

# 1st Meeting work-group AP 2.2: Interoperability

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Berlin, 2nd February 2012



## Agenda

- 1 Round of introduction
- 2 Introduction to IANUS
- 3 Short presentations of interoperability scenarios and approaches
- 4 Discussion: „Interoperability“ in the context of a research data centre
- 5 Constitution of subgroups
- 6 Subgroup work
- 7 Final discussion



## 1. Round of Introduction: Members of the working-group

- Hans-Georg Becker – University Library, TU Dortmund
- Kai-Christian Bruhn – i3mainz, FH Mainz
- Gregory Crane – Perseus Digital Library, Tufts University Boston
- Frank Förster – Graduate school for Landscape Archaeology, Uni Kiel
- Reinhard Förtsch / Robert Kummer – CoDArchLab, University Köln
- Reiner Göldner – Landesamt für Archäologie in Sachsen, Dresden
- Günther Görz – Lehrstuhl für Informatik, Universität Erlangen-Nürnberg
- Irmela Herzog – Amt für Bodendenkmalpflege, Bonn
- Leif Isaksen / Tom Brughmans – University Southampton
- Eric Kansa – OpenContext - Project, University of California/Berkeley
- Wibke Kolbmann / Matteo Romanello – DARIAH, DAI Berlin
- Jens Ludwig – State and University Library, Göttingen
- Allard Mees / Guido Heinz – Römisch-Germanisches Zentralmuseum, Mainz
- Michael Merkel / Karthrin Mertens - Helms-Museum Hamburg
- Frank Schwarzbach – Lehrstuhl für Geoinformatik, HTW Dresden
- Rainer Simon – AIT Austrian Institute of Technology, Wien
- Regine Stein – Fotoarchiv, University Marburg
- Arne Weiser – Lehrstuhl für Grabungstechnik und -dokumentation, HTW Berlin



## 2. Introduction to IANUS

### IANUS Research Data Centre for Archaeology and Ancient Studies

German Archaeological Institute – Deutsches Archäologisches Institut (DAI)



Universität zu Köln

DFG - working-group



Stiftung  
Preußischer Kulturbesitz

NIEDERSÄCHSISCHE STAATS- UND  
UNIVERSITÄTSBIBLIOTHEK GÖTTINGEN



Christian-Albrechts-Universität zu Kiel



Curt-Engelhorn-Zentrum Archäometrie gGmbH  
An-Institut der Universität Tübingen



berlin-brandenburgische  
AKADEMIE DER WISSENSCHAFTEN

**Foundation:** Members of the seven working-packages from different institutions

## Outlining the present situation

Modern research in Ancient Studies and Archaeology is faced with a growing amount of data, which in many cases is

- » produced by **different, thematically interrelated disciplines** like archaeology, philology, anthropology, ancient history, geography, archeobiology
- » owned by and kept in **heterogeneous infrastructures** and projects like museums, universities, academies, national cultural bodies and research institutions
- » stored with **various technical formats, metadata standards**, archiving problems and legal issues
- » stuck in **local systems and thus not interoperable** and accessible for other humans and machines
- » **lacking a sustainable storage and archiving strategy**





## Envisaging a possible future

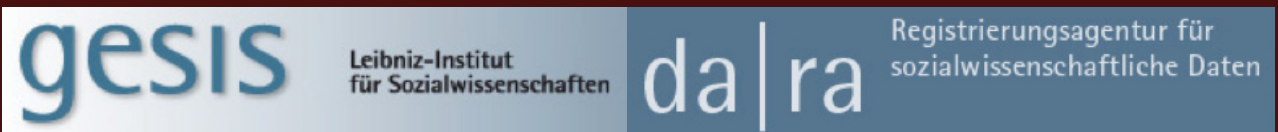
The national centre, supported by the relevant scientific community in Germany, takes care about all the archaeological data in Germany to guarantee:

- » support for old and new projects
- » long term preservation
- » dissemination of and easy access to all kind of data
- » inter-connectivity and interoperability
- » transparent documentation

## Existing exemplary centres



**GeoDatenZentrum**  
Zentraler Geodatenservice für amtliche Geobasisdaten





## Working Packages (APs)

**AP1 – Data-Infrastructure:** Evaluation of existent (research-) infrastructure and software-solutions under a technical, generic and subject-specific point of view.

**AP2 – Interoperability:** Evaluation of existent services and interfaces for data-migration, -standardisation and -communication under a technical point of view and a semantic analysis of the different meta-data-models, -standards and controlled vocabularies.

**AP3 – Community-Building:** Finding a way to integrate all the heterogeneous groups, subjects and different institutional stakeholders within the German archaeology to guarantee a broad legitimation of the centre.

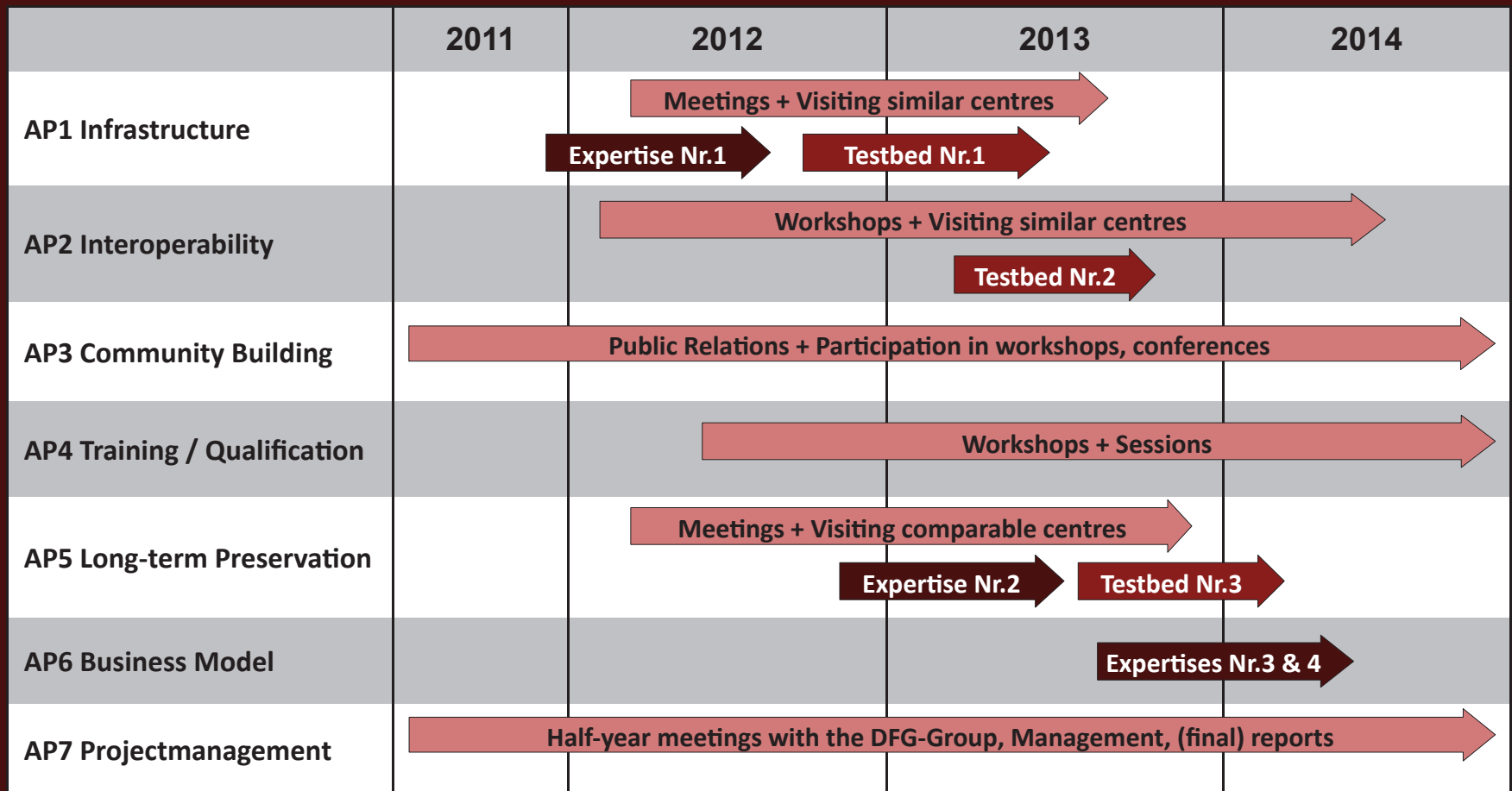
**AP4 – Teaching:** Evaluation of how the centre could deal with the gap between educational qualification and the requirements of the working environment by handling digital data.

**AP5 – Long-term preservation:** Evaluation of different concepts for long-term data preservation, embedding, generating and processing data and how the data should be structured, delivered and at least documented.

**AP6 – Business model:** Analysis of possible organisational forms for the centre, evaluation of the legal condition of data-generating, special copyright restrictions and the limits of (inter)national preservation orders. Examining how the service level agreements should be organised.



## General Roadmap







## Working Package 2: Interoperability – technical perspective

### Evaluation of

- different file formats
- tools/services für data migration processes
- interfaces and protocols for communication / data exchange

### Discussion of the relevance of existing solutions/concepts

- OASIS and OAI-PMH
- XML-initiatives (e.g. GML, TEI)
- semantic web languages (e. g. OWL, RDF)
- persistent identifiers (e.g. URN, DOI, Handle)
- vocabularies (e.g. SKOS, thesauri, gazetteer, taxonomy, tagging)
- Linked Open Data



## Working Package 2: Interoperability – semantic perspektive

### Metadata-models

- Dublin-Core
- CIDOC-CRM
- AdeX
- MuseumDAT
- CDWA Lite
- LIDO
- MODS
- CCO/Cataloging Cultural Objects
- FRBR
- ArcheoML
- International Core Data Standard for Archaeological Sites and Monuments
- ...

### Vocabularies / Thesauri

- Begriffssystematiken in der Museumsdokumentation
- Gemeinsame Normdatei [GND]
- Virtual International Authority File [VIAF]
- Iconclass
- The Getty Art & Architecture Thesaurus [AAT]
- The Getty Thesaurus of Geographic Names [TGN]
- Geonames
- ...



## Working Package 2: Aims, actions and schedule

### Aims

- reports with precise recommendations and action-plans for implementation
- naming existing deficits / problems IANUS has to address
- definition and realisation of testbeds to test usability and workflow of interoperability scenarios

### Actions

- five meetings of the whole working-group until beginning 2014
- work in 3-5 subgroups
- Testbed, i. e. prototype programming for selected specific tasks / services as proof-of-concepts

Thema	2011				2012											
	Sept	Okt	Nov	Dez	Jan	Feb	März	April	Mai	Juni	Juli	Aug	Sept	Okt	Nov	Dez
Interoperabilität																
AP2.1 (Del)				DEL-1			DEL-2		DEL-3		DEL-4		B			
AP2.2 (AG + T)					AG-1							AG-2				

Thema	2013												2014				
	Jan	Feb	März	April	Mai	Juni	Juli	Aug	Sept	Okt	Nov	Dez	Jan	Feb	März	April	Mai
Interoperabilität																	
AP2.1 (Del)																	
AP2.2 (AG + T)	AG-3						AG-4	T				AG-5				B	



### 3. Short presentations of interoperability scenarios and approaches

3.1 Leif Isaksen (Electronics and Computer Science, University of Southampton)

Archaeology and the semantic web (PhD)

3.2 Kai-Christian Bruhn (Geoinformatics & Surveying, University of Applied Science Mainz)

Interoperability in Geo-Sciences: The OGC and the INSPIRE-Initiative

## Coffee-break





## 3. Short presentations of interoperability scenarios and approaches

### 3.3. Reiner Göldner (State Office for Archaeology, Dresden)

The ADeX-Format of the Association of State Archaeologists of Germany

### 3.4 Regine Stein (Bildarchiv Foto Marburg, Marburg)

Lightweight Information Describing Objects: Contributing Content to Cultural Heritage Repositories

### 3.5 Matteo Romanello (DARIAH-DE at DAI, Berlin)

Interoperability in DARIAH-DE



### 3. Short presentations of interoperability scenarios and approaches

3.6 Simon Rainer (Austrian Institute of Technology, Wien)

PELAGIOS - Interlinking Ancient World Research Resources Through Place

3.7 Wibke Kolbmann (DARIAH-DE at DAI, Berlin)

The Levels of Interoperability in Europeana

3.8 Günther Görz (Computer Science/ Artificial Intelligence, University of Nürnberg-Erlangen)

The WissKI Scientific Communication Infrastructure

## Lunch







## 3. Short presentations of interoperability scenarios and approaches

### 3.9 Guido Heinz (Römisch-Germanisches Zentralmuseum, Mainz)

Interoperability scenarios and approaches. Related Projects at RGZM

### 3.10 Michael Merkel (Helms-Museum, Hamburg)

Related IT-Projects at the Helms-Museum Hamburg



## 4. Discussion: „Interoperability“ in the context of a Research Data Centre

### Definition of the terms „interoperability“ resp. „data integration

„Interoperability can be defined as: the ability of the systems, procedures and culture of an organisation to be managed in such a way as to maximise opportunities for exchange and re-use of information, whether internally or externally“. (ATHENA WP3)

„Das Ziel der Informationsintegration: Der Zugriff auf eine Reihe bestehender Informationssysteme soll durch eine zentrale, integrierte Komponente mit einer einheitlichen Schnittstelle für Anwender und Anwendungen erleichtert werden“ (U. Leser – F. Naumann, Informationsintegration (2008))



## Different perspectives and approaches depending on ...

... structural properties:

- technical (Dateiformate, Datenmodelle, Schnittstellen, Anwendungen, (Web-)Services)
- semantic (Metadaten, Datenschema, kontrollierte Vokabulare)
- legal (Gesetze, Bestimmungen, Gebühren)
- institutional (Museen, Akademien, LDA, Universitäten, Archive, etc.)

... workflows / data life cycles:

- data production or collection
- short-term storage
- analysis
- long-term preservation
- publication and dissemination
- re-use

... data types and contents:

- representations of physical objects
- texts / written sources
- geoinformation
- administrative data
- natural scientific data
- statistics



## Heterogenous data within IANUS due to ...

... generic differences:

- Complex, interwoven project archives (e.g. of field surveys, excavations, geophysical prospection, building history, restauration, etc.)
- self-contained lists and databases (e.g. site indices, public monument records, cultural heritage lists, institutional inventories)
- documentation or catalogues of dissertations / thesis
- retrodigitised archive material

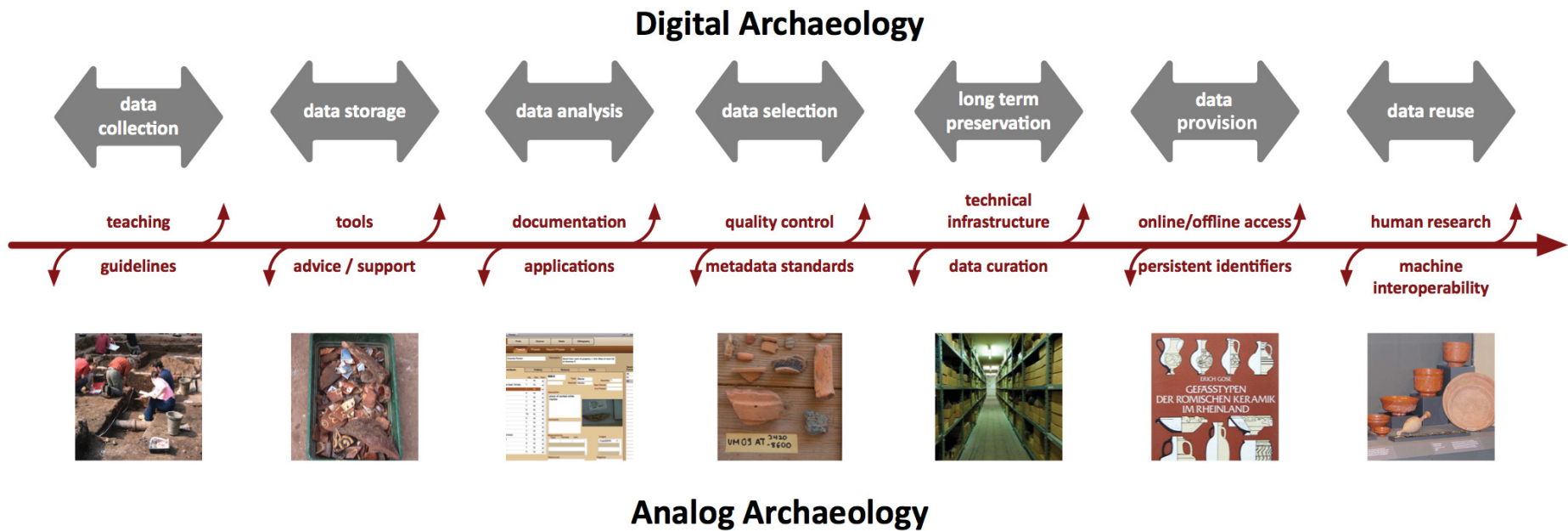
.. different stakeholders:

- Individual researchers
- collaborative projects, possibly international
- Institutions
- companies

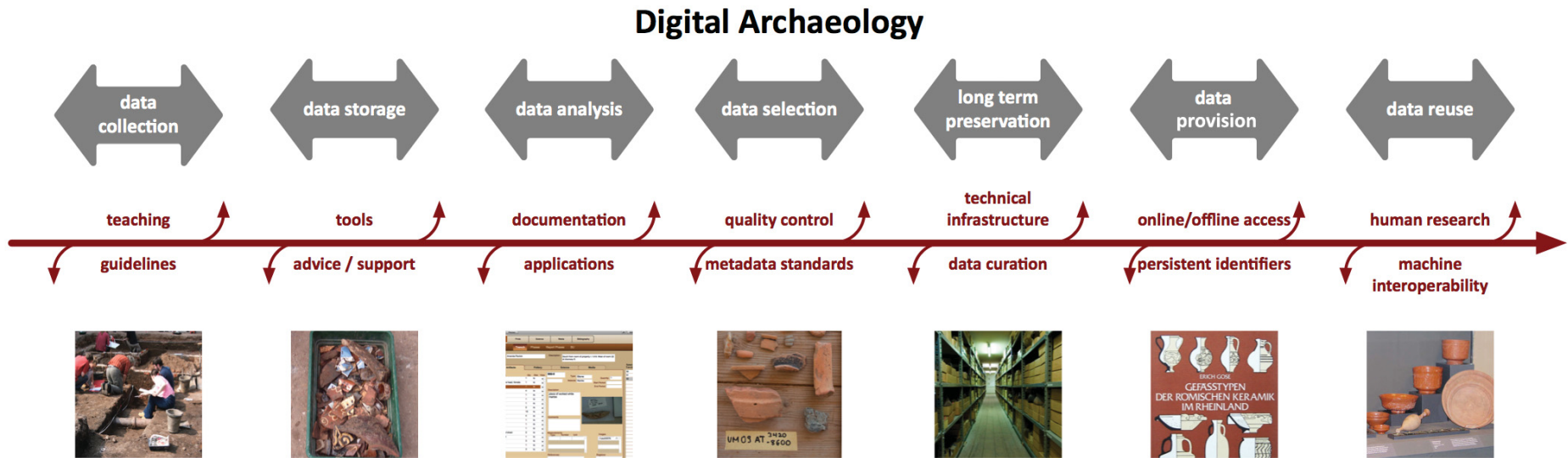
... different entities:

- data collections consisting of heterogenous files (e. g. whole project archives)
- single files / documents (e. g. photos or drawings documenting one or several objects)
- single instances in structured systems (e.g. databases, lists, spreadsheets, polygons)
- Independent external web-resources

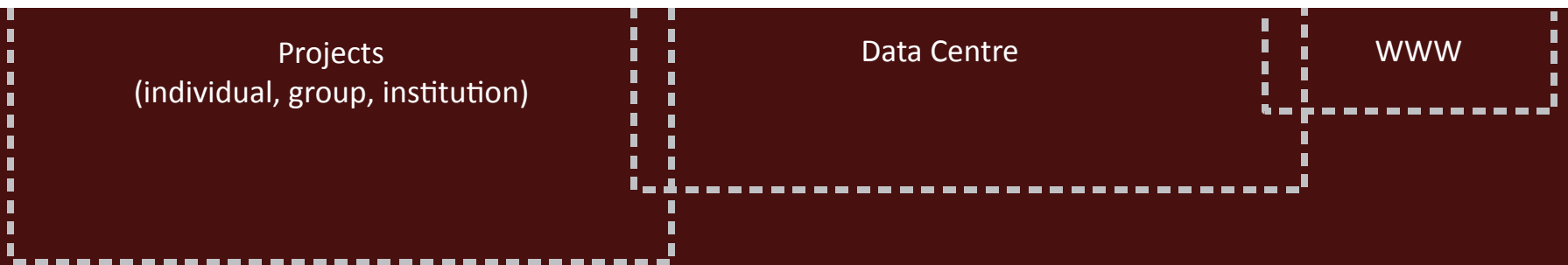
## Data-Workflows in Archaeology



## Data-Workflows in Archaeology



### Analog Archaeology





## 4.1 Interoperability / Data Integration within projects

Challenges to address are the exchanges between different ...

- data resources
- applications and IT-Systems
- data models, concepts and methods
- users
- terminology

→ Possible Tasks for IANUS:

Best-practice-guides and guidelines, recommendations and support, development and distribution of tools, teaching and training



## 4.2 Interoperability / Data Integration within a research data centre

Challenges to address are ...

- convenient access to heterogenous data resources
- harmonisation of different data modells
- defining / translating controlled vocabularies
- creation of metadata
- strategies for the information retrieval

→ Possible Tasks for IANUS:

data control, schema mapping, data migration / transformation, standardisation of terms, realisation of ontologies, programming Interfaces





## 4.3 Interoperability / Data Integration with external data providers/users

Challenges to address are ...

- the dissemination of static and/or dynamic data
- the dissemination of information via web-portals
- the dissemination of information via web-services
- the provision of references to resources

→ Possible Tasks for IANUS:

harmonisation of standards (semantic, technical), provision of persistent identifiers, interfaces for web-services

## Coffee-break





## 5. Work in Subgroups

Possible subgroups according to ...

... content providers and data life cycle:

Project (individual / group / institution) – data centre (internal) – data centre (external)

... technical and semantic issues:

file formats – data models – metadata catalogues – controlled vocabularies – persistent identifiers – interfaces

... content:

fotos & drawings – databases – geoinformation – written sources – natural sciences

... workflows:

documentation – analysis – data ingestion – information retrieval – data dissemination / reuse



## 6. Final discussion

Further steps

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