



Canonical Modeling at Novartis

Using a canonical model to link business definitions
with physical data implementations

Canonical Model Management Forum, Washington DC, 10 May 2011

Daniel Brückner, Global Head EA Pharma Development



Agenda

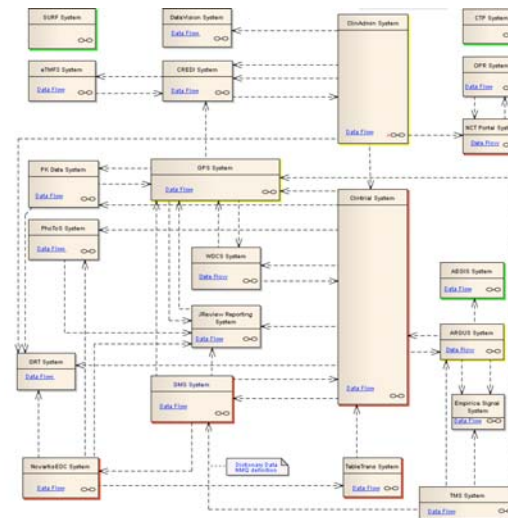
Introduction

- § From IT Services to Information Services
- § Canonical Model at Novartis
- § Summary and Outlook

Introduction



Daniel Brückner



IT Application Landscape

The Pharma Challenge today

- § Pharma 1.0 Blockbusters
- § Pharma 2.0 Personalized medicines
- § Pharma 3.0 Patient Outcomes

Agenda

§ Introduction

From IT Services to Information Services

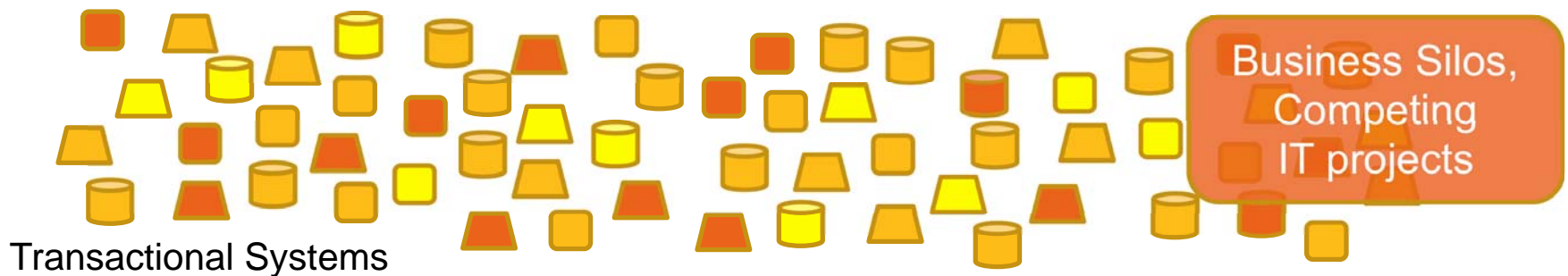
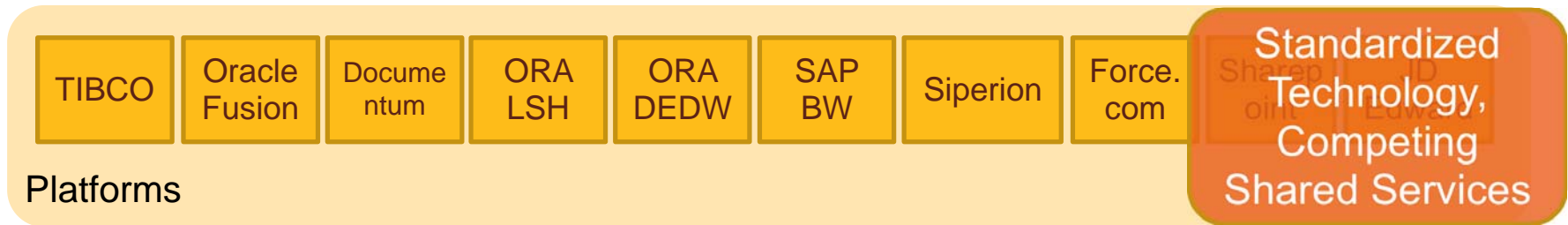
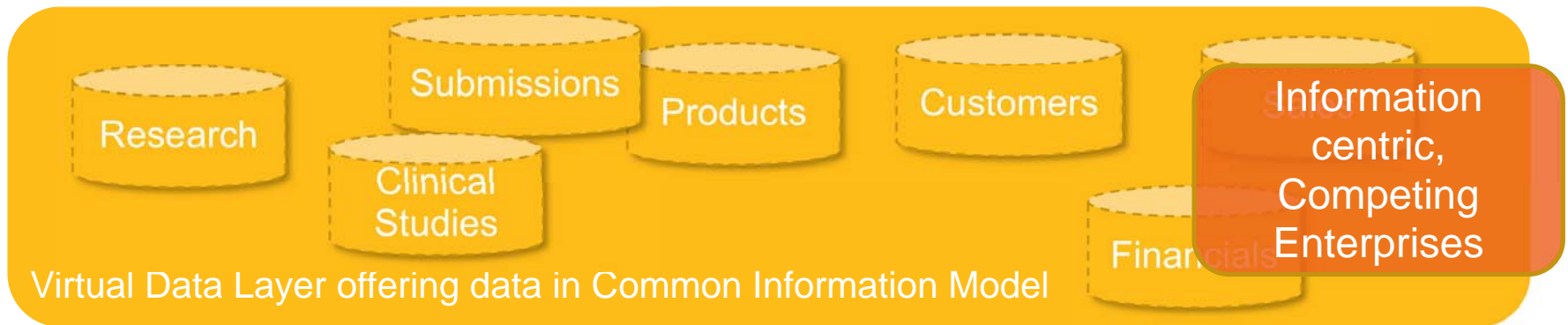
§ Canonical Model at Novartis

§ Summary and Outlook

From IT Services to Information Services



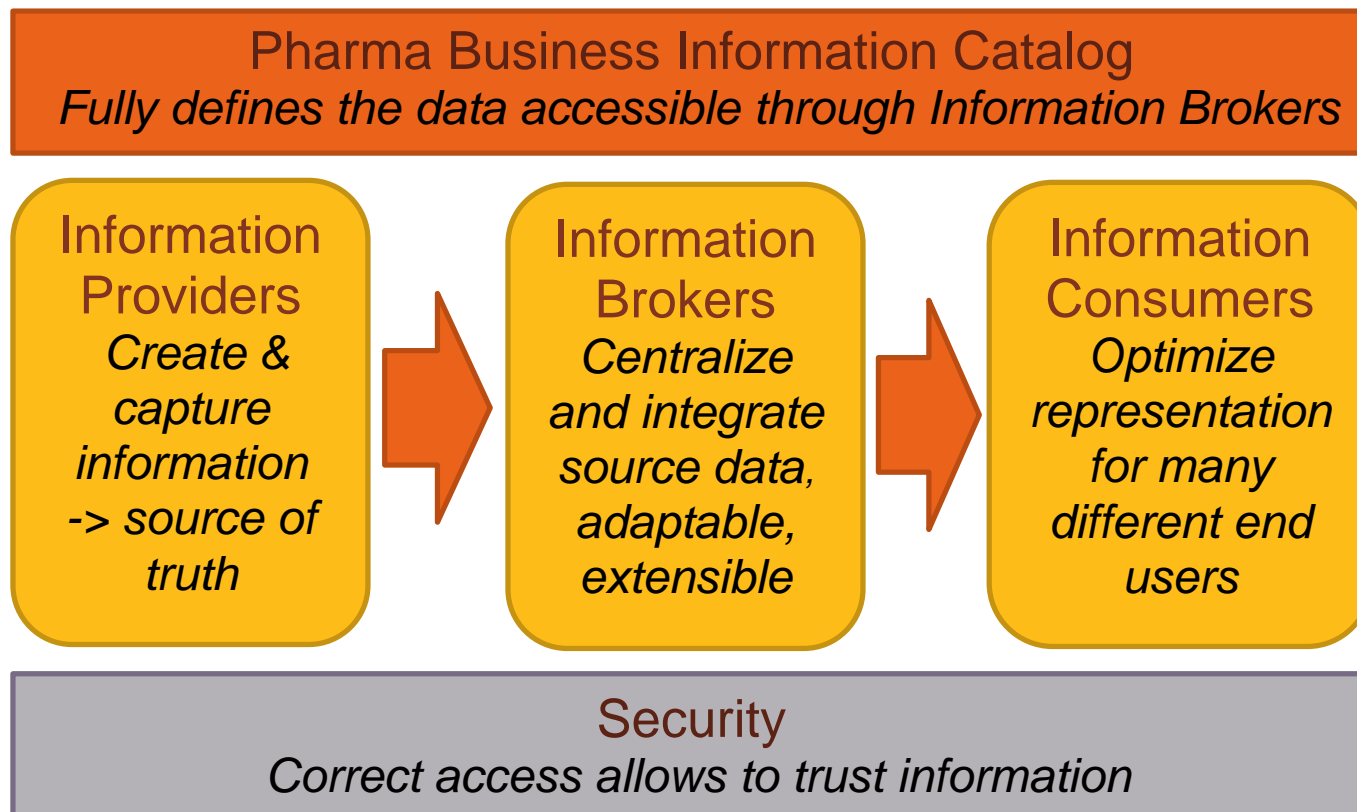
An Information Layer leveraging existing platforms *to find and access information within the web of systems*



Information Centric Architecture

Vision and Reference Architecture

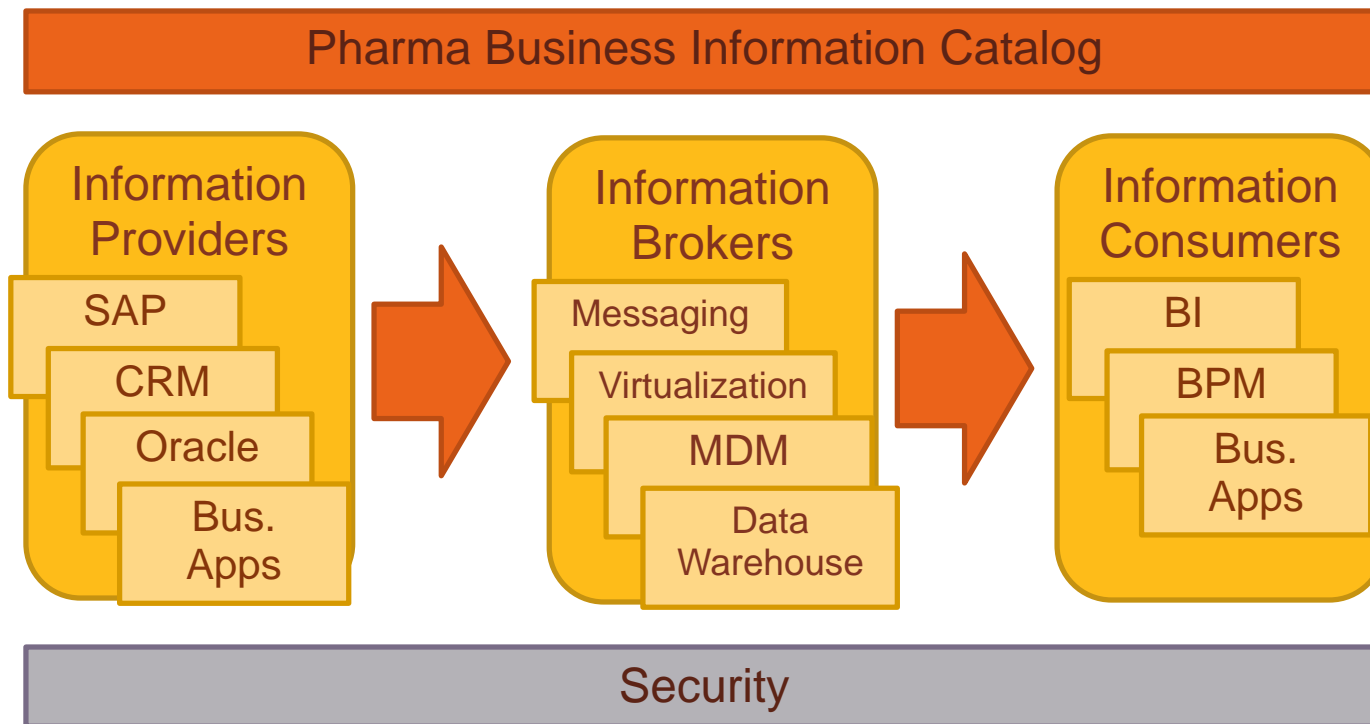
Boundaryless Information Flow, achieved through global interoperability in a secure, reliable and timely manner.



Information Centric Architecture

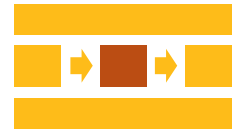
Vision and Reference Architecture

Boundaryless Information Flow, achieved through global interoperability in a secure, reliable and timely manner.



Information Brokers

Centralize and integrate source data, Adaptable, Extensible



§ Data Warehouse(s)

- Batch processes
- Including Study Pools (Brand Marts)

§ Master Data Management

- Consolidation of multiple versions of the truth
-> concept of survived record

§ Messaging (Oracle Fusion, SAP XI/PI)

- Realtime, event based information provisioning

§ Data Virtualization

Pharma Business Information Catalog

Fully defines the data accessible through Information Brokers



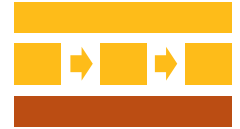
§ There is exactly one Catalog for all of Pharma

§ For all data available through Information Brokers, the Business Information Catalog defines

- Semantics
- Scope of validity
- Location (source of truth)
- Relations to Business Vocabularies and Standards

(Information Centric) Security

Correct Access allows to Trust Information

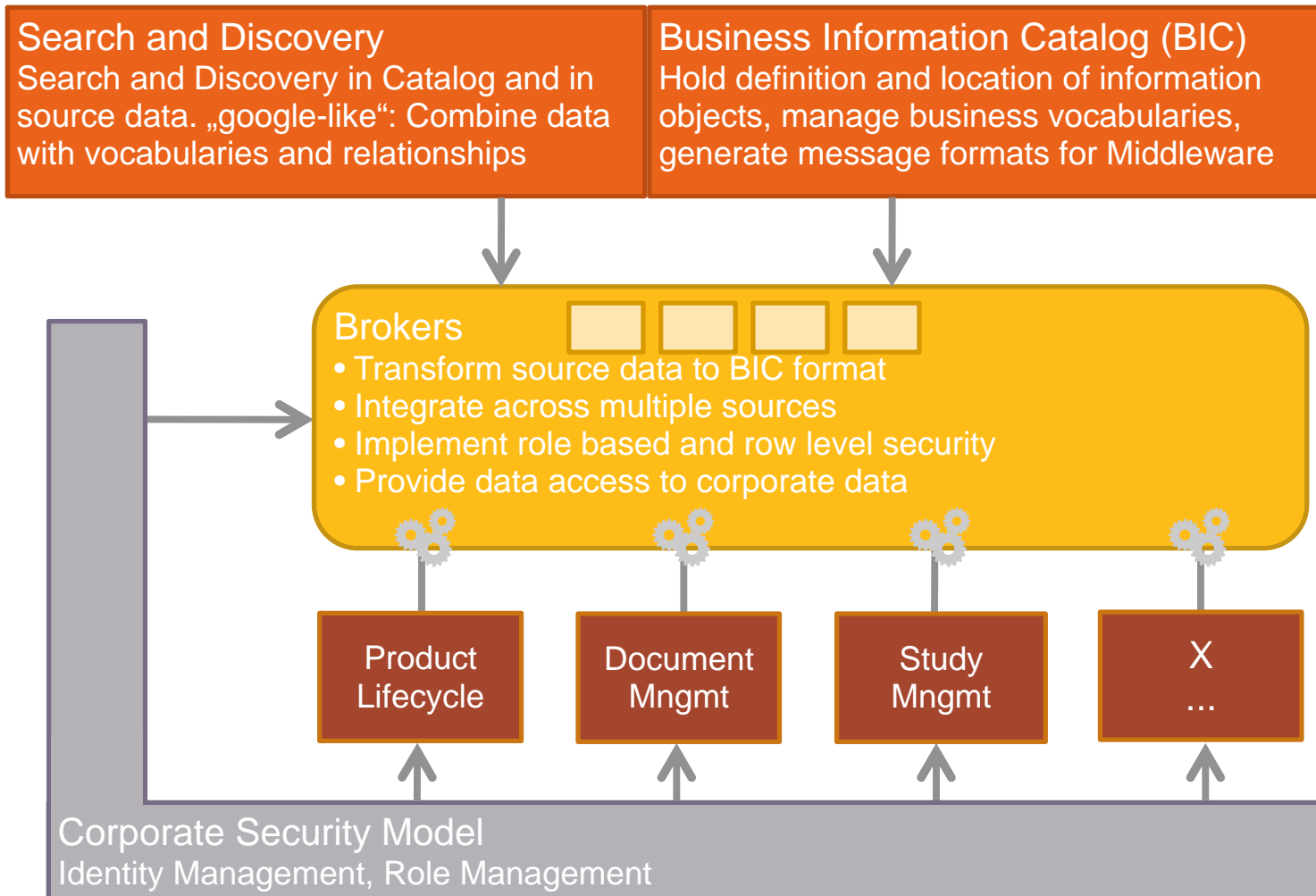


§ Managing access to *information* for *people*

§ Steering information access in

- Information Providers (Source Systems)
- Information Brokers
- Information Consumers

Components for Implementation



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Canonical Information Model: Purpose

- § Captures and represents business Information
- § Business and IT both can use one language for analysis, specifications, design and implementation - eliminating translations among these steps
- § Existing implementations and external standards will be mapped against this one language.
- § Independent of technology – allowing to link business knowledge with any technical implementation.

Canonical Information Model: Benefits

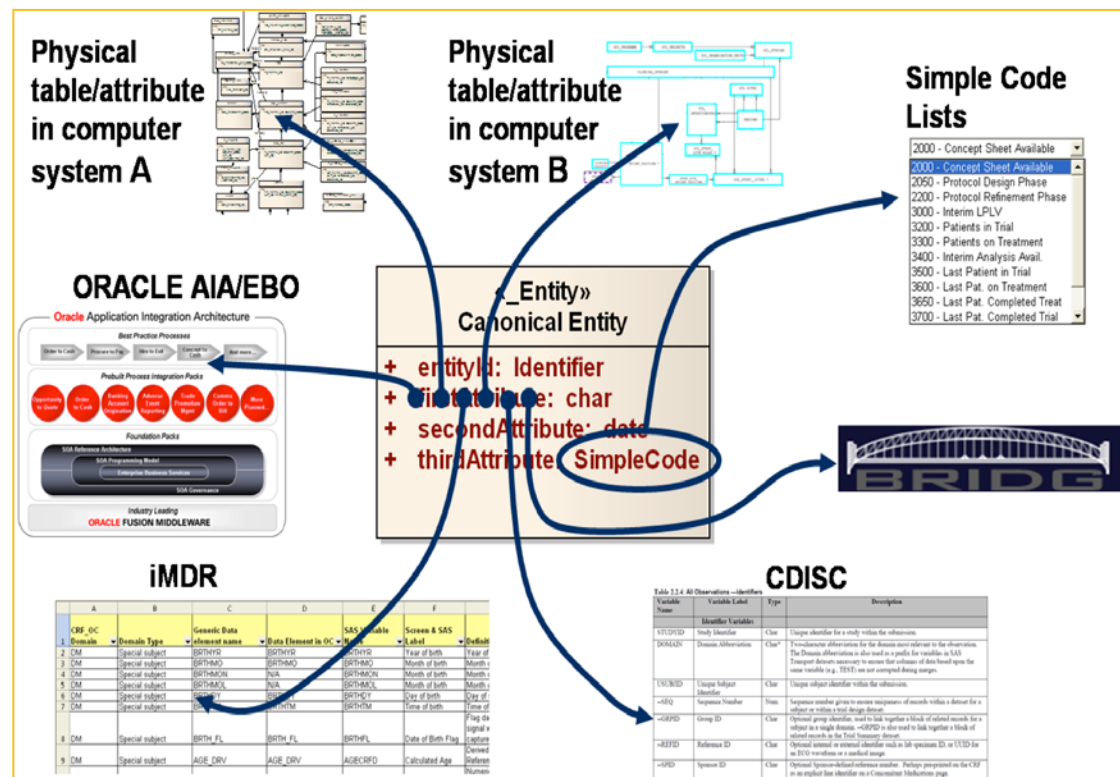
§ Approved by business, improving trust

§ Facilitates integration

§ Consistent use of information across systems

§ Improves data quality through data integrity and validation

§ Reduces development time and cost through reusability



Canonical Model: A Definition (by Forrester)

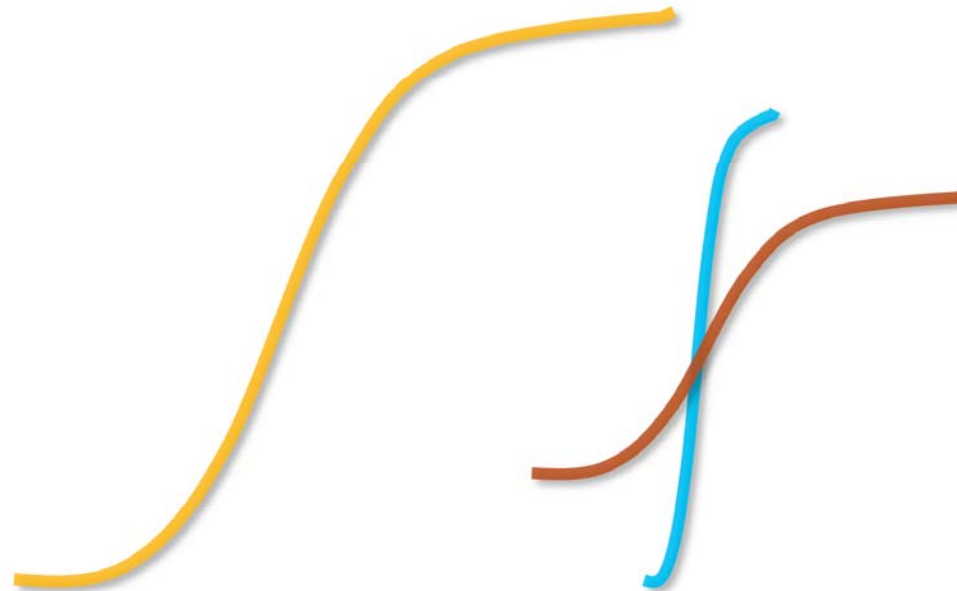
A canonical information model is a model of the semantics and structure of information that adheres to a set of rules agreed upon within a defined context for communicating among a set of applications or parties.

not complete
provides semantics and structure
adheres to rules
valid for a business function
for communication among systems and associates
and it is published

Canonical Model, some numbers

Canonical Entity Count	Attribute Count
93	1007

Entity Reuse



Logical and Physical Models

§ Logical Models

- Canonical Model, used by Business, Business Analysts, Solution Architects

§ Physical Models

- XML based messages, i.e. AIA based EBO's
- PLSQL based DB views
- .csv files
- All used by implementation groups

Creating and Maintaining the Model

§ Data definitions are controlled

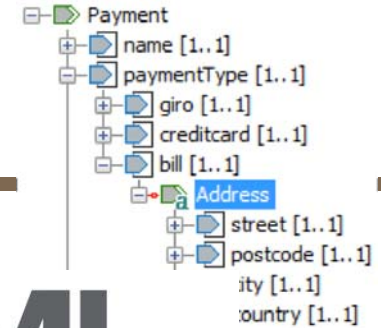
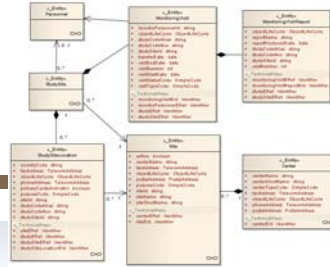
- Sign off by Business Owner before publishing
- Definitions are published on intranet
- Definitions are versioned, and have status

§ Using the definitions

- Architects are involved in the start phase of all projects
- Negotiate data interfaces and extensions of canonical definitions in scope (goal is to reduce multi-source situations)

§ We go for the maximum accepted, not for the maximum thinkable

Tools



- § Visualize Canonical
- § Supports discussions with business experts

- § Manage Versions & Releases
- § Mappings to sources and vocabularies
- § Create physical XML messages

Entities	→	Complex Type
Attributes	→	Local Element
Data types	→	Element name types

Achievements to date

§ Multiple Interfaces consolidated to a single one

- Lead to data consistency in downstream systems
- New data requests are handled much quicker now
- Single source of truth

§ Known semantics raise trust about information

§ Coverage in Study Management domain > 50%

§ Data Warehouse, Middleware (ESB) und Reports BI teams all use the same data definitions, as defined by business, no translation steps any more.

§ Reuse of Definitions is >70%

Difficulties

§ We need the RIGHT business expert

- Includes motivating them
- Difficult to find more than one person, often have one perspective only

§ Different business units are asked to agree on definitions

- Ends up as a mix of a catalog and a semantic model

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Summary and Outlook

- § We have a lot of definitions and have more projects adding on to them
- § The (business) definitions are used directly in the data warehouse and the messaging middleware
- § We follow clear processes for approval and publishing
- § We have a positive business case
- § We negotiate and take what we can achieve
- § We are ready for the next extensions, at the speed that is digestable for the organisation
- § On the physical level, there are several different implementation technologies
- § Security and search are still system centric
- § We are implementing tools to scale the approach (i.e. parallel model extensions)

Thank you for your attention



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