Impact of the Interoperability of ERPs on Information Systems Disintegration

Tarek Samara, University of Paris 1 Pantheon-Sorbonne, IAE Paris, France

ABSTRACT

As an ERP package could be viewed as an integration indicator, it could thus measure the information system integration rate (ISIR). Therefore, the integration rate (IR) of an information system (IS), which is composed of only one ERP package, should be higher than the IR of another IS, which is composed of an ERP that is well (or not well) integrated with other subsystems. Some “information technology strategies adopted by ERP vendors and/or by firms could affect, and/or they could be influenced by, the level of ERP interoperability. Whether or not a reliable interoperability is possible to be developed and/or proposed by ERP vendors; firms could interoperate, within the framework of their IS, an ERP package with other subsystems, or they could implement this package as the only component of their IS. When strategies change, the level of ERP interoperability could be modified from reliable to unreliable and the ISIR could be affected. This paper tries to understand how these changes could impact the level of ERP interoperability in a manner that could provoke the IS disintegration.

KEYWORDS

Cloud Computing Interoperability, ERP in the Cloud, ERP Interoperability with Other Subsystems, Information System Disintegration, Integration Rate, IT Strategies, Native ERP Interoperability

INTRODUCTION

The information system (IS) integration is one of the main reasons for the “Enterprise Resource Planning (ERP)” system adoption (Ratkevičius et al., 2012). Any ERP system pushes a company toward full process integration and solves the fragmentation of data (Dixit, 2011). However, “One ERP, to cover all needs, has proved largely illusory” (Deshayes, 2004). Companies use different ERP systems to meet different needs. One-third of companies use an ERP application supplied by a single vendor while two-thirds use software from two or more vendors (Ventana Research, 2010). Most of the interviewed customers have some other applications that interface with the ERP system (Rabay’a et al, 2013). In a case study of an ERP project in healthcare, integration with various different internal systems such as non-ERP applications, web applications and mobile devices was needed (Stefanou & Revanoglou, 2006). Although an ERP could be seen as an indicator of IS integration, one ERP could rarely occupy the whole IS alone. Often the architecture consists of many ERP systems and/or other sub-systems.

An “Information System Integration Rate (ISIR)” could be measured by an indicator like an ERP package; and/or by tools and interfaces like (“Enterprise Application Integration (EAI)”, “Service-Oriented Architecture (SOA)”, “Application Programming Interface (API)”, “Enterprise Service Bus (ESB)”, “Extensible Markup Language (XML)”, etc.) in the whole IS. An ISIR acquired thanks to one ERP system (one vendor, one technology, native integration between modules, one database…)

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could be evaluated as higher than an ISIR obtained by the other mentioned interfaces (several vendors, different technologies, several interfaces and databases, etc.).

The expansions of traditional ERP systems (i.e., ERP 1st Generation = old modules like production planning, purchasing, manufacturing, sales, distribution, accounting, and human resources) have been studied (Cecagnoli et al., 2012). Vendors are always increasing the capabilities of their ERP system by adding additional modules (Moon, 2007). New users’ needs are constantly taken into account, by ERP vendors, as new modules - “Customer Relationships Management (CRM)”, “Supply Chain Management (SCM)”, “Product Lifecycle Management (PLM)”, “Business Intelligence (BI)”, E-business… - within the context of the evolution of ERP from “1st towards 2nd Generation (G)” (Samara, 2015).

When the IS of a firm is composed of an ERP, the taking into account of the new users’ needs could be principally performed according to two strategies: - evolution of ERP from 1st to 2nd G (one vendor); - integration or interfacing of the ERP (1st or 2nd G) with other subsystems (third party). Depending on the level of ERP interoperability (reliable or unreliable), the IS could be more or less disintegrated. This level of interoperability could measure if ERP’s modules are well (or not well) integrated between them “native ERP interoperability”; and if this ERP package is well (or not well) integrated with other subsystems within the framework of the whole IS. Therefore, evolution of the users’ needs affects the ISIR whose evolution could be negative if there is disintegration or a decreasing in the ability to exchange data (unreliable interoperability) between ERP and other subsystems (Samara, 2016).

It is still lack of the research and considerations about how interoperability strategies of vendors and/or of firms can be achieved with ERP systems within the enterprises from strategic management perspective rather than technical notion. More generally, some “information technology (IT)” strategies adopted by vendors and/or by firms could impact, and/or they could be influenced by, the level of ERP interoperability in in a manner that could provoke an IS disintegration. This matter could be important because sometimes, instead of a desired integration, a kind of IS disintegration can occur.

**RESEARCH QUESTION AND METHODOLOGY**

This paper aims to check whether or not the IS disintegration would be possible due to some IT strategies adopted by vendors and/or firms that could provoke an unreliable ERP interoperability. It tries to explain more in-depth this possible relationship; and it also suggests some best practices aimed at overcoming this question (prevent any IS disintegration that could occur due to a changing in the level of ERP interoperability from reliable to an unreliable).

In order to reply to the research question, the literature review helps us to suggest two variables for which four values could be assigned: - Interoperability of ERP (values = unreliable or reliable) as an “Independent Variable (IV)”; - Evolution of ISIR (values = IS disintegration or IS integration) as a “Dependent variable (DV)”. Interoperability of ERP could be viewed as same IV which represents two kinds of interoperability: 1 - interoperaibility of ERP with other information subsystems; 2 - native interoperability between ERP’s modules. Evolution of ISIR could be negative or positive: 1 - decrease = IS disintegration; 2 - increase = IS integration. With these concerns in mind, the main research hypothesis is:

**H1:** The level of the ERP interoperability (unreliable or reliable) impacts the ISIR (a decreasing of the IR increases the IS disintegration; while an improvement of the IR reduces the IS disintegration).
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