ABSTRACT

This paper approaches innovations as an organizational learning and change processes that organizations employ to adapt to new and changing environments. Learning is related to adoption-diffusion analysis in sociology, which studies how innovations are disseminated within organizations and divisions. The paper suggests these two innovations stages related to the demand (adoption) and diffusion (dissemination) help us understand the management accounting innovations processes in organizations.

KEYWORDS: Organizational learning, Adoption, Diffusion, Dissemination, Accounting change

INTRODUCTION

Process innovations in organizations are essentially strategic decisions because they not only require resource allocations but also involve management’s willingness to accept the attendant risks associated with the initiations and adoption of the innovation. The learning strategy that the organization utilizes in the adoption of innovations shapes the scope (breadth or depth) of the adoption and diffusion of an innovation. The sociological approaches of adoption-diffusion frameworks are appropriate to a better understanding of single and double loop learning in functional, divisional and complex organizational settings.

Single-loop and double-loop learning are applied to examine the extent to which environmental factors, industrial organizational structures, technological developments, ecological issues, government regulatory agencies, and cultural and social forces shape the learning processes adopted by organizations. This paper argues that the reasons why some management accounting innovations are more successfully adopted than others depends on the appropriateness the learning strategy (single or double loop) that the organization chooses to the particular innovation. We suggest that the sociological approaches of learning and innovations provide a useful framework to examine these issues.

LITERATURE REVIEW

Organizational Learning: Single and Double-Loop

Organizational learning has been viewed as a source of competitive advantage. It helps organizations to develop and adopt innovation strategies that enable organizations to respond
Organizational learning has been viewed as entailing “new insights and modified behavior.” [It] occurs through shared insights, knowledge, and mental models” (Stata, 1989, p. 64). Researchers from diverse disciplines: sociology, organizational behavior, to mention a two of them, have argued that an organization’s effective utilization of innovations is enabled primarily by an appropriate learning strategy (Lant and Mezias, 1992; Attewell, 1992; Mezias and Glynn, 1993; Fichman and Kemerer, 1997; and Schulz 2001). Learning increases the organization’s ability to adapt to its changing competitive environment and successfully implement appropriate strategic changes intended to improve its performance (Windrum, 2001; Lopez et al. 2005). Thus, both the adoption and diffusion of innovations and organizational learning are important to organizations confronted with the need to innovate in order to improve long-term performance (Sandberg, 2007).

Lumpkin and Lichtenstein (2005) have identified three approaches to organizational learning: behavioral, cognitive, and action. Behavioral learning deals with the capacity of organizational processes, structures and systems to support learning (pp. 453-454). Cognitive learning, on the other hand, focuses on individuals’ capacity to change their mental cognition and abilities in order to acquire, assemble, and interpret knowledge (pp. 454-455). Action learning addresses the application, practicality, and effectiveness of acquired knowledge in solving problems. It has implications for an improvement in an organization’s performance.

The Argyris and Schon (1978) classified learning into single- and double-loop based on action learning and the impact learning has as incremental (single-loop) or radical (double-loop) change. Action learning enables individuals to be reflective, ask questions, increase their willingness to uncover problems, discontinue extant routines that hinder performance, and take appropriate actions that impact the organization at large. It changes patterns and styles of communication and interaction among members. Argyris and Schon (1978) suggested that, in action learning, there is openness and willingness to take competitive advantage in innovations and productivity (pp. 455-457). Members exchange ideas, commit themselves to problem-solving, and adapt to the new learning environment. There is discovery, awareness, and cooperation in creating synergies of the new knowledge that enhances the organization’s capabilities and competencies.

Organizational learning, thus deals with developing knowledge and enabling organizations to become more competitive by better adapting to their environment. For example, in marketing, Kandemir et al. (2005) suggested that learning broadens the scope of organizational market orientation in order to achieve a competitive advantage. It influences the culture and orientation that organizations have towards their customers. Learning enables multinational corporations to compete globally by identifying and acquiring knowledge, develop new insights and perspectives that helps them adjust to the complex international marketing environment. According to Vera and Crossman (2004), organizational learning can be a source of competitive advantage that drives organization’s strategic decisions. When learning is institutionalized, it becomes a part of the operating activities of the organization, and eventually is embedded in policies, procedures and daily routines (pp. 222-225).

In the organizational behavior literature, organizational learning is defined as the study of how organizations adapt to new and changing environments through the adoption and integration of new and innovative practices (see Davenport, 1993). Thus, in addition to adoption, learning is also related to diffusion analysis in sociology, which studies how innovations are disseminated across a particular population, i.e., similar group, (Rogers, 1971 and 1995; Rogers and Shoemaker, 1971) and within an organization (Sandberg, 2007). In this paper we apply the
organizational learning framework to the management accounting literature in order to understand better why management accounting innovations succeed or fail in organizations.

When an organization introduces an innovation, the nature and effect of that innovation will be determined by the learning strategy that the organization adopts. This choice will influence the magnitude of the organization’s change in terms of extent (technical or administrative) and scope (autonomous or systemic). When process innovation is supported by organizational learning, it facilitates diffusion and adoption. Stata (1989) viewed organizational learning as a competitive advantage for organizations able to respond quickly to changes in their institutional environments (p. 64). In other words, in order to respond to competitive changes, organizations cannot effectively utilize process innovations without a well-developed learning strategy (Lant and Mezias, 1992; Mezias and Glynn, 1993; Porter, 1980). The learning strategy follows a two-stage process: single-loop and double-loop learning (Argyris and Schon, 1978 and 1996). We define single-loop learning in terms of incremental change, and double-loop learning as radical change. They are discussed in the following sections.

Single-Loop Learning

The objective of single-loop learning is to find improved ways and methods to perform the tasks the organization currently performs. These changes can occur in a variety of ways. Some organizations change through trial and error; others change by adopting innovations that have been successful elsewhere. The rationale for adopting an innovation in such cases is the cost-benefit analysis. This is the essence of single-loop learning. Thus the focus of the single-loop learning is on detection of errors/inefficiencies and on their correction in order to improve the organization’s performance, strategy, and systems. Single loop learning is designed to improve existing activities within the organization and to modify their functionality in order to maintain the stability of the system. This, the adaptation process allows organizations to make incremental changes to improve performance.

In general, incremental changes are “generated through continuous improvement processes, are more clearly defined and better understood than transformative changes” (Dibella, 2007, p, 237). Accordingly, there are fewer unknowns because the processes being adjusted or redesigned are not new. There is a greater likelihood that changes are understood and outcomes known. Resource expenditures required by design are limited with few unintended consequences.

Double-Loop Learning

Double-loop learning occurs when an organization is able to detect and correct errors in the operating norms and activities of the organization (Van de Ven, 1986). Double-loop learning allows an organization to institute new norms and procedures in order to transform organizational activities. It is a second-order learning that leads to re-orientation (Lant and Mezias, 1992), discontinuous change, and development of new paradigms to do things differently than in the past. Discontinuous change usually arises from changes in markets, technology, and competitive forces. There will be unanticipated interruptions and disruptions in operations. Because these discontinuous changes require significantly different adaptive strategies and approaches to managing organization activities, organizations plan ahead to address them.

Bessant (2005) noted that, when organizations face problems that are beyond their current domain or “normal operating conditions,” the viable alternative approach for addressing them is
through discontinuous innovation. “Discontinuous can take a number of forms – for example a step change in technological development, the emergence of a totally new market or a dramatic shift in the political/regulatory environment” (p. 37). Discontinuous changes occur most often when an organization is operating in dynamic environment. Bessant (2005) referred to discontinuous innovation as “generative” or “double-loop” learning that involved the development of new behaviors that, over time, eventually become embedded into routines (p. 38).

Double-loop learning occurs when an organization begins to innovate by constructively challenging current routines and activities. In the process, organizations develop alternative assumptions, ideas, and resources to replace old rules. In this manner, double-loop learning can generate new technologies that lead to major changes in knowledge and activities within organizations. If double-loop learning is to become robust and advance the organizational learning process, it can do so by identifying, suggesting potential solutions, and eliminating unsuccessful solutions. As a result of this process, “errors are eliminated by reflecting on mismatches between tentative solutions tried and expected outcomes” (Blackman et al., 2004, p. 19). In other words, there is reflective learning when new solutions develop to solve existing errors/problems (for an example, see Rowe et al., 2008).

Thus, double-loop learning questions existing operational activities in order to bring about radical changes that will alter and change these activities. Strategies, missions, and systems are altered to bring dynamic changes in the organization work activities and processes so that they become flexible and adaptable to the changing environment. Organizations acquire a new knowledge base and competencies that will enable them to interact and manage the external environment. Through the double loop learning process, the organizations have acquired the knowledge required to better utilize their resources.

In summary, double-loop learning is most likely to occur when organizations face a dynamic environment with continuous changes in both the external and internal environmental sectors. In these conditions a double-loop learning strategy, particularly one that involves paradigm changes, is necessary to sustain and improve organizational performance. Double-loop learning also is required when an organization accustomed to an incremental (single-loop learning) environment is faced with a likely unanticipated discontinuous change in its external environment (for example, see Rowe et al., 2008). Accordingly, both single- and double-loop learning strategies shape both technological and administrative innovations within the context of adoption and diffusion of technological innovations.

THEORETICAL DEVELOPMENT/MODEL

Adoption and Diffusion Issues Related to Single and Double-Loop Learning

Adoption-diffusion theory describes the process whereby the innovation is planned and implemented. The theory of Argyris (1992), Argyris and Schon (1978 and 1996) regarding organizational learning describes the type of learning: single-loop or double-loop, required by the innovation. Finally, we utilize the work of Atwell (1992) and of Schultz (2001) on organizational learning, of Rogers (1971 and 1995) and of Sandberg (2007) on adoption and diffusion theories in order to identify and understand the potential pitfalls faced by management in implementing accounting innovations. We argue that the two types of organizational learning: the single and double-loop approaches have a significant effect on the process of adoption and diffusion process innovation strategies.
The sociological approach of adoption-diffusion assumes that the learning process of process innovations starts with adoption of technological changes that affect production relations and economic organizations in society (Coleman et al., 1966; Zaltman et al., 1973). The learning process is shaped by several characteristics of the organization. These are organizational power and structures, conflictual and coalition-based relationships, individual goals, social order, and distribution of resources. Learning and innovations potentially can alter existing political power structures in the organization if they are initiated/adopted by those that are not part of the coalition. As the result, power conflicts among coalition members could result in delays in adoption of technological innovations. Such delays in adoption makes the result of the “technologically improved product” short-lived and obsolete more quickly than might otherwise be the case (Butler, 1988, p. 20).

Differences in early and late adoption may be attributed to factors related to cohesion and structural arrangements in the peer group. In a study of medical innovation, Burt (1987) discovered that structural attributes of physical proximity, structural equivalence, friendliness, and network relationships enhanced the diffusion of innovation. Physicians adopted new drugs, when they observed their peers in the medical profession have adopted these innovations (Coleman et al., 1966).

The availability of resources also can affect the adoption of an innovation. Functionally based economic assumptions stress return on investment and cost-saving mechanisms when making investments in technological innovations. It is assumed that organizations make different decisions about investment choices: when to adopt, how to seek the most profitable investment technique, where to invest, how to determine the cost of new investments, and obtain more information about time, costs, and alternatives. It may involve a rational decision to delay action until all the relevant information about other organizations’ experiences is obtained (Soete and Turner, 1984, p. 615).

The relevant information that potential adopters may desire can include the experience of early adopters. As Witt (1997) noted: “The agents who adopted the new technology or variant at an early stage would have to bear a negative total relative benefit resulting from the initial network diseconomies. In contrast, those who adopt at a time when the diseconomies have already turned into network economies would profit from the ‘investments’ of the early adopters” (p. 769. See also Jensen, 1983 and 2001).

**Adoption-Diffusion and Innovation Lag**

In general, organizational lag refers to the relative differences in the degree to which organizations adopt technical and/or administrative innovations (Damanpour and Evan, 1984, p. 394). There are individual, group, and organizational differences that contribute to innovation lag. Individual factors deal with personality, behavior, and attitudinal constraints. Organizational factors are more general in nature and address institutional environmental factors that affect innovations. Divisional structures and arrangements influence the degree and success of innovations in organizations. These characteristics explain whether or not there is an innovation lag in organizations. For example, administrative innovations naturally face organizational constraints. Bureaucratic procedures in operating systems of mechanistic structures and difficulties in establishing cost-benefit linkages in administrative innovations have contributed to innovation lag. Accounting control systems as part of administrative operating systems have experienced innovation lag over the years. However, recent developments in
information technology have contributed to incremental changes in accounting, recording, and reporting of production and quality costs in business and manufacturing organizations.

We have noted those differences in organizations arising from divisional structures, work arrangements, as well as individual and group characteristics; all influence innovation behavior and the degree to which innovation can impact organizational performance. Information and communication are considered critical in the dissemination of innovation and in the creation of adoption lag. As noted earlier, some (Jamali 2005) believe that a matrix organizational structure facilitates the adoption of innovations.

Rogers (1971) and Rogers and Shoemaker (1971) concluded that the flow of innovation information and technological know-how are important in the diffusion process of innovation. In particular, they stressed the level of contact between originators and adopters, personality characteristics of early adopters, the nature of the flow of information, and the choice of communication channels as key factors which affect the degree and speed of the adoption process. They suggested that the best strategy to accelerate diffusion is through the identification and dissemination of innovation by influential early adopters (opinion leaders referred to as “champions”). Once they are identified, the next step is to provide them with the support they need to influence others (followers) to imitate the innovators and adopt the innovation.

Failure to target influential early adopters and lack of appropriate means of communication could reduce the demand for innovation information, resulting in innovation lag. In essence, what Rogers and Shoemaker (1971) are suggesting is comparable to the view of Grattet et al. (1998) who viewed “diffusion as a process involving the homogenization of cultural practices and policy forms” (p. 288). In other words, diffusion involves cultural assimilation and the sharing of norms and values within the targeted population of the organization.

When mechanistic structures prevail, differentiation minimizes both frequency of contact and exchange of information flow. As these hierarchies separate workflow, face-to-face communication becomes difficult (Hull and Hage, 1982, p. 572) contribution to adoption lag. Differentiation and specialization eventually contribute to formalized control systems and relationships that create communication barriers and reduce the flow of information, information sharing, coordination, and cooperation among organizational units and suppress dissemination of innovation. The decision-making process becomes centralized, with minimal involvement of employees at the lower levels of management. All of these make an innovation across units much more difficult, and creating adoption of innovation lag.

Mechanistic structures support the institutionalization of management control systems featuring increased bureaucratization and the tightening of control of resource-sharing and allocation mechanisms through operational procedural manuals that require documentations, and adherence to operating procedures (Kober et al., 2007, pp. 446-447). Although these management control structures change to fit management’s strategies, the changes are not likely to be extensive. Rather, they will encompass incremental and procedural changes. Jamali (2005) has attributed this gradual change process to the traditional management model of functional centralized structural systems being driven primarily by rules, prescriptions, efficiency, cost reduction, hierarchical structures, and division of labor to improve production. It is derived from scientific management principles of division of labor, functional management of centrality, stability, planning, organizing and controlling organizational operations, and bureaucratic management of subordination and hierarchical authority. This view critically assumes that organizations operate in
DISCUSSIONS AND ANALYSIS

The Two Stages of Organizational Learning: Adoption and Diffusion

Once the need to innovate to solve a problem has been ascertained, Schulz (2001) suggested that the learning process usually follows a sequence of steps/stages that reflect how the subunit’s/organization’s experience influences the process by which knowledge is adopted and disseminated throughout the organization. He argued that organizational learning and change usually follows an evolutionary process in terms of the “number of processes that create new knowledge or modify existing knowledge” (p. 663). These processes start with how knowledge is gathered or obtained (codified), followed by the extent to which it is analyzed (explored), and ultimately communicated (selectively diffused). Schulz (2001) described the process of resolving the problem as having two inter-related stages. The first stage, acquisition/production (adoption), consists of the gathering of knowledge/information, its codification, and exploration. It is followed by the second stage, namely, the dissemination/distribution (diffusion) processes (p. 676). Nevertheless, when changes in the organization’s external environment persist and the organization faces a crisis, this can overcome management’s resistance to change and accentuate the need for organizational learning, and for proactive change and adaptation strategies of development and transformation.

When the decision process begins, specific innovations are championed by opinion leaders who both perceive the existence of the problem and ascertain what they consider to be a viable solution. These opinion leaders typically are executives or front-line managers who communicate and champion the innovation to lower level managers and/or employees. This constitutes the first stage of learning (adoption). In those instances where the problem is sufficiently severe or the organization has not been able to identify any specific innovation/knowledge required for a viable solution, organizations may identify an outsider (e.g., a consultant) as a champion (See Rowe et al. 2008, 2012). The second stage (diffusion) in the implementation of a successful organization-wide innovation occurs when managers/employees within the sub-unit accept and implement the innovation.

Stage one (adoption) considers why certain innovations are more likely to be implemented. Stage two (diffusion) helps us to understand why the dissemination of accounting innovations within the organization is more successful in some instances than others. While adoption describes the process whereby an organization becomes aware of the need to change (innovate), diffusion refers to the dissemination of the innovation to other parts/all of the organization. In other words, the term “diffusion” refers to the dissemination of the innovation within the (intra)organization rather than its spread to other (inter)organizations. It traces how the adoption-diffusion process is shaped by a variety of activities in which individuals, change agents, and organizations participate in the learning/innovation processes. Accordingly, the learning process is analogous to the two phases described by Attewell (1992): awareness of the innovation and acquisition of the know-how required to implement the new process. In this context, the two stages of innovation can be illustrated as encompassing, at stage one, where the adoption of innovation is limited to a single division-wide intervention. At stage two, the innovation is then disseminated or diffused to other divisions in the organization, making it double-loop systemic learning.
The first stage of the diffusion of an innovation within an organization begins with its identification by champions who obtain the support of their top management and acquire the information they need to influence others (followers) to adopt it. Thus, information and communication are critical to moving the innovation forward and in determining the length of the time lag between early and late adopters. For example, Kumar and Krishnan (2002) discussed two types of lead-lag differences in the introduction of new technology among countries. The first process, which they identified as “waterfall strategy,” pertained to the time or the order of entry when the diffusion process was introduced. This strategy follows the lead-lag approach, in which the lead country (or organization) adopts the new technology, and the lag country (or organization) follows (p. 328). The second process, referred to as the “sprinkler strategy,” involves innovations which could be “simultaneously introduced” in multiple countries or organizations. In this case there is no lead-lag effect and no significant social, cultural, and economic differences among the adopters (p. 328).

Most diffusion research suggests that dissemination occurs when there is a lead-lag difference between countries and/or organizations (Weinjert, 2002). The lead-lag approach is predominant view in research on diffusion in social and economic development. It also is referred as the “trickle-down” effect. In social and cultural change programs, the “trickle-down” effect has been generally accepted by researchers to explain social and economic development (Leagans and Loomis, 1971). Katz (1999) related the “trickle-down” effect to the predominant theory of the S curve in diffusion research. The assumption is that it is “true, there is the general S curve in the adoption of innovations and its more sophisticated elaborations; there is the general rule of trickle-down from higher to lower status; and there is the apparent need for reinforcement from peers prior to adoption” (p. 147). Katz (1999) argued that there is no general theory or framework of diffusion except for “a set of tools for making generalizations possible…” (p. 147).

In diffusion research, it is assumed that ideas or practices are communicated through networks or leaders who promote these values to adopting individuals and groups. In addition in organizations, the trickle-down process may also proceed from superiors to subordinates. In any case, diffusion is reciprocal and involves a two-way process. Despite the voluntary tone of the above discussion, in practice the process of diffusion is not necessarily always a voluntary process. The innovation does not always originate from within the affected sub-unit. In some situations it can also be imposed by consultants hired by the organization’s leadership or a strong, politically powerful leader(s) in the organization who supports a particular innovation forcing new ideas or culture on the sub-unit in order to change existing patterns of behavior.

In general, diffusion involves an “imitation” process that assumes persuasion, command, or influence in the social interaction process. By imitation, we are referring to the copying of innovations and/or obeying of “request” of the champion by interconnected individuals and groups. It also can be a social contagion process where word of mouth plays an important role in the diffusion process. In other words, the adoption of innovation entails a social process where communication, persuasion, and interaction with opinion leaders facilitate the process. This is because opinion leaders are sources of social influence. They can identify a subset of initial potential adopters who then promote the adoption of a particular innovation within the community. Opinion leaders who are credible, accessible, and who have the means of advancing new practices and ideas are able to provide support and influence for dissemination of the innovation. These are the early adopters. They have successfully tried the innovation and thus have the credibility required to influence its acceptance by subsequent or later adopters. Opinion leaders also function as change agents by facilitating “the task of transmitting information” (Gatingon and Robertson, 1985, p. 860).
Although communication is the key to an innovation’s diffusion, adoption of the innovation in a particular organization may entail a certain degree of modification of the innovation, or what Dearing (2009) terms as “intervention adaptation” (p. 513; italics in original). Over time, there are incremental adjustments in innovations designed to accommodate the organization work environments, and cultural contexts. Adoption, when planned and implemented, makes an innovation program in intermediary organizations such as public health or agricultural practices, for example, are more effective and instrumental.

According to Rogers (1995), the diffusion framework involves interpersonal communication or spread of information in the social system (see also Riemer-Reiss, 1999). Frenzel and Grupp (2009) further advanced this view by arguing that, in diffusion, there is “communication of information about the innovation as being crucial for its adoption” (p. 44). Personal influence may account for the spread of innovation. Yet, some successful innovations are adopted later because the information was either not quickly disseminated or discovered until later. If on the other hand, the dissemination of information about an innovation occurs only when it becomes “epidemic,” i.e., spreads rapidly through a related group(s), Frenzel and Grupp (2009) suggested that the core assumption of the epidemic model is that innovations are likely to be adopted when targeted populations are “infected” by the innovation when it reaches them (p. 45). This is comparable to the information contagion approach where friendship ties, proximity, and the characteristics of comparable segments of a group or community facilitate interaction and the rapid communication and spread of the innovation.

Thus, personal influence of various types forms one of the basic components of the diffusion theory. The rate of spread of diffusion is dependent on personal influence of the opinion leader(s). Among the factors which affect the efficacy of the opinion leader are: relevance of personal influence, intent of influence, personal characteristics of the opinion leader, the form (verbal or non-verbal) of the communication medium, the direction of the influence (“opinion seeking” or “opinion giving”), and the network process (“similarity among individuals”) adopting the innovation (Gatingon and Robertson, 1985, p. 855). In general, personal interactions are more likely to prevail when there is a social attractiveness; among individuals who possess the same behavioral attributes. Accordingly, there are personal characteristics that are related or based on “higher income, higher education, younger, more socially mobile, more favorable attitudes toward risk, greater social participation and higher opinion leadership” associated with innovativeness (Gatingon and Robertson, 1985, p. 861).

Weinjert (2002) related social-contagion effect, personal ties and characteristics to the cultural community approach of adoption and diffusion, if these behaviors are accepted by organization members and groups. She identified three factors in the institutionalization of behaviors that are considered acceptable policies and standardized practices, namely, (1) global adoption of technologies by multi-national corporations, (2) inter-connectedness of the world community through advanced communication systems and media, which render the process of diffusion universal, and (3) the transfer of process innovations to create comparable societal structures (p. 315). She also noted that computer and Internet usage globally is considered essential for modernity, growth, and development. The mass media can promote the diffusion of technology and advance its institutionalization and globalization by facilitating adoption and diffusion processes (pp. 316-317).

Katz (1999) also noted that “diffusion also is facilitated by a compatible social structure” (p. 150). Diffusion can succeed when new ideas are introduced in a society that has “a compatible value systems (contraception has a harder time in Catholic countries) and compatible media (print
serves participatory democracy better than television does).” That is, innovation is less costly to adopt when it is “less upsetting,” i.e., more consistent with current beliefs, and compatible with the status quo (p. 150). In organizations and societies with compatible value systems, innovation champions are accepted as leaders and play important roles in the dissemination of new ideas and information that support process innovations.

Sandberg (2007) noted that enthusiastic champions serve as catalysts in organizations for the developmental stage of radical innovations (idea generation) and subsequent diffusion throughout the organization. “At the development stage, the enthusiasm spread from the champions and the core team to other parts of the organization, and in some cases also to other development partners” (p. 269). She associated radical innovations with technologically new and commercially successful products and services that offer substantial benefits to customers. The role of networking serves as a driving force in the diffusion of the innovation and its successful marketing to customers through “personal visits, customer education, simulations and trials” (p. 271). While radical innovations resulted in the development of new products and services (for example, the ePost Letter and the Nordic Walkers cases that were commercially successful), their diffusion to customers and their diffusion outside of the organization was a gradual process designed to sustain enthusiasm for the long term.

Accordingly, the need for a radical (comprehensive) accounting innovation begins when external environmental and internal constraints give rise to the perception of the need for organizational learning. It is the cumulative effect of both the constraints and the perceptions of a need for change that affects whether or not a specific organization at a particular time adopts an innovation to meet a particular perceived need.

**Adoption-Diffusion in the Management Accounting Literature**

Organizations need for growth, political power; increased competitive posture and desire to adapt to environmental changes create the need for learning and innovation. Organizational learning becomes critical in promoting strategic planning and control systems to enact cost accounting changes (Kaplan and Norton, 2001) in organizations. The rise of new rivals, i.e., external constraints, leading to the perception by management of the need for a change in cost management system is illustrated by the rise of competition from Japan in a variety of industries, including that of automobiles. This competition created a sense of urgency and a need to adapt on the part of U.S. firms. The result was the adoption of a variety of new (for the U.S. firms) management activities/processes such as just-in-time technology (JIT), Five Sigma quality control, and, in accounting, an increased interest in cost measurement, e.g., ABC (Anderson, 1995) in many organizations. However, in other organizations the actual adoption of proposed changes such as ABC was resisted and in some instances rejected due to extant organizational structures and bureaucracy.

Barnett and Hansen (1996) noted that an organization’s history and the lessons learned from past failures and/or successes both serve as internal constraints to the adoption and diffusion of an innovation/change within the organization. These constraints are reflected in both the organization’s formal and informal structures related to strategy, policies, employees, and organizational culture, all of which include norms, shared values, and behaviors. For example, Anderson and Young (1999) reported that context and organizational factors affected the nature of the ABC system developed within a firm. They found that the complexity of the ABC system proposed increased with the size of the group involved in the development of the new cost system. This suggests that the system they adopted represented a compromise among the
participants. The Anderson and Young’s (1999) study reveals that initially organizations may be rigid and resistant to change because they have stable routines and cultural practices that satisfy current performance levels and, therefore, the managers perceive no need to change and saw different costs associated with the proposed changes. As the result, the new system represented, as Brunsson (1982) proposed, a series of adaptations to the various extant routines of the subunits.

Over time, what are initially considered new accounting innovations tend, as described by Anderson and Young (1999) and Ansari and Euske (1987), to be resisted by organizational members. However, if they ultimately are accepted, they become the part of and are institutionalized as autonomous operating procedures used to administer stable and routine functions. Such bureaucratization of the innovation in management accounting leads to programmed rules and routines, that later tend to be mechanistic and associated with efficiency of work procedures (Burns and Stalker, 1961). In essence, technical innovations lead to the establishment of stable rules/mechanisms, or what Schultz (1998) described as new birth and codification of accounting rules, that can contribute to resistance to new process innovations.

When technical accounting procedures are bureaucratized, management planning and control systems become more formal and institutionalized. In these operating systems, mechanistic innovations prevail in day-to-day activities. Accounting tasks become centralized to handle those operations and production activities that are routine, repetitive, and programmable (Dirsmith and McAllister, 1982). Formal rules not only specify procedures, they also define employee roles. Accounting numbers, in effect, control employee behavior as well as the operating activities of the organization. Formal accounting control systems monitor employee performance and the existence of quantitative reports leads to their replacing the use of personalized and qualitative feedback and inter-personal relationships in control systems.

The predominance of a formal intra-unit orientation, i.e., controllability, in the organization’s performance evaluation and reward systems has another important effect. It reduces the interactions among units and discourages/inhibits the diffusion of a potential innovation within the organization. Each unit operates as a distinct and separate unit within the organization’s hierarchy. The members minimize its relationship with or connection to any other unit. This inhibits the flow of innovations across units and favors stand-alone innovations (Schulz, 1998). The awareness of the need for inter-unit cooperation may increase when organizational problems have “thematic relatedness,” i.e., possess a high degree of similarity, or reflect a joint dependence on the same resources as often is the case with accounting problems or procurement problems (Schultz 1998). Although these changes might lead to acceptance by some and resistance by other members, the uncertainties surrounding these changes might require members to accept them or else leave the organization. Under these circumstances, the central management of the organization can develop relatively generic common rule(s) that can be utilized by many or all of the organization’s sub-units.

The scale of the innovation/intervention also is relevant. When an innovation requires large-scale abolition of old rules to eliminate obsolete systems and helps to alter the system, the recommendation is that the organization undertakes a large-scale intervention program specifically intended not only to abolish old rules but also to replace them with new ones. It can be inferred that Schulz’s (1998) radical measures of rules follow the double-loop learning strategy.
Organizational learning of the sort contemplated in management accounting, e.g., ABC or BSC, requires a significant change in the organization's rules and procedures. This involves an OD (autonomous) or OT (systemic) radical change strategy. This type of change is accompanied by organizational response to the natural selection process of new forms (innovations) and results in transformational second-order change (double-loop) learning. Both ABC and BSC require a significant change in the manner a process is viewed, i.e., "thinking outside the box." ABC requires accountants and managers to view a new and more complex set of cost drivers that includes drivers not been utilized in previous costing systems. BSC is an example of double-loop learning in management accounting which stresses product development and new markets which focus on delivery of goods and services that meet customers' needs. It emphasizes the user's need to think beyond the traditional management accounting model of short-term profitability ("outside the box") and to integrate new dimensions. The introduction of non-financial measures of marketing, production, and human resources management requires reorientation, i.e., double-loop learning, by those involved in managing the organization.

In general, organization innovation refers to the adoption of new behaviors, ideas, or systems; usually process innovations that involve administrative processes or services that affect employees' behaviors and organizational structures are more complex. They are context-dependent where decentralized structures which have complex job structures with flexibility in the diffusion of innovations. In general, centralized structures facilitate the adoption process. In the context of management accounting systems, the success of adoption-diffusion of innovations depends on the choice of management accounting intervention strategies/typologies: division and/or organizational wide. In general, OD innovations involve both technical and administrative innovations in accounting. OD focuses on technical improvements, accounting innovations address incremental changes that are targeted at formalization, specialization, and efficiency in operations, e.g., work structures, processes or procedures, and changes in individual and group behaviors. Damanpour (1987), Damanpour and Evan (1984), and West and Farr (1989) refer to these changes as having micro-orientation, focusing on division and/or departmental structural changes.

On the other hand, when divisional based process innovation change is accompanied by transformational changes, accounting changes entail an administrative reform that corresponds to organizational-wide intervention strategies. The change is broader and addresses reorientation learning focused on new methods, e.g., search for new market opportunities and product innovations, or seek alternative responses to environmental changes. Accordingly, differences in institutional and organizational behaviors and cultural processes among institutions of various sizes at either divisional or field levels contribute to variations in the adoption and diffusion of process innovations. It is widely accepted that, in larger organizations, greater structural complexity and interdependence require an emphasis on incremental as opposed to transformational changes.

While organizations may prefer incremental approaches because of their desires for short-term, less disruptive improvements, they are more likely to pursue radical transformations of strategic change following a trial-and-error period of unsuccessful incremental changes. They undertake these radical reorientations primarily for two major reasons: first, because of sustained low performance, i.e., internal cause; or, second, because of the need to address major technological, social, and environmental changes, i.e., external cause (Tushman and Romanelli, 1985; Barley, 1986).
Although innovation involves learning, the nature of the learning process does not completely describe the manner in which an innovation affects the organization. Accordingly, we have applied the two interrelated organizational sociological dimensions of innovations processes, namely, the adoption and diffusion theories of Rogers, 1971 and 1995, to approach organizational learning to discuss the process innovations strategies in in management accounting systems.

CONCLUSION

In conclusion, we suggest that management accounting researchers pay particular attention to an organization’s approach to adoption and diffusion of innovation strategies, particularly when they are designing and implementing process innovation programs for an organization. It is important to understand the sequences or stages within which a successful innovation takes place. Schulz (2001) described the sequence of the learning-innovation process in organizations as consisting of two inter-related stages: adoption and diffusion. He related the first stage to the acquisition/production (adoption) of knowledge that results in gathering information, codification, and exploration. This is followed by the second stage which is the distribution or dissemination (diffusion) processes. In an organization the adoption stage is when the organization acquires the knowledge related to the potential innovation. Diffusion, the second stage, involves the dissemination and transfer of that knowledge from a unit/division to the entire organization.

When the two stages—adoption and diffusion—are applied to management accounting innovations, they address issues that are commonly associated with the success and/or failures of any innovation. Stage one reveals why certain management accounting innovations are more likely to be implemented (adopted) than others. Stage two details why the dissemination (diffusion) of some accounting innovations is more successful than others. These two stages of organizational learning-innovation implied that knowledge production (adoption) and distribution (dissemination) processes follow an evolutionary process.

When an innovation is implemented, it initially can be introduced as an incremental change, one that can be limited in both its scope and its breadth of administrative changes (single-loop). This means that situations which are most likely to benefit from its initiation can serve as the prototype for its adoption by the firm. This minimizes the risk to the organization as well as the costs involved. It also enhances the cost-benefit of the experiment, i.e., adopting it on a limited administrative change or reform basis, have a single-autonomous scope. By contrast, double-loop-systemic is likely to be broad in its scope and breadth. This means that old thinking patterns must be replaced by radical, new approaches. The introduction of radical change is expected to require systemic double-loop learning and an overall-wide organizational intervention strategy. This necessitates the development of a comprehensive strategic plan for the innovation with a longer-term time horizon that is more costly to implement by comparison with that of incremental division focused innovation strategy. When accounting innovations call for organizational-wide intervention strategies, the potential disruptions of the organization’s processes, e.g., resistance to the changes, are expected to be significant. When systemic double-loop organizational learning strategies result in reorientation and paradigmatic learning changes, accounting innovations become instrumental in instituting transformational changes to replace existing accounting reporting and control systems.
We applied an evolutionary perspective to describe the adoption-diffusion processes of management accounting innovations. We suggest that the evolutionary process has at least two stages that are related to the demand (adoption) to the diffusion (dissemination) of process innovations. We argue that one of the most critical factors that impacts the understanding of the innovation process and determines the intervention strategies in the context of single and double-loop learning process: Accordingly, the organizational context for either single or double loop learning is largely influenced by organizational structural (divisions or units) arrangements for the implementation of the innovation process.

The adoption-diffusion framework can thus assist in the understanding of how innovation will be received by the organization. It suggests that the greater the degree of the scope (autonomous or systemic) to which a reporting innovation will impact the activities of the organization, the greater the learning (double-loop) effort required in implementing it. While there is supporting empirical evidence in the adoption-diffusion literature in sociology, it has the potential to do empirical work within the context of ABC and/or BSC cases in the accounting literature. Accordingly, the framework can help to understand and explain how management accounting innovations, for example, ABC and/or BSC are likely be resisted and/or received, and possibly disseminated by the organization that has adopted the innovation.

REFERENCES

References available upon request.