

BExIS 2 for Data Managers

BExIS UserDevConf2015

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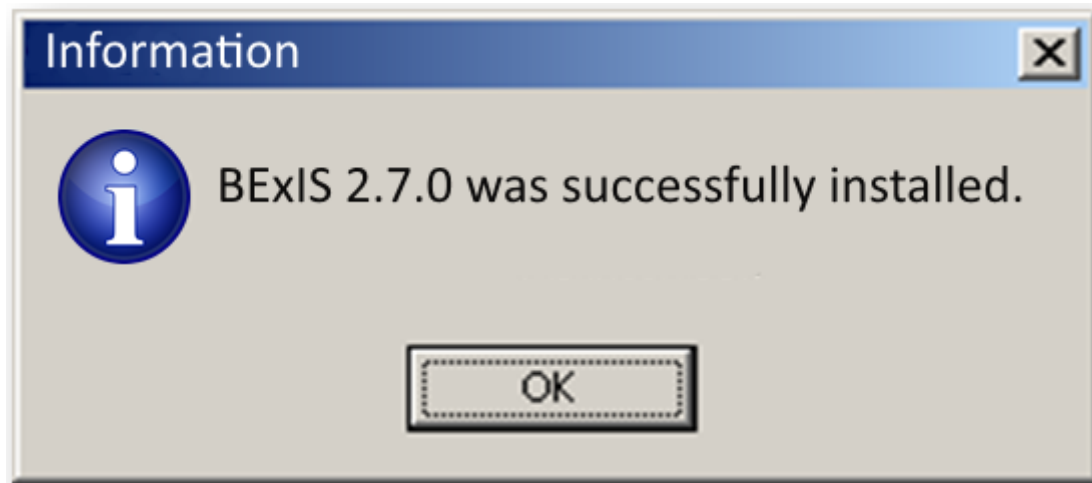
Deployment

- App + DB on a single machine
 - Physical
 - Virtual
- App and DB on different machines
 - Single machine
 - Clusters + load balancing (not tested)
 - OS/ virtualization dependent
- Storage machine
 - big files
 - External resources
 - Original versioned files

Installation

- Setup a database
- Setup the app within the IIS
- Run the app

Installation



What more?

Covered subjects

- Configuration/ tweaks
- Concepts/ Features
- Development
- Metadata Structure

Configuration: Create Database

Web.config -> appSettings

CreateDatabase

- True: Removes everything and creates an empty one
- False: Assumes a DB compatible to the **WORKSPACE** exists.
- Any change: restarts the application

Configuration: DB dialect

Web.config -> appSettings

DatabaseDialect

- PostgreSQL82Dialect: PostgreSQL 8.2 and upper
- DB2Dialect: IBM DB2 10.x and upper
- Anything else: Not tested, needs more configuration

Configuration: Workspace Path

Web.config -> appSettings

WorkspacePath: All core and module config/
static data goes here

- Default: leave it empty
- Anywhere else: Give read/ write permissions to the IIS/ app pool user

Configuration: Data Path

Web.config -> appSettings

DataPath: Uploaded files, temporary files, for each user

- Anywhere: Give read/ write permissions to the IIS/ app pool user

Configuration: Logging

Web.config -> appSettings

IsLoggingEnable: controls all logging types

IsCallLoggingEnable: tracks which functions are called

IsPerformanceLoggingEnable: measure call time

IsDiagnosticLoggingEnable: measures call time + data passed to the functions

IsExceptionLoggingEnable: catches exception leaks

Configuration: Logging

- Environment:
 - Time
 - User
 - Language
 - OS, Browser, Session, ..
- Call Info:
 - Component
 - Class
 - Method
- Measurement:
 - Processing time
 - Parameter passed
 - Returned value
 - Exception
- Data
 - Id
 - Type
 - Operation
 - Relationship

Configuration: Logging

- Monitored functions are determined by developers
- Data managers can turn on/off the switches
- There are some log types, no one can stop

Configuration: DB mappings

- Mapping files as XML in the workspace
- Table and column names are customizable
- Good for name clashes in existing databases

Configuration: SSL

- Either the whole application or nothing
- Multiple URL per application
- Configure it in IIS
- Later: SSL enforcement for individual URLs

Take a Breath

Questions so far?

Still a bunch of slides ahead

Data Manager

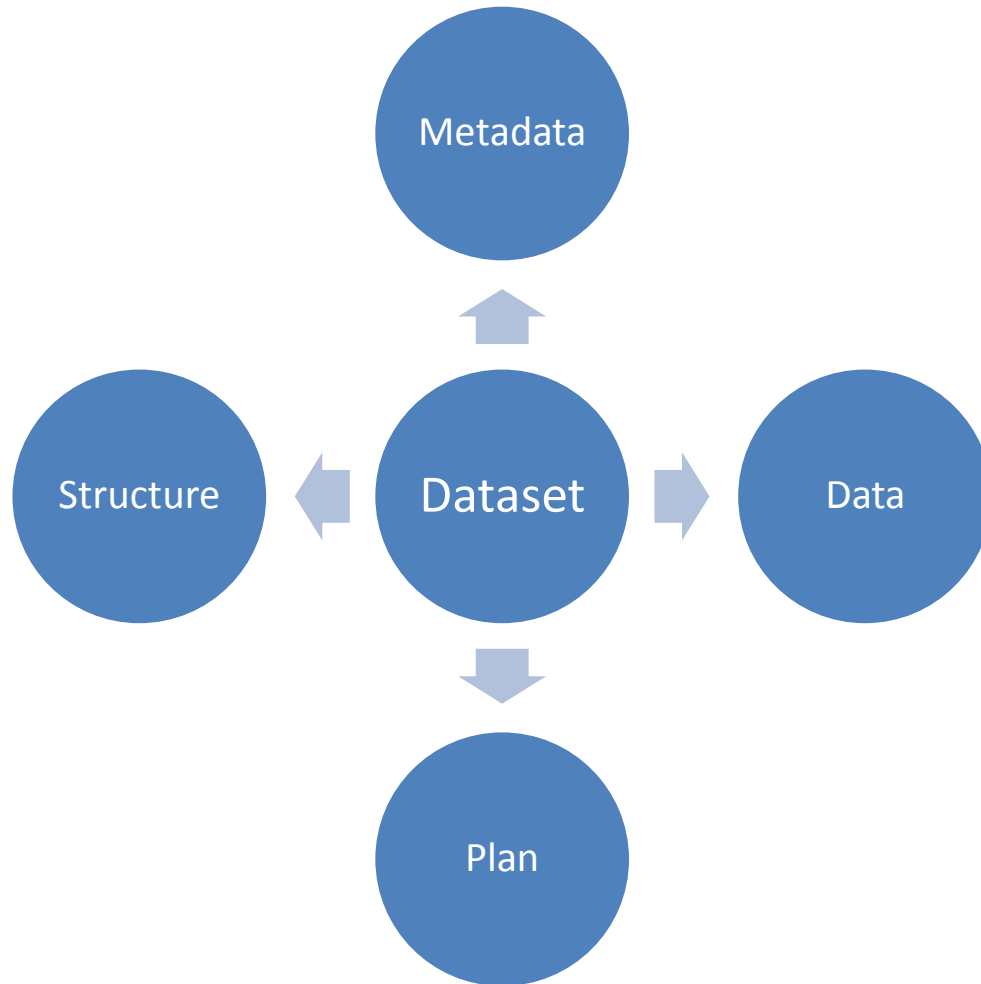
- We assume that:
 - You maintain the data
 - Plus the system
 - A group of researcher are working with you
 - There are some policies to conform to
 - You embrace reusability

Concept: The DLM

Look at these:

1. **A conceptual model for data management in the field of ecology**, Javad Chamanara, Birgitta König-Ries, Journal of Ecological Informatics, volume 24, November 2014, Pages 261–272
2. **An Extensible Conceptual Model for Tabular Scientific Datasets**, Javad Chamanara, Michael Owonibi, Alsayed Algergawy, Roman Gerlach, The International Symposium on Challenges for Designing and Using Datasets (DATASETS 2015), June 21 - 26, 2015 - Brussels, Belgium
3. **BExIS++ Conceptual Model in UML**: <http://fusion.cs.uni-jena.de/bppCM/index.htm>

Concept: Dataset



Concept: Primary Data

Variable 1

Variable 2

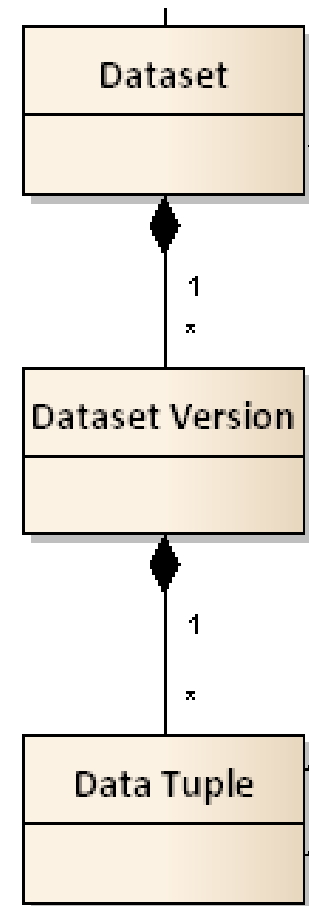
S.N.	Temp	Time	S.M.	Depth	Pos.	Hu.
14	22	1	12	-10	A	46
13	23	2	10	-10	B	45
16	21	3	12	-11	C	30
16	18	5	15	-10	A	25
18	14	6	17	-9	D	25

Tuple

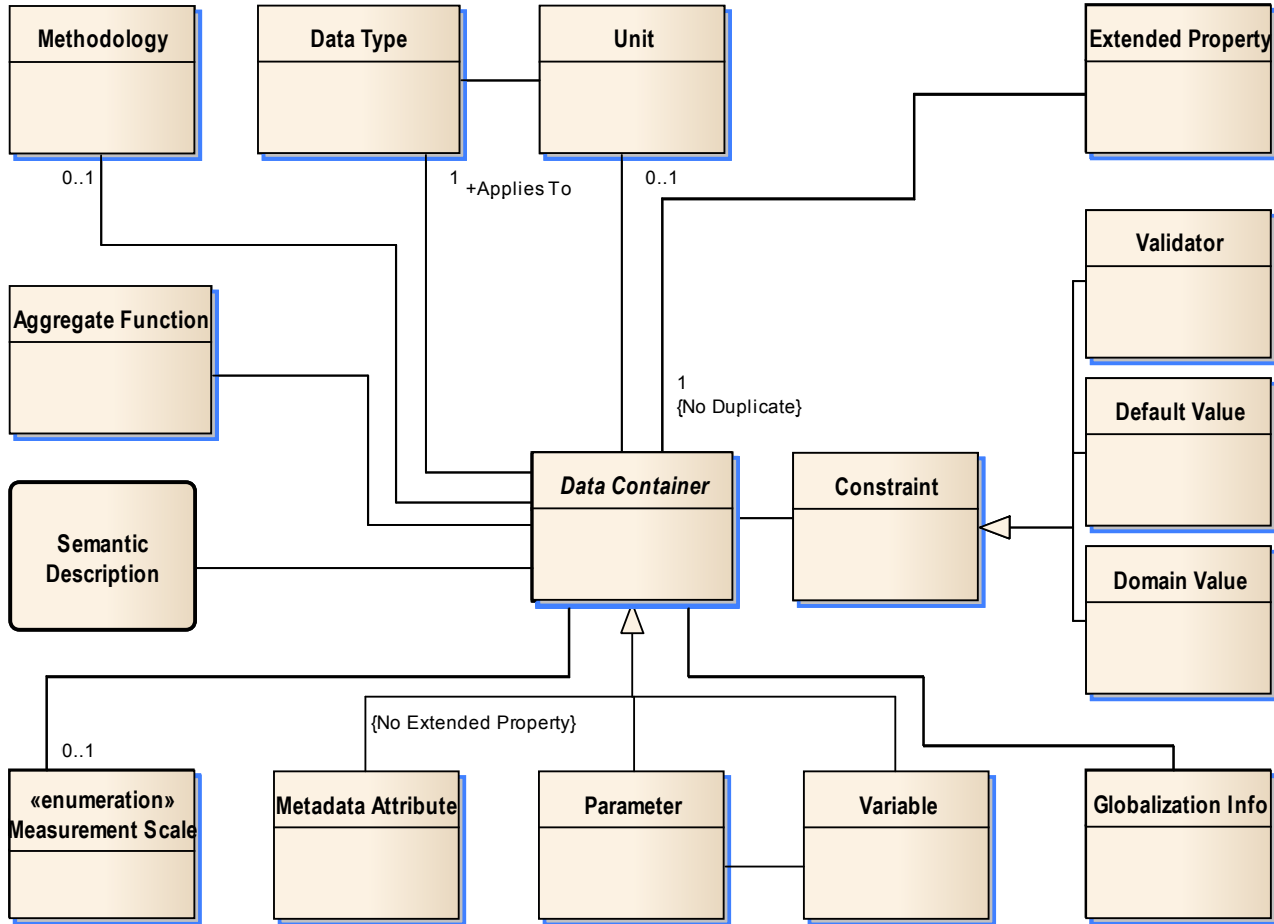
Cell

Concept: Dataset Versioning

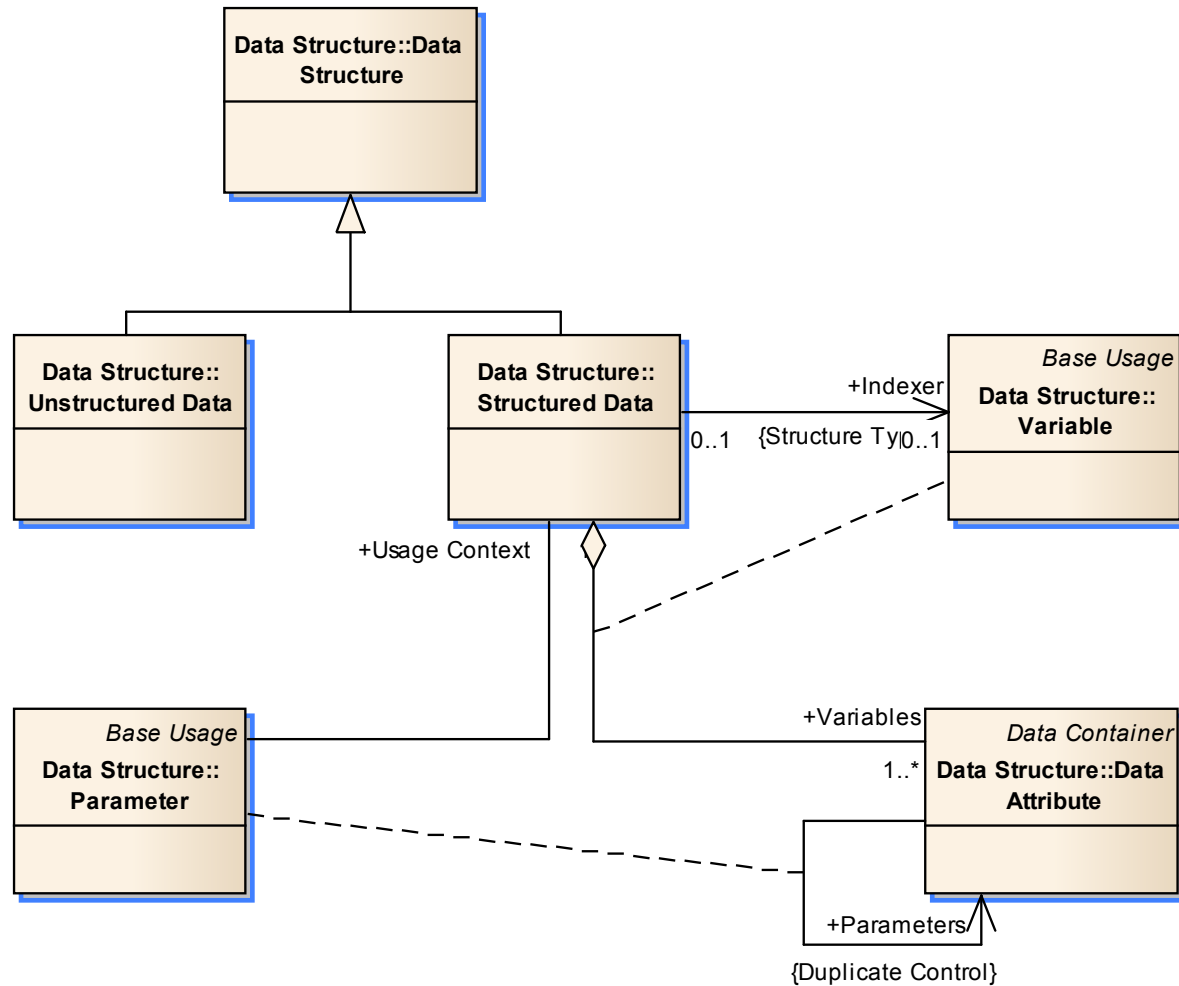
- Datasets have multiple versions
- Each has its own metadata
- Each has its own primary data
 - Don't worry, we use differential versioning
- All versions share one
 - Data structure
 - Metadata structure
 - Data plan



Concept: Data Structure



Concept: Data Structure



Concept: Data Structure

Ceate Data Type

Name:*

Description:

SystemType: Boolean ▼

Note: *A true or false value.*

*Please don't leave empty

Save Cancel

Concept: Data Structure

Create Unit ✕

Name:*

Abbreviation:*

Description:

Dimension Name:

Dimension Specification:

Measurement System:

	Name	Id	System Type	Description
<input type="checkbox"/>	String	1	String	A Unicode String
<input type="checkbox"/>	Number	2	Int32	An Integer Number
<input type="checkbox"/>	Decimal	3	Double	An Real Number
<input type="checkbox"/>	Date	4	DateTime	A date with time
<input type="checkbox"/>	Text	5	String	For long text

*Please don't leave empty

Concept: Data Structure

Create Data Attribute ✕

Name:* Description:

ShortName:

Unit:

DataType:

Constraints

Range	invert <input type="checkbox"/>	Min <input type="text" value="0"/>	include <input checked="" type="checkbox"/>	Max <input type="text" value="0"/>	include <input type="checkbox"/>	<input type="text" value="i"/> Description <input type="text"/>
Pattern	invert <input type="checkbox"/>	MatchingPhrase <input type="text"/>	<input type="text" value="i"/>	Description <input type="text"/>		
Domain	invert <input type="checkbox"/>	Terms <input type="text"/>	<input type="text" value="i"/>	Description <input type="text"/>		

*Please don't leave empty

Concept: Data Structure

Create Data Attribute ✕

Name:* Description:

ShortName:

Unit:

DataType:

Constraints

Range	invert <input type="checkbox"/>	Min <input type="text" value="0"/>	include <input checked="" type="checkbox"/>	Max <input type="text" value="0"/>	include <input type="checkbox"/>	<input type="text" value="i"/> Description <input type="text"/>
Pattern	invert <input type="checkbox"/>	MatchingPhrase <input type="text"/>	<input type="text" value="i"/>	Description <input type="text"/>		
Domain	invert <input type="checkbox"/>	Terms <input type="text"/>	<input type="text" value="i"/>	Description <input type="text"/>		

*Please don't leave empty

Concept: Data Structure

- Structured
 - Reuses Data Attributes
 - Names them as “Variables”
 - Multiple use of attributes in
 - One data structure
 - Or different structures
 - Set variables as optional or mandatory

Concept: Data Structure

- Unstructured data
 - File based datasets
 - Custom formats
 - External Resources
- Model as “Resource Descriptor”
 - More info? Ask Martin Hohmuth

Concept: Search Attributes

The screenshot shows a search interface with a navigation menu at the top: Home, Search, Plan, Collect, Administration, and Help. On the left, there are two sections: 'Categories' and 'Properties'. The 'Categories' section shows a tree structure with 'Owner Name (2)' containing 'Christian Brehm (1)' and 'Mierscheid (1)', and 'Contact Name (2)' containing 'Christian Brehm (1)' and 'Mierscheid (1)'. The 'Properties' section has a 'Project' dropdown menu set to 'All'. The main search area includes a search bar with a dropdown menu set to 'All', radio buttons for 'New search' and 'Based on previous search', and a 'Search' button. Below the search bar is a table with columns: ID, Title, Owner Name, and Dataset Description. The table contains two rows of data. Callouts point to various elements: 'Property' points to the 'Project' dropdown, 'Facet' points to the 'Categories' tree, 'Category' points to the 'Owner Name' column header, and 'General (free text)' points to the search bar.

General (free text)

Property

Facet

Category

Functions	ID	Title	Owner Name	Dataset Description
Details	1	Bird survey data 2012	Christian Brehm	Bird surveying data during breeding...
Details	2	Netzfluegler Raw	Mierscheid	

Friedrich-Schiller-University Jena, Germany.
BEXIS is being developed as part of the [BEXIS++ Project](#).

Concept: Search Attributes

Edit

Owner Name

General

id 5

Display Name ?

Source Name ?

▼

X

Metadata Node ▼

X

+ ?

Header Item ?

Default Header Item ?

Type

Search Component Type ?

Data Type ▼ ?

Index Parameters

Map to a ABCD

Attribute Type

Map to EML

Concept: Re-indexing

- Search attributes are indexed
- But not automatically
- Wondering why?
 - It's expensive!
 - If primary data is included, it's more expensive!

Concept: Re-indexing

- When to index?
 - When a dataset is submitted or updated
 - On a schedule
 - When the system load is not that much
 - Whenever asked!
 - Whenever you like!!
- Just be patient...**
- More questions?
 - Ask Michael Owonibi, David Blaa

Concept: Single Sign On

- Rely the authentication to an external provider
 - LDAP
 - Active Directory
- Tweaks available
 - Ask Sven Thiel

Take another Breath

Questions so far?

Will be finishing in 12 ± 3 minutes

An architectural reminder



Every Module may:

- Use the core functions
- Have configuration
- Have seed data
- Have static resources
- Access the database
- Access external services

Development: Module

- Architectural patterns
- Available functions from the core
- Inter module dependencies/ communication
- Release periods
- Limitations
- Tools
- Licensing

Development: Other SBMSs

- Have an organization wide DBMS?
- Have expertise in another DBMS?
- Do not like PostgreSQL or IBM DB2?

- Duplicate the mapping files
- Adjust them to the DBMS of your choice
- If works, share it with us! If not,
 - Talk to: Javad Chamanara
- It is a 2-3 weeks effort, if you know N/Hibernate

Concept: Seed Data

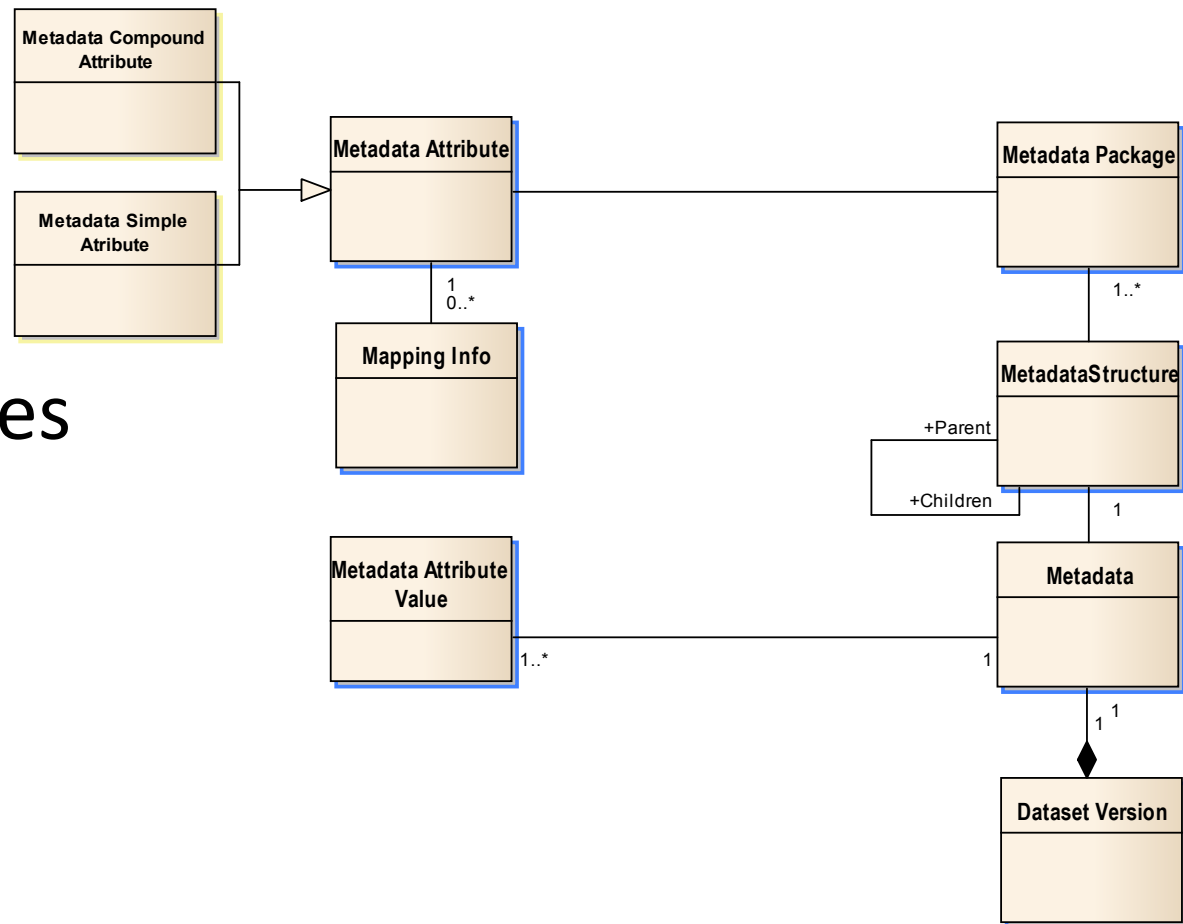
- Security information
 - Features
 - A group and
 - A user
- Data types
- Units of measurement
- Metadata Structures
 - ABCD
 - EML
- Accessible via the workspace

Development: UoM

- Have a collection of measurement units?
- Describe them in the provided format
- Add them to the seed data folder
- **Install the software!**
- If works:
 - Share it with us, we add it to future releases
- If not!
 - Talk to David and/ or Martin

Development: Metadata Structure

- Metadata structure governs what should be in metadata
- Packages
- Simple types
- Compound types
- Cardinality



Development: Metadata Structure

- Import from XSD file(s)
- Translation rules apply
 - Elements
 - Constraints
- Mapping information for export
 - From your metadata schema
 - To target standards
 - ABCD
 - EML, ...

Development: Metadata Structure

- We accept well defined metadata schemas
- Evaluate and Transform them
- Share them by adding to BExIS
- Talk to David and/ or Roman

Development: Metadata Structure

```
1031 <xs:simpleType name="email">
1032   <xs:annotation>
1033     <xs:documentation>
1034       Email address
1035     </xs:documentation>
1036   </xs:annotation>
1037
1038   <xs:restriction base="xs:string">
1039     <xs:pattern value="([a-zA-Z0-9_-])([a-zA-Z0-9_-\.]*)@(\(((25[0-5]|2[0-4][0-9]|1[0-9][0-9]|
1040     [1-9][0-9]|0[0-9])\.)\{3\}|((([a-zA-Z0-9\-\.]*)\.)+))([a-zA-Z]{2,}|(25[0-5]|2[0-4][0-9]|1[0-9][0-9]|1-9][0-9]|0-9))\)" />
1041   </xs:restriction>
1042 </xs:simpleType>
```

Contact

* Name	<input type="text"/>
* Email	<input type="text" value="das"/>
Street	<input type="text"/>
Zipcode	<input type="text"/>
City	<input type="text"/>
Country	<input type="text" value="Select please"/>

Validate

+ Error 1

- Error 2

in Package : **Contact (1)**
Attribute : **Email (1)**
Provided value does not match the pattern. The value should match `(([a-zA-Z0-9_-])([a-zA-Z0-9_-\.]*)@(\(((25[0-5]|2[0-4][0-9]|1[0-9][0-9]|1-9][0-9]|0-9))\.)\{3\}|((([a-zA-Z0-9\-\.]*)\.)+))([a-zA-Z]{2,}|(25[0-5]|2[0-4][0-9]|1[0-9][0-9]|1-9][0-9]|0-9))\)` case insensitive.

Development: Metadata Structure

```
<xs:simpleType name="String50">
  <xs:annotation>
    <xs:documentation xml:lang="en-us">normalized string restricted to 1..50
  </xs:annotation>
  <xs:restriction base="xs:normalizedString">
    <xs:minLength fixed="true" value="1"/>
    <xs:maxLength fixed="true" value="50"/>
    <xs:whiteSpace fixed="false" value="collapse"/>
  </xs:restriction>
</xs:simpleType>
```

Representation

Language-specific label representation [ATTR: language]

* **Text**

Abbreviation

Validate

[-] Error 1

in Package :
Representation (1)
Attribute : **Text (1)**
Provided value is out of range. The value should be between 1 inclusive and 255 inclusive.

[+] Error 2

Development: Metadata Structure

```
<xs:simpleType name="country">
  <xs:restriction base="xs:string">
    <xs:enumeration value="Afghanistan"/>
    <xs:enumeration value="Akrotiri"/>
    <xs:enumeration value="Albania"/>
    <xs:enumeration value="Algeria"/>
    <xs:enumeration value="American Samoa"/>
    <xs:enumeration value="Andorra"/>
    <xs:enumeration value="Angola"/>
    <xs:enumeration value="Anguilla"/>
    <xs:enumeration value="Antarctica"/>
    <xs:enumeration value="Antigua and Barbuda"/>
    <xs:enumeration value="Argentina"/>
    <xs:enumeration value="Armenia"/>
    <xs:enumeration value="Aruba"/>
    <xs:enumeration value="Ashmore and Cartier I"/>
    <xs:enumeration value="Australia"/>
    <xs:enumeration value="Austria"/>
    <xs:enumeration value="Azerbaijan"/>
    <xs:enumeration value="Bahamas, The"/>
    <xs:enumeration value="Bahrain"/>
    <xs:enumeration value="Bangladesh"/>
    <xs:enumeration value="Barbados"/>
  </xs:restriction>
</xs:simpleType>
```

Organisation

* Name	<input type="text"/>
* URL	<input type="text"/>
Street	<input type="text"/>
Zipcode	<input type="text"/>
City	<input type="text"/>
Country	<div style="border: 1px solid black; padding: 2px;"><div style="background-color: #e0e0e0; padding: 2px;">Select, please</div><div style="background-color: #007bff; color: white; padding: 2px;">Select, please</div><div style="padding: 2px;">Afghanistan</div><div style="padding: 2px;">Akrotiri</div><div style="padding: 2px;">Albania</div><div style="padding: 2px;">Algeria</div><div style="padding: 2px;">American Samoa</div><div style="padding: 2px;">Andorra</div><div style="padding: 2px;">Angola</div><div style="padding: 2px;">Anguilla</div><div style="padding: 2px;">Antarctica</div><div style="padding: 2px;">Antigua and Barbuda</div><div style="padding: 2px;">Argentina</div><div style="padding: 2px;">Armenia</div><div style="padding: 2px;">Aruba</div><div style="padding: 2px;">Ashmore and Cartier Islands</div><div style="padding: 2px;">Australia</div><div style="padding: 2px;">Austria</div><div style="padding: 2px;">Azerbaijan</div><div style="padding: 2px;">Bahamas, The</div><div style="padding: 2px;">Bahrain</div></div>

Development: Metadata Structure

```
<xs:simpleType name="String50">
  <xs:annotation>
    <xs:documentation xml:lang="en-us">normalized string restricted to 1..50
  </xs:annotation>
  <xs:restriction base="xs:normalizedString">
    <xs:minLength fixed="true" value="1"/>
    <xs:maxLength fixed="true" value="50"/>
    <xs:whiteSpace fixed="false" value="collapse"/>
  </xs:restriction>
</xs:simpleType>
```

Representation

Language-specific label representation [ATTR: language]

* **Text**

Abbreviation

Validate

[-] Error 1
in Package :
Representation (1)
Attribute : **Text (1)**
Provided value is out of range. The value should be between 1 inclusive and 255 inclusive.

[+] Error 2

Want more?

That was it! There is no more 😊

Thank You