

Chapter 28

A Taxonomy of Scientific Areas Driving Assessment of Organisations Readiness

Sotirios Koussouris

National Technical University of Athens, Greece

Spiros Mouzakis

National Technical University of Athens, Greece

Fenareti Lampathaki

National Technical University of Athens, Greece

ABSTRACT

Enterprise Interoperability is one of the most crucial research domains of the modern information age, as it is directly linked with the competitiveness of enterprises as it defines at a large extent the ability of an enterprise to take advantage of the productivity gains offered by the ICT solutions available. However, although various solutions and best practises are emerging on a daily basis, it is the fragmented analysis of the domain that restrains the birth of holistic solutions that will provide the needed leverage to enterprises. Motivated by this situation, this chapter provides an analysis of the different scientific areas that can be found under the Enterprise Interoperability landscape and proposes an assessment framework which may support the identification of the current interoperability profile of an organisation while it reveals various solution paths that could be developed in order to gradually improve the interoperability status of the latter.

INTRODUCTION

Today an enterprise's competitiveness is to a large extent determined by its ability to seamlessly interoperate with others. The advantage of one enterprise over another stems from the way it manages its process of innovation. Enterprise

Interoperability has therefore become an important area of research to ensure the competitiveness and growth of European enterprises.

Research has significantly advanced the field of Enterprise Interoperability in a number of areas over the past few years. Nowadays, this is a well-established applied research area, studying the

DOI: 10.4018/978-1-4666-8111-8.ch028

problems related with the lack of interoperability in the organisations, and proposing novel methods and frameworks to contribute with innovative solutions for Enterprise Interoperability problems. Pragmatically, in spite of the research developed so far, nowadays we are still missing concrete results regarding the laying of the scientific foundations of Enterprise Interoperability. This is a deficit recognised by the Enterprise Interoperability research community, disabling the generalisation and complete reuse of the methods and tools that have been developed (ENSEMBLE Support Action, 2010).

This chapter is organised as follows: the upcoming section provides a short background on the need for Enterprise Interoperability while the following section provides an analysis of the Enterprise Interoperability and a decomposition of the domain to its main ingredients which are titled as “Scientific Areas” (SA). Moving on, an Assessment Framework is presented which maps the different Scientific Areas to the readiness of each organisation and this section is complemented with three use cases which provide examples on how such an approach may support organisations to improve their interoperability profile. Finally, future research directions are presented and the conclusions of this chapter are presented.

BACKGROUND

Interoperability is defined as “the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together” (Cooperstock, 2009). IEEE defines interoperability as “the ability of two or more systems or components to exchange information and to use the information that has been exchanged.” Interoperability means the ability of information and communication technology (ICT) systems and of the business processes they support to exchange data and to enable the sharing of information and knowledge.

Through the years, however, interoperability tends to obtain a broader, all-inclusive scope of a repetitive, well organised, and automated at ICT level feature of organisations, as indicated in the definition of the draft EIF 2.0 (European Commission, 2010): “Interoperability is the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations via the business processes they support, by means of the exchange of data between their respective information and communication technology (ICT) systems” and the Enterprise Interoperability Research Roadmap (Charalabidis, Gionis, Moritz Hermann, & Martinez, 2008) “Interoperability is a utility-like capability that enterprises can invoke on the fly in support of their business activities.” In our view, the most appropriate definition introduces Enterprise Interoperability as “the capacity of two or more enterprises, including all the systems within their boundaries and the external systems that they utilise or are affected by, in order to cooperate seamlessly in depth of time for a common objective” (Lampathaki, Koussouris, Mouzakitis, Charalabidis, & Psarras, 2011).

Modern sciences introduce a paradigm shift since, unlike the traditional philosophy of science, they usually do not apply to a single domain, being interdisciplinary and eclectic. They search their methods and raise research questions in broad areas, crossing borders and engineering different scientific fields. For example, the modern computer science embraces formalisms and algorithms created to support particular desired behaviour using concepts from physics, chemistry, biology (Dodig-Crnkovic, 2002), (America Mathematical Society, 2010). Thus, being also a multi-disciplinary domain by nature, the establishment of Enterprise Interoperability scientific base should be developed comprising concepts and theories from related neighbouring sciences and scientific domains (Charalabidis, Jardim Gonçalves, & Popplewell, 2010).

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