

# Chapter 3

## Theoretical Foundations of Inter–Organizational Information Systems: Towards a Framework Grounded on Seven Theories

**Maria Madlberger**  
Webster University Vienna, Austria

### ABSTRACT

*Research on Inter-Organizational Information Systems (IOIS) provided many insights, which, however, are very fragmented in terms of applied theories. This results in a quite isolated understanding of single aspects of IOIS rather than a comprising approach to the research subject. To address these shortcomings, the chapter investigates seven theories in respect of their explanation of IOIS adoption and use, its drivers, IOIS-based collaboration between firms, and benefits and costs of IOIS. The applied theories are social exchange theory and embeddedness theory (organization theories), transaction cost theory and agency theory (economics-related theories), the resource-based view of the firm and network theory (strategic management approaches), and game theory. The findings and the resulting framework imply that all these theories lead to similar recommendations on the use of IOIS although they have very diverse assumptions and lines of argumentation. The chapter stresses that the investigated theories supplement rather than contradict each other.*

### INTRODUCTION

Inter-Organizational Information Systems (IOIS) have largely affected the way of doing business in many ways. In particular, IOIS are enablers and drivers of various forms of inter-organizational

coordination and collaboration. Based on the fact that IOIS-based collaboration is related to a variety of business contexts, research efforts in this field are by nature spanning across business administration and information systems research. As a result, research in the context of IOIS relies on multiple theoretic approaches. For example, a literature review conducted by Madlberger &

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Roztocki (2008) revealed that not less than 23 theories were applied in 80 information systems (IS) research papers on IOIS-based collaboration.

The existing large body of research on IOIS provides a rich source of knowledge about IOIS use, its benefits, and risks. At the same time, the available knowledge about IOIS misses a common theoretical understanding and is therefore highly scattered and unstructured which limits its value to researchers as well as practitioners. Especially the large diversity of underlying theories that are used to explain the impact of IOIS often leads to results that seem to be contradictory. A comprehensive theoretical framework for IOIS research could provide substantial benefits to researchers and practitioners. For IS researchers it can help to identify research gaps, address contradictory facts, further develop theories, and draw conclusions for related issues, such as implications for research on collaboration, social and sociological issues and technical requirements for IOIS based on key tasks performed by them. Benefits to practice are a more consistent approach of business and management problems and a possibly more aggregated and comprising view. Thus a framework of IOIS-related theories can provide business practice with a bird's eye view instead of focusing on theoretic details. Furthermore, the framework can serve as a basis for empirical work which can benefit practice considerably.

One useful step to move towards a more comprising theoretical viewpoint is the discussion and comparison of theories that were used by IS researchers to analyze IOIS. Such a comparison should highlight the different foci and backgrounds of the theories and allow identifying what these theories have in common and what differentiates them in terms of their contribution to investigating IOIS issues.

The proposed approach considers the analysis of theories that were applied by IS researchers in the IOIS context. As a starting point, the main focus lies on theories that contribute to an understanding of the organizational behavior related to IOIS use

as well as the impacts that are achieved through IOIS. Thus this analysis is related to the business administration and economics viewpoint on IOIS. Therefore it does not cover theories outside this discipline, for example theories stemming from IS research and sociology as well as social sciences which would provide further insights in a wider analysis.

As a conceptual background the systematics of (Osborn & Hagedoorn, 1997) is applied. Osborn & Hagedoorn (1997) investigate theories related to interorganizational alliances and thus focus specifically on the interfirm collaboration. Following their approach, the author starts her analysis within the following conceptual research streams: organization theories, economics-based theories, and strategic management theories. These approaches are supplemented with an analysis of game-theory. The latter research stream is highly related to economics and contributes much to the understanding of drivers and benefits of information sharing, which is tightly connected to IOIS use and impacts. These four theoretical streams cover large areas of IOIS use and IOIS-based collaboration. Within these approaches seven theories are examined. Each of them is analyzed with regards of organizations' adoption and usage behavior of IOIS as well as IOIS-related benefits and costs. The discussed theories are the following:

1. **Organization theories approach:** social exchange theory and theory of embeddedness,
2. **Economics-based approach:** transaction cost theory and agency theory,
3. **Strategic management approach:** resource-based view of the firm and network theory, and
4. **Game-theoretic approaches.**

Research on IOIS covers many different aspects that need to be understood in order to analyze theories' implications for IOIS. For analyzing theories in respect of their contribution to research on IOIS, particularly behavioral and organizational

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