

Registry Implementation for SDI Germany (GDI-DE) – Status Quo –

Andreas von Dömming

**INSPIRE Conference 2009
Eleventh International Conference of the GSDI Association
Rotterdam, Netherlands
15-19 June 2009**

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Architecture of SDI Germany (GDI-DE)

Use Cases & Concepts

Coordinate Transformations

Unique Identifiers

Visualisation

Monitoring and Reporting

Summary & Outlook



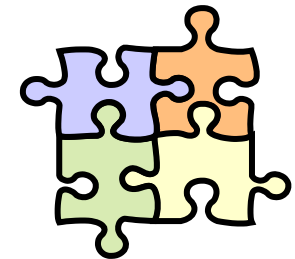
- national level
the Nation (Federation)
with parliament,
administration,
judicial power



- regional level (16 States)
each with parliament,
administration,
judicial power

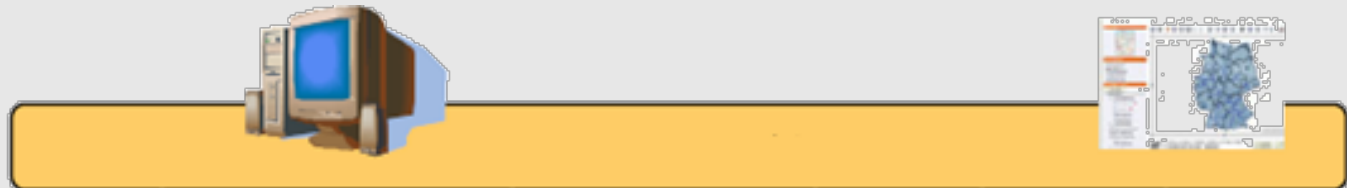


- local level (~14.000
Municipalities)
with many rights of self-
government



Architecture – central and distributed services

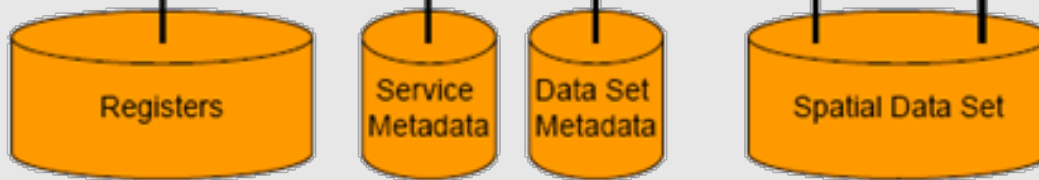
Applications,
Geoportals
or equivalent



network
services



resources and
backend
applications

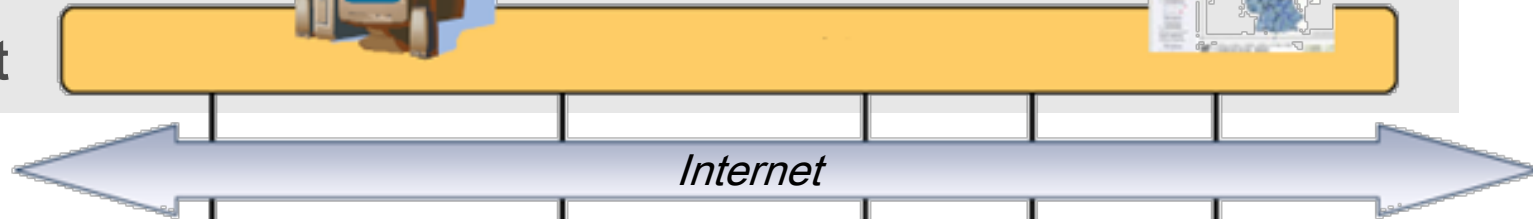
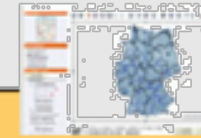


Source: INSPIRE
Technical Architecture
verview_v1.2.doc
(modified)

central “gateway” services
+ distributed services

distributed services

Applications,
Geoportals
or equivalent



network
services

Registry Service

Pilot
Project
Registry



Discovery Service

Geodaten-
Katalog-DE
(csw 2.0.2 AP ISO 1.0)



View
Service

Download
Service

Transf.
Service

resources and
backend
applications



Spatial Data Set

Source: INSPIRE
Technical Architecture
verview_v1.2.doc
(modified)

central "gateway" services
+ distributed services

distributed services



Goals:

- **gain experience !** → registry technology, organisation, content, architecture
- find solutions for SDI requirements: e.g. managing of unique identifier

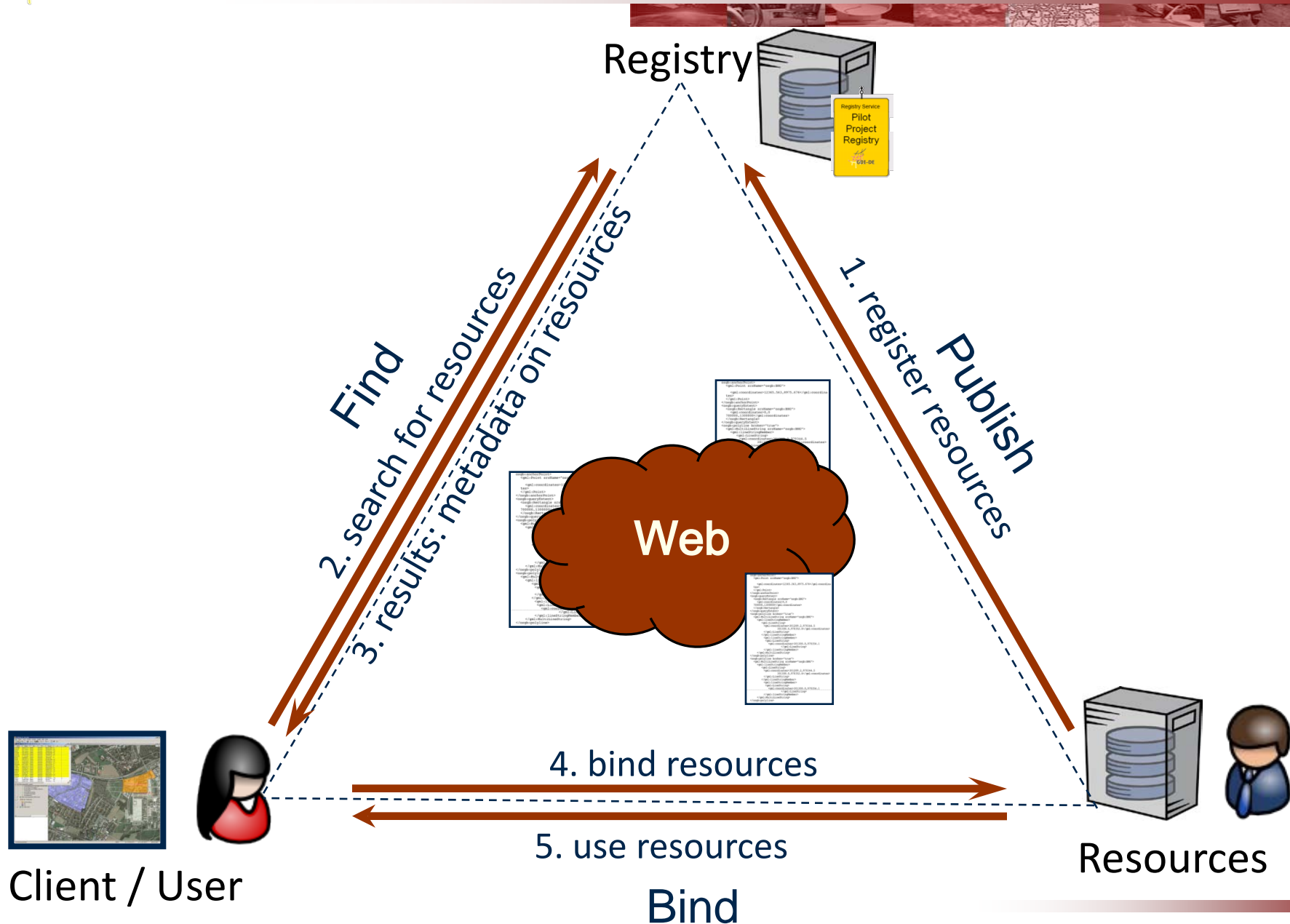
Start:

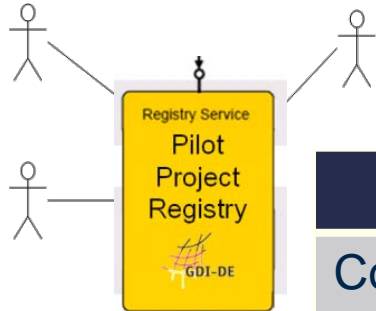
- June 2008
- planned for duration of 2 years

work plan:

- identify use cases
- define information models
- implement registry/registers
- evaluation
- conclusions/recommendations for GDI-DE

SOA – based on Publish Find Bind - Pattern



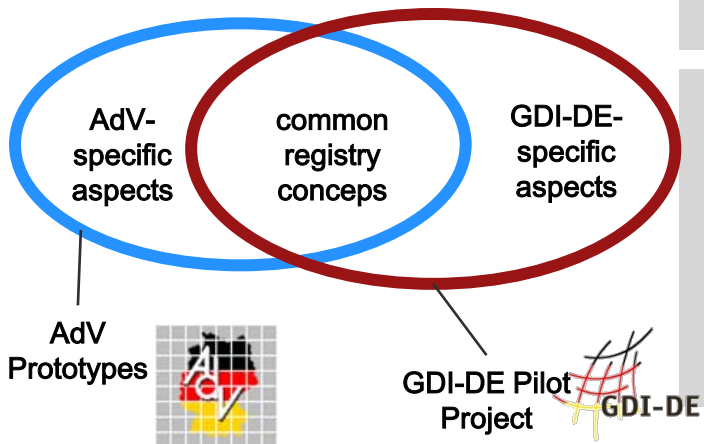


Use case	description
Coordinate Transformations	Registers for parameter of coordinate reference systems and coordinate transformations.
Unique Identifiers	Registers for managing and resolving of SDI wide unique identifiers as required by INSPIRE.
Visualisation	Registers to support sharing of visualisation descriptors.
Monitoring & Reporting	Registers to support the management of „INSPIRE-Monitoring and Reporting“-related data.
Terms of use	Registers to support simple terms of use, provided for click-through licenses.

topic	description
Coordinate Transformations	Registers for parameter of coordinate reference systems and coordinate transformations.
Unique Identifiers	Registers for managing and resolving of SDI wide unique identifiers as required by INSPIRE.

2007: 1st AdV-Registry-Prototyp (by AdV¹)
 focus: crs, units of measure
 based on CSW & ebXML-RIM

2008-2009: 2nd AdV-Registry-Prototyp (by AdV¹ & GDI-DE)
 focus: unique IDs, coordinate transformation service based on ebXML-RS & ebXML-RIM



¹ AdV: Working Committee of the Surveying Authorities of the States of the Federal Republic of Germany



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complex item structure for CRS registers

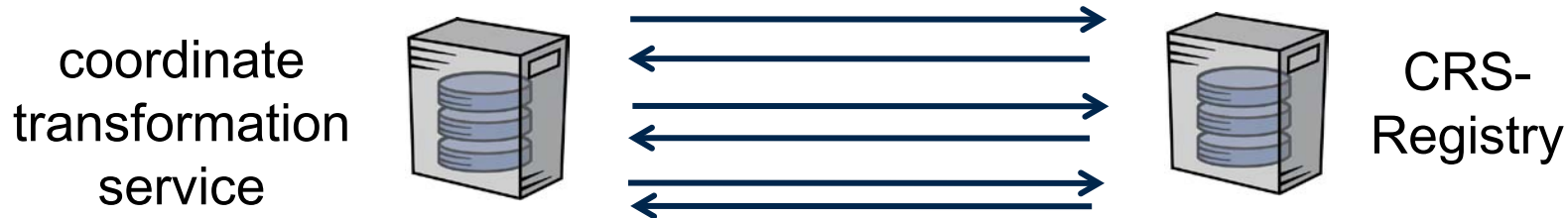
CRS registered in atomic parts → clients must first retrieve all parts to “compile” the full CRS

Ressourcentyp	ISO 19111 Types siehe ISO 19111 Kapitel 8-11 und ISO/TS 19127 Kapitel 7 und Annex B	ISO 19136 Object Types siehe ISO 19136 Kapitel 12
Koordinatenreferenzsystem	SC_CRS SC_CompoundCRS SC_SingleCRS SC_GeodeticCRS SC_ProjectedCRS SC_ImageCRS SC_VerticalCRS SC_DerivedCRS SC_EngineeringCRS	AbstractCoordinateReferenceSystem CompoundCRS SingleCRS GeodeticCRS ProjectedCRS ImageCRS VerticalCRS DerivedCRS EngineeringCRS
Koordinatensystem	CS_CoordinateSystem CS_PolarCS CS_SphericalCS CS_CylindricalCS CS_UserDefinedCS CS_AffineCS CS_VerticalCS CS_LinearCS CS_EllipsoidalCS CS_CartesianCS	AbstractCoordinateSystem PolarCS SphericalCS CylindricalCS UserDefinedCS AffineCS VerticalCS LinearCS EllipsoidalCS CartesianCS
Datum	CD_Datum CD_VerticalDatum CD_GeodeticDatum CD_EngineeringDatum CD_ImageDatum	AbstractDatum VerticalDatum GeodeticDatum EngineeringDatum ImageDatum
Koordinatenoperation	CC_ConcatenatedOperation CC_PassThroughOperation	ConcatenatedOperation PassThroughOperation

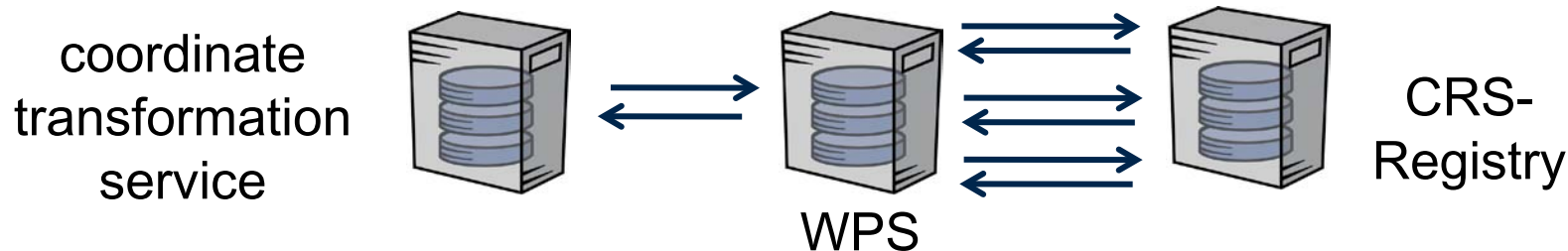
	CC_SingleOperation CC_Transformation CC_Conversion	SingleOperation Transformation Conversion
Koordinatensystemachse	CS_CoordinateSystemAxis	CoordinateSystemAxis
Koordinatenoperationparameter	CC_GeneralOperationParameter CC_OperationParameter CC_OperationParameterGroup	GeneralOperationParameter OperationParameter OperationParameterGroup
Koordinatenoperationmethode	CC_OperationMethod	OperationMethod
Ellipsoid	CD_Ellipsoid	Ellipsoid
Nullmeridian	CD_PrimeMeridian	PrimeMeridian

Ressourcentyp	ISO 19136 Types siehe ISO 19136 Kapitel 16.2 und Annex D.3.13	ISO 19136 Object Types siehe ISO 19136 Kapitel 16.2
Maßeinheit	UnitDefinition ConventionalUnit BaseUnit DerivedUnit	UnitDefinition ConventionalUnit BaseUnit DerivedUnit

Ressourcentyp		
GeoInfoDok-Version	(kein Repository-Eintrag)	(kein Repository-Eintrag)



complex client-server dialog to retrieve full CRS information,
 → Problem: much business logic on client side ☹️



Option: use case oriented interface (Service) in-between (e.g. WPS) that encapsulates business logic

→ Advantages: simpler clients,
 reduced dependency on registry technology on client side



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INSPIRE requirement:

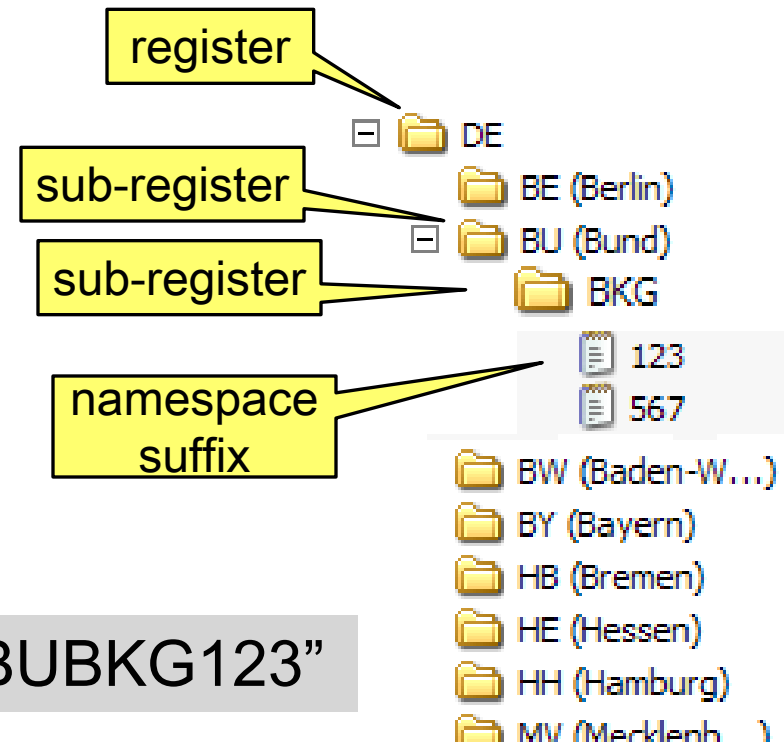
- unique identifiers for spatial objects

Pattern:

urn:x-inspire:object:id:<namespace>:<local identifier>[:<version>]

→ similar concept needed as for internet domain name registration
e.g. <http://www.bkg.bund.de>

→ hierarchical namespace-Registers



example: unique namespace = “DEBUBKG123”

2007: results 1st prototype:

- missing ebXML-RIM and ISO 19135 support for CS/W,
- ISO 19135 not implementable without specific extensions in CSW,
- problems with joins, aliases (see also final report).

recommendation (2007):

- Test and evaluate ebXML-RIM and ebXML-RS

2009: interim results, 2nd prototype (final report not yet published):

- problems with different life-cycle behaviour of ISO 19135 and ebXML-RS,
- → ebXML-RS is not yet operational for our use cases.

recommendation (2009)

- **realise registry as “simple” system** (database, file system, web-interface, ...),
- **observe further development of ebXML-RS.**



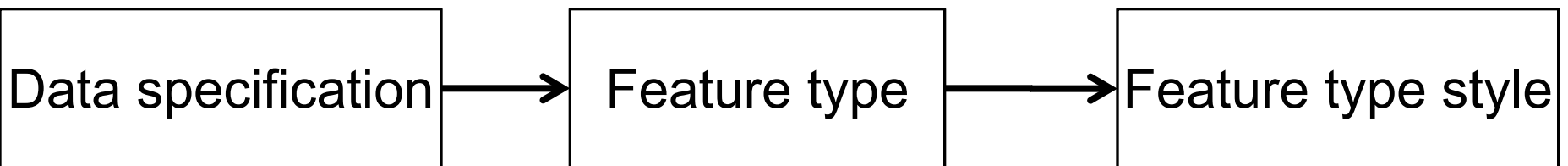
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common requirement:

- manage and share visualisation descriptors

register for feature type styles (simple approach)



requires register for data models and feature type styles

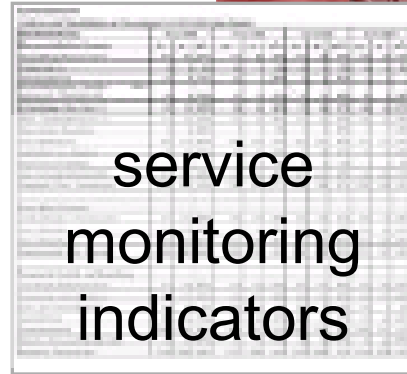


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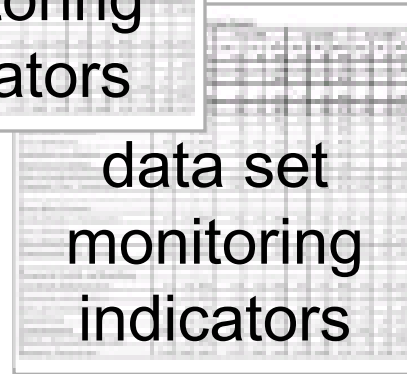
Implementing Rule Monitoring and Reporting

collect from
national SDI



service
monitoring
indicators

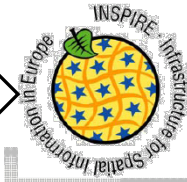
Indicator	Value	Unit	Frequency
Service availability	99.9%	%	Monthly
Service response time	2.5s	s	Monthly
Service error rate	0.01%	%	Monthly



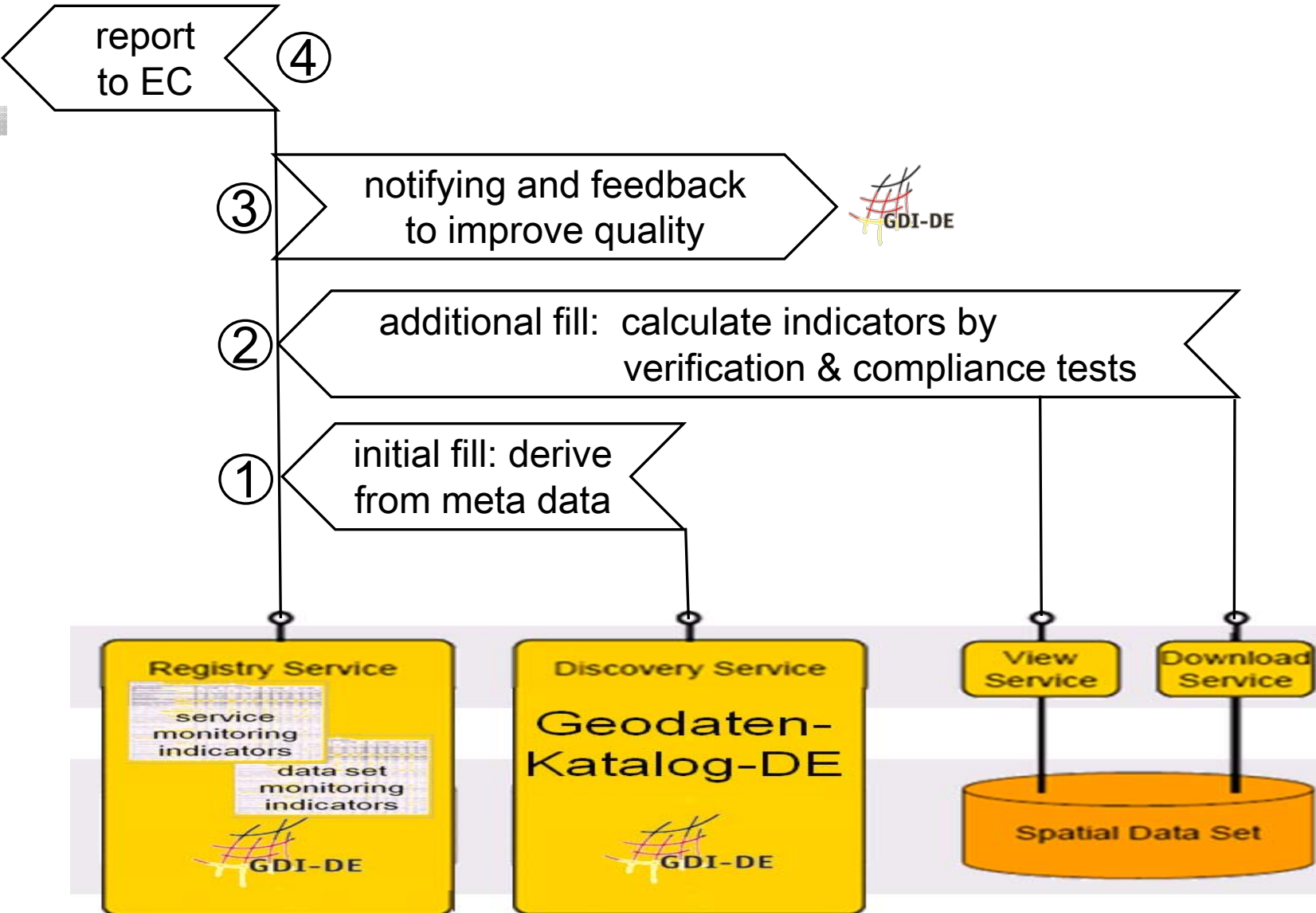
data set
monitoring
indicators

Indicator	Value	Unit	Frequency
Data set completeness	95%	%	Quarterly
Data set accuracy	98%	%	Quarterly
Data set consistency	99%	%	Quarterly

report to
EC



task of
national point of contact
for INSPIRE



concepts:

- use cases defined
- concepts & information models developed

implementation (next step):

- at present no reliable base technology available (CSW & ebXML-RS both not sufficient)
- recommendation to follow “simple” approach (database, file system based, web-interface, cvs, ...)
- supporting services (e.g. WPS) help with complex use cases and reduce dependency on registry-technologies
- further results will be expected from the ongoing project



Thank you for your attention!

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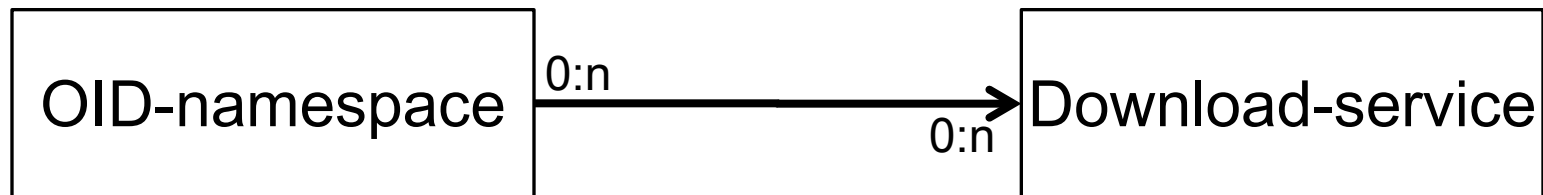
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INSPIRE requirement:

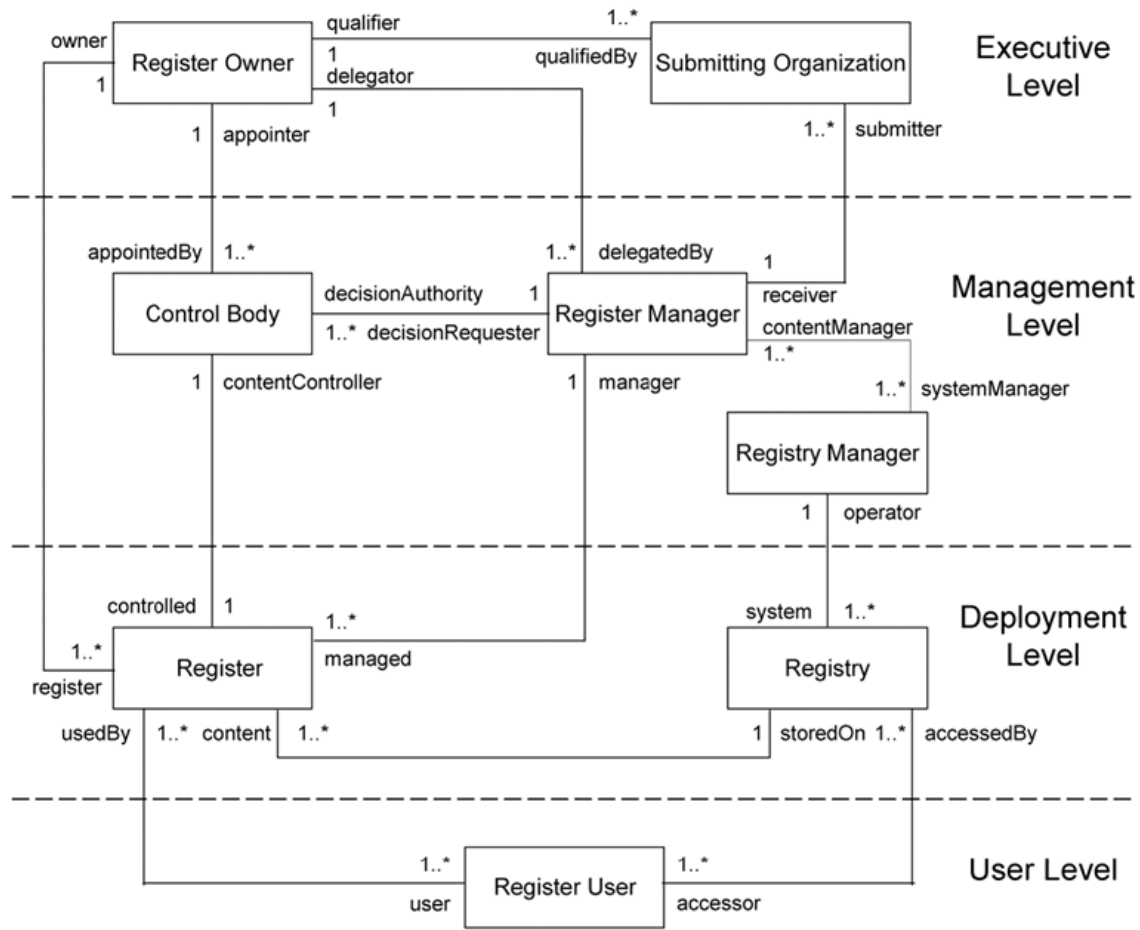
- referencing spatial object and resolving

Register for Relations from OID-namespaces to Download-services



workflow for resolving:

1. request list of relevant download-services from registry
2. iterate through the list to find the required feature
(found → success, not found → continue iteration)



ISO 19135 Governance

Registry Technology ?

Questions:

Service interfaces (life-cycle management and queries): **ebXML RS or CS/W ?**

Governance rules: **ebXML Registry or ISO 19135 or CS/W ?**

Base information models: **ebXML RIM or ISO 19135 or Dublin Core ?**

base technology: **Geo-specific solutions or geo-enabling mainstream IT ?**

Resources	Service that provides resources	Resource-Descriptions (metadata)	Registry service specification
spatial data sets	download or viewing service (e.g. WFS, WMS)	ISO 19115 ISO 19139	OGC- CSW 2.0.2 AP ISO 1.0
spatial data services	-	ISO 19119 ISO 19139	OGC- CSW 2.0.2 AP ISO 1.0
Namespace for OID	?	?	?
Styles	?	?	?
data models, codelists	?	?	?

Cross organization context: to organise or share information between many organisations.

Reusability: information is used by a huge number of users or systems in SDI.

Significant influence: essential information where it is important to use exactly the same information for all systems (e.g. parameters of coordination systems)

Strategic impact: the reuse of specific information may be of a great advantage for establishing a SDI and therefore it can be a strategic issue to provide these information widely (e.g. standardized terms of use).