

# The Web Science Subject Categorization (WSSC)

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## ABSTRACT

Following the fruitful discussions about an early version [1] of the Web Science Subject Categorization (WSSC) system, we present a “stable” version (in SKOS [2]) of the first epistemological index for the scientific study of the Web. The WSSC aims to facilitate communication and collaboration among scholars of the Web from various perspectives i.e. computational, mathematical, social, economic and legal. WSSC 1.0 by no means is “written in stone” and must be considered as the very first attempt to discuss a Science Subject Categorization for the Web ecosystem as a central subject of study.

## Categories and Subject Descriptors

WSSC: [webscience.org/2010/B.3](http://webscience.org/2010/B.3) Web Science Theory and Epistemology;

## Keywords

Scientific Classification, Web Science Theory and Epistemology, SKOS, Linked Data.

## 1. PURPOSE

Practically, every discipline is focusing its research efforts on the most important issues during specific periods of time. Today, economists put their efforts to discover new ways for estimating systemic risk because of the severe financial crisis; biologists try to find new personalized cures to diseases after encoding DNA and so forth. Concerning the Web ecosystem, scholars are facing two major challenges [3]:

- i. to preserve and expand the fundamental right of equal and universal online access to information against restrictive political actions and oligopolistic business practices and
- ii. to accelerate socio-economic development by facilitating life-critical functions in the developing world and by enabling the publication, interlink and re-use of valuable datasets in the developed world.

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## 2. STRUCTURE

The WSSC contains five distinct categories, namely: General, Web History and Methodology, Web Technologies, Web Analysis and Web Society.

The **General (A)** category refers to Instructional and Research exposition, Conference proceedings and collections of papers. The **Web History and Methodology (B)** category includes Web history, related biographies and epistemological and theoretical models of the Web artifact.

The Web is an application that runs on the Internet and the progress of the latter is crucial to the Web’s universal role. It is vital for innovation that Internet and the Web work together but advance independently [3]. The **Web Technologies (C)** section categorize the underlying infrastructure (Web Milieux and Basic Web Architecture) and the major enabling technologies for each Web era, namely Web 2.0, Semantic Web/Linked Data and Web of Things.

The class of scale-free networks, massively analyzed and used in various disciplines and applications during the last years, was initially discovered in Internet and Web networks of real data [4]. The **Web Analysis (D)** category refers to the Mathematical Methods applied in the Web. The **Web Society (E)** category represents the following perspectives: Economic and Business analysis, Social Engagement and Social Science, Personal Engagement and Psychology, Philosophy, Law and Politics and Governance.

Introductory school and university courses in Computer Science are often out of date, remaining stuck on the utilitarian prospect of Web technologies. In this aspect, Web Science education should address the complex techno-social issues of the Web in an attractive and compatible way to modern real phenomena and other scientific approaches. Pre-college, Undergraduate and Graduate studies of the Web are contained in the **Teaching the Web (F)** category.

## 3. USING WSSC IN YOUR WORK

The Web Science Subject Categorization [5] (<http://webscience.org/2010/wssc.html>) is a tree-based classification of topics for scientific activities related to the Web, aimed to facilitate communication and collaboration among scholars of the Web from various perspectives i.e. computational, mathematical, social, economic and legal. The basic purpose of the WSSC is to support the indexing and search for publications about a given topic.

Every Web-related scientific activity (esp. conferences, courses, journals, publications etc.) should reference the relevant WSSC category (or multiple categories) in the latest categorization (currently the 2010 version). The references should be placed before the main text of the publication (usually after the title and abstract, but before the introductory section) and have the following form:

WSSC: [webscience.org/2010/E.2.1](http://webscience.org/2010/E.2.1) Social networks;  
[webscience.org/2010/E.5.1](http://webscience.org/2010/E.5.1) Intellectual Property in the Web;  
[webscience.org/2010/C.5.4](http://webscience.org/2010/C.5.4) Linked Data

Alternative format with each category on a new line (for example to limit wrapping in a two-column layout):

WSSC:  
[webscience.org/2010/E.2.1](http://webscience.org/2010/E.2.1) Social networks;  
[webscience.org/2010/E.5.1](http://webscience.org/2010/E.5.1) Intellectual Property in the Web;  
[webscience.org/2010/C.5.4](http://webscience.org/2010/C.5.4) Linked Data

The order of the categories should start from the most relevant one.

The "webscience.org/version/code" links should be spelled out in full as shown, and they should be clickable hyperlinks where applicable (in HTML, PDF, and other formats that support hyperlinking). The inclusion of hyperlinks will allow the use of generic search engines to find publications relevant to a topic by asking for documents that link to the topic, while writing the links in full in the text will support their function even in printed publications, or where hyperlinking is not available (e.g. in plain-text publications).

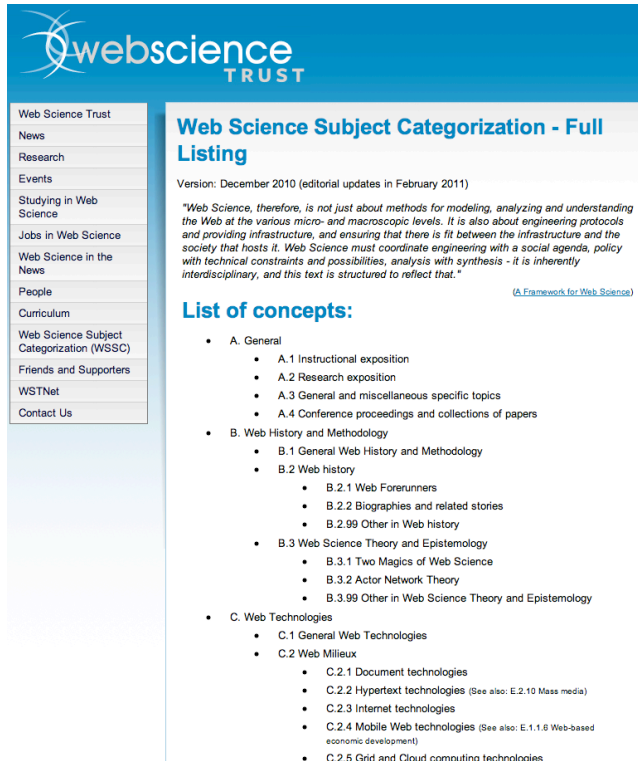


Image 1: The Web Science Subject Categorization (WSSC) system is part of the Web Science Trust

## 4. ENGINEERING AND NEXT STEPS

The Web Science Subject Categorization (WSSC) system is part of the Web Science Trust (Image 1). The basic inputs for the first version of the proposed Web Science Subject Categorization are related to existing classification systems and Web Science<sup>1</sup> and WWW conferences. In WSSC 1.0 appear direct links to the following existing classification systems: ACM<sup>2</sup> for computing, AMS<sup>3</sup> for Mathematics, JEL<sup>4</sup> for economics, Sociological Abstracts Classification Scheme<sup>5</sup> and Political Science Abstracts Classification Scheme<sup>6</sup>.

The SKOS description of WSSC 1.0 facilitates semantic processing for Web Science related publications. This description can be inter-connected to basic Linked Data components like DBLP [6] and Dbpedia [2].

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## REFERENCES

- [1] M. Vafopoulos, "Web Science Subject Categorization (WSSC): A proposal for discussion," *The Web Science Trust*, 2010.
- [2] S. Auer, C. Bizer, G. Kobilarov, J. Lehmann, R. Cyganiak, and Z. Ives, "Dbpedia: A nucleus for a web of open data," *The Semantic Web*, 2007, p. 722–735.
- [3] T. Berners-Lee, "Long Live the Web: A Call for Continued Open Standards and Neutrality," *Scientific American*, November, vol. 22, 2010.
- [4] A.L. Barabási and R. Albert, "Emergence of scaling in random networks," *Science*, vol. 286, 1999, p. 509.
- [5] M. Vafopoulos, "Web Science Subject Categorization (WSSC)," *The Web Science Trust*, 2011.
- [6] M. Ley, "Dblp: some lessons learned," *Proceedings of the VLDB Endowment*, vol. 2, 2009, p. 1493–1500.

<sup>1</sup> <http://journal.webscience.org/>

<sup>2</sup> <http://www.acm.org/about/class/1998/>

<sup>3</sup> <http://www.ams.org/mathscinet/msc/msc2010.html>

<sup>4</sup> [http://www.aeaweb.org/journal/jel\\_class\\_system.php](http://www.aeaweb.org/journal/jel_class_system.php)

<sup>5</sup> <http://www.csa.com/factsheets/supplements/saclass.php>

<sup>6</sup> <http://info.csa.com/political/classcodes.shtml>

