**Ontology for Lexicographic Data Collection and ANalysis (OLDCAN)**

Initial model specification

**Introduction**

A shared understanding and representation of information resources became an essential aspect of exposing cultural data over the Linked Open Data (LOD).  This shared understanding is expressed using ontologies that define the structure and the semantics of the target domain. Ontologies are used to describe domain knowledge in a consistent manner and provide a shared conceptualization of the domain. Ontology enables users to have a common understanding of the semantics or the interpretation of the information resources and permits machines to identify and process the resources consistently.

Previously ontologies were widely used in the medical and library domains. In nowadays, other disciplines are advancing in the use of this shared conceptualization to describe the discourse of their domain. Digital humanity has joined the initiative of using ontologies for describing various contents produced in the domain. In this document, we present an ontology that models data collection methods used for historical-cultural lexicographic data from the beginning to the end of the 20th century. The data collection method mainly uses questionnaires and produced a huge collection of both the questionnaire and the answers to the questionnaire. The content of the questionnaire covers diverse topics. Such data collection methods were also used in other countries by different organizations.

To utilize such historical-cultural data, a formal and shared description of the data collection methods(questionnaires) plays a significant role. We designed an ontology to describe the data collection methods in general and the questionnaires. The first model is based on a detailed analysis conducted on WBO sets of questionnaires, individual questions and paper slip answers. In addition to modelling the questionnaire, the model captures relationship of concepts within the domain and concepts across interrelated domains.

ExploreAt! Project deals with various types of information resources. This includes Questionnaires, answers on paper slips and dictionaries prepared from the answers collected using the paper slips. Questionnaires are used to collect information using various questions about specific objects or concepts. The response was used to prepare the Dictionary of Bavarian Dialects in Austria (WBÖ).

**Purpose of the Model**

The purpose of this model is to support a shared understanding and formal representation of the concepts, relationships and axioms of the data collection methods used to collect historical-cultural linguistic information.

**Namespaces**

The ontology model is available with the following namespace

[http://www.oeaw.ac.at/vocabs/oldcan#](http://www.oeaw.ac.at/vocabs/OLDCA)

**Prefix**

@prefix OLDCAN: <[http://www.oeaw.ac.at/vocabs/OLDCAN#](http://www.oeaw.ac.at/vocabs/OLDCA)>

hassubQuestion/ isSubQuestionOf

**Questionnaire**

Foaf:

Author

**Topic**

OntoLex: Lexical

Concept

hasQuestion/

isQuestionOf

hasAuthor/isAuthorOf

hasTopic/isTopicOf

hasRelatedQuestionnaire/ isrelatedQuestionnaireOf

OntoLex: Lexical

Entry

**Question**

hasAnswer/

isAnswerOf

**SystematicQuestionnaire**

**AdditionalQuestionnaire**

isA

**… More to come here**

**OnomasiologicalQuestion**

**SemasiologicalQuestion**

**PhonologicalQuestion**

**DescriptionQuestion**

**IllustrationQuestion**

**ThesaurusQuestion**

**SyntacticQuestion**

**MetaphoricalQuestion**

**CulturalQuestion**

**DichotomousQuestion**

**MorohologicalQuestion**

isA

**MultipleChoiceQuestion**

**RatingQuestion**

**RankingQuestion**

**Answer**

hasTopic/isTopicOf

**Questionnaires**

**Class: Questionnaire**

A questionnaire represents a set of questions that are related to each other. A questionnaire contains metadata such as questionnaire identifiers, titles, agents and publication related information. There are six different types of questionnaire which are treated as the subclasses of Questionnaire class.

Subclass: SystemanticQuestionnaire, AdditionalQuestionnaire, [more to come here]

Example

:Fragebogen1 a oldcan:Questionnaire;

**Class: SystematicQuestionnaire**

Systematic Questionnaire is a Questionnaire that is used to collect data. This type of questionnaire is used from the beginning of the data collection process.

SubclassOf: Questionnaire

Example

:Fragebogen1 a oldcan:SystematicQuestionnaire;

a oldcan:Questionnaire;

**Class: AdditionalQuestionnaire**

Additional Questionnaire is a Questionnaire that is used as a supplementary questionnaire to the systematic questionnaire.

SubclassOf: Questionnaire

Example

:Fragebogen110 a oldcan:AdditionalQuestionnaire;

a oldcan:Questionnaire;

**Class: QuestionnaireSet3**

Description here

SubclassOf: Questionnaire

Example

:Fragebogen120 a oldcan:QuestionnaireSet3;

a oldcan:Questionnaire;

**Class: QuestionnaireSet4**

Description here

SubclassOf: Questionnaire

Example

:Fragebogen121 a oldcan:QuestionnaireSet4;

a oldcan:Questionnaire;

**Class: QuestionnaireSet5**

Description here

SubclassOf: Questionnaire

Example

:Fragebogen130 a oldcan:QuestionnaireSet5;

a oldcan:Questionnaire;

Class: QuestionnaireSet6

Description here

SubclassOf: Questionnaire

Example

:Fragebogen140 a oldcan:QuestionnaireSet6;

a oldcan:Questionnaire;

**Object Property**

**ObjectProperty: hasAuthor**

The hasAuthor property relates the questionnaire to one or more author of the questionnaire.

Domain: Questionnaire

Range: Author

inverseOf: isAuthorOf

ObjectProperty: **hasTopic**

The hasTopic property relates the questionnaire or the question to the topic of the questionnaire.

Domain: Questionnaire, Question

Range: Topic

InverseOf: isTopicOf

ObjectProperty: **hasQuestion**

The hasQuestion property relates the questionnaire to one or more question which is contained in it.

Domain: Questionnaire

Range: Question

InverseOf: isQuestionOf

ObjectProperty: **hasRelatedQuestionnaire**

The hasRelatedQuestionnaire property relates the questionnaire to one or more related questionnaire that share similar topic.

Domain: Questionnaire

Range: Questionnaire

InverseOf: isRelatedQuestionnaireOf

**Data Property**

DataTypeProperty: **title**

The title of the questionnaire.

Domain: Questionnaire

Range: rdf:langString

DataTypeProperty: ?? add upcoming properties when Barbara complete the data.

The ?? of the questionnaire

Domain: Questionnaire

Range: rdf:langString

Example

:Fragebogen1 oldcan:hasAuthor :Steinhauser\_Walter

oldcan:hasTopic :Kopf

hasQuestion :Frage1A1

hasTitle “Kopf” @de

hasTitle “Head” @en

**Questions**

A **question** is a linguistic expression used to make a request for information, or the request made using such an expression. The information requested is provided in the form of an answer[[1]](#footnote-1). There are various categorizations of questions proposed by researchers. The categorizations, for example, are based on purpose, context, ways and/or mediums of the questions.

In this ontology, we categorize the questions mainly based on the content, the forms and the expected answers from the respondents. From our set of questionnaires containing 24, 382 questions, we identified the following major categories. Some additional categories are included to accommodate future processing of additional questionnaire sets.

Class:Question

A Question represents an expression used to request information.

Subclass: OnomasiologicalQuestion, SemasiologicalQuestion, DichotomousQuestion, DescriptionQuestion, IllustrationQuestion, MorphologicalQuestion, PhonologicalQuestion, SyntacticQuestion, MetaphoricalQuestion, ThesaurusQuestion, CulturalQuestion, MultipleChoiceQuestion, RatingQuestion, RankingQuestion.

Example

:Frage1A1 a oldcan:Question;

:Frage1A2 a oldcan:Question;

**Class: OnomasiologicalQuestion**

**Onomasiological Question** is a **Question** which asks for the name of a given entity. Onomasiological question may take a form of “how do you call x?”.

SubclassOf: Question

Example

:Frage1A1 a oldcan:OnomasiolocialQuestion;

:Frage1A1 a oldcan:Question;

**Class: SemasiologicalQuestion**

**Semasiological Question** is a **Question** which asks for the meaning of a given entity. Semasiological question may take a form of “what does x means?”.

SubclassOf: Question

Example

:Frage1A2 a oldcan:SemasiolocialQuestion;

:Frage1A2 a oldcan:Question;

**Class: DichotomousQuestion**

**Dichotomous** **Question** is a **Question** which asks for a selection of answers from a binary option. It includes Yes/No, Agree/disagree, etc. types of answers for stated questions.

The term “Dichotomous” is used as an umbrella term to put yes/no, agree/disagree, this/that type of questions together as they are essentially asking the user to select one or the other.

SubclassOf: Question

Example

:Frage34C17 a oldcan:DichotomousQuestion;

:Frage34C17 a oldcan:Question;

**Class: DescriptionQuestion**

**Description** **Question** is a **Question** which asks for a written representation of a given entity. An example of description question could be “What would be the function of X?”.

SubclassOf: Question

Example

:Frage10E27 a oldcan:DescriptionQuestion;

:Frage10E27 a oldcan:Question;

**Class: IllustrationQuestion**

**Illustration** **Question** is a **Question** which asks for a pictorial, diagrammatic, etc. representation of a given entity. An example of illustration question could be “What Does X look like?”.

SubclassOf: Question

Example

:Frage18E16e a oldcan:IllustrationQuestion;

:Frage18E16e a oldcan:Question;

**Class: MorphologicalQuestion**

**Morphological** **Question** is a **Question** which asks about the structure and the formation of words and parts of words. Based on the structure, morphological questions can take various forms.

SubclassOf: Question

Example

Frage34C17 a oldcan:MorphologicalQuestion;

: Frage34C17 a oldcan:Question;

Notice that Frage34C17 is also a dichotomous question.

**Class: PhonologicalQuestion**

**Phonological** **Question** is a **Question** which asks for the pronunciation (Sound), or phonetic representation of words.

SubclassOf: Question

Example

:Frage25O16 a oldcan:PhonologicalQuestion;

:Frage25O16 a oldcan:Question;

**Class: SyntacticQuestion**

**Syntactic** **Question** is a **Question** which asks for a construction of phrases or sentences using a given word or a given idiom. They have the form “Provide a phrase/sentence for/using a word/idiom X”.

SubclassOf: Question

Example

:Frage42A19 a oldcan:SyntacticQuestion;

:Frage42A19 a oldcan:Question;

**Class: MetaphoricalQuestion**

**Metaphorical** **Question** is a **Question** which asks for some conveyed meanings of a given word or expression. Metaphorical questions are related to semasiolgical questions, but they ask for additional interpretation of the expression beyond its obvious meaning.

SubclassOf: Question

Example

:Frage13D10a a oldcan:MetaphoricalQuestion;

:Frage13D10a a oldcan:Question;

**Class: ThesaurusQuestion**

**Thesaurus** **Question** is a **Question** which asks for a list of words or expressions that are used as synonyms (Sometimes, antonyms) or contrasts of a given entity.

SubclassOf: Question

Example

:Frage27Q34 a oldcan:ThesaurusQuestion;

:Frage27Q34 a oldcan:Question;

**Class: CulturalQuestion**

**Cultural** **Question** is a **Question** which asks for a belief of societies, procedures on how to make or prepare things and how to play games, contents of cultural songs, poems used for celebrations etc.

SubclassOf: Question

Example

:Frage4K17a a oldcan:CulturalQuestion;

:Frage4K17a a oldcan:Question;

**Class: MultipleChoiceQuestion**

**Multiple** **choice** **Question** is a **Question** which asks for a selection of one item from a list of three or more potential answers.

SubclassOf: Question

Example

:Frage1000\* a oldcan:MultipleChoiceQuestion;

:Frage1000\* a oldcan:Question;

\*= fake Frage, not spotted yet

**Class: RatingQuestion**

**Rating** **Question** is a **Question** which asks the respondent to assign a rate (degree of excellence) to a given entity based on a predefined range.

SubclassOf: Question

Example

:Frage1000 a oldcan:RatingQuestion;

:Frage1000 a oldcan:Question;

\*= fake Frage, not spotted yet

**Class: RankingQuestion**

**Ranking** **Question** is a **Question** which asks to compare entities and rank them in a certain order.

SubclassOf: Question

Example

:Frage1000\* a oldcan:RankingQuestion;

:Frage1000\* a oldcan:Question;

\*= fake Frage, not spotted yet

**Object Property**

ObjectProperty:isQuestionOf

The isQuestionOf property relates the question to one questionnaire.

Domain: Question

Range: Questionnaire

InverseOf: hasQuestion

Example

:Frage2A1 a oldcan:SemasiolocialQuestion;

:Frage2A1 a oldcan:Question;

:Frage1A1 oldcan:questionOf :Fragebogen1

ObjectProperty: hasAnswer

The hasAnswer property relates the question to the answer of the question.

Domain: Question

Range: Answer

InverseOf: isAnswerOf

Example

:Frage1A2 a oldcan:SemasiolocialQuestion;

:Frage1A2 a oldcan:Question;

:Frage1A2 oldcan:hasAnswer :answer\_to\_Q1

ObjectProperty: hasTopic

The hasTopic property relates the question to the topic of the questionnaire.

Domain: Questionnaire, Question

Range: Title

InverseOf: isTopicOf

Example

:Frage1A2 a oldcan:SemasiolocialQuestion;

:Frage1A2 a oldcan:Question;

:Frage1A2 oldcan:hasTopic :Head

ObjectProperty:hasSubQuestion

The hasSubQuestion property relates the question to one or more subquestions under it.

Domain: Question

Range: Question

InverseOf: isSubQuestionOf

Example

:Frage2A1 a oldcan:SemasiolocialQuestion;

:Frage2A1 a oldcan:Question;

:Frage1A1 oldcan:questionOf :Fragebogen1

**Datatype Property**

DataTypeProperty: originalQuestion

The original Question asked

Domain: Question

Range: rdf:langString

DataTypeProperty: shortQuestion

The short form of the original Question asked.

Domain: Question

Range: rdf:langString

DataTypeProperty: originalData

The original Question printed on the questionnaire and used during data collection.

Domain: Question

Range: rdf:langString

Example

:Frage1A2 a oldcan:SemasiolocialQuestion;

:Frage1A2 a oldcan:Question;

:Frage1A2 oldcan:originalQuestion “Kopf: Kopf/Haupt (in urspr. Bed.) in Vergl./Ra. (Kopf stehn, der Kopf möchte einem zerspringen)” @de

oldcan:shortQuestion “Kopf/Haupt (urspr.Bed.) in Vergl./Ra.\*” @de

Oldcan:originalData “Null” @de \*\*

\*\* Notice that the actual null value will not appear in the graphdb.

**Topic**

A topic is the main subject of the questionnaire or a given question. A questionnaire may focus on a general topic such as “Food” and a question may cover subtopics such as “Traditional Food”. This information is treated as topic. A topic is considered as a form of Ontolex: lexical concept.

Class:Topic

A **Topic** represents the main subject of a questionnaire or a question. A questionnaire may focus on a general topic such as “Food” and a question may cover subtopics such as “Traditional Food”.

:Head a :topic

a ontolex:LexicalConcept

**Object Property**

ObjectProperty: isTopicOf

The isTopicOf property relates the topic with either the questionnaire or the question it is discussed in.

Domain: Topic

Range: Questionnaire, Question

InverseOf: hasTopic

**Answer**

An Answer is a written, spoken or illustrated response to a question. The different types of the questions defined in the Questions section have answers either in a written form, spoken form or in a form of illustrations and diagrams. In the case of questions that involve lexical data collection, a given answer could be associated with some lexical category. For example, the answer to a ThesaurusQuestion is expected to be a word, or multiword expression in the OntoLex ontology.

Class:Answer

An **Answer** represents a written, spoken or illustrated response to a question.

**Object Property**

ObjectProperty: isAnswerOf

The isAnswerOf property relates the Answer to the question.

Domain: Answer

Range: Question

InverseOf: hasAnswer

**Datatype Property**

DataTypeProperty: paperSlip

The paper slip that contains the answer.

Domain: Answer

Range: rdf:langString

DataTypeProperty: answerText

The actual text containing the answer.

Domain: Answer

Range: rdf:langString

DataTypeProperty: supplementaryText

A supplementary text describing additional sources for the answer. This includes locations the media containing the answer other than written format. This includes physical/computer locations to diagrams, pictures etc.

Domain: Answer

Range: rdf:langString

Authors/ collectors

**Authors**

Authors/ collectors are defined in FOAF ontology and we will reuse the definition provided in FOAF Agent/Author classes.

Class:Author

See: FOAF Agent, Author

**Object Property**

ObjectProperty: isAuthorOf

The isAuthorOf property relates the Author to the questionnaire.

Domain: Author

Range: Questionnaire

InverseOf: hasAuthor

**Datatype Property**

DataTypeProperty: FirstName, LastName, PlaceOfBirth, DateOfBirth, Nationality

See: FOAF data properties defined for an Agent class.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Types of Questions** | **Synonym** | **Description** | **Example** | **Sample Question** |
| Thesaurus Question | Synonym | Questions asking to list words or expressions that are used as synonyms (sometimes antonyms) or contrasts of a given entity. | 1. What words have a similar meaning as X 2. What words have a contrasting meaning as X | 1. 27Q34 2. 104A10, 104A7 |
| Syntactic Question |  | Questions asking about the construction of phrases or sentences using a given word or a given idiom. | 1. Provide a phrase/sentence for/using a word X. 2. Provide a phrase/sentence for/using an idiom X. | 1. 42A19 2. 4K9b, 6A2, 61A1,4K18e,22E1a |
| Semasiological Question | Semantics | Questions asking the meaning of a given entity. | What does X mean? |  |
| Rating Question |  | Questions asking to rate (degree of excellence) a given entity based on a certain range | What is your German language skill? [0, 1, 2, 3, 4, 5] 0=poor, 5 = excellent |  |
| Ranking Question |  | Questions asking to compare entities and rank them in a certain order | Rank your language skills  \_ English, \_ Spanish, \_ German, \_ Finnish |  |
| Phonological Question |  | Questions asking about the sounds (pronunciations), or phonetic representation of words. | How do you pronounce X? | 25O16 |
| Onomasiological Question | naming | Asking the name of a given entity. | How do you call X? |  |
| Multiple Choice Question |  | Questions asking to select one option from a list of three or more answers. |  |  |
| Morphological Question |  | Questions asking about the structure and formation of words and pats of words. Based on the structure, morphological questions can take various forms. | 1. What compounds go with X? 2. What is the diminutive with X? 3. What is the plural of X 4. What are the other forms of X 5. What are the derivatives of X? | 1. 33C12a 2. 34C17 |
| Metaphorical Question | Figurative | Questions asking about conveyed meanings of a given word or expression. Metaphorical questions are related to semasiological questions, but ask additional interpretation of the expression. | What is the conveyed/another meaning of X? | 13D10a |
| Illustration Question | Diagram, figure, graphic | Questions asking for a pictorial, diagrammatic etc. representation of an entity | What does X look like? | 18E16e |
| Dichotomous Question | Agreement Question | Questions containing binary choices. Example Answering Yes/No question, Agree/Disagree, This/that | Do you speak German? Yes/No |  |
| Description Question |  | Questions asking for a written representation of a given entity | What would be the function of X? | 10E27 |
| Cultural Question | Custom | Questions asking about belief, steps, contents and procedures of how a given entity (physical or conceptual) is produced, celebrated or performed. Cultural questions can fall under one or more of the other question categories. | 1. Popular believes 2. Activities at a communal event 3. Traditional medicine 4. Prayers: Asking for prayers for a specific event X 5. Songs: Asking for songs for specific event X 6. Humour: Asking for Jokes for a situation/action/people etc. 7. Games-1: Asking for games that deal with a certain topic 8. Games-2: Asking for expressions used while playing games 9. Food: Asking for certain food 10. Living Organisms: asking for names of living organisms | 1. 4K17a 2. 5C4 3. 59C26, 59C27 4. 55/56 5. 55, 56 6. 4K26 7. 40A2 8. 34C32 |

1. https://en.wikipedia.org/wiki/Question [↑](#footnote-ref-1)