Measuring the Quality of Descriptive Languages for Products and Services

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Descriptive Languages for Products and Services

- Key functionality: Reference to business meanings (e.g. a product or service) in an unambiguous, machine processable manner.
- Descriptive Languages vs. Ontologies
- Most popular architecture: combination of classes, an attribute library, and class-specific attribute lists

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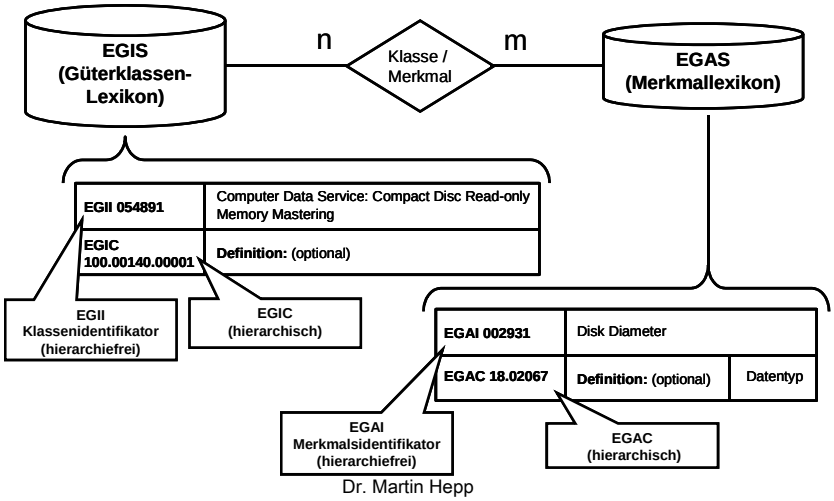
eOTD Architecture



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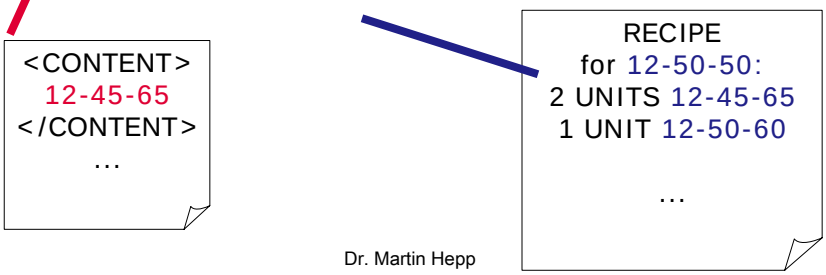
Semantic Standards provide two functions

They can be used for

- the description and
- as a point of reference.



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Content Quality of Descriptive Languages for Products and Services

- Quality and usefulness is determined by how well it covers the linguistic needs of a business domain.
- Content development and maintenance is a major challenge.

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Linguistic Dynamics of Business Meanings

...Language is a living organism that adapts to the development and the trends of society as a whole.

(Umberto Eco
in the preface to Ogden / Richards:
„The Meaning of Meaning“)

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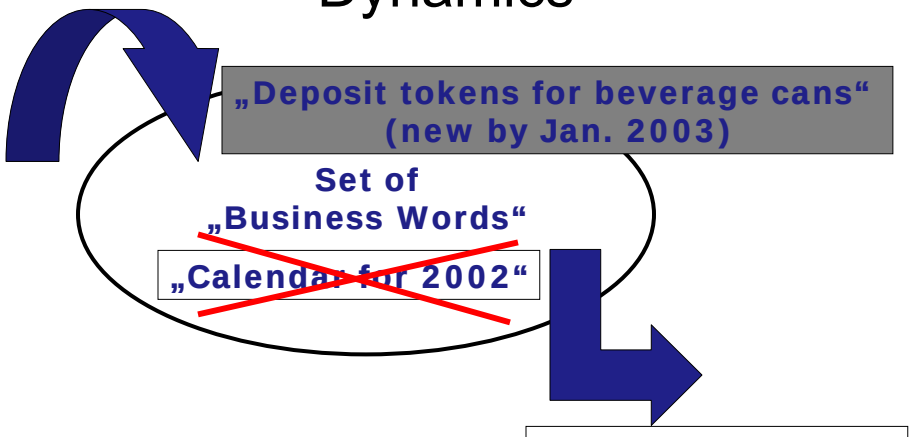
Speed of Maintenance vs. Linguistic Dynamics



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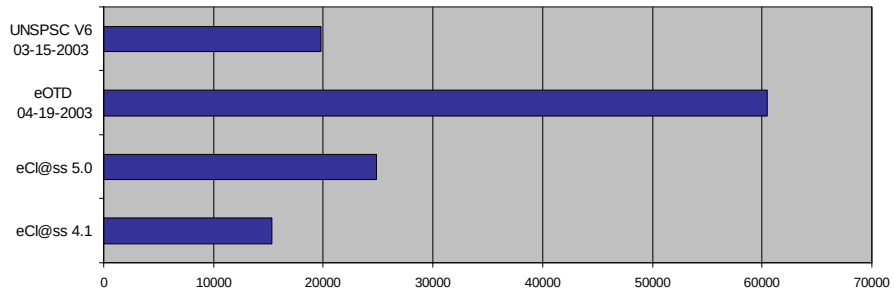
Vision. Value. You.

Total Number of Product and Service Classes



	eCl@ss 4.1	eCl@ss 5.0	eOTD 04-19-2003	UNSPSC V6 03-15-2003
Classes	15315	24814	60474	19778

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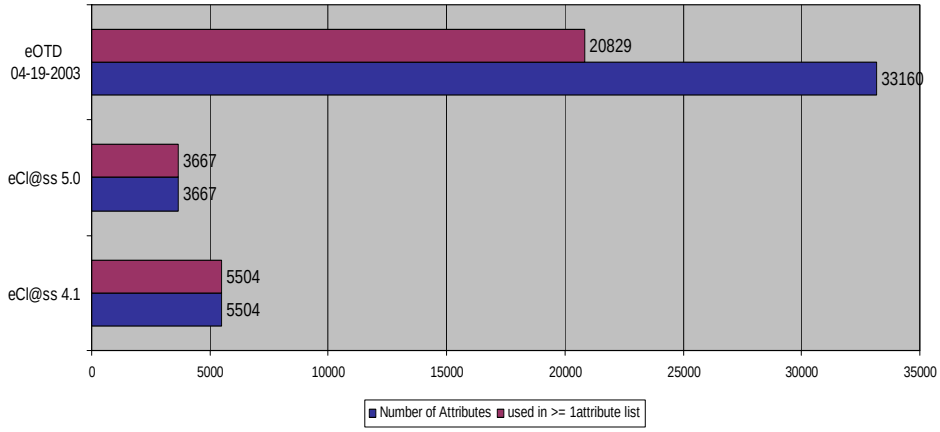
Size of the Attribute Library



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Metrics for Content Quality

- Distribution of Entries along the Top-Level Hierarchy
- Semantic Weight and Semantic Value

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Distribution of Entries along the Top-level Hierarchy

	eCl@ss 4.1	eCl@ss 5.0	eOTD 04-19-2003	UNSPSC V6 03-15-2003
Product classes	15315 (all levels)	24814 (all levels)	60474 (all levels)	19778 (all levels)
Number of top-level categories	22	25	79	55
Mean (percentage)	696 (4.5 %)	992 (4 %)	765 (1.3 %)	360 (1.8 %)
Amount of nodes in the biggest top-level category	3594	5303	14802	2447
Percentage	23.47 %	21.37 %	24.48 %	12.37 %
Amount of nodes in the three biggest top-level categories	6788	9818	24082	5860
Percentage	44.32 %	39.57 %	39.82 %	29.96 %

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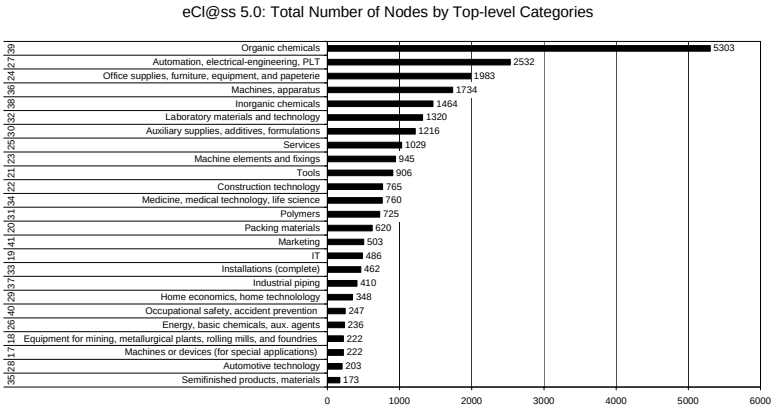
Distribution of Entries along the Top-level Hierarchy



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Quality of Attribute Assignment

	eCl@ss 4.1	eCl@ss 5.0	eOTD 04-19-2003
Number of node-specific attribute lists	6507	7913 (7917, see text)	19927 (quality issues, see text)
Percentage (based on the *total* number of product classes)	42.5 %	31.9 %	33 %

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eCl@ss 5.0: Clusters of Attribute Usage Frequency in Attribute Lists

Percentage of Classes with this Attribute	Number of Attributes	Share of the Attribute Library
> 75 %	5	0.14 %
29...74 %	none	
25...28 %	44	1.20 %
3...24 %	none	
< 2 % (but contained in more than one attribute list)	1942	52.96 %
contained in exactly one attribute list	1676	45.70 %

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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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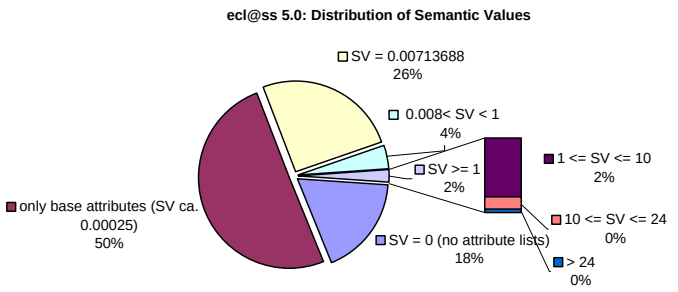

SV = 0 (no attribute lists)
only base attributes (SV ca. 0.00025)
SV = 0.00713688
0.008< SV < 1
1 <= SV <= 10
10 <= SV <= 24
> 24

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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.

Discussion, Questions, Comments?

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