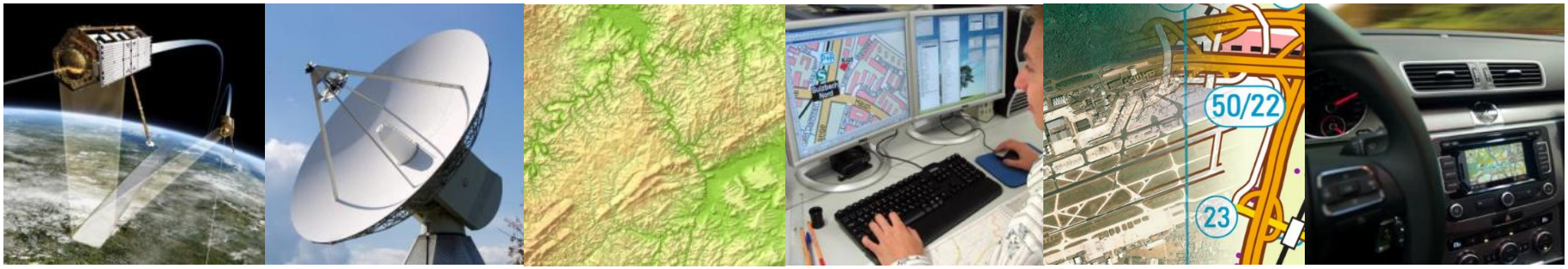
Federal Agency for
Cartography and Geodesy

Quality management of geodata

at the Federal Agency for Cartography and Geodesy (BKG)

Eszter Kiss

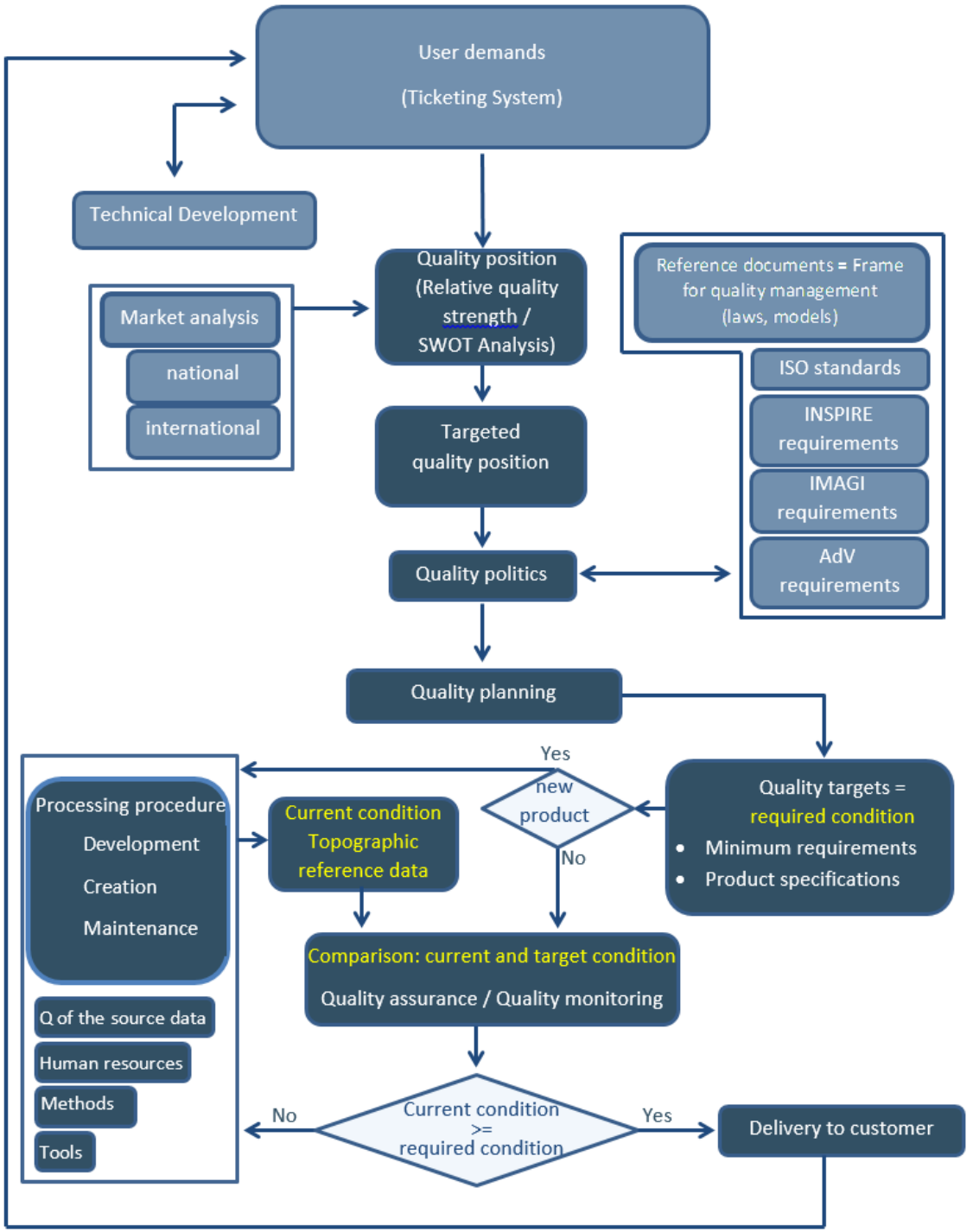
Bundesamt für Kartographie und Geodäsie



Content

- The Control Loop of quality management
- Quality assurance of topographical reference data in Germany/BKG
  - Reference documents – appraisal
  - Quality evaluation
  - Reporting quality information
  - Extension QA-methods to other federal authorities
- Summary and outlook

Control Loop of quality management



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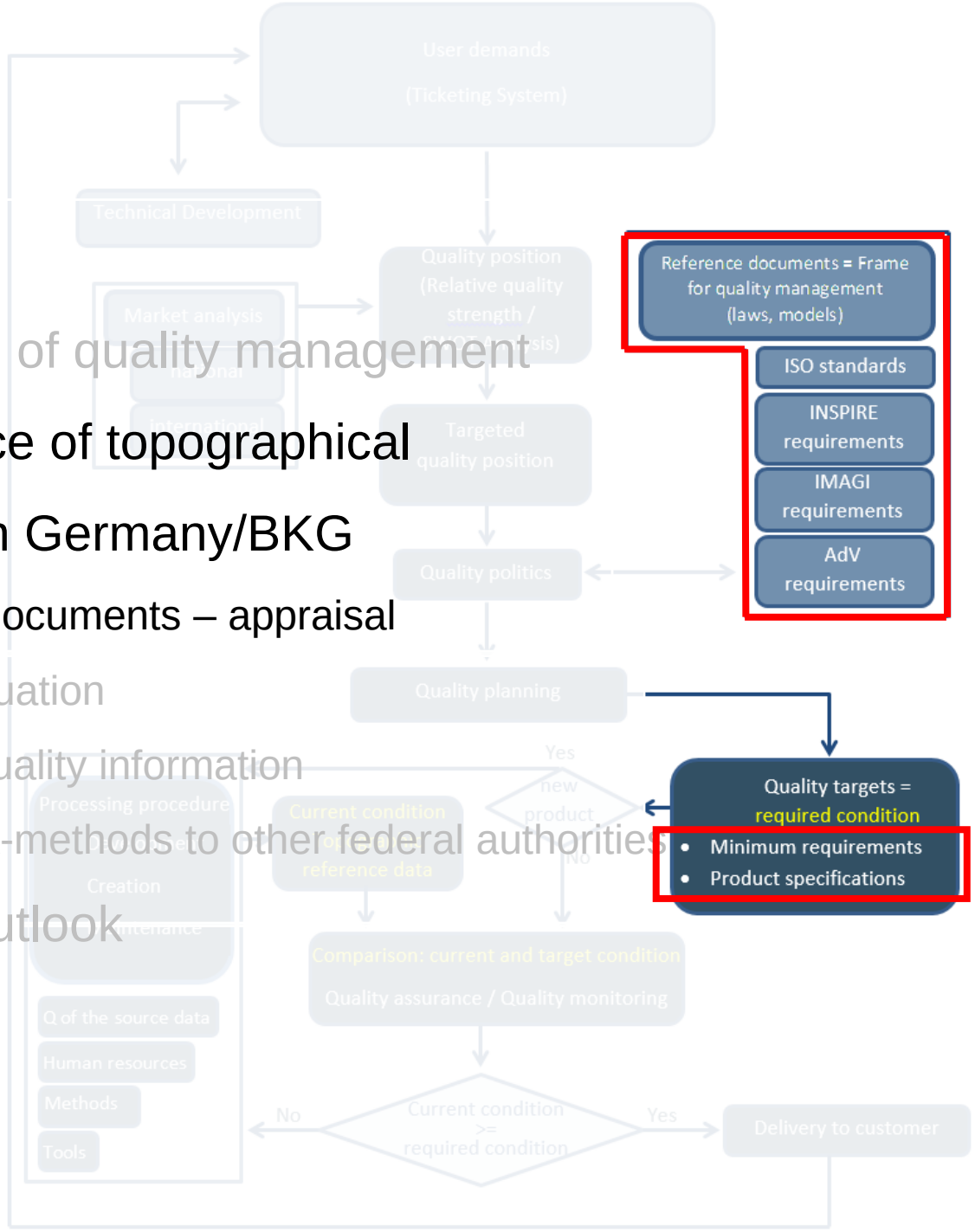
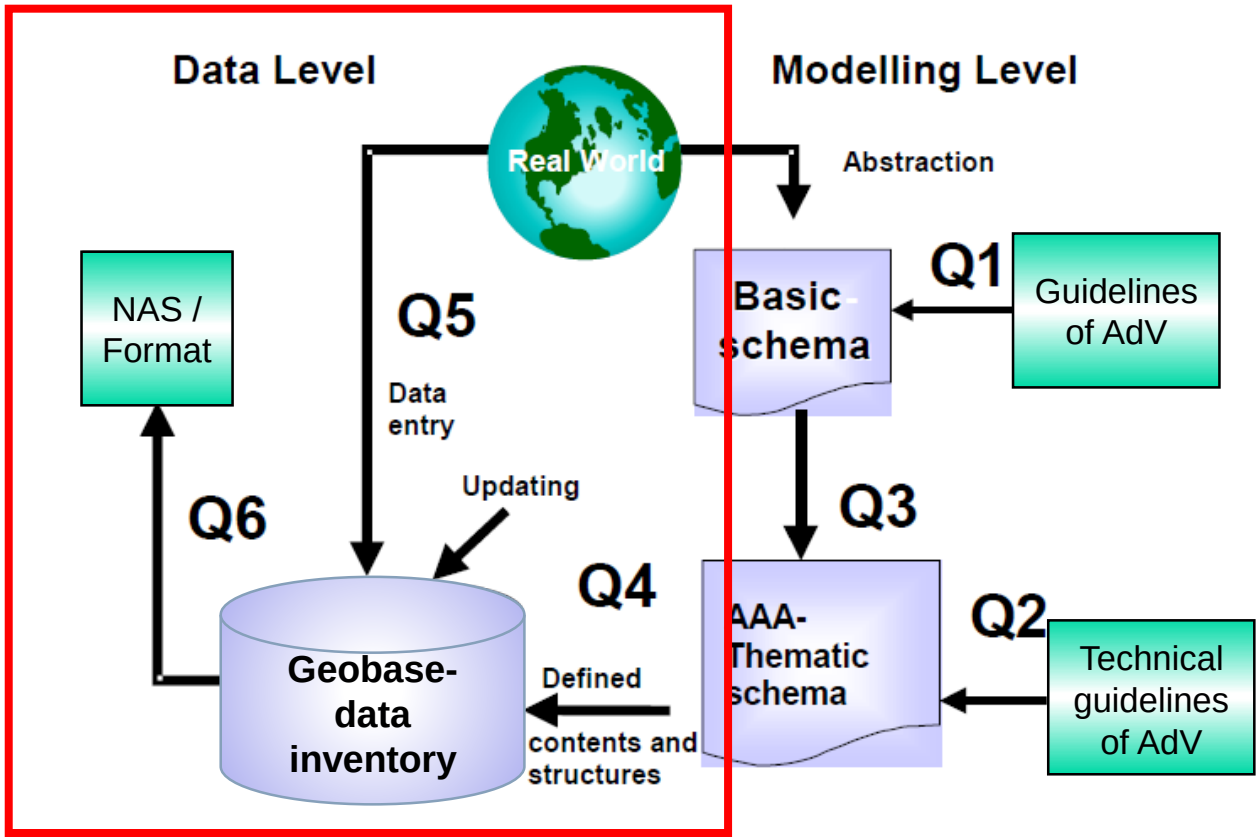


Quality assurance of topographical reference data in Germany
AdV-quality-concept

Arbeitsgemeinschaft der Vermessungsverwaltungen der Länder der Bundesrepublik Deutschland (AdV)



3-phase plan of IMAGI – cause for this study

IMAGI

1. Phase: Development and evaluation of QA-methods for topographic reference data of the BKG

extension

2. Phase: Transfer to federal reference data

3. Phase: Transfer to all datasets at federal level

extension

Reference documents - appraisal

Reference documents - appraisal

Preconditions for high quality

- Quality aims

  Clarity, understandability, unambiguity:

  ⟶ clear definition of quality-elements

  ⟶ clear definition of quality-aims

  ⟶ verifiability of quality-aims

  Completeness: ⟶ existence of requirements

  Significance/relevance for the users

  No contradictions in requirements

Reference documents - appraisal

Preconditions for high quality

- Quality aims

  Clarity, understandability, unambiguity

„Great things happen when the world agrees“

Reference documents - appraisal

Preconditions for high quality

- Quality aims

  Clarity, understandability, unambiguity:

  → **clear definition of quality-elements**

International Organization for Standardization

Great things happen when the world agrees

- Positional accuracy
- Temporal accuracy
- Completeness
- Logical consistency
- Thematic accuracy

ISO ✓

German legislation ✓

Reference documents - appraisal

Preconditions for high quality

- Quality aims → **clear definition of quality-elements**

ISO 19115 / 19157

Thematic accuracy……

Positional accuracy……

Temporal accuracy……..

Completeness……..

Logical consistency

- Conceptual consistency
- Domain consistency
- Format consistency
- Topological consistency

AdV Abstract Test Suite

Logische Konsistenz
(Logical consistency)

- Thematische Integrität (Thematic consistency)
- Räumliche Integrität (Geometrical/ positional accuracy)
- Integrität der Fortführung (Accuracy of updating / maintenance)
- Logische Vollständigkeit (Logical completeness)
- Integrität der Schlüssel und Beziehungen (Topological consistency)

Reference documents - appraisal

Preconditions for high quality

- Quality aims

~~Clarity, understandability, unambiguity:~~

→ ~~clear definition of quality-elements~~

→ ~~clear definition of qualty-aims~~

→ ~~verifiability of quality-aims~~

~~Completeness:~~ → existence of requirements

Significance/relevance for users ?

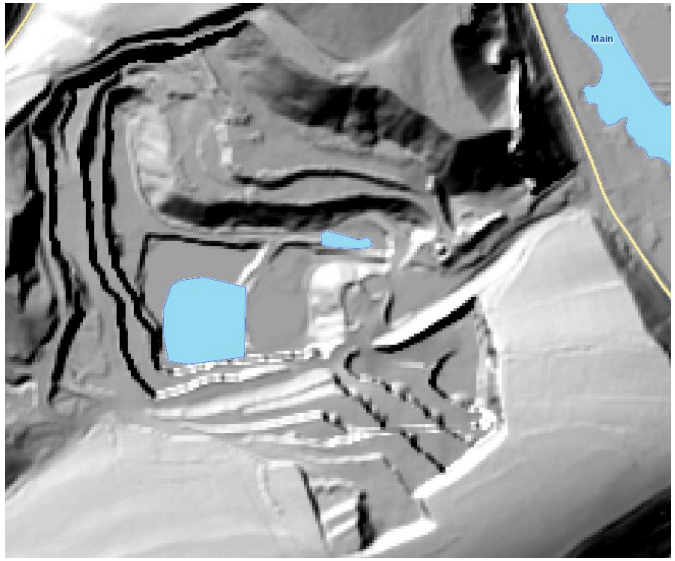
No contradictions in requirements ?

Reference documents - appraisal

Preconditions for high quality

- Quality aims

Significance/relevance for users



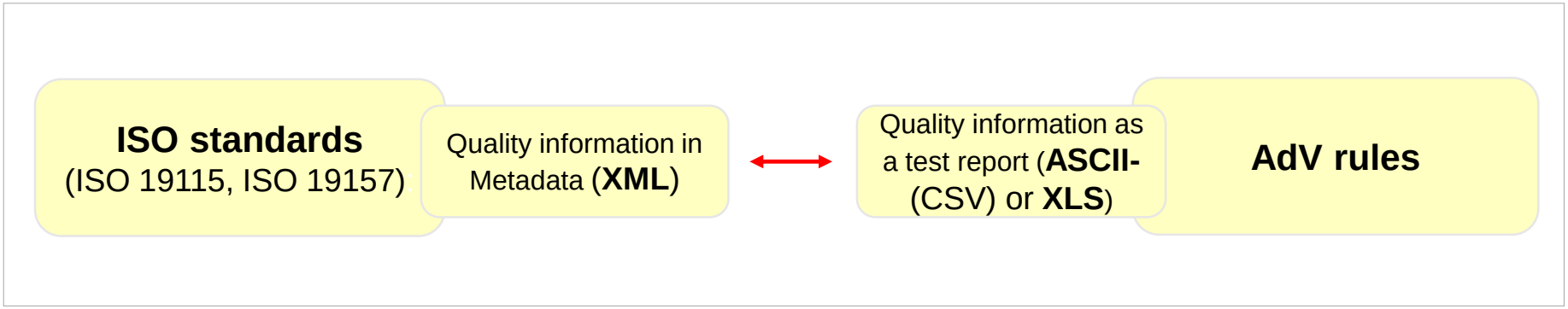
Inconsistency between DTM and hydro!

Reference documents - appraisal

Preconditions for high quality

- Quality aims

No contradictions in requirements



Reference documents - appraisal

Preconditions for high quality

- Quality aims

~~Clarity, understandability, unambiguity:~~

→ ~~clear definition of quality elements~~

→ ~~clear definition of qualty aims~~

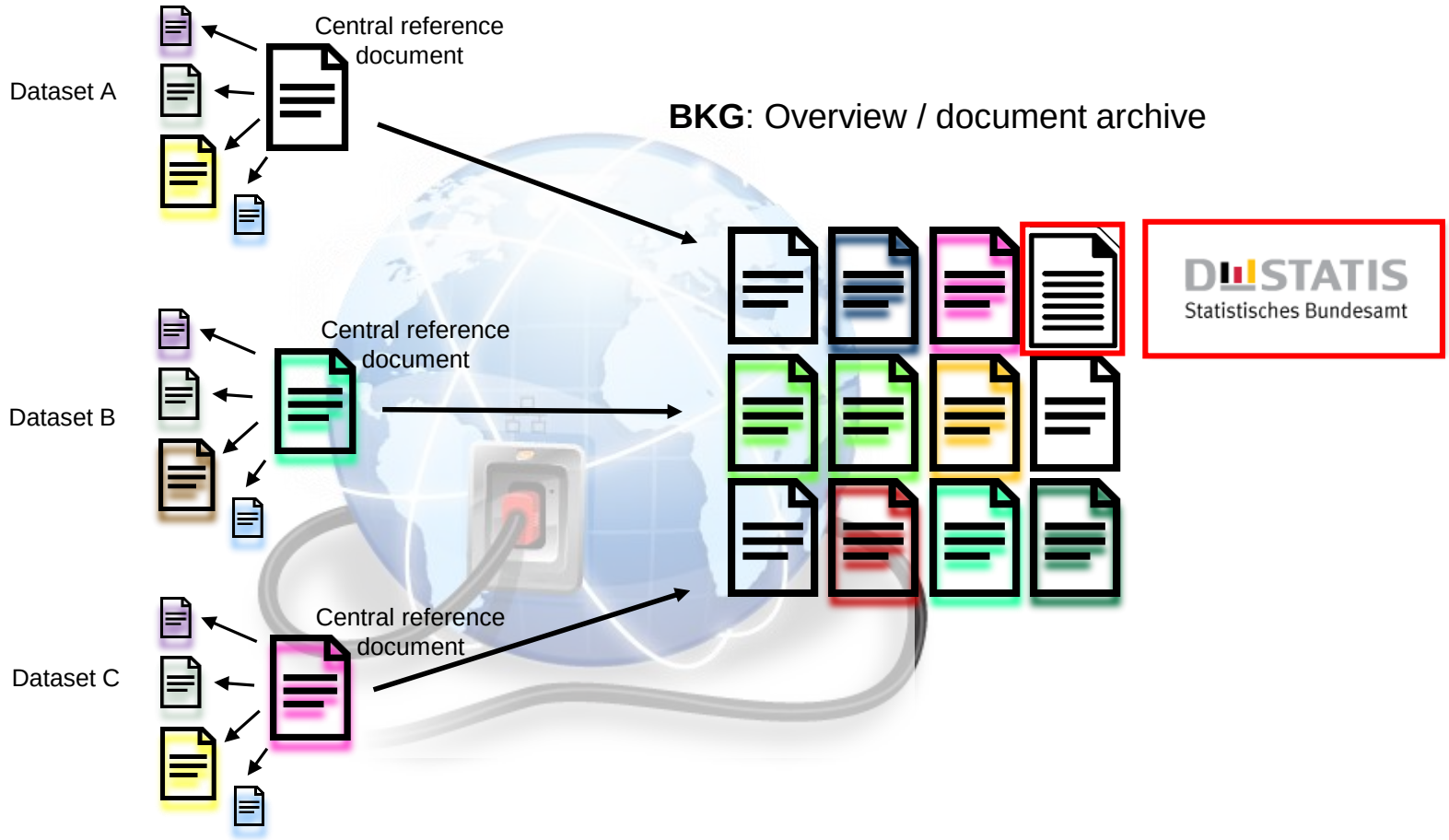
→ ~~verifiability of quality aims~~

~~Completeness:~~ → existence of requirements

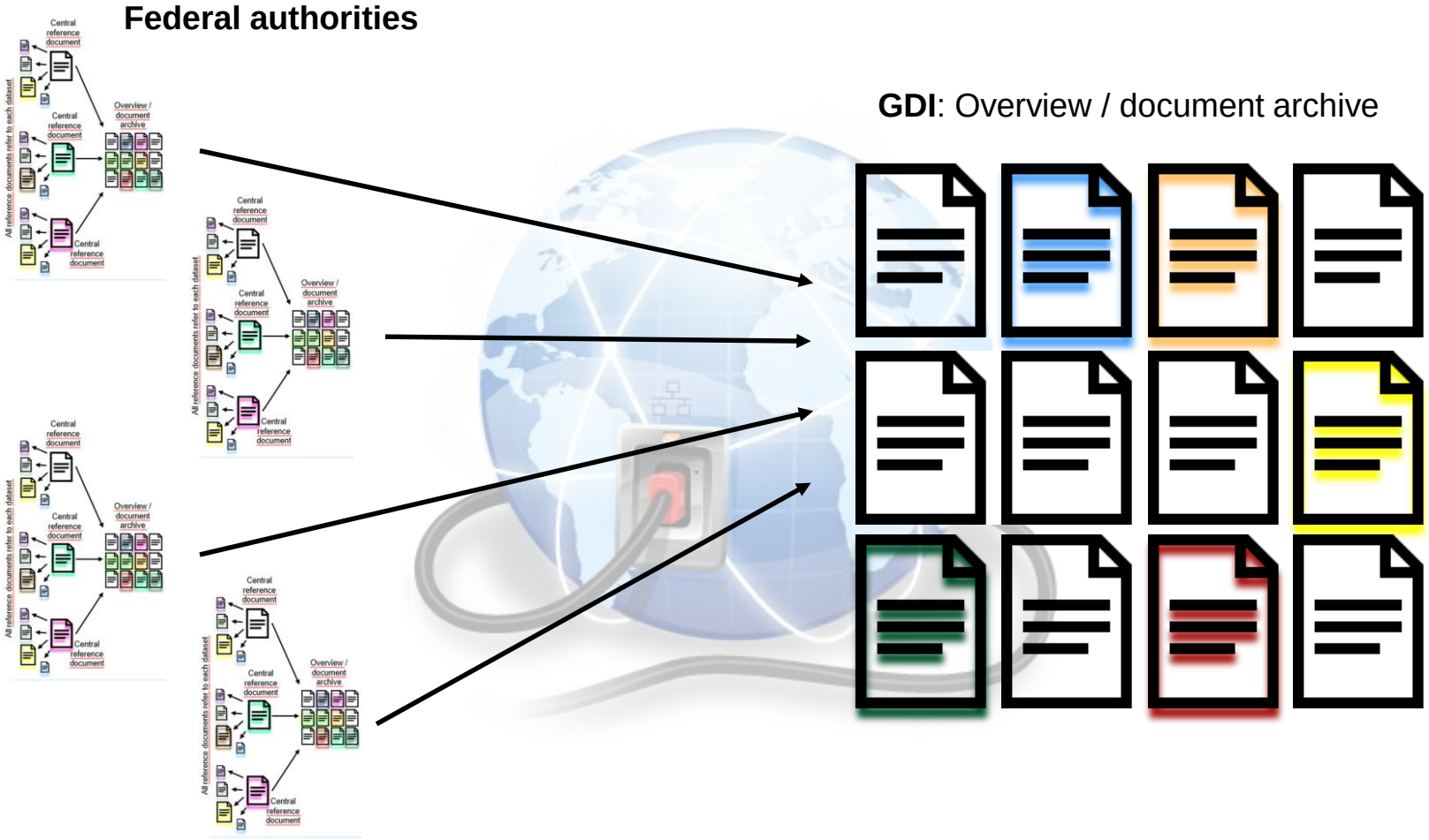
~~Significance/relevance for users~~

~~No contradictions in requirements~~

Reference documents – proposed solution



Reference documents – proposed solution



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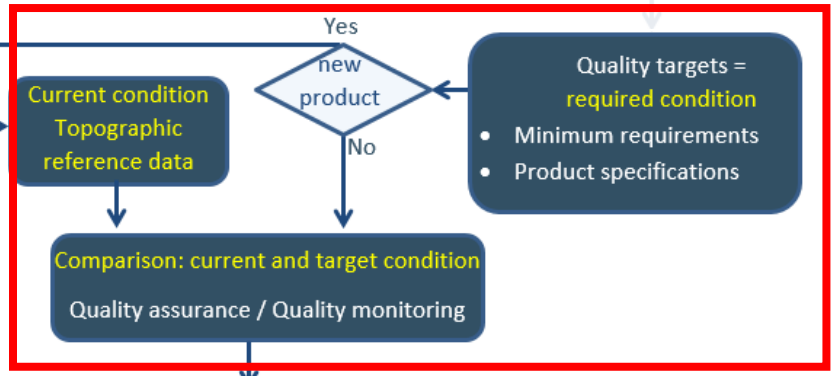
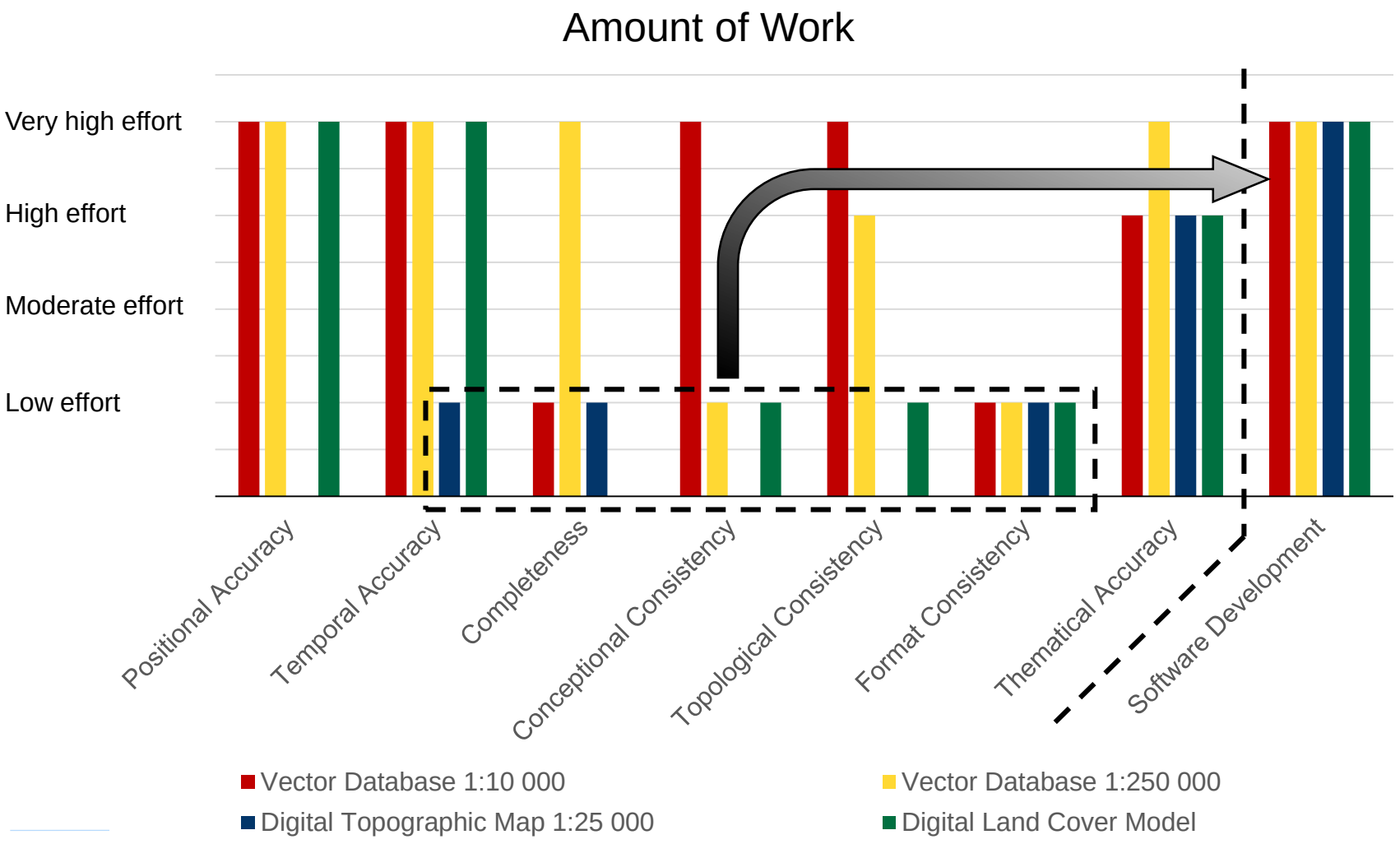
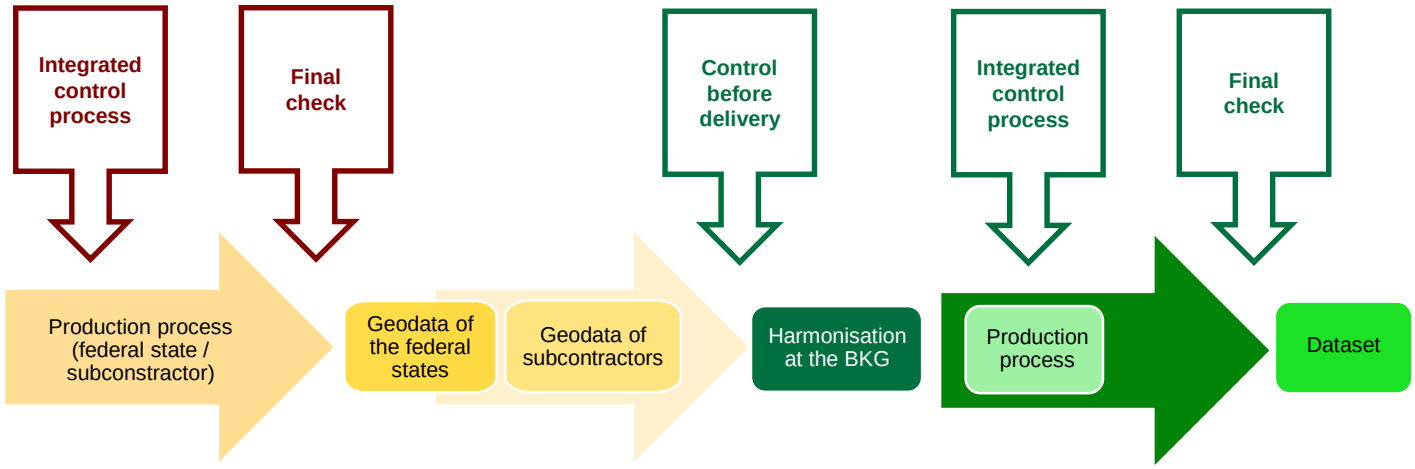


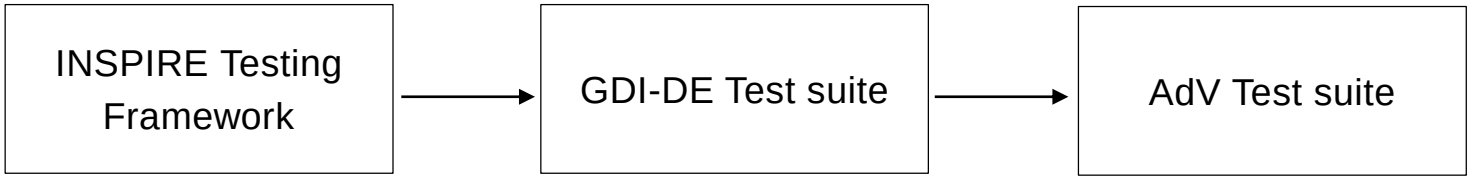
Quality evaluation: Quality assurance at the BKG



Quality evaluation: Quality assurance (when & how)



Control tools at the BKG: 3A Server (AED SICAD) / ProSuite QA-Extention for ArcGIS (ESRI Switzerland) / ESRI ArcGIS (ArcMap, ArcCatalog, 3D Analyst, Spatial Analyst, Mosaic Dataset, etc.) / ESRI Geoprocessing-Tools automated with PythonMap Server-Suite (Morelli) / FME / eCognition / Adobe Photoshop / ISO-standardized screens / Spectralphotometer / GNSS instrument



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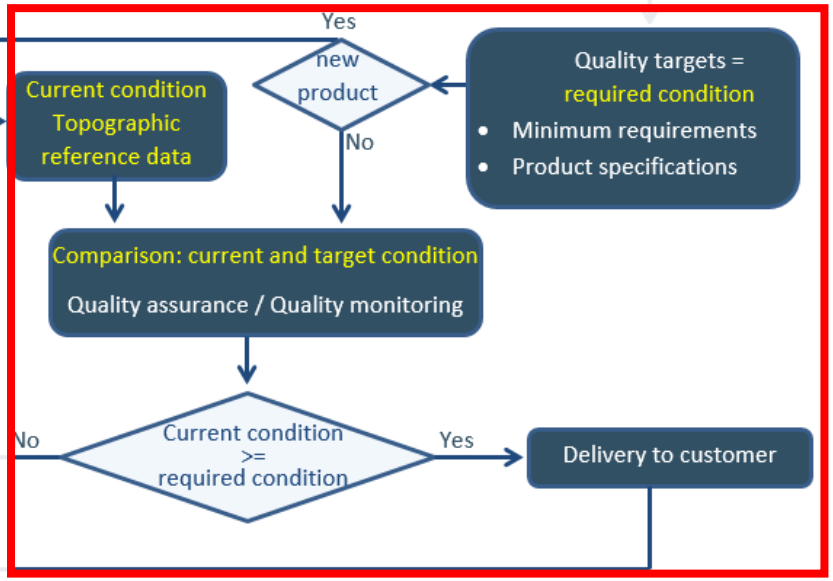
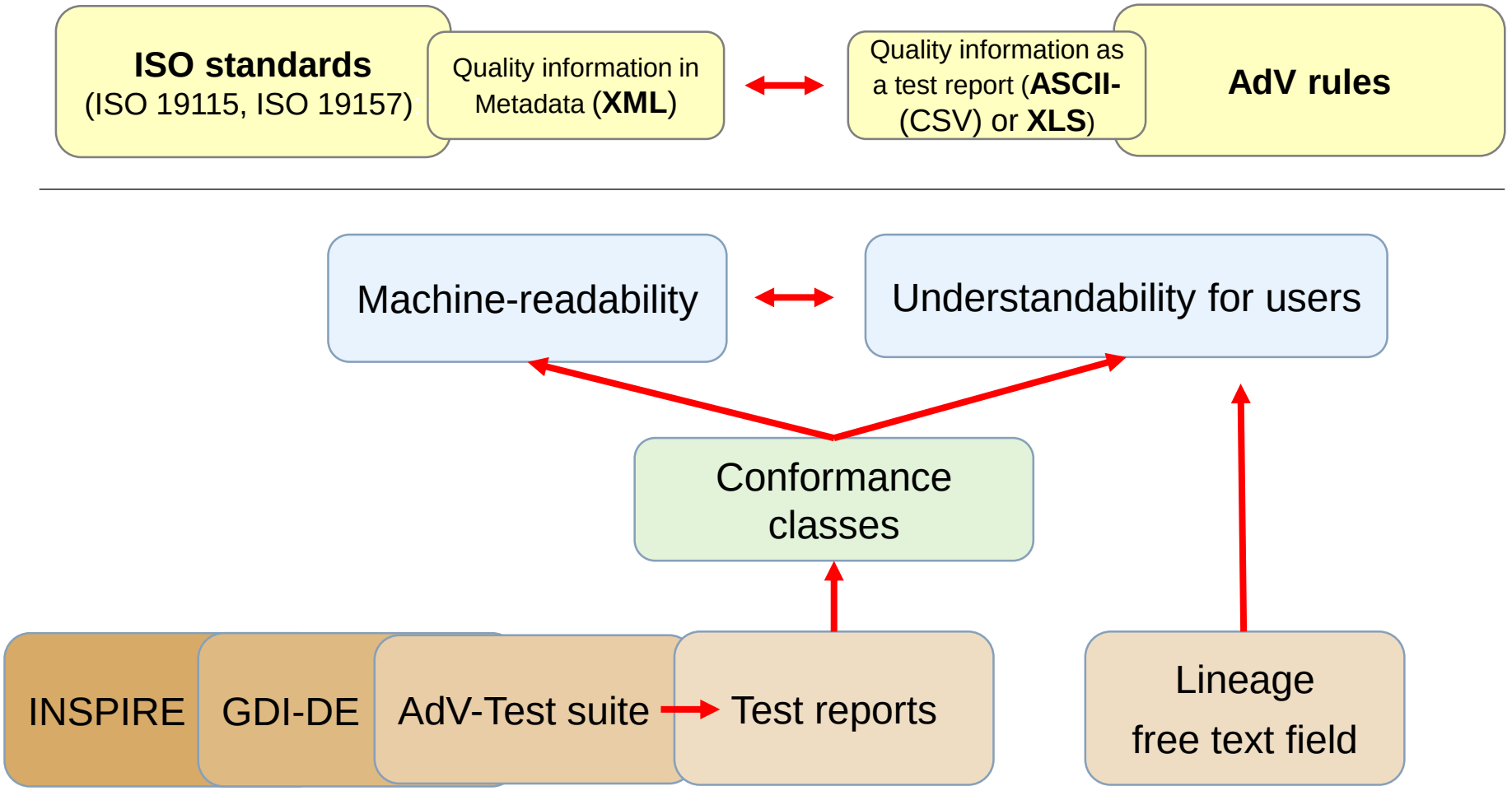


Reporting quality information



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Transfer QA-methods to other federal authorities

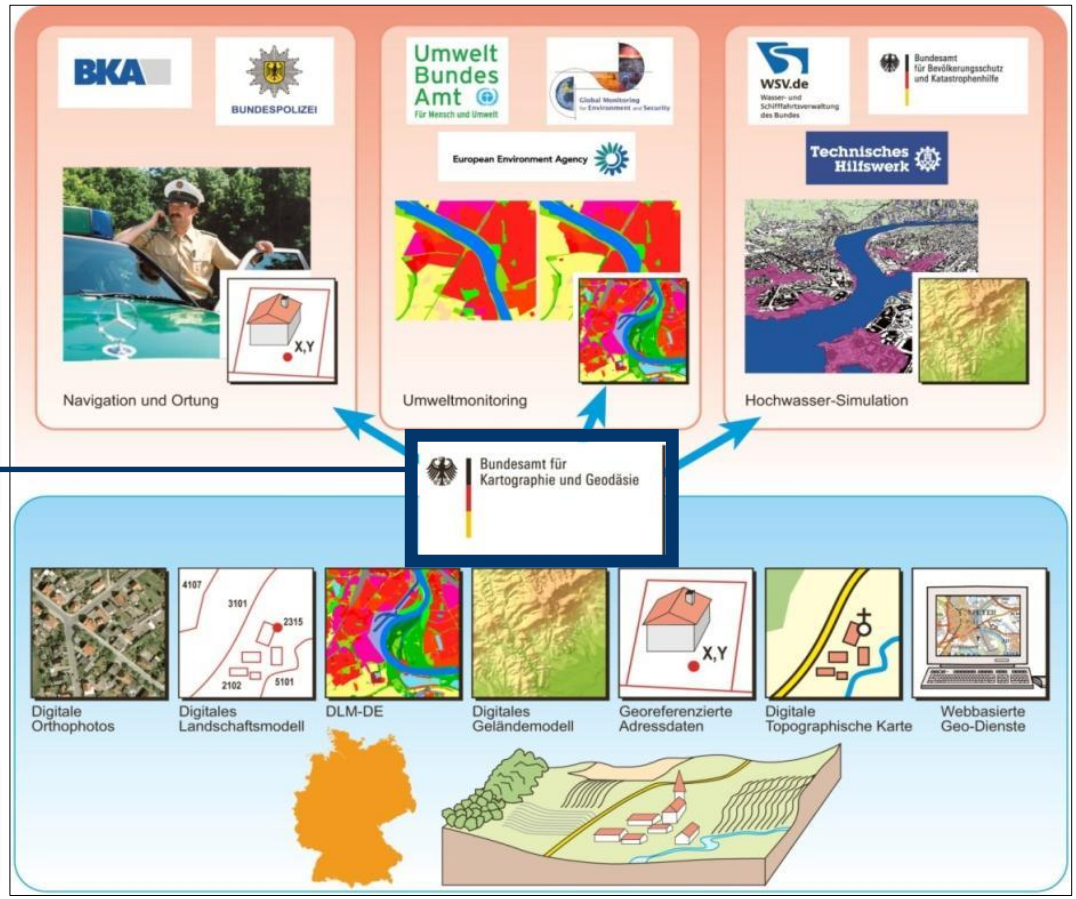
IMAGI

1. Phase: Development and evaluation of QA-methods for topographic reference data of the BKG

Additional adaption is necessary!

extension

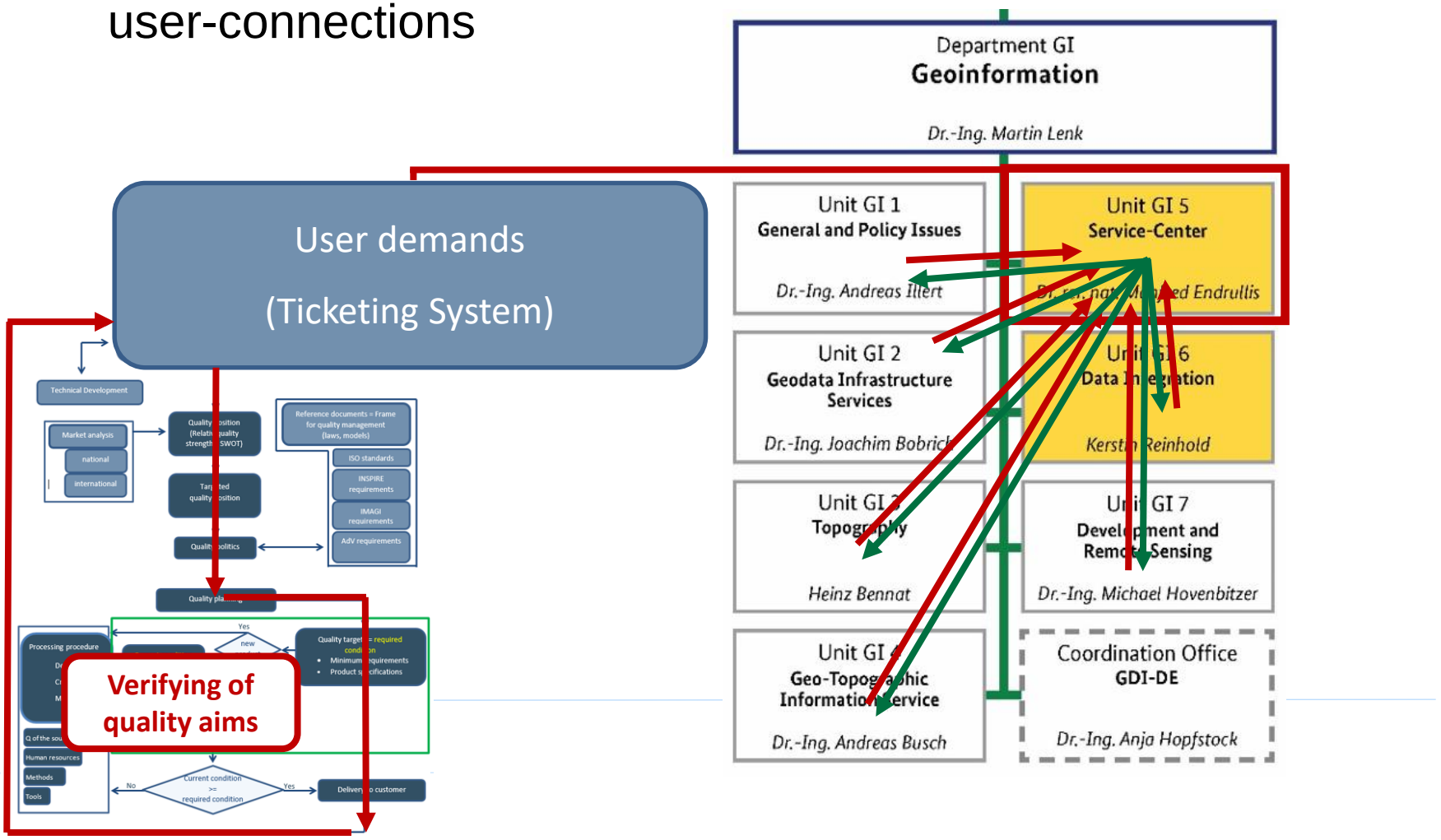
2. Phase: Transfer to federal reference data



Summary and outlook

What we learned at the BKG

- User needs analysis → Unification, extension to all user-connections



Summary and outlook

What we learned at the BKG

- User needs analysis → unification, extension to all departments ✓
- User needs analysis → adaptation of quality aims periodically ✓
- Documentation of quality monitoring → unification → central reference document (online) + document-archive + quality handbook ✓
- Modelling of the production-process → increase efficiency ✓

Summary and outlook

What we learned in general

– discussion at higher level necessary (IMAGI, AdV, QKEN)

- Quality evaluation: mandatory or optional? ✓
- Document-overview at GDI-DE level ✓
- Old / new ISO standards ✓
- Pragmatic solution for reporting quality information ✓
- New evaluation tools: INSPIRE Test Framework, GDI-DE Testsuite, AdV-Test suite → Conformance classes ✓

Thank you for your kind attention!

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