

Business Informatization Level

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INTRODUCTION

IT diffusion is central to the new economy and is reflected in a process of informatization of society and businesses. Although initially coined to represent the diffusion and adoption of information technology (IT) in all levels of society, the term informatization is also employed to represent the use of information technology resources in organizations. Weissbach (2003), for instance, defines *informatization* as being the process of gradual and increasing application of “planned and systematic use of IT penetrating the organization’s functions”. As pointed out by Lim (2001), the evaluation of an organization’s *Informatization Level (IL)* is an important managerial concern. The author also points out the difficulties associated with this evaluation, stating that “this is not a simple problem because informatization includes many intangible factors such as the quality of information and the organization’s culture”. The purpose of evaluating a company’s IL is to provide information for the organization to improve precisely its informatization level. It is also a means of benchmarking the efficacy and efficiency of IT investments in order to set up the baseline for improvement.

This topic depicts a measurement method for the IL of companies and shows results of its application in 830 Brazilian industries (Zwicker, Vidal, & Souza, 2005). The development of this method was based on the principle that IT results in companies are not obtained merely through investments and the implementation of systems but rather through its proper use in business processes. The proposed method extends the informatization dimensions proposed by Lim (2001), using the process-based view of the IT business value creation model proposed by Soh and Markus (1995) and the concept of “information systems coverage” proposed by Ravarini, Tagliavini, Buonanno, and Sciuto (2002).

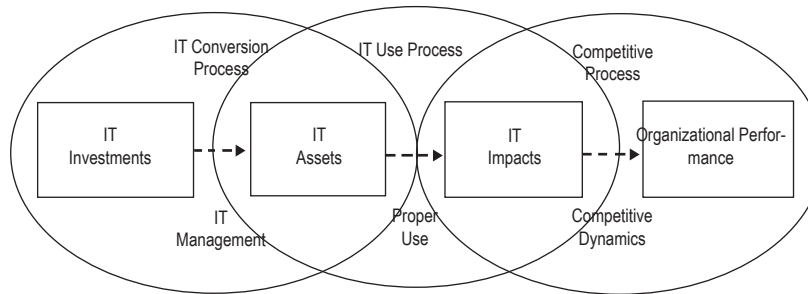
BACKGROUND

Accordingly to Hu and Quan (2005), there are four main visions in studies focusing the creation of *IT business value* through the use of the technology: the macroeconomic view, that believes that IT creates excess returns over other types of capital investments; the process-based view that believes that IT investments create competitive advantages by improving operational efficiency of intermediary processes; the resource-based view, that believes that IT investments create sustainable competitive advantage via unique, immobile, and path-dependent strategic resources and capabilities; and the digital option view that argues that IT investment creates values by giving options and flexibility for firms. Since the study is focused on the organizational level, the second and third views (process- and resource-based) are deemed more adequate.

Soh and Markus (1995) present a model that synthesizes concepts of other studies that also incorporate the process-based view (Grabowski & Lee, 1993; Lucas, 1993; Markus & Soh, 1993). Figure 1 represents the sequence of events and results associated to the process of obtaining organizational benefits from IT investments, according to this model. To obtain an improvement in the organization’s performance by means of IT requires that IT impacts occur in the intermediary processes of the organization. However, the fact that impacts from intermediary processes were obtained is not sufficient to obtain organizational performance improvements, since this depends on external factors, such as the economic context and competition. These aspects comprise the “competitive process” of the model and must consider the requirements of the competitive dynamic in which the company is inserted.

On the other hand, to obtain the impacts of IT on the organization’s processes requires that IT assets be available, that is: systems in operation, implemented infrastructure and people with suitable knowledge concerning the technology and its possibilities. IT assets constitute a combination of IT resources, applications, and the qualification of people

Figure 1. IT and business value creation (Soh & Markus, 1995)



(from the IT area and users). Human resources also include the partnership relationship with the users. Thus, IT assets are divided into tangible assets (hardware, software) and intangible assets (knowledge, relationship).

It is worth noting that the mere existence of IT assets does not necessarily imply that IT impacts will be obtained. It is necessary to consider the actual use of these assets, which comprises the “process of IT use”, and meeting the requirements of “proper use” of these assets. The proper use refers to the effective application of the IT assets in the organization’s activities and processes. In considering the appropriate use of IT, one must take into account: its extent (scope of business tasks performed with IT support), its intensity (volume of use), and the level of IT dependence that is imposed to the company.

Finally, the consolidation of IT assets calls for a compatible level of IT investments. However, the investments do not assure that effective assets will be obtained, since these investments can be made inappropriately. Weill (1992) defines the capacity of converting IT investments into IT assets as the “conversion effectiveness” and states that this results from the aspects of the organizational atmosphere that influence IT, the quality of IT management, and the company’s commitment to IT. The effective transformation of IT investments into IT assets constitutes the “*process of IT conversion*” which, to be effective, broadly speaking, requires meeting IT management requirements.

INFORMATIZATION LEVEL MODEL

Based on the previous discussion, the concept of informatization, its dimensions, and the IL model adopted are established. Informatization can be defined as the managed process by which an organization continuously expands its IT assets and extends and deepens their appropriate use, aimed at improving the effectiveness and performance of its activities and processes. The five dimensions proposed for the IL measure in organizations are: (1) *IT Infrastructure*, related to

fundamental IT assets; (2) *IT Applications Portfolio*, related to tangible information systems resources and intangible aspects of these resources; (3) *IT Organizational Use*, related to the extent and intensity of IT use in the organization; (4) *IT Governance*, related to the management of IT resources, the management of its use, and the planning and development of IT resources aligned with the organization’s businesses; (5) *IT Organizational Impacts*, related to effectiveness and performance benefits for organizational activities and processes, achieved through the use of IT. The dimensions appear in the IL model at Figure 2.

In Figure 2, IT expenditures correspond to the sum of investments in IT and expenses with IT (IT expenses are related to monthly or periodic expenses like payroll, maintenance, and telecommunications). They are a necessary although insufficient condition for achieving certain levels of informatization, as indicated by the dotted arrow to the left of the figure. A better IL can contribute to the improvement of the organization’s performance, although not necessarily so, as indicated by the dotted arrow to the right. The operational characteristics of the enterprise (for example, its size and the sector in which it operates) appear mediating the relationships between the IT expenditures, the IL, and the organization’s performance. The characteristics of IT governance also interfere in the conversion of IT expenditures into a certain level of informatization. The dimensions “IT organizational use”, “IT governance”, “IT infrastructure”, and “IT applications portfolio” work in combination, for the obtainment of “IT organizational impacts”. The set of these five dimensions comprise the measurement structure proposed for the IL.

INFORMATIZATION LEVEL MEASUREMENT METHOD

The study gathered data from a sample of 830 Brazilian industrial companies that originated 66 indicator variables

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