

# UNDERSTANDING THE DYNAMICS OF IS VALUE CREATION IN AN INTER-ORGANIZATIONAL CONTEXT

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## ABSTRACT

In this study, we focus on understanding the process of value creation in an inter-organizational (IOS) context. Specifically, we analyze how the dependencies between inter-firm and intra-firm process affect IOS value creation and how do the complementarity between technology and process artifacts affect process of IOS value creation. We build our research framework based on theoretical concepts in institutional literature such as structuration theory. Synthesizing the insights provided by structuration theory and institutional literature with the work of Soh and Markus, we extend their process framework to analyze the dynamics of IS value creation in an inter-organizational context. Since our focus in this study is on studying the processes involved in IOS systems, we consider case study approach as the most appropriate to develop rich and thick descriptions of the process dynamics in inter-organizational context. We propose a nested approach to individual cases from specific industries by selecting one key project where inter-organizational systems were set up. We seek to analyze the results at a business unit level that operate within a single competitive environment. Our study will draw upon archival data and interviews of the key informants of alliance process and inter-organizational systems in these organizations. Through this research, we hope to contribute to IS literature in many ways. First, we aim to address a conceptual gap at the social network level. Second, the research is expected to provide insights into complementary relationship between process and technology artifacts and its impact on process of IS value creation in inter-organizational context. Finally, study results will provide managerial implications for leveraging IS resources in alliance relationship.

**Keywords:** IS value, IOS, Process theory, Complementarity

## 1. Introduction

Over the years, organizations have continued to invest in information systems with little or no evidence about how much value such investments add to the organization. The decade of 90's witnessed an unprecedented increase in investments made by organizations in implementing information technologies and associated systems that not only cut across the functional and management levels in the organization but also integrated the suppliers and distributors. Since such investments constitute a significant proportion of total capital investments, a legitimate concern about the value of such investments is inevitable. This concern is best reflected in a famous comment made by Noble Laureate and economist Robert Solow when he concluded after reviewing IT spending of the firms "we see computers everywhere except in the productivity statistics" (Brynjolfsson & Hitt, 1993). It was not until early 90's that this issue of IT productivity caught the attention of IS researchers. Since then, there have been many studies linking IT investments to firm performance. However, the results of such studies can, at best, be termed as mixed. Loveman (1990) and Roach (1991) concluded in their studies that higher investments in IT do not visibly affect the performance of the enterprise while prior to their work, Harris and Katz (1989) suggested that high performance firms spent a significantly higher proportion of revenues for IT than did low performance firms. Brynjolfsson and Hitt (1996), through their work, claimed

to resolve the “productivity paradox” associated with IT investments. However, they noted that the relationship between IT spending and productivity is not well understood. Work by Tam (1998) across four industrialized new economies indicates results consistent with those reported from studies conducted in US but identifies some discrepancies across four newly industrialized economies in terms of impact of IT on firm performance. In empirical studies of IT and organizational performance, the outcome has most often been measured by financial indicators such as return on investment (Mahmood and Mann, 1991; Weill and Olson, 1989) and ratio of expenses to income (Bender, 1986; Harris and Katz, 1991; Markus and Soh, 1993).

There are some open issues associated with earlier attempts to assess IT value. First, the majority of these studies are based on the variance theoretic approaches and attempt to establish a necessary and sufficient causal relationship between IT investments and firm performance. In an organization, it is difficult to identify firm performance as a direct outcome of the IT investments. It seems more plausible that firm performance is a function of a host of variables apart from IT investments. The variance theory approach inherently assumes causal variables to be necessary and sufficient to produce the effect (dependent variable). This assumption may be inadequate in context of the relationship between IT investments and firm performance because of the presence of other intervening variables. Barua et al. (1995) state that “(s)udies that attempt to relate IT expenditures directly to firm level output variables ignore the web of intermediate processes, where first-order effects exist”. From this standpoint, judging value of IT investments through firm level financial indicators may not only reveal an incomplete picture of the true performance of IT in an organization but also may be inappropriate because of existence of host of intervening variables.

The second issue is related to the nature of measures used to assess the impact of IT investments. Prior studies primarily use economic measures to assess IT value. Since firm performance measures are mostly financial in nature, it is understandable that such measures provide only one way to assess benefits accruing from IT investments. However, economic measures tend to ignore the intangible benefits associated with IT investments such as flexibility, better decision-making, and response time improvements. As discussed earlier, impacts of IT investments on firm performance operate through a web of intermediate processes (Barua et al., 1995). The contribution of IT investments in economic terms to the financial indicators associated with the firm performance requires a detailed understanding of “process conversion effectiveness” i.e. how different processes, that IT impacts in an organization, convert this impact it to the overall financial performance of the company. Economic measures of IT effectiveness can, at best, establish a correlation between firm performance and IT investments but prove inadequate in establishing a causal relationship between the two. These measures tend to ignore areas where IT may create value for the organization but the benefits may not be quantifiable.

Finally, organizational performance is not a simple construct. Literature on organizational effectiveness shows that multiple views of organizational performance are possible (Bedeian and Zammuto, 1991). The view that holds organizations as rational and goal seeking entities, considers goals achievements as the measure of organizational performance. In another view, if organizations are to be considered as coalitions of power constituencies, degree of satisfaction of organizational constituents such as stakeholders, employees, distributors or even customers may form an appropriate measure of organizational performance (Prahalad et al., 2002). In yet another view, “bargaining relationship” or bargaining equation of the organization with its surroundings to take advantage of the scarce resources may be considered one of the measure to assess organizational performance (Bedeian, 1984, p.147). Given the multiplicity of views, it is clear that organizational performance is a multidimensional construct since all the views discussed above are valid in most organizations. Therefore, different perspectives can be used to reflect organizational performance. As a result, comparing IT effectiveness across organizations using organizational performance indicators may not provide adequate view of IT performance in an organization.

The issue of IT performance is rendered more complicated by the extension of information systems beyond the boundaries of the organization in an attempt to integrate suppliers, distributors, and even customers. The rise of technologies like the Internet, Electronic Data Interchange (EDI), Intranet, Extranet, Groupware, Collaborative technologies and other technologies like computer-mediated communication make it easier to exchange information across host of organizations. Organizations tend to benefit from upstream and downstream

integration of their information systems with their suppliers and distributors. However, organizational performance and IT performance in inter-organizational context becomes a function of a host of new variables which are marked by their near absence when studying organizational and IT performance at firm level. For example, resource dominant organizations that have adopted EDI, would attempt to influence their resource dependent trading partners to adopt EDI so as to increase their own benefits of adoption (Teo et al., 2003). So, institutional pressures – mimetic, coercive, and normative may play a significant role in IT performance in inter-organizational context (Teo et al., 2003).

Inter-organizational information systems may, on one side, help to reduce production and transaction cost or improve coordination but on other side, may increase other costs associated with establishing and maintaining contracts with customers, a new type of dependency. In a way, inter-organizational information systems increase inter-organization coordination and vulnerability simultaneously (Hart and Estrin, 1991). From this standpoint, real benefits from inter-organizational systems to individual firms may be even more difficult to assess than for stand-alone information systems at the firm level. Use of firm level measures of IT effectiveness used in earlier studies may prove to be not only difficult but also challenging in inter-organizational context. Majority of research attempts discussed earlier were focused on firm level impact of IT. There are not many studies in IS literature that have looked at performance of IT in inter-organizational context. From this perspective, we find a gap in IS literature that needs to be addressed.

From above discussion, two things clearly emerge. One, there is a need for an alternative approach to study how IT adds value to organizations that provides a wider perspective on role of IT in the organization than a narrow view provided by economic measures. Second, there is a need to develop frameworks to understand how IT creates business value in an inter-organizational context. Our objective in research is to develop and test one such framework to understand dynamics of IS value creation in an inter-organizational context. We use the process framework for measuring IT value used by Soh and Markus (1995) as our initial starting point and extend it to inter-organizational information systems. This paper is organized as follows. We present a review of the literature followed by theoretical research framework. We then discuss the research methodology and suitability of the research framework. We conclude the paper by discussing the potential contribution of this research.

## **2. LITERATURE REVIEW**

The primary objective of this research is to develop a framework to understand how IT adds value in inter-organizational context. Our focus is on IT systems that either help shape or develop inter-organizational linkages, henceforth called inter-organizational systems i.e. IOS. From this standpoint, the business value of IT can be judged on the basis of how well IOSs help develop or sustain such inter-organizational relationships or alliances. With this perspective, we assume that organizations collaborating with each other in developing such systems realize the strategic nature of these relations to their business. Since issues involved in assessing IT value in inter-organizational context are both technological and organizational, this study draws upon studies conducted in different fields such as IS, organizational sciences, and strategic management. We begin this section with review of IS literature on IT value.

The majority of studies reported in IS literature on IT value focus on establishing a link between IT spending and firm level financial performance indicators. To address the concern for productivity of computers, number of research attempts were made to provide evidence that computers do indeed help improve productivity (Brynjolfsson & Hitt, 1993; Brynjolfsson & Hitt, 1996; Brynjolfsson & Yang, 1999; Brynjolfsson & Hitt, 2000; Devraj and Kohli, 2000; Kohli and Devraj, 2000; Hitt and Brynjolfsson, 1996). The majority of these studies were longitudinal in nature and used financial measures such as sales, IT capital, IT labor, Return on Investment, and Return on Assets. Some studies also used indirect measures as indicators of IT performance. For example, Brynjolfsson and Yang used financial market valuation as a measure to assess the contribution of investments made in information technology (Brynjolfsson & Yang, 1999). All these studies reported a positive relationship between IT investments and financial performance indicators of the firm. However, some studies in IS literature have reported negative or mixed

results about impact of IT on organizational performance (Lee and Barua, 1999; Koski, 1999; Hitt and Brynjolfsson, 1996; Panthawi, 1999; Prasad and Harker, 1997; Rai and Patnayakuni, 1997).

The majority of studies in IS literature on IT value seems to be in response to the question whether there is a link between IT investments and productivity improvements within the organization. So, the connotation of IT value that emerges from such studies is that IT is valuable if a link can be shown between increase in firm output or higher gross marginal products and the investments made in IT or computers. However, this notion does not take into account other benefits like enhancement of skills of the employees of the firm or enhanced ability of the company to meet the competition or the increased capabilities within the firm for product innovation. These intangible benefits may not make themselves evident over a short term but might manifest over couple of years or even decades. So, it is difficult to understand how this narrow view of IT can be adequate to explain the notion of "value" of IT. One may argue that if you cannot attribute economic gains to IT, you can easily deem IT to be not producing result or simply being 'ineffective' from organizational perspective. However, this could be misleading because the problem might not be with IT being effective or not being effective but it might be something to do with inability to come up with a comprehensive way of analyzing contribution of IT to economic gains or lack of understanding of how IT impacts organizational performance.

Other studies on IT value in IS literature focused on aspects other than financial performance of the company such as impact on processes, productivity improvements or intangible benefits (Grover et al. 1998; Brynjolfsson et al. 2000; Soh and Markus, 1995; Mooney et al. 1996). Brynjolfsson et al. viewed IT benefits as enhancing intangible organizational assets (Brynjolfsson et al. 2000) and reported that each dollar of installed computer capital in the firm is associated with at least five dollars of market value, after controlling for other assets. This study appears to be an attempt to define IT value in terms of its ability to enhance intangible organizational assets. Soh and Markus (1995) and Mooney et al. (1996) propose the process approach to study impact of IT in an organization. They argue that IT does not impact firm performance directly but its impact operates through a web of processes, which generate different orders of effect on firm performance. These seem to suggest a different approach to IT value at a firm level than the ones adopted in earlier studies.

Having discussed the studies on value at firm level, we now turn our attention to inter-organizational systems. Most of the studies on inter-organizational systems in IS literature focus primarily on understanding the benefits of such systems (Malone et al., 1987; Bakos and Nault, 1997; Subramani, 2002). Malone et al. (1987) focused on the role of IOS in electronic markets to reduce the cost of coordination, while Subramani (2002) suggests that IT deployments in supply chain leads to closer buyer-supplier relationships. Johnston and Vitale (1988) discuss how organizations can gain competitive advantage with inter-organizational systems while Barrett and Konyunski (1982) studied the issues involved in developing inter-organizational systems. We did not find many studies in IS literature that attempted to measure IT value in IOS. The lack of studies assessing IT value in inter-organizational context seems to suggest a lack of clarity about ways to measure it. We see this as an opportunity to develop an understanding of IT value in inter-organizational context because of the advent of technologies like Internet, Intranet, and Extranet that lead more and more organizations to invest in inter-organizational systems.

In subsequent sections, we outline the relevance of institutional literature to the basic premise of this study. There are two major issues being addressed in this paper. One, how IT value can be assessed in a better way at firm level? Second, how can a framework of IT value at firm level be applied in inter-organizational context? We discuss the relevance of institutional literature in light of these two issues.

## **2.1. Institutional Literature**

At the firm level, every strategic investment is expected to contribute to organizational performance. Like any other business investment, IT investments are also expected to enhance organizational value. However, as discussed earlier, despite number of earlier attempts, it is still not very clear how IT contributes to organizational performance. Studies conducted in organizational sciences provide us with reasons why it is not very easy to identify causal factors responsible for organizational performance. For example, March and Sutton (1997) point out that most studies of organizational performance are incapable of identifying the true causal relations

among performance variables and other variables correlated with them through the data and methods they normally use. March and Sutton (1997) seem to suggest that organizational performance effects are interrelated in a rich system of probable feedback loops and numerous mechanisms. From this perspective, in order to establish a link between IT performance and organizational performance, it is important to develop a deeper understanding of organizational processes rather than concentrating on mere causal relationships. This implies that IT value can be better understood at firm level by studying organizational processes. This takes us into the domain of organizational or institutional literature in search of theoretical models to develop better understanding of organizational processes. We now discuss how institutional literature is relevant in studying IT value at inter-organizational level.

Inter-organizational information systems are premised on the strategic nature of inter-organizational alliances and relationships. Success of IOS depends on the strength of such relationships and the processes that shape these alliances. This suggests us to take a closer look at the nature of alliance formation and process issues in inter-organizational relationships that affect IOS and in turn are also affected by IOS. In a way, IOS tend to meet an unmet demand of organizations forming the alliance by providing them with a way to achieve more competitive market position or greater internal efficiency (Hart and Estrin 1991). This implies that to understand the impact of IOS, we need to investigate how information is processed within, or between organizations. Therefore, we may have to include process descriptor variables associated with implementation of IOS and their actual outcome. From that standpoint, inter-organizational information systems seem to be deeply grounded in institutional processes.

We feel that our paper study benefits by adopting an institutional approach to processes in inter-organizational context. A study by Teo et al. (2003) suggest use of institutional theory as lens to understand the factors that enable the adoption of inter-organizational systems. Results of their study indicate all three institutional pressures –mimetic, coercive, and normative have significant influence on organizational intention to adopt financial electronic data interchange. These results suggest impact of institutional variables on IOS function, which are likely to influence value of IOS.

Inter-organizational systems are becoming central in coordinating transactions between buyers and their suppliers, generating substantial economic benefits in the process (Bakos, 1991). From this perspective, IOS represent an increasingly common institutional structure that result from the widespread use of IT. From institutional perspective, role of ownership of such networks of IT systems becomes critical because ownership structure determines the level of network or IOS investments, which in turn determine the functionality, profitability, and in some cases the viability of these networks. Thus, value of IOS is likely to be influenced by alternative ownership structures, particular interests of participants in IOS network, potential competitors, and industry regulators. This highlights the role of strategic or power constituencies as discussed earlier in influencing IOS.

Our study relates to the notion of institutions in many ways. First, a search for a framework for IT value in inter-organizational context calls for a deep understanding of processes and structures not only at the firm level but also at inter-firm level. This takes one to the concept of organizational fields where organizations operate in environments where an organized structure for resources and schemas exist. From this standpoint, information technology not only moderates the organizational or institutional processes within the bounds provided by individual organizations participating in such a network alliance but may also moderate the inter-firm processes. Therefore, a structure-technology-process approach deeply ingrained into institutional literature will help us develop the value framework for IT in our study.

Second, in this study, we aim to benefit from theoretical concepts in institutional literature such as Giddens's (1979) structuration theory. This theory, developed as a social theory, offers the potential to analyze the network processes without neglecting structure. The notion of social interaction in structuration theory, where agents intentionally or reflexively act to shape network processes and relationships in order to coordinate the activities in the network, we feel, could provide requisite theoretical background for our study while analyzing impact of IOS on network process and thereby, develop our framework for IT value in inter-organizational context.

Third, we assume IT value in inter-firm alliances to be tightly integrated with alliance or network effectiveness. This essentially means how IOSs enhance network effectiveness or add business value to the organizations participating in the network. Network effectiveness could be a function of individual firm processes and inter-firm processes. On the level of individual network firms, network effectiveness results from that part of the network effect, which a particular firm is able to appropriate and eventually to represent it in its accounts. On the level of the total inter-firm network, network effectiveness depends upon the effectiveness of all single network firms and upon the augmentation of resources to be achieved by the differentiation and integration of the entire network. In this sense, network effectiveness –via the network effect –contributes to organizational effectiveness. This perspective also leads us to believe that inter-firms networks are rather fractured social systems with an asymmetrical distribution of power. From this standpoint, network effectiveness can be defined as the viability and acceptability of inter-organizational practices, processes and outcomes in light of systems requirements and powerful stakeholders. This definition of network effectiveness takes us to the concepts of stakeholders and strategic constituencies in the organizational domain. Therefore, to develop our framework for IT value in inter-organizational context, we need to closely look at institutional literature not only for organizational effectiveness but also for concepts like stakeholders or strategic constituencies.

Fourth, IOS can help create new patterns of communication and help develop number of cross boundary activities within firms (Estrin 1986). This is based on the transaction cost theory which describes a continuum of ways in which production activities are managed, from internal to market, based on transaction costs (Williamson, 1982), which, in turn, is related to the cost of coordination in a market under uncertainty. This aspect of IOS seems to be rooted in institutional economics.

Finally, our study is based on the cultural cognitive pillar of institutions focusing on common beliefs and shared logics of action. Institutional logics i.e. belief systems and related practices (Scott, 2001) provide the organizing principles that furnish guidelines to organizational field participants as to how they are to carry out the work. The hyphenated label cognitive-cultural recognizes that internal interpretive processes are shaped by external culture frameworks. Meyer and Rowan (1977) and DiMaggio and Powell (1983) emphasize the extent to which wider belief systems and cultural frames are imposed on or adopted by individual actors and organizations. Role of such belief systems and cultural frames could be critical in determining network effectiveness in an inter-organizational network context. From this perspective, IT value in organizational context could be dependent on belief systems and cultural underpinnings of the network actors.

Thus, our study is closely integrated with the notion of institution. In this study, we develop our understanding of inter-organizational processes partly through earlier studies in institutional literature and use it to develop a process-oriented framework for IT value in inter-organizational context. In next section, we discuss our theoretical framework and our research hypotheses.

### **3. THEORETICAL FRAMEWORK**

Prior research in inter-organizational relationships points to the process issues involved in the relationship (Pfeffer and Nowak, 1976; Kochan, 1975; Zeitz, 1980; Shortell and Zajac, 1988) or suggest approaches to manage the coordination process (Whetten, 1981). However, the analysis in these studies remains at the level of conceptual development or cross sectional analysis, and fails to capture empirically the process dynamics of collaboration. From this standpoint, we believe analyzing the unfolding of events at the interface between the firms in strategic alliance will help reveal the issues involved in adoption and adaptation of IOSs. This, in turn, will determine their value. In IOSs, it appears that most of the issues are multi-level because of involvement of more than one organizations and higher number of strategic constituencies than in single firm. From this perspective, multi-level issues can't be captured by single level theories such as variance theories. Multi-level theories such as process theory provide a "deeper, richer portrait of organizational life –one that acknowledges the influence of organizational context on individual's actions and perceptions" (Klein et al. 1999).

Process theories explain how outcomes of interest develop, organizational performance in our case, through a sequence of events, including IT investments in our case (Mohr, 1982). Kaplan (1991) states that the process theories can be “valuable aids in understanding issues pertaining to designing and implementing information systems, assessing their impacts, and anticipating and managing the process of change associated with them.” The main advantage of the process theories is that they can deal with more complex causal relationships than variance theories, and provide an explanation of how the inputs and outputs are related, rather than simply noting the relationship.

At the inter-organizational level, process theory provides a theoretical lens to understand the dynamics of relationships between alliance partners and role of information technology in building and sustaining these alliances. In such a context, IOSs are shaped not only by the interplay between individual organizational processes and processes operating at the organizational boundaries but also in turn influence these processes at a later stage. This indicates a three-way interaction between inter-organizational processes, individual organizational processes, and IOS as indicated in figure 1.

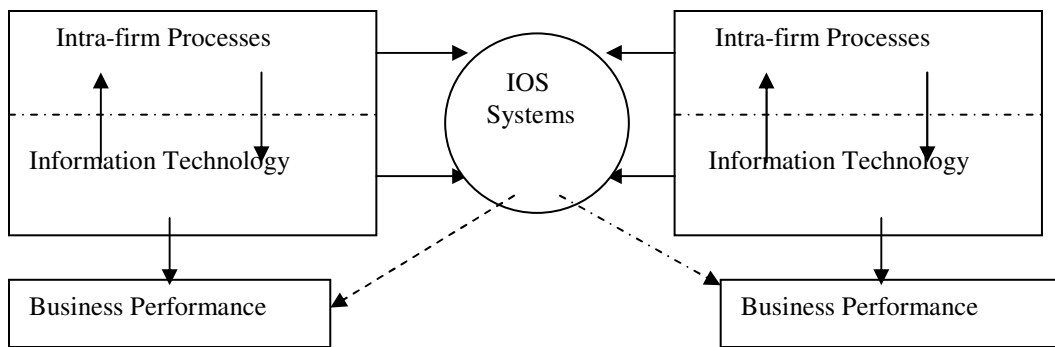


Figure 1. Three-way interaction in IOS Systems

Having discussed this, we find process theory provides a viable alternative to variance theory to study business value of IOS. Using the work of Soh and Markus (1995), we extend their process framework to analyze the process of IS value creation in inter-organizational context. We propose that in inter-organizational context, apart from IT assets, process assets are also created which are unique for a particular set of organizations participating in an alliance. Such process assets are a result of unique features associated with individual firms processes that help strengthen the alliance processes through the use of IOS. We identify two separate sequences of events that impact organizational performance in inter-organizational context. Even though these have been identified separately but these are complementary in nature and influence each other. So, our proposed process framework for assessing IT value in inter-organizational context is presented in Figure 2.

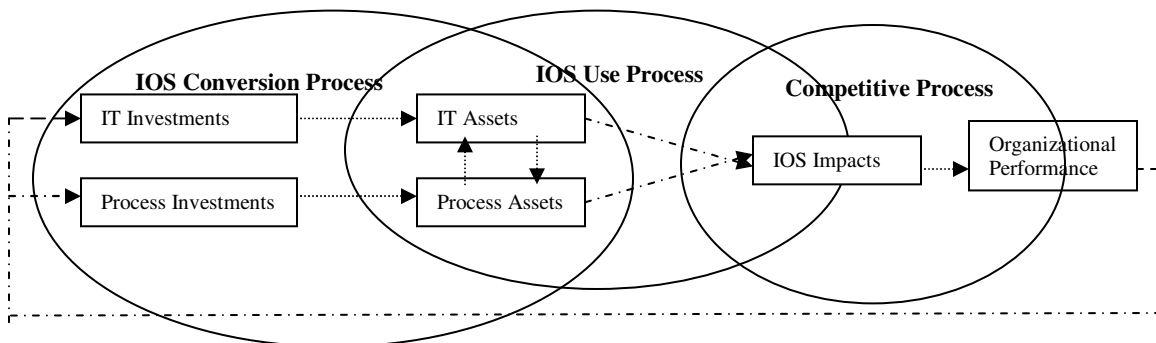


Figure 2. IS Value Creation Model for IOS

In the process model presented in Figure 2, we identify three processes, namely, IOS conversion processes, IOSs use processes, and the competitive process. We propose two levels of investments associated with IOS systems, unlike IT systems at firm level. One, those related to technology and related IT processes and second, those related to business processes between the alliance partners. Organizations operating in an alliance develop their own IT assets and process assets over time. Process assets refer to improved intra-firm and inter-firm processes that help achieve economies of scale. In inter-organizational context, these process assets influence IT assets and also, get influenced by them in turn. These two assets together create what is considered the value of IOS systems i.e. "IOS impacts" on organizations in the network. Some of the obvious impacts include better coordination, ability to introduce new products or services, or raising the barriers to entry. And finally, these IOS impact influence the organizational performance. Therefore, this model reflects a sequence of events or processes that interact with each other to produce their impact on organizational performance. We also visualize our theoretical model as an iterative feedback loop with higher levels of organizational performance fueling further investments in IOS systems and processes.

Using this model, we formulate our research questions as follows:

1. What are the key process descriptor variables for IOS systems that influence the process of IOSs value creation?
2. How do the dependencies between inter-firm and intra-firm processes affect the IOS value creation?
3. How do the complementarities between process and technology artifacts affect the process of IOS value creation?
4. How do IOS systems affect and alter process capability and maturity of the alliance partners in inter-organizational context?

Having discussed our research model and research questions, we discuss our research methodology in next section.

#### **4. SUITABILITY OF RESEARCH FRAMEWORK**

Using the proposed research framework, we aim to analyze the dependencies between the two types of investments and processes between the alliance partners while implementing inter-organizational IOS systems. One type of investments are those related to technology and related IT processes and second type of investments are those related to business processes between the alliance partners. Organizations operating in an alliance develop their own IT assets and process assets over time. Process assets refer to improved intra-firm and inter-firm processes that help achieve economies of scale. In inter-organizational context, these process assets influence IT assets and also, get influenced by them in turn. These two assets together determine the business value of inter-organizational systems. By conceptualizing our theoretical framework as an iterative feedback loop, it will help us gain significant insights into how higher levels of organizational performance fuel further investments in inter-organizational systems and processes.

The conceptual model (Figure 1) provides the framework for analyzing the relationship between process and technology artifacts. This will facilitate analyzing the complementary relationship between the process and technology artifacts and its impact on the process of IOS value creation.

#### **5. RESEARCH METHODOLOGY**

Since our focus in this study is on analyzing the processes involved in IOS systems, we consider the case study approach as being most appropriate to develop rich and thick descriptions of process dynamics in inter-organizational context. Since we intend to use the case study approach, we believe the most critical aspect is the selection of cases. Among the many types of strategic alliances, we propose to focus on the ones in IT industry and automobile industry. Our reasons for selecting these two particular industry segments are two fold. One, these two industries have been at the forefront of adopting inter-organizational systems. Major players in automobile

industry like General Motors or Ford Motors have made considerable investments in developing supply-chain management systems. In the IT industry, many notable alliances like those between Dell and Sony or between Cisco and its business partners have proved the benefits of IOS systems beyond doubt. Second, these two industries have achieved a certain level of maturity in IOS systems, it will be useful to compare and contrast the results from organizations in these two industries to understand issues in IOS effectiveness across the two leading adopters of IOS systems.

We propose a nested approach to individual cases from these industries by selecting one key project where inter-organizational systems were set up. We seek to analyze the results at a business unit level that operates within a single competitive environment to understand the role of different processes in determining IOS value. Our study will draw upon archival data and interviews of the key informants of alliance process and IOS systems in these organizations.

We intend to interview senior executives in the selected organizations, from the level of CEO, CFO to CIO. We propose to collect the data using semi-structured interviews with these senior executives. We will also draw upon the historical data of the organizations such as financial performance and investments related to IOS systems and related processes. Using the collected data, we propose to map the data to analyze the process variables and their dependencies.

## CONCLUSIONS

The process of IS value creation in inter-organizational context is not a well-researched and well understood issue. Specifically, how does relationship between process and technology artifacts affect the process of IS value creation in inter-organizational context is an under-researched concept in IS literature. Through this research, we hope to contribute to IS literature in many ways. First, we aim to address a conceptual gap at the social network level. Second, the research is expected to provide insights into complementary relationship between process and technology artifacts and its impact on process of IS value creation in inter-organizational context. Finally, study results will provide managerial implications for leveraging IS resources in an alliance relationship.

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