8-2010

What characterizes an Enterprise Systems Implementation Methodology?

Daniela Mihailescu

Jönköping International Business School, daniela.mihailescu@ihh.hj.se

Follow this and additional works at: http://aisel.aisnet.org/amcis2010

Recommended Citation


http://aisel.aisnet.org/amcis2010/147

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2010 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
What characterizes an Enterprise Systems Implementation Methodology?

Daniela Mihailescu  
Jönköping International Business School, Sweden  
daniela.mihailescu@ihh.hj.se

Marius Mihailescu  
School of Economics and Management, Lund University, Sweden  
marius.mihailescu@ihh.hj.se

ABSTRACT

Enterprise Systems Implementation Methodology (ESIM) is considered to be a critical factor for successful Enterprise Systems (ES) implementations. In spite of ESIM’s potential and significance for practice, little attention has been paid to this object of study in ES literature. Current studies reveal contradictory findings regarding its potential value and provide a fragmented understanding of it. This paper, therefore, addresses the following research question: What characterizes an ESIM? and suggests that ESIM can be interpreted in terms of its characterizing aspects, i.e. formalized, relational and emergent. This interpretation provides guidance in assessing ESIM in practice and lays the groundwork for useful follow-on research. Since ESIM might be regarded as one of the latest interventions undertaken in an attempt to improve the quality of an ES product and the productivity and quality of an implementation process, this study retains valuable insights of prior works in Information Systems Development research.

Keywords


INTRODUCTION

By the late 1990s, the ES solutions market represented one of the fastest growing in terms of license sales and implementations (Caldas and Wood, 1998). The ES solutions came into widespread use and were suggested to represent a de-facto standard to replace legacy systems in large and multinational companies as well as SMEs (Davenport, 1998; Bingi, Sharma and Godla, 1999; Parr and Shanks, 2000). According to Scott and Shepherd (2002) the ES market was one of the fastest growing markets in the software industry with a penetration of 67% and the largest segment of a company’s applications budget (34%). The trend contributed to the formation of a significant market for ES solutions and of a triadic group consisting of ES vendors and ES implementer organizations on the supply side, and customers or implementing organizations on the demand side (Sammon and Adam, 2004). Focusing on the knowledge and the interrelationship between the supply side, particularly on ES implementer organizations, and demand side, i.e. ES customers, Haines and Goodhue (2003) suggest that each of the three parties have particular knowledge and skills necessary for implementing ES solutions. As pointed out by Haines and Goodhue (2003), ES implementers need to grasp and contribute implementation methodology, which is intended to support, not a software development process, but an implementation process (Caldas and Wood, 1998; Haines and Goodhue, 2003).

The clear distinction between the development and the implementation of ES seems to alter the work practice significantly in terms of roles and responsibilities, activities and competences (Davenport, 1998; O’Leary, 2000). Although most ES solutions provide similar functionality, each ES vendor has developed its own instance of ESIM, which, as suggested by Truex and Avison (2003, pp. 509), represents “both a type of method engineering approach and a platform with design and configuration tools supporting that approach”. For instance, “One Methodology” was suggested for implementing PeopleSoft’s solutions, now incorporated in Oracle’s ES solutions who promote the “Application Implementation Methodology”.

The “Sure Step” methodology is recommended by Microsoft for implementing Microsoft Dynamics solutions, and the “AcceleratedSAP”, or ASAP methodology, is developed and recommended by SAP AG as a de-facto standard for implementing SAP solutions. These implementation methodologies have been suggested in response to the pressure for more efficiency and effectiveness but also flexibility and quality of ES solutions. Yet, the productivity and quality of ES solutions and implementation processes continue to be problematic, calling into question the potential value of ESIM. Given the scarcity of research (Adam and Sammon, 2004; Rosemann, 2003) and contradictory findings on the value of ESIM (van Slooten and Yap, 1999), there is a need to scrutinize alternative approaches for understanding what characterizes ESIM. This paper represents such an attempt. We begin by briefly presenting challenging issues related to ESIM. Then, we present related literature and perspectives undertaken in the IS development field, since ESIM is considered to represent one of the latest initiatives in IS development (Truex and Avison, 2003). Based on the reviewed literature a broader interpretation of ESIM is suggested in terms of its characteristics. This interpretation retains valuable insights of prior works and lays the groundwork for follow-on research. Finally, we discuss some of the potential benefits of interpreting ESIM in terms of its characteristics and conclude with suggestions for further research.

CHALLENGING ISSUES RELATED TO ESIM

Scholars (Esteves and Pastor, 2001; Sumner, 2005) suggest that deploying ESIM represents a critical success factor in ES implementations. Yet, there is a lack of studies about the definition and deployment of such methodologies (Esteves and Pastor, 2000). Rosemann(2003); makes similar observations. Adam and Sammon (2004) also emphasize that more studies are needed to improve our understanding of the adequacy of methodologies in order to avoid future problems in ES implementations. Estevez and Pastor’s (2001) and Estevez and Bohorquez’s (2007) annotated bibliographies of ES publications in the main Information Systems journals and conferences for 1997-2000 and 2001-2005 respectively, show that studies regarding the definition and deployment of ES implementation methodology are still scarce as illustrated in Table 1.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General articles</td>
<td>Of 38 general articles about ES four deal with business modeling and deployment of modeling tools applied in an ES context</td>
<td>Of 40 general articles about ES ten deal with business modeling and deployment of modeling tools applied in an ES context</td>
</tr>
<tr>
<td>Implementation</td>
<td>Of 78 articles about implementation ten deal with implementation approaches</td>
<td>Of 207 articles about implementation 21 deal with implementation approaches</td>
</tr>
</tbody>
</table>

Table 1. Studies regarding ES implementation methodologies between 1997-2000 and 2001-2005

Besides a limited research which is mainly focused on describing potential components of ESIM, like modeling tools and implementation approaches, some studies arrive at contradictory results regarding the potential value of ESIM in practice. For instance, in the SAP community by 1999, only two years after introducing ASAP in the US, customers or implementing organizations from the US preferred SAP’s methodology rather than methodologies offered by their implementation partners (Input company, 1999 in Esteves, Chan, Pastor, and Rosemann, 2003). Moreover, according to Esteves et al. (2003) deploying ASAP or Powered by SAP methodologies seemed to impact the productivity in ES implementations which averaged only 8 months, compared to 15 months for standard implementations. Fleisch, Österle and Powell (2004) evaluated the deployment of ASAP in four ES implementation projects in small and medium sized companies. The authors found that all four companies completed the implementation quickly and effectively. Yet, analyzing the underlying characteristics of ASAP, van Slooten and Yap (1999) and Hedman (2003) come to contradictory conclusions. Van Slooten and Yap (1999), who applied Wijers, Seligman, and Sol’s framework (1992) to discuss the IS engineering process, consider the ASAP as “a very sound method in terms of Wijers’s Framework for Understanding” (van Slooten and Yap, 1999, 227). Contrary to this, Hedman (2003) who applied Iivari, Hirschheim, and Klein’s (2000) framework to analyze the underlying assumptions of ASAP considers the instrumental view of humans and organizations as well as the bureaucratic character of the ASAP methodology as a drawback, which may explain users’ aversion to the system or its use. Similarly, Bhattacharjee (2000) indicates that although selected for the potential to support rapid implementation, ASAP lacked the flexibility necessary for extensive customization needs and for the support of process improvements. It also alienated functional user groups from system implementation. More generally, Truex and Avison (2003) suggest that in spite of potential advantages, in its shape, i.e. with a focus on the rapid implementation of ES software, ESIM is a source of dissatisfaction for ES adopting organizations.
RELATED RESEARCH TO ESIM

ESIM is one of the latest approaches in IS development methodology (ISDM) initiatives. Since this type of initiative originated in the late 1960s (Avison and Fitzgerald, 2006), there is a large and heterogeneous body of ISDM research. The research on ISDM has attracted scholars across a range of research fields providing various interpretations based on different perspectives. Although the review presented in this section does not have the intention to be exhaustive, it nonetheless highlights four theoretical perspectives that have been applied in the interpretation of ISDM. These perspectives highlight different but complementary aspects, useful in identifying the characteristics of ESIM.

A system perspective

One of the interpretations of ISDM follows from Bertalanffy’s (1968) General System Theory, which helps to describe and explain complex and abstract concepts by conceiving them as systems. This view emphasizes the importance of understanding ISDM as an indivisible whole consisting of interacting, but different types of components or subsystems. Despite ongoing issues and diverse interpretations, ISDM seems to include a collection of interrelated components such as: paradigm, approach, method, technique (Avison and Fitzgerald, 2006; Huisman and Iivari, 2006), development tools, and services (Avison and Fitzgerald, 2006; Beynon-Davies, 2002). This perspective provides a description of potential content of ISDM that might be assembled in concordance with the characteristics of particular types of projects (Brinkkemper, 1996) and provided to stakeholders in order to achieve the development of an IS product and the management of an IS development process.

A structuration perspective

ISDM is interpreted from a structuration perspective by Orlikowski (1992, 405), who argues that technology in general and ISDM in particular represent “a kind of structural properties of organizations developing and/or using technology. That is, technology embodies and hence is an instantiation of some of the rules and resources constituting the structure of an organization”. Although the components of ISDM are not explicitly discussed by the author, she makes a distinction between methodology and Computer-Aided Software Engineering (CASE) tools categorizing the first as a radical innovation and the latter as an incremental innovation. Hence, the implementation of an ISDM is considered to result in a radical change, while the implementation of one of its components, is considered to result in an incremental change.

Based on ISD empirical literature, Sambamurthy and Kirsch (2000) suggest that structures like ISDM might be invoked in the ISD context by stakeholders in learning or knowledge acquisition, communication, conflict, negotiation, influence, control, coordination, and persuasion. Although the structuration perspective does not insist on the content of ISDM, like the previous strand of research, it provides the view of ISDM as a socially constructed means, with enabling or constraining potential.

An innovation perspective

Based on Kwon and Zmud’s (1987) IS implementation model and Rogers’s (1995) Diffusion of Innovation theory (DOI), Huisman and Iivari (2002) found that along with other individual, organizational, task, and environmental factors, the characteristics of ISDM perceived by systems developers to influence deployment are: relative advantage, usefulness compatibility, and trialability. As showed by Venkatesh, Morris, Davis, and Davis (2003), the two constructs relative advantage and usefulness are similar and highlight the individual’s performance expectancy. In other words, at an individual unit of adoption, ISDM is perceived as a potential means, which if used, enables gains in job performance. Moreover, deploying ISDM is perceived to improve communication and the career of individual developers (Johnson, Hardgrave, and Doke, 1999).

The other two characteristics of ISDM, i.e., compatibility and trialability, are perceived to remove barriers and are therefore considered significant to facilitate intention, formation and use. An emphasis on the individual developer’s perceptions is considered too narrow to be of much use for organizations which adopt ISDM, because it underemphasizes the challenges and the role of adopters (Newell, Swan and Gallaers, 2000). Therefore, researchers drawing on a knowledge diffusion perspective have focused their attention on analyzing the barriers that can impede the transfer or the integration of knowledge within or across organizations and communities.
A knowledge and learning perspective

Drawing on a knowledge diffusion perspective, ISDM has been conceptualized as a source of knowledge which embodies “best practice” in ISD within an organization or IS community (Iivari, Hirschheim and Klein, 2004). Accordingly, ISDM is regarded as an object that can be transferred through some form of communication from a supplier side (Beynon-Davies and Williams, 2003), and assimilated through learning on the adopter side (Fichman and Kemerer, 1997). While these sides have two distinct roles in relation to the ISDM, in both cases the aim of the ISDM is to support or change the knowledge base and, hence, the practice within organizations or IS community. Fichman (1995) argues that innovations of this type have the potential to increase returns on adoption having a high network potential but, when first introduced, generate high knowledge barriers and low performance relative to current best practices. Regarded from a short-time perspective, it seems that ISDM creates problems for potential adopters who, as suggested by Beynon-Davies and Williams (2003), also need to unbundle the simplified and “black-boxed” solutions provided by the supply side, and integrate them with locally situated knowledge. Fisher and Ostwald (2003) have interpreted ISDM from a learning perspective. Yet, according to the authors, ISDM is not a holder of knowledge but an evolving artifact which becomes understandable and meaningful as it is used. Accordingly, ISDM has been interpreted as a boundary object needed to mediate knowledge communication within as well as between communities. From this perspective, ISDM is not simply acquired but must be created and communicated through the interaction of members of a group (Fisher and Ostwald, 2003). This view is different from the one provided by the knowledge diffusion perspective, according to which the relationship between participants is based on a notion of control and interaction of members of a group (Fisher and Ostwald, 2003). This view is different from the one provided by the knowledge diffusion perspective, according to which the relationship between participants is based on a notion of control and interaction of members of a group (Fisher and Ostwald, 2003). This view is different from the one provided by the knowledge diffusion perspective, according to which the relationship between participants is based on a notion of control and interaction of members of a group (Fisher and Ostwald, 2003). This view is different from the one provided by the knowledge diffusion perspective, according to which the relationship between participants is based on a notion of control and interaction of members of a group (Fisher and Ostwald, 2003). This view is different from the one provided by the knowledge diffusion perspective, according to which the relationship between participants is based on a notion of control and interaction of members of a group (Fisher and Ostwald, 2003).

Table 2 summarizes the four perspectives applied in the interpretation of ISDM along with their focus and example of sources.

<table>
<thead>
<tr>
<th>Perspectives on ISDM</th>
<th>Focus on ISDM’s contents (1) and features (2)</th>
<th>Focus on ISDM’s Deployment of ISDM</th>
<th>Example of sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and learning</td>
<td>1) – 2) Abstract, fragile, triableable, unpackaged, modular, adaptable, standardized</td>
<td>Deployment of ISDM between individuals as well as within and between collectives (e.g. groups, organizations, communities)</td>
<td>Beynon-Davies and Williams, (2002); Iivari et al., (2004); Fichman and Kemerer, (1997); Fisher and Ostwald, (2003)</td>
</tr>
</tbody>
</table>

Table 2. Perspectives applied in the interpretation of ISDM

The literature may explain the dissension that continues to exist with regard to the nature and value of ISDM. Firstly it reveals a shifted focus from the content of ISDM and its potential to support stakeholders in ISD project towards its characteristics and potential to change, i.e., innovation, learning, and structuration. Secondly, the assessment of ISDM deployment in isolation appears to be beneficial and to extend human capabilities by providing support for e.g., production, coordination, collaboration, and learning at the individual level (Huisman and Iivari, 2002), project level (Fitzgerald, Russo, and Stolterman, 2002), organization (Orlikowski, 1992), or community level (Beynon-Davies and Williams, 2003). But, since these levels are related in a nested hierarchy, the development and deployment of ISDM might have not only intentional but also detrimental consequences, e.g., resistance, knowledge barriers, and competence-destruction. The issue with the studies presented on ISDM is not that the results are flawed or inadequate, but that these results reflect a different focus, providing a fragmented view. The literature review discloses the complex and ambiguous nature of ISDM and its potential not only to support but also to induce changes and improvements. Hence, two particular issues emerge: 1) divergent findings and fragmented understanding of ISDIM, which, as we see it, might be related to a narrow interpretation; and 2) a shift of focus from contents and potential individual improvements in performance, towards an emphasis on potentials and challenges in the development and deployment of ISDM at a collective level. A broader interpretation of ISDM, therefore, seems to be an appropriate point of departure to identify ESIM’s characteristics.
THE CHARACTERISTICS OF ESIM

Based on presented literature on ISDM and ESIM we suggest that an ESIM is characterized by: 1) a formalized aspect which refers to its contents and features, 2) a relational aspect which refers to related components to ESIM, i.e. stakeholders, ES product and ES implementation process, and 3) an emergent aspect which refers to ESIM’s development and deployment in ES implementation projects, as well as within and between organizations. While the formalized aspect provides useful information about the content and features of ESIM, the relational aspect directs the attention towards the potential components that influence and are influenced through different activities in two intertwined stages, i.e. development and deployment that contribute to the emergence of ESIM.

The formalized aspect refers to the content and features of ESIM and emphasizes the importance of regarding ESIM as an indivisible whole consisting of interrelated but different components, e.g. paradigm, approach, method, technique, tool, service. These components might be more or less sophisticated but each of them provide particular functionality which might facilitate or impede stakeholders to achieve their interests, e.g. to improve performance, understanding or interaction in diffusing ESIM within or between organizations, or in managing the implementation process and implementing the ES product.

Hence, the second aspect, i.e. relational aspect, directs the attention towards the components, i.e. stakeholders, implementation process and ES product that might influence and are influenced by the ESIM. Given the resources in terms of positions and powers, knowledge and experiences, as well as their interests, the stakeholders might engage in the development or deployment of ESIM in order to support or change 1): existing processes, e.g. phases, tasks and deliveries in the implementation process; 2) existing products, e.g. functionality provided by the ES products, and 3) resources, e.g. positions, powers, knowledge, experiences.

The last aspect, i.e. emergent aspect, refers to the activities undertaken by stakeholders in the development and deployment of ESIM within or between organizations, as well as in ES implementation projects. For instance, the development and deployment of ESIM might entail activities like production, assemblage or adaptation of ESIM’s components and their communication and integration with the specific knowledge base of an organization, e.g. processes and products, as well as formalization and standardization. The outcomes of these activities provide the conditions for the development and deployment of ESIM in ES implementation projects. This might also entail adaptation, but this time with regard to the type of implementation project, as well as coordination, visualization, automation and documentation of the implementation process, and configuration/customization of the ES product. These different but complementary aspects aid focusing on research efforts at the outset of a study and provide an integrated view of ESIM as illustrated in Table 3.

<table>
<thead>
<tr>
<th>ESIM</th>
<th>Formalized aspect</th>
<th>Relational aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Content: paradigm, approach, method, technique, tool, and services</td>
<td>- Stakeholders: resources (positions, powers, knowledge, experiences) and interests (performance, understanding, interaction)</td>
</tr>
<tr>
<td></td>
<td>- Features: formalized, reusable, compatible, abstract, fragile, trialable, unpackaged, modular, adaptable, standardized</td>
<td>- ES implementation process: phases, tasks, deliveries</td>
</tr>
<tr>
<td>Emergent aspect</td>
<td>ESIM development and deployment:</td>
<td>- ES product: functionality</td>
</tr>
<tr>
<td></td>
<td>1) within and between organizations entailing for instance production, assemblage or adaptation, communication, integration, formalization and standardization;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) in ES implementation projects entailing for instance adaptation, coordination, visualization, automation, documentation, configuration/customization</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. An integrated interpretation of ESIM based on its characterizing aspects
DISCUSSIONS

Although the reviewed literature provides limited evidence on the potential value of ESIM, as exemplified in the case of ASAP and more generally in the case of ISDM, the insights that surfaced from these studies yielded a preliminary understanding of ESIM as a complex and ambiguous, as well as intriguing object of study. ESIM represents an intriguing object of study for at least two reasons.

Firstly, because time and budgets overruns have been more a rule than an exception in IS development projects and in ES implementation projects (Grabski, Leech and Lu, 2003; Esteves and Pastor, 2001). Yet, as indicated by some studies (Fleisch, Österl and Powell, 2004; Estevez, Chan, Pastor, and Rosemann, 2003) the deployment of ESIM has the potential to improve the productivity of the implementation process and the quality of the ES product. Secondly, as ESIM is regarded as one of the latest approaches in IS development and as a type of complex innovation technology, it would impose a substantial knowledge burden on adopters impeding its deployment (Fichman, 1995). Additionally, the diffusion of this type of complex innovation is slow, not only between but also within organizations and could be met with resistance by developers (Zelkowitz, 1996; Pfleeger, 1999). Yet, as indicate in the literature, the time for diffusion of ASAP within the SAP community has been reduced and its potential deployment contributes to more shorter and efficient implementations (Fleisch et al., 2004). Hence, the assessment of ESIM might provide valuable knowledge about, at least, two perpetual and essential issues in ES, i.e., on the one hand shorter and more efficient implementation processes, and on the other hand, reduced knowledge burden and faster diffusion of ‘best practice’.

In line with scholars from ES (Adam and Sammon, 2004; Motiwalla and Thompson, 2009, Sumner, 2005) it is our contention that ESIM has a central role in practice. ESIM is considered important in the implementation of ES solutions and also in education. However, a narrow interpretation of ESIM, although valuable to highlight particular aspects, might be detrimental to understanding it. Hence, a broader interpretation of ESIM in terms of three characterizing aspects is suggested in this paper.

CONCLUSIONS AND FURTHER RESEARCH

The literature review revealed four theoretical perspectives on ISDM: 1) system, 2) structure, 3) innovation, and 4) knowledge. These perspectives highlight different but complementary aspects, useful in identifying the characteristics of ESIM. The interpretation of ESIM provided in this paper suggests an integrated view on ESIM as characterized by three different but complementary and interrelated aspects: formalized, relational and emergent. The formalized aspect refers to the content and features of ESIM and emphasizes the importance of regarding ESIM as an indivisible whole consisting of interrelated but different components, e.g. paradigm, approach, method, technique, tool, service. The relational aspect, directs the attention towards the components, i.e. stakeholders, implementation process and ES product that might influence and are influenced by the ESIM. The emergent aspect, refers to the activities undertaken by stakeholders in the development and deployment of ESIM within or between organizations, as well as in ES implementation projects. While each aspect regarded in isolation provides a set of different overarching themes or components, together these aspects provide a more nuanced view on ESIM. This point of departure is useful for describing what characterizes an ESIM and provides the possibility to overcome some of the contradictory results and the tension identified in the literature in the assessment of either formalized, relational or emergent aspects of ESIM.

The next step in our enquiry into ESIM is to explain why, how and when the development and deployment of ESIM might enhance human capabilities in a stratified context. We hope that our work will inspire other scholars and guide sound investigations of ESIM in order to enhance the knowledge base on it, and raise awareness of the complexity and potential value of ESIM among practitioners.

REFERENCES