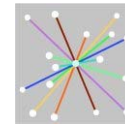




Specifying Intersystem Relations

Requirements, Strategies and Issues

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Overview

- Initial situation
- Information retrieval and knowledge exploration
- Relational Structures in an international comprehensive KOS
- Characteristics and functions of intersystem relations
- Inventories of intersystem relations
- Specifying intersystem relations
- Conclusion



Initial situation

- Heterogeneity of knowledge organization systems
- Need for integrated solutions for interconnected systems

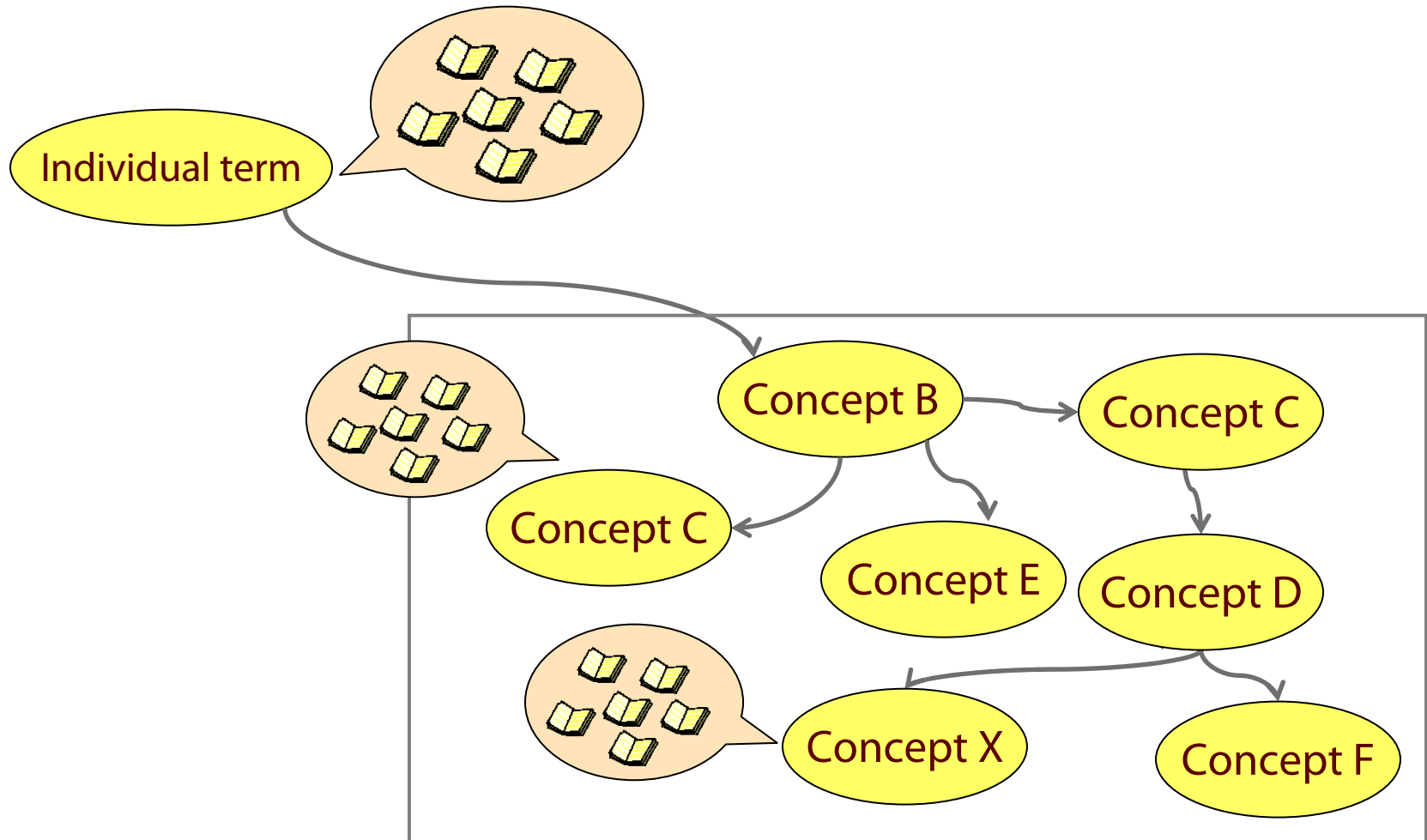


Focus

- Machine-assisted reasoning
- Cognitive interpretation of relations
- Importance of a differentiated semantic structure for exploration and retrieval
- Combination of information retrieval and knowledge exploration

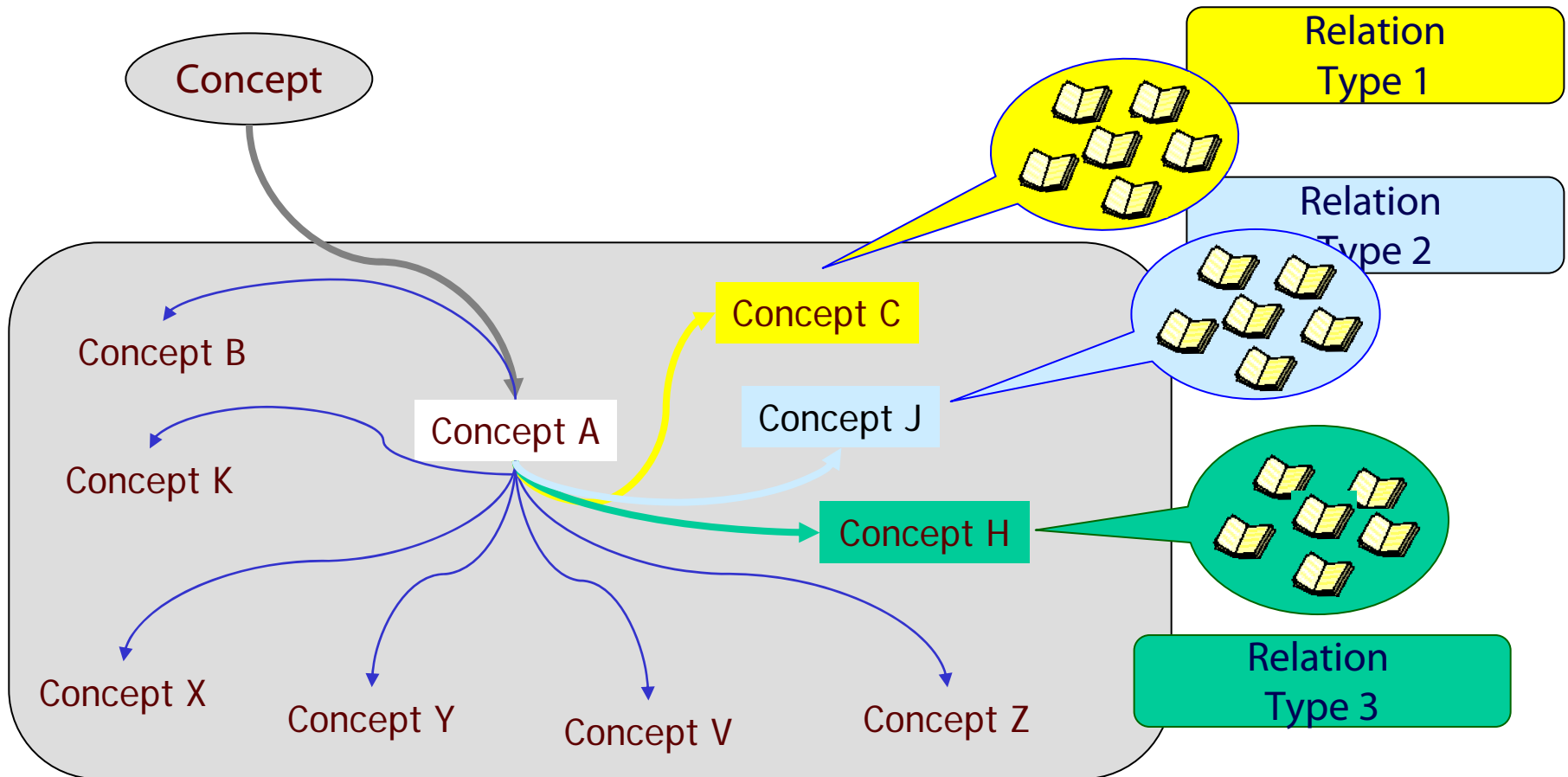


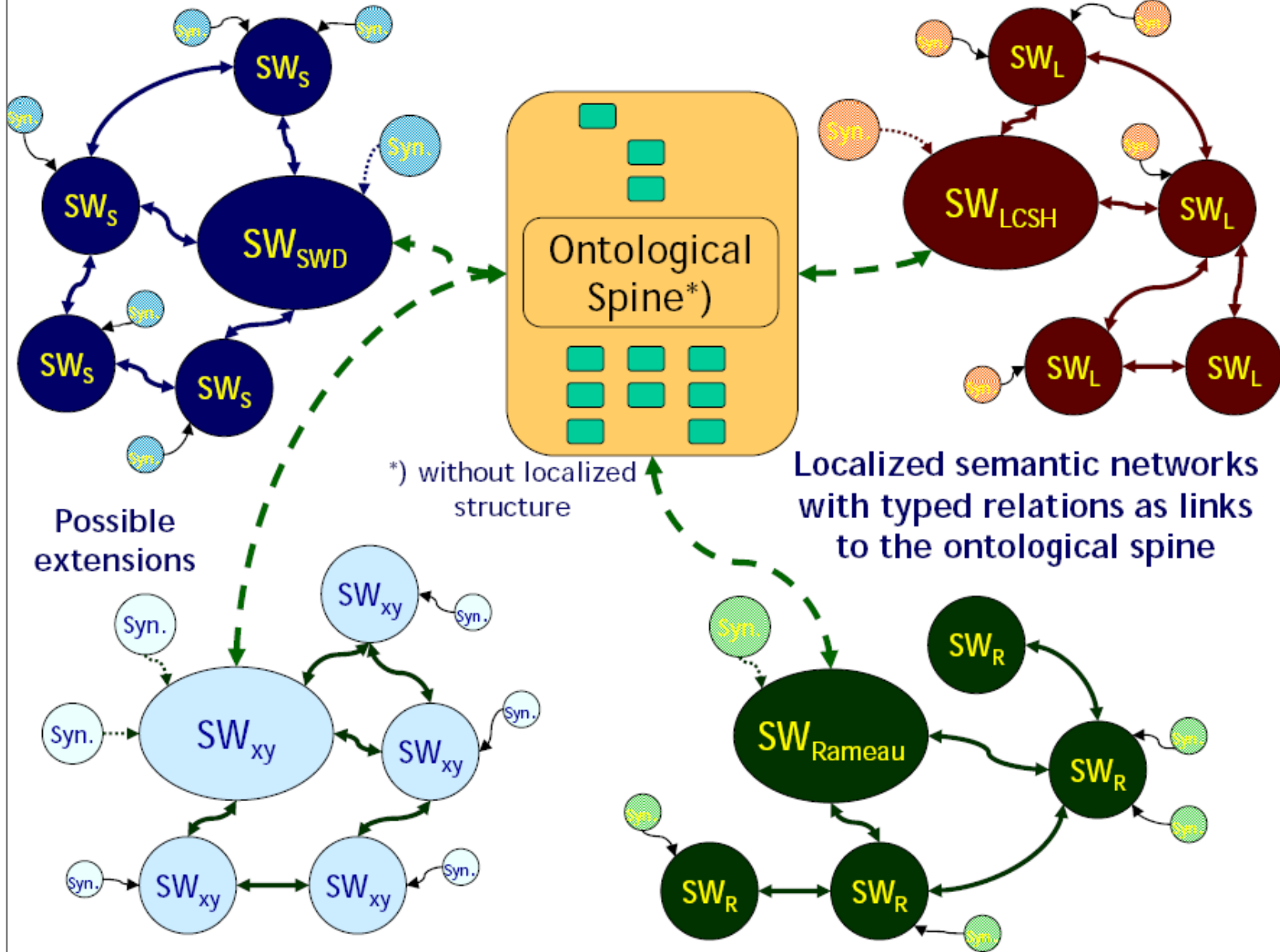
IR and knowledge exploration





Differentiated knowledge exploration







Intersystem relations

- Intersystem relations without any specified semantic content
- Relation types that are similar to those within individual concept schemes (equivalent, hierarchical, associative)
- Relation types exclusively used for the description of intersystem relations
 - Project specific relation types (e.g. degrees of determinacy in CrissCross)



Information in typed intersystem relationships

- Semantic content denoting kind of relation
 - Designed for cognitive interpretation
- Logical characteristics
 - Machine-readable information designed to support automatic processes like search expansion
 - Closely related to the semantic content (e.g. broader/narrower might imply transitivity)
- Formal specification of intersystem relations



Development of an inventory of relations

- Inductive approach / Bottom-up strategy
 - Starting with the development of a highly specific inventory
 - Subsumption of relations to more general and more applicable types

- Deductive approach / Top-down strategy
 - Starting with an existing set of relations (e.g. common relations in thesauri or classifications)
 - Gradual specification of relations and expansion of inventories.

- Inventories of relations have to be arranged in a well-structured, comprehensive array which can be handled intuitively. This can be guaranteed by a hierarchical modeling of relations.



Specifying intersystem relations (I)

- *Bottom-up* strategy starting with observations concerning characteristics of mapping relations before adopting relationships
- Data Basis: Linkages created within the CrissCross project
 - Directional deep-level one-to-many conceptual mapping

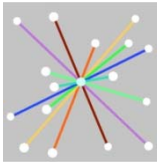
Subject Headings of the
German Subject Heading Authority
File (SWD)

post-coordinated usage;
concepts context-free



Notations of the
Dewey Decimal Classification
(DDC)

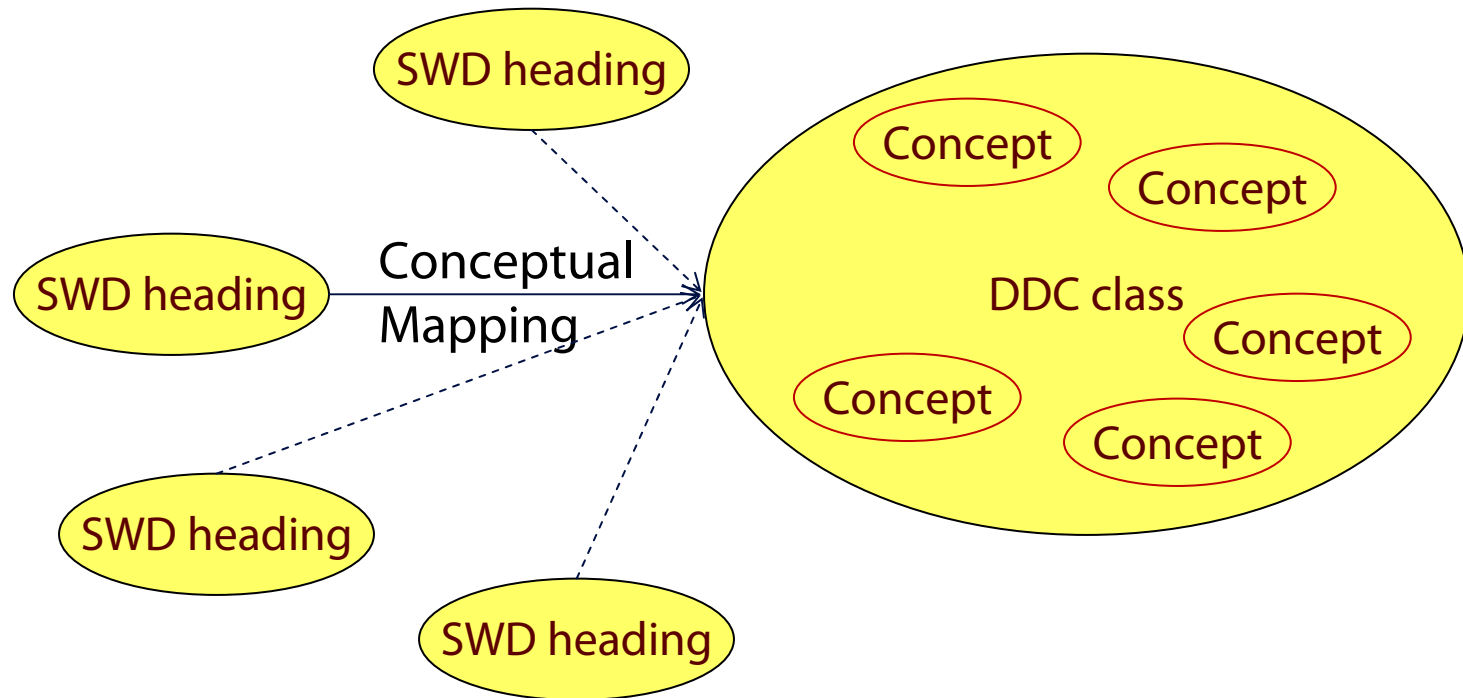
precombined classification;
classes context-sensitive





Specifying intersystem relations (II)

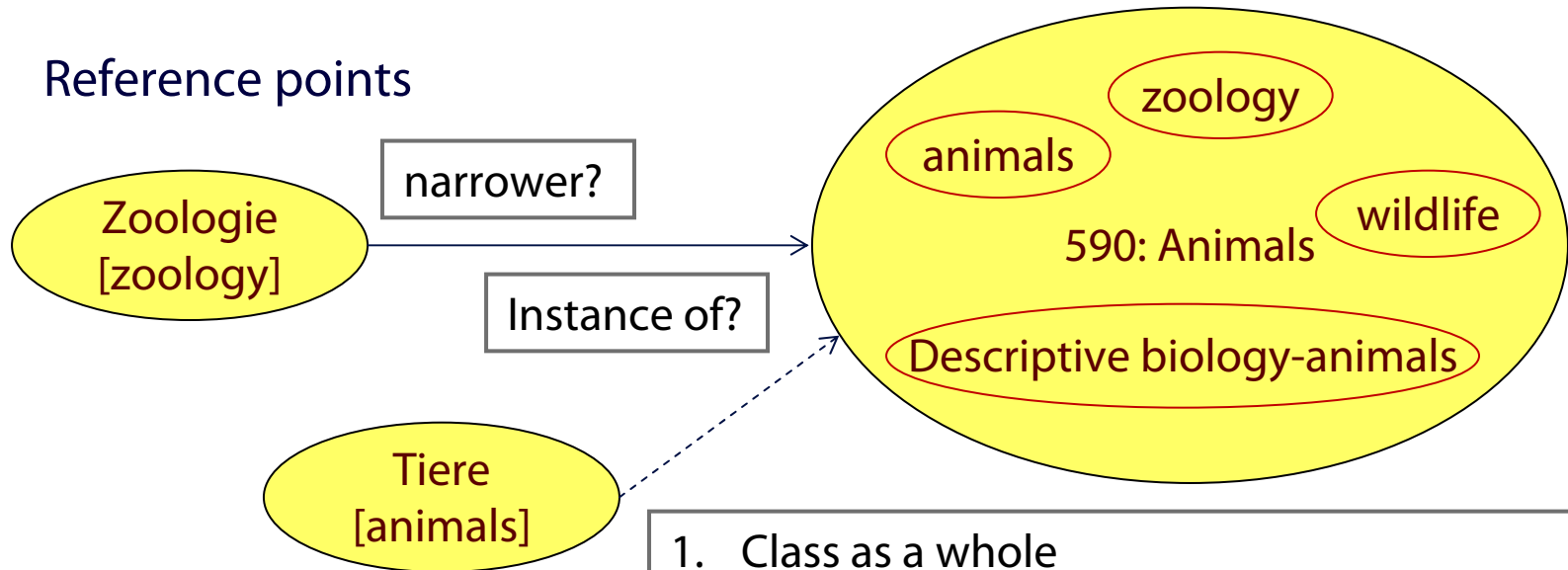
➤ Reference points





Specifying intersystem relations (II)

➤ Reference points



Limited expressivity

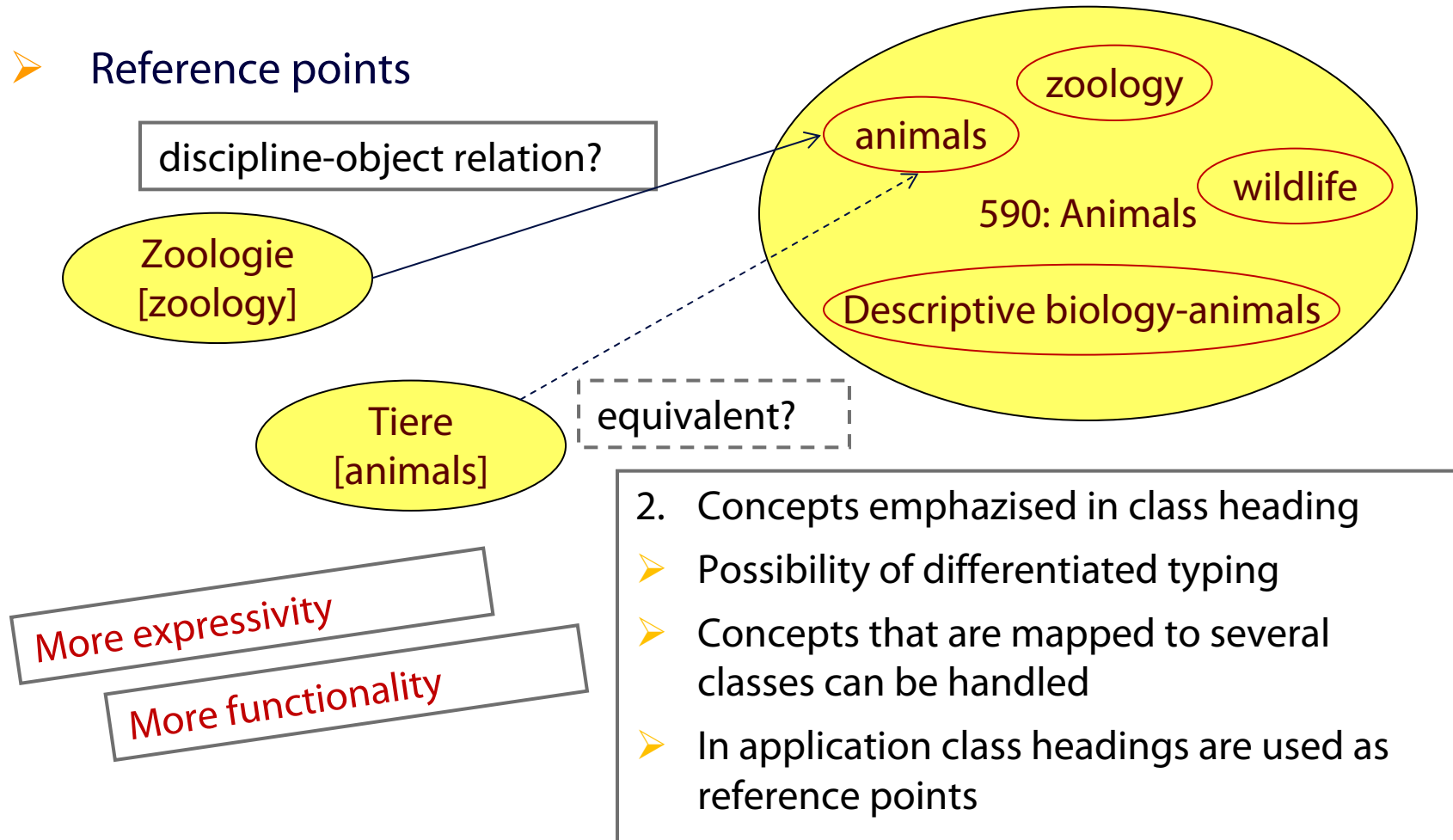
Limited functionality

1. Class as a whole
 - Little leeway for typing
 - Difficulties in handling concepts that are mapped to several classes
 - In applications class headings are used as reference points



Specifying intersystem relations (II)

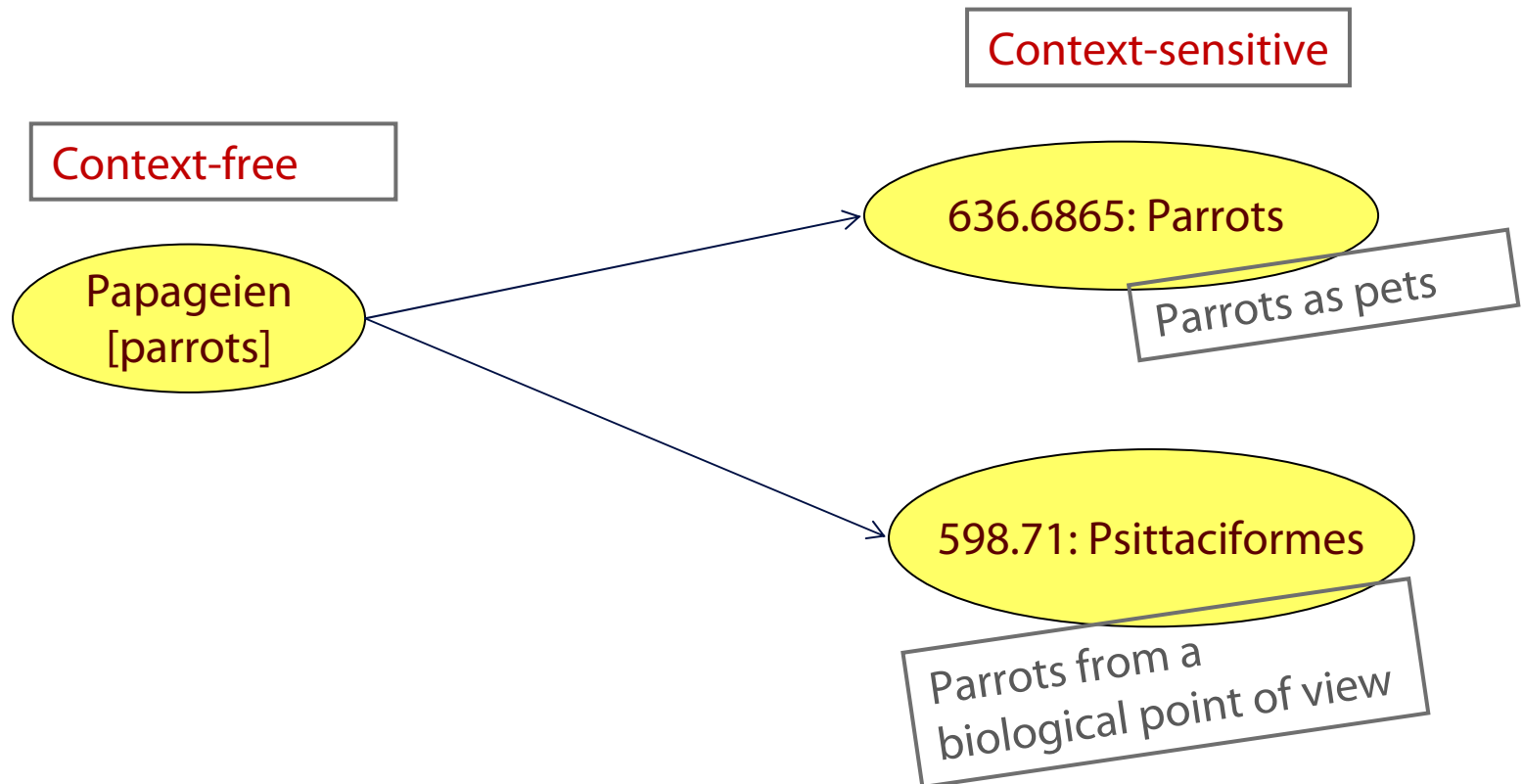
➤ Reference points





Specifying intersystem relations (III)

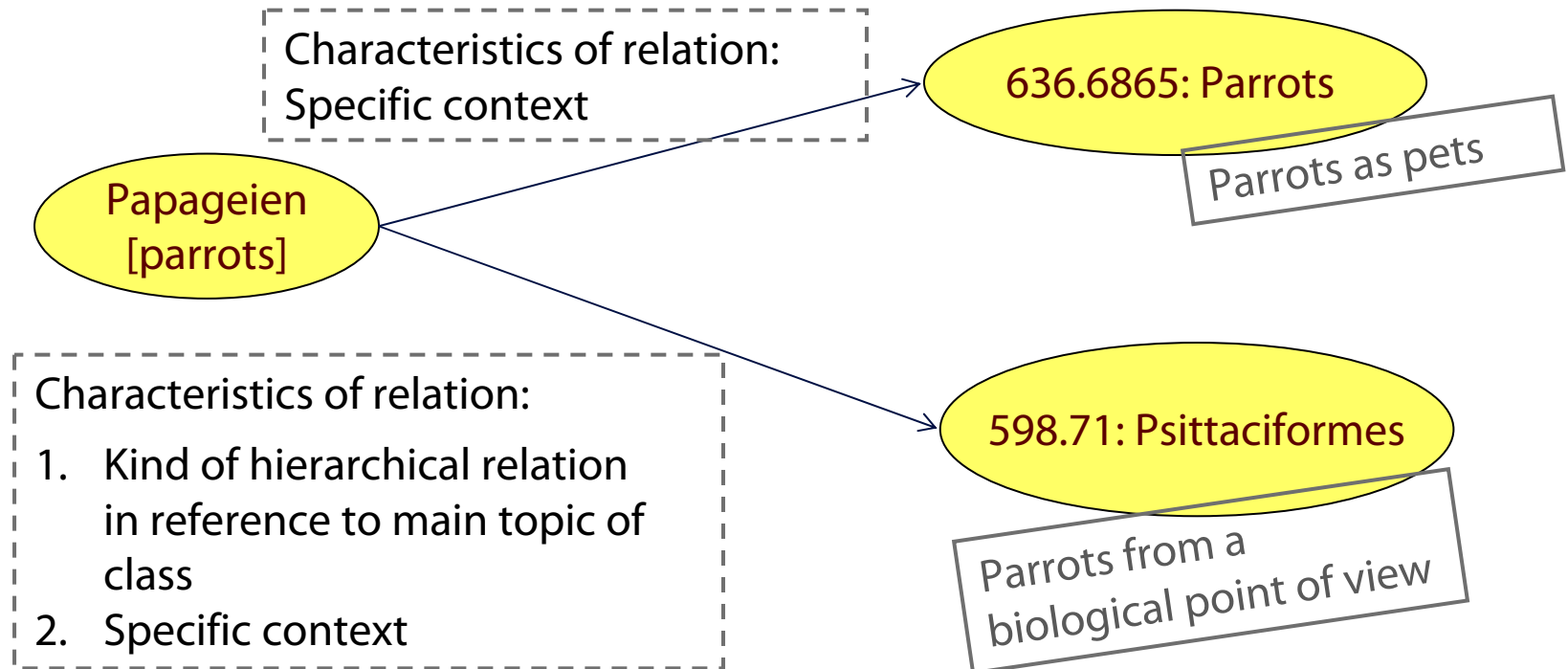
- Differences in respect to context





Specifying intersystem relations (III)

➤ Differences in respect to context

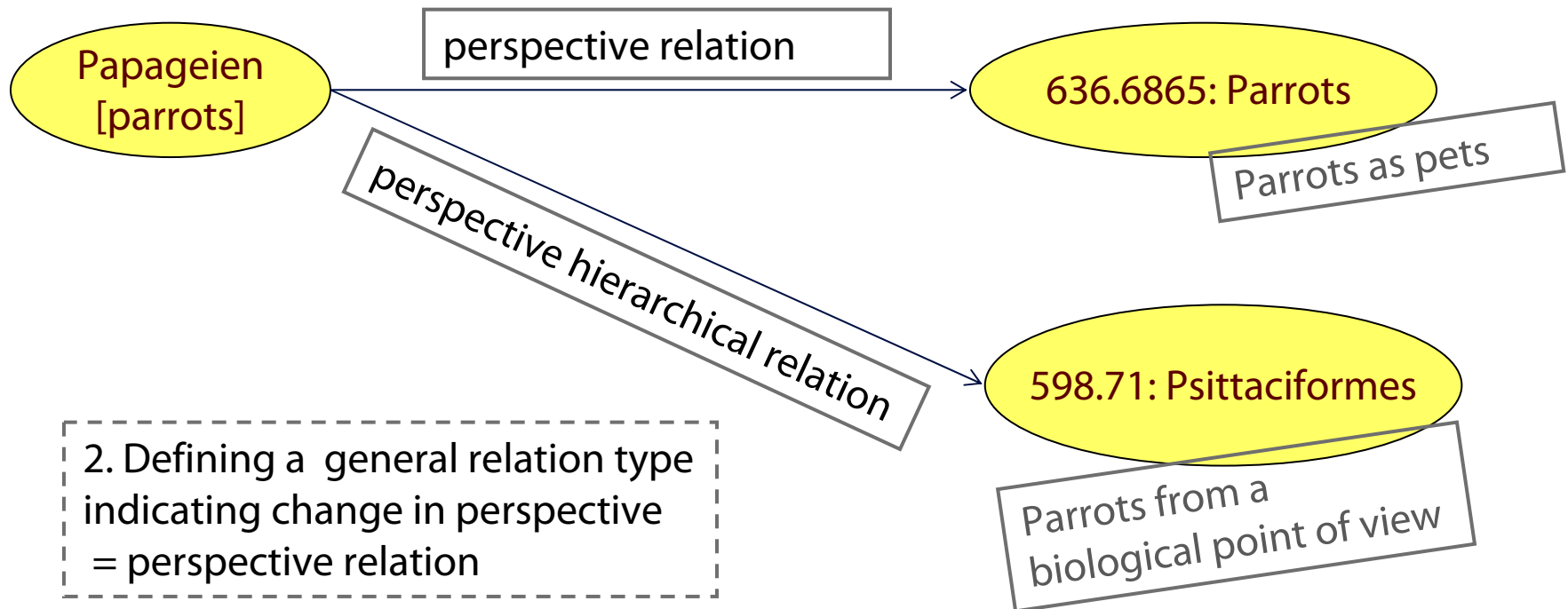




Specifying intersystem relations (III)

➤ Differences in respect to context

1. Adopting specific relation type described by Svenonius (2001): Perspective hierarchies that indicate a specific point of view is provided

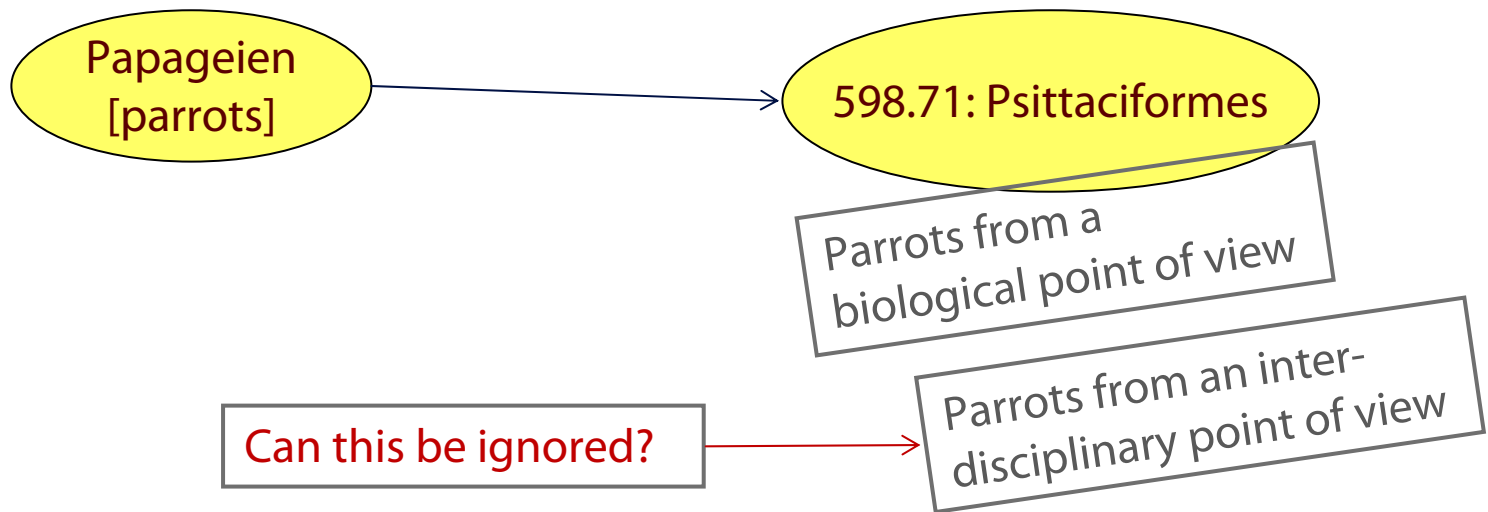


2. Defining a general relation type indicating change in perspective = perspective relation



Specifying intersystem relations (IV)

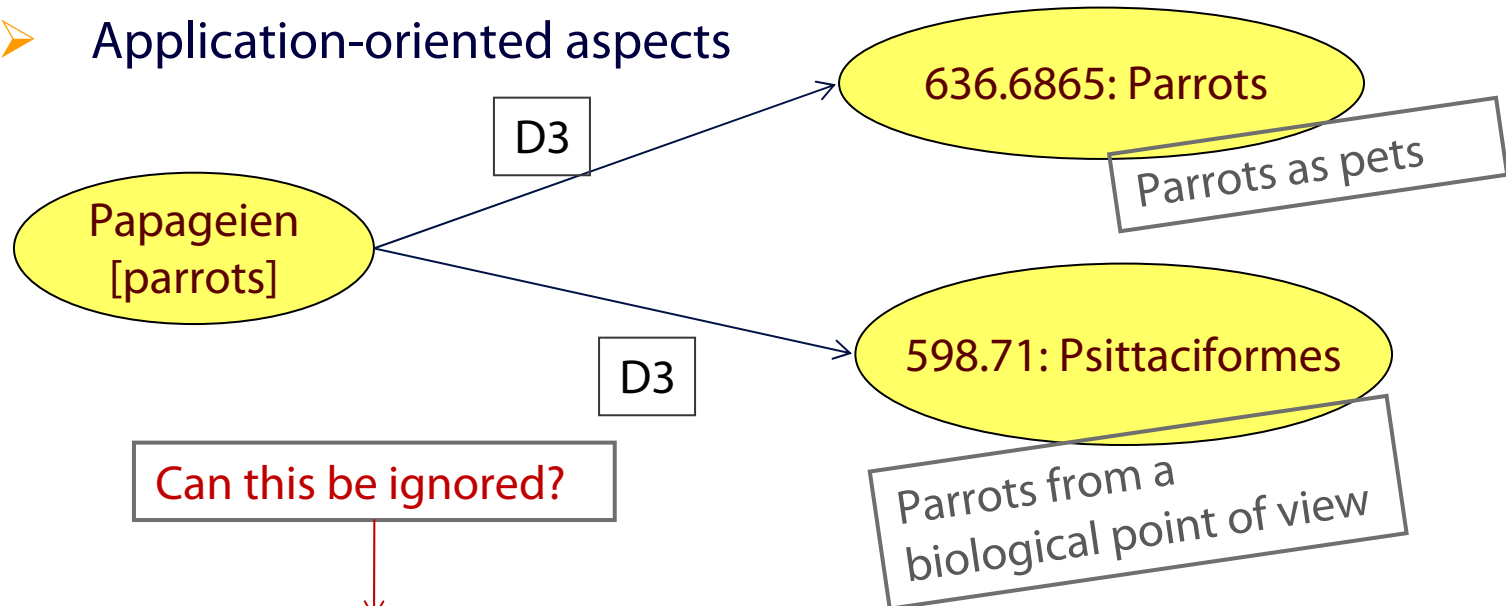
- Additional issues that might be considered
 - „Places of unique definition“ (cf. e.g. DDC)





Specifying intersystem relations (IV)

- Additional issues that might be considered
 - Application-oriented aspects



In *CrissCross*, Degrees of Determinacy (*D*) orientate on the topic-class relations inherent in DDC which are application-oriented and that are important to support specific retrieval mechanisms



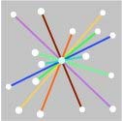
Conclusion

- Specified intersystem relations
 - must reflect the specificity of mapping relations
 - must be complemented by expressive interconcept relations
 - are an integral functional element of a comprehensive international KOS
- Specifying intersystem relations is not an aim in itself but is directed at enhancing the functionality of knowledge organization systems esp. in respect to *comprehensive differentiated knowledge exploration* in heterogeneous information spaces.



Thank you for your attention

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