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From Interoperability Maturity Models...

Numerous models evaluate the interoperability of systems in terms of maturity. They all distinguish three categories of barriers to interoperability: a set of systems can encounter conceptual, organizational, or technological problems (C4ISR 1998; Clark and Jones 1999; Tolk and Muguira 2003). An enterprise can be considered as a system and defined by a set of elements that interact with its environment. The main objective of interoperability is to improve these interactions. Thus, it is appealing to behold how the concept of maturity can contribute to this enhancement. Furthermore, since these interoperability maturity models are focused on a system of systems (maturity between several systems) and strictly on one category, it is relevant to consider an approach that takes all categories into account, and also consider a system independently from other ones. This approach allows an enterprise to fully evaluate its own capacity to interoperate, and therefore to anticipate possible problems before a partnership. As a consequence, we introduce the concept of *potentiality*.

... Toward an Enterprise Interoperability Potentiality Model

An enterprise that has potentiality possesses intrinsic attributes related to the three categories of interoperability that allow it to interoperate more easily with another enterprise in a partnership. In other words, potentiality is an intra-enterprise evaluation without the need to know the interoperating partner. The main goal is to increase the capacity to implement interoperability and to decrease the risk of encountering problems during a partnership. Our enterprise interoperability potentiality model defines the evaluation of the potentiality of an enterprise according to the three categories that impact the development of interoperability, and the levels where interoperability takes place: business, processes, services, and data (figure 1). For each category and each level of interoperability, there are five levels that characterize potentiality: (1) the **isolated** level, which represents a total incapacity to interoperate; (2) the **initial** level, where interoperability requires strong efforts that affect the partnership; (3) the **executable** level, where interoperability is possible even if the risk of encountering problems is high; (4) the **connectable** level, where interoperability is easy even if problems can appear for distant partnership; and (5) the **interoperable** level, which considers the evolution of levels of interoperability in the enterprise, and where the risk of meeting problems is low.

The goal is to evolve throughout the levels of potentiality to reach the top one. Although this evolution is compulsory in order to decrease the risk of meeting problems and to facilitate the implementation of interoperability, maximum potentiality does not imply full interoperability. Indeed, the use of standard tools by an enterprise does not ensure that a partner will use the same ones. Hence, problems of interoperability can still appear.

Potentiality / Level	Conceptual potentiality	Organizational potentiality	Technological potentiality
Business	Isolated, Initial, Executable, Connectable, Interoperable	Isolated, Initial, Executable, Connectable, Interoperable	Isolated, Initial, Executable, Connectable, Interoperable

Figure 1. The enterprise interoperability potentiality model for the business level

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