Evolution of Standards Terminologies in the Domain of Manufacturing Enterprise

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This presentation reports on analysis of the terminologies of standards published by the International Organization of Standardization (ISO) in the domain of manufacturing enterprise. It describes the networks formed when standards derive their terminologies either implicitly or explicitly from the terminologies of earlier standards. Provides tentative conclusions about trends towards the integration of terminologies of different standards. Finally, it presents a model for describing and measuring modifications to terminologies and evaluates that model against subjective human evaluations.

There are currently many standards that deal with various aspects of manufacturing enterprise. Many of these standards are developed by working groups associated with the ISO. Historically, these working groups often had a limited awareness of the efforts by other groups to develop standards within similar enterprise domains. As a result, communities that made use of a given standard tended not to be fully aware of the work done by communities that used standards that were similar, but different. In addition, manufacturing enterprise standards generally employ their own terminologies to represent the relevant concepts. Although different standards' terminologies may overlap considerably, a given term is likely to be interpreted in different ways across multiple standards.

Frequently, these distinctions can simply be attributed to different accepted definitions of the given term. However, in some cases, two standards might provide interpretations for a given term that are similar enough to occur within the same general definition, but have enough subtle distinctions as to make it difficult for their respective communities to cooperate. For example, Integrated Definition (IDEF) Methods <http://www.idef.com/> interprets a "function model" as an abstract representation and a "process model" as concrete realization. In contrast, ISO 19439 does not separate "process" and "function", but instead represents "process" as occurring within the life-cycle of an enterprise functionality. Communities utilizing IDEF might make distinctions between "process" and "function" that communities using ISO 19439 could consider to be irrelevant or even harmful (Martin, 2004). There is currently a concerted effort on the part of many working groups in the ISO to bring their standards into alignment with each other, and with standards developed by other agencies, such as the Electronic Commerce Code Management Association (ECCMA).

This paper traces the evolution of the terminologies of twenty-one standards used in manufacturing enterprise in order to demonstrate the social and logical processes by which standards are integrated and/or made interoperable with each other. We found that standards in manufacturing enterprise frequently base their definitions on earlier standards, but that these references have not yet developed into a large network. Conceptual representations are prone to more significant changes as standards are revised than as new standards are created. In addition, there is a lack of consensus in interpreting the significance of modifications to wording. While it is possible to model the modifications to standards, there are no clear trends in subjective evaluations against which to evaluate the model. Future research will collect more empirical data in an attempt to identify such trends.
References


