



# Semantic Web-based Information Management and Knowledge Sharing for Innovative Product Design and Engineering

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## Objectives

WIDE aims at providing a basis for improving the quality and efficiency of innovative product design.

The key to improving innovative design lies in better information management and knowledge sharing support of the inter-working of multi-disciplinary design teams.

WIDE aims at improving innovative product design by applying emerging Semantic Web (SW) techniques to develop and test an effective information management and knowledge sharing system for multi-disciplinary design teams.

The WIDE system will support the effective and efficient inter-working of industrial designers and engineers by offering a natural and coherent environment for identifying information needs, finding and accessing different information sources, receiving and viewing information from the different sources and relating the results to the

current state of the ongoing designing. Figure 1 shows the WIDE system architecture.

In doing so, WIDE puts to a real test the emerging SW techniques and identifies where further work is needed to actually achieve the much greater levels of machine aided decision support needed in today's fast moving, short time scale, innovative product design activities.

## Developments

*Information management and knowledge sharing in multidisciplinary design teams*

Different people can use different technical languages, work together and share their knowledge without having all to speak a common language.

This means that a sufficient understanding of the other's terminology, without an ability to speak it, can form a sufficient basis for an effective collaborative working and for sharing knowledge. The WIDE project takes this

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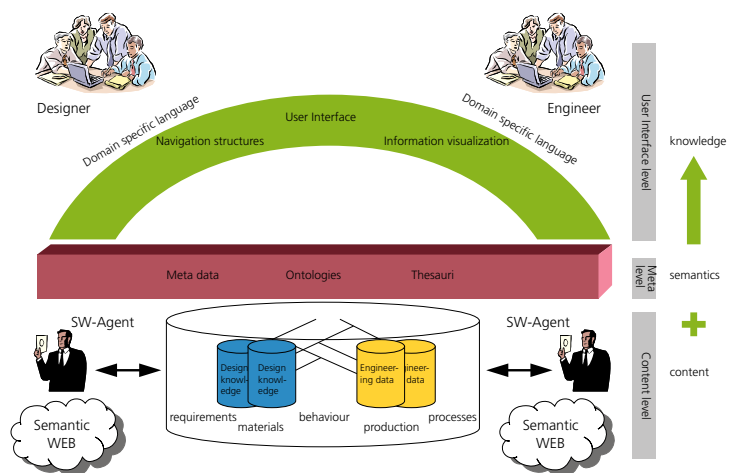


Figure 1: The system architecture of WIDE

multi-language plus cross-understanding idea as the basis for its model of supporting industrial designers and product engineers who work together and share knowledge effectively and efficiently, although they speak quite different technical languages and come from different professional cultures. This represents an innovative approach to effective knowledge sharing in product design, and is different from the more classical knowledge management approaches, which seek to have everybody involved speak the same language.

#### *A process ontology supports the WIDE core system*

Ontologies define existing objects in some domain, their properties, and how the different entities are related. They are intended to support human interpretation of information about the domain covered by the ontology, and to support machine processing of the same information. The importance of ontologies as an essential component of Semantic Web technologies has brought a convergent work on ontology specification and web-based specification languages. The WIDE system aims at using the emerging standards and tools in this area (e.g. XML and XMLS, RDF and RDFS, together with DAML+OIL). The WIDE project will be one of the first projects to develop and use a process ontology as a key element of its information management and knowledge sharing system for product design.

#### *Application of emerging Semantic Web technologies*

Using the Semantic Web as the basis for a system to support information management and knowledge sharing in product design thus represents a

challenging and serious test of the technologies involved. The WIDE system will thus pioneer the way towards the use of Semantic Web technologies in effective support of information management and knowledge sharing in design, engineering and in other business areas.

An **example scenario** illustrates the WIDE concept:

A stylist, who is currently working on restyling a current production car, needs data to get suggestions for the new radiator grille, in order to keep the customer's brand family feeling adding something »aggressive, powerful from the sixties« specific of the new interpretation of the car. He makes a query in the WIDE-system about the customer's production and images of last 15 years linked with a query about design examples for the »aggressive and powerful look from the sixties«.

The result is the visualization of a list of possible items, including CAD-files of »Vehicles Packaging« and data from the company database on sixties cars as well as pictures from the Internet showing not only cars but also aggressive animals, athletes running, sixties design, items and fashion from that period, where he takes good hints for his job.

This is enabled by using semantic web technologies, ontologies, thesauri and terminology dictionaries.

#### **Project partners:**



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