Content Metrics for Products and Services Categorization Standards

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Products and Services Categorization Standards (PSCS)

What are PSCS?

Classes, Taxonomies, and Properties, (…),

reflecting domain consensus about how products or services can be grouped and described

Importance and Core Applications

1. Any kind of mechanized content integration of product-related data (e.g. e-catalogs or spend analysis)
2. Parametric search

=> A standard vocabulary for representing products and services in a form suitable for automated processing

Examples:

eCl@ss	http://www.eclass.de
UNSPSC	http://www.unspsc.org
eOTD	http://www.eotd.org
RosettaNet Technical Dictionary	http://www.rosettanet.org

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Metrics and Their Motivation

1. PSCS = Architecture + Content
2. ContentQuality(PSCS) = f(Input, ProcessingPerformance)
3. Tagging existing products and services data is labor-intensive and costly; you want do to it only once.
4. PSCS must cover the representational needs or your business – if there is not suitable category, you cannot tag your product (trivial, but important).
5. Users and standards bodies must be able to monitor the content quality (e.g. specificity, progress,…) of a given PSCS.
6. Simple metrics (e.g. number of classes) are of little value.

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Our Goal: Generic and Comprehensive Set of Metrics

Metrics that reflect the internal complexity (e.g. progress) and balance of any PSCS that meets common structural properties

- Size
- Growth and maintenance
- Hierarchical order and balanced content
- Property library
- Quality of class-specific property sets

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Size, Growth, and Maintenance

PSCS	Version	Total number of classes	New classes	Modified classes	New classes per 30 days	Modified classes per 30 days
eCl@ss	4.1	15315	n/a	n/a	n/a	n/a
eCl@ss	5.0	24814	13292	2418	865,0	157,4
eCl@ss	5.0SP1	24919	164	35	47,8	10,2
eCl@ss	5.1beta	25585	667	24918	131,6	4918,0
eCl@ss	5.1de	25658	84	0	74,1	0,0
eOTD	01-17-2003	58973	58973	n/a	n/a	n/a
eOTD	10-01-2003	58898	52	0	6,1	0,0
eOTD	11-01-2003	58901	5	0	4,8	0,0
eOTD	03-01-2004	58975	74	0	18,3	0,0
eOTD	06-01-2004	58970	5	0	1,6	0,0
eOTD	08-01-2004	58970	0	0	0,0	0,0

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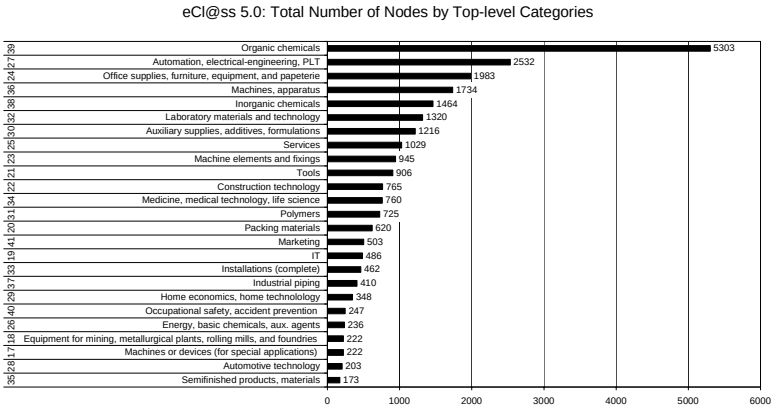
Distribution of Entries along the Top-level Hierarchy



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Degree of Balance

	Release	% of classes in largest category	% of classes in 3 largest categories	Largest category / median of the category size
eCl@ss	4.1	23%	44%	814%
	5.0	21%	40%	731%
	5.0SP1	21%	40%	731%
	5.1beta	21%	39%	732%
	5.1de	21%	39%	732%
eOTD	10-01-2003	24%	40%	5255%
	11-01-2003	24%	40%	5254%
	03-01-2004	24%	40%	5255%
	06-01-2004	24%	40%	5255%
	08-01-2004	24%	40%	5255%
UNSPSC	6,0315	12%	30%	1128%
	6,0501	12%	29%	1134%
	6,0801	12%	30%	1134%
	6,1101	12%	30%	1108%
	7,0401	12%	30%	1107%
	7,0901	12%	30%	1107%

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Semantic Value and Weight

Semantic Weight for each attribute:

$$SW_i = \frac{1}{Number\ of\ Attribute\ Lists\ Containing\ A_i}$$

Semantic Value for each class:

$$SV_j = \sum SWA_i \mid A_i \in S_j$$

Distribution properties!

Mean	0.17994013
Min	0.00019964
Max	87.88928283
Median	0.00025091
Mode	0.00025091

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Semantic Value

	Release	Semantic Value			
		Mean	Median	STD	Coefficient of Variation
eCl@ss	5.1de	4,74E-05	6,16E-07	2,48E-04	**523%**
eOTD	08.01.2004	1,70E-05	6,52E-09	7,32E-05	**432%**
RNTD	4.0	1,15E-03	6,41E-04	1,79E-03	**155%**

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Application

1. Corporations can use the metrics to evaluate the content quality of a specific descriptive language with regard to their product range or sourcing needs.

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Application

2. Standards bodies could use those metrics to

- monitor the development of content quality,
- assess the amount of resources necessary to eliminate the shortcomings,
- rank content maintenance alternatives,
- motivate industry groups to help improve currently weak segments of the standard.

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Thank you!

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