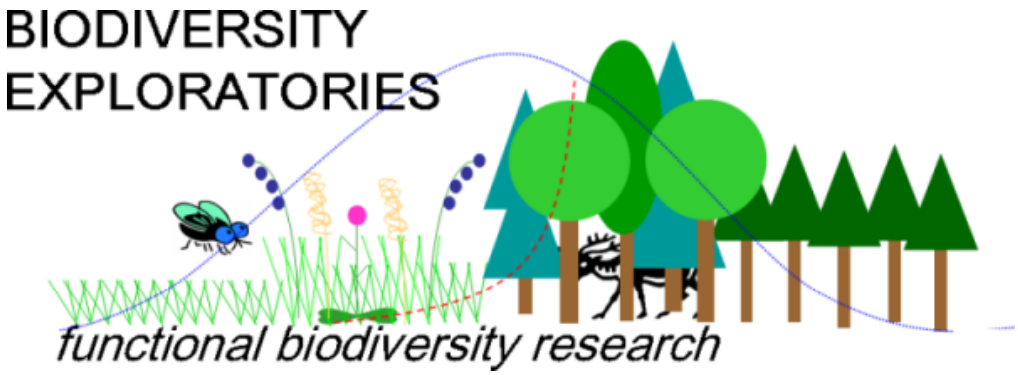

Data Management

Calin Arens

Dennis Heimann

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functional biodiversity research

Outline

- Background
- Information System Requirements
- Database Model
- Architecture
- Integrating other data sources
- Outlook

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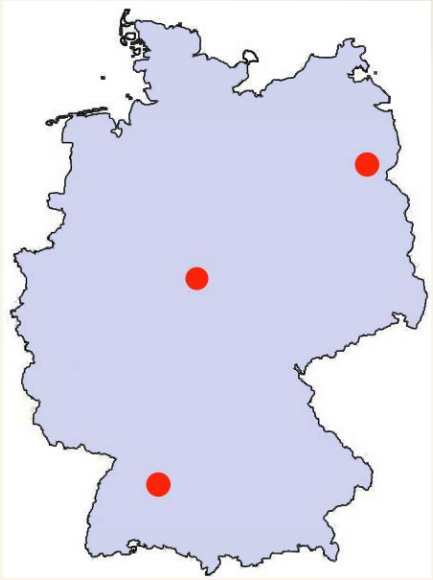
Background

- Answer critical questions about changes in biodiversity and the impact of those changes for ecosystem processes

- Three large-scale and long-term research sites → the Exploratories
  - Biosphere Reserve Schorfheide-Chorin
  - National Park Hainich
  - Biosphere Reserve Schwäbische Alb

- 1000 plots per Exploratory



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Background

- Network of several working groups
  - heterogenous data (spatial, temporal, …)
  - Additional informations (Metadata, Publications, …)
- Long-term perspective Project
  - method change
  - people change
  - …

➡ an effective and unified way of data storage, access and exchange is needed

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Information System Requirements

- Support of international standards (GBIF, BioCase, …)
- Satisfy interdisciplinary requirements
- Problem-oriented data merge
- Browse, query, extract data (shape, CSV, XML, ABCD, Darwin-Core)
- Statistical treatment of data, automatic calculation of secondary data (e.g. mass per hectare)
- Georeferenced Maps, Services (WMS, WFS, KML)
- Metadata

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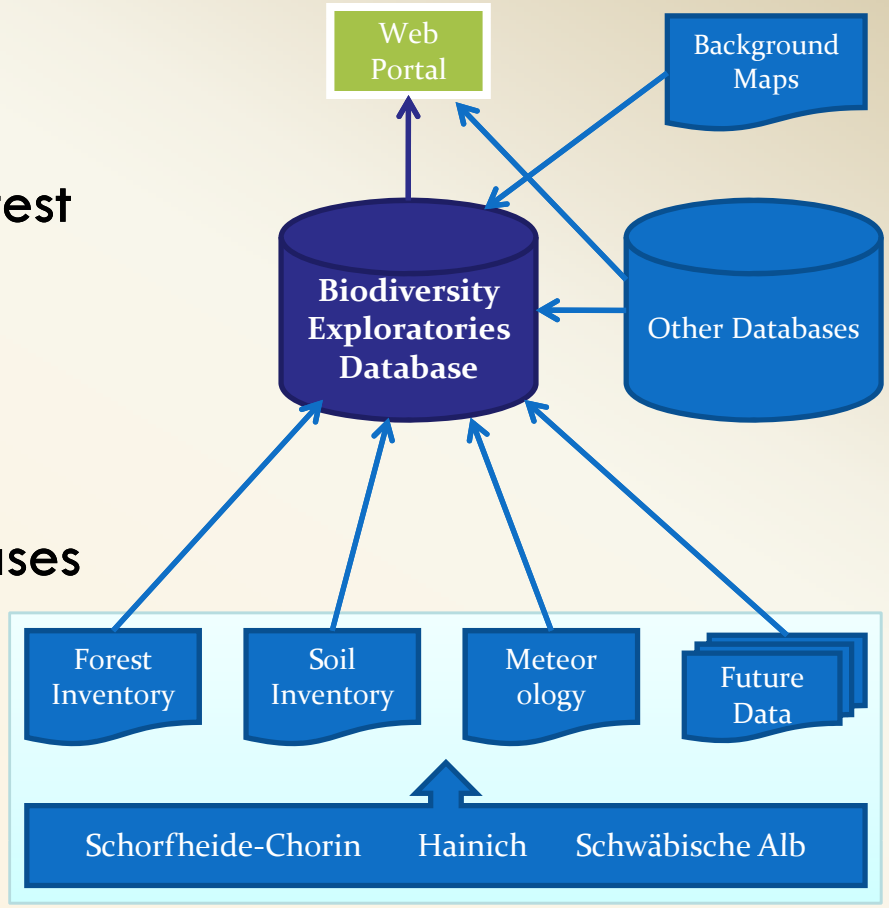
Information System Requirements

- Public and restrict data → User Rights Management
- Data Entry
  - Data upload
  - Automatic plausibility/quality test
    - Scientific name checking
    - Range, format checking
- Interoperability
  - Integration of/to other Databases
  - Scientific Name Server,
    BGC Research DB, …



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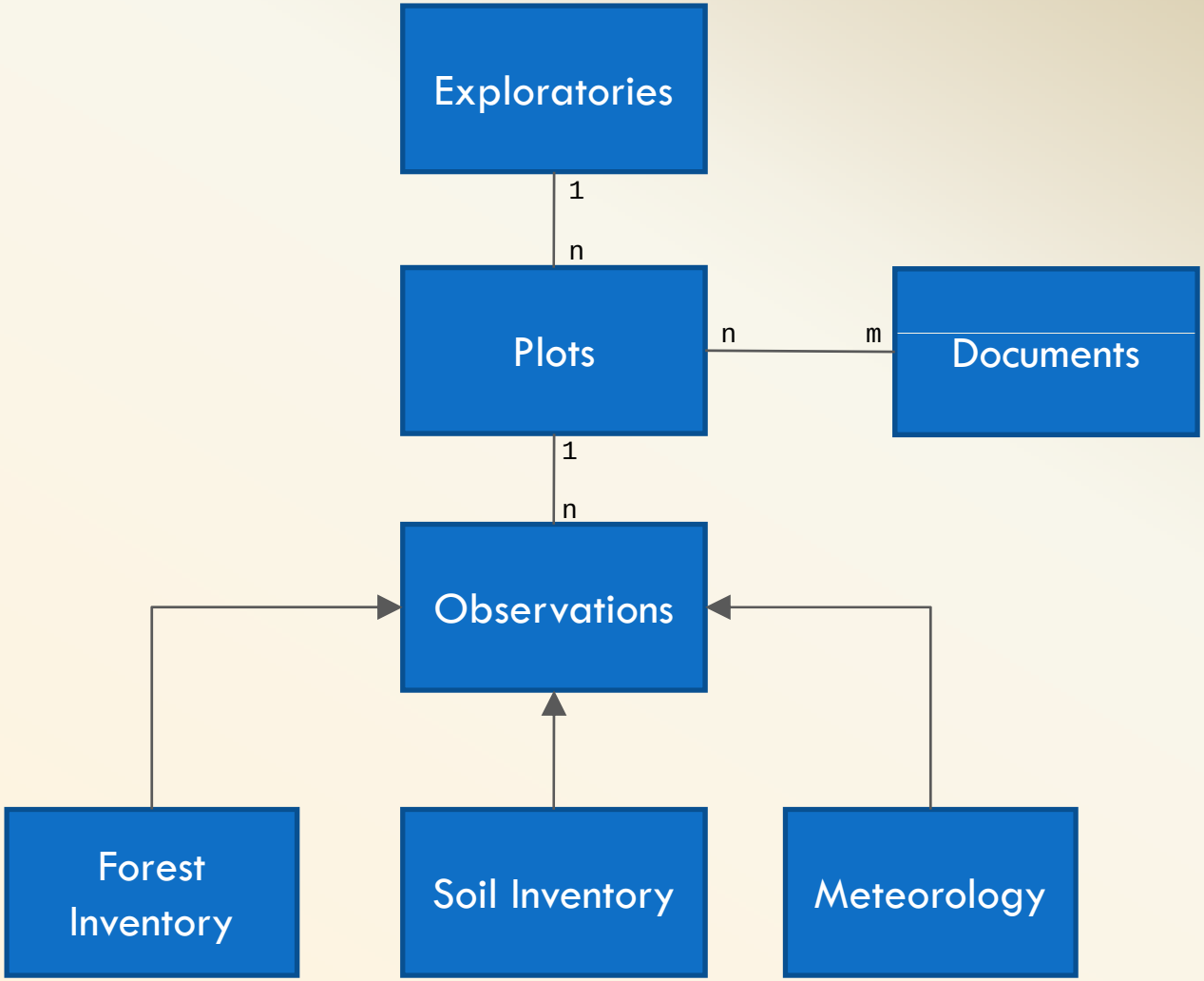
Database Model



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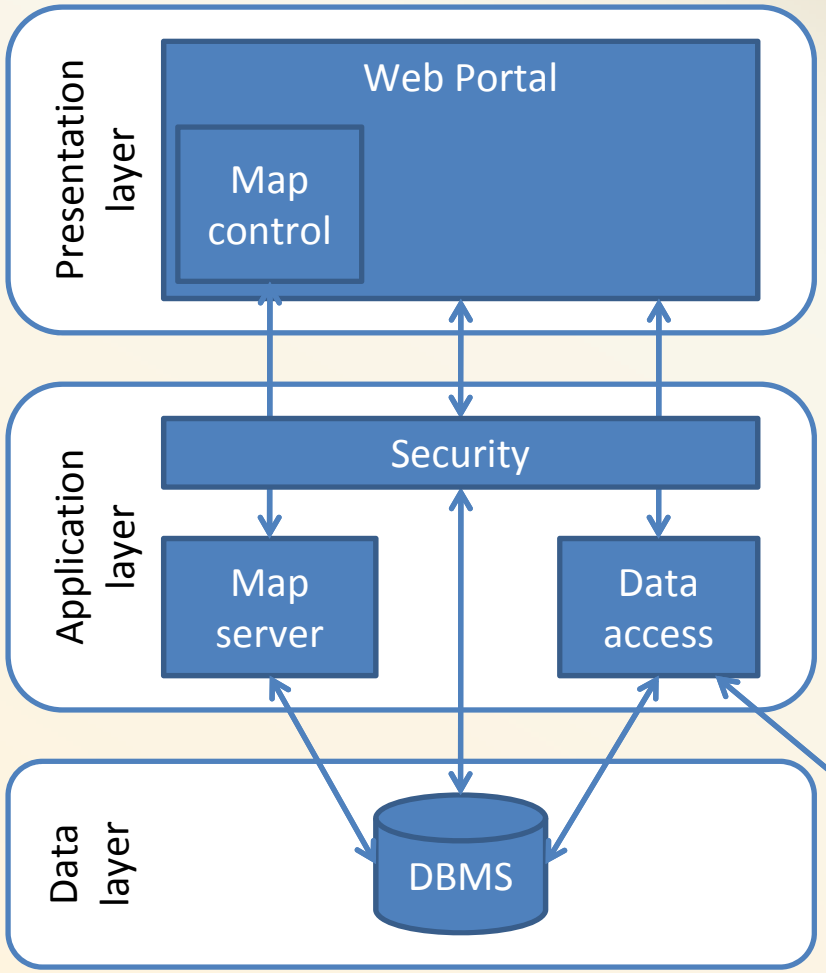
Architecture



Map control

ArcGIS Server, Google Maps, MapGuide, OpenLayers

Web Server

ISS or Apache

Map server

ArcGIS Server, Geoserver/TileCache

DBMS

DB2/Oracle Spatial/PostgreSQL/ArcSDE

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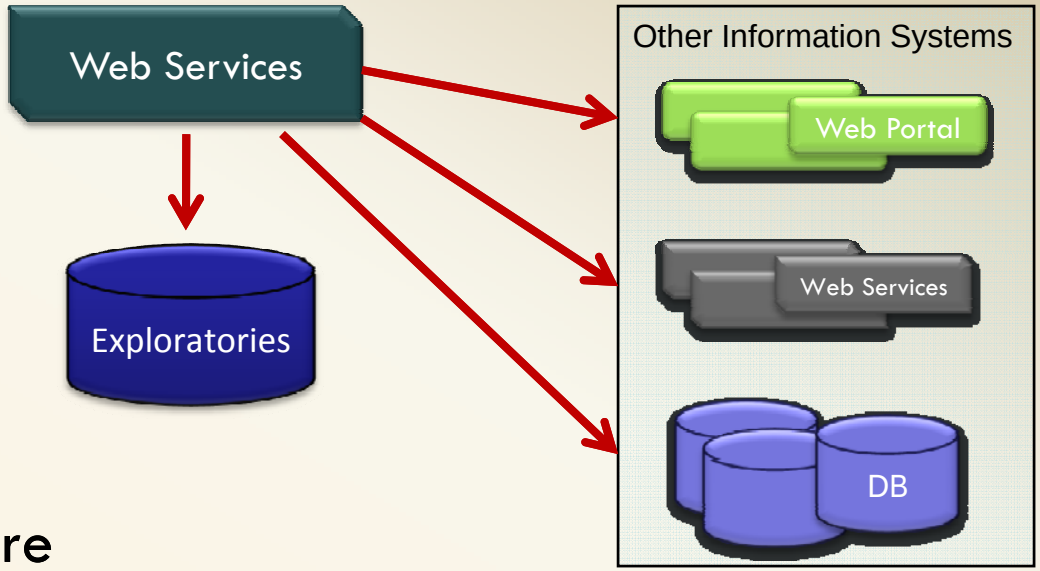
Architecture

Data Access through Web Services



- Pros
  - open standards
  - Data transfer over HTTP
  - Open, flexible architecture
  - language and operating system independent
  - Comparatively easy integration of new data sources
- Cons
  - Performance (XML, Parsing)

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Integrating other data sources

For interoperability reasons various data sources have to be integrated

- Goal: a High degree of transparency
- Many unsolved questions/problems
  - Availability of Sources (Caching?)
  - Various Interfaces (often only HTML-Forms)
  - Various Formats (structured, semi-structured, unstructured)
  - Response Time (critical e.g. for automatic name checking during data entry)
  - Composition of Data requested from different Sources (e.g. for statistical treatment)
  - …

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Outlook

We have

- a Basic concept for the Information System

Next steps

- Fine-tune the concept
  - Security, User management
- Choose Hard- and Software
- Implementation of the first observations (forest, soil, meteo)

Future

- More data and functionality