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EXTENDED ENTERPRISE AND INFORMATION SYSTEMS GOVERNANCE IN AN INTER-ORGANIZATIONAL CONTEXT

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Flexibility, openness, and cooperation are fundamental tendencies that positively mark the ensemble of private and public sector organizations. For a sustainable development in a more and more complex globalized and competitive business environment, the enterprises tends to multiply their alliances and partnerships, in order to develop new organization forms, like Extended Enterprises (EE). As a response to the management visible needs in the field of inter-organizational processes, a new typology of information systems arises: inter-organizational information system (IO-IS), integrating IT&C and extended enterprise resources, in respect to fundamental principles like strategic alignment, performance and compliance. The present paper (1) clarifies the subject-affiliated concepts, (2) analyzes the IO-IS typology and IT&C implementation solutions, and (3) debates the IS governance issue in an inter-organizational context.

Keywords: e-business, extended enterprise, inter-enterprise cooperative information systems, workflow, corporate governance, IS governance

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1. Conceptual considerations

Information and communication technologies (IT&C) potentialities have enabled enterprises to choose from o considerably range of support solutions for sustainable development in a globalized and extremely competitive environment. As a consequence of adopting IT&C (figure 1), management and governance research preoccupations focus, especially, on emergent concepts delimitation, ontologies definition, best-practices contingent rules proposal, or elaboration of analysis models related to the incidence of IT&C use at organizational and inter-organizational level.

E-business is a generic concept embodying the ensemble of IT&C means and resources, based on Internet and web servers, used for functional amelioration, in order to create value for the enterprise, for its costumers or other partners. We can affirm that e-business defines the enterprise capacity for exploiting the potentialities of on-line service concept, regarding the partners' relationships optimization (figure 2).

Figure 1. Adopting IT&C in an inter-organizational enterprise context

Business-to-Business (B2B) is the base for the extended enterprise and aim at using IT&C for the (partial or total) information sharing between enterprise and business partners: suppliers, entrepreneurs, customers, services providers or financial organisms. The e-business adoption:

- Allows a better internal process articulation;
- Forms an interface between enterprise business processes and customers, entrepreneurs, suppliers or other partners processes;
- Emphasizes enterprise business model, in respect to the value creation mechanisms.

The recent advent of Smart Business Network concept extends the traditional enterprise area and opens new challenges, especially in the modular and dynamic business process management field. The inter-organizational process management refers to a business strategy for optimizing the extended enterprise collaborative business processes, forming the base for the inter-organizational information-systems (**IO-IS**) development. An IO-IS

signifies the ensemble of knowledge, human resources, procedures and technical means, concerned with the automation and coordination of data exchange between two or more distinct organizations *(Amza, 2006)*. From a capitalistic point of view, inter-organizational information systems create electronic links between different organizations that collaborate one with the other. These systems actively participate to the creation of long-lasting competitive advantages for all the enterprises from their supply area. From the point of view of accomplished functions, an IO-IS associates the classical functions of an information system (collection, storage, processing, extraction, distribution) with additional essential functions (like conversion, security, audit, validation, journalizing, structuring, synchronization, simulation), and, eventually, with specialized functions for reaching the goals that IOIS was developed for (for example, a system created for "electronic market" may integrate functions like: intermediation, negotiation, catalog, logistics, legal framework). In many cases, in the attempt to optimize and integrate the organizational and inter-organizational value chain informational flow, IO-IS activates as a bridge between individual enterprise information systems, connecting the business solutions (like ERP or Extended ERP) in an integrated vision (Tudor, 2006).

The e-business organizations adoption generated the emergence of new inter-organizational networks forms, permitting the advent and development of the Extended Enterprise (**EE**) concept. An Extended Enterprise can be described as the ensemble of juridical independent enterprises, organizing progressively new cooperation forms, thus structuring their activity complementarity, with the main goal of producing finishing goods or services for an identified specialized market customers (Florescu&Tamaş, 2006). The ensemble behaves like a unique enterprise, being settled on alliances and partnership relations. Although many forms of Extended Enterprise may be identified, the present paper portrays, mainly, the EE model coordinated by a pilot enterprise (the inter-organizational network leader). In this particular perspective, the Extended Enterprise enables its actors to share, effectively:

- Values, relationships and trust for a medium and long time horizon;
- Common goals and market objectives, or inter-organizational relationships capitalization, in order to obtain strategic advantages;
- Enterprises information/knowledge, for process and decision improvement purpose;
- Business resources and collaborative workflow tools, in regard with their commitments keeping, and a better business network knowledge management.

Building an Extended Enterprise is not an easy task. This involves partnerships agreements concerning the active participation of each enterprise for the common established goals achievement, in compliance with transparency, confidentiality, security and performance principles. Corporate governance, a topicality term originated from organizational theory, is perceived as the ensemble of rules, principles and articulation mechanisms between the shareholders and enterprise managers. Furthermore, as the field of value creation in a sustainable collaboration business network moves to an inter-organizational context, a new vision about corporate governance comes forward, taking into consideration both **stakeholders** and **shareholders** roles and privileges (even if the shareholders interests have priority). According to Kumar &Van Dissel (1996), corporate governance in an inter-organizational context "can be interpreted as the ways in which inter-organizational work is divided among the partnering organizations by assigning specific roles to them and the ways in which coordination is achieved among these roles". The information system (IS) governance (or IT Governance, for English literature) is described as a component of corporate governance, moving its principles and rules into the IS field (Florescu&al., 2007). IS Governance Institute (IGSI, 2004) defines IS governance as an ensemble of command and control structures and processes, designed for aligning the IT support to the organizational strategy, in compliance with enterprise objectives. Therefore, IS Governance can be described as "effective, efficient and controlled management of IT, while achieving business alignment and value delivery" (*Source*:www.cronos.be). The IS governance provides a reasonable assurance for the external actors that the IS function of an enterprise is well managed. When discussing the touching points between IS and Corporate Governance the "compliance" and "performance" aspects must be balanced (as described in figure 2). The business performance management researches relating to the inter-organizational context dissociate the internal performance from the global system performance (Rascol-Boutard&Eggrickx, 2007).

The governance approach bases on two important corporate strategic mechanisms:

- *Control and Audit*, with the main goal to assure the compliance of business activity with the legitimate authority interests and strategy, thus, minimizing, as much as possible, the exposure to risks.
- *Strategic management*, using a specific tools and techniques measurement system for the enterprise performance overseeing.

The international COBIT standard, elaborated by ISACA (System and Audit Control Association) provides a set of measurements, benchmarks, processes and generally accepted best practices usable by IT users, managers and auditors willing to maximize the benefits of using information technology and implementing strong IT governance through an organization (Tudor & Mangiuc, 2008). IS Scorecard can be understood as an adapted version of Balance Scorecard developed by Kaplan&Norton (2003) for building a performance indicators system for the strategic achievements electronically surveillance.

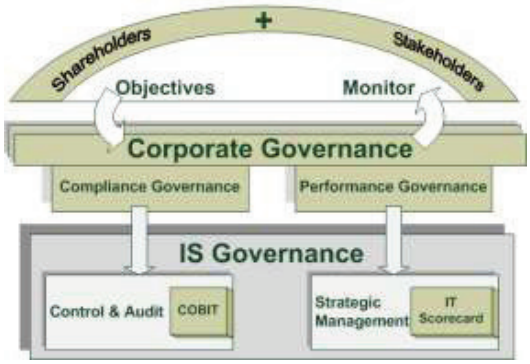


Figure 2. The IT Governance place in Corporate Governance

2. The IO-IS typology and IT&C solutions

When reviewing the literature born from scholarly concern in the broader extended enterprise information system area (Florescu&Tamaş, 2006; Aubert &Daussort, 2002), someone can distinguish several IO-IS classification criterions: the organizations agreements regarding the IO-IS, the involved organizations' strategic objectives, the participants' legal ownership form, the cooperation direction and the independence degree of the inter-connected organizations. For the purpose of presenting an IO-IS taxonomy related to the present paper context, we adopt a classification based on the organizations independence degree into the accepted system (table 1).

The practice outlines a diversity of IT&C conceptual and technical solutions for IO-IS implementation and enterprise adoption: Electronic structured data exchange on Internet (EDI-XML); Extranet functionality; Inter-enterprise Cooperative Information Systems (ICIS).

Electronic Data Interchange (**EDI**) on Internet benefits of XML (eXtensible Markup Language) advantages, involving a protocol existence between two involved entities: the message initiator and the receiving unit. The receiving unit can, thus, store data in the internal database without being necessary any additional data re-collection actions. The messages transmission on Internet benefits of advanced techniques for the data confidentiality and for the assurance of dataflow security.

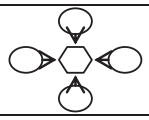
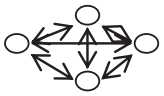
	Shared information IO-IS	**Supply Chain IO-IS**	**Network IO-IS**
The independence type	Grouped	Sequential	Reciproc
Configuration			
The conflict potentiality	Low	Medium	Important
Example	Electronic Market (*E-marketplace),* Extranet	Tranzactional System EDI/XML Extranet	Inter-entreprise Cooperative Information Systems

Table 1: The typology of IO-IS

The aforementioned development practice adopted for structured data exchange-based IO-IS enables a tight integration of HTML, XML and Web service solutions. The web services advantages (concerning the field of inter-connecting enterprises business processes) open the road to another important conceptualization for the IO-IS area: Service Oriented Architecture (SOA), referring a popular design paradigm for adaptive and flexible information systems development. Currently, the use of web services in the context of extended enterprise is recognized as a universal solution for supporting cooperative processes through the use of advanced technologies (Tudor, 2006). Recent researches give particular attention to financial-information electronic exchange, by the means of XBRL standard (eXtensible Business Reporting Language). The XBRL success is due to the coherence and compliance with financial communication international norms (like IFRS, Basel II, etc.) and to the fact that it is founded on the XML platform.

The **Extranet** enables the partner companies to share information and knowledge using the web site. (Florescu&Tamaş, 2006). For industrial enterprises, the Extranet-based inter-organizational information systems address, especially, to sub-contractors, important suppliers, or loyal customers. The Extranet IO-IS solution can, also, be adopted for sharing sensitive data and information between accounting expertise cabinets and their customers.

The Inter-enterprise Cooperative Information Systems (**ICIS**) represents one of the key points of the good working of an extended enterprise. ICIS offer a shared environment for common, synchronous or asynchronous activities

communication and collaboration, in conjunction with security and confidentiality principles compliance. This particular type of IO-IS fosters both the agents mobility (individuals, services, business units, or, even enterprises) and organizations integration (by connecting data, applications, processes or knowledge) at extended enterprise level. According to Boughzala (2001) considerations in the area of cooperative information systems, extended enterprise can be perceived as the ensemble of partner agents, sharing resources and complementary competencies, in order to attain a set of common objectives. One of the cooperative agents plays the role of the pilot (leader) entity for the ICIS. Such a system encloses not only information and knowledge, but also a common syntax and semantic for the shared data, in order to become intelligible to all extended enterprise members. For a better coordination between business partners, one common practice consists in the integration of ICIS with complementary IT&C solutions such as: *workflow systems* (for business activities modeling capabilities in conjunction with the management of these activities and their associated different actors involved in the inter-organizational processes execution) or *common management document systems* (combined, presently, with the team work systems). Both the practitioners and scholars research studies asses the opportunity of ontologies use for the treatment of coordination problems, in the area of inter-organizational business process workflow.

3. The IS Governance in an inter-organizational context

According to Weill&Ross (2004), there is a consistent difference between IS Governance and IS Management: governance determines who makes the decisions, while management is the process of making and implementing the decisions. The evolution of using information system in a business environment based on externalization and partnership concepts, contributed to a visible grow of business processes complexity, in regard with IS management and governance. By developing inter-organizational relationships, the IO-IS can be considered a strategic asset, liable to generate a competitive advantage, mainly for its capacity of capturing resources. This asset must be use in compliance with both performance and conformity principles.

The IS Governance finds its roots on corporate governance general principles (IGSI, 2004):

- *Strategic alignment* focuses on ensuring the linkage of business and IS plans, on defining, maintaining and validating the IS value proposition, and on aligning IS operations with enterprise operations;
- *Value delivery* is about executing the value proposition throughout the delivery cycle, ensuring that IS delivers the promised benefits against the strategy, concentrating on optimizing costs and proving the intrinsic value of IS;
- *Resource management* is about the optimal investment in, and the proper management of, critical IS resources: processes, people, applications, infrastructure and information. Key issues relate to the optimization of knowledge and infrastructure.
- *Risk management* requires risk awareness by senior corporate officers, a clear understanding of the enterprise's appetite for risk, transparency about the significant risks to the enterprise, and embedding of risk management responsibilities into the organization;
- *Performance measurement* tracks and monitors strategy implementation, project completion, resource usage, process performance and service delivery, using, for example, balanced scorecards that translate strategy into action to achieve goals measurable beyond conventional accounting.

The inter-organizational context imposes an extension to governance principles, which will enable the governance equation to include the stakeholders' points of interest, in accordance with IO-IS typology. The research concerning the field of IO-IS governance concentrates on two directions: IS governance specific elements presentation and IS governance performance analysis in an inter-organizational context. According to Weill&Ross (2004) the IS Governance for an inter-organizational context flows, also, in two directions:

- The decisions domain regarding the IS functions, which includes: decisions related to IT&C-based infrastructure, IS management decisions, and IS projects decisions;
- IS Governance modes for the decision-specific domains.

Harguem&al.(2006) proposed an IS governance performance analysis model, which can be further adapted for the inter-organizational context. In the attempt to enlighten the problem-specific aspects, this model assorts the decisive factors, required for a representative analysis, into three main categories: organizational, technological, and inter-organizational (figure 3).

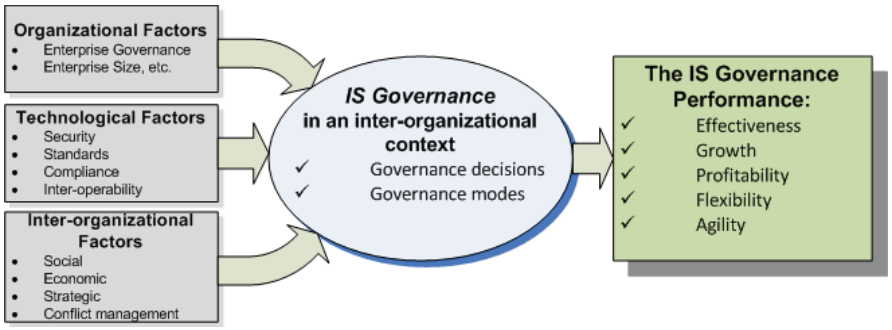


Figure 3. The significant factors impact on IS Governance performance in an inter-organizational context
(*Source*: Adapted from Harguem&al., 2006)

- *Organizational factors* refers the characteristics and organizations behavior relative to the IS adoption and internal IS management;
- *Technological factors* approach the IS infrastructure assessment, selection, installation and proper use for supporting internal and external activities;
- *Inter-organizational factors* enclose the ensemble of collaboration relationships (grouped by economic, strategic, social, or conflict management considerations) between organizations sharing the same IO-IS.

Conclusions

Guided by the continuous concern to achieve the sustainable development in a globalized and competitive business environment, the enterprises choose to multiply their collaboration/partnership relationships, in order to add business value and to increase the overall performance in terms of transparency and compliance. The aforementioned relationships find their expression in information/data sharing and exchange or collaborative work inter-organizational processes. Nowadays, IT&C market offers solutions for inter-organizational information systems development, supporting the management and automation of business processes that intersect the physical boundaries of the organizations. The financial-accounting domain has predilections to IO-IS domain, from the financial structured data electronic exchange point of view. Recent researches bring to our attention the standardization of financial information transfer, by the use of eXtensible Business Reporting Language (XBRL), based on XML and international general accepted norms in the field of financial communication (IFRS, Basel II, etc.). The IS Governance moves now to an inter-organizational context, comprising new specific elements and characteristics, that will open up the field to a wide range of future research streams. A further research direction could aim to formulate a system of metrics for assessing the organizational, technological and inter-organizational factors incidence for the IO-IS governance performance.

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