gesis
Leibniz Institute for the Social Sciences

Working with the STARDAT DDI-Lifecycle Library

6th Annual European DDI User Conference
London, 2014/12/01

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GESIS – Leibniz Institute for the Social Sciences

Outline

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Agenda

13:30 - 14:00	Welcome Workshop objectives Introduction of participants
14:00 - 14:30	Architecture Principles
14:30 - 15:00	Exercise 1: Getting the demo app run on your local machine Questions & Discussion
15:00 - 15:30	Break
15:30 - 16:00	Implementation Principles
16:00 - 16:30	Exercise 2: Reconstruct the historization & versioning show case Exercise 3: Create a study description
16:30 - 17:00	Questions & Discussion

Introduction of Participants

- What is your name? What is your affiliation?
- What is your professional background?
- What do you like most at your daily work right now?

- How high would you rate your experience in DDI C/L? Possible levels: beginner, junior pro, senior pro or guru
- Are you familiar with Java, Spring, Hibernate, Freemarker, Maven, Git, Eclipse?
- What are your expectations of this tutorial?

Tutorial Objectives

After this workshop, you will be able to

- download, compile and (re)use all source and binary code of the library and demo application
- understand the basic design principles of the library
- create simple study descriptions in the formats DDI 3.1 and DDI 3.2

STARDAT Project at a Glance

- Integrated management system for standardized metadata documentation
- Replacement for production systems DBK, DSDM, CBE of GESIS data archive
- Support of and high interoperability with DDI-C and DDI-L
- Longterm-preservation with DDI

Classification of the Library

- Open source,
- Java-based,
- extensible
- domain model library
- with object-relational persistence
- to support DDI Lifecycle metadata documentation

- Hybrid between *Contract First* and *Code First*!

Distinction of Design Principles

- Architecture principles
  - Abstract, high level concepts
  - Technology independent
  - All-or-Nothing decisions
- Implementation principles
  - Concrete, low level realisations
  - Technology dependent
  - Balancing priorities

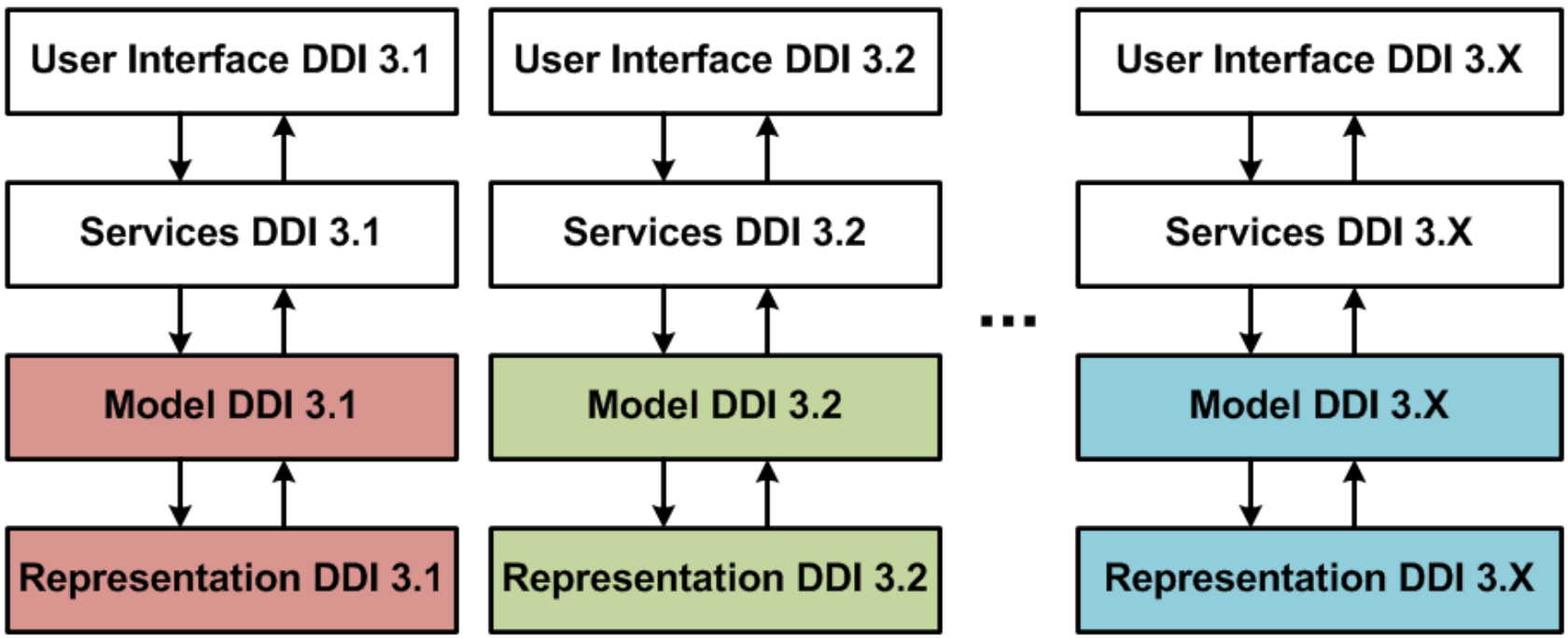
Feedback appreciated!

- Obviously, classification is ambiguous and criticisable!

Outline

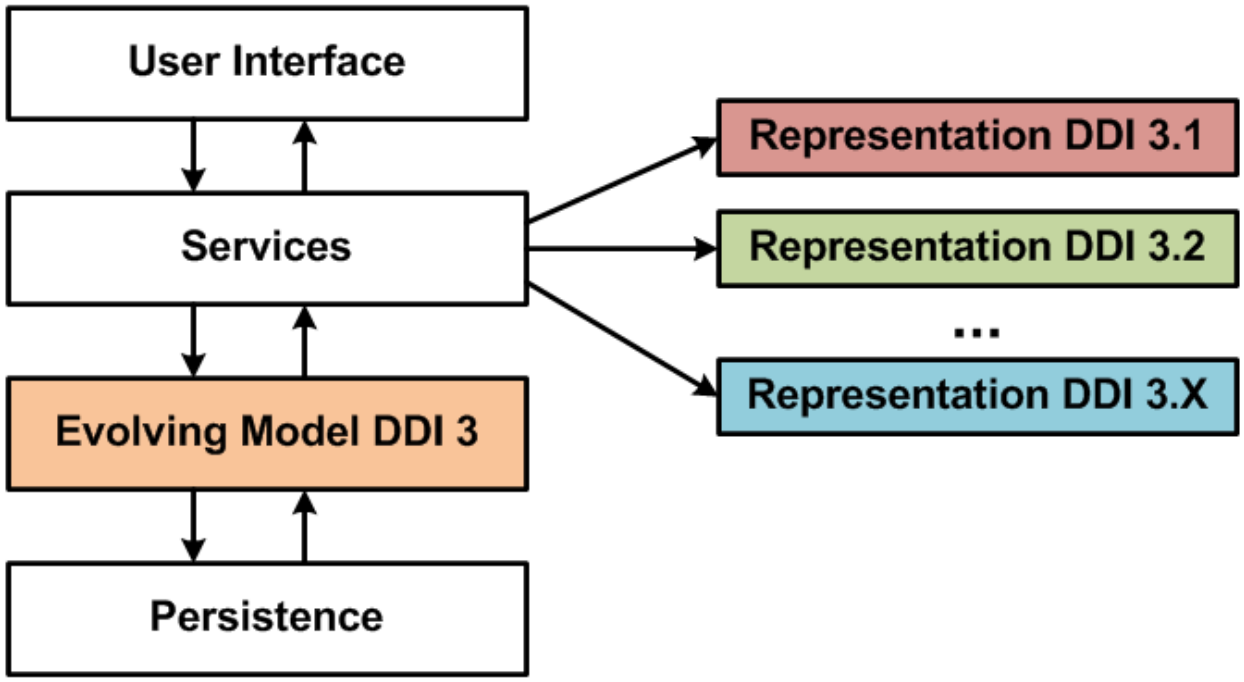
Separation of Model and Representation

Contract First – XML Schema-based Approach



Separation of Model and Representation

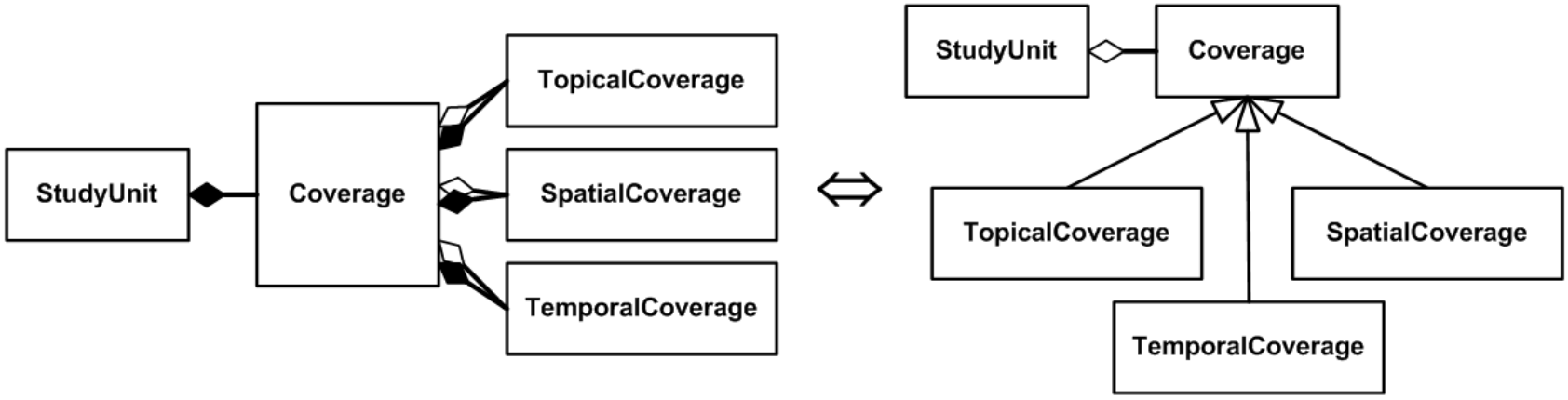
Hybrid between *Contract First* and *Code First*!



Separation of Model and Representation

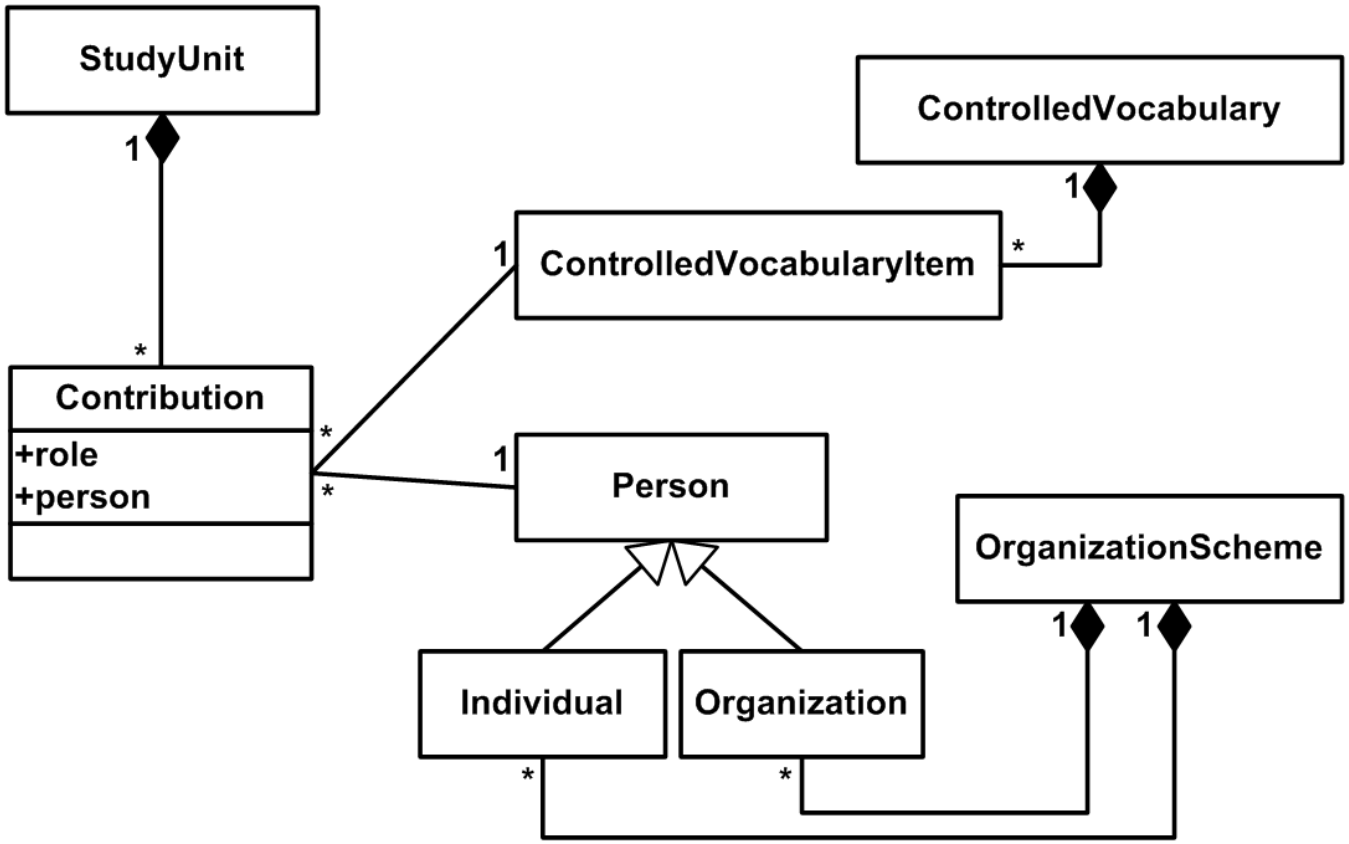
Architecture Principle: SMORE

- leads to true abstraction in memory
- is the very necessary base for true interoperability
- Example for mixing: Coverage



Separation of Model and Representation

ddi:Citation

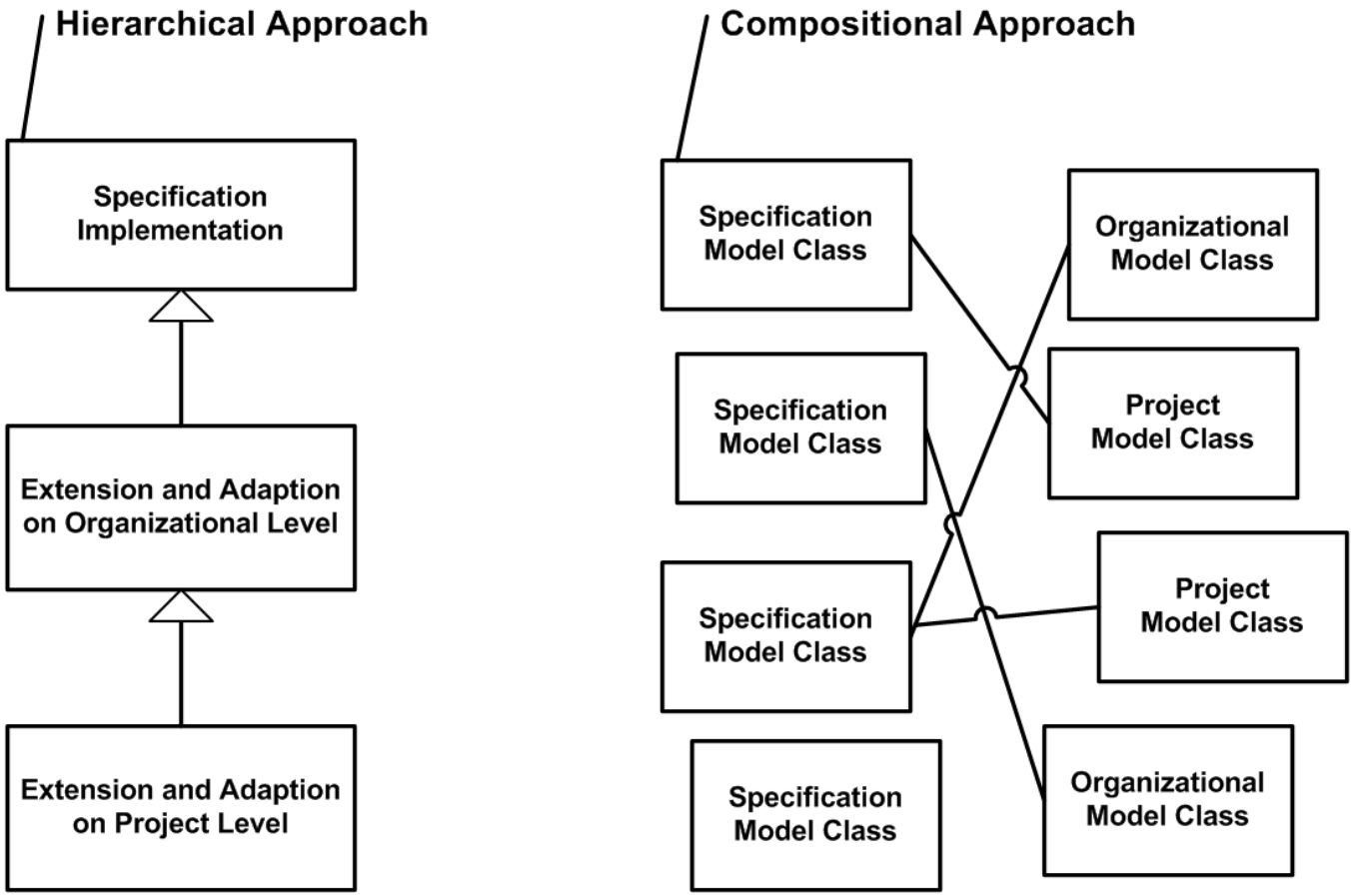


Separation of Modeling and Mapping

Architecture Principle: SMOMA

- avoids specific, not reusable implementations
- allows use case specific, possibly different mappings
- makes incompatibilties explicit
- Examples for mixing
  - dcterms in ddi:Citation
  - Everything as ddi:Note
  - Creating a type PrimaryResearcher instead of explicitly mapping information on ddi:Creator, ddi:Publisher or ...

Extensible object-oriented model



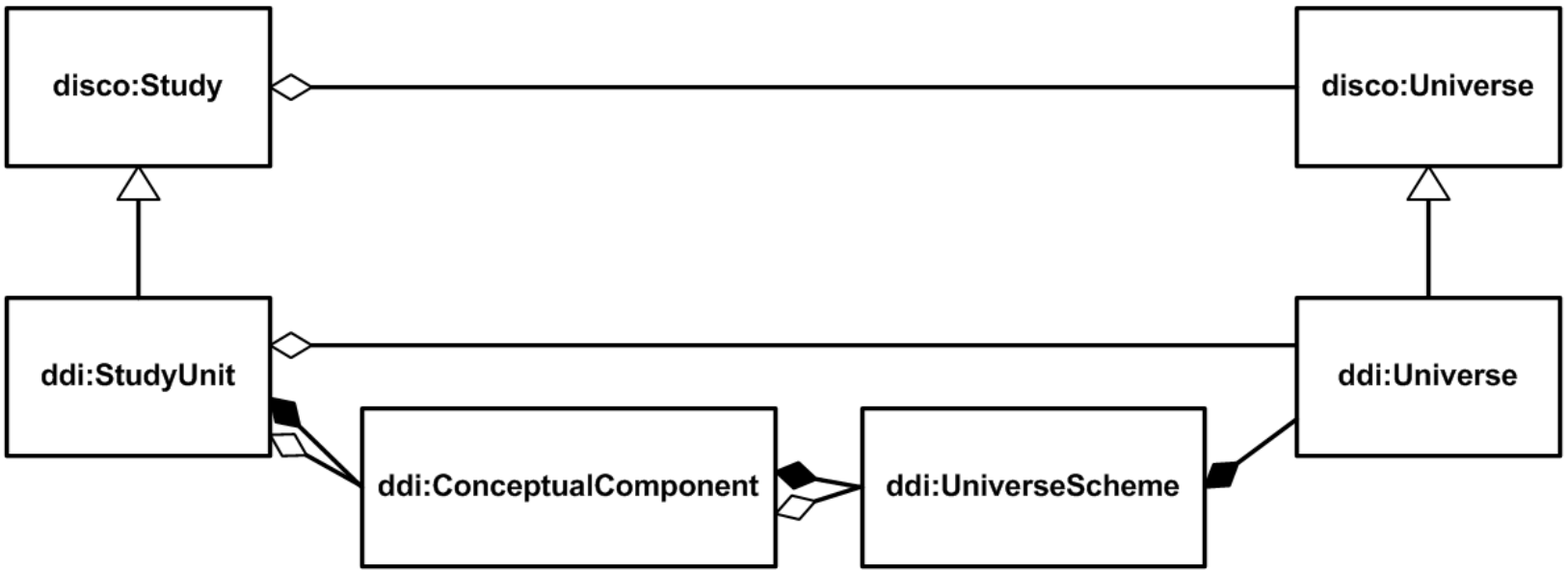
Extensible object-oriented model

Comparison of the Two Approaches

- Hierarchy (Inheritance)
  - Technical infrastructure on organizational level (+)
  - Support of services out of the box (+)
  - Lower-level components must be true extensions (-)
  - Explicit definition of requirements for extensibility (-)
- Composite (Mapping)
  - Independence and flexibility in modeling (+)
  - Making incompatibilities explicit (+)
  - Re-implementation of components (-)

Extensible object-oriented model

Implementation Challenge: Loss of Maintainables



Separation of *Model* and *Validation*

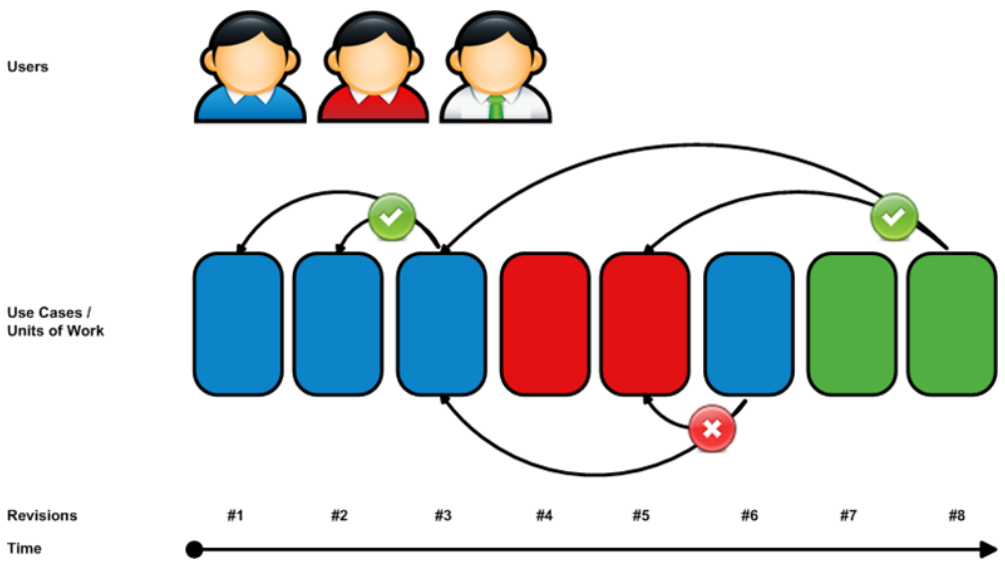
Architecture Principle: SMOVA

- Validation requirements may differ relating to agencies, projects, time and DDI versions
- Usage of validation strategies for every resource according to requirements
- Domain model objects are only data transfer objects (DTO).
- Model invalidating constraints are rules of logic.
- Model is structure, validation is process.

Container-managed transactions

Architecture Principle: CMT

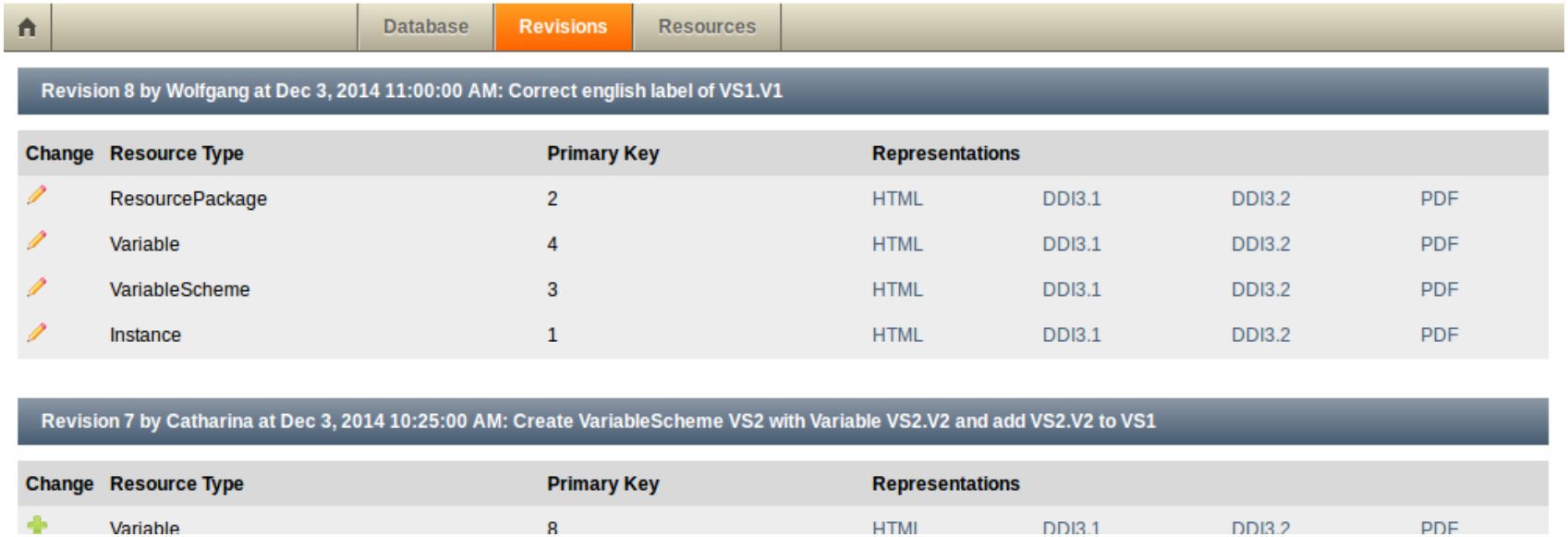
- Transaction management delegated to IoC container
- Services as (a)synchronously executable units of work



Exercise 1

Getting the demo app run on your local machine

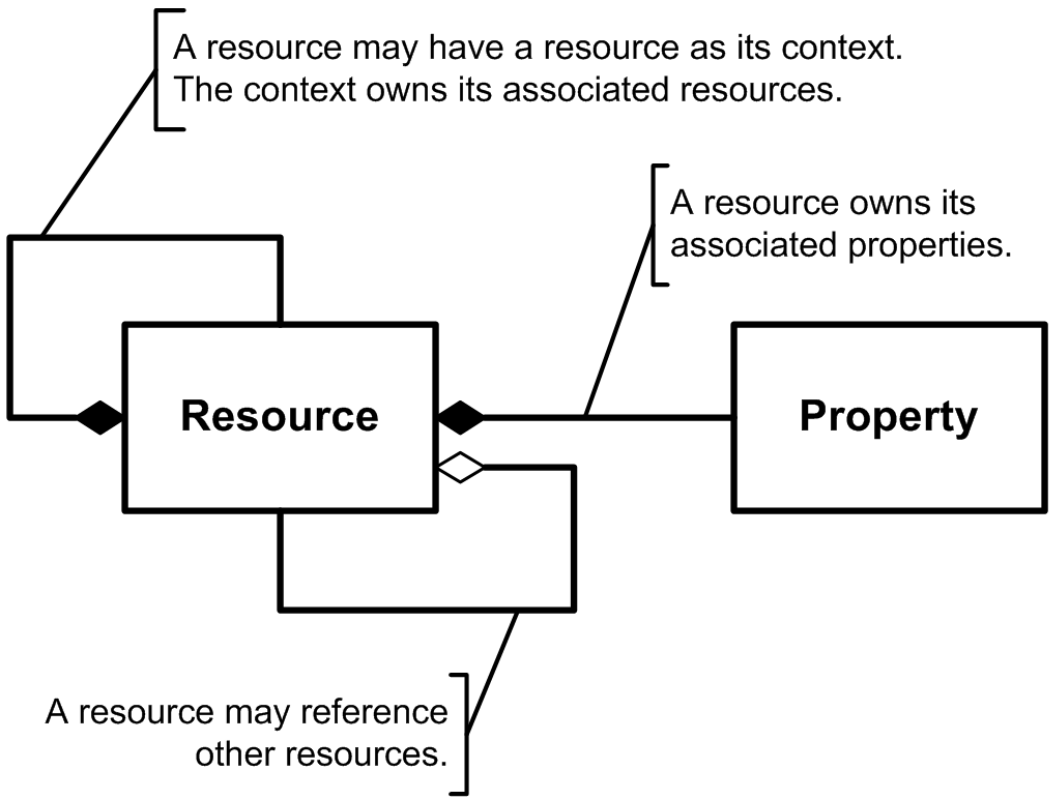
- http://stardat.codenomics.de/historization-and-versioning/getting-started
- run it locally with *mvn clean tomcat7:run*



Outline

Objects either of Type Resource or Property

Implementation Principle: ORP



Objects either of Type Resource or Property

Implementation Principle: ORP

- A property must be associated with only one, owning resource.
- Any object which has Uniform Resource Names is of type Resource.
- Any object which is not of type Resource is of type Property.
- From persistence view Resource is an @Entity, Property is a @MappedSuperClass.

Domain Semantic Objects of Type Resource

Implementation Principle: OSR

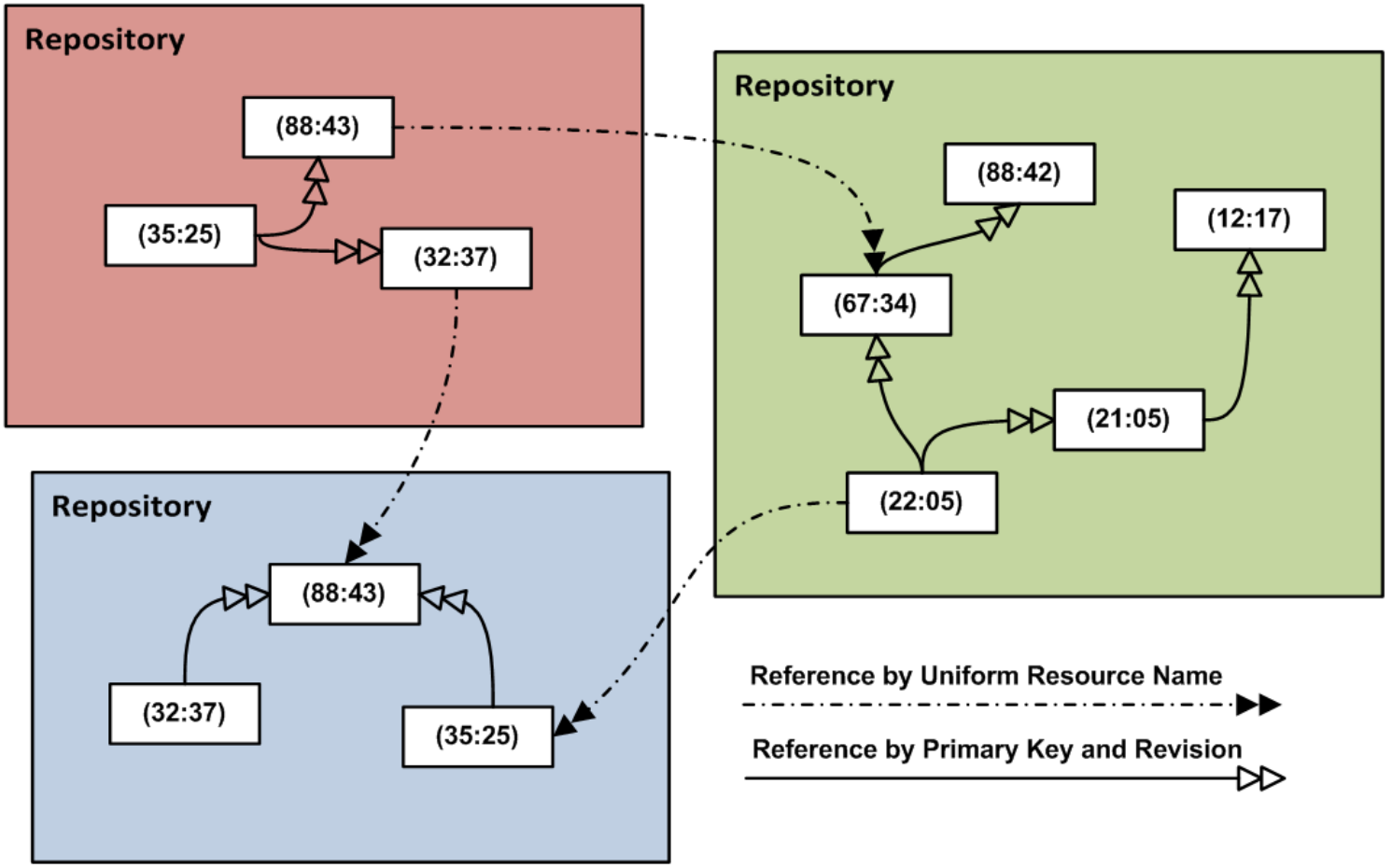
- Distinction of identifiable, versionable, maintainable objects not reasonable
  - ddi31:r:Abstract as identifiable, but never referencable?
- A resource is
  - a doamin object
  - which is maintained by an agency
  - with identity
  - across the whole lifecycle.

Java Class *Resource*

with JPA and Hibernate Envers Annotations

```java
@Audited
@Entity
@Inheritance( strategy = InheritanceType.TABLE_PER_CLASS )
public abstract class Resource implements ChangePropagatable
{
    @Id
    @GeneratedValue( strategy = GenerationType.TABLE )
    private Long primaryKey;

    @Column( columnDefinition = "BINARY(16)" )
    private UUID hashCodeSurrogate;

    @Column
    private long timestamp;

    public abstract Resource getContext();

    // ...

    @Override
    @PrePersist
    public void propagateChange()
    {
        timestamp = RevisionContext.getInstance().getTimestamp();
        if ( getContext() != null )
            getContext().propagateChange();
    }
}
```

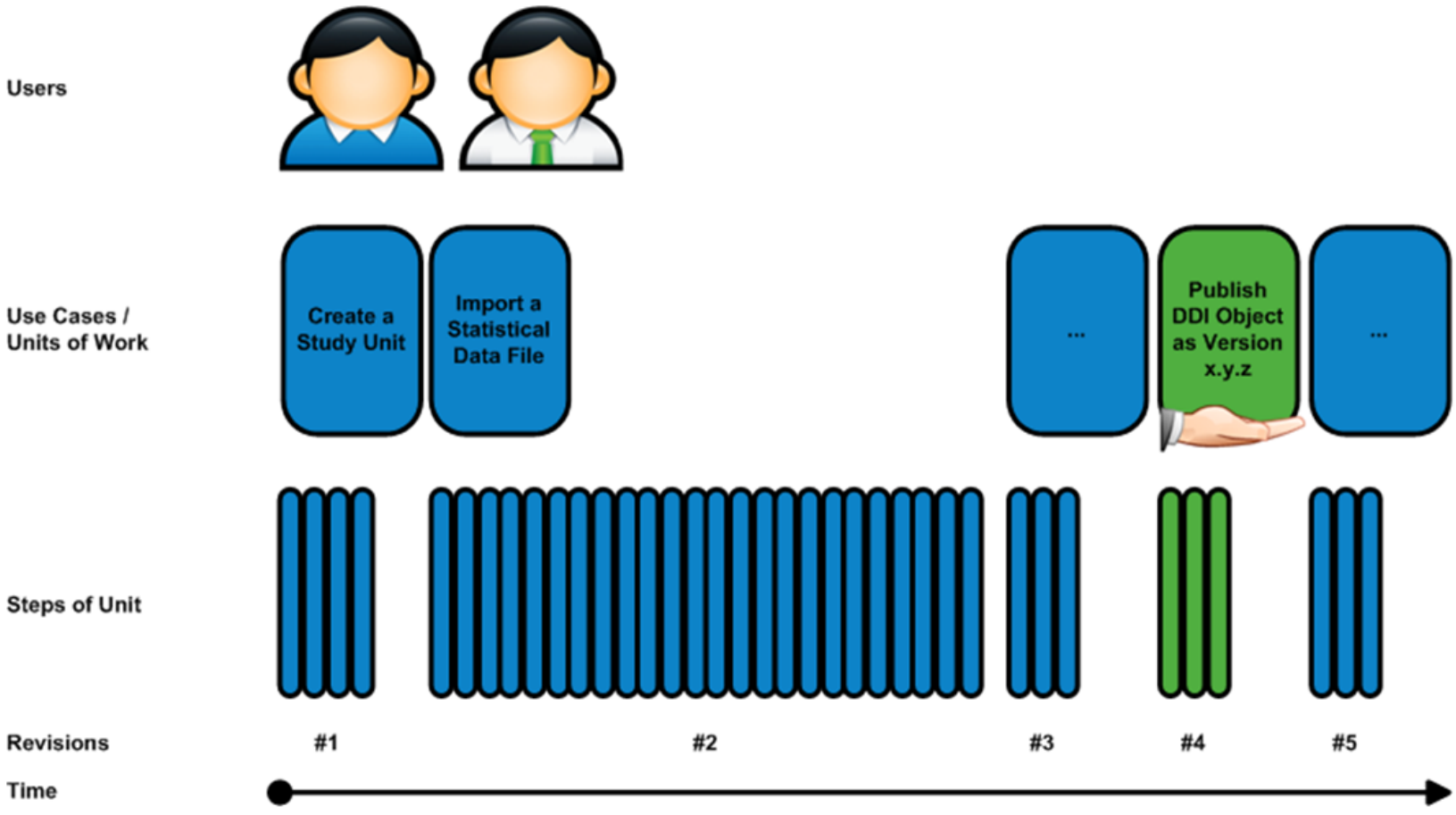
Separation of Int. and Ext. Identification



Separation of Int. and Ext. Identification

- Internal identification
  - Meet technical requirements of persistence technology by primary keys
  - Efficient storage and querying by single-valued, flat identifiers without any semantics
- External identification
  - Meet business requirements of domain by uniform resource names
  - Distributed resolution of multi-valued, hierarchical identifiers with semantics

Separation of Historization and Versioning



Definition: *Historization*

- is the technical process
- to keep track of change
  - which metadata objects changed
  - when
  - why
  - by whom
- within a transaction
- on attribute and relationship level;
- builds the foundation of *Versioning*.

Definition: *Versioning*

- is the business process
- to flag a given metadata object
- at a given revision with a version number
- according to the agency's versioning policy
- if possible with recommendation or automatically.

Note!

- Revision number is a global identifier of repository state.
- Version number is not a property of a metadata class.

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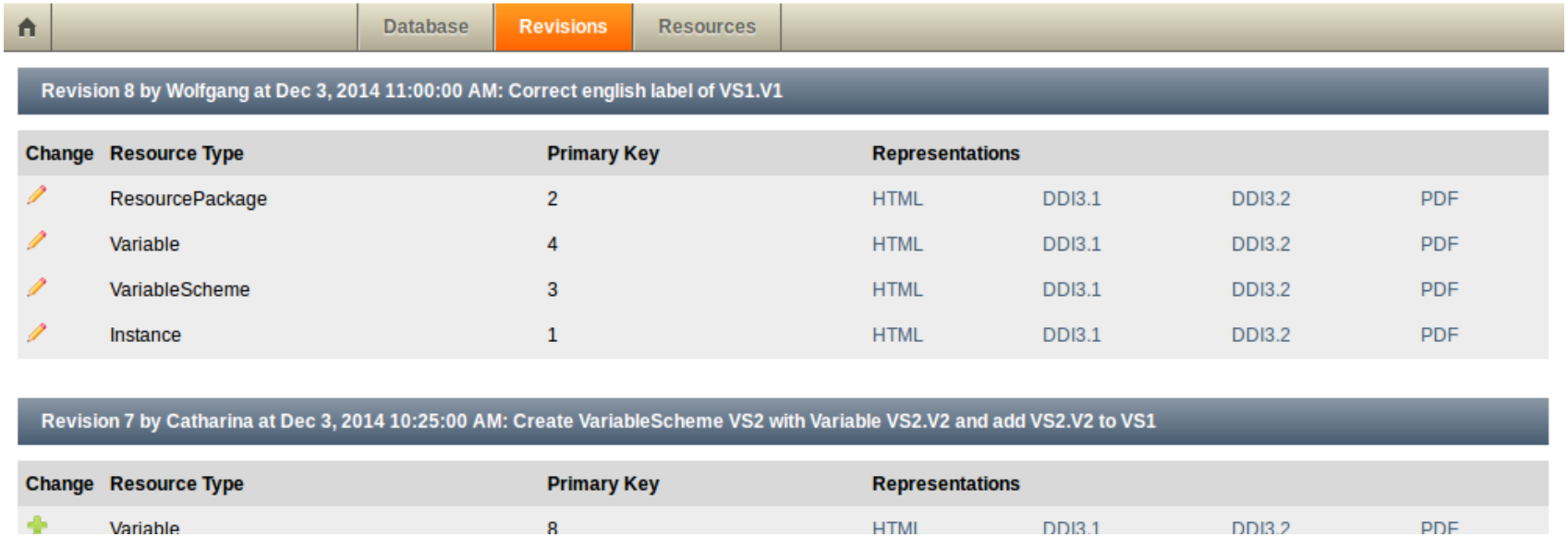
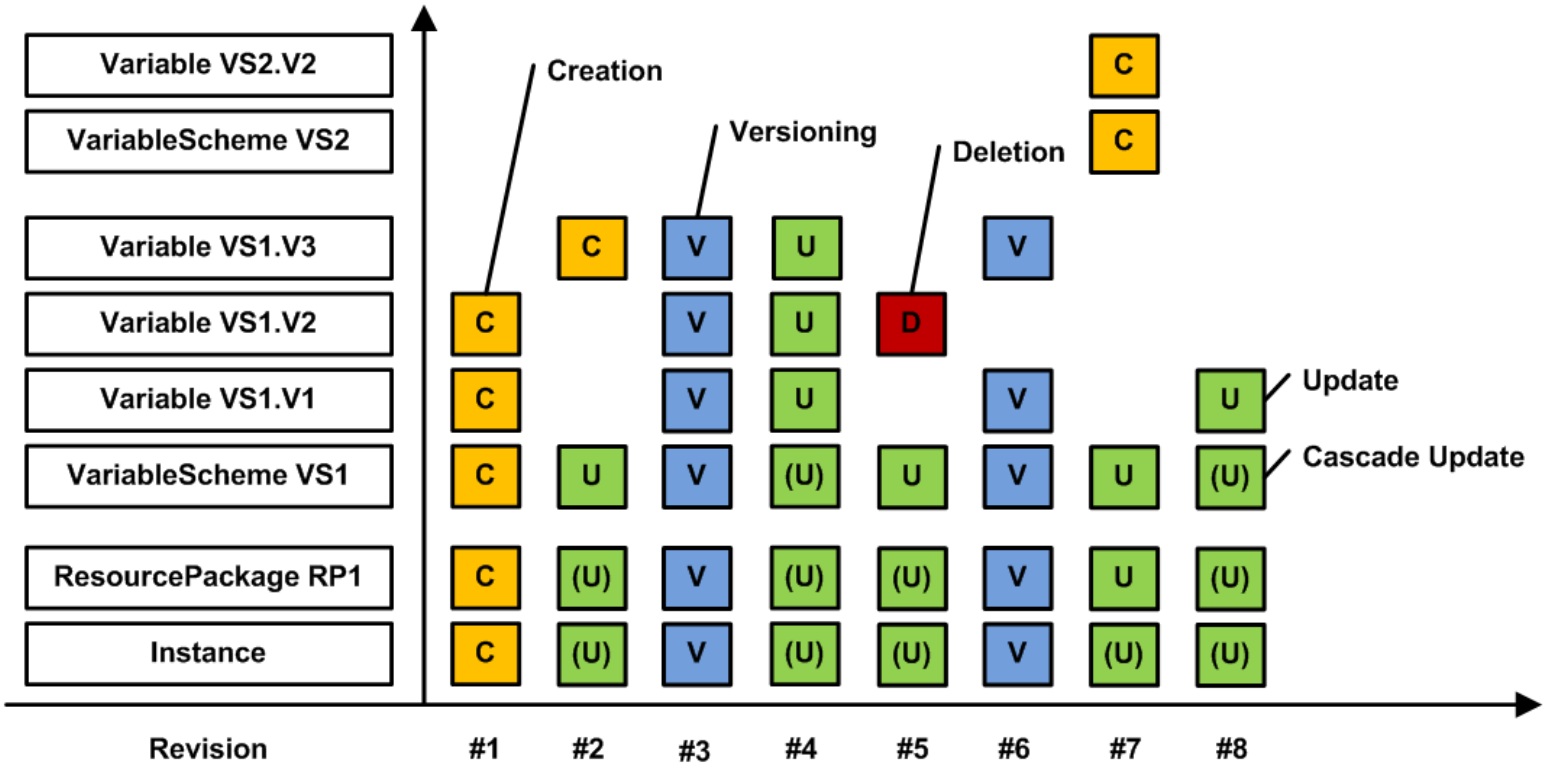


Exercise 2

Reconstruct the historization & versioning show case



Outline

Wrap-up

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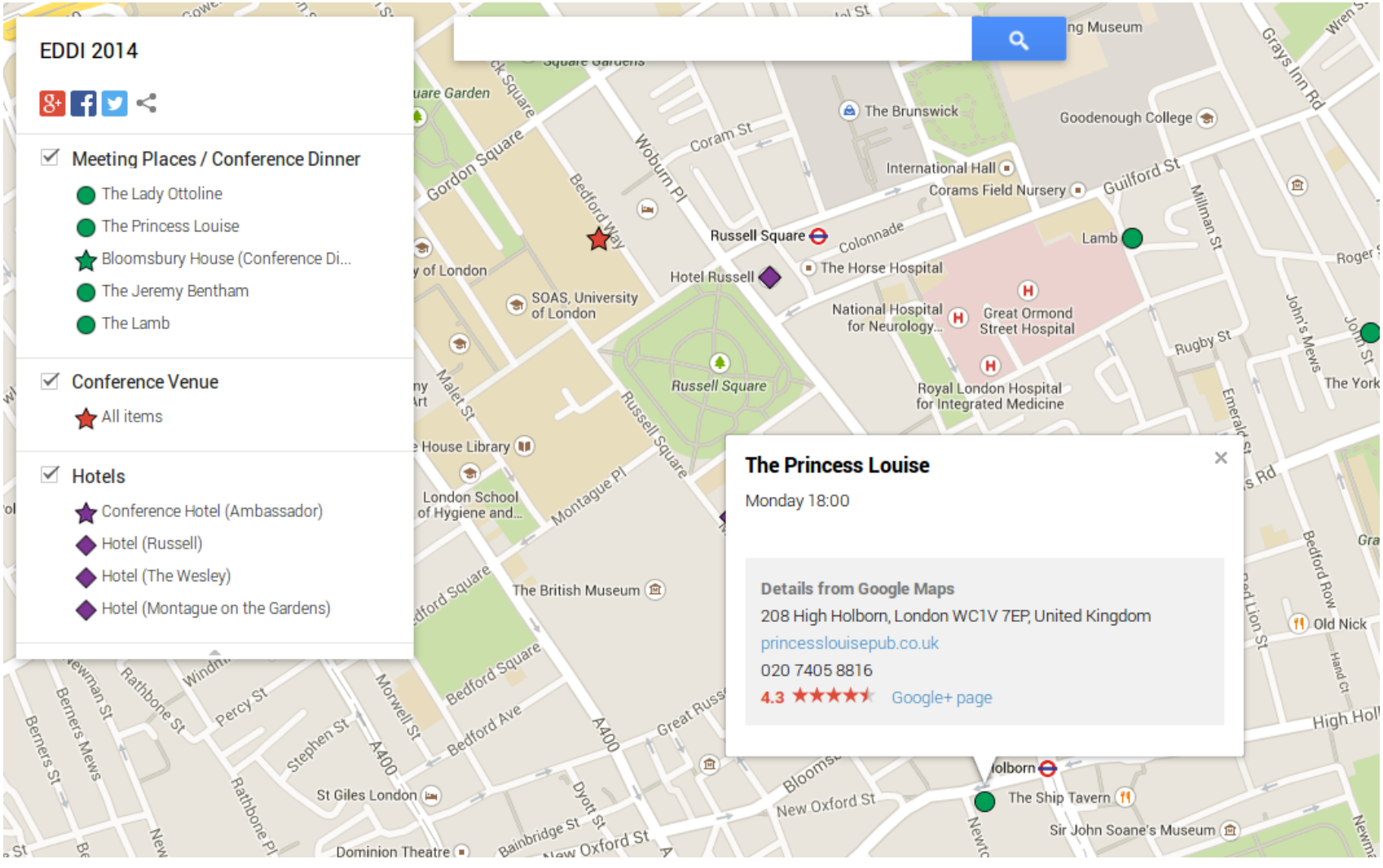
- Introduction into the basic design principles
- First steps to create simple study descriptions in the formats DDI 3.1 and DDI 3.2


EDDI 2014
Meeting Places / Conference Dinner
The Lady Ottoline
The Princess Louise
Bloomsbury House (Conference Di...
The Jeremy Bentham
The Lamb
Conference Venue
All items
Hotels
Conference Hotel (Ambassador)
Hotel (Russell)
Hotel (The Wesley)
Hotel (Montague on the Gardens)
The Princess Louise
Monday 18:00
Details from Google Maps
208 High Holborn, London WC1V 7EP, United Kingdom
princesslouisepub.co.uk
020 7405 8816
4.3
Google+ page
Russell Square
Hotel Russell
The Brunswick
Goodenough College
International Hall
Corams Field Nursery
Lamb
The Horse Hospital
National Hospital for Neurology...
Great Ormond Street Hospital
Royal London Hospital for Integrated Medicine
SOAS, University of London
The British Museum
St Giles London
The Ship Tavern
Sir John Soane's Museum
Old Nick
Dominion Theatre

Thank you!

Enjoy upcoming EDDI!

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