DEFINING THE NOTION OF CONCEPT MAPS 3.0

Jensen, Jesper ; Johnsen, Lars

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**DEFINING THE NOTION OF CONCEPT MAPS 3.0**

Jasper Jensen & Lars Johnsen, University of Southern Denmark, Denmark

Email: jesjen@sdu.dk, larsjo@sdu.dk

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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 exported to web 1.0 (GIF, HTML) or SVG, formats (CXL).
  - Can be embedded in webpages.

- **Concept maps 2.0**
  - Can be created using distributed online web based tools (Group Cloud).
  - Utilize social web (web 2.0) technology to facilitate sharing and collaboration.
  - Are represented in open standards such as SVG (Scalable Vector Graphics).

- **Concept maps 3.0**
  - Utilize semantic web (web 3.0) technology to make concept maps discoverable (search engines can find and process concept maps based on their content).
  - Can be exported to web 3.0 (RDF/OWL, formats).
  - Can be embedded in webpages.
  - Are represented in open standards such as SVG (Scalable Vector Graphics).

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**Defining Five Fundamental Requirements for Concept Maps 3.0**

We have adopted the following Web Data Principles (Wilde, E., 2016, [http://dret.github.io/webdata/](http://dret.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
- Restricted
- Unique
- Standardized
- License

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 accessible via 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 specifically identified or subjects in the structure. (Johnsen, L. & Jensen, J., 2016)

2. **Concept maps should be standardized** by a well known and/or well documented vocabulary. (Wilde, E., 2016, [http://dret.github.io/webdata/](http://dret.github.io/webdata/)). This allows concept maps to be machine readable and machine processable, thus discoverable and conductive to processing. Furthermore, we propose that this vocabulary should be added to the W3C concept maps by using formats such as JSON-LD (JavaScript Object Notation for Linked Data) or RDF (Resource Description Framework).

3. **Concept maps should be annotated by metadata using “well known” and/or “well documented” vocabularies**. (Wilde, E., 2016, [http://dret.github.io/webdata/](http://dret.github.io/webdata/)). We propose to use schema.org ([http://schema.org/](http://schema.org/)) as the main vocabulary to mark up concept maps because it is both well known and thus discoverable and conductive to processing. Furthermore, we propose that this vocabulary should be added to the W3C concept maps by using formats such as JSON-LD (JavaScript Object Notation for Linked Data) or RDF (Resource Description Framework).

4. **Concept maps should be linkable 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 enhance automatic 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 a Creative Commons license, which will allow the concept maps in question to be licensed in the same way they are used.

References:


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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

- **A link to a Creative Commons license granting the concept map may be used.**
- **A link to relevant external resources may be given.**
- **A link to an alternative version of the concept map may be used.**