

Motivation and background

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1. Interoperability

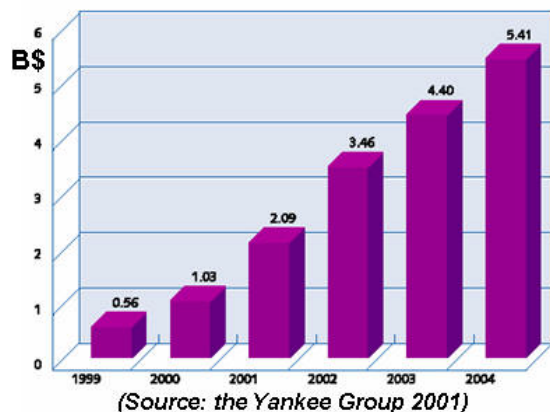
1.1. Definition

The IEEE Standard Computer Dictionary defines interoperability as “the ability of two or more systems or components to exchange information and to use the information that has been exchanged”.

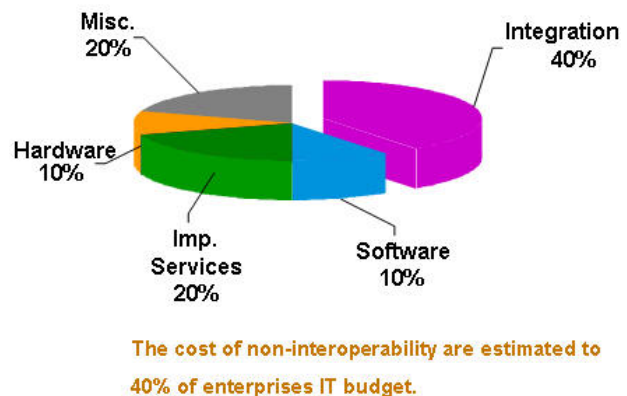
1.2. Rationale

System interoperability is a growing interest area, because of the continuously growing need of integration of new, legacy and evolving systems, in particular in the context of networked businesses and eGovernment. Enterprise applications and software systems need to be interoperable in order to achieve seamless business across organisational boundaries and thus realise virtual networked organisations.

Application integration license revenue



System implementation budget



Interoperability is seen as the key to increase competitiveness of enterprises. According to the Yankee Group the cost of non-interoperability are estimated to 40% of enterprises IT budget. The fact that the enterprise application integration (EAI) market is increasing is a clear indication of the interoperability problem. Enterprises systems and applications need to be interoperable to achieve seamless operational and business interaction, and create networked organizations.

2. ATHENA project

ATHENA – Advanced Technologies for interoperability of Heterogeneous Enterprise Networks and their Applications - is an Integrated Project sponsored by the European

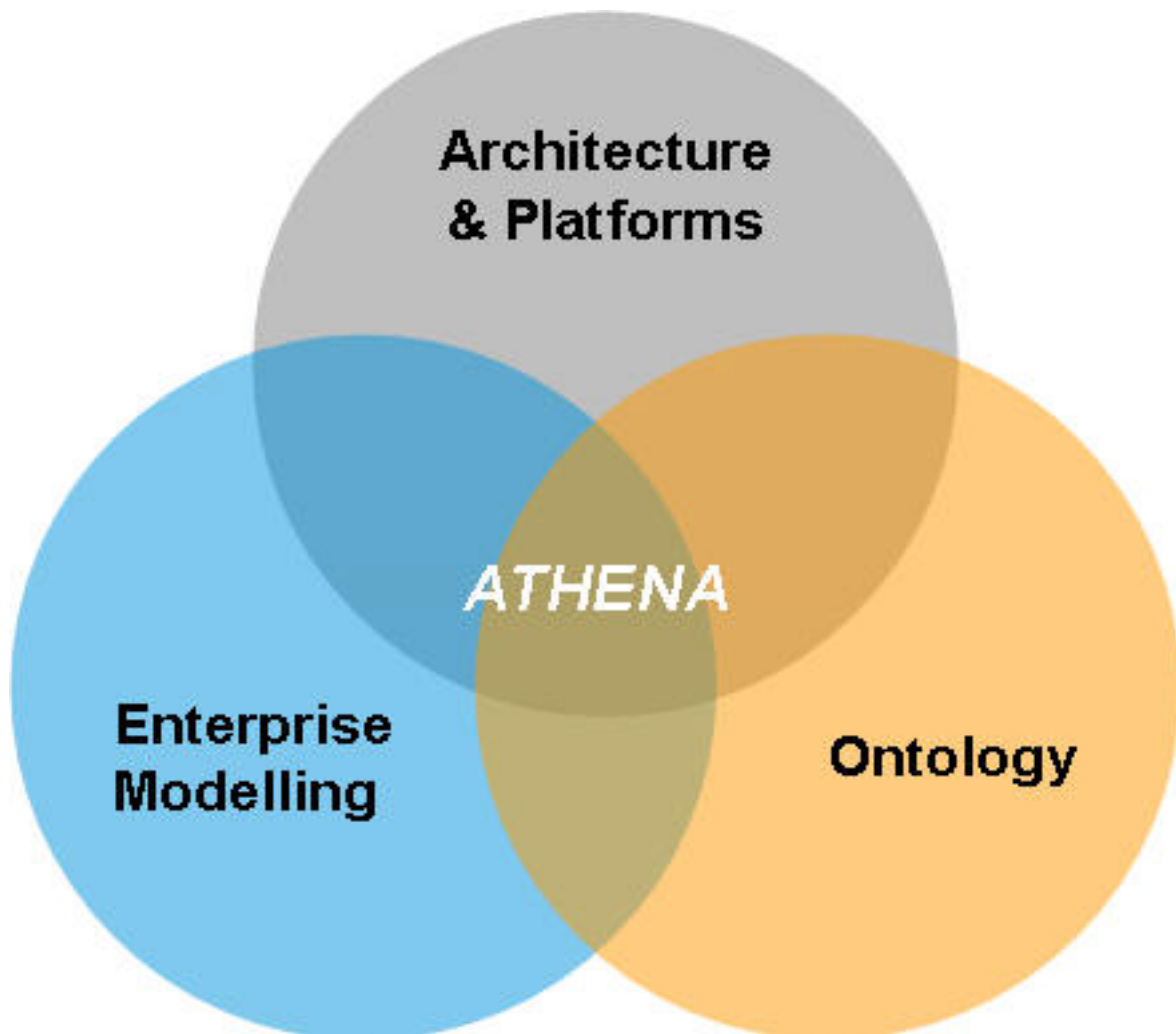
Commission in support of the Strategic Objective “Networked businesses and government” set out in the IST 2003-2004 Workprogramme of FP6. Building upon an ambitious Vision Statement “By 2010, enterprises will be able to seamlessly interoperate with others”, ATHENA aims to make a major contribution to interoperability by identifying and meeting a set of inter-related business, scientific & technical, and strategic objectives.

The ATHENA programme of work is defined for producing results that span the full spectrum of interoperability from technology components to applications and services, from research & development to demonstration & testing, and from training to evaluation of technologies for societal impact. In ATHENA, Research and Development is executed in close synergy and collaboration with Community Building, for ensuring that solutions to multi-disciplinary research challenges are of optimal industrial relevance leading to broad uptake by the end user.

The ATHENA consortium currently comprises 19 leading organisations in research, academia, industry and other stakeholder communities including SMEs, working collaboratively in pursuit of a common set of objectives in interoperability.

ATHENA is committed to creating a long term impact for advancing interoperability which is mainstream, inclusive and has critical mass. To this end, ATHENA is initiating an open, neutral and independent Enterprise Interoperability Centre (EIC) to which all stakeholders, in both private and public sectors, are invited to participate.

2.1. Knowledge integration



The originality of the ATHENA project is to take a multidisciplinary approach by merging three research areas supporting the development of Interoperability of Enterprise Applications and Software.

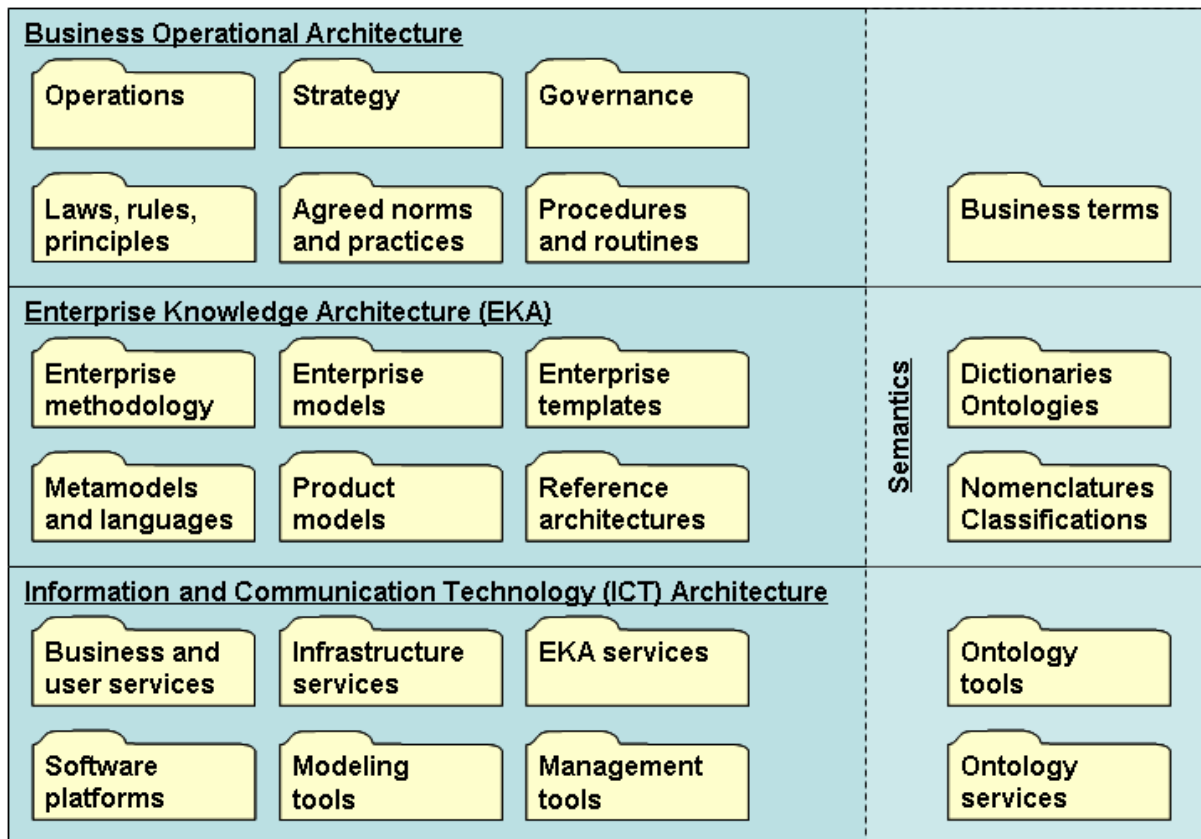
- **Architecture & Platforms:** to provide implementation frameworks,
- **Enterprise Modelling:** to define interoperability requirements and to support solution implementation,
- **Ontology:** to identify interoperability semantics in the enterprise.

2.2. Holistic approach

ATHENA adopts a holistic perspective on interoperability in order to achieve real, meaningful interoperation between enterprises. ATHENA builds upon the FP5 thematic network IDEAS (Interoperability Development for Enterprise Applications and Software,

IST-2001-37368). The IDEAS network identified the need for a structured approach to collect, identify and represent the current state of the art, vision statements, and research challenges. It defined a framework for capturing and inter-relating this information from many perspectives called the IDEAS Interoperability Framework.

- The business layer is located at the top of the framework. In this layer, all issues related to the organisation and the operations of an enterprise are addressed. Amongst others, they include the way an enterprise is organised, how it operates to produce value, how it takes decisions, how it manages its relationships (both internally with its personnel and externally with partners, customers, and suppliers).
- The knowledge layer deals with acquiring a deep and wide knowledge of the enterprise. This includes knowledge of internal aspects such as products, the way the administration operates and controls, how the personnel is managed, and so on, but also of external aspects such as partners and suppliers, laws and regulations, legal obligations, and relationships with public institutions.
- The ICT systems layer focuses on the ICT solutions that allow an enterprise to operate, make decisions, exchange information within and outside its boundaries, and so on.
- The semantic dimension cuts across the business, knowledge and ICT layers. It is concerned with capturing and representing the actual meaning of concepts and thus promoting understanding.



To achieve meaningful interoperability between enterprises, interoperability must be achieved on all layers:

- **Business layer:** business environment and business processes
- **Knowledge layer:** organisational roles, skills and competencies of employees and knowledge assets
- **ICT layer:** applications, data and communication components
- **Semantics:** support mutual understanding on all layers

