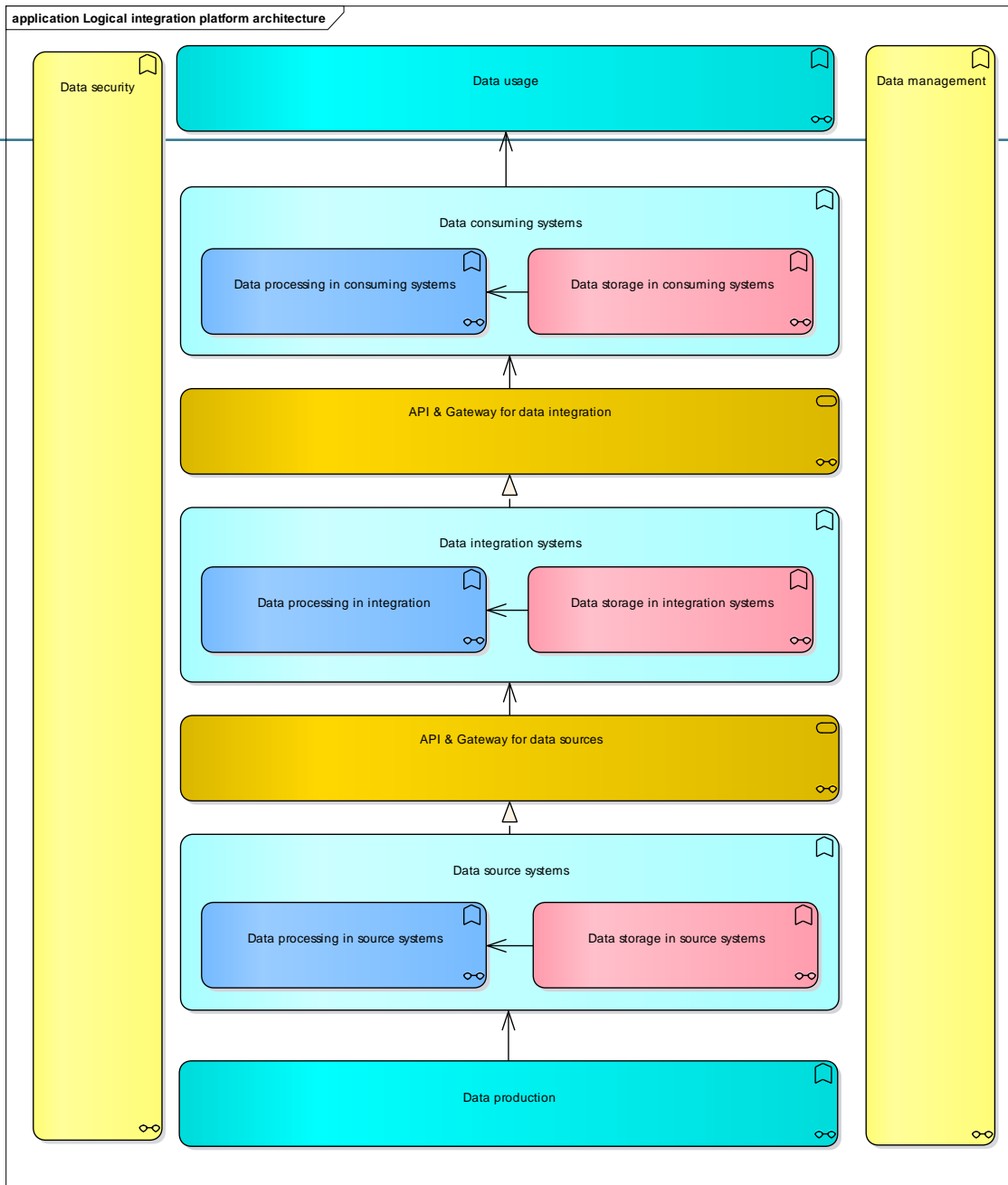
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Subjects in EA

- Logical architecture
- Big Data Patterns
- ABB
 - Hourglass models
 - Data pipes
- SBB
 - Express
 - Advanced
- Use cases
 - Reisman
 - RES forecasting
- Non functionals
 - Dama
 - ISO Software qualities
 - AIC

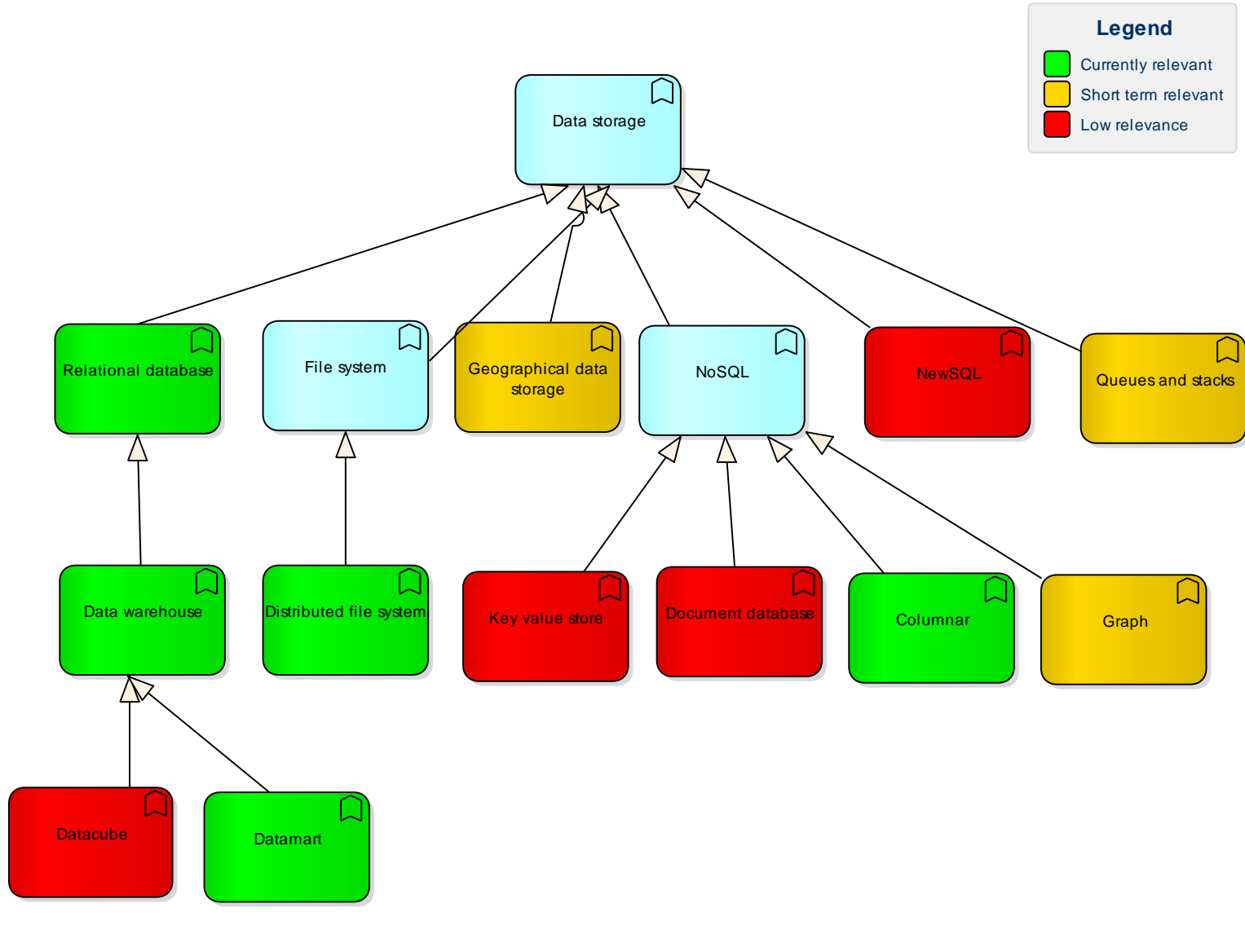
Layered architecture Overview



Example storage



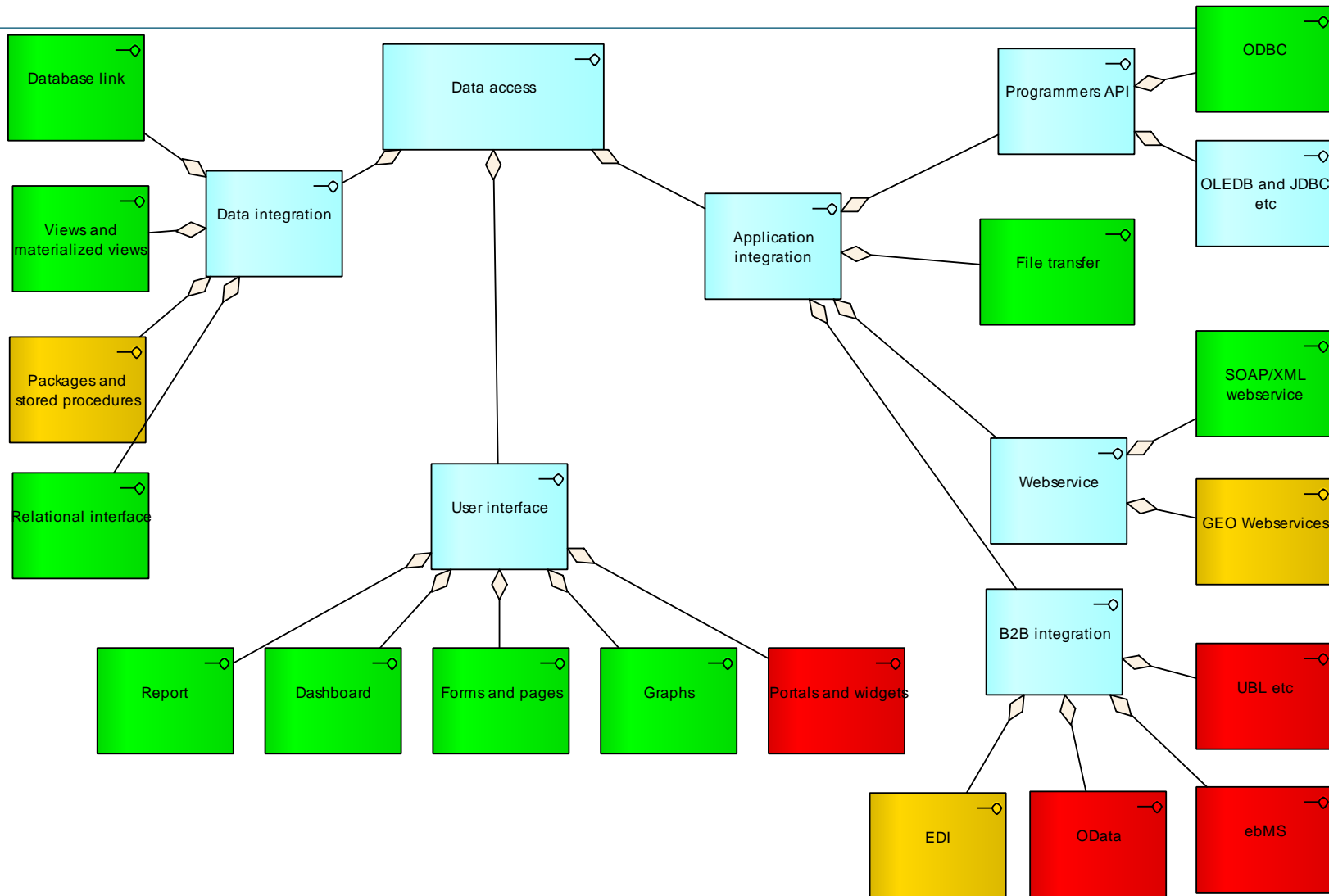
application Data storage



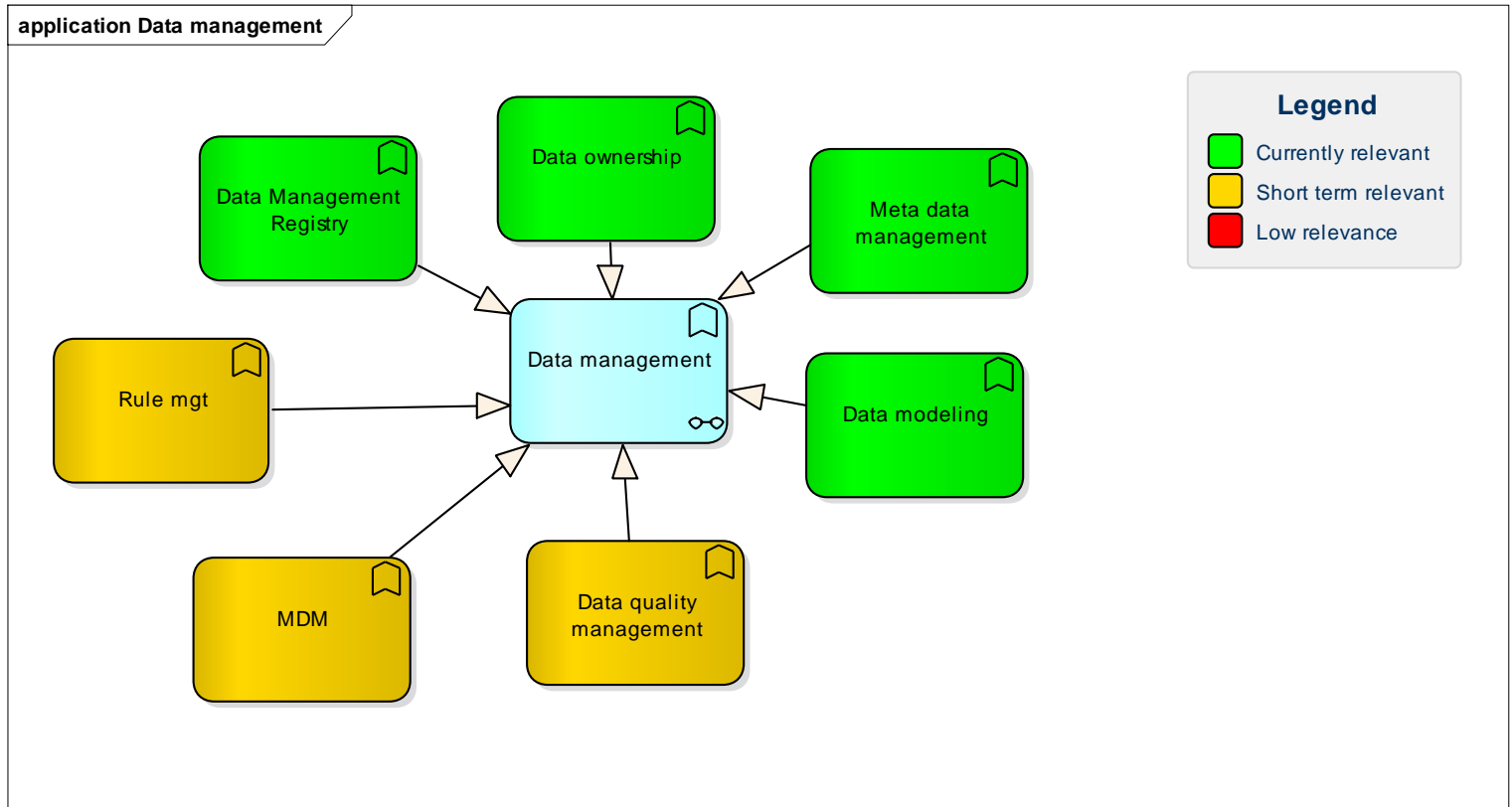
Example interfaces



application Data integration interfaces



Example management



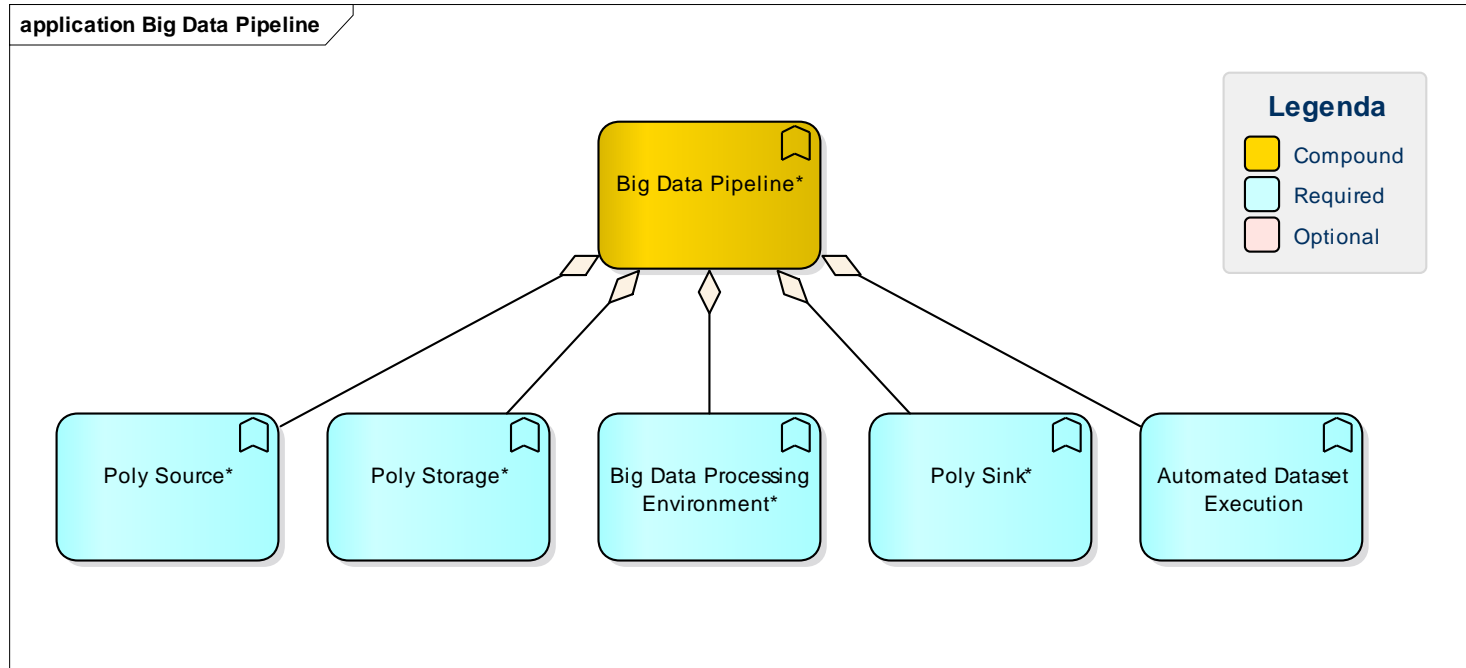
Link to Big Data Patterns



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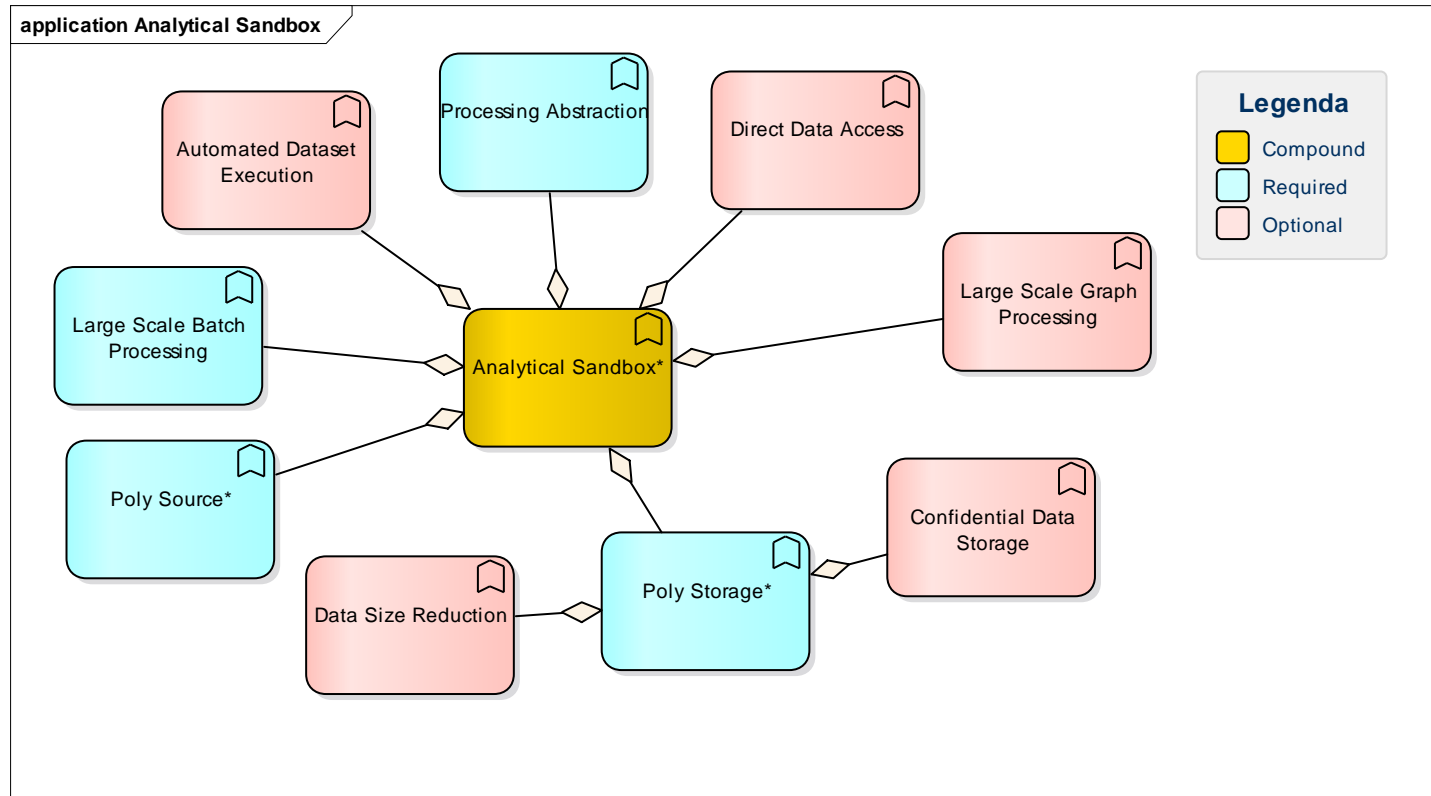


Example data pipes

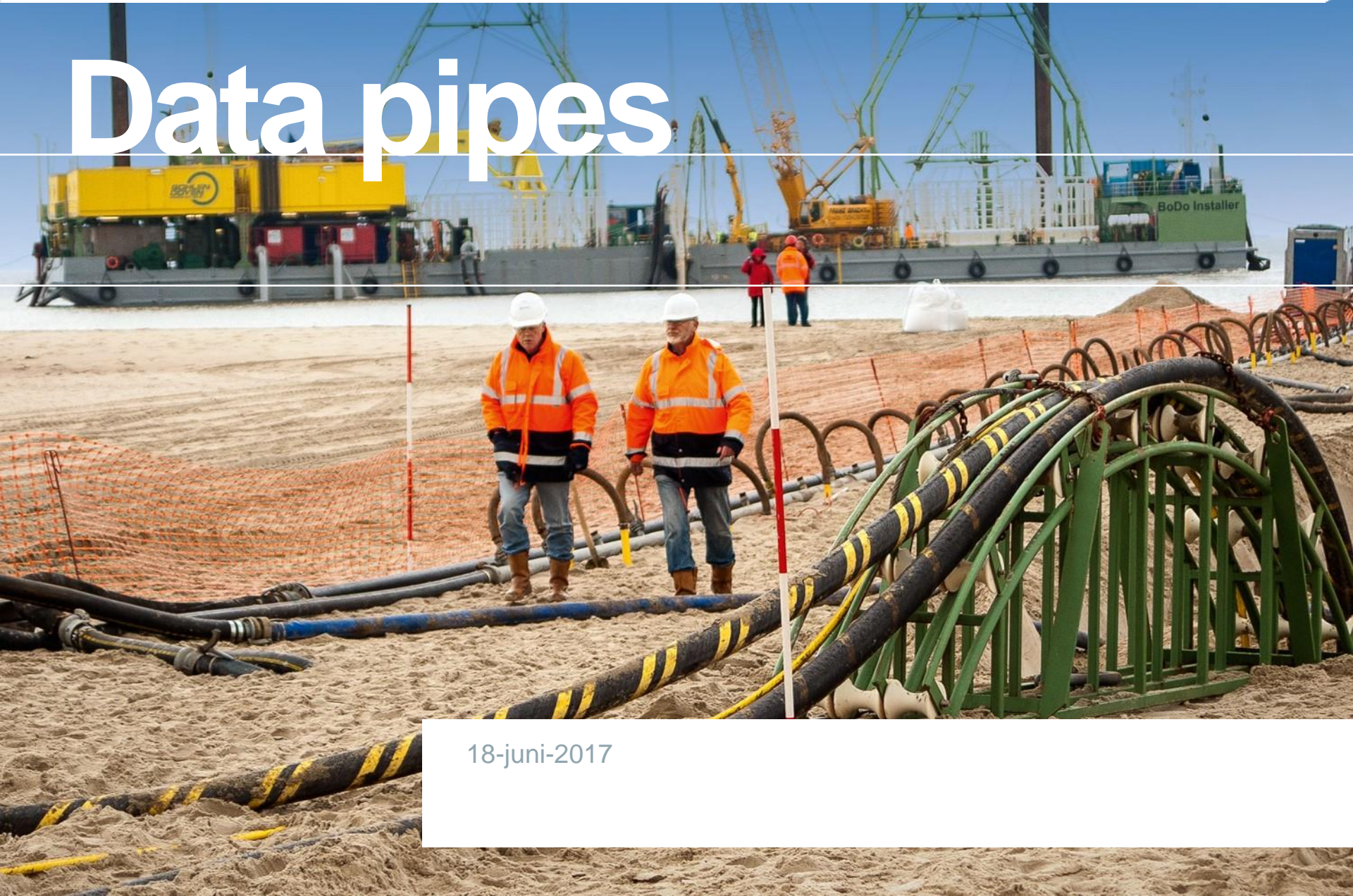




Example analytical sandbox

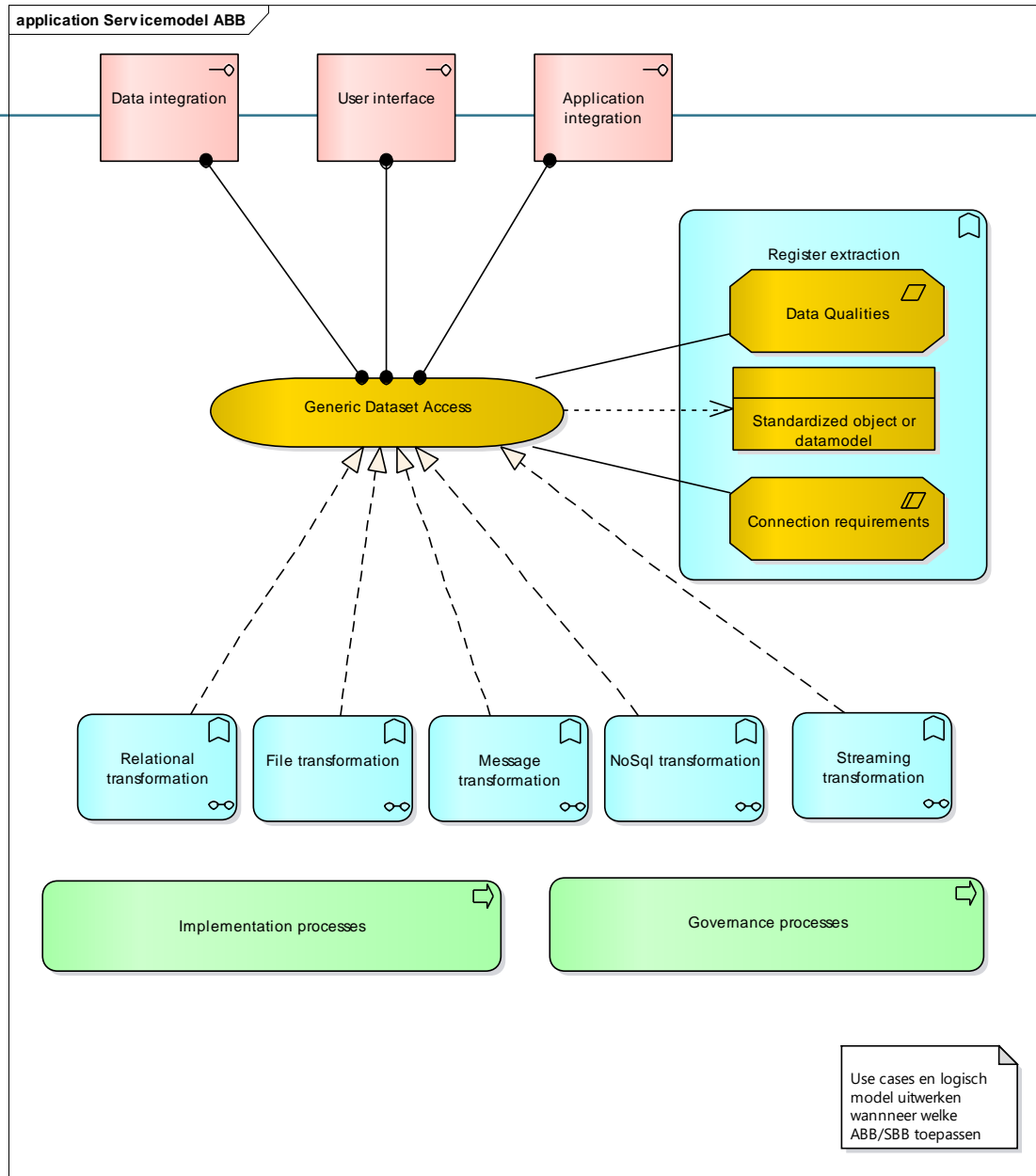


Data pipes

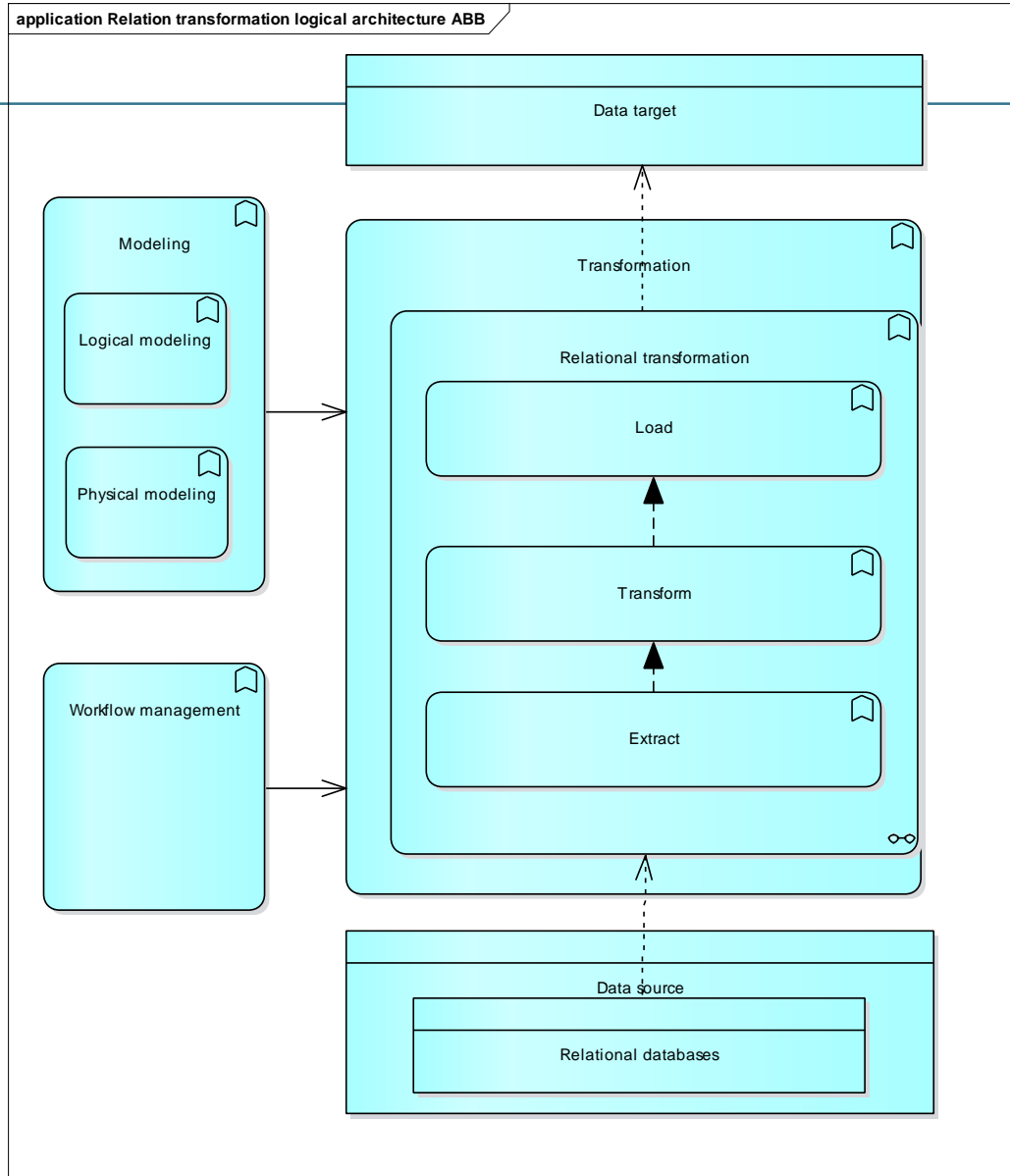


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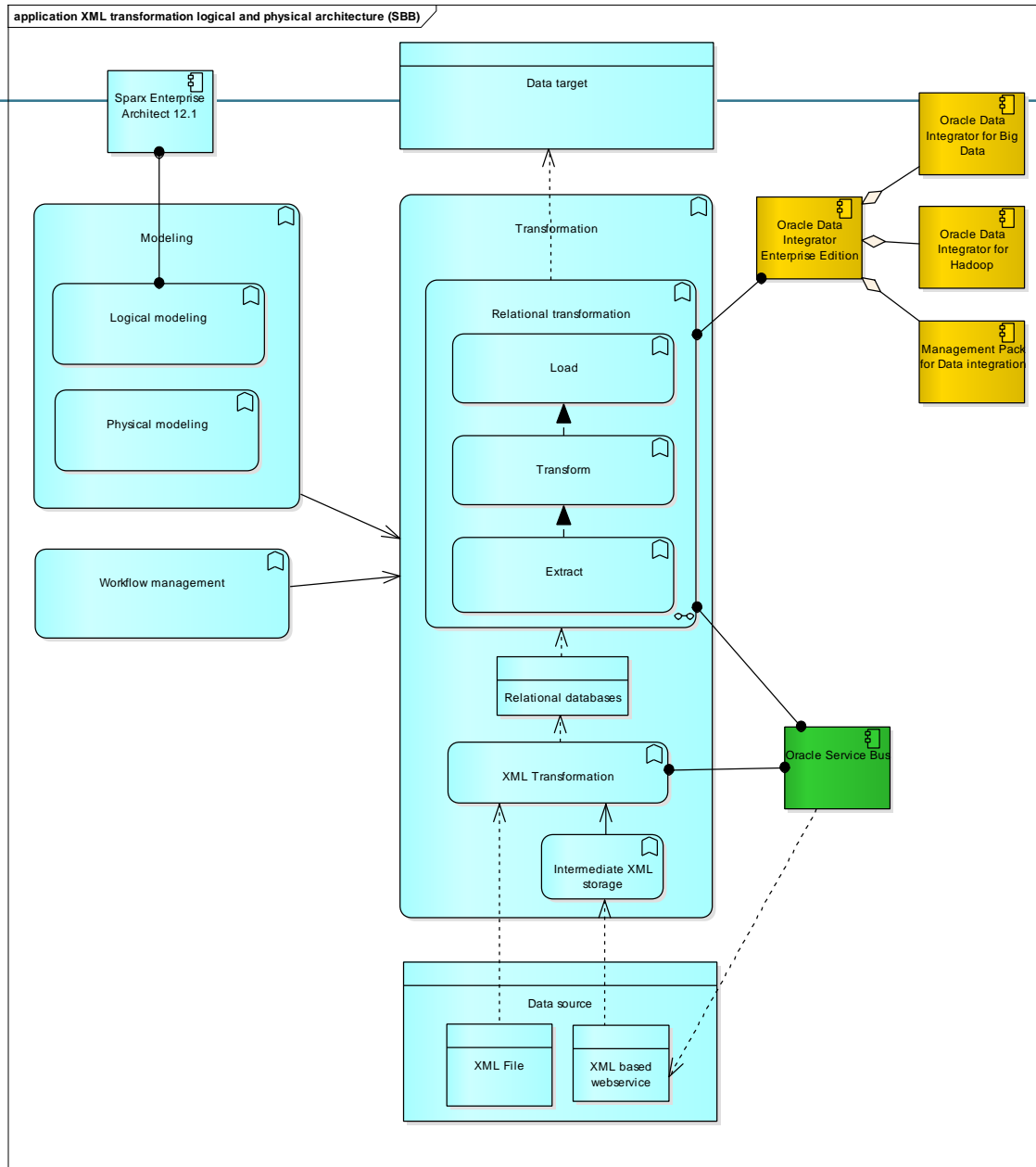
Data pipe ABB overview



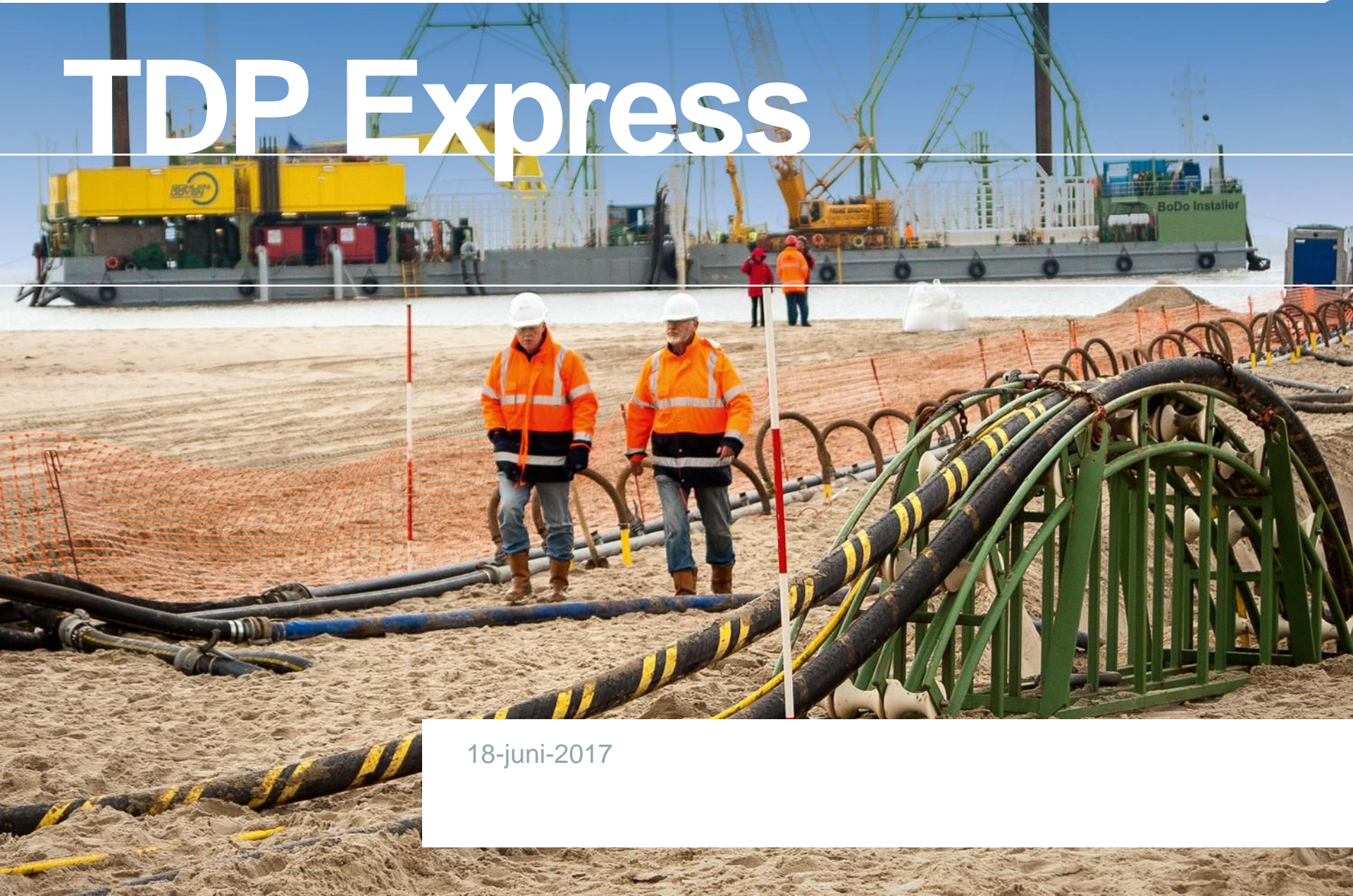
Data pipe ABB relational



Data pipe SBB message



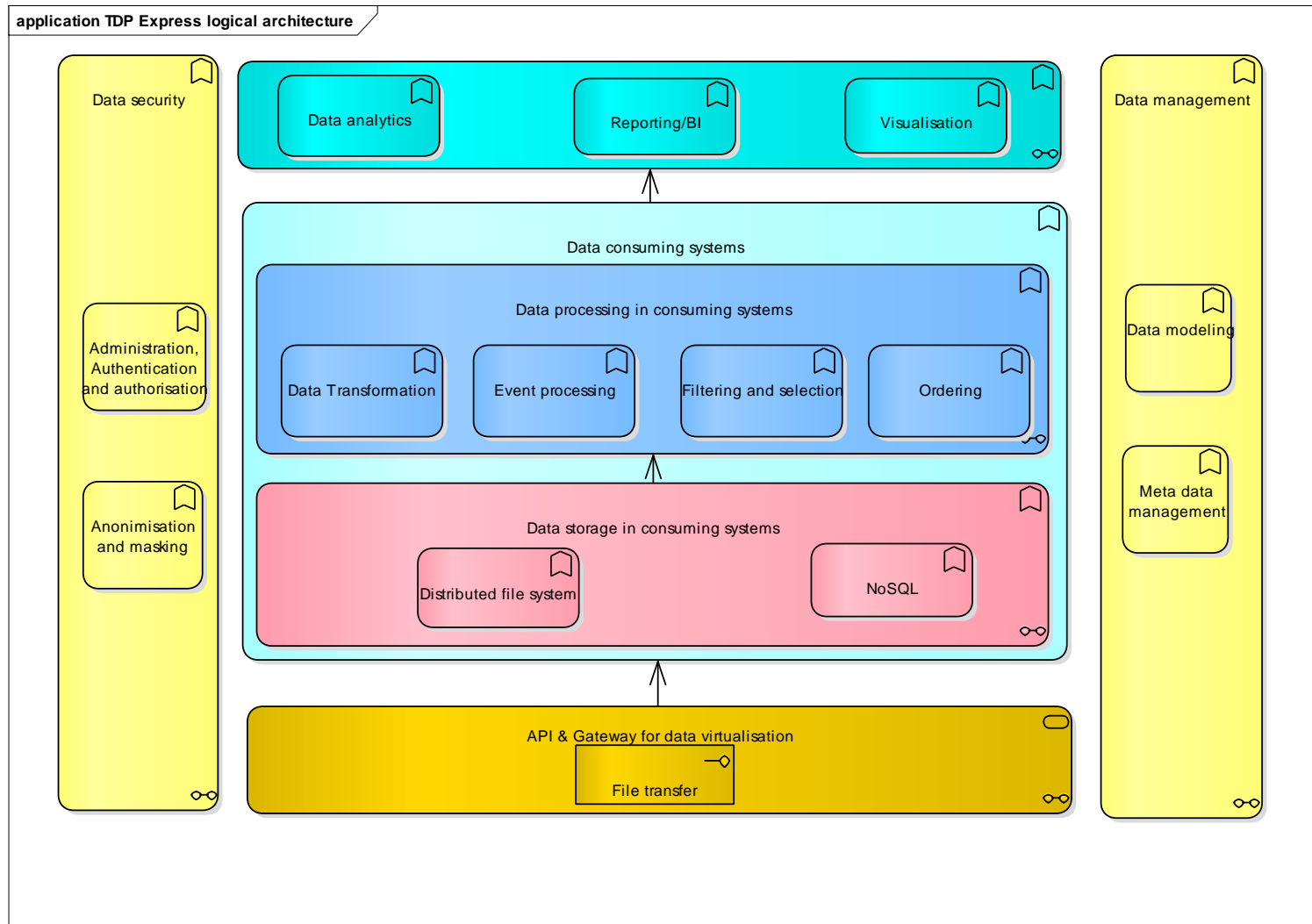
TDP Express



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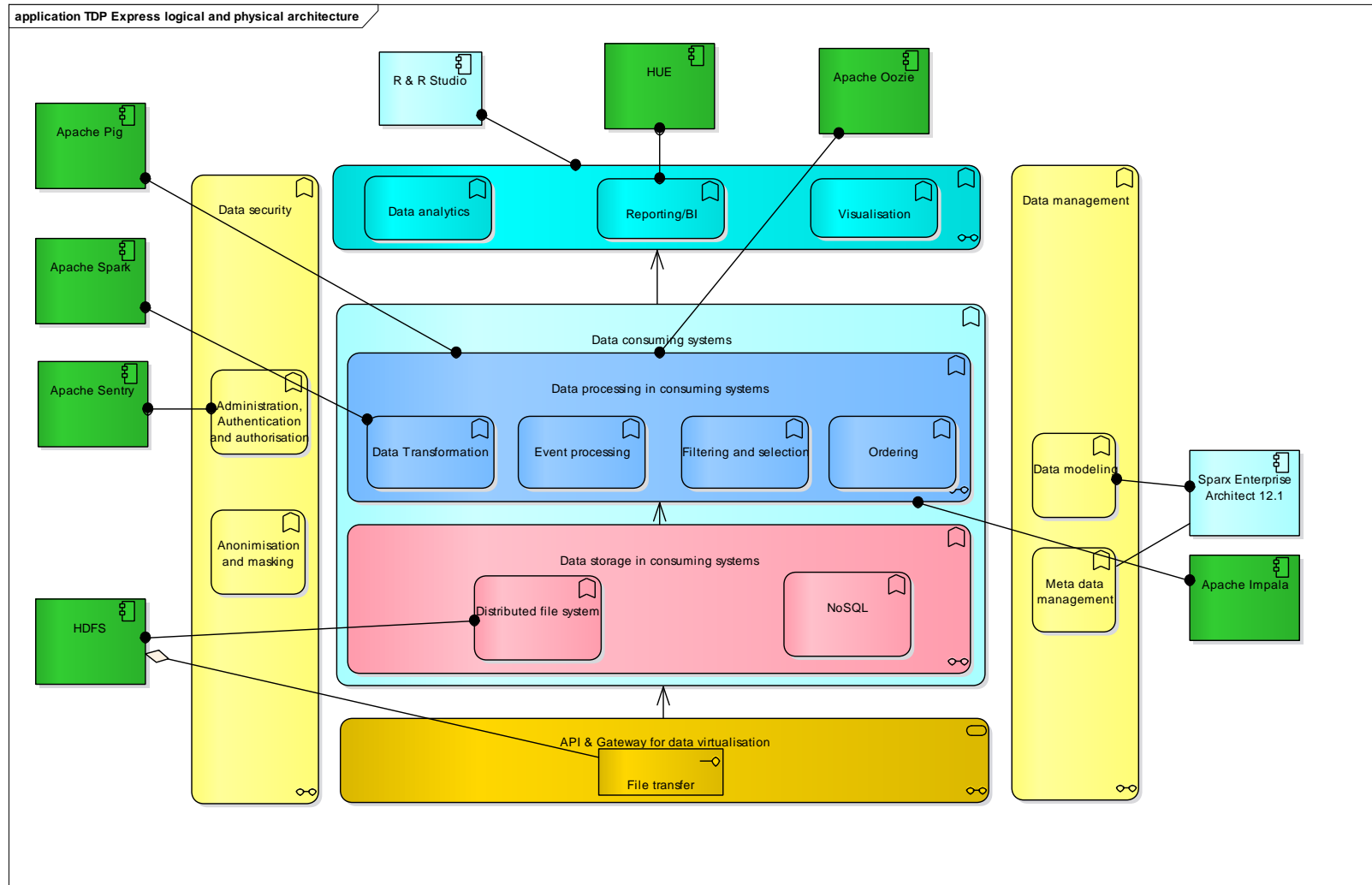


Logical Architecture Express





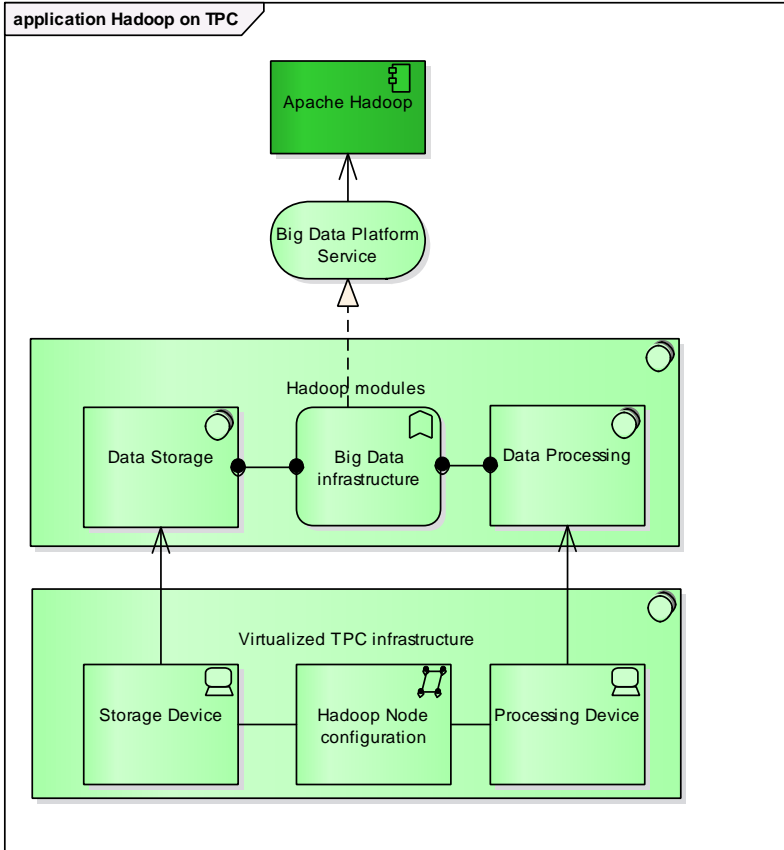
Physical Architecture Express



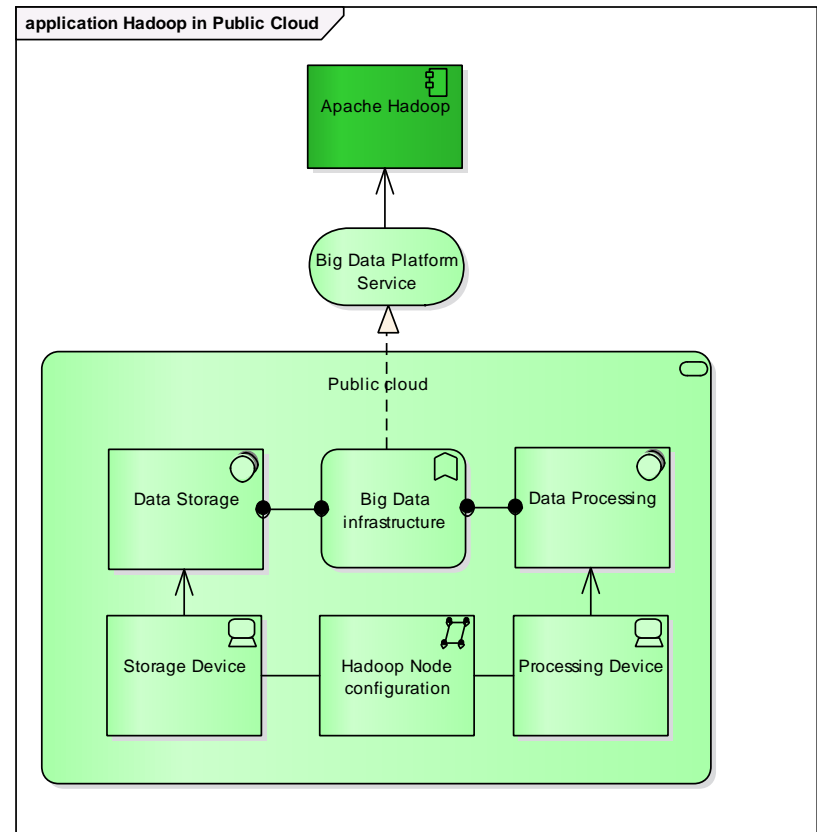
Express cloud alternatives



application TDP Express cloud alternatives



application Hadoop in Public Cloud



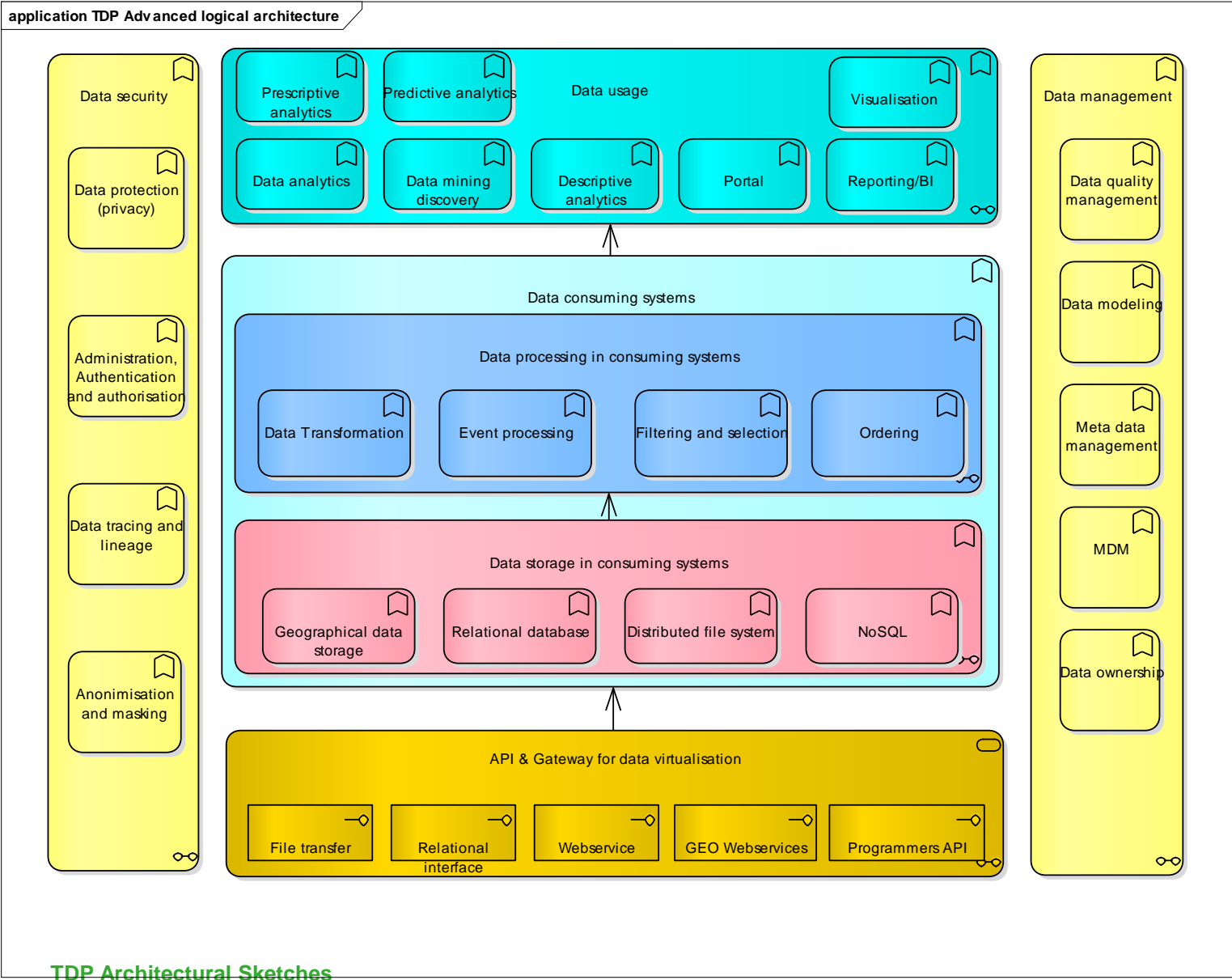
TDP Advanced



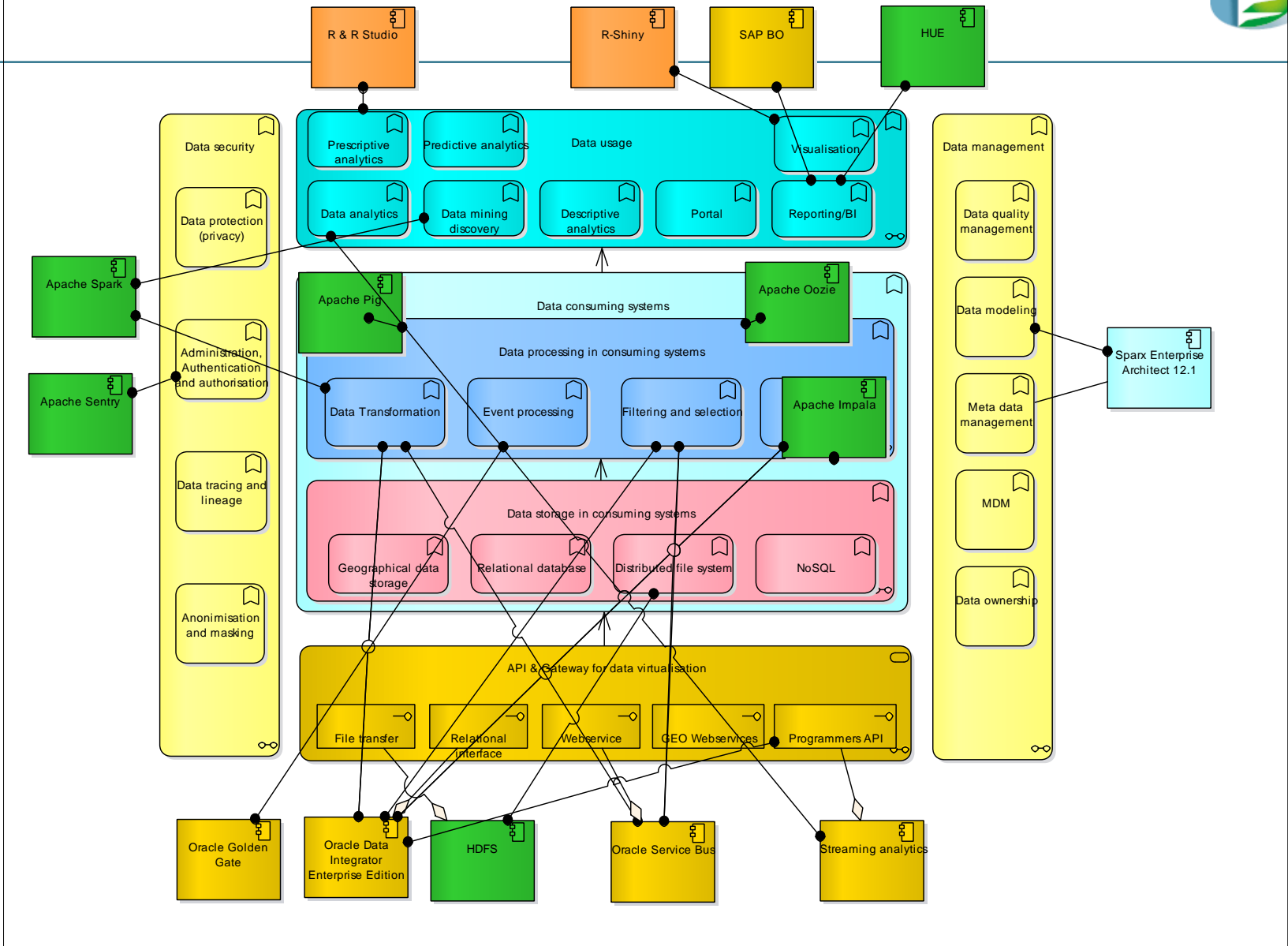
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Logical Architecture Advanced



Physical Architecture Advanced

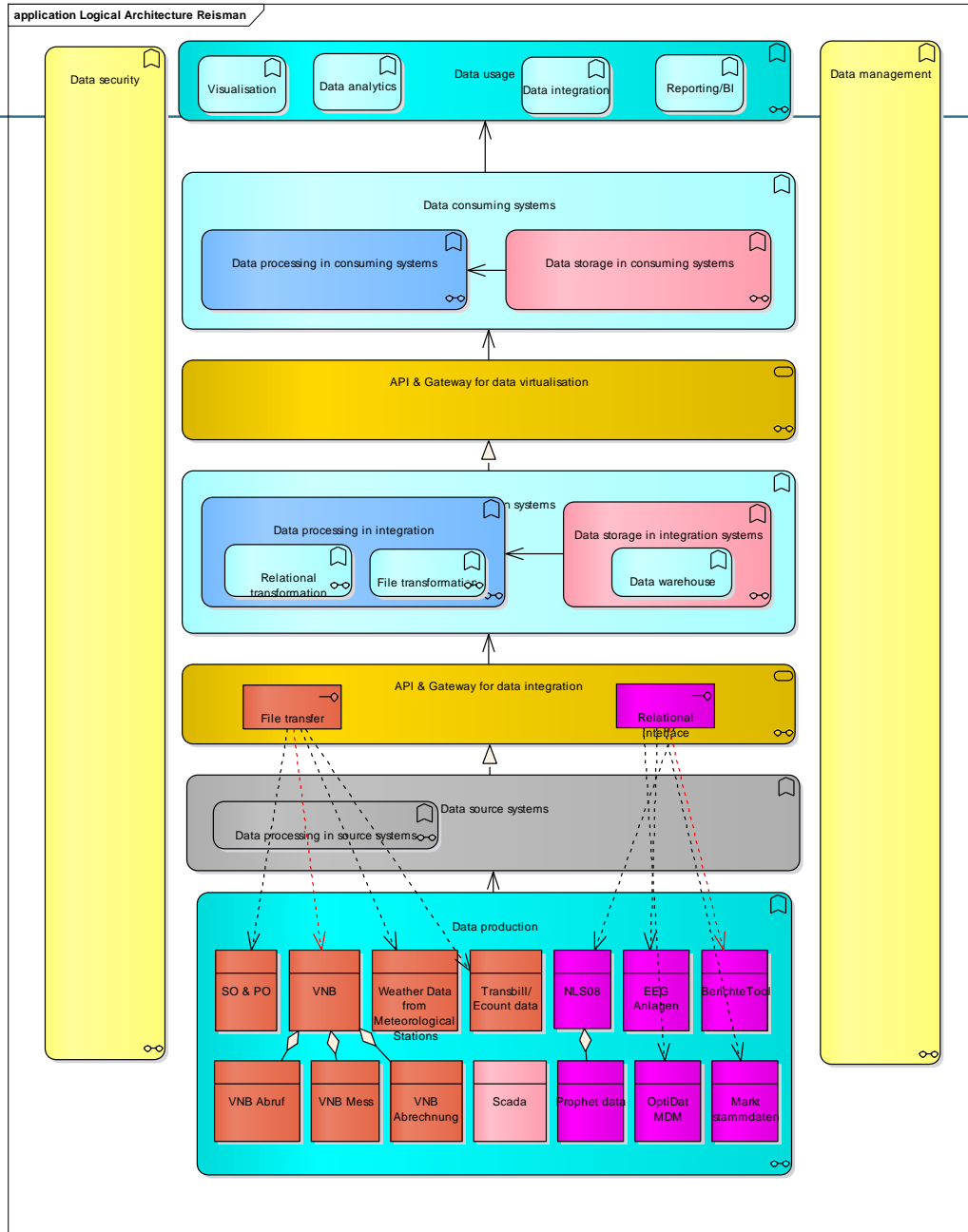


Reisman



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Logical Architecture Reisman





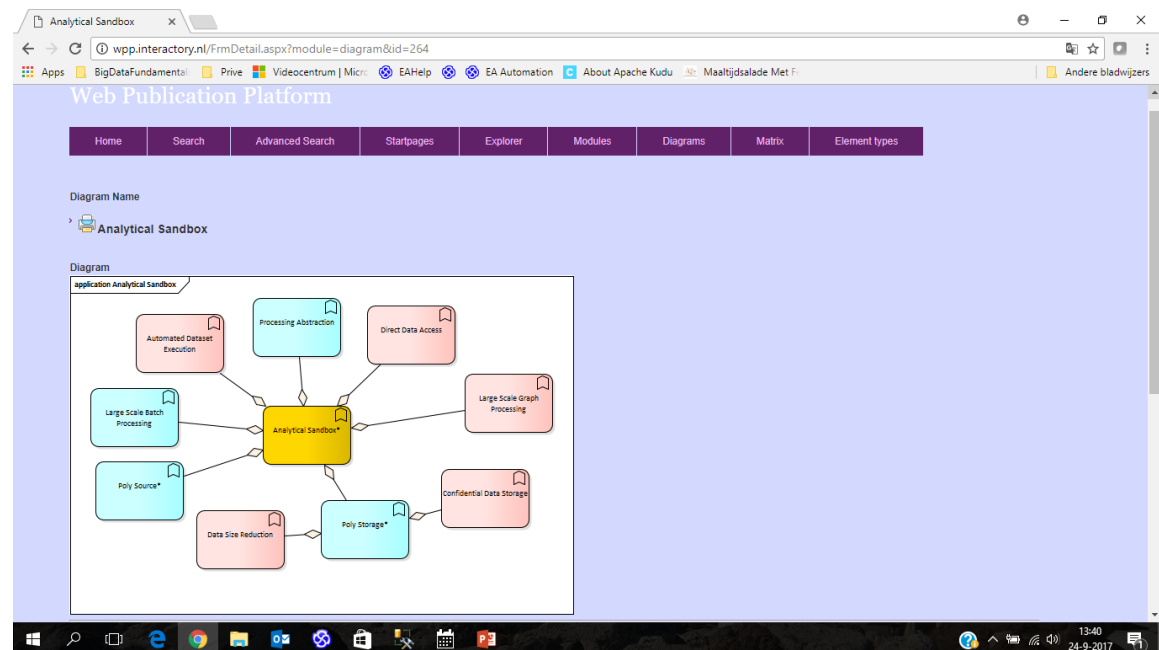
Lessons learned

- Agile approach is difficult when other teams stay waterfall
 - LDA
 - IMCB
- Only ArchiMate for modeling is insufficient
- Usage of the quick scan in powerpoint helped a lot
- Architectural maturity levels are different in GE and NL
- Start with a data catalog from the start (in EA?)
- Data Management and Governance are essential for success
- Cooperate with other large programmes (Libra/BMR) within TenneT



More information

- <http://wpp.interactory.nl> is configured with the Big Pattern catalog
- Eap file is available from the zip
- Email for more information: bert@interactory.nl



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TenneT is een toonaangevende Europese netbeheerder (Transmission System Operator, TSO) met haar belangrijkste activiteiten in Nederland en Duitsland. Met circa 22.000 kilometer aan hoogspanningsverbindingen zorgen we voor een betrouwbare en zekere elektriciteitsvoorziening aan 41 miljoen eindgebruikers in de markten die we bedienen.

Taking power further