Chapter 18
Enterprise Interoperability

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ABSTRACT

Many interoperable frameworks have been suggested, developed, and implemented in the past. Most of them are based on XML, web services, and semantic web technologies. In the meantime, globalization and the further development of internet and web have raised new challenges and opportunities. New form of networked organizations, known as virtual enterprises, seeks for knowledge sharing around common goals. The rise of the social and ubiquitous world, where everything is going to be connected, gives a lot of technical opportunities for electronic business, but at the same time makes new barriers due to increasing heterogeneity issues. This chapter gives an overview of main challenges, obstacles, approaches, recent research efforts, and forecasts in order to overcome recent interoperability problems.

INTRODUCTION

EC (Electronic Commerce) represents one of the major driving forces to build an electronic society. In the past enterprises faced with interoperability problems, first in the era of closed systems, later on in the infant era of open systems and ACME (A Company that Make Everything) -like vendor's solutions (Kajan, 2014). Since then, many interoperable frameworks have been suggested, developed and implemented; most of them are based on Web services and Semantic Web technologies. With the advent of globalization many organizations look for new partners to reach common goals to improve, for example, production rate, increase market share, refine supply chain, etc. Such new networked organizations are known as Virtual Enterprises (VEs). In a VE it is unlikely that any single partner will decide on the infrastructure, applications, and/or processes to be used. Instead, knowledge sharing around common goals and retaining the autonomy of each partner is crucial (Kajan, et. al., 2016).

In recent days enterprises are facing with a new challenge: everything is connected or it is going to be connected in the near future. In that movement social networking, networked things, smart objects, social communities of Web services, etc., are taking place as stated by Tan et al. "Currently, most social networks connect people or groups who expose similar interests or features. In the near future, we expect that such networks will connect other entities, such as software components, Web-based services, data resources, and workflows" (Tan et al., 2013).

As a consequence the new engineering discipline driven by the torrents of data available today has born: the data science. Data is collected about anything, at any time and any place (van der Aalst, 2014). In such circumstances there is a lot of new heterogeneity issues between business processes, supported applications, data sources, events, and associated data on one side and different hardware, operating systems, database systems, network infrastructure, etc. on the other side, that make huge difficulties and barriers in achieving the full potential of EC. This article gives an overview of main challenges, obstacles, approaches and recent research efforts, and forecasts in order to overcome recent interoperability problems.

THE ISSUES AND CHALLENGES OF ENTERPSISE INTEROPERABILITY

The Web is the backbone of a new social era -a more open, global, ubiquitous, and pervasive platform. People, software, and things are part of a new era in which almost "everything" will be socially connected as shown in Figure 1. We refer to it as the *Social World*. The complexity of social world calls for mutual understanding of all entities involved. Besides many initiatives, ideas, and particular platform-to-platform solutions, connecting all by mutual understanding and self-learning capabilities is yet a big challenge (Dorloff & Kajan, 2012).

Interoperability is the ability of two or more systems or components to exchange information and use the information that has been exchanged in a useful way.[1] In the context of social enterprises (i.e., those that explore data from social world), interoperability is the ability of interactions (exchange of information and services) between enterprise systems (Verginadis, 2011), but also to explore and exchange information of mutual interest gathered from social world. It has triggered the need of capturing the intrinsic characteristics of the business world (enterprises, their applications and stakeholders that may run various business processes) on the one side, and social and ubiquitous worlds on the other side, for bridging the gap between them. These goals have emphasized by (Romero and Vernadat, 2016) as "Enterprise Interoperability and Networking services will need to become a 'commodity' in order to support the building of a hyper-connected world and the seizing of its opportunities for industry (e.g. Industry 4.0)…".

Figure 1. The social world
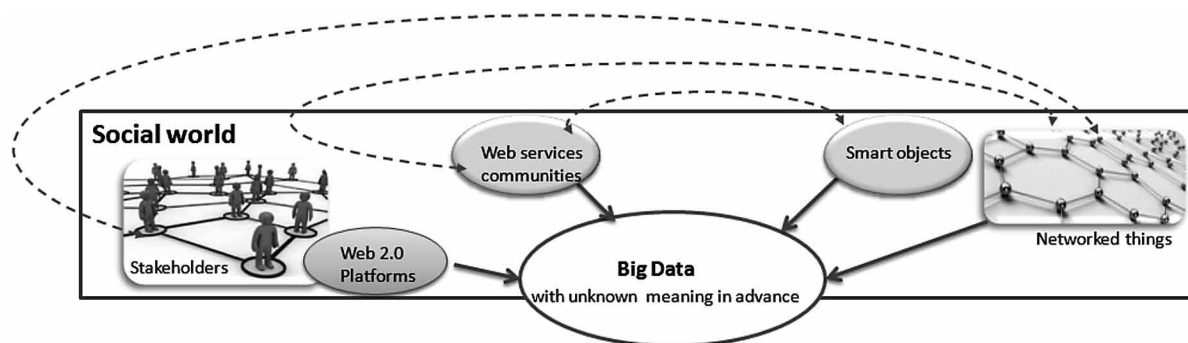
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