DEFINING THE NOTION OF CONCEPT MAPS 3.0

Jensen, Jesper ; Johnsen, Lars

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Jasper Jensen & Lars Johnsen, University of Southern Denmark, Denmark
Email: jaspersj@ studying.sdu.dk, larsjo@sdu.dk

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 authored using paper based tools (e.g. CmapTools).
• Can be stored in text files (text/xml).
• Can be embedded in webpages.

Concept maps 2.0
• Can be created using dedicated web-based tools (e.g. CmapCloud).
• Can be viewed in web browsers as SVG or HTML5 transitions.
• Can be embedded in webpages.

Concept maps 3.0
• Can be edited using dedicated online/web based tools (CmapCloud).
• Can be utilized in linked web (web 2.0) technology to facilitate sharing and collaboration.
• Can be represented in open standards such as SVG (Scalable Vector Graphics).

Concept maps 3.X
• Can be edited using dedicated tools (CmapCloud).
• Can be viewed in web browsers as SVG or HTML5 transitions.
• 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://diret.github.io/webdata/), which outline five recommendations for exposing data on the Web of Data / Semantic Web.

Three recommendations state that Web Data should be:
• Usable
• Linkable
• Parseable

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

1. “Concept maps should be usable, that is accessible as persistent or 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 entities or subjects in the structure.” (Johnsen, L. & Jensen, J., 2016)

   We suggest representing concept maps in HTML (Extensible Markup Language) or HTML5 (Hyper Text Markup Language), and can be rendered as part of larger web pages.

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.” (Johnsen, L. & Jensen, J., 2016)

   SVG can also be utilized to fulfill this requirement of concept maps being accessible, as SVG is a W3C (World Wide Web Consortium) endorsed open format and standard, supported by browsers, can be embedded in HTML (Hyper Text Markup Language), and can be rendered as part of larger web pages.

3. “Concept maps should be annotated with metadata using ‘well-known’ and/or ‘well-documented’ vocabularies.” (Johnsen, L. & Jensen, J., 2016)

   We propose to use schema.org (http://schema.org/) as the main vocabulary to markup concept maps because it is both well-known, well-documented, and supported by major search engines. This allows concept maps to be more discoverable and conductions to processing. Furthermore, we propose that this schema.org vocabulary be added to SVG concept maps by using formats such as LD+JSON (Linked Data + JavaScript Object Notation) or RDFa (RDF in HTML) standards for annotating SVG in SVG documents.

4. “Concept maps should be related 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 be made automatically processing. Individual concepts should be linked to external resources to better determine their identity.” (Johnsen, L. & Jensen, J., 2016)

   This can be achieved by linking to Wikidata entries, which can act as unique identifiers as it contains referencing web pages, which unambiguously indicate the meaning or identity of similar 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.” (Johnsen, L. & 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 and to whom they may be put to use and under what circumstances.

References:

A simple example of how a concept map 3.0 can be annotated and exposed as web data using the schema.org vocabulary and the format JSON-LD

This particular example includes a snippet of code specifying metadata for a history concept map about the American general George Armstrong Custer.