We know from the information processing perspective within the theory of organizations that IT can reduce coordination costs by increasing an organization’s information processing capacity. Purpose of this paper is to empirically examine the relationship between greater investments in information technology and lower coordination costs on firm-level data. Two high-level measures of coordination costs are defined based on the information processing perspective within the theory of organizations. Our hypothesis that greater IT investments should be correlated with lower coordination costs is tested with both measures on longitudinal data from a cross-sectional sample of 18 large Italian companies over an 8-year period between 1988 and 1995. Results on this sample seem to support our hypothesis by showing a significant and negative correlation both aggregately and on sub-samples of data clustered by industry.
Other studies suggest, on the contrary, a positive correlation (cf., Brynjolfsson and Hitt, 1993; Harris and Katz, 1991; Siegel and Griliches, 1991; Alpar and Kim, 1990; Krueger, 1993). A number of explanations have been advanced to try and reconcile or explain the inconsistency between these different findings. For example, in some cases, IT can be considered a necessary condition for a company to remain competitive, rather than an opportunity to increase its performance. Alternatively, IT could be beneficial to individual firms, but at the expenses of other competitors, thus resulting in tentative findings at an industry level.

This paper focuses on the possibility that conflicting results have occurred partly due to inappropriate measures of both investment and performance variables (cf., Brynjolfsson, 1993). Smith and McKeen (Smith and McKeen, 1993) note that IT contributes to performance either by increasing the productivity of labor or by generating revenue through the creation of new products and services. Most of previous research works have relied on traditional indicators of business performance that provide assessments of productivity. For example, ROI provides indications of a company’s productivity, since it increases as the income grows with respect to total assets, but it does not necessarily express variations in the size of the business. On the other hand, IT investments have not always been defined precisely to include only technology outlays whose impact can be measured by the selected performance indicators. Historically, there have been definitional problems in information systems research (cf., Keen, 1980; Bakopoulos, 1985) and how information technology is defined varies from broad conceptualizations which include technologies such as typewriters, facsimiles, and telephones, to very narrow ones which consider specific application programs for a given firm. Keen points to a general lack of theoretical foundation in the information systems research field (Keen, 1980). In this research, we try to ground both IT investment and performance indicators on the same theoretical view of how IT affects organizations and their performance.

An interpretation of the information processing perspective within the theory of organizations is discussed in order to identify and define the organizational role of IT. The information processing perspective explains how information technology can increase an organization’s information processing capacity and, consequently, reduce the organizational costs to process information, referred to as coordination costs. We define working capital and structure costs as proxies of coordination costs and use them as indicators of aggregate IT performance. While the first proxy measures coordination costs from the cost-income statement, the second measures the capital invested to finance coordination costs from the balance sheet. Different information technologies are classified based on their organizational roles. The category of IT that plays a coordination role and has the potential to reduce coordination costs is selected for investigation. The correlation between higher investments in this category of IT and lower coordination costs is tested on longitudinal data from a sample of 18 companies. The correlations that are found are not meant to propose our measures of coordination cost as the only organizational variables that highlight the opportunity of investing in IT. Rather, the intent is to suggest a higher attention to the conceptualization of the variables measuring IT investments and corresponding benefits.

The presentation is organized as follows. First, our theoretical approach to the investigation of IT benefits is discussed. This is followed by the definition of the performance indicators and their testing. The paper concludes by discussing the limitations of the proposed approach and suggesting directions for future research.

**Theoretical Aspects of IT’s Impact on Business Performance**

The information processing perspective within the theory of organizations has explained how the amount of information needed by organizations to make decisions increases as environmental uncertainty grows (Galbraith, 1973; Galbraith, 1977; Simon, 1976; Tushman and Nadler, 1978; Randolph, 1978; Daft and Macintosh, 1981; Robey, 1981; Mackenzie, 1984; Daft and Lengel, 1986; Huber and McDaniel, 1986; Lee and Leifer, 1992). In this stream, organizations are assumed to be complex information processing entities with an overall information processing capacity (IPC).

Simon (1976) suggests that, in general, organizations are created to accomplish tasks too complex for any independent subset of their components. For instance, individuals cooperate within organizations to achieve goals beyond the cognitive capabilities of any single agent. Simon (1976) refers to the cognitive limits of decision makers as their “bounded rationality.” That is, it is impossible for a single, isolated individual to achieve any high degree of rationality. March and Simon explain that specialization and coordination of different agents within groups are the means to transcend these boundaries of rationality (Simon, 1976; March and Simon, 1958; March, 1994). When we see agents as information processors, their rationality determines their individual information processing capacities and organizations can be regarded as the means for overcoming these individual limits in processing information.

However, Arrow (1974) notes that information must be coordinated to its effective use within an organization. In organized work, the criteria for specialization include purpose, process, or place, but rarely information itself (Bolton and Dewatripont, 1994). For example, where functional specialization is the criterion, organization units are distinguished by the specific bottom-line service they offer, and share various types of information, such as customer profiles,
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