

# Contribution to a methodology to develop interoperability of enterprise applications

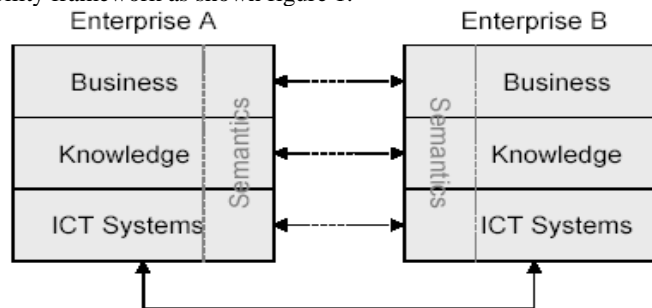
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**Abstract.** This paper aims at presenting an overview on a methodology to develop interoperability of enterprise applications. After a presentation of the definition of interoperability used as starting point and the main objective of this research, approaches to develop interoperability, particularly the federated approach, in the frame of networked enterprise will be given. A draft of interoperability general approach as well as axis of methodological frame which are currently developed will be proposed. Conclusion will be given at the end of the paper.

## 1 Context and objective to develop interoperability

According to the definition from IDEAS [1] project, interoperability can be defined as the ability of interaction between enterprise software applications. The interoperability is considered achieved if the interaction can, at least, take place at the three levels: *data*, *application* and *business process* with the semantics defined in a business context. The business level is decomposed in three sub levels: *business model*, *decisional model* and *business process*. This definition is represented by the IDEAS interoperability framework as shown figure 1.



**Fig. 1.** Simplified IDEAS interoperability framework

In this context, the main objective of the research is to elaborate a methodology allowing establishing interoperability between enterprise applications in the frame of networked enterprise (e.g. virtual enterprises) [2]. This research focuses on interoperability at the level of enterprise modelling (process, decision-making...).

## **2 Approach and expected research result**

According to ISO 14258 [3], it exists three approaches to develop interoperability: integrated, unified and federated. The integrated approach which requires a standard format for all the constituents systems is considered not adapted to networked enterprises environment. The unified approach can only be used if there exists a pre-defined meta-model for mapping between diverse models/applications to establish semantic equivalence. The federated approach seems most promising to networked enterprises where models and applications need to dynamically adapt and accommodate, in particularly in the virtual enterprises environment. Indeed using federated approach to establish interoperability allows the enterprises in question to keep their own identity, methods of work, tools and applications; and possibly with reduced time, limited changes and costs to establish interoperability.

This research work aims at developing a methodology that provides the guide on how to implementing an interoperability solution in the networked enterprise through a federated approach. More precisely the methodology allows establishing interoperability by: (1) following a structured approach in a step-by-step manner; (2) dynamically composing available interoperability solution elements according to identified requirements; (3) identifying and involving various actors and stakeholders of the enterprises concerned.

## **3 Interoperability general approach and methodological framework**

General approach to achieve interoperability is represented as shown in figure 2:

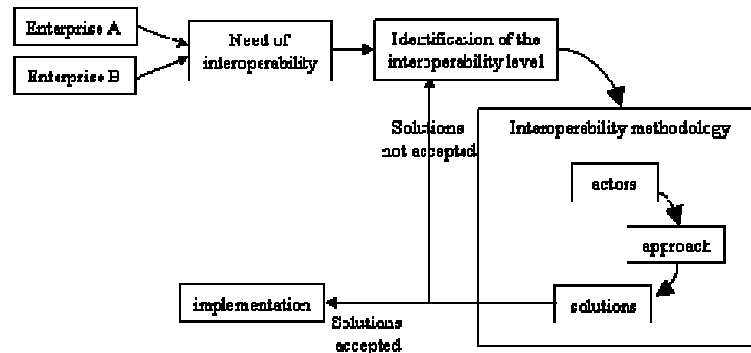


Fig. 2. Interoperability general approach and Methodological frame

A methodological framework will be defined to structure various concerns:

- **Actors axis:** here it is question to determine the actors and stakeholders of the interoperability analysis and design, focusing on the three sub levels. As an example, in the decisional interoperability context it is necessary to identify all decision-markers contributing to the decision making.
- **Approach axis:** the goal is to start from the existing system in order to determine the need of interoperability, the different obstacles to establish interoperability (analysis), and to compose the solution to establish interoperability
- **Solutions axis:** this is concerned with modelling tools, concepts, principles and partial solutions to use for each sub level (*business model*, *decisional model* and *business process*). Actors/stakeholders at a given phase of the approach can choose necessary solution elements to support the modelling, analysis and design.

## 4 Conclusion

This research develops a methodology to help establishing interoperability at the business level in the context of virtual enterprise. The federated approach is chosen. A methodological framework will be defined to structure various concepts, approaches and solution elements. Currently we focus our research at the decisional model level to study how to improve decisional interoperability.

## References

1. IDEAS (2003), IDEAS project Deliverables (WP1-WP7), Public Reports, [www.ideas-roadmap.net](http://www.ideas-roadmap.net), 2003.

2. O. Perrin, C. Godart, A model to support collaborative work in virtual enterprises, *Data & Knowledge Engineering* 50, 2004, pp 63-86.
3. ISO (1999), ISO 14258 - Industrial Automation Systems - Concepts and Rules for Enterprise Models, ISO TC184/SC5/WG1, April 14, 1999.