DEFINING THE NOTION OF CONCEPT MAPS 3.0

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Web based concept maps can be viewed as reflections of generations of web technology. Thus we define the following generations of concept maps:

Concept maps 1.0
- Can be created using dedicated tools
- Can be shared through links
- Coverage is limited to the local computer

Concept maps 2.0
- Can be created using dedicated online tools
- Can be shared through links
- Coverage is limited to the local computer

Concept maps 3.0
- Can be created using dedicated web based tools
- Can be shared through links
- Can be embedded in webpages

Defining Five Fundamental Requirements for Concept Maps 3.0

We have adopted the following Web Data Principles (Wilde, E., 2016, http://dire.github.io/webdata/), which outline five recommendations for exposing data on the Web of Data / Semantic Web.

These recommendations state that Web Data should be:
- Linkable
- Parseable
- Usable
- Understandable
- Scalable

Based on the Web Data Principles above, we propose five requirements for concept maps 3.0 as data sets:

1. Concept maps should be "linkable", that is available as persistent at stable identifiers. This obviously applies to the concept map as a whole but preferably also to its constituent parts. In this way, external resources can be linked to specific elements or objects in the structure." (Johnson, J. & Jensen, J., 2016)

We suggest representing concept maps in JSON (JavaScript Object Notation), which is an XML (Extensible Markup Language) language for two dimensional graphs that also makes it possible to attach unique identifiers to all the visual elements that constitute a concept map.

2. Concept map distributions should be represented in open formats that do not require proprietary software for processing and whose source code is open to inspection." (Johnson, J. & Jensen, J., 2016)

SVG can be used to fulfil this requirement of concept maps being "processable", as SVG is a W3C (World Wide Web Consortium) endorsed open format and standard, supported by browsers, can be embedded in HTML (Hypertext Markup Language), and can be rendered as part of larger web pages.

3. Concept maps should be annotated by metadata using "well known" and/or "well documented" vocabularies." (Johnson, J. & Jensen, J., 2016)

We propose to use schema.org (http://schema.org/) as the main vocabulary to mark up concept maps because it is both well known, well documented, and supported by major search engines. This allows concept maps to be "processable", that is discoverable and accessible for processing. Furthermore, we propose that this schema.org metadata be added to SVG concept maps by using formats such as RDFa (Resource Description Framework in Attributes) or JSON-LD (Linked Data in JSON).

4. Concept maps should be exposed to other resources to enhance their informational or learning value. Links should be typed if possible to signal their communicational purpose and/or the nature of their target and to improve automatic processing. Individual concepts should be able to reference external resources to better determine their identity." (Johnson, J. & Jensen, J., 2016)

This can be achieved by providing links to Wikidata entities, which can act as unique identifiers in a manner referencing web pages, which unambiguously indicate the meaning or identity of some concept.

5. Concept maps should be labeled with a license to signify when, where, how and by whom they may be put to use and under what circumstances." (Johnson, J. & Jensen, J., 2016)

This can be achieved by linking to a Creative Commons license, which will allow the concept maps in question to signal how users can use the concept maps they have downloaded.

References: