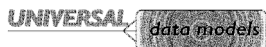


# Enterprise Information Architecture at Nokia Using Universal Data Models: A Case Study

Len Silverston, Universal Data Models, LLC; Teemu Mattelmäki, Nokia Corporation

## Enterprise Information Architecture at Nokia Using Universal Data Models, LLC: A Case Study

Teemu Mattelmäki, Chief Information Architect, Nokia  
Len Silverston, Universal Data Models, LLC



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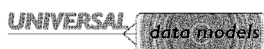
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### Purpose and Agenda



- Purpose
  - To share methods and experiences at Nokia using Universal Data Models
- Agenda
  - Overview of key principles employed at Nokia
  - Universal Data Model overview
  - Implementing Universal Data Models at Nokia
  - Summary of learnings



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## Key Principles Employed at Nokia



- Integration and consistency of applications
- Re-use - Universal data models and patterns
- Robustness - by using flexible, adaptable structures
- Relate to different audiences (city plans, city area plans, building blueprints)
- Middle up approach searching for common structures
- Integrated enterprise architecture - information architecture part of it
- Think big - start small



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## Challenges at Nokia




- During the last 10 years there has been **lack of focus in data modeling** because of packaged applications development.
- Move to modular application architecture (SOA), outsourcing of processes and data warehousing are **increasing the need for information integration** internally and externally.
- Need to find efficient ways to speed up the data modeling competency and maturity. => Proven data models, patterns and methods are needed.




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## A Practical Solution




- “Universal Data Models”
  - Common, re-usable data structures
  - Proven models that we applied
  - At Nokia, these models covered about 70% of the info requirements
  - Provided holistic views
  - Saved time and increased quality
  - Flexible, adaptive data models



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## Are Businesses Too Unique to Use Template Models?



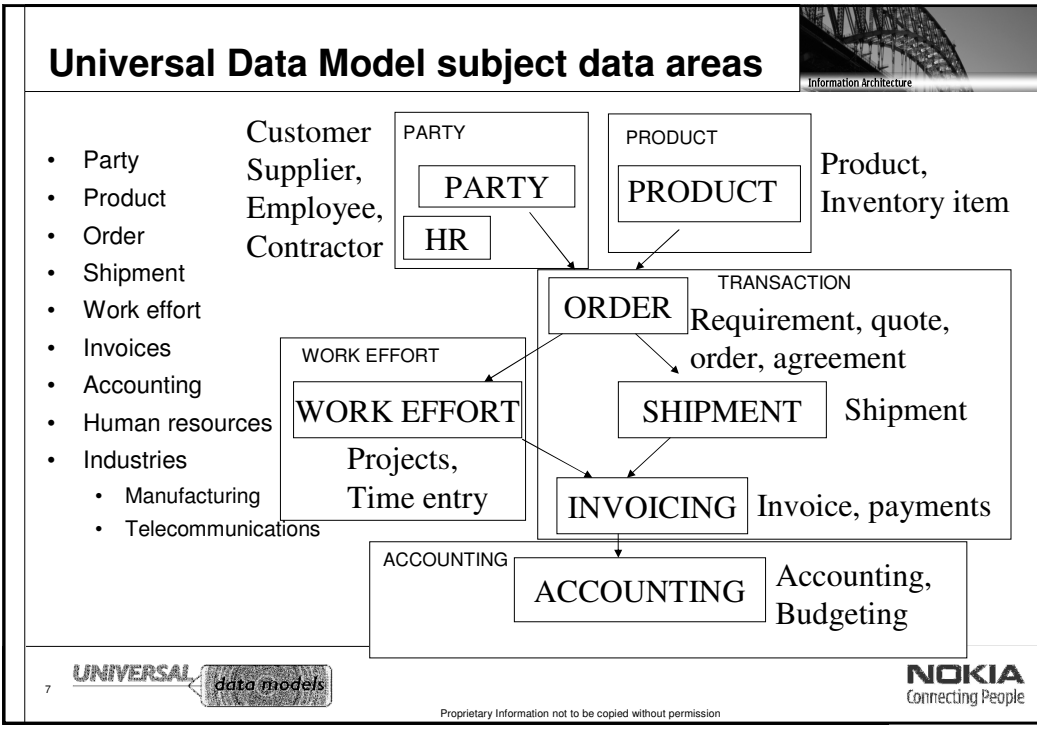
COMMON CONSTRUCT EXAMPLES

- People and organization demographics
- Products or services
- Transactions
  - Orders
  - Shipments
  - Invoices
  - Payments
- Work efforts
- Accounting and budgeting

*Business are unique, however,  
the types of data they deal with are generally similar*

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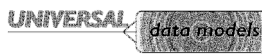
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- ### Universal Industry Models Used At Nokia
- Manufacturing
    - Design engineering
    - Bills of materials
    - Deployments
    - Manufacturing orders
  - Telecommunications
    - Components and assemblies
    - Network infrastructure
    - Network capacity
    - Telecommunications usage
  - Professional services
    - Quotes
    - Engagements
    - Time tracking
  - E-Commerce
    - Click stream
    - Content management
- UNIVERSAL data models** (8) **NOKIA** Connecting People
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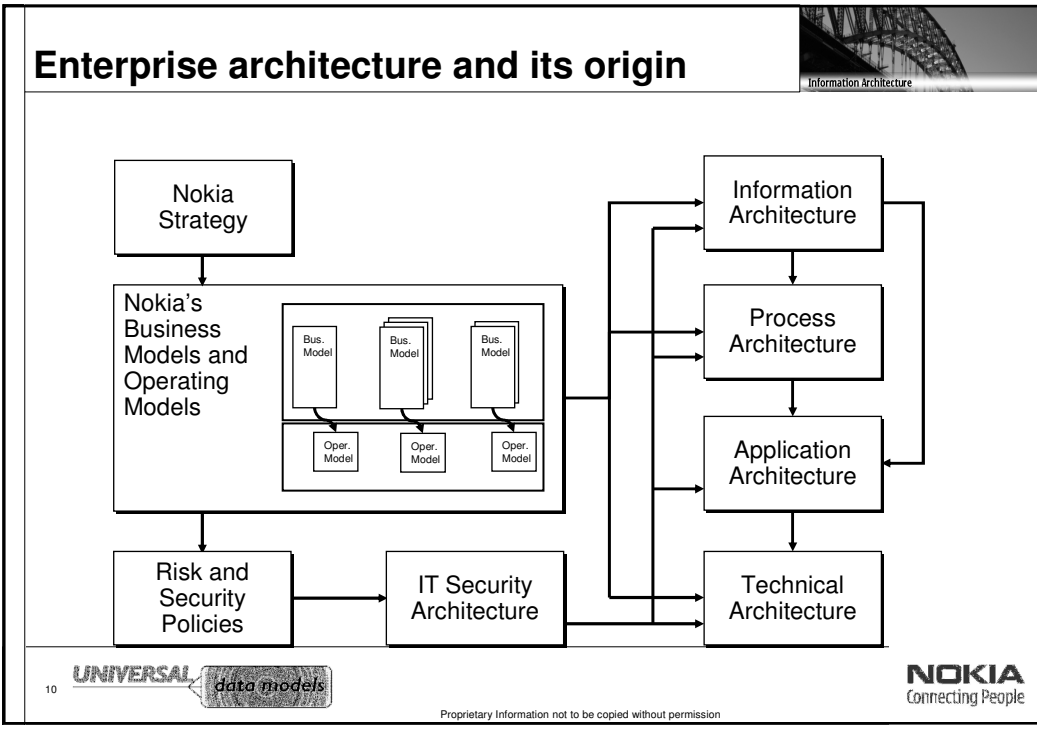
## Nokia's Application of Universal Data Models

- Information architecture as part of enterprise architecture
- Information architecture benefits
- How are the UDMs used at Nokia?
- UDMs and NEIM
- Deployment of UDMs at Nokia
- Examples of models
- What worked and what didn't work







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## Information Architecture Usage & Benefits



**Target: Solid, fact based management decisions**

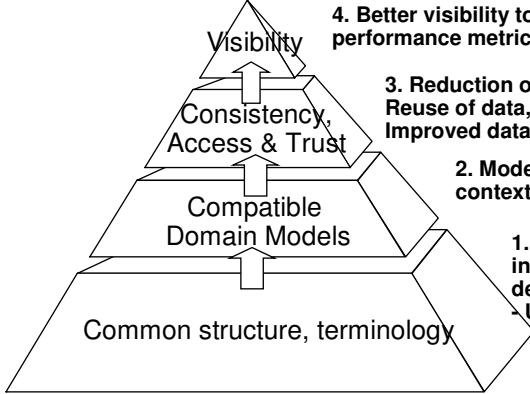


**4. Better visibility to accurate business performance metrics**

**3. Reduction of complexity - One time data entry, Reuse of data, Efficient application integration, Improved data consistency and security**

**2. Model reuse and adaptation to the business context**

**1. Framework for incremental and integrated process and application development (based upon proven models UDM and others)**



Visibility

Consistency, Access & Trust

Compatible Domain Models

Common structure, terminology


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## How were the UDMs used at Nokia?



- NEIM (Nokia Enterprise Information Model) was developed independently first
- Then, UDM was used as a major input and a common reference for additions
- UDM have been adopted to Nokia incrementally through a process called “NEIMification
- UDM saved time and effort on new subject areas by not re-inventing the wheel
- UDM provided another perspective to thinking
- UDM quality assured modeling efforts

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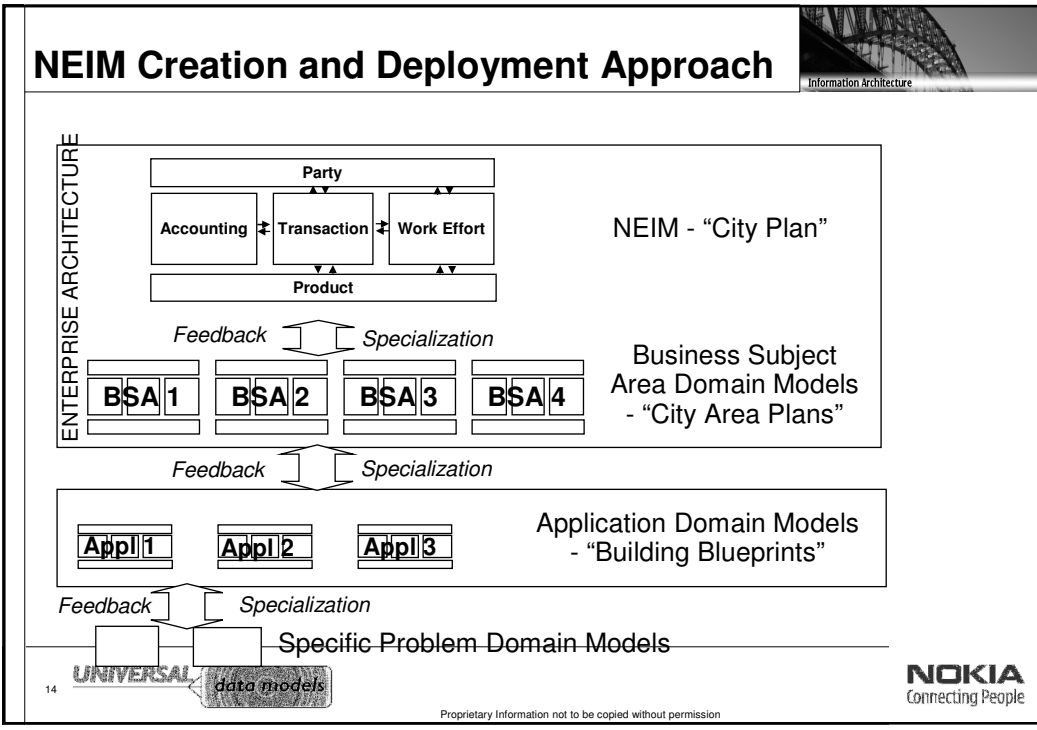
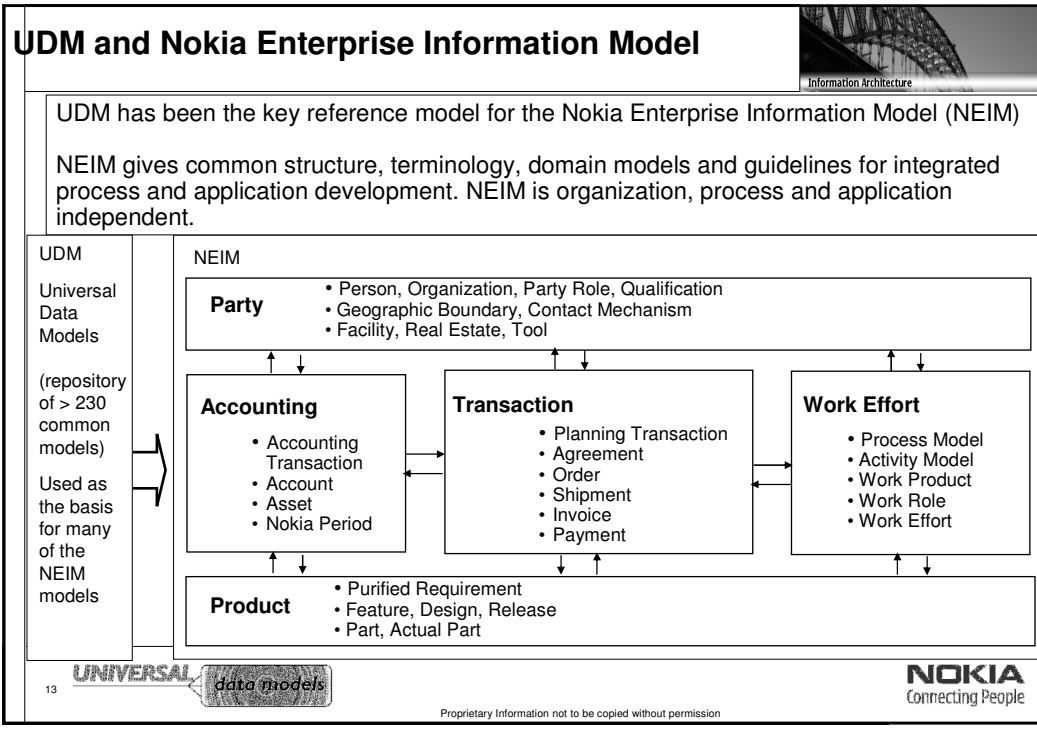
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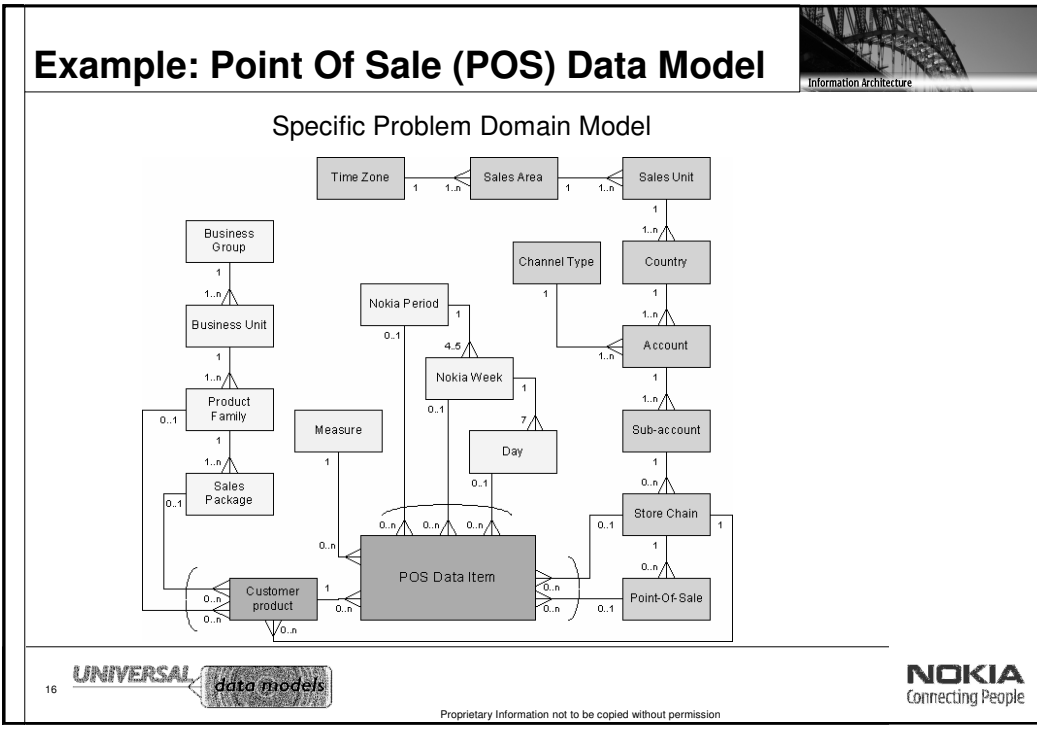
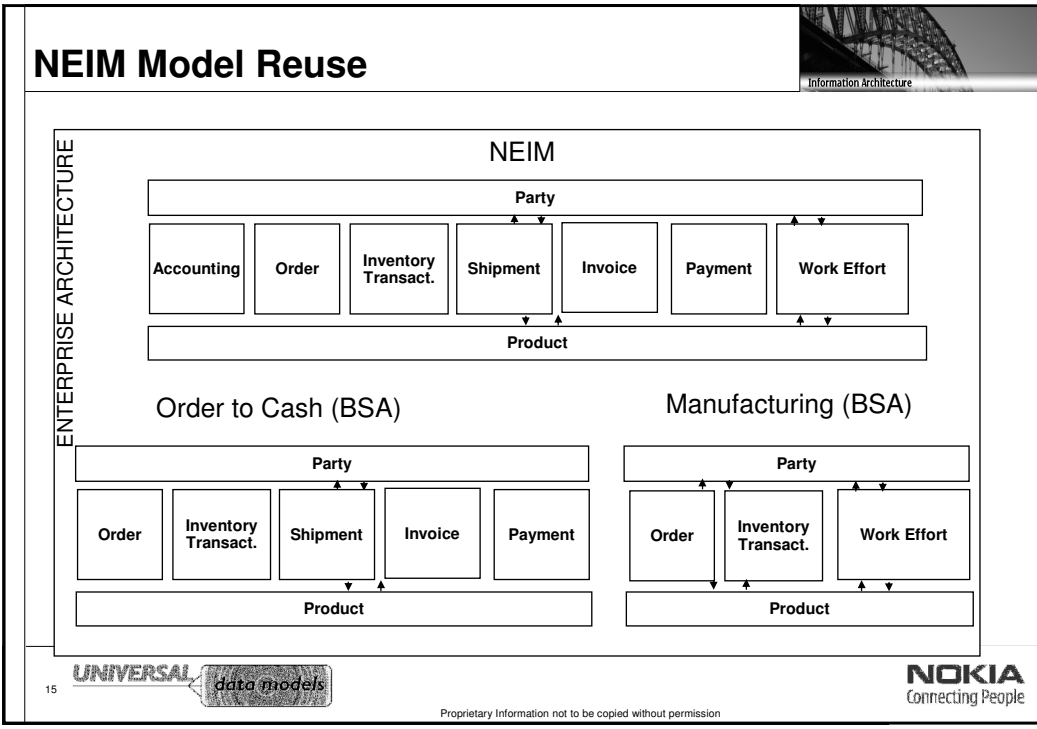
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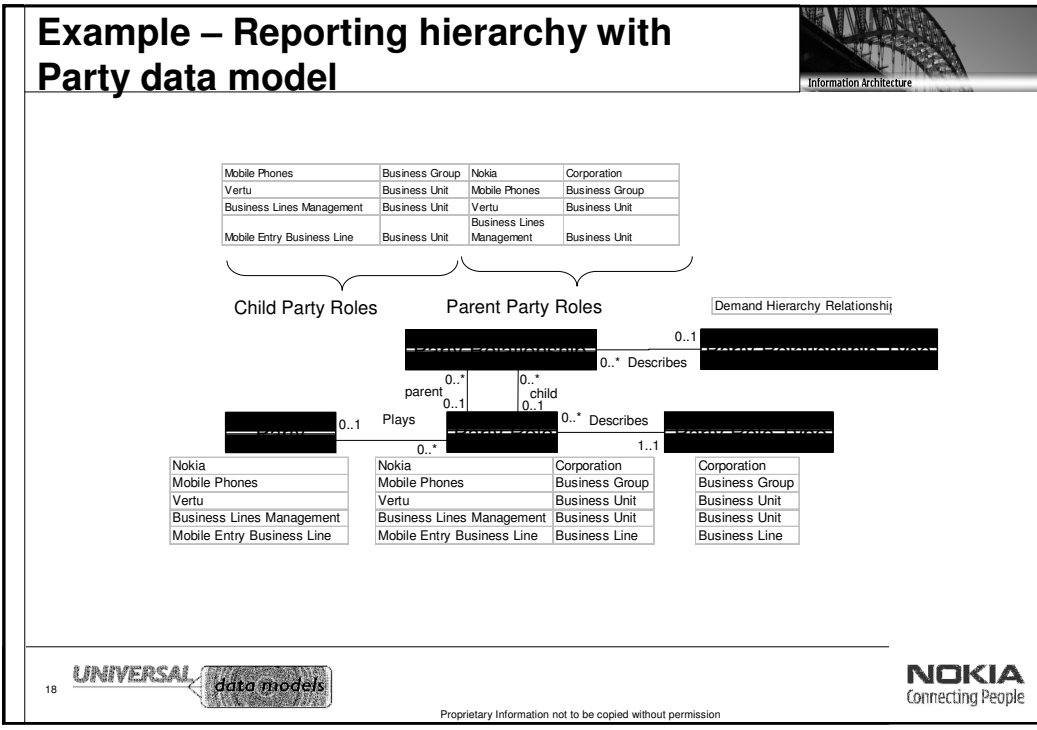
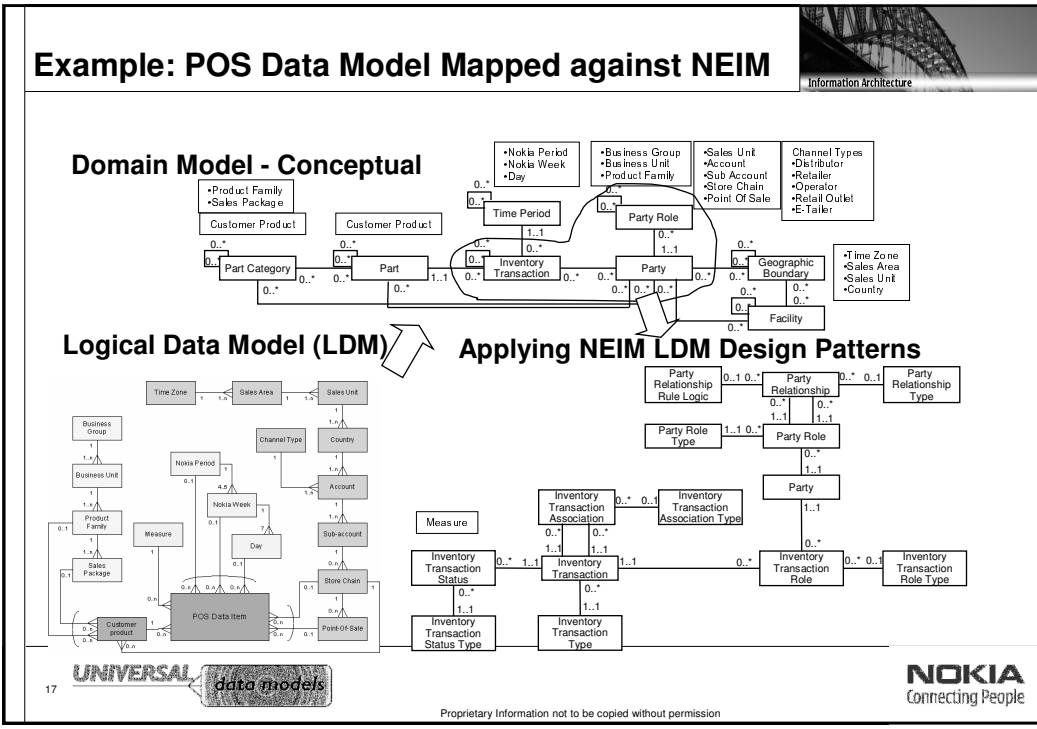


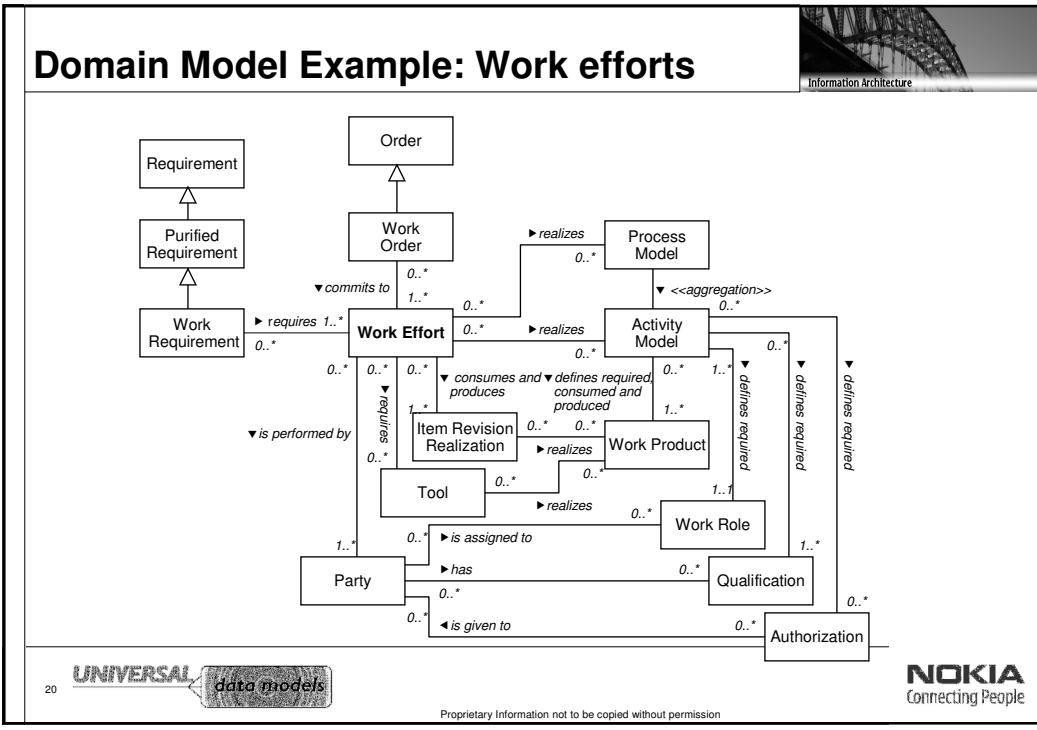
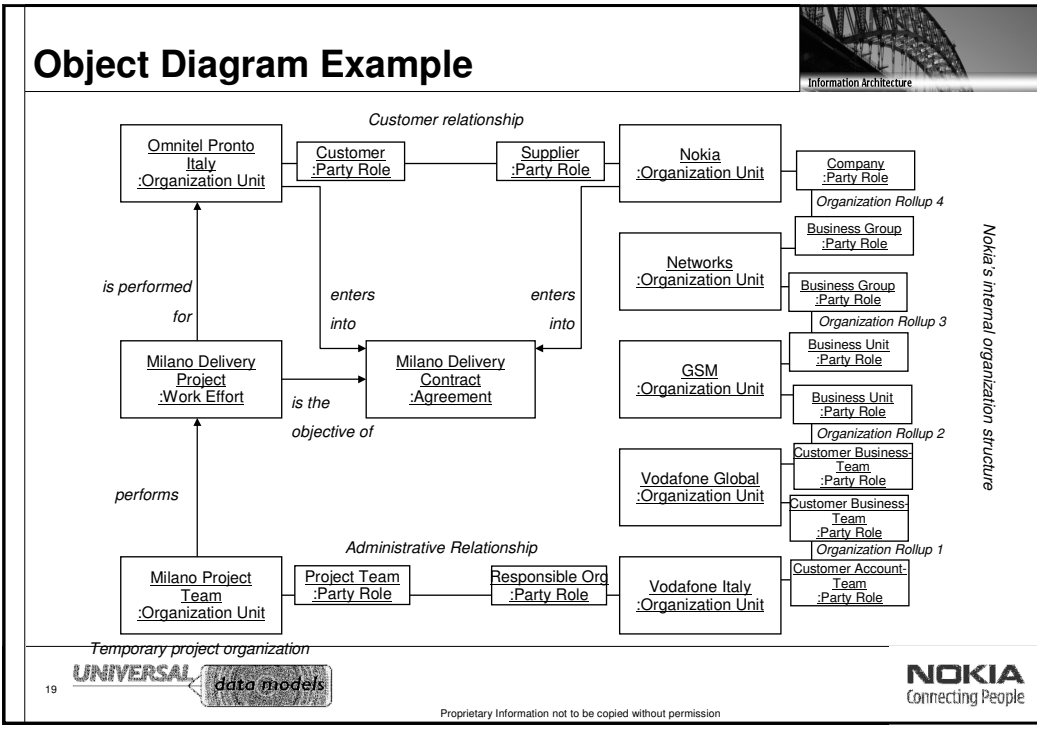
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### Observations

History of NEIMification

Transition/evolution of NEIM to UDM

Current status of NEIM

Receptivity of NEIM

Where we are going from here

**NEIM**  
(Nokia Enterprise Information Model)

UDM  
Universal  
Data  
Models

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### What worked and didn't work and why

- What Worked
  - Having a reference model as a starting point for modeling speeds up the modeling work because:
    - It gives a structure and template for local adoption. It guides the consistency of data models.
    - It is easier to get to an agreement. It is stronger than someone's opinion. It can be used as a standard. If we someone does not follow the standard, he/she has to justify that.
  - Allowing business area views to relate better and provide semantics
  - Using UDMs as tools, however, not a substitute for business requirements
  - Applying and customizing UDM patterns for consistency across applications
  - Skilled data modeling facilitators
  - Can convert from "not invented here" to enterprise perspective
- What Didn't Work As Well
  - Ideally start with template models sooner
  - Theoretical discussions
  - Skills ramp up

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**Questions?**



- Teemu Mattelmaki, Nokia  
teemu.mattelmaki@nokia.com
  
- Len Silverston, Universal Data Models, LLC  
lsilverston@univdata.com



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