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UNDERSTANDING THE ROLE AND TRANSFORMATION OF THE INFORMATION TECHNOLOGY FUNCTION IN ORGANIZATIONS

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Abstract

The study of the role and evolution of the information technology function in organizations has prompted much interest among researchers in our field for some time now. Many researchers have tried to describe the IT function and to explain its transformation over time. However, we have observed that the existing typologies are often based on a single dimension, attached to historical periods, or built into a normative discourse that calls for an ideal archetype of the IT function. Rather than following these views, we propose that there exist many archetypes of IT functions, and that each one of them evolves in response to a limited number of parameters. First, based on a literature review, we propose a typology of the roles of the IT functions within archetypes that are defined according to four fundamental dimensions. Second, we apply this typology in an examination of the process by which IT functions are transformed over time, helped in this by the punctuated equilibrium theory. The ultimate objective of this paper is to provide a new conceptual and theoretical perspective on the role played by IT functions in organizations and on how such functions may evolve or transform over time.

Keywords: IT function, transformation, roles, archetypes, typology, punctuated equilibrium theory

Introduction

The question of the contribution of information technology to organizational performance continues to generate controversy within our discipline. On one hand, the information systems literature provides many examples of companies that have developed a competitive advantage through their use of IT. On the other hand, the processes by which this value is realized remain unclear.

IS researchers have long studied the relationship between IT and organizational performance, and they have done it from several perspectives. For instance, a few researchers have attempted to understand and measure the relationship between corporate investments in IT and the financial performance of the firm (e.g., Hitt and Brynjolfsson 1996). Based on this subgroup of studies, it would appear that performance effects are observed only when technological projects are accompanied by other appropriate organizational changes. Further, a large body of academic and trade literature supports the importance of aligning IT and business strategies (e.g., Sabherwal et al. 2001). Last, another group of researchers have examined the role played by the IT function and its influence on organizational outcomes. Precisely, the bulk of this research has looked at how the IT function should transform and reinvent itself in response to changes in technologies and business practices (e.g., Cross et al. 1997).

The present study is situated in the latter stream of research and seeks to provide a new conceptual and theoretical perspective on the role, transformation, and contribution of the IT function in organizations. In pursuit of this objective, three interrelated research questions were initially stated: (1) What archetypes describe the various roles played by the IT function in organizations? (2) How can we explain the dynamics underlying the transformation of the IT function over time? (3) What organizational outcomes are associated with the various archetypes?

This conceptual article is strictly concerned with the first two research questions. We begin by proposing a typology of IT archetypes developed from an exhaustive review of the relevant literature. We then explain the theoretical underpinnings associated with the theory of punctuated equilibrium in order to provide a deeper understanding of the dynamics of transformation of the IT function in organizations. We conclude with a brief discussion of the theoretical and practical implications of the conceptual developments proposed herein.

Literature Review

Several researchers working in this field have tried to characterize and explain changes in the role played by the IT function in organizations. For one thing, it would appear that the role played by the IT function has evolved over a series of periods, which would explain why several authors chose to describe the IT function through a historical perspective. For example, DeSanctis et al. (2000) present five phases of technological development, from the 1960s to the current period beginning in 2000, and the associated implications for the IT function. They suggest that advances in IT continually bring about new eras of IT management challenges for technologists and managers. Likewise, McNurlin and Sprague (2001) propose that the IT function has been transformed through the changing benefits derived from IT. They suggest distinct periods in which IT was used to cut costs, boost employee productivity, improve decision-making capacity, support organizational strategy, and establish better relationships with customers and other business partners. At different times, it has been argued that IT should be a support function (Peppard and Ward 1999), should be aligned with organizational strategy (McNurlin and Sprague 2001), should act as a business partner with other business units (Agarwal and Sambamurthy 2002), or should play a leadership role in the organization (Reich and Nelson 2003).

Other researchers have portrayed the IT function in organizations through the nature and breadth of its interactions with the rest of the business. For example, Peppard and Ward (1999) developed a typology of IT organizations based on the relationship it has with business units derived from both business and IT viewpoints. They characterized these as the *disconnected*, *unloved*, and *high achieving* IT functions. Another example is provided by Gordon and Gordon (2002), who examined the nature of the interaction between corporate IT and business units as a way of understanding the structuring of the IT function. They proposed four prototypes, each one having different consequences in the way IT services are handled.

Third, IS researchers have adopted a normative perspective or discourse in studying the role of the IT function in organizations. For instance, it has been argued that IT organizations should act as partners with business units (Agarwal and Sambamurthy 2002) and start to play a leadership role in businesses (Reich and Nelson 2003). Interestingly, such normative logic appears to be in sharp contrast with the results of a recent survey that revealed nearly 50 percent of CEOs consider that their IT function should continue in its support role rather than become a partner of the organization (Levinson 2004). Results of this survey seem to challenge the idea that an ideal profile exists for the IT function in organizations.

In short, although prior work in this field has substantially contributed to our understanding of the role and evolution of the IT function, we consider existing typologies to be fragmented or incomplete, and based on the assumption that IT organizations evolve similarly and at the same speed in response to technological changes in the organization's environment. We do not subscribe to these premises, but see instead a diverse set of archetypes for the IT function and an IT organization that adapts and evolves in response to a given number of organizational and environmental factors. This paper takes a first step toward remedying these limitations by proposing a typology of the role of IT organizations in businesses, within archetypes that are defined according to four fundamental dimensions. Next, we apply this typology in an examination of the process by which IT functions are transformed over time, helped in this by the punctuated equilibrium theory.

Toward a Typology of the Role of IT Functions in Organizations

Our review of the literature has led us to characterize the archetypes proposed herein along four dimensions: the IT function's main activities and tasks, the knowledge and skills of IT professionals, the interface between the IT function and the organization's business units, and, finally, certain aspects of the IT function's governance. The following paragraphs describe these dimensions in turn.

IT function's main activities and tasks: Over the years, researchers who looked for a typical archetype of the IT function very often began by analyzing the tasks and activities accomplished by IT professionals and managers (e.g., Agarwal and Sambamurthy

2002; McNurlin and Sprague 2001; Rockart et al. 1996). These studies revealed an extensive range of activities. The IT function can develop or acquire IT, manage projects, provide advice, identify available technological innovations, plan the IT architecture, and so on. We believe that each of these activities will have a place in the portfolio of activities of each archetype, albeit with varying degrees of importance (McNurlin and Sprague 2001). For example, the experimentation of IT innovations is an activity that will be more or less important, depending on the archetype. In addition, we posit that IT functions falling into different archetypes may be engaged in similar activities, but will differ in terms of how those activities are carried out. Technology monitoring, for instance, could be driven by technical concerns (new materials, new versions of databases, patches, etc.) or by strategic considerations (the technological innovations of competitors, assessments of how the organization can employ new technologies, etc.), depending on the archetype.

Knowledge and skills of IT professionals: According to Reich and Nelson (2003), the role that the IT function can play in an organization is directly influenced by the knowledge and skills of its IT professionals, including the IT manager. Although technical skills are usually the essence of an IT specialist's expertise (Feeny and Willcocks 1998), other types of knowledge are also important. Business skills are needed, particularly when undertaking projects in partnership with other business units and in the development of strategic thinking (Feeny and Willcocks 1998). Interpersonal skills are critical if an IT professional is to assume a leadership role in the organization and carry out long-term contracts with business partners (Feeny and Willcocks 1998). Several authors have also suggested that IT professionals must be skilled in managing change (e.g., Markus and Benjamin 1996). As with the preceding dimension, we posit that the relative importance of each skill type and knowledge will vary from one archetype to another.

Interface between the IT function and the organization's business units: For several researchers, the relationship between the IT function and the rest of the business is at the heart of any definition of the IT function. For example, Agarwal and Sambamurthy (2002) believe that the IT function should be organized to foster coevolution with the rest of the enterprise. The IT function would then be in a position to act in partnership with other units, while the organization would be encouraged to create value in its use of IT resources. Rockart et al. (1996) believe that if IT is to succeed in its role, it must first develop strong and on-going relationships with the organization's business units. IT professionals and intermediate managers must, therefore, work together to develop their understanding of the organization's opportunities to use IT, identify the functionalities required, and then choose from the available technological solutions. We can see the significance that this factor acquires in determining how we characterize the IT function in organizations. It follows that the closeness of these working relationships and the nature of the on-going exchanges would vary from one IT function archetype to another.

Governance of the IT function: Governance in the context of this study refers mainly to the IT function's accountability. The more an organization requires added value from its IT function, the more the accountability of the IT function is an important consideration (Reich and Nelson 2003). Accountability refers to how members of an organization or a business unit use their authority and assign responsibility as part of their activities (Ross and Weill 2004). The accountability of the IT function at the organizational level is usually determined by the CEO (Ross and Weill 2004). Therefore, organizations must ensure that IT professionals, the IT manager, system users, and business managers are charged with clearly defined tasks that fall within the limits of the responsibilities and accountability of each party. In addition, Feeny et al. (1992) and Rockart et al. (1996) observed that the accountability of the IT manager was an important factor in achieving a good relationship between the IT function and the rest of the organization. This relationship was then considered a key success factor to achieve organizational performance from IT use. Indeed, the IT function's accountability as established by the CEO reveals the function's role in the organization. In this sense, we believe that accountability can take a different form in each of the proposed archetypes.

As in the work of Ross et al. (1996), these four dimensions are distinct yet interdependent. For example, the knowledge and skills of the IT function's professionals will necessarily influence the nature and scope of its activities. Similarly, the accountability of the IT function will influence the types of activities it undertakes and how they are carried out. Moreover, the knowledge and skills of the IT manager may relate directly to his or her participation in the management team. In summary, we agree that the four dimensions described above are interdependent.

IT Function Archetypes

Based on the four dimensions discussed above, we have identified five archetypes of the IT function which we have labeled partner, systems provider, infrastructure builder, leader, coordinator. Table 1 summarizes the characteristics of each archetype.

Table 1. IT Function Archetypes

	Activities	Knowledge and Skills of IT professionals	Interface	Governance
Partner	Providing advice and expertise to ensure effective implementation of business strategies.	Knowledge of business processes. Project management skills. Team work abilities.	Vigorous collaboration on a day-to-day basis between IT professionals and organizational members.	IT and line managers accept shared accountability for IT projects.
System provider	Developing/acquiring and implementing IT applications.	Understanding of technological capabilities and how they can be applied to a given problem.	Business systems managers act as the interface between the business and the IT function.	IT professionals are responsible for systems deployment and business users are accountable for project outcomes.
Infrastructure builder	Architecting, planning, and overseeing infrastructure. Developing IT standards. Centralizing and integrating data.	Skills related to the integration of IT/systems. Ability to understand business processes and align them with IT infrastructure. Negotiation skills.	Business managers rarely participate in developing the enterprise architecture. They clarify strategy intent and IT manager targets IT architecture.	Reliability, integrity of infrastructure. Quality of service. Adequate IT infrastructure to support business activities.
Leader	Experimenting with emerging technologies. Identifying the likely obsolescence of the current business model.	Negotiation skills. Knowledge of the business.	IT function members are influencers. Strong CIO-CEO relationship.	IT takes responsibility for business profitability and success. Accountable for the development of IT-based organizational capabilities.
Coordinator	Managing the IS/IT sourcing strategy. Managing partnerships with vendors and business units.	Project management. Technical, interpersonal and negotiation skills.	IT function mediates relationships between business units and vendors.	IT is accountable for IT efficiency and must ensure strategic flexibility for the organization.

Partner: Under this archetype, the main objective of the IT function is to create IT-enabled business capabilities to support current business strategies (Rockart et al. 1996; Venkatraman 1997). The IT function plays the role of strategic business partner of organizational innovation (Agarwal and Sambamurthy 2002; Clark et al. 1997). The IT function and the organization achieve a two-way strategic alignment (Rockart et al. 1996), developing iteratively and reciprocally over time (Agarwal and Sambamurthy 2002; Sambamurthy et al. 2001). Thus, IT professionals and line managers work together to understand business opportunities, determine needed functionalities, choose among technological options, and decide when urgent business needs demand the sacrifice of technical excellence for immediate, albeit incomplete, solutions (Rockart et al. 1996; Venkatraman 1997). Accordingly, the IT function ensures that line managers at all levels understand the potential of IT and how to use this resource more effectively in carrying out their strategies (Rockart et al. 1996). Therefore, vigorous collaboration on a day-to-day basis between IT professionals and organizational members can be observed (Agarwal and Sambamurthy 2002; Peppard and Ward 1999; Rockart et al. 1996). Under the partner archetype, IT managers are catalysts for redesigning business processes (Venkatraman 1997) and IT professionals have a good understanding of business processes (Peppard and Ward 1999; Rockart et al. 1996), are specialized in project management, are able to work effectively in teams, and possess up-to-date technical abilities (Clark et al. 1997). From an accountability standpoint, both IT and line managers accept responsibility for systems projects (Rockart et al. 1996). Finally, in this archetype, the CIO is either a formal or informal member of the top management team (Rockart et al. 1996).

System provider: Under the system provider archetype, the first objective of an IT function is to supply computer applications supporting the organization's day-to-day needs (McNurlin and Sprague 2001). The IT function plays the role of information systems supplier (Cross et al. 1997; Peppard and Ward 1999; Ross 2003). As a result, the IT function organizes its activities around the development (or acquisition) and maintenance of applications (Peppard and Ward 1999; Ross 2003). Under this archetype, the IT function manages the infrastructure (data center, telecommunication networks) independently of the business strategy (Venkatraman 1997). IT projects are managed by IT specialists and are under their complete responsibility (Peppard and Ward 1999; Ross 2003). Consequently, business managers are often reticent to take on too much responsibility for IT (Cross et al. 1997). As systems analysts, IT professionals develop process awareness throughout the business (Cross et al. 1997; Peppard and Ward 1999). They also understand how to apply technological capabilities to a given problem (Cross et al. 1997). Within this archetype, business systems managers act as the interface between the business and the IT function (Peppard and Ward 1999). Finally, business people define their strategy without IT input, and IT delivers solutions without a good understanding of the business strategy (Ross 2003).

Infrastructure builder: Under the infrastructure builder archetype, the IT function's main objective is to build and manage an IT infrastructure that supports business processes and reduces architectural complexity (Agarwal and Sambamurthy 2002; Ross 2003). Accordingly, the IT function is responsible for building the IT architecture and infrastructure to obtain technical integrity and integration (Ross 2003). Architecting, planning, and overseeing infrastructure are key words for this archetype (Cross et al. 1997). The IT function is also responsible for establishing technological standards to limit technological choices and to reduce the number of platforms it manages (Agarwal and Sambamurthy 2002; Rockart et al. 1996; Ross 2003). In some cases, the IT function will implement data warehouses, or middleware applications, to share access to data, integrate transactions, and enable strategic agility (Ross 2003). It can also develop customized or reusable modules (Ross 2003). IT professionals have technical abilities related to the integration of IT (Ross 2003). Change management and negotiation skills are also essential in this archetype to convince organization members that technological standards need to be prioritized over specific business needs. Instead of defining the solution and looking for the best technology, the IT function negotiates the best possible solution among the acceptable technological platforms (Ross 2003). Therefore, the IT function needs to understand and communicate the value of the IT infrastructure (Rockart et al. 1996). Business managers rarely participate in developing the IT architecture. They defer the responsibility to the IT function to set the technological policies and standards (Ross 2003). Business managers clarify strategy intent and the IT manager targets IT architecture accordingly (Ross 2003). Finally, the IT function is accountable for elements like IT efficiency, reliability, and integrity of the IT infrastructure, quality of service and the potential of IT infrastructure to support business activities (Rockart et al. 1996; Ross 2003).

Leader: In this fourth archetype, the IT function plays a leadership role in identifying opportunities and not just responding to requests (Reich and Nelson 2003). The focus is on the long-term and is aimed at creating new IT-based business strategies (Venkatraman 1997). The IT function organizes its activities around the early experimentation of emerging technologies in order to identify the likely obsolescence of the current business model (Venkatraman 1997). This helps the IT function to contribute to the development of completely new strategies based on the potential of IT (Venkatraman 1997). In the leader archetype, IT professionals possess strong teamwork and collaboration skills (Reich and Nelson 2003). They are also able to share their knowledge, to learn new knowledge from the business members, and to negotiate with and influence others (Reich and Nelson 2003). The CIO and the CEO have developed a strong relationship over time (Reich and Nelson 2003). Based on this, the IT function persuades the organization to modify its strategy, (Reich and Nelson 2003) building on the potential of innovative technologies (Venkatraman 1997). Also, it is not unusual to observe the presence of a chief technology officer (CTO) under this archetype (Reich and Nelson 2003). Finally, the IT function takes responsibility for business profitability and success (Reich and Nelson 2003). As a result, the IT function is accountable for its contribution to the development of IT-based organizational capabilities (Reich and Nelson 2003; Venkatraman 1997).

Coordinator: Under this fifth and last archetype, the IT function plays the role of coordinator of IT-based activities. In order to provide more flexibility to the organization, the IT function manages relationships between vendors and business units (Agarwal and Sambamurthy 2002; Feeny and Willcocks 1998; Rockart et al. 1996). The IT function plans activities for the present state of affairs, but also plans for the future in developing strategic partnerships with vendors or business units (Feeny and Willcocks 1998). In essence, the IT function creates the link between vendors and business units. Main activities of the IT function include managing the IS/IT sourcing strategy in order to meet the interests of the business, ensuring the success of existing contracts for IS/IT services and identifying the potential added value of IS/IT service suppliers (Feeny and Willcocks 1998). The IT function also articulates the needs of business units in requests for proposals, and assists business units in evaluating received proposals (Agarwal and Sambamurthy 2002). Thus, IT projects are conceived as business projects, with IS and other dimensions (Feeny and Willcocks 1998). In order to realize these activities, IT professionals possess technical, business, interpersonal, project management, and negotiation skills (Feeny and Willcocks 1998; Rockart et al. 1996). Under the coordinator archetype, it is

possible to observe a strong collaborative business/IT relationship (Feeny and Willcocks 1998). The IT function is responsible for ensuring that the organization can exploit its markets to achieve a business advantage through IT over time (Feeny and Willcocks 1998). This means that the IT function is accountable for assuring IT efficiency (control of IT costs) and strategic flexibility (staff size of IT function) for the organization (Agarwal and Sambamurthy 2002).

In summary, the proposed typology provides a clear description of the roles that the IT function can play within organizations, within five archetypes that are defined according to four fundamental dimensions. We will now apply this typology in an examination of the process by which IT functions evolve and transform over time, helped in this by the punctuated equilibrium theory.

Dynamics of the Transformation of IT Functions

The theory of punctuated equilibria was first proposed by paleontologists Niles Eldredge and Stephan Gould (1972) and was further developed by Tushman and Romanelli in the mid-1980s in their work on organizational transformation (Tushman et al. 1986; Tushman and Romanelli 1985). This theory states that the evolution of any system is characterized by long periods of relative stability where incremental change can be observed. This stability is interrupted by short periods of radical change that leave the system thoroughly transformed. The theory of punctuated equilibrium has recently been employed in the field of information systems to explain a variety of phenomena such as the study of the dynamic strategic alignment (Sabherwal et al. 2001) and the appropriateness of information systems adopted by small business (Street and Meister 2004), to name but a few.

Theoretical Basis for Punctuated Equilibrium

The theory of punctuated equilibria consists of three core concepts that provide insights into the process by which IT functions are transformed in organizations: a fundamental structure, periods of radical change, and periods of equilibrium. Each will be discussed in turn.

Fundamental structure: The fundamental structure of a system represents its underlying, enduring aspect. It reflects the actions, relationships, and decisions or choices, whether conscious or not, in relation to how the system works and the routines that support its continued existence (Gersick 1991). For instance, in their study of organizational change Tushman and Romanelli (1985) defined the fundamental structure of an organization—which they called strategic orientation—as being comprised of five elements: values and beliefs, organizational strategy, power distribution, organizational structure, and control systems. When transposed into our context, the fundamental structure of an IT function may be described according to the four dimensions presented in Table 1. Each of the archetypes presented in this table, therefore, represents a particular configuration of the fundamental structure of the IT function.

Periods of revolutionary change: Periods of revolutionary change are usually short periods during which the fundamental structure is subject to reappraisal, effectively leaving the system in a temporary state of imbalance (Gersick 1991). Such a period is characterized by modifications to all of the components of the system's fundamental structure, and leads to the creation of a new configuration (Gersick 1991). In their study of organizational change, Romanelli and Tushman (1994) defined the period of revolutionary change as a period in which a significant change occurs in strategy, structure and the distribution of power within an organization. In the information systems field, Sabherwal et al. (2001) defined radical change as requiring significant change in at least three of the four dimensions underlying the fundamental structure of the IS strategic management profile. For the purposes of this study, we privilege a more generic definition of the concept of revolutionary change and, like Greenwood and Hinings (1993), define the revolutionary change period as one in which an IT function moves from one archetype to another. We conclude that an IT function has undergone revolutionary change when profound changes have occurred in the IT function's activities or tasks, in the knowledge or skills of its professionals, in its relationships with the other business units, and in its governance.

Periods of equilibrium: The periods of equilibrium are generally periods during which a system protects its fundamental structure and remains committed to underlying choices. In periods of equilibrium, certain minor or incremental adjustments may be made to protect the fundamental structure from disturbances originating internally or externally (Gersick 1991; Tushman et al. 1986). Applied to organizations, the theory explains that enterprises organize their fundamental structure in such a manner as to establish strong interdependencies between their basic components, making it difficult to transform the organization (Tushman and Romanelli 1985). Taking inspiration from the work of Sabherwal et al., and in order to be consistent with the

archetype definitions presented in the preceding section, we will define a period of equilibrium as one in which the IT function maintains itself within the same archetype.

Forces That Stabilize or Foster Change

The three main concepts of the theory of punctuated equilibrium help us to grasp an idea of the process of transformation of the IT function stating that the IT function should be in stable periods for some time, and should transform itself fundamentally through periods of radical change. However, if one wants to develop a theoretical explanation of the dynamics of the transformation of the IT function in organizations, s/he needs to understand the forces that influence radical change as well as those that influence stability in a particular IT archetype.

Through an attentive examination of the relevant organizational change and information systems literature, we developed a theoretical explanation of the process by which IT functions transform over time. We propose that five forces are at work in the organization's environment, within the organization or the IT function. Each of these forces will now be discussed in detail.

Performance: Performance is one of the main forces in the theory of punctuated equilibrium that can either maintain inertia or effect revolutionary change. When the performance of a system is considered adequate, performance is considered a stabilizing mechanism (Tushman and Romanelli 1985). In organizations, the ability to meet managers' performance expectations constitutes a mechanism for reinforcing existing behaviors and structures which are then perceived as appropriate (Tushman and Romanelli 1985). Similarly, when members of other business units perceive the performance of the IT department to be adequate, the IT function is then legitimate in reproducing its existing behaviors. In so doing, the IT function reinforces the various elements of its fundamental structure through its daily actions, leading to the stability of its contribution to the organization.

Performance not only acts as a stabilizing mechanism; it can also foster change and transformation (Sabherwal et al. 2001; Tushman and Romanelli 1985). In effect, if managers in the organization consider the function's performance inadequate, this will serve as a marker and indicate that the existing configuration of the fundamental structure is no longer appropriate (Tushman et al. 1986). Thus, when the IT function's performance is considered inadequate, the function loses some legitimacy to carry out its activities, and this raises serious questions about its fundamental structure. Pressure will be brought to bear on the IT function to transform itself and make its performance more responsive to the expectations of other business units.

Environment: A second factor that is often discussed as a force influencing the onset of the periods of revolutionary change is variations occurring in the organization's environment. Indeed, it is generally acknowledged that changes in the political, technological, or legal context of the organization can considerably alter an industry's competitive climate and cause organizations to conduct periodic reviews of their fundamental structure (Tushman et al. 1986). Several researchers in the field of information systems have examined the relationships between changes in the environment, changes in the organization, and the influence of these changes on IT. For example, Sabherwal et al. observed that increased competition, falling prices, and new legislation are all important factors that would lead organizations and IT functions to adjust their strategies and/or structures in order to maintain performance levels.

While changes in the IT function's environment can provoke radical change, relative stability in the environment may allow the IT function to maintain its role in the organization. Tushman and Romanelli have posited that in a stable environment there is no pressure on organizations to undergo transformative change. On the contrary, they concentrate their energy on refining routines and other procedures, effectively reinforcing the fit between different aspects of their fundamental structure. Consequently, in the presence of a very stable organizational and technological environment, IT functions are under no pressure to change. They can focus on improvements to the routines and other procedures that enable it to continue playing its particular role in the organization. By making its fundamental structure progressively more coherent, the IT function slowly develops the specific skills and competencies (Feeny and Willcocks 1998; Ross et al. 1996) that will allow it to maintain its particular contribution to the overall organization.

Culture: Culture, values, and beliefs have often been proposed as forces that foster stability in an organization by maintaining a united front and encouraging members to act toward a common goal (Meyerson and Martin 1987; Tushman et al. 1986). The organizational culture can be seen as a significant force that acts to stabilize the IT function within a given archetype. In general, periods of equilibrium find employees developing habits that reinforce and promote central values (Tushman et al. 1986). When these values and norms concern IT and the IT function, actions help maintain the fundamental structure, thereby stabilizing the IT function within a given archetype. IT professionals are not immune to the organizational values and norms surrounding IT.

As a result, they develop a common history with other members of the organization, contributing to the reproduction of acceptable behaviors. The organizational culture consolidates these behaviors, which in turn reinforces the fundamental structure (Tushman and Romanelli 1985) and helps stabilize the IT function within a given archetype.

However, culture can also be a divisive force in organizations. The differentiation perspective of culture proposed by Meyerson and Martin (1987) underscores the fact that consensus exists mainly within organizational subcultures. Furthermore, many authors have noted cultural differences between the IT function and other business units (e.g., Robey and Markus 1984; Smith and McKeen 1992). Inconsistencies, diversity, and a lack of consensus between these cultures are destabilizing forces that edge the IT function toward transformation. When cultural differences between the IT function and other business units become excessive, a very uncomfortable situation often arises, which then calls for change (Smith and McKeen 1992).

Expectations with respect to the role of the IT function: Close alignment between an organization's expectations concerning the role of its IT function and the role the IT function actually plays is a stabilizing force that encourages only incremental changes in the IT function within the limits of a given archetype. In fact, when an organization's CEO and CIO come to share the same vision of the role of IT in general and of the IT function in particular, a better relationship has been observed between these two managers (Feeny et al. 1992), leading to a stabilization of the IT function's archetype over time. However, the organization's expectations of its IT function and the effective role the function assumes often fall out of alignment. When this occurs, the lack of alignment between expectations and behaviors creates a discrepancy that fosters change, either in the expectations of the organization, or in the role assumed by the IT function.

Seniority of the function's managers: The seniority of managers in organizations has often been cited as a force that acts to stabilize the fundamental structure of a system (Gordon et al. 2000; Tushman and Romanelli 1985). In fact, it has been shown that managers with high seniority consider it very important to preserve the *status quo* in their organization (Gordon et al. 2000). In our viewpoint, there is no reason to believe that IT managers are different in this regard (see Stephens et al. 1992).

In contrast, the arrival of new employees and managers has often been associated with radical change in organizations (Gersick 1991; Gordon et al. 2000; Romanelli and Tushman 1994; Sabherwal et al. 2001; Tushman and Romanelli 1985). Some studies of organizational development have suggested that managers with less than 10 years of seniority are more inclined to propose and implement radical changes, while more experienced managers tend to favor incremental changes (Tushman and Romanelli 1985). Sabherwal et al. also observed that employee turnover and the presence of external partners can encourage revolutionary change in the IS strategic alignment process. These observations lead us to believe that the arrival of new executives, within or outside the IT function, and the presence of external partners can stimulate radical change in the role played by the IT function in the organization.

In summary, the theory of punctuated equilibrium helps us to explain the dynamics of transformation of IT functions and to understand which forces foster stasis or inspire change in IT functions. Indeed, this theory gives us a deeper appreciation and a more detailed understanding of the transformation of IT functions in organizations.

Theoretical and Practical Contributions

This paper was intended to enrich our knowledge of the role and transformation of the IT function at several levels. From a theoretical perspective, it has made a significant contribution to the literature by presenting a dynamic, holistic, and theory-based vision of the transformation of IT functions in organizations. Unlike previous studies, this paper adopted a multidimensional perspective and proposed to conceptualize the role of the IT function through five archetypes that were clearly defined according to four fundamental dimensions. Moreover, our research has been based on a theoretical model, one that is well established in other reference disciplines, in order to expand our understanding of the dynamics of transformation of the IT functions in organizations. In this sense, our research has made an innovative contribution to the theoretical development of our discipline.

In addition, the theory of punctuated equilibrium takes into account the specific context of an IT function in order to explain how it changes over time and acknowledges both the overall environmental context and the organizational setting of each IT function. We believe that the inclusion of these factors gives a fuller understanding of why an organization's IT function reflects one particular archetype rather than another. Furthermore, the theory enables us to maintain a certain distance from the current view that advocates an ideal role and profile for the IT function and associates important changes in the function with technological developments in the environment.

Despite the fact that the foundations of the punctuated equilibrium theory are generally well-accepted by members of the scientific community investigating management and organizational development, a few researchers have nonetheless been critical of its universal application. One of the main limits of the theory seems to be its inability to explain change in organizations that are in perpetual transformation (Brown and Eisenhardt 1997). This having been said, even if at a theoretical level it would appear that the theory of punctuated equilibrium is well-suited to the study of the transformation of IT functions, it still must be shown empirically that the theory applies. In this regard, we have started to study the radical transformation of the IT function in a health care organization.

Conceptualizing the IT function's process of transformation through the theory of punctuated equilibrium opens the way to new areas of research in our discipline. For example, future research could use this new approach to track the complex and arduous passage from one archetype to another. Ultimately, we will develop a better understanding of the transformation process and of the factors that ease or hinder the transition from one particular archetype to another.

Importantly, this paper also breaks new ground and represents a significant theoretical advance in terms of how we conceptualize performance. By viewing performance not as a dependent variable but as a *force* that helps maintain inertia in an IT function or fosters transformation, this paper has suggested that the phenomenon of the contribution made by an IT function can be studied from a new and original perspective. For instance, future research could investigate how the gap between *expected* performance and *actual* performance, as perceived by both general managers and IT managers, influences or impacts the evolution of the IT function in organizations.

In addition to making important contributions in terms of theoretical development, this paper has several important practical implications. Our typology of archetypes offers managers a diagnostic tool for identifying the archetype that best describes the IT function in their organizations. Managers will then be in a better position to identify the role played by this function in their organizations, and it will be easier to recognize the value of its potential contribution to the organization as a whole. This tool can also be used to identify potential problems related to internal inconsistencies between the dimensions underlying each archetype, inconsistencies that would limit the potential contribution of the IT function. The theory of punctuated equilibrium should offer managers a better understanding of the dynamics of transformation and the forces that act to maintain the status quo or foster change in IT functions. This will allow administrators to make more informed adjustments to their actions and behaviors in the interest of controlling or developing the factors they consider essential for maximizing their function's contribution to the organization.

In summary, this paper proposes a new perspective on an interesting and relevant subject by putting forward several archetypes in which IT function can transform as opposed to the current view that there is an ideal archetype for the IT function wherein IT functions undergo transformations mainly in response to the same environmental changes or pressures.

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