
Introduction

Cheickna Sylla

New Jersey Institute of Technology,
School of Management,
CAB 3rd Floor, Newark, NJ 07102, USA
E-mail: sylla@adm.njit.edu

Biographical notes: Cheickna Sylla is an Associate Professor at the School of Management, New Jersey Institute of Technology (NJIT), Newark, New Jersey. He holds a PhD in Industrial Engineering from SUNY at Buffalo, New York. His teaching and research interests include decision support modelling and evaluation, statistical analyses, operations management and human factors. His publications appear in *IEEE Transactions in Systems, Man and Cybernetics*, *IEEE Transactions on Engineering Management*, *European Journal of Operations Research*, *Computers and Industrial Engineering*, *Computers in Industry*, *Manufacturing Review*, *Human Factors*, *Control Engineering Practice*, *Cost Management*, *International Journal of Technology Management*, *International Environmental Agreement*, and *International Journal of Networking and Virtual Organizations*.

A few years ago, it would have been hard to imagine the tremendous changes brought by the advances in information technology from the late 1970s to the onset of the new millennium. The incredible progress made in advancing information technology forever changes the way business is to be conducted in the USA and the entire global sphere. This led to new economic realities and a paradigm shift leading to information technology centric organisations. Indeed, the tremendous advances of information access and processing capabilities are forcing business organisations to work collaboratively to establish successful global alliances for better utilisation of their knowledge and market accessibility. While the results of past research have demonstrated that effective communication, coordination, cooperation and collaboration are key success factors in managing inter-organisational alliances, still many essential questions related to the best practices for inter-organisational collaboration remain largely unanswered. Moreover, it is also clear that the effectiveness of these alliances mechanisms is, to a considerable degree, a function of quality, frequency, and relevance of information flow, physical system networks and collaborative arrangements; yet information flow is, in turn, seriously affected by the trust in the communication and security agreement, and the competence of the management processes involved.

Many researchers have argued that the capabilities for multiple organisations to partner in developing information systems do not appear to match the tremendous pace of the growth and role of information technology and globalisation. According to many, the requisite interfaces between organisations, which supposedly provide the channels for effective information exchange, are not being thoroughly managed as a serious subject of research evaluation or assessment. This may be due to the lack existing

standards upon which to establish and guide the management of organisational partnership and associated information exchange infrastructure for collaborative inter-organisational software development. Consequently, inter-organisational processes are currently being examined as a set of self-feeding processes, with little management intervention, which are hypothetically assumed to haul out the objectives of collaboration.

To put it plainly, inter-organisational collaboration in any form of IT development is a Socio-Technical System (STS) and requires an analysis of a social environmental model for socio-technical performance. Like any socio-technical system, inter-organisational collaboration in IT development, requires a human-machine system group effort built upon a technical base. Such a system adds social requirements to a list of human-computer interaction requirements, which add to technical requirements (i.e., for hardware and software). Like any such system, inter-organisational collaboration in software development in the global network poses a number of research questions and challenges to the information systems managers regarding socio-technical performance in addition to business requirements. Research efforts are needed as a steering mechanism for addressing the questions on how to deal with the pressing problems of forming and managing collaborative alliances for software development within the context of STS. Important issues and questions about forming hybrid alliances which combine best business alliance characteristics and which define best attributes and practices for learning coalitions, remain largely unresolved. Learning alliances are associations where partners focus on collaborative learning, exploration and accumulation of product and process knowledge; that is, to learn together and share one another's information and knowledge resources. While other business alliances focus on added value and market expansion through integration of partners' skills and assets, these sorts of alliances clearly help to better exploit new global emerging markets within all its STS dimensions, technologies and/or to establish new core competencies.

This special issue provides a compilation of the state of the art research contributions in the form of independent research papers addressing inter-organisational collaboration in information system development. From the context of socio-technical system, these include, but are not limited to, collaboration in software development, collaboration in building communication networks, in forming supply chain networks and related security, or in structuring many forms of collaborative coalitions. Clearly, the critical success factors in dealing with the above issues also need to be identified. The contributions include case study papers describing lessons learned from successful collaboration among two or more organisations. Studies that focus on the new and emerging methodologies and customer service applications are also discussed. All in all, the contribution to the state of the arts can be summarised from the following socio-technical perspectives:

- Effective inter-organisational collaboration in IT projects
- Impact of technology on organisational learning
- Measuring best practices in inter-organisational collaboration
- Data exchange and knowledge in inter-organisational alliances

- Collaborative system development in coordinating supply chain activities
- Managing cross time and spatial differences in a global IT network
- Successes, failures and lessons learned in off-shoring IT projects
- Risk and security issues and solutions in inter-organisational collaboration
- Knowledge management issues in collaborating IT organisations
- Forecasting the technical forms and modes of development in IT collaboration.

The contributions presented in this special issue provide ample discussions of the above perspectives. The paper by P. Ben Chou proposes a game theoretical model to examine different levels of cooperation between two organisations forming a strategic alliance to exploit their collective resources of knowledge and information technology as a local public good. Using the extensions of the model, he characterises different equilibria based on different levels of cooperation. He shows that a higher level or speed of creating new knowledge can change the structure of the game from a prisoners' dilemma game to a coordination game as an evolutionary process. He also discusses the determinants that can increase the synergy level of the two collaborating firms. Consequently, the author proposes that it is possible for both partnering firms to reach the stable and more efficient full collaboration equilibrium than the Nash collaboration equilibrium, which, from a theoretical perspective, manifests the importance of good communications among firms discussed in this special issue.

Mojgan Mohtashami, Cheickna Sylla, Il Im and Fadi P. Deek offer a comprehensive study of information processing effectiveness in inter-organisational collaboration in software development. While it is known that effective coordination and collaboration are the key success factors in management of inter-organisational alliances, questions related to best practices remain largely unresolved. To address this gap and related questions, the research presented in this paper focuses on the role and effectiveness of the Information Processing (IP), as well as information utilisation across organisational boundaries. The research offers an important set of factors in three categories related to organisational background, contingency process and information technology processing capacity to investigate how higher levels of these factors will result in higher levels of IP, and if this in turn will result in a higher level of software development effectiveness. Expanding beyond these results, the paper develops a multidisciplinary framework to address managerial strategies and technology issues to improve the effectiveness of inter-organisational communication for successful alliance in software development projects.

Jiang Yu, Hailing Lin and Pek-Hooi Soh offer a research study of several attempts for building a collaboration network for 3G system development in China. Observing the growth process of China's telecommunication manufacturing firms with their collaborative innovation capabilities in developing their third generation (3G) system, the authors try to answer the question "*what can the leading domestic firms actually do given their technological competence base and how did they form and coordinate international collaboration networks given the turbulence of the environment?*" This paper examines the dynamics and challenges of such a collaboration network from an evolutionary perspective.

Chin-Hsiao Hsiang, Ruey-Shun Chen, Y-C. Chen and Chia-Chen Chen propose a framework for collaborative commerce and an internet organisational business model based on the tourism industry. This study reviews the concept of collaborative commerce and business model innovation. It surveys the status of websites in the Taiwan tourism industry and explores the business model innovations used by internet organisations. It proposes three types of extra-web organisational frameworks according to operational characteristics across-websites of the tourism industries. Results are drawn from several case studies discussing lessons learned from an implementation at the Veteran Affairs Commission in Taiwan.

The paper by Raija Halonen shed some lights on removing obstacles when implementing inter-organisational information systems. According to the author, modern society presumes that information is easily and quickly transferred between participants during collaboration. However, in case of organisations participating in implementing the information systems across organisations, difficulties in collaboration is ever more daunting. Clearly, information sharing among participating partners requires more complex answers and resources. Her paper highlights the importance of communication, prescribes and describes the trust that lies behind effective collaboration.

According to Federico Pigni, Aurelio Ravarini, Giacomo Buonanno and Donatella Sciuto, Inter-Organisational Information Systems (IOIS) will play a relevant role in shaping competition now and in the years to come. According to these authors, although companies have become extremely efficient in managing information and logistics inside their boundaries, communication and coordination among partners is still far from effective. In a global market where the entire supply chain is involved in company success, the proper design and implementation of an IOIS is becoming mandatory. Small and Medium size Enterprises (SMEs), and in particular those inside industrial aggregations could greatly benefit from IOIS implementation; however a widely accepted IOIS adoption theory is still lacking. The paper explores the role of inter-organisational information systems within SMEs aggregations. Focusing on the description of an industrial aggregation this paper proposes a framework, its implementation and a field test on 70 companies within an industrial district, to understand the relationships among aggregation's main players.

According to Mojgan Mohtashami, Fadi P. Deek and Il Im, coordination of planning, production, and delivery processes is more effective and efficient when it is done at the supply chain level than at the individual firm level. To make supply chain level coordination possible, companies in a supply chain need to exchange data and information timely, seamlessly and collaboratively to develop a control monitoring system. This requires tight integration of systems among various entities in a supply chain. Collaborative software development is becoming more important because it is critical for successful system development for supply chain coordination and management. Some challenges in a collaborative software development environment derive from the need to integrate various heterogeneous systems, facilitate proper information exchange and communication, and define organisational control and management issues. This paper examines the issues and obstacles in collaborative software development in the supply chain management context.

Mojgan Mohtashami, Vassilka Kirova, Thomas Marlowe and Fadi P. Deek, examine the challenges in developing risk driven management contingency policies and propose a framework for managing risks when implementing collaborative software development.

Collaborative relationships, including 3rd party development, outsourcing, off-shoring, and peer-to-peer alliances, require significant changes to management, technical and support activities, processes and policies, in particular:

- major modifications and enhancements of internal organisational practice to support collaborative relationships and communication
- significant enhancements and integration of organisational Risk Monitoring, Mitigation and Management (RMMM) plans
- creation or adaptation, implementation and evaluation of management policies and processes to support these activities.

All these challenges entail a structured and comprehensive approach to risk management in collaborative software development environments. In response, this paper outlines a risk management framework in which early and ongoing planning, clear policies, and mature management contingency processes play a critical role.

The paper by Xu Jiang offers a comprehensive perspective and key factors leading to successful strategic alliances formations. According to Jiang, strategic alliances have been a common phenomenon in today's dynamic and uncertain competitive environments. He suggests how strategic alliances tend to fail; and he provides a list of the key motivational factors which could propel firms into successful alliance formation. Indeed, scholars have examined the rationale for alliance formation through a number of theoretical approaches. Among them are transaction cost economics, resource-based view, and knowledge-based view shown in mainstream literature. These outlooks were reviewed and analysed in this paper. The results offered by Xu show that none of the three perspectives can provide a complete explanation for alliance formation and management. Thus, this paper proposes an integrative framework for organising the literature on the alternative perspectives of strategic alliances.