

Exchange of Performance Assessments between Swiss Education Organisations

Urs Hassler ETHZ, urs.hassler@id.ethz.ch



Project Motivation (1)

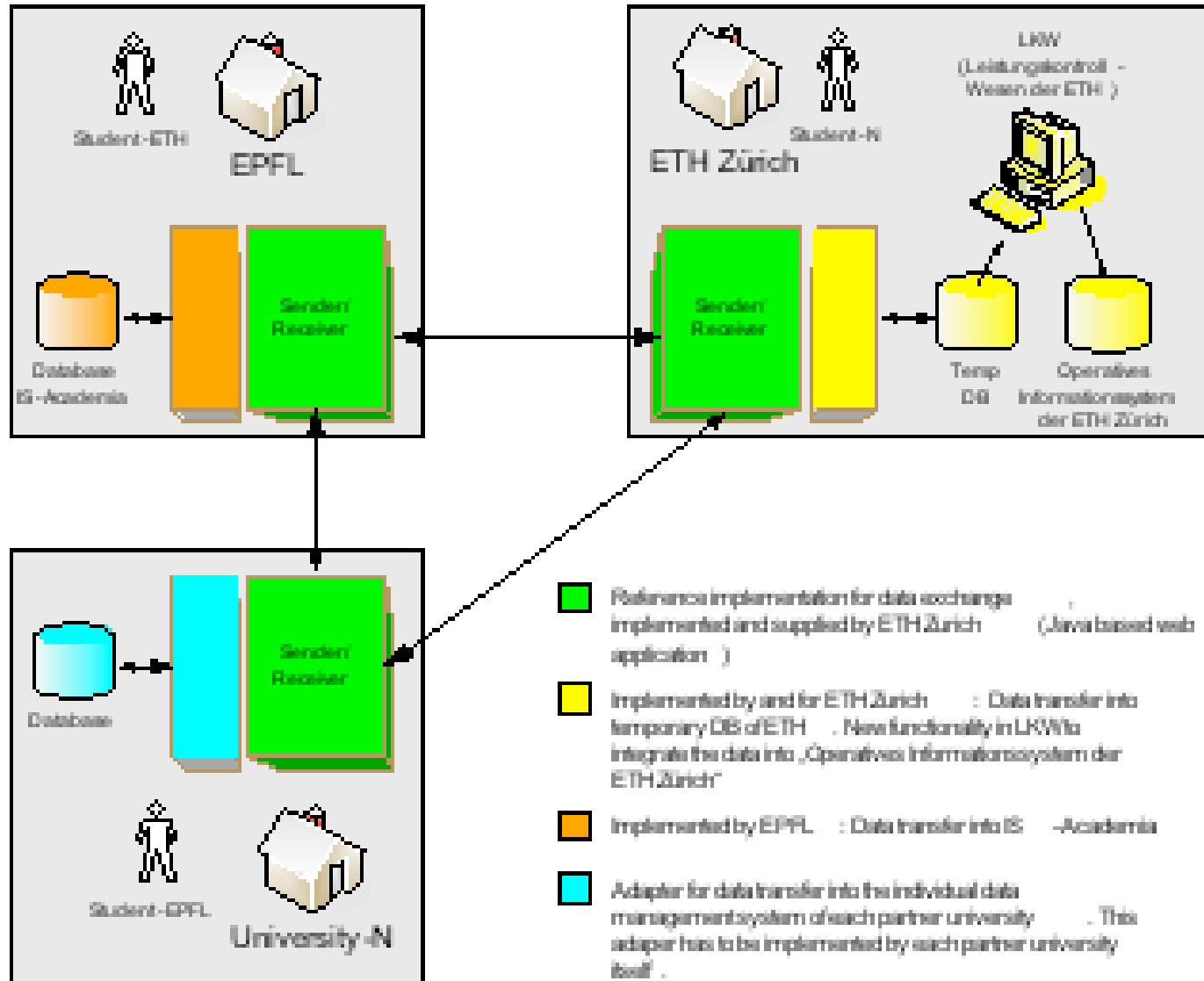
- Students register for a programme at a home university and follow courses at partner university.
 - Joint-master-programs
 - ETHZ – EPFL: Nuclear Engineering
 - ETHZ – UZH: Computational Biology, currently offered as 2 masters with identical programme
 - Exchange students
 - Courses taken at neighbouring universities:
 - EPFL – UNIL, ETHZ – UZH
- Performance assessments will be taken at partner university
- Results must be reported to home university.

Project Motivation: Difficulties

- No standardized way for reporting of grades / results.
- Bilateral agreements on how / when data will be reported.
- Performance assessment often reported by students only in success case.
- Increasing workload in (home and partner) universities due to increasing number of co-operations and due to credit system.
- Errors due to manual interaction, typos.
- Misinterpretation of grades due to different grading systems.

Project Goal

- Define a data structure which allows to identify a performance assessment together with results / grades, credits taken at some university
- Define and implement an electronic exchange platform for documents corresponding to this structure
- Define an API and deliver a reference implementation for integrating the transmitted data into the home university's system.
- Pilot: Implement exchange between EPFL and ETHZ



Data Exchange: Mandatory Message Parts

- Student ID: person who took the performance assessment. (Switch AAI: swissEduPersonUniqueID).
- Performance assessment ID: Identifier for the performance assessment
- Time information: Semester, date of performance assessment.
- Type of performance assessment: Graded? Ungraded?
- First trial? Repetition?
- Sender / receiver universities.
- Result: Passed? Failed?

Data Exchange: Optional Message Parts

- Course units combined in performance assessment (Used in case of ETHZ to derive diploma supplement data).
- Suborganisations which process performance assessment data.
- For graded performance assessments:
Grades together with corresponding grading system.

Data Exchange: Data Format, Valid Messages

- Data format for performance assessments messages (short: PAMs) will be XML
- Structure of message determined by a survey
 - Can received data be integrated in systems of home universities?
 - Can a request for performance assessment data be processed?
 - Common structure on which all participating universities can agree.
- Technical result: XML Schema Definition for Swiss Edu Performance Assessments Messages

XML Schema
PAM.xsd

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">  
  <xsd:element name="performanceAssessmentsMessage" type="SwissEduPAMType"/>  
  <xsd:element name="comment" type="xsd:string"/>  
  <xsd:complexType name="SwissEduPAMType">  
    <xsd:sequence>  
      <xsd:element name="sender" type="SwissEduOrganisation"/>  
      ...  
    </xsd:sequence>  
  </xsd:complexType>  
</xsd:schema>
```

Data Exchange: Communication Protocol

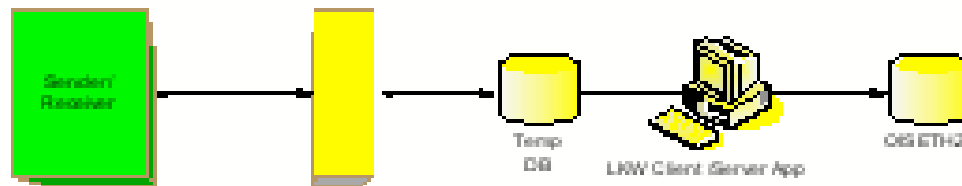
- What operations are needed to handle the functional workflow?
- What requests / notifications will be implemented?
- Should PAMs be sent out when the necessary data are available or should a PAM be requested? Is a hybrid system necessary?
- Determine the state changes on the target system in order to guarantee the completeness of the PAM exchange.
- Exceptions: What technical and functional exceptions will occur?

Data Exchange: Security Aspects

- Exchange of PAMs is highly sensitive
- Confidentiality and message integrity must be guaranteed
 - Application of digital certificates for message signatures, signature verification, encryption and decryption
- Authorisation: Ensure that a home university can only access data of their students at a partner university.

Data Integration: Adapter

- IT infrastructure of participating universities will be inhomogeneous
- An API will be defined which gives access to all service methods and offers methods for data integration into the universities' management systems.
- The API will be implemented by each participating university in order to adapt the system to the specific needs.
- Example: ETHZ



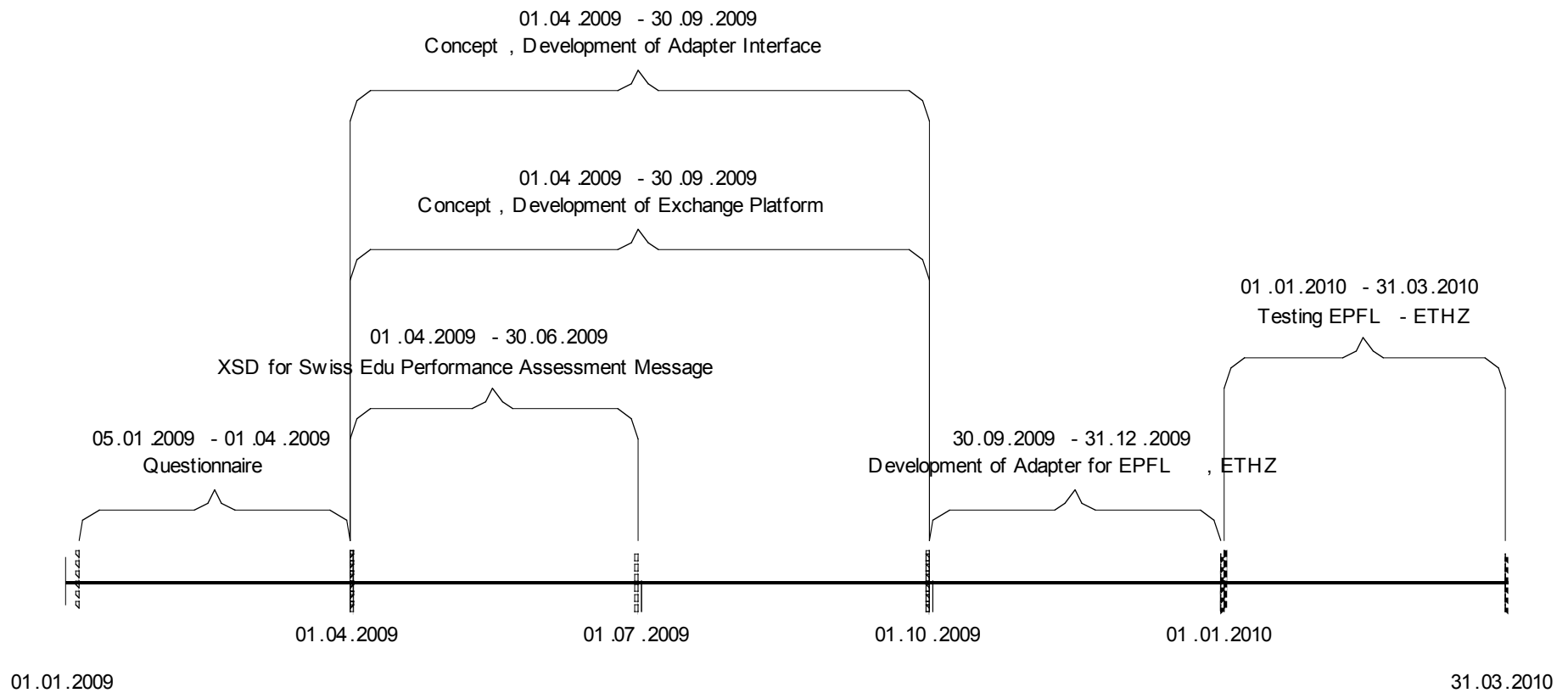
Data Integration: Adapter (2)

- Issues in the design of the adapter:
- Technical issue: Define an API so that all interested universities can be attached to the exchange platform.
- Control that the data are sent / received and processed only once.
- Guarantee the correct processing of correction messages
- How can accounting of performance assessments be implemented in a general way? Currently this knowledge is local to departments / faculties.

Pilot EPFL - ETHZ

- Exchange platform will be implemented by ETH Zurich as a webservice run on a Java EE 5 application server.
- Adapter ETHZ: Implementation of integration API for the purposes of ETHZ, realised by ETH Zurich.
 - Data received must be stored in a temporary database for further processing within ETHZ by a back office application.
 - Data requested must be transformed into the data format which can be processed by the exchange platform.
- Adapter EPFL: Implementation of interface with its management system IS-Academia studies, realised by EPFL.
- Test: The data exchange process will be tested with ETHZ students studying at EPFL and vice versa.

Project Schedule



Project Monitoring

- Acceptance of resulting platform depends on the dataset that all participating universities must agree on.
- Desirable: All universities describe their requirements on a performance assessments message which can be processed and integrated into their IT Systems.
- Universities in monitoring group:
 - University of Basel
 - University of Lausanne
 - University of Zurich
 - EPFL
 - ETHZ
 - Universities of applied sciences