

Basic requirements to reference-information modelling in demand-driven agro-food chains

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Introduction

The paper focuses on the role of reference-information modelling in demand-driven agro-food chains. Demand-driven chains require agile information systems that enable chain processes to sense and react dynamically to demand information. We argue that reference-information modelling can be an effective approach to achieve this, if a dynamic approach is applied. The objectives of the paper are a) to get insight in requirements for reference-information models that should be met to support information systems agility in demand-driven agro-food chains, and b) to assess the usefulness of existing reference models. The study is based on literature study and expert interviews.

Reference-information models

Reference-information models are generic conceptual models of information systems that formalize recommended practices for certain class of domains (Fettke and Loos 2003; Rosemann and Aalst 2005). Reference-information models are used as blueprints for enterprise or chain information systems and thus enable reuse of information models based on predefined models.

The development of reference-information models can be categorized in three stages:

1. History: static reference models for single-domains (first generation);
2. Present: static reference models for multiple-domains (second generation);
3. Future: dynamic reference models for multiple-domains (third generation).

Basic requirements reference-information models in demand-driven chains

Demand-driven chains are often mentioned as a way to meet volatile customer demand and to involve customer impact in the execution of all chain processes (Vollmann et al. 2000; Childerhouse et al. 2002; Christopher and Peck 2003; De Treville et al. 2004). They require agile information systems that enable chain processes to sense and react dynamically to demand information. Dynamic multiple-domain reference models (third generation) can be powerful tools to achieve this. They provide the ability to configure the required functionality in the relevant scenarios of demand-driven chains from standard components.

This implies that a third generation approach is needed for reference-information models in demand-driven chains. The essential distinction with dynamic reference models for single companies is that an overarching layer is added that focuses on the integration of single-companies on all reference model elements.

In the paper the dynamic approach in demand-driven agro-food chains is elaborated in basic requirements with respect to the represented typical objects, content and formalisation of the reference-component repository, dynamic configurator and ICT alignment.

Usefulness existing reference models in demand-driven chains

In order to determine the usefulness of existing reference models in demand-driven chains, we investigated and classified some comprehensive examples of existing reference-information models (as visualized in figure 1).

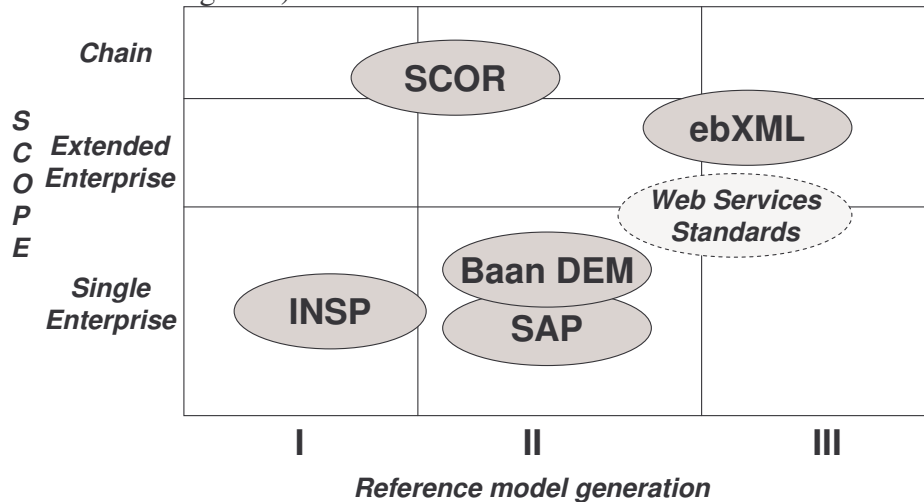


Figure 1 Classification existing reference-information models

As argued before, reference-information models in demand-driven chains should be third generation models on chain level (upper-left quadrant). However, in the reference model investigation no third generation reference models are found. Most investigated reference models are based on static approaches. Only the philosophy of the ebXML model fits well to the idea of dynamic reference modelling, but it still lacks configuration functionality. None of the investigated reference models contain elements of a dynamic configurator. Also static configurators are missed, only the Baan DEM models contain some high-level configuration rules.

Furthermore, although existing reference-information models provide detailed and complete representations of business functions, they are focussed on single enterprises. Exceptions are ebXML (exchange of information between single enterprises) and SCOR (operational supply chain order management, production, returns and planning). No models are found that represent how processes can be integrated in demand-driven chains.

The absence of dynamic reference-information models and the focus on single enterprises imply that current reference models are not appropriate in demand-driven chains, although they provide valuable building blocks.

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