

Towards a comprehensive international Knowledge Organization System

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Networked Knowledge Organization Systems

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Objective

- Layout and reflection of the requirements of KOS
- Development of theories and model strategies

for the construction of a

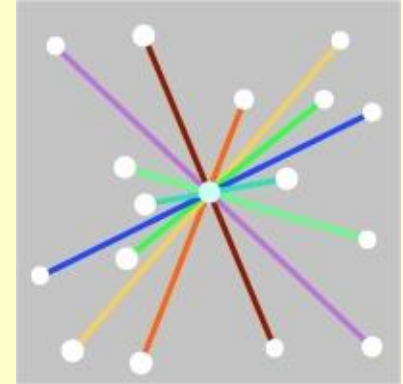
comprehensive international

Knowledge Organization System



CRISSCROSS

and



RESEDA

Repräsentationsmodelle semantischer Daten

(Representational models for semantic data)

Towards an international KOS

International information spaces with heterogeneously indexed resources require adjusted KOS to enable navigation and research.

An international KOS faces challenges of

- language differences
- structural differences
- typological differences



Towards an international KOS

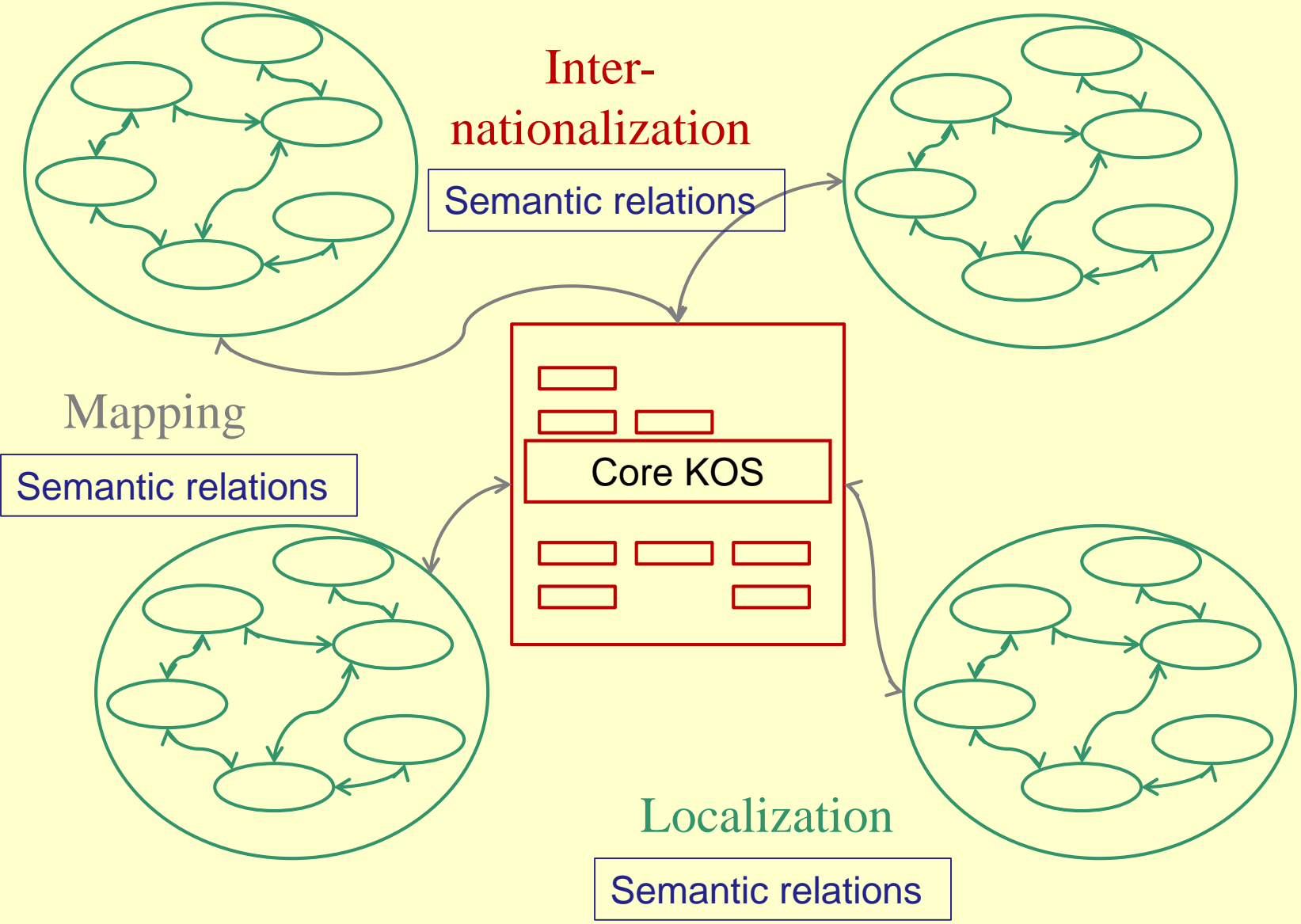
In order to derive benefit from indexing data, many projects focus on establishing interoperability between well-established KOS.

In doing so, they concentrate on issues concerning technical and conceptual interoperability, neglecting issues of the relational structure of the newly created KOS.

Semantic relations as integral part of an expressive and functional system.



Comprehensive international KOS — Model



Internationalization — Definition

in context of software engineering and marketing

„Internationalization encompasses the planning and preparation stages for a product in which it is built [...] to support global markets. The process means that all cultural assumptions are removed and any country- or language-specific content is stored externally to the product so that it can be easily adapted.“

(LISA — The Localization Industry Standards Association)



Internationalization — Definition

transferred to knowledge organization systems

Internationalization is the process of generalizing a knowledge organization system with reference to the representation of concepts and their semantic relations so that it can handle multiple languages and viewpoints. It implies the identification of the most appropriate structural form for a core KOS and the decision for a concrete KOS that is taken as initial point for developing delocalized concepts and structures.



Internationalization — Tasks

Selection of the best structure for a core KOS in regard to required characteristics

- closed structure
- coverage of all fields of knowledge
- language independency



Internationalization — Tasks

Decision for a concrete KOS that should furtheron be internationalized

DDC as a good candidate as it is

- most widespread KOS (135+ countries)
- many countries already engage in further development of the DDC
- translation of recent years as first step towards internationalization



Internationalization — Tasks

Developing delocalized structures

- Identification of existing global structures
- Identification of existing local structures
- Research to which extend the historically determined *American bias* can be substituted by international concepts and structures (international cooperation with OCLC)
- Research which parts / relations of the DDC can and should be available within a spine (up to which level, semantic relations)



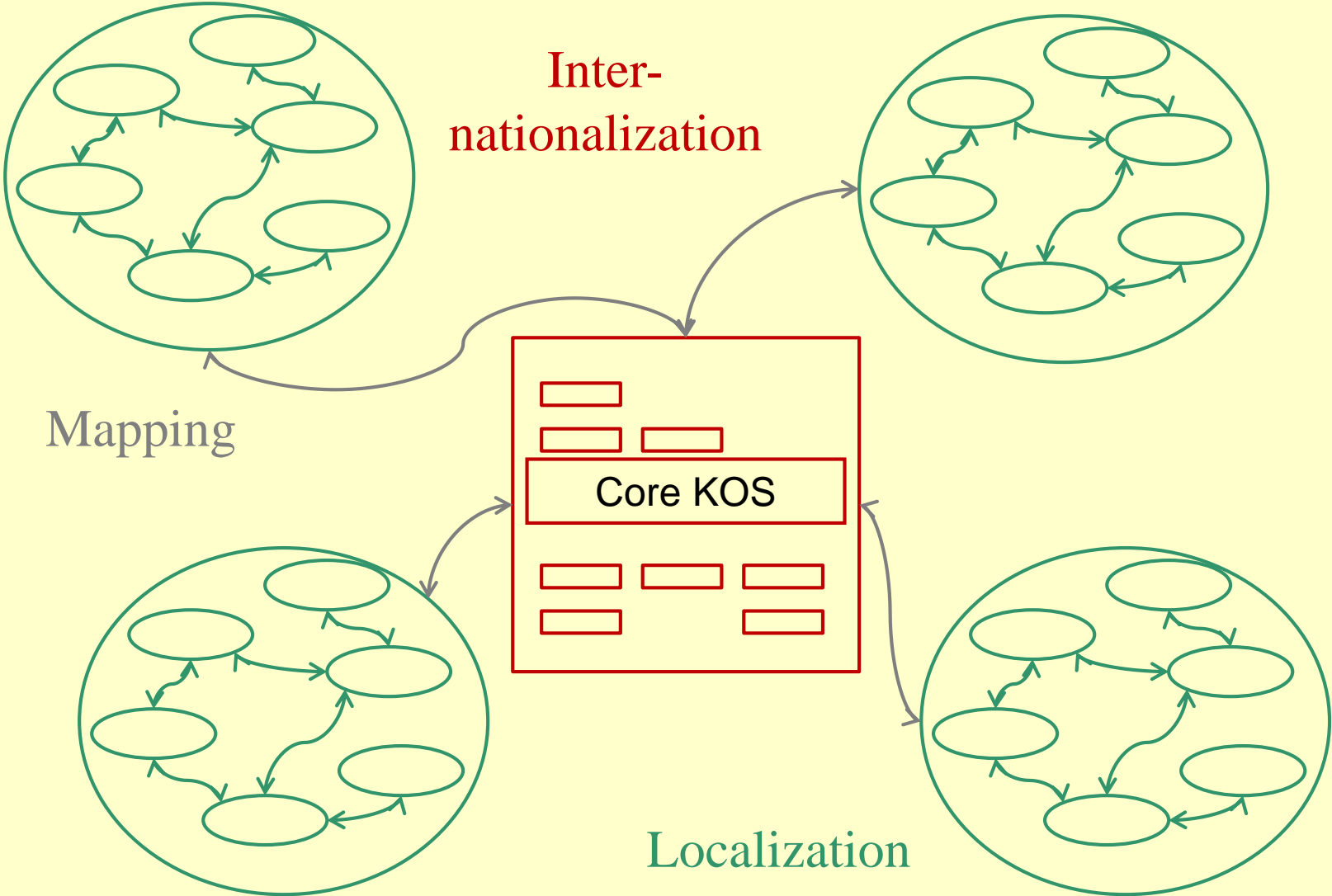
Internationalization — Relations

Requirements for the relational structure of the core system:

- Hierarchical spine with additional semantic relations
- General language-independent semantic relations, that will have to be found in all participating systems
- Specific and well-defined types of relations with fully developed semantic content and precise logical characteristics



Comprehensive international KOS — Model



Mapping — Definition

Mappings are means to establish interoperability between the internationalized core KOS and the multiple localized KOS.

The functionality of the global KOS as a whole and its efficiency in retrieval scenarios depends on the adequacy and precision of these links. Differences in KOS (for ex. typological differences between classifications and verbal concept schemes like thesauri) should be balanced by specific links.



Mapping — Tasks

Development of a basic set of match types in order to support information seekers in switching between KOS

Conduction of bilateral mappings between the top concepts of the local/localized KOS and the internationalized KOS — preferably intellectual

Research how further specification of the match types in regard to the connected KOS might be possible



Mapping — Match types

Recent studies dealing with the establishment of interoperability between KOS through mapping process mainly concentrate on mapping processes between structural similar KOS (Renardus, MACS, Icsh-esp).

There is a wide range of project-specific match types; the so-far emerged coincided set of match types basically correspond to the mapping properties proposed in SKOS (s. <http://www.w3.org/TR/2008/WD-skos-reference-20080829/#mapping>). Nevertheless, they can only be adopted limitedly as basis for mapping between heterogeneous KOS as their expressivity is constrained.



Mapping — CrissCross

Unidirectional, specific mapping of subject headings of the SWD to notations of DDC; notations are integrated in the SWD database

Relations between SWD and DDC classes are expressed by four „Degrees of Determinacy“ (D) taking the scopes of meaning of the given SWD subject headings and DDC classes as initial points. The meaning of the degrees of determinacy orientates on the DDC understanding of how a concrete topic relates to the whole of topics that constitute a specific class.



Mapping — CrissCross — Example

Degree of Determinacy 3

„The connotation scope of the SWD subject heading *approximates the whole* of the assigned DDC class“

Approximate the whole

„When a topic is nearly coextensive with a full meaning of a DDC class, the topic is said to „approximate the whole“ of the class. [...] When a topic approximates the whole of a class, standard subdivisions may be added.“

(Dewey Decimal Classification glossary)

Class-here-note

„Topics identified in class-here-notes [...] are said to *approximate the whole* of the number [...].“

(Dewey Decimal Classification glossary)



Mapping — Relations

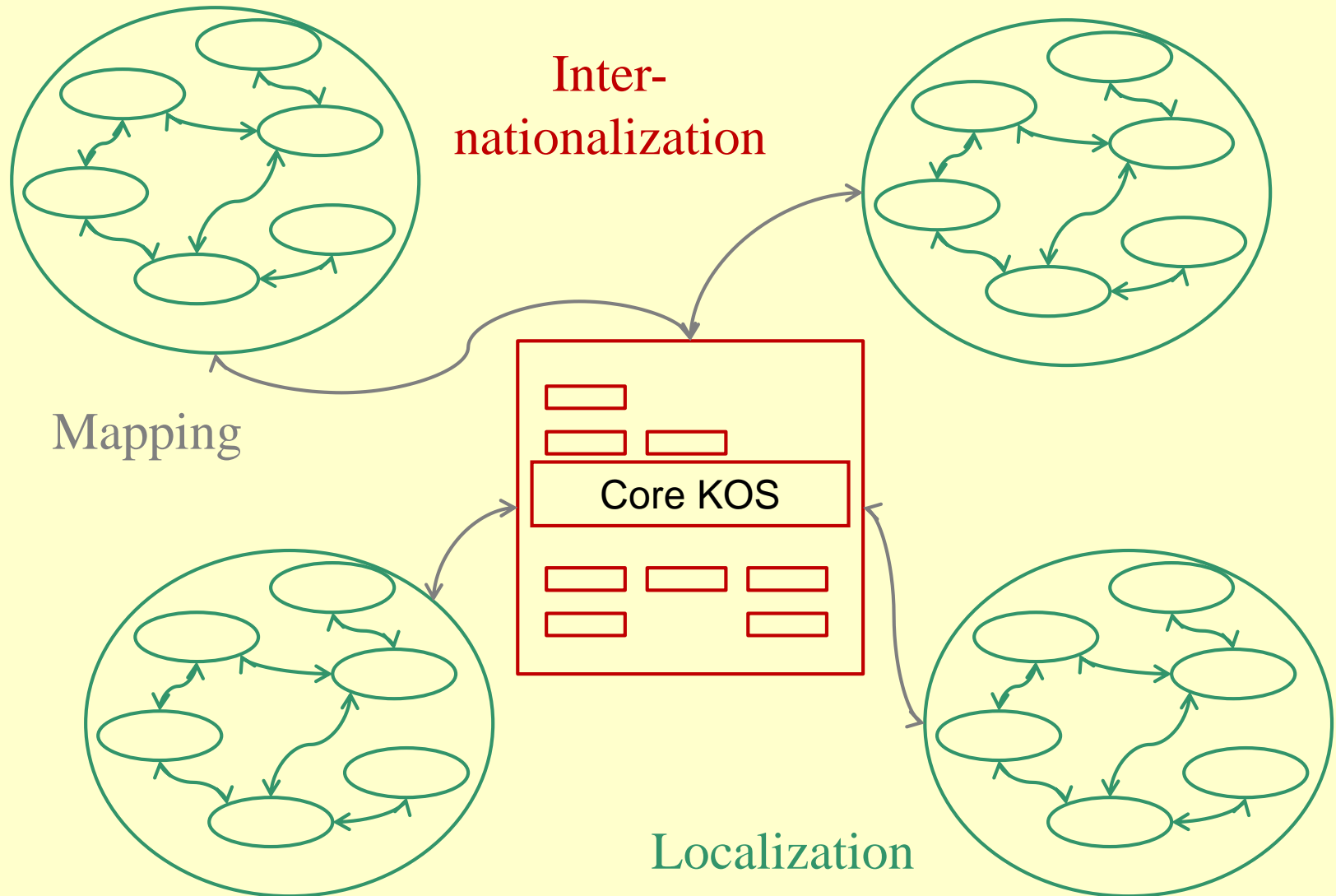
Mapping various structurally heterogeneous KOS (like indexing languages or reference terminology with each other or a core-system) requires the expressivity of a differentiated set of relations

Particularly the mapping of structurally and typologically different systems requires types of mapping relations that capture and model the typological difference appropriately.

Bilateral mappings also require the appropriate representation of the potential directionality of the respective mapping types.



Comprehensive international KOS — Model



Localization — Definition

in context of software engineering and marketing

„Localization is an integral part of globalization, and without it, other globalization efforts are ineffective. [...] Localization is the process of modifying products or services to account for differences in distinct markets.“

(LISA — The Localization Industry Standards Association)



Localization — Definition

transferred to knowledge organization systems

Localization is the process of modifying KOS in regard to the local information needs. It is focused on the particular language, culture, historical developments, politics, social structures and involves the adequate translation of the internationalized concepts into the specific language as well as the enhancement and elaboration of local / national concepts and semantic relations in a local KOS.



Localization — Relations

Requirements for semantic relations in local systems:

- Possible extension of a language-independent and universal basic set of relations by more precise and domain- or vocabulary-specific types.
- Development of a concise inventory containing both: general and specific relations
- Functional and user-friendly arrangement and presentation of the inventory for the retrieval process.



Conclusion - Outlook

Strategies of **internationalization**, **localization** and exhaustive **mappings** integrate the development and enrichment of existing indexing languages into an interoperable comprehensive international Knowledge Organization System.

Such a system facilitates refined hermeneutic processes of information seeking.

Implementing these strategies and developing the sophisticated inventories is a complex and extensive task that can only be achieved in a long-term perspective.



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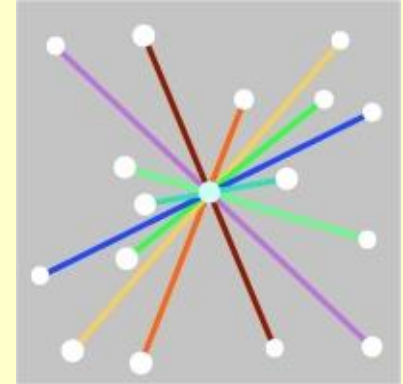
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