DHBW Mannheim

Evolutionary Student Research Projects in Domain Specific Modelling for an ERP-System with ADOxx

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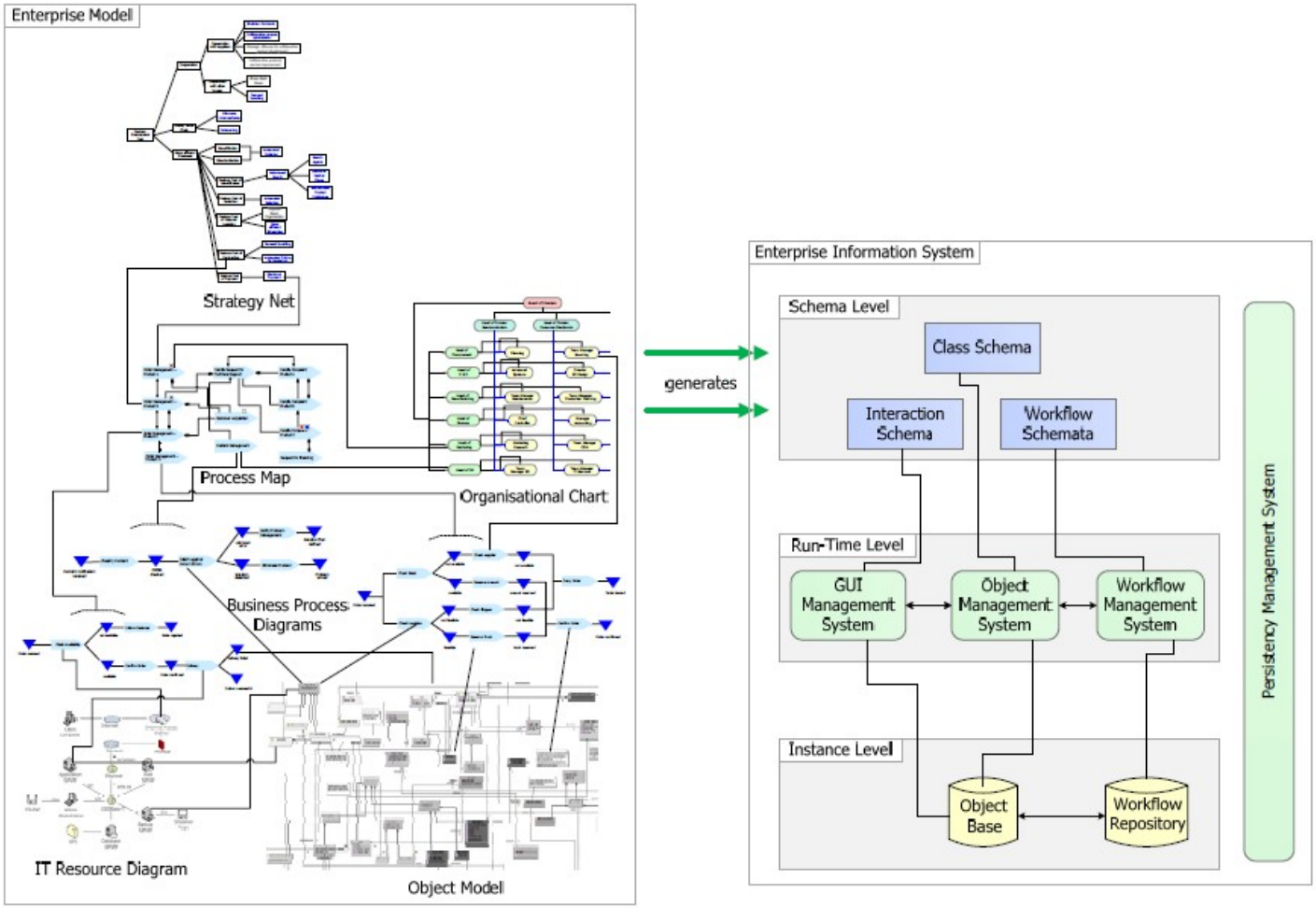
Two perspectives of this research:

- Model-based ERP-configuration
  - modelling methodological aspects
  - IT-system integration
- Challenging innovation project in context of university course
  - student capabilities
  - group and communication dynamics

Vision of the Project



Source: Frank, U.; Strecker, S.: Beyond ERP systems: An outline of self-referential enterprise systems. Information Science Research reports at University of Duisburg-Essen no. 31, 2009 p. 11

Student course projects in business informatics at DHBW:

- Standard projects
  - application of familiar and established technologies
  - focus on integration of full stack of development issues
    - requirements with reconciliation of conflictive goals
    - implementation
    - testing
- Innovative and research oriented projects exceed this, with
  - incorporation of complex relatively new technologies
  - requisite inclusion of ‘new’ knowledge
  - high level of interdependencies

Basic Options for Research:

- Building a complete framework with integrated modelling- and ERP-functionality
  - most interesting from methodological perspective
  - very high effort required
  - more easily transferable to diverse systems

- Combination of existing systems
  - building on rich set of functionality
  - perspective in some aspects limited by chosen systems
  - must accommodate with some peculiarities of systems chosen

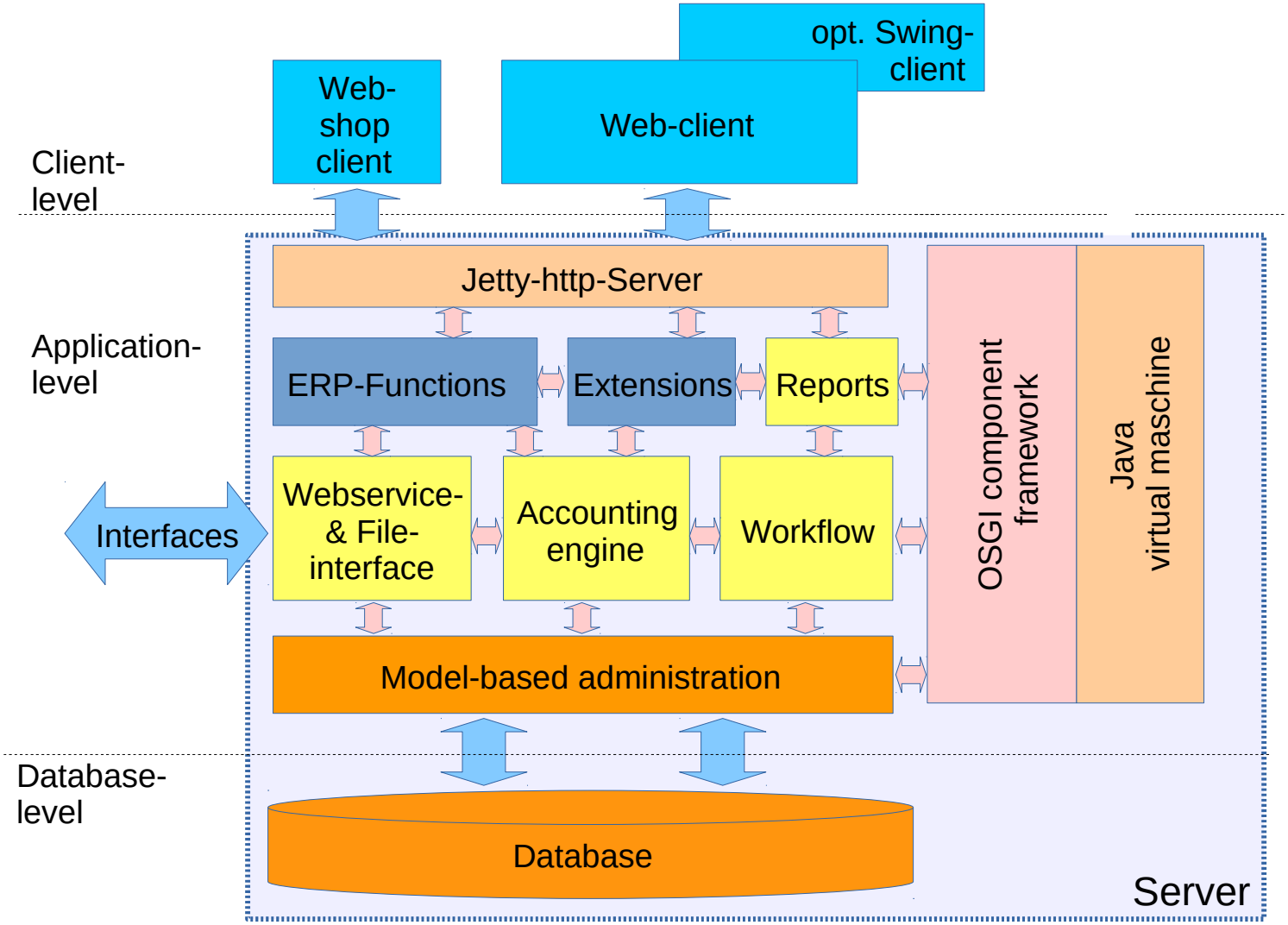
Selection of Suitable Systems for Exploratory Research

- Modelling system - ADOxx
  - definition of high quality graphics
  - adaptive incorporation of custom attributes
  - set of common interfaces

- ERP-system - iDempiere
  - adaptable workflows
  - multi-language and multi-currency features
  - web-services for data exchange
  - available with source-code and documentation freely

iDempiere
Open Source ERP System

Structure of ERP-System iDempiere



Obstacles in the beginning:

- Anticipated problems
  - no complete definition of project goals
  - heterogeneous quality of documentation
  - high demand on abstraction in metamodelling
- Unexpected obstacles
  - systems provided on student laptops not fit for development environment
  - complexity of required XML-processing
  - group size effects on communication and decisions for redirection

Project Organization

Project management team

General

- Guiding project and adaptation

Administration

- Communication and control of current tasks

ADOxx team

Domain-design team

- Symbols for model elements
- Attributes of classes
- Comparison of modelling languages

IT-development team

- Implementation of designed classes
- Supplement of expressions for renaming of classes
- Analysis of XML-interface
- Development of AdoScript routine for data-exchange

iDempiere team

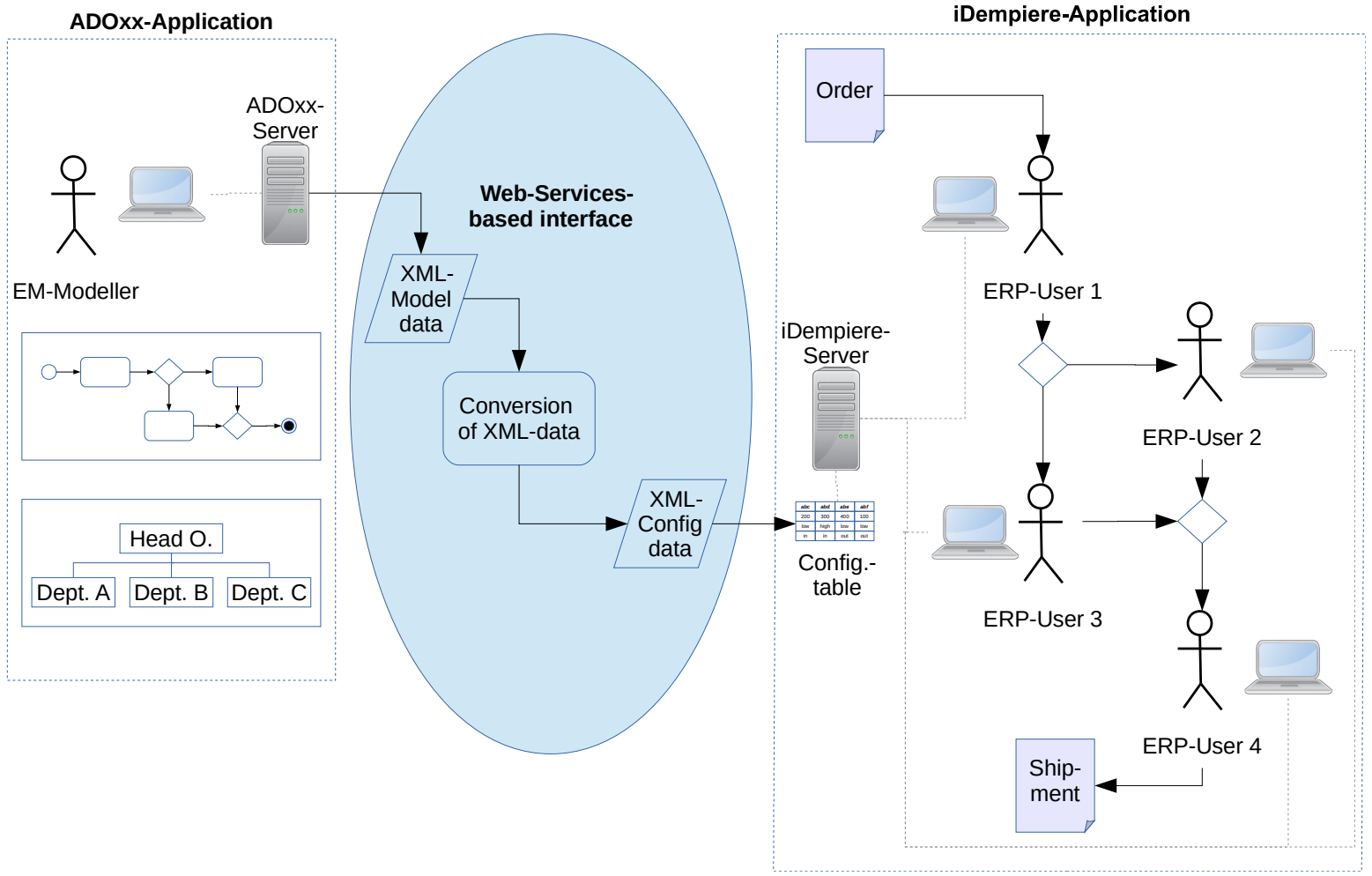
Domain-design team

- Documentation of data structures
- Tests with relevant configuration data

IT-development team

- Transform data for iDempiere Web-services
- Automating the creation of web-services

Overview on model driven configuration of iDempiere with ADOxx



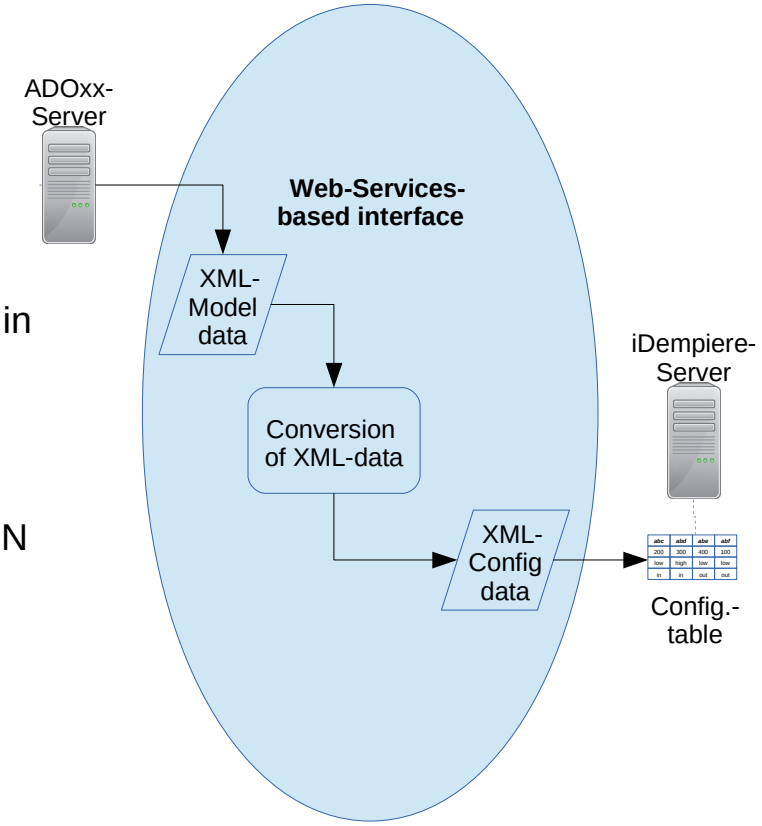
Some details on required XML-conversion etc.

Output of XML from ADOxx

- Inclusion of a dedicated button
- First solution three steps: initiating call, calling and then receiving XML-file
- Some additional elements in output fields

Conversion (part A)

- Translation of XML to JSON



Conversion of model-data (B)

- Filtering of object attributes
  - translation of attribute names
- Automatic configuration of required web-services (to be put aside in 2nd project)
- Translation of relationships
  - query of technical key
  - inclusion in object-data
- Translation to XML

Input to iDempiere

- Ordering sequence of web-service executions
- Assembly of web-service-call and execution
- Processing of results (i.e. technical keys)

Model-based configuration of ERP-systems

First Results for Configuring iDempiere with ADOxx models

- Handling of subtle interdependencies with diverse design options
- Collection and documentation of knowledge on
  - ADOxx- XML-model-data
  - XML-transformation
  - iDempiere web-services
- Standard interfaces adequate for direct transfer
  - ADOxx – model-creation
  - iDempiere – import of model-data
- Student project can produce reusable results for iterative innovation projects

Model-based configuration of ERP-systems

Further Observations, Questions and Ideas

- ADOxx focus on single developers – missing out
  - structuring of different types of classes
  - support for concurrent development missing
  - assisted combination of library fragments areas
- Incorporation of standard web-service ESBs
- Influence of bias on choices of projects
  - technologies for development
  - focus of work options e.g.
    - ADOxx vs.
    - JavaScript routine config. tables
- ...

Reflexive Research

Foundation for numerous successive innovation projects

- Cooperation with companies
  - Effects of size of company
  - Focus in different domains
- Projects interesting base due to provision and active usage of relevant technologies
- Improvement for succeeding projects
- Long list of interesting and demanding features
  - extension to other content areas
  - integrating other goals and bi-directional exchanges

Questions and comments?

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