ORGANIZATIONAL DOWNSIZING AND INNOVATION

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ABSTRACT

Companies implementing a downsizing strategy aiming at increasing cost efficiency and operational effectiveness may face the fact that their innovative ability is hampered. In this paper, we develop a model of the mechanisms through which organizational downsizing affects innovation. We use existing theory to develop propositions regarding the details of how and why organizational downsizing affects innovation. Our model contains three components: a) the organization's stock of knowledge, b) the individual's creativity, and c) the knowledge creation process. These are three components which previous research on innovation management has suggested strongly affects innovation. Downsizing is also likely to affect all three components in various ways. Overall, we can expect downsizing to have a negative effect on innovation, but there are aspects of the knowledge creation process which may be positively affected by downsizing.

KEYWORDS

1. **Innovation**
2. **Knowledge**
3. **Knowledge creation**
4. **Organizational downsizing**

Content

INTRODUCTION

Our concern in this paper is with how companies can maintain innovation while pursuing a downsizing strategy. Downsizing has been a managerial practice for increasing organizational efficiency and effectiveness during the last two decades (e.g. Budros, 1999; Cameron et al., 1991; De Meuse et al., 1994). The general reason for using downsizing is to achieve bottom-line objectives (McKinley et al., 1995) and more specifically to: a) achieve a reduction of overhead and operational cost, b) speed up decision making and communication through reduction of management levels, and c) reduce duplication due to mergers (Nienstedt, 1989).

Although announcements of downsizing have been shown to lead to short-term positive reactions from the stock market (Cameron, 1994a), the ability of downsizing to enhance productivity and improve bottom-line performance has not gone uncontested (McKinley et al., 1995). There are few examples of companies actually accomplishing their initial goals, which tends to result in new downsizing activities a few years later (Cameron, 1994a). Negative effects have been reported on variables ranging from employee loyalty, motivation and morale (Devine et al., 2003; Mishra & Mishra, 1994; Mishra & Spreitzer, 1998; Mishra et al., 1998) to Return on Assets (ROA), Return on Equity (ROE), Return on Investments (ROI) and stock price (Cascio, 1993; De Meuse et al., 1994). In particular, there are studies arguing for a negative relationship between downsizing and innovation (Amabile & Conti, 1999; Bommer & Jalajas, 1999; Dougherty & Bowman, 1995). This negative relationship forms the starting point for our research interest in this paper.

Existing research on organizational downsizing covers different levels of analysis, including a global or industry level (Pinsonneault & Kraemer, 2002), a micro or individual level (Devine et al., 2003; Mishra & Mishra, 1994; Mishra & Spreitzer, 1998; Mishra et al., 1998; Spreitzer & Mishra, 2002), and an organizational or strategic level (Cameron, 1994a). The main focus in existing research is on antecedents to downsizing and the outcomes of downsizing (Cameron, 1994a). Existing research has, however, little to say about the relationship between downsizing and innovation (Amabile & Conti, 1999; Bommer & Jalajas, 1999; Dougherty & Bowman, 1995). Given the importance of innovation for the competitiveness of companies (Tidd et al., 2001, pp. 4-6), it is worthwhile to investigate the effects on innovation from a downsizing strategy.

Our objective in this paper is to develop a conceptual model of the relationship between downsizing and innovation. We do this by means of a theoretical investigation, in which we focus our attention on the impact of downsizing on: a) the organization's stock of knowledge, b) the individual's creativity, and c) knowledge creation processes. These three factors have previously been found to be significant for organizational innovation to occur. To attain our objective, we draw on concepts from the literature on organizational downsizing, knowledge management and organizational innovation.

The paper is structured as follows. First, we define organizational downsizing and review the existing research on downsizing. Second, we review the literature on organizational innovation, identifying the determinants of the innovation process. Third, we discuss how downsizing influences the innovation process. Fourth, we develop a model of the mechanisms through which downsizing affects innovation, captured in a set of propositions. The paper concludes with a summary discussion and implications for future research.

As with all research there are boundaries to what can be said to be included in the study. Most importantly, we are concerned with downsizing and its consequences within the organization, i.e. intra-organizationally. Thus, we follow the tradition established in the special issue on organizational downsizing published by Human Resource Management in 1994 (Cameron, 1994a). The rationale is that we are concerned with what the effects are from downsizing on innovation. Our choice of focusing on the organization as our unit of analysis also has implications for how the innovation process is viewed. We are concerned with issues relating to the process taking place within the organization, implying that determinants of innovation outside the boundaries of the organization will not be considered.

ORGANIZATIONAL DOWNSIZING – A LITERATURE OVERVIEW

Defining Organizational Downsizing

We follow the definition of organizational downsizing suggested by Budros (1999, p. 70), who defines the concept of downsizing as *"an organization's conscious use of permanent personnel reductions in an attempt to improve its efficiency and/or effectiveness"*. The implication of the definition of downsizing is that we place the *conscious use of permanent personnel reductions* at the heart of downsizing. The reason is the most scholars not only associate the process of downsizing with the process of reducing the size of the organization, they also agree that downsizing is something intentionally undertaken by the organization (Budros, 1999; Cameron, 1994b; Cascio, 1993; De Meuse et al., 1994; Freeman & Cameron, 1993, 1994; McKinley et al., 1995; Mishra & Mishra, 1994).

However, it is important to note that we do not equate downsizing with layoffs. The difference between layoffs and downsizing is that layoffs are solely concerned with the individual level of analysis, while downsizing is a broader concept applicable to other levels of analysis than solely the individual level. Additionally, downsizing is a strategic decision while layoffs are an operational mechanism used to implement a downsizing strategy. (Freeman & Cameron, 1993).

The emphasis on being a strategic *intent* instead of being an *involuntary* loss of resources is what distinguishes organizational downsizing from the literature on organizational decline (see discussions in Cameron, 1994a, b; Cameron et al., 1991; Cascio, 1993; Freeman & Cameron, 1993, 1994). Freeman & Cameron (1993) identified four factors that distinguishes downsizing from decline, and distinguish downsizing from other related concepts. First, downsizing is an *intentional* endeavor. Second, downsizing is not limited to *reductions in personnel*, although it is usually involved. Third, the focus of downsizing is to improve either the *efficiency* or the *effectiveness* of the organization. Finally, *work processes* are likely to be affected, wittingly or unwittingly. An additional difference between the literature on downsizing and decline respectively is that downsizing activities can be implemented independent of if the organization is growing or declining (Cameron et al., 1991).

There is also a need to elaborate on the last part of the employed definition of organizational downsizing: "*improvement of organizational efficiency and/or effectiveness*". Most organizations that downsize are concerned with improving the efficiency of the organization (Amabile & Conti, 1999; Cameron, 1994b; De Meuse et al., 1994; Freeman, 1999; Freeman & Cameron, 1994; Mishra & Mishra, 1994).

However, there are few practical examples of organizations aiming for effectiveness, and no theoretical or conceptual discussions on the concept of effectiveness and its relationship with downsizing (Budros, 1999). In this paper we are therefore concerned with how organizations aim at doing things more efficiently and are not concerned with effectiveness.

During the last two decades there have been numerous examples of companies downsizing, yet many managers do not use the word downsizing. Instead they use concepts such as building-down, reorganizing, rationalizing, consolidating, rightsizing, resizing, slimming, etc (for a comprehensive list see Cameron, 1994b). We have chosen to see these concepts as overlapping and synonymous concepts, where downsizing is the general concept encompassing all of the above-mentioned concepts. The reason is that the underlying logic is common for all these concepts, namely that they are strategic implementations that affect at least one of the following: a) the size of the company's work force, b) the costs, or c) the work processes (Cameron, 1994b).

Existing Research on Organizational Downsizing

Studies of organizational downsizing have been conducted at three levels of analysis: a global or industry level, a micro or individual level, and an organizational or strategic level. At the global or industry level discussions on downsizing includes mergers and acquisitions, joint ventures, market strategies and national employment trends (Pinsonneault & Kraemer, 2002). The micro or individual level of downsizing focuses on issues such as individual stress, empowerment and trust (Devine et al., 2003; Mishra & Mishra, 1994; Mishra & Spreitzer, 1998; Mishra et al., 1998; Spreitzer & Mishra, 2002). Research at the organizational or strategic level has received increased attention, dating back to the special issue on organizational downsizing published by Human Resource Management in 1994 (Cameron, 1994a). In the special issue and in subsequent articles the focus has been on examining the following three questions; 1) *whether* to implement downsizing, 2) *how* to implement downsizing and 3) *what* the effects are of downsizing on the organizations performance.

Studies of *whether* to implement downsizing has focused on identifying the key dimensions of downsizing in order to improve the competitive position of the organization (e.g. Bruton et al., 1996; Cameron, 1994b; Drew, 1994). Studies concerned with *how* an organization downsize are often based on a theoretical model of downsizing approaches and/or discussion of "best practice" (e.g. Cameron, 1994b; Freeman & Cameron, 1994). Most studies of *what* the effects are of downsizing focus on the effect on the individual (e.g. Devine et al., 2003; Mishra & Mishra, 1994; Mishra et al., 1998). Examples of effects that have been studied are how empowerment and trust changes among employees that are left in the organization after downsizing. Survivors lose trust in the top management and may believe that the company is unreliable. Additionally the willingness to take risks also declines and the employees become more resistant to change (Cameron et al., 1991; Devine et al., 2003; Mishra et al., 1998).

In comparison to these studies we are mostly concerned with the effects of downsizing on innovation. This is an area which has so far not been that thoroughly researched. This is to some extent surprising, as the ability to be innovative and to engage in rapidly and relentless continuous change is often crucial for survival (Bourgeois & Eisenhardt, 1988; Damanpour, 1991). Three exceptions can be found in the literature:

- First, Dougherty & Bowman (1995) who examined the effects of downsizing on product innovation. In their article the authors examined if downsizing hinders or help product innovation, and in what way. The main conclusion in their study is that

downsizing disrupts the organization's ability to create innovations since downsizing breaks the system of entrepreneurial networking in the organization.

- Second, Amabile & Conte (1999) who examined changes in the work environment during downsizing. They identified that the work climate is negatively affected by downsizing, and in particular that creativity diminishes during downsizing. Furthermore it appears that the creativity in the organization is depressed a long time beyond the end of the downsizing, prompting Amabile & Conte (1999, p. 637) to state that "the product innovation future of this high-tech company could be in serious danger".

- Third, Bommer & Jalajas (1999), identified four consequences of downsizing at the individual level: (1) the willingness to take risks were reduced, (2) there was a reduced willingness to make suggestions, (3) the motivation to do a good job was reduced, and finally (4) there was a rise in fear in the organization.

A common theme across these three studies is a plea for more studies linking downsizing to various aspects of innovation. In particular each of these three studies touches upon, but do not explicitly discuss, the role and importance of a) the organization's stock of knowledge (c.f. Dougherty & Bowman's idea about entrepreneurial networking), b) the individual's creativity (c.f. Bommer & Jalajas discussion about effects from downsizing at the individual level), and c) the knowledge creation processes necessary to create innovations (c.f. Amabile & Conte's idea about changes in the work climate affecting creativity and ultimately innovation).

Our aim in this paper is to theoretically examine the relationship between downsizing and innovation, through examining the impact of downsizing upon three components: a) the organization's stock of knowledge b) the individual's creativity, and c) the knowledge creation processes. But before we can do so we need to understand the process leading to innovation, after which it is possible to address the relationship between downsizing and innovation in more detail.

ORGANIZATIONAL INNOVATION – A LITERATURE OVERVIEW

It is well documented that the management of innovation is a key source of competitive advantage (e.g. Kogut & Zander, 1992; Schumpeter, 1934; Tidd *et al.*, 2001; Wheelwright & Clark, 1992; Zander & Kogut, 1995). The importance of innovation for competitive advantage is reflected in research on innovation management, which is a huge field. Brown and Eisenhardt (1995) argue that innovation research is conducted at either an economic-oriented tradition across countries and industrial sectors, or at an organizational-oriented tradition, concerned with the micro level of product development within companies. We follow the later of these two traditions as we are concerned with how downsizing affects innovation within organizations. Important to note is also that we focus on the factors influencing innovation, and that our focus is on innovation as a general concept, avoiding the sometimes blurred debate concerning the type of innovation being in focus, e.g. being radical or incremental, etc. (Garcia & Calantone, 2002).

Over the years there have been several attempts to synthesize the literature on innovation management in order to grasp what is a rather fragmented literature. In our synthesis of innovation management literature, we draw on three existing, widely referenced, literature reviews (Brown & Eisenhardt, 1995; Damanpour, 1991; Tushman & Nadler, 1986), to build on existing knowledge and avoid re-inventing the wheel. Building upon these reviews, we

have created a synthesized model of the drivers of innovation (see Figure 1). In our synthesis of existing research, we have paid particular attention to the determinants of innovation which are likely to be affected by downsizing.

Figure 1: The Innovation Process (Source: Brown & Eisenhardt, 1995; Damanpour, 1991; Tushman & Nadler, 1986)
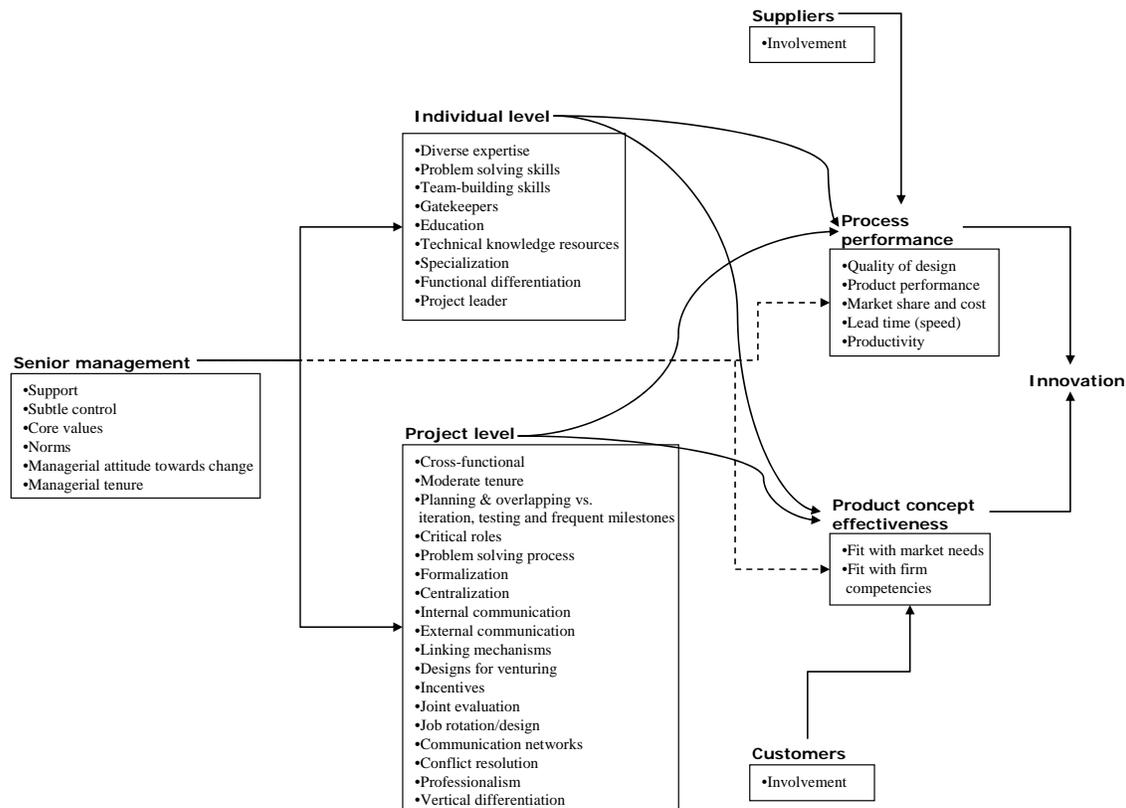
The first part in the synthesised model of the innovation process concerns the role of senior management, who directly influences the individual working in development projects, as well as the whole project. Senior management can also, indirectly (indicated by the dotted lines in the figure), influence the performance of the process as well as the effectiveness of the product concept, even though these two components are essentially influenced by the individual in the organization or by the project. It should also be noted that since we are concerned with the intra-organizational level we will not further elaborate upon the role of suppliers and customers for creating innovations.

Senior Management

Senior management has an important role in stimulating innovation in companies. Senior management support is notoriously mentioned as being positively correlated with product development success, as it provides the projects with both financial and political resources (e.g. Cooper & Kleinschmidt, 1987; Gupta & Wilemon, 1990; Zirger & Maidique, 1990). In addition senior managment may also influence who is selected as project leader and the

amount of subtle control given to the project leader (Brown & Eisenhardt, 1995), as well as actively bringing together individuals from diverse areas of work to solve common problems (or opportunities) (Tushman & Nadler, 1986). Finally senior management has an important role in communicating and being a role model for subordinates in order to reinforce innovation (Damanpour, 1991).

However, the role of senior management in stimulating innovation is far from straightforward. If senior management goes beyond a directive role, into a more detailed governance of a project it creates lower team performance (Bonner et al., 2002). Extensive involvement with many formal controls reduces the autonomy and consumes time for the product development project. At the same time too little control can also be negative, as the team does not get guidance and feedback from senior management (Karagozoglu & Brown, 1993).

Individual Level

The individual level is of crucial importance for achieving innovation as it is the individuals in the organization that actually do the development work (Brown & Eisenhardt, 1995). At the individual level the benefits of having a variety of specialists is said to be a broader knowledge base and increased opportunities for cross-fertilization of ideas (Damanpour, 1991). Amabile (1988) holds a similar view as she argues that innovation is the result of creativity and creativity in turn is defined as the production of novel and useful ideas by and individuals or a small group of individuals working together. These individuals would, however, have limited opportunities to interact if the project leader does not work hard on achieving integration and coordination between the individuals, such as gatekeepers (Allen, 1977) and idea generators, within the organization (Tushman & Nadler, 1986).

Project level

A consistent theme in the literature on innovation management is the emphasis on having cross-functional teams where members from various functional areas are included (e.g. Wheelwright & Clark, 1992; Zirger & Maidique, 1990). The argument is that an increased amount and diversity of information is beneficial for improving the development process (Brown & Eisenhardt, 1995). Additionally having a broad set of contacts increases the opportunities for learning from others and increases the possibility of having informal contacts in the organization which is claimed to be beneficial to the organization (Tushman & Nadler, 1986). The role of communication, both internal and external, is said to affect the process performance and ultimately innovation since the project get access to a larger amount and diversity of information (Damanpour, 1991; Imai et al., 1985). A related issue to the role and importance of communication is the question of team tenure, where it is argued that a moderate tenure is beneficial, a project with a short history lacks the mechanisms to work effectively, where as projects with long tenure tend to neglect external information and become inward focused (Katz, 1982, 2004).

Process performance

The process performance consists of five related components. The quality of design is related to the issue of the timing of releasing a product to the market, and what flexibility a company has in that process. Product performance and lead time are both associated with the speed of the overall development cycle, i.e. how long it takes before the company has a product out on the market. The ability of having a rapid, yet flexible development process, in terms of having the possibility of being flexible in the timing of introducing new products, has implications

for the overall productivity, market share, cost, and the ability to achieve a premium price (Brown & Eisenhardt, 1995; Wheelwright & Clark, 1992). Most of the research done this far is concerned with ways to make the innovation process more efficient, without taking into account that there are different types of innovations ranging from radical to incremental (Garcia & Calantone, 2002). The answer to handle these two types of innovations has been identified to be the building of what Tushman &O'Reilly III (1996) call "ambidextrous organizations".

Product concept effectiveness

In the literature it is claimed that the development of products that are low-cost, have unique benefits and are built upon the specific competencies within the company create financially successful products since these products are more attractive to customers (Brown & Eisenhardt, 1995). The ability to create attractive products resembles the idea of generic strategies (Porter, 1980, 1985). Companies that want to attain a sustainable competitive advantage need to focus one of three possible generic strategies: overall cost leadership, differentiation, or focus. The discussion of the need to have a fit between a company's competencies and the needs of the market is similar to the discussion concerning strategic fit. For instance Miles & Snow (1984) discuss the need of a company to have a strategic fit both externally with the environment, and internally among strategy, structure and management processes.

ORGANIZATIONAL DOWNSIZING AND INNOVATION

Returning to our model over the innovation process it is clear that not all parts of the process are affected by downsizing. In Figure 2, we have indicated the parts of the innovation process that are likely to be affect by downsizing. As can be seen in figure 2 the decision to initiate downsizing, taken at the senior management level, have implications both at the individual level, but also at the project level.

Figure 2: Influence from Downsizing on the Innovation Process (influence indicated by *italics*)
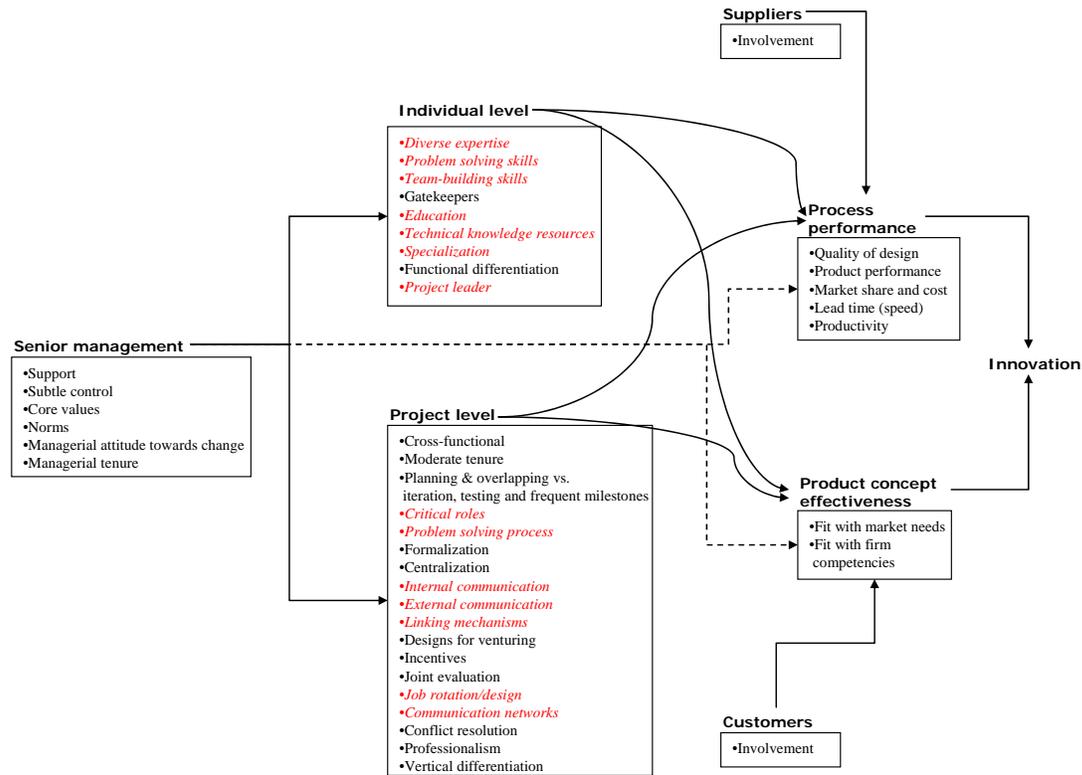
Downsizing at the individual level

At the individual level the effects from implementing downsizing are several. Naturally the *project leader* is affected as the focus may turn from the project and its goals to solely achieving strictly financial goals, and the willingness to take risks may decline as the project leader becomes resistant to change (Bommer & Jalajas, 1999; Mishra et al., 1998). Additionally it has been shown that downsizing may cause critical skills to disappear (Drew, 1994), which in turn may affect the *problem-solving* and *team-building skills* in the company.

Following downsizing may also be a need to change processes and procedures as well as defining new job responsibilities and reporting relationships (Spreitzer & Mishra, 2002). The result of downsizing may be that remaining members in the organization have to take on jobs of laid-off coworkers, requiring different skills, thus, reducing the overall level of *education* in the organization as well as a decrease in *specialization* among the remaining individuals (Mishra & Spreitzer, 1998). Both Devine et al. (2003), and Amabile & Conte (1999) argue that there is a need to manage the individuals that are left after a downsizing, in particular there is a need to pay attention to the individuals level of stress and well-being. If not correctly handled there is a risk that the long-term ability of being innovative is reduced, since the individual creativity is hampered (Amabile & Conti, 1999).

Downsizing at the project level

The results of downsizing at the project level are often correlated with lower levels of work encouragement for creativity and problem solving (Bommer & Jalajas, 1999), hampering the *problem solving process* (Amabile & Conti, 1999), there may also be a resistance to change (Cameron, 1994b). There also seem to be a deterioration of *communication*, both internally and externally, as well as on different levels (Cascio, 1993; Dougherty & Bowman, 1995), i.e. damaging the *linking mechanisms* or entrepreneurial networking (Dougherty & Bowman, 1995). A related issue to communication is the fact that downsizing breaks the *networks* of informal relationships (Dougherty & Bowman, 1995). Since fewer people are left to do more work the ability to *rotate* between different jobs is also limited (Drew, 1994), and at the same time as there are fewer employees left to do the work, more *roles* (i.e. individuals) becomes *critical* for the success of the organization (Mishra et al., 1998). Finally, the downsizing seem to hamper both the process leading up to innovation in terms of a reduction of communication, damaged linking mechanism and reduced possibilities for entrepreneurial networking. Additionally the overall stock of knowledge within the organization also seems to be reduced as there are fewer employees left to do the work.

A MODEL OF THE EFFECTS OF DOWNSIZING ON INNOVATION

In synthesizing the effect of downsizing on innovation one step further, into a model, we use knowledge as a central organizing variable. Knowledge has extensively been pointed out as the key resource for innovation (Grant, 1996; Kogut & Zander, 1992; Spender, 1996; Teece, 1998; Zander & Kogut, 1995). In fact, innovation can in one sense be seen as the result of the combination of existing and new knowledge (Kogut & Zander, 1992). Underlying the framework is thus the proposition that downsizing influences innovation through its effects on organizational knowledge. This is in line with the proposition posed by Fisher and White (2000, p. 249) that 'downsizing /…/may seriously damage the learning capacity of organizations'.

Our synthesized model is shown in Figure 3. The model contains three central components, which have previously been shown to be significant for innovation to occur: a) the organization's stock of knowledge (Kogut & Zander, 1992; Zander & Kogut, 1995), b) the individuals' creativity (Amabile, 1993; Bommer & Jalajas, 1999), and c) knowledge creation processes (Nonaka, 1994; Nonaka & Takeuchi, 1995). Below, we go through these three components and discuss how downsizing influences each of them. The discussion is summarized into propositions.

Figure 3: A Model of the Relationship between Downsizing, Knowledge, and Innovation
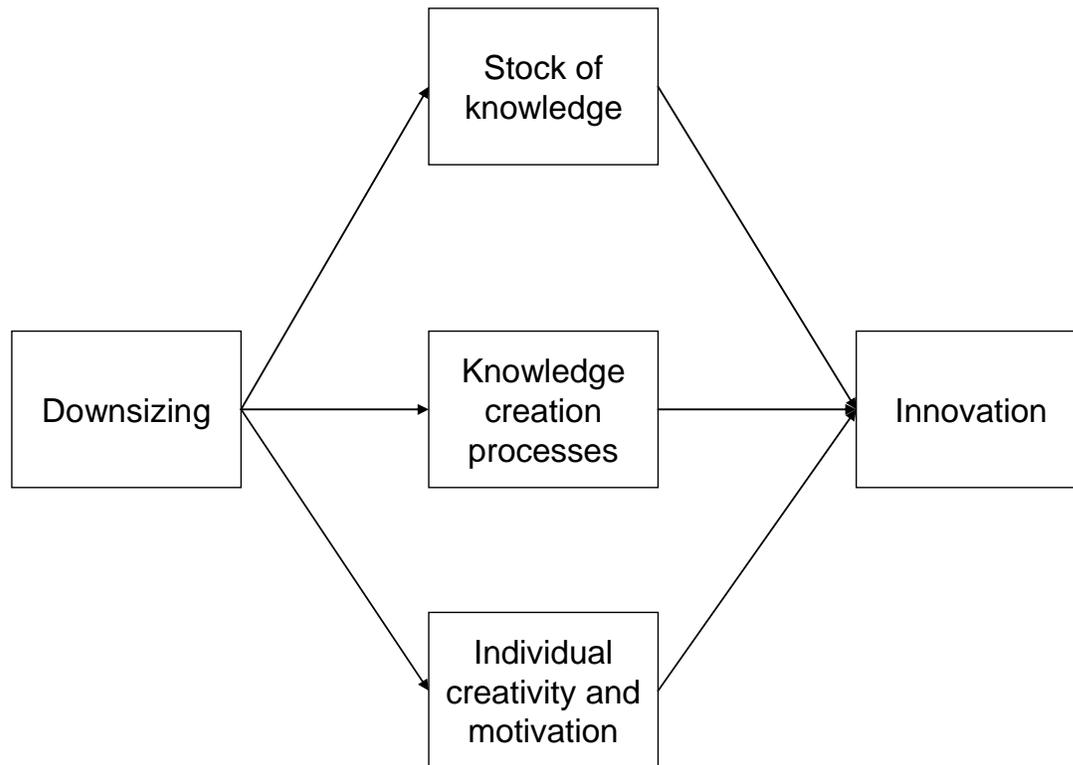
Downsizing and the organization's stock of knowledge

One of the more direct effects of downsizing on innovation is through the effect on the organization's stock of knowledge, here defined as the collective competence among the employees in the organization, including both formal and informal relationships (c.f. Dougherty & Bowman, 1995). Venzing et al. (1998) points out that it is difficult to observe the knowledge status and flow in the organization, and for that reason the knowledge that resides in an organization is unique to that specific organization, which in turn makes it difficult to know what the full effects of implementing downsizing will be for the organization and its ability to be innovative.

It is, however, fairly straightforward to assume that implementing downsizing reduces the organization's stock of knowledge. As employees leave the organization critical skills may be lost which can damage customer relationships or operations (Drew, 1994). Gupta and Wilemon (1990) identified that if there are too many inexperienced project members, or the wrong mix of members in a project group, the product development process is delayed. In a similar vein, it has also been found that downsizing breaks the network of informal relationships, these relationships are of crucial importance for innovators who draws upon experiences in various parts of the organization, building commitment and sponsorship from senior management, and as a consequence of downsizing the remaining members in the organization have fewer avenues to get support and resources (Dougherty & Bowman, 1995).

Thus, the management of an organization's stock of knowledge is becoming more important and includes a need for companies to decide on and balance a maximal transfer of knowledge internally, while keeping control of the direction and diffusion of knowledge to the external environment. According to Kogut and Zander (1992, p. 384) "the central competitive dimension of what firms know how to do is to create and transfer knowledge efficiently within an organizational context". As a consequence the focus is no longer solely on the process of knowledge transfer, but also incorporates the management of a firms stock of knowledge for creating a competitive advantage (Kogut & Zander, 1992; Zander & Kogut, 1995). The reason is that the knowledge held by a company and the way that people cooperate within the company is embedded in organizational principles, and these principles are more than the knowledge at the individual level, making it not possible to hire new employees when old employees leave expecting them to have the same knowledge within the organization since the organization's stock of knowledge certainly will look different (Kogut & Zander, 1992).

Proposition 1: downsizing negatively affects the organization's stock of knowledge

Downsizing and the individual's creativity

Individual creativity is at the heart of innovation. It is individuals' creativity that makes development of new ideas possible (Amabile, 1988; Amabile & Conti, 1999; Van de Ven, 1986). Negative effects on individual creativity will thus have a negative impact on innovation. Downsizing has been found to negatively affect individual creativity (Amabile & Conti, 1999). Bommer & Jalajas (1999) identified that downsizing is associated with (1) less risk taking among the employees, (2) the willingness to make suggestions was also reduced, (3) a decreased motivation of doing a good job, and finally (4), increased amounts of fear. All these effects are damaging innovation. Similarly, Amabile and Conte (1999) found that creativity within the organization suffers considerably during downsizing, and the effect seems to last several months after the downsizing ended, and as a consequence they argue that the future capabilities of being innovative for downsizing companies may be in grave danger. Thus, we would propose that:

Proposition 2: downsizing negatively affects the individuals' creativity

## Downsizing and the knowledge creation process

The third and final effect of downsizing on innovation is through its effect on the knowledge creation processes that are necessary for successful innovation to occur (Crossan *et al*, (1999). The ability of a company to create knowledge allows the company to develop better products and services (Nonaka, 1994). Thus, the ownership of knowledge assets, and the ability to combine them with other assets, create values which in turn lead to a competitive advantage (Teece, 1998).

Using knowledge creation processes as the third and final variable that links downsizing with innovation is in particular motivated by the fact that it focuses the processes within the organization that link the individual and group levels of analysis (Crossan *et al*, (1999). This is consistent with our focus on the intra-organizational effects of downsizing. It is also

suitable given the identified effects of downsizing on the individual and project level, see Figure 2. Knowledge creation processes is also what links the other two components in our synthesized model: individuals use their creativity to build on the existing stock of knowledge to create new knowledge which is embedded in new products and services.

Following the pioneering work by Nonaka (1994; Nonaka & Takeuchi, 1995), we conceptualise knowledge creation as the ability to share and transfer knowledge among employees in the organization. The process of creating knowledge takes place in the continuous and dynamic interplay between tacit and explicit knowledge which involves four different patterns of interaction: *socialization* (tacit to tacit), *externalization* (tacit to explicit)*, combination* (explicit to explicit), and *internalization* (explicit to tacit) (see Fig. 1). These patterns of interaction are a representation of the ways that existing knowledge may be transformed into new knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995).

Figure 4: Four Modes of Knowledge Conversion (Source: Nonaka & Takeuchi, 1995, p. 62)

	Tacit knowledge	Tacit knowledge	
Tacit knowledge	Socialization	Externalization	Explicit knowledge
Tacit knowledge	Internalization	Combination	Explicit knowledge
	Explicit knowledge	Explicit knowledge	
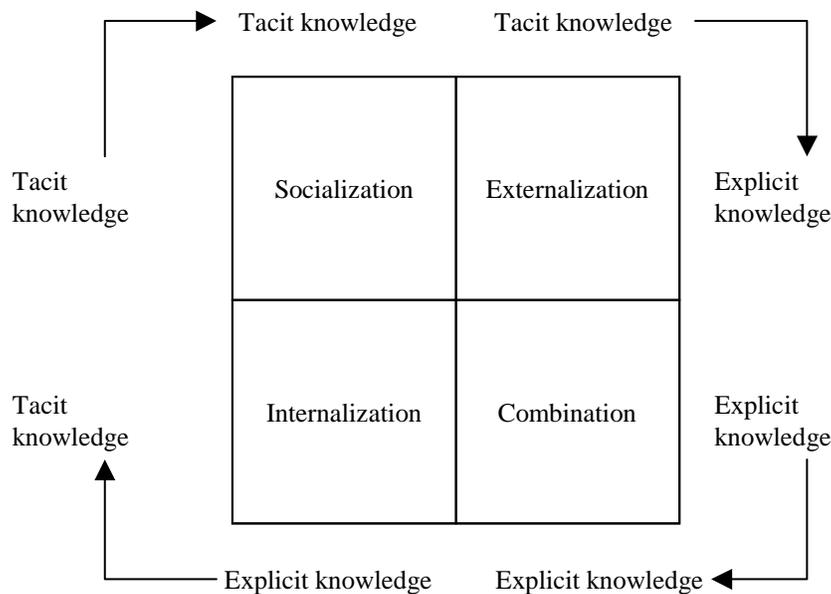
- *Socialization* is the process of acquiring tacit knowledge without language, by sharing experiences through observation, imitation and practice, thereby creating tacit knowledge such as shared mental models and technical skills. Thus, socialization is required for individuals to interact with one another. On-the-job training is a common example of socialization.

- The process of articulating tacit knowledge to explicit concepts is called *externalization*. This is trigged by a dialogue among employees in the organization in

which metaphors, concepts or models are developed to generate an understanding of what is going to be developed.

- ▪ *Combination* is the process of combining different kinds of explicit knowledge. Through adding, sorting and recategorizing explicit knowledge new knowledge is developed.

- ▪ *Internalization* is the process of embodying explicit knowledge into tacit knowledge. Internalization occurs as different employees share mental models and technical know-how, a process closely related to "learning by doing". For explicit knowledge to be turned into tacit it is often helpful if the knowledge is verbalized or diagrammed into manuals, oral stories or documents.

Organizational knowledge is created in the continuous and dynamic interplay between tacit and explicit knowledge, which occurs when there is a shift between the four modes of knowledge conversion. There are different things that affect the changes from one form to another. Socialization occurs through the creation of teams in which the employees in the organization interact. The team makes it easier for the employees to share their experiences and perspectives. The externalization process is created by the use of dialogues, e.g. regarding what a metaphor should consist of. Combination may occur when there is co-operation around the development of a new product or a service. Internalization creates new knowledge by using learning by doing, in a process where errors occur and are corrected, and concepts are modified, in order to create a better solution. We would expect downsizing to affect each of the four modes of knowledge conversion differently, making it difficult to say with certainty that downsizing is either positively or negatively related to knowledge creation processes

Downsizing and the Process of Socialization

Starting with socialization, a process calling for extensive interactions between members in the organization, the result of downsizing in terms of having fewer employees is that the process of socialization may be facilitated in different ways – depending on who (and the competencies that person is holding) leaves the project (Richtnér, 2004). First, if a project loses one or more key members, then the remaining members need to have a joint execution in order to share their experiences and ultimately making the project successful. Second, if newcomers replace more experienced members, there may be need to conduct on-the-job-training if the new member lacks experience (Devine et al., 2003), thus facilitating the process of socialization.

Proposition 3: downsizing positively affects the process of socialization

Downsizing and the Process of Externalization

The process of externalization is about establishing design concepts and prototypes in order to capture the spoken and unspoken needs of customers, which requires the use of metaphors, analogies, and models (Nonaka & Takeuchi, 1995). We would expect downsizing to trigger a dialog among the remaining employees in the organization, as experienced employees are lost or newcomers come into the projects, as a consequence of the necessity for everybody to understand the direction of an innovation project. Similar arguments can be found in previous studies, for instance, Katz (1982) and Katz and Allen (1982) argue that new members in innovation projects can contribute with fresh ideas and approaches, which is positive for the project. A similar idea is "redundancy", the intentional overlapping of information about

business activities and management responsibilities (Nonaka & Takeuchi, 1995), in innovation projects. The idea of redundancy is related to "strategic rotation" of personnel inside the organization (Nonaka, 1991, 1994), where newcomers contribute with new insights, but also to the issue of cross-functional teams (Brown & Eisenhardt, 1995; Zirger & Maidique, 1990).

The process of externalization and the consequence of downsizing are closely related to the findings above, concerning the process of socialization. Once a project loses competence in some way it needs to have a dialogue in the project on the metaphor, or concept being developed, thus facilitating the process of externalization. To summarize:

Proposition 4: downsizing positively affects the process of externalization

Downsizing and the Process of Combination

Documentation of product development projects is often of crucial importance since objective data can be analyzed systematically by interested actors ranging from customers to top management. For members of a project the possibility to have documents, data and prototypes makes it is easier for members to gain systematic knowledge of the product being developed by the project (Nonaka & Takeuchi, 1995), which in turn facilitates the process of combination.

We would expect downsizing to varied effects on to the process of combination. Downsizing may bring about a need to make as much knowledge as possible explicit to all members of a project, which calls for an increased documentation and more frequent meetings. The reason is that the members of a project may fear that they will be affected by future downsizing (Bommer & Jalajas, 1999) and as a consequence want to make as much knowledge as possible explicit. Yet, on the other hand, downsizing may imply that the remaining individuals in the organization become more concerned about the own interests (Mishra et al., 1998). Additionally employees working with an innovation project may reduce the number of meetings and not be willing to make a lot of documentation, making it difficult to share explicit knowledge, i.e. hampering the combination process. Thus, the consequences of implementing downsizing are, for the process of combination, pointing in different directions.

Proposition 5: the effects of downsizing on the process of externalization can either be positive or negative

Downsizing and the Process of Internalization

For the innovation project it is important that the knowledge gained from the development work is internalized, making sure the members of an innovation project share mental models and technical know-how (Nonaka & Takeuchi, 1995). A project that has verbalized or diagrammed the knowledge into oral stories, documents or manuals promotes the process of internalization. A company initiating downsizing may find that the process of internalization is facilitated. First, as members leave the project, or are replaced by less experienced members, it is necessary for the remaining members and the new member(s) to learn about the product – which is best done while working with the product, i.e. learning by doing. Second, the remaining members of an innovation project may find it necessary to share their experiences and know-how as members leave the project, which may be facilitated as the remaining

members document their work in order to make sure that other employees in the organization can read and understand what has previously been done in the innovation project.
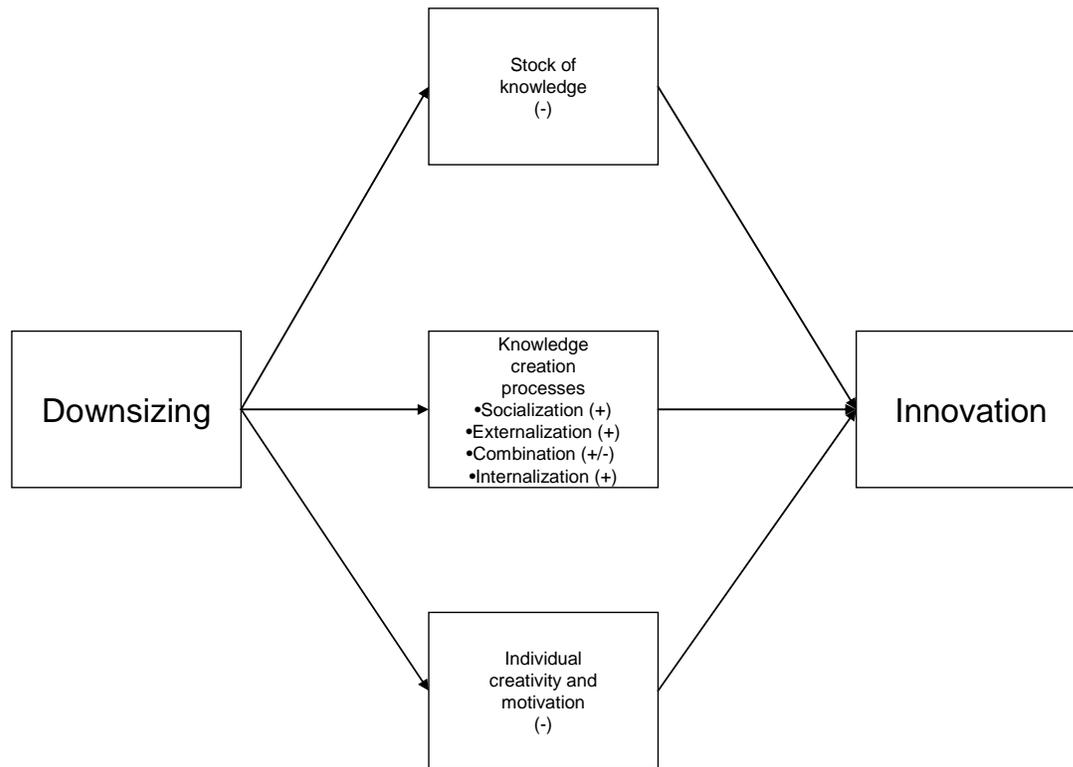
Proposition 6: downsizing positively affects the process of internalization

CONCLUSIONS

We set out to develop a model of the mechanisms through which downsizing affects innovation. The rationale was the prevalence of downsizing as a managerial practice implemented to increase efficiency and effectiveness. However, among the negative effects of downsizing is its effect on innovative capability. Whereas previous research has been useful in highlighting the existence of a negative relationship between downsizing and innovation, there have been few studies which explain this negative relationship. Drawing on existing theory on organizational downsizing, innovation management and knowledge management, we developed a model with three different components: a) the organization's stock of knowledge, b) the individuals' creativity, and c) the knowledge creation process. These are the three components which previous research on innovation management has suggested strongly affects innovation and which are likely to be affected by downsizing.

Downsizing can affect all three components in various ways, as illustrated in Figure 5. Overall, we can expect downsizing to have a negative effect on innovation, but there are aspects of the knowledge creation process which may be positively affected by downsizing. Our findings nuance the view on the relationship between downsizing and innovation, which in previous studies has been shown to be negative (Amabile & Conti, 1999; Bommer & Jalajas, 1999; Dougherty & Bowman, 1995).

Figure 5: A Model of the Relationship between Downsizing, Knowledge, and Innovation

Stock of
knowledge
(-)

Knowledge
creation
processes
•Socialization (+)
•Externalization (+)
•Combination (+/-)
•Internalization (+)

Individual
creativity and
motivation
(-)

Downsizing

Innovation

Using Nonaka's foundational work on knowledge creation, we have developed the view of the relationship between downsizing and innovation at the level of the product development projects (Nonaka, 1994). In his work Nonaka is providing a theoretical lens through which to integrate downsizing with innovation is useful as it considers individual and organizational knowledge, but also tacit and explicit knowledge. It should be noted that even though the knowledge creation process seems to be positively affected by downsizing it may be a result of, or rather a consequence of a reduction in the overall stock of knowledge in the organization, as well as a reduction among the individual's creativity. More research is clearly needed to address and further clarify the relationship between the three components of an organization's stock of knowledge, the individual's creativity, and the knowledge creation process.

Our model is conceptual and clearly needs research in order to be validated. Doing survey-type research may help to validate the propositions derived in this research, through testing and clarifying our findings. One starting point could be use the scales of socialization, externalization, combination and internalization first developed by Nonaka et al. (1994) and later refined by Sabherwal & Becarra-Fernandez (2003), to test our propositions. It would also be valuable to examine if each of the four modes of knowledge conversion are equally important at different points in time. Additionally the influence from downsizing on the process of knowledge creation, the organization's stock of knowledge, and the individual's creativity may also be tested in different environmental settings.

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