Publishable Summary

Market needs and expectations require a rapidly evolving production framework: thus, production systems, from small to large scale and integrated factories, have to be conceived and set-up in shorter and shorter times. The current challenge in manufacturing engineering consists in the innovative integration of the product, process and factory worlds and related data, aiming at synchronizing their lifecycles.

A holistic, integrated, adaptive and scalable **Virtual** representation of the **Factory** can empower this synchronization, promoting cost savings in the implementation of new manufacturing facilities or reconfiguration of existing ones, thanks to the effective virtual representation of buildings, resources, process, and products.

These challenges are faced by the development of a **Virtual Factory Framework** (VFF). The approach of the three years of research project funded by the European Commission is based on four pillars:

1) Semantic Shared Virtual Factory Data Model (VFDM),

2) Virtual Factory Manager (VFM),

3) Software Tools, based on the VFDM able to interact through the VFM,

4) Integration of Knowledge

VFF partners will show you applications aim at solving real industrial cases.

Activities of the last six months of the project were focused on the validation of the project results.

WP7 coordinated activities among partners to validate the Industrial scenarios that are an effective application of single modules and the framework of the project.

VFF Public Event was on the 21st February 2013 at PALAZZO DELLE STELLINE

C.so Magenta 61 Milano (Italy)

During the event the audience had a privileged access to VFF results. Demos from different Industrial sectors: automotive (as Audi, Volkswagen, Compa), Machinery (Comau, Homag, Ficep), whitegoods industry (Frigoglass), aeronautics (as Alenia) showed the interoperability framework with an ontological approach and all different sw modules coming from three years of the research project.

Finally the attendees had experts at their disposal as well as many other industrials for networking and information exchange information.

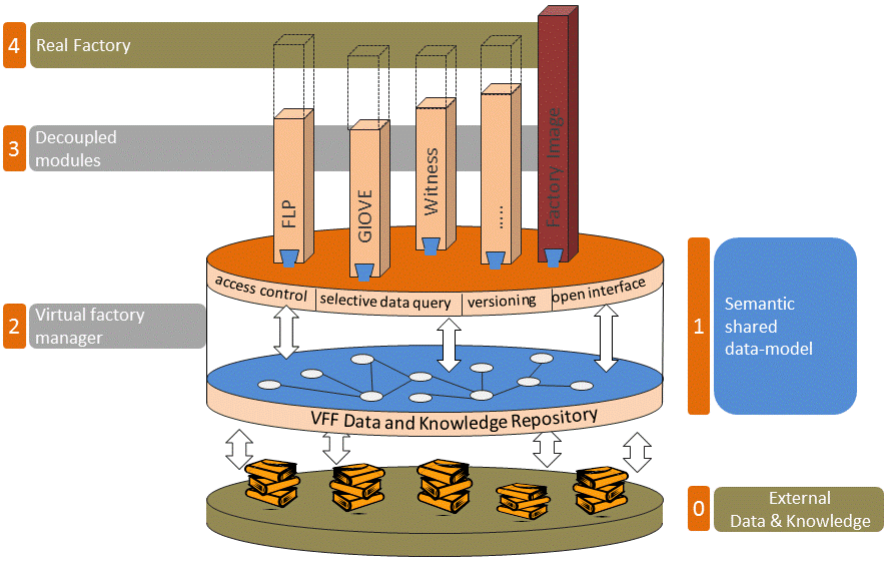

Fig.1: the semantic Virtual Factory Famework

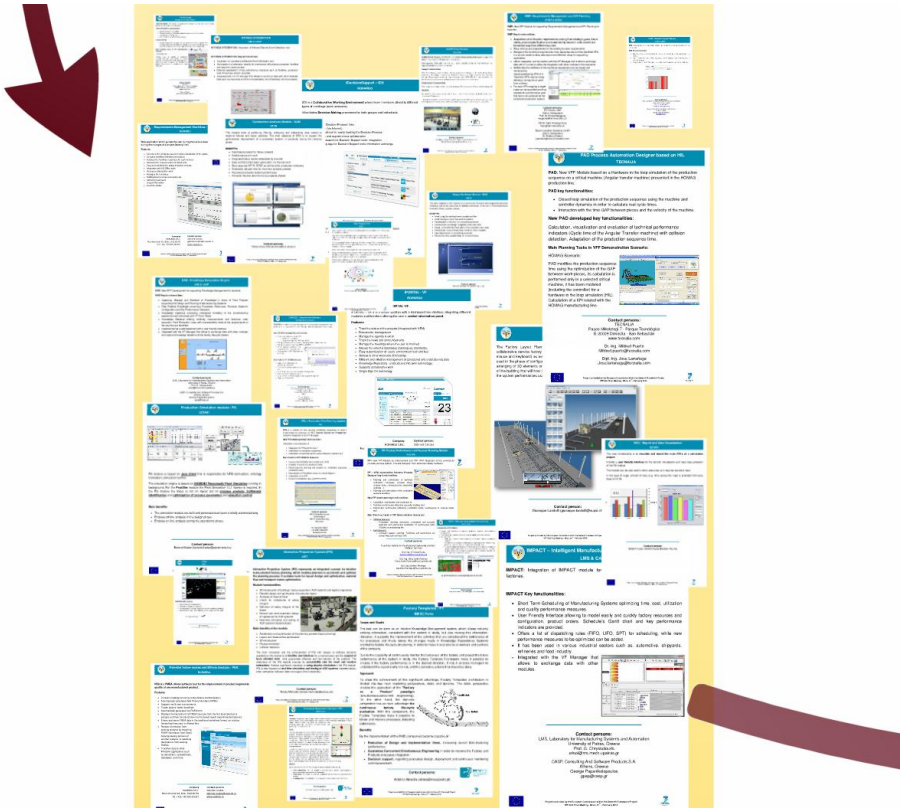

Fig.2: VFF module files

The audience to the Event was around 50 people. The participants expressed their interest during the meeting with suggestions and comments. After they answered to an on-line questionnaire about the usefulness of the project subjects, the importance of specific aspect and further suggestions about foreseen actions to facilitate the market introduction.

In the last 6 months of the project, the whole consortium tested the framework and its effectiveness.

Main result is the VFF framework assuring the interoperability of the entire Factory in all its phases.

- The semantic Virtual Factory Framework consists of 4 pillars:
- Semantic Virtual Factory Data Model
- Semantic Virtual Factory Manager and its Repository
- Decoupled Virtual Factory modules
- Real Factory integration

The semantic Virtual Factory Data Model (VFDM) consists of a set of coherent standard extensible set of ontologies for the integrated representation of the factory objects and knowledge domain, based on Semantic Web technology.

Data and Knowledge coming from different industrial domains and processes (0) converge in the shared Data and Knowledge Repository. The common VFDM (1) assures a comprehensive vision of the information and the possibility to share it with different actors along the factory life-cycle.

The shared Data and Knowledge Repository is governed by the Semantic Virtual Factory Manager (VFM) (2) that provides the functionalities of access control, data versioning and selective data query. The Decoupled Virtual Factory modules (3) are software tools and applications used to support specific activities in the product/process/factory life-cycles. These modules are integrated in the framework and can access and modify the shared factory data thanks to the services provided by the VFM.

Finally, the shared data repository can be synchronized with the Real Factory thanks to the Factory Image module (4), thus closing the loop with the External Data & Knowledge (0). (Please refer to the Project schema in the pdf)

Practical results was the realization of the 8 Industrial scenarios covering different industrial phases and in different market sectors. The framework was applied demonstrating its usefulness.

The Final Public Event was a precious moment to underline the interest among industry people about the ontology approach and its use in production.