Knowledge work has been defined as a profession, a characteristic of individuals, and as an individual activity. We review and critique these definitions of knowledge work and propose that knowledge work is best understood as discretionary behavior in organizations. As such, knowledge work is understood to comprise the creation of knowledge, the application of knowledge, the transmission of knowledge, and the acquisition of knowledge. Each of these activities is seen as a discretionary behavior. Employees are likely to engage in knowledge work to the extent that they have the (a) ability, (b) motivation, and (c) opportunity to do so. The task of managing knowledge work is focused on establishing these conditions. Organizational characteristics such as transformational leadership, job design, social interaction and organizational culture are identified as potential predictors of ability, motivation and opportunity. Implications for further research and practice are identified.

Ever since Peter Drucker (1979) first coined the phrase ‘knowledge workers’, organizational practitioners, researchers and theorists have become increasingly concerned with the growing population of ‘knowledge workers’ (see for example, Horibe 1999) and, by extension, the management of organizational knowledge (e.g. Davenport and Prusak 1998; Harvard Business Review 1998; Stewart 1997; Von Krogh and Roos 1996). Special issues of both the Journal of Management Studies (1993) and the California Management Review (1998) have addressed the topic and there is increasing recognition that organizational knowledge represents the firm’s ‘intellectual capital’ (Stewart 1997) and is a source of both current and future earnings. Indeed, Drucker (1999) has gone as far as to suggest that a firm’s ability to recognize and manage organizational knowledge will be the single most important determinant of firm survival.

Despite this widespread and growing recognition, as yet there is little consensus as to exactly what constitutes ‘knowledge work’, making it difficult if not impossible to achieve Drucker’s conditions for survival. Indeed, in researching this paper, we ended up reading the accounting literature (for the extension of human resource accounting principles to the notion of intellectual capital), the MIS literature (for the identification/evaluation of technological approaches to knowledge management) as well as the management literature (i.e. for case studies and recommendations on how to motivate the ‘new’ population of management workers). Given this diversity of perspectives, it is not at all surprising to find that there are a variety of definitions for ‘knowledge work’.

We begin, therefore, by reviewing these definitions and pointing out what we believe are critical weaknesses. We suggest that some
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Definitions are too limiting, while others direct our attention in the wrong direction. We end this initial consideration by proposing our own definition - knowledge work as discretionary organizational behavior. As we discuss in detail, we believe that this new definition has substantial implications for human resource management in organizations.

Paralleling the recognition of the importance of knowledge work has been the concern that the existing body of knowledge we have accumulated about management and employee motivation is no longer relevant (see for example, Giles et al. 1999). First, the demands of the new economy are described as forcing a new focus on the acquisition of analytical skills (e.g. Locke and Kochan 1995). In turn, the advent of knowledge work is seen as substantially rewriting the assumptions and managerial practices of the past. Proponents of this view implicitly, or sometimes explicitly, assume that 'knowledge workers' somehow represent a new breed of worker with different needs, values and motivators from traditional workers. Despite this concern, recommendations as how best to manage 'knowledge workers' often emphasize building trust and increasing employee autonomy recommendations that are substantially the same as those contained in the traditional literature on employee motivation and satisfaction. Thus, although researchers have recognized the emergence of a new category of work, practical responses to this new phenomenon frequently seem like putting 'old wine in new bottles' as traditional recommendations for job design are repackaged in the language of the 'new economy'.

How then are we to 'manage' knowledge work and 'knowledge workers'? We suggest that defining knowledge work as a discretionary activity places the emphasis back on managing people in organizations. That is, rather than 'managing knowledge', our focus will be on managing the true owners of knowledge; the people who work in organizations. Organizations will be successful in this task to the extent that they increase employees' ability to engage in knowledge work, motivation to engage in knowledge work, and opportunities to engage in knowledge work. It is only by identifying and changing the organizational conditions that enhance employee ability, motivation and opportunity that we can truly engage in 'knowledge management'.

In developing this argument, we do not think it useful to discredit all that we know about organizational behavior and how to enhance organizational outcomes. Indeed, by placing the emphasis back on increasing motivation, ability and opportunity, we suggest that our accumulated body of knowledge about human resource management becomes all that much more important. Indeed, we suggest that the most startling implication of the new knowledge economy will be the increased emphasis on human resource practices in organizations.

Thus, in this paper we focus on defining exactly what comprises 'knowledge work' in organizations rather than on unquestioned and untested assumptions of what 'knowledge workers' want in organizations. In doing so, we hope to achieve three interrelated goals. First, as described above, we review the existing literature to propose a definition of knowledge work in organizations. In doing so, we explicitly reject the taxonomic approach favored in the popular management literature in favor of specifying how knowledge is actually used in organizations. Secondly, we propose a model of knowledge work based on the suggestion that the use of knowledge in organizations is largely a discretionary behavior that can be encouraged but not demanded by organizations and their managers. Finally, we identify the implications of both our definition and model of knowledge work for research and practice in organizations. In doing so, we attempt to make our assumptions about the phenomenon explicit and subject them to empirical enquiry and practical experience. We suggest that such a rigorous evaluation of assumptions is necessary in order to develop a true understanding.
of knowledge work and its impact in the new economy.

The Definition of Knowledge Work

Despite their popularity, it is increasingly clear that the terms ‘knowledge worker’ and ‘knowledge work’ are, at best, poorly defined in the literature. At least three thematic definitions of knowledge workers are evident. First, knowledge work has been defined as a profession. Secondly, knowledge work has been described as an individual characteristic. Finally, knowledge work has been defined as an individual activity. Each of these definitions is reviewed below.

Approach 1: Knowledge Work as a Profession

First, knowledge work is most frequently defined in terms of a circumscribed list of occupations, typically comprising professional occupations and those associated with information technology or high tech industries (Choi and Varney 1995; Dove 1998). For example, Nomikos (1989, 165) has defined knowledge workers as comprising ‘a group that includes scientists, engineers, professors, attorneys, physicians, and accountants’. Others, although not identifying specific occupations, identify education or organizational level as the defining characteristic of knowledge work. For example, Bentley (1990) defines knowledge workers as those with high education and training, thereby indirectly limiting the definition to professional occupations. Janz et al. (1997, 878) similarly defined knowledge workers as ‘high level employees who apply theoretical and analytical knowledge, acquired through formal education’. Wuthnow and Shrum (1983) took this form of definition to an extreme by defining knowledge workers as a ‘new class’ due to a rising number of knowledge-based occupations and rising levels of education.

As others have noted, this is an elitist view (Choi and Varney 1995) that we believe finds its roots in the Tayloristic tradition of separating ‘thinking’ and ‘doing’ in organizations. There are several problems with such an approach. First, the separation of thinking and doing is a holdover from an earlier age, which ignores the expanding role of blue-collar workers under new forms of work organization. For example, in firms that adopt strategies of participative management, blue-collar workers are frequently highly trained in production processes and/or quality control and routinely participate in creative decision making as part of their jobs (see Cusimano 1995 for a description of such training efforts). Re-engineering groups, quality control groups, participative decision-making initiatives and a host of autonomous or semi-autonomous work groups in organizations belie the assumption that there are ‘managers’ who think and ‘workers’ who do. Rather, current models of production and organization require the active involvement of all workers in the planning of production processes and the resolution of specific problems in organizations.

This is an important exclusion because every major analysis of workplace change has identified increased worker participation as a central feature of the new environment (Giles et al. 1999). By excluding certain groups of employees from our definition of knowledge workers, we take away both the opportunity for these individuals to contribute to the organization as well as the expectation that such contributions will be made. We suggest that both employees and their employing organizations are considerably disadvantaged by this approach.

Secondly, defining knowledge workers in terms of specific occupations focuses on credentialism rather than contribution. That is, this approach focuses on what individuals have done (i.e. education, experience, professional qualifications) rather than on what they are doing (i.e. the way they are currently contributing to the organization). For example, although they encourage a broader definition, even Choi and Varney (1995)
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retain the qualification of ‘well educated’ (p. 41) as part of their definition of knowledge worker. As Dove (1998) points out, it is the possession of ‘knowledge’ that defines knowledge workers, not the possession of credentials. In defining knowledge workers as those possessing educational or professional qualifications, researchers divert focus from what workers actually do in favor of a focus on what position individuals hold in the organization.

Finally, defining knowledge workers in terms of occupations can be misleading. As Scarbrough (1999, 8) notes ‘Knowledge workers are not a discrete occupational group and most of the descriptions of such workers tend to lump together a variety of education and roles.’ In doing so, researchers risk muddying the waters by focusing on a diverse and heterogeneous ‘category’ (i.e. knowledge workers) comprising many individual subcategories (i.e. occupations).

Approach 2: Knowledge Work as an Individual Characteristic

In partial recognition of these problems, some authors have begun to define knowledge workers in terms of individual characteristics as opposed to characteristics of the job. For example, Ahmad (1981) defined knowledge workers as egotistical and sensitive individuals who thrive on public recognition. More typically, Tampoe (1993) emphasizes creativity and innovation in his definition as does Brophy (1987). An extension of this strategy is to define knowledge workers in terms of what they contribute to the organization as a result of personal characteristics such as creativity and innovation. For example, Harris and Vining (1987) emphasize the role of knowledge workers in adding value to products and services. Similarly, Harrigan and Dalmia (1991) define knowledge workers as those who create intangible value-added assets.

This approach has the advantage of moving beyond the occupational title to a consideration of what an individual actually contributes. Thus, the creation of value or being innovative becomes the hallmark of knowledge work rather than incumbency in a particular position. However, it must be noted that occupations in most organizations are hierarchically structured such that the opportunity to make this type of contribution is not open to all.

Again, focusing on individual characteristics or their expression in the workplace runs the danger of setting up two ‘classes’ of workers; those that display creativity and those that do not. More importantly, such a definitional strategy confounds ability and opportunity (Parker and Wall 1998); it is not clear whether knowledge workers are more creative or more innovative as much as they are simply given the opportunity to express these characteristics in the workplace. This is an important consideration, because most organizations are designed along lines that create opportunities to contribute for some individuals and take away opportunities for others. It remains unclear whether the level of contribution an employee makes to the organization is a function of his/her ability or creativity or whether it is a function of the opportunity to contribute.

Approach 3: Knowledge Work as an Individual Activity

A final and still emerging definitional strategy has been to define knowledge work in terms of the balance of ‘thinking’ and ‘doing’ activities. For example, Drucker defines knowledge work as comprising those jobs in which incumbents work more with their heads than with their hands. In this approach, the focus is on what employees actually do in their day-to-day activities (i.e. creation of ideas, Conn 1984; work that entails high levels of cognitive activity, Helton 1988; individuals who work with information to make decisions, Fox 1990). Again, recognizing the potential confound with opportunity, this approach has the merit of attempting to focus on behavior to
define knowledge work. At the same time, this approach is not without its critics.

Several authors have noted the potential to define the category of ‘knowledge work’ out of existence by relying on contribution or the use of intellectual abilities. Most employees, for example, make some contribution to the firm (thereby adding value) and use some intellectual abilities in the daily completion of their duties. Yet, if all work is rightly understood as knowledge work, then the category is superfluous. That is, if we are all knowledge workers, then there is no need to use the term – simply referring to ‘workers’ would imply ‘knowledge workers’.

We suggest that this is the case and that the categorical definition of ‘knowledge work’ and ‘knowledge workers’ is misleading. In particular, reliance on such definitions has focused attention on specific groups of workers rather than on what those workers actually do in organizations. In contrast, we propose that knowledge work is not a category, but rather a continuum along which work may vary. Thus, all employees may well be knowledge workers although the extent and nature of knowledge use may vary substantially both within and across organizations.

A Proposed Definition of Knowledge Work in Organizations

We suggest that knowledge work is best understood, not as an occupation, but as a dimension of work. That is, the most appropriate focus for researchers and managers is on the use of knowledge in the workplace. While occupations may be expected to vary in the role that knowledge plays, there is also expected to be considerable variation within occupations as individuals choose (or choose not) to use their knowledge to aid the organization.

How then is knowledge used in the workplace? In their investigation of knowledge work in 30 organizations, Davenport et al. (1996) describe at least four forms of knowledge use. First, employees may be primarily engaged in finding existing knowledge. Secondly, employees may be involved in creating new knowledge. Existing knowledge may be packaged by employees for other consumers or may be applied to a production process or problem.

These four themes are also evident in the eight categories of firm knowledge use identified by Ruggles (1998) who suggested that organizational knowledge use consists of:

- generating new knowledge
- accessing valuable knowledge from outside sources
- using accessible knowledge in decision making
- embedding knowledge in process, products, or services
- representing knowledge in documents etc.
- facilitating knowledge growth
- transferring existing knowledge into other parts of the organization
- measuring knowledge assets.

Similarly, Nonaka (1991a) focuses on the creation of knowledge and in particular the interrelations between explicit and tacit knowledge. Explicit knowledge is that which can be transmitted to others through formal, systematic language (Polyani 1966). In contrast, tacit knowledge refers to knowledge that is embedded in individual experience and, as a result, is difficult to communicate to others. Polyani (1966, 4) defines the essence of tacit knowledge with his observation that ‘We know more than we can tell.’ A set of technical drawings or measurements constitutes explicit knowledge; the skill that a master craftsman has ‘at his finger tips’ constitutes tacit knowledge (Nonaka and Takeuchi 1995).

Nonaka (1991a, 1994) proposed a fourfold classification (see Figure 1) resulting from the transmission of both types of knowledge. Socialization involves the transmission of tacit knowledge between individuals as when a new employee learns through observing and working with a skilled worker (e.g. on-the-job training or apprenticeship systems). Com-
Knowledge work as organizational behavior

Combination involves the transmission of explicit knowledge between individuals and is perhaps best illustrated by the activities that constitute formal education (i.e. teaching a class). Articulation refers to the conversion of tacit knowledge to explicit knowledge. Literally, articulation involves making the ‘unknown’ known. As Nonaka and Takeuchi (1995) the use of metaphor and analogy constitute articulation. Finally, internalization is represented by the conversion of explicit knowledge to tacit knowledge. Professions that involving diagnosis and trouble-shooting (e.g. mechanics, medicine, repair) are based on internalization whereby the individual learns the formal knowledge so well it becomes ‘second nature’. As a result, skilled workers in these areas will often know the answer to a problem without being able to reproduce their decision-making steps. Nonaka (1991a) also suggest that articulation and internalization are the most important forms of knowledge creation because they result in an increase in the organization’s store of knowledge.

Thus we define knowledge work as a discretionary behavior focused on the use of knowledge. Based on the foregoing, we have suggested that there are at least four forms of knowledge work in organizations: (a) the creation of new knowledge or innovation; (b) the application of existing knowledge to current problems; (c) the packaging or teaching (see Bird (1994) and Nonaka (1991a) for a discussion of the importance of knowledge transmission) of knowledge; and (d) the acquisition of existing knowledge through research and learning. We suggest that each of these forms may be manifested by workers at all levels of the organization and that the organization’s ability to ‘manage knowledge’ will be a direct function of the ability to elicit these forms of discretionary behavior in the workplace.

Towards a Model of Knowledge Work

Knowledge Work as Discretionary Behavior

It has become increasingly popular to link the notion of knowledge work to the notion of intellectual capital (Edvinsson and Malone 1997; Stewart 1997) and, hence, directly to the value of the firm. Drucker (1999), for example, describes knowledge workers as ‘capital assets’ (p. 87). Ulrich (1998) defined a firm’s intellectual capital as a multiplicative function of ‘competence’ and ‘commitment’. Previously, Barling et al. (1996a) described the fundamental equation of industrial/organizational psychology as

Performance = Ability × Motivation

Implicit in this multiplicative model is the assumption that if either quantity (i.e. ability or motivation) equals zero, then performance will also equal zero. Thus, the model is non-compensatory in that high levels of ability do not compensate for a lack of motivation and vice versa. Wall et al. (1992) extended this basic formula to include the role of opportunity – in addition to ability and motivation, employees must have the opportunity to perform. Our proposed model of knowledge work draws on these formulations to propose that the use of knowledge at work is enhanced by organizational practices that increase employee’s knowledge (i.e. ability), employee’s motivation to use knowledge or employees’ opportunities to use knowledge in the workplace. More formally, employee ability,

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Figure 1. Nonaka’s modes of knowledge conversion.

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motivation and opportunity are posited as mediators of the relationship between organizational practices and the use of knowledge in the workplace.

Implicit in this formulation is the notion that knowledge use in organizations is fundamentally a discretionary behavior. Drucker (1999, 84) suggested that increasing knowledge worker productivity 'requires that knowledge workers want to work for the organization in preference to all other opportunities'. It is this 'wanting to work for the organization' that is characteristics of employees' affective commitment (Meyer and Allen 1997).

In advancing the position that knowledge work is discretionary behavior, we explicitly deny any direct link between employees' knowledge and the intellectual capital of the firm. Put simply, the organization does not and cannot 'own' the knowledge of employees, and to categorize such knowledge as an 'asset' is fundamentally misleading. Stewart (1998,169) captured this perspective with his observation that 'It is more accurate – and more useful – to think of employees in a new way: not as assets but as investors.' Pfeffer and Sutton (2000) agree that knowledge is not a tangible asset and suggest that simply increasing the stock of knowledge is not enough. Rather, organizations need to ensure that knowledge is used appropriately and efficiently. For these authors, it is the discretionary use of knowledge by individuals that leads to organizational growth and survival.

Similarly, Davenport (1999) explicitly rejects the metaphor of employees' intellectual capital as a firm asset. Pointing to the fact that the individual not the organization controls the asset, Davenport (1999) argues that employees are most properly viewed as investors of their intellectual capital. As investors, employees choose whether or not to invest their skills in a given company. Perhaps more to the point, as investors, employees choose when to invest their knowledge, and how much of their knowledge to invest. Moreover, employees choose to withdraw their investment in the workplace when the 'pay-off' falls below acceptable levels. An organization's intellectual capital can only be enhanced by catalysts that encourage these investment decisions. Importantly, simply employing an individual is not a guarantee that the investment will be made. Rather, the organization's task is to stimulate employee investment by creating the appropriate conditions.

Importantly, these choices cannot be constrained by the organization. For example, an organization can send an employee on a training program but it cannot insist that the employee learn. The organization can request, but not demand, the creation of new ideas that will add value to the firm. These observations proceed from Drucker's (1999) observation that knowledge work is not primarily a matter of the quantity of output (which is easily mandated by the organization). Rather, it is the quality of output that is important, and it becomes difficult if not impossible to mandate the quality of knowledge use in organizations.

This, then, is the fundamental distinction between knowledge and physical work. It is relatively easy to coerce and control physical labor that by definition is observable and measurable. Indeed, by applying the appropriate levels of job design and control, an employing organization can fairly easily ensure that employees are operating at 'peak efficiency'. In contrast, knowledge work is fundamentally unobservable – one observes the outcomes not the process of knowledge work. As a result, the organization cannot impose external controls. Rather, the organization must focus on creating the conditions for the enhanced performance of knowledge work. We suggest that enhancing employee ability, motivation and opportunity provide these conditions.

Towards a Model of Knowledge Use in Organizations

A proposed model of knowledge use in organizations is presented in Figure 2, with rationales for the proposed linkages following.
Knowledge work as organizational behavior

Figure 2. Model of knowledge use in organizations.

As shown, we suggest that three central characteristics (i.e. employee ability, employee motivation and opportunity) mediate the relationships between the use of knowledge in organizations and various organizational predictors of knowledge use. Consistent with this mediational view, we suggest that changes in organizational practices are likely to affect the use of knowledge in organizations to the extent that they act to increase employee ability, increase employee motivation or increase employees' opportunity to use their knowledge in the workplace.

Mediators

One of the central requirements for employees to engage in knowledge work is that they have the ability to do so. Indeed, prescriptions for managing knowledge workers frequently focus on the organization’s need to invest in training and developmental activities (e.g. Beatty et al. 1997). In arguing the need for ongoing training as a retention hook, Zidle (1998) suggested ‘In other words, give knowledge workers room to grow – or others will’. Of course, training and developmental activities are not the only way to increase employee abilities. There are two basic choices organizations face in acquiring the competencies they need. Organizations can make the required competencies through training and development or they can buy these competencies through employee selection. Others have also focused on rigorous selection as a key component of human resources strategy (Pfeffer 1998).

Selection and training operate in tandem to ensure that employees have the knowledge required to do the job. However, the promotion of knowledge work in organizations requires going beyond the objective attainment of knowledge or credentials to include employees’ perceptions of their skill base and evaluation of their ability to use this knowledge. This is the notion of self-efficacy: ‘concerned not with the skills one has but with the judgments of what one can do with whatever skills one possesses’ (Bandura 1986, 391). Research on self-efficacy has confirmed that individuals who see themselves as being efficacious in particular areas (a) cope more effectively with change (Hill et al. 1987), (b) perform better on related tasks (Barling and Beattie 1983), and (c) persist at tasks when faced with adversity (Lent et al. 1987).
accumulated linking self-efficacy perceptions and work performance (Stajkovic and Luthans 1998).

Recently, Parker (1998) has expanded on the notion of self-efficacy to define a new construct: role breadth self-efficacy. In her words, role breadth self-efficacy is the sense of confidence individuals have in their ability to ‘carry out a broader and more proactive role, beyond traditional, prescribed technical requirements’ (Parker 1998, 835). Knowledge work, as we have defined it, is likely to be enhanced by being proactive and using one’s initiative, being self-managing, having high levels of interpersonal and problem-solving skills. Role breadth self-efficacy is the confidence individuals have that they can engage in activities such as solving long-term problems, designing new procedures and products, setting goals and targets and exchanging information with colleagues and customers. As such, we suggest that organizational features that enhance an individual’s sense of role breadth self-efficacy will result in enhanced use of knowledge in the workplace.

Acquiring required competencies is only the first chore of an effective human resource system. In the current context, ability is a necessary but insufficient condition for knowledge work in organizations. Directing the expression of individual skills and knowledge toward the achievement of organizational goals is an equally important function. This is the question of motivation; given that employees have knowledge and have the skills to exploit that knowledge, why do they choose to use, or not to use, their knowledge to organizationally defined goals?

One answer to this question can be derived from the notion that employees ‘invest’ their knowledge in the organization (Stewart 1998). Like all investors, employees expect a return on their investment; the more attractive that return, the more likely individuals are to make the investment. Moreover, we know that the attractiveness of a return on investment is predicated on two central features; risk and the rate of return.

We suggest that the analogue to investment risk in this context is employees’ trust in the organization. Trust has been defined as comprising both a cognitive and an affective component (Cook and Wall 1980; McAllister 1995). The cognitive component reflects the belief that management is sufficiently skilled to justify employees’ confidence in their actions. The affective component reflects the belief that management will not do anything deliberately to harm employees, vindicating employees’ faith in management’s intentions. The importance of trust in management is indicated by data showing that the initial development of trust in management was critical for the formation of high performance work teams, and ultimately, high performance levels (Banker et al. 1996).

We suggest that the ‘rate of return’ on employees’ investment of knowledge in the organization is reflected in employees’ sense of affective commitment to the organization. First, affective commitment is defined as individuals’ desire to remain in the organization and work hard for the organization because they want to (Meyer and Allen 1997) as opposed to because they have to (continuance commitment) or because they feel obligated (normative commitment). As such, affective commitment reflects employees’ pride in their membership of the organization, their desire to be a part of the organization, and to their willingness to retain membership in the organization. Employees who display these positive attitudes to the organization would be motivated to help the organization, and one way of doing this would be to elevate one’s performance. Empirically, the available data confirm the suggestion that affective commitment is a predictor of performance (e.g. Barling et al. 1996b, 1998; Keller 1992; Meyer and Allen 1997; Meyer et al. 1989). Secondly, affective commitment is based on a reciprocal and exchange-based relationship between the organization and the individual. That is, the individual offers his/her talents to the organization in exchange for the rewards of organizational membership.
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Thus, we suggest that employees’ willingness to use their knowledge for organizational ends is a function of both their trust in the organization and their commitment to the organization. We note that data consistently indicate empirical relationships between trust and affective commitment (Barling et al. 1998; Cook and Wall 1980).

Even if employees are willing and able to use their knowledge to attain organizational goals, they may be prohibited from following through on this investment. That is, the organization and its culture act to encourage or inhibit knowledge use in the workplace, and the third necessary precondition for knowledge use is that employees are accorded the opportunity to use their knowledge.

The literature on knowledge management is replete with strategies designed to encourage knowledge sharing within the organization and, more particularly, the sharing of knowledge across functional or disciplinary boundaries. Davenport and Prusak (1998, 88), for example, suggest that the simplest and best means to encourage knowledge transfer in organizations is to ‘hire smart people and let them talk to one another’. As these authors point out, the key to this strategy – encouraging interaction and knowledge sharing among employees – is where organizations most frequently discourage knowledge sharing. ‘Organizations often hire bright people and then isolate them or burden them with tasks that leave no time for conversation and little time for thought’ (Davenport and Prusak 1998, 88).

Similarly, the historical separation of ‘thinking’ and ‘doing’ in the workplace that began with the Scientific Management movement, actively inhibits the use of knowledge in the organization. Indeed, those employees who are frequently the most knowledgeable about specific production processes are most frequently the last consulted; despite widespread recognition of the adage that ‘nobody knows the job as well as the person who does it’. Thus, we propose that knowledge use in organizations must be based on (a) employees with high levels of ability who are (b) motivated to use their knowledge toward organizational ends and (c) given the opportunity to use their knowledge in the workplace. We now turn our attention toward organizational practices that we believe will facilitate these three conditions.

Predictors

What, then, are the organizational practices that contribute to increasing employee motivation, ability and opportunity? Drawing on contemporary theories of job design (e.g. Wall and Parker 1998) and previous research, several job/organizational features emerge as likely predictors of these necessary conditions.

Bass (1985, 1990) initially presented a model of transformational leadership comprising four components, namely idealized influence, inspirational motivation, intellectual stimulation and individualized consideration. Idealized influence takes place when leaders build subordinates’ respect and trust by behaving in a fair manner, and do what is right rather than what is expedient. Inspirational motivation occurs when leaders increase followers’ awareness of the mission or vision toward which they are working, and raise followers’ expectations of what they can achieve, thereby motivating them to pursue the groups’ goals. Transformational leaders use intellectual stimulation when they encourage their followers to look at old problems from new and differing perspectives, giving rise to followers’ creative thinking and innovation. Lastly, transformational leaders grant individualized attention to their followers, considering their needs and abilities. With their use of individualized consideration, transformational leaders play an especially important role in followers’ growth and development (Bass 1985, 1990).

We suggest that these characteristics are reasonable predictors of knowledge use in organizations. First, conceptually, the dimensions of transformational leadership are designed directly to influence knowledge use
(e.g. intellectual stimulation) or to provide an indirect influence by creating the conditions (e.g. commitment, trust) that would lead to such use.

Secondly, in a series of studies we have demonstrated that transformational leadership is related to a diverse array of productivity and morale-related outcomes (Barling et al. 1996b, 1998). Of particular note, we have shown that supervisor’s transformational leadership is related to both employee trust and employees’ affective commitment to the organization. Most important to the proposed model, these variables were found to mediate the links between transformational leadership and performance. Consistent with the definition of knowledge work as discretionary behavior, there is evidence that transformational leadership is related to discretionary organizational citizenship behaviors (Podsakoff et al. 1996). There are also data supporting the relationship between research group productivity (i.e. knowledge work) and supervisors’ transformational leadership (Keller 1992).

One study in particular provides powerful evidence to support the linkages hypothesized above. Utilizing a field experiment design, (i.e. with random assignment to treatment and control conditions), Barling et al. (1996b) conducted an evaluation of the effectiveness of training transformational leaders. They trained nine bank managers in transformational leadership techniques emphasizing intellectual stimulation. Barling et al. (1996b) were able to show that the subordinates of the trained leaders evidenced increased affective commitment to the organization relative to subordinates of untrained leaders. Moreover, the data showed that branch level (sales-based) financial outcomes improved in the branches where the managers had participated in training.

These results are important in the current context for two reasons. First, these results go beyond simple tests of association/correlation to allow for causal inference. Thus, these data indicate a causal relationship between leadership training and enhanced commitment/financial performance. Secondly, the training focused largely on intellectual stimulation and on teaching managers how to increase employees’ ability and willingness to solve problems and market product lines. In short, managers were taught to facilitate their employees’ use of knowledge in the workplace.

Secondly, the proposed model identifies the role of job design features, specifically the dimensions corresponding to the Hackman and Oldham (1975, 1976, 1980) theory of job design, i.e. autonomy, task variety, task significance, task identity and feedback. Studies of technological changes to jobs, for example, have found that such changes affected worker satisfaction indirectly through the mediating variables of job scope (i.e. job design features) and role ambiguity (cf. Coovert 1995). That is, to the extent that new technology affected task variety, task identity, feedback and the other traditional job characteristics, worker satisfaction was affected. Moreover, there is widespread agreement that knowledge work is predicated on control/autonomy (e.g. Drucker 1999; Wall et al. 1990). Indeed, Drucker (1999) emphasizes the role of autonomy and the resulting sense of responsibility as being critical to the management of knowledge workers.

Of course these suggestions are not new. Control at work is thought to have almost uniformly positive benefits for all workers (for reviews of this literature, see Ganster and Fusilier 1989; Terry and Jimmieson 1999). In particular, high levels of control have been associated with a wide range of positive outcomes, including decreased anxiety and depression (e.g. Carayon 1993; Mullarkey et al. 1997), burnout (e.g. Melamed et al. 1991), and somatic health complaints (e.g. Carayon 1993; Fox et al. 1993) as well as increased job satisfaction (e.g. Tetrick and LaRocco 1987), and job performance (e.g. Greenberger et al. 1989).

It is clear that control is a multidimensional construct (Coovert,1995). McInerney (1989), for example, suggested that technological
changes in the workplace are associated with at least five types of control: (a) an individual's control over others; (b) an individual's control by others; (c) planning and the use of information; (d) an individual's control over work; and (e) access to information and people within the organization. The ability to access information and control the use of such information would seem to be particularly important to knowledge work.

The ability and requirement to learn new skills/knowledge (i.e. task variety) also appears to contribute to both the ability and motivation of knowledge workers. Janz et al. (1997) note that these effects may not be simple linear relations—rather aspects of job design (i.e. control and interdependence) may interact to influence knowledge work.

In the context of the current model, there is consistent evidence that job design, and in particular features characteristic of enriched jobs, is related to affective commitment to the organization (Mathieu and Zajac 1990; Meyer and Allen 1997). These data are consistent with the exchange-based notion of affective commitment that identifies commitment as resulting from the organization providing a more enriched and stimulating work environment.

Using both cross-sectional and longitudinal research designs, Parker (1998) showed that job enrichment was a key predictor of role breadth self-efficacy and suggests that this enhanced sense of confidence may be one mechanism through which work redesign results in higher performance. This prediction was grounded in the observation that enhancing day-to-day autonomy and participation in decision making has two major effects. First, employees' sense of control is enhanced. Secondly, individuals are provided with sustained opportunities to acquire mastery experiences that are critical to the development of self-efficacy. Based on her results, Parker (1998, 850) suggested that 'Job enrichment is thus likely to be an especially salient initiative when it comes to promoting RBSE'.

Thirdly, social interaction appears to be an important predictor of knowledge use. Firms interested in increasing the use of knowledge frequently establish opportunities for employees to gather either formally or informally for the purposes of sharing information and knowledge. Referred to variously as learning communities (Martiny 1998), communities of practice (Stewart 1997), or affinity groups (Van Aken et al. 1994), the intent of such groups is typically to achieve a variety of objectives such as (a) sharing information, (b) solving problems and capturing improvement opportunities, (c) identifying and addressing education and training needs, and (d) building trust and cohesiveness (Van Aken et al. 1994).

The establishment of a 'user community' or of 'affinity groups' is increasingly recognized as an important part of knowledge management in organizations (Nonaka 1991b). Moreover there is evidence that increasing such social interactions will impact on both individual and organizational performance. Wall et al. (1990) identify both the quantity and quality of social interaction in the workplace as predictors of performance in advanced manufacturing technological environments. Parker (1998) found that participation in 'improvement groups' was associated with increased role breadth self-efficacy.

Van Aken et al. (1994) outline several key characteristics of affinity groups. First, participants held the same job position, thereby excluding the possibility of power imbalances based on hierarchical position in the organization. Secondly, formal group member roles (e.g. recorder, convener, reporter) were assigned in order to structure group processes. Thirdly, groups met regularly, frequently and typically off-site. Fourthly, groups possessed a group charter or 'mission'. Finally, groups were self-managed. It is doubtful whether these specific characteristics are actual requirements for successful groups. However, it is likely that the underlying principles that they represent (e.g. equalize power within the group, focus on group processes, move the group through the stages of group development) are key to success.
Consistent with our proposed model, Van Aken et al. (1994) report that the major outcomes of the groups were to increase members’ ability by sharing information and increasing the education/training and development of group members. Membership in the affinity groups also acted to increase employee motivation. In particular, group members reported that enhanced trust in each other and the organization was a primary benefit of group membership. Finally, membership in such a group may, in and of itself, establish the opportunity for members to use their knowledge.

Finally, the fourth major category of predictors identified in the model comprises the ‘culture’ (i.e. expectations and reward structure) of the organization. In essence, the suggestion here is that organizations will encourage the use of knowledge to the extent that they expect and provide opportunities for skill/knowledge growth and to the extent that they reward such opportunities.

Organizations communicate their expectations about knowledge use in organizations in a variety of ways. Identification of the need for change in knowledge use practices, development and dissemination of a vision statement and the demonstrable commitment of top management to a new approach to knowledge management seem to be key aspects of this communication (e.g. Martiny 1998). The appointment of a ‘knowledge activist’ (von Krogh et al. 1999) or knowledge champion within the firm to promote knowledge use and creation has been recommended as a visible sign of commitment to improving knowledge use processes. Moreover, traditional human resource practices such as selection and training can either support, or detract from, the use of knowledge in firms. Drucker (1999) emphasizes the role of continuous learning (hence training) in enhancing knowledge workers’ productivity. In his identification of organizational practices that create a high performance environment Pfeffer (1998) emphasized the role of both rigorous (i.e. skill-based) selection and extensive ongoing investment in employee training.

Both practices are suggested here to increase both the ability and motivation of employees to use their knowledge in organizations. Clearly, investment in selection and training increases the ability of employees as organizations select and/or train individuals in specific competencies. However, such investments also send a message about the importance of knowledge use in organizations. The longstanding corporate tradition of providing employees with information tools/resources but not providing training or the time to use the resources sends a very clear message about the importance of knowledge sharing. Most importantly, the organization’s activities in this regard will override any ‘lip service’ paid to the concept of knowledge management.

Organizational rewards can also enhance or detract from knowledge use in organizations. Certainly an emerging literature on skill/competency-based pay structures supports the role of salary structures in enhancing performance in high-skill occupations (Lawler 1995; Ledford 1995) and it is a truism that management frequently gets the behaviors it is willing to reward.

Despres and Hiltrop (1996, 51) identify three essential characteristics of reward systems for knowledge workers:

(a) They will be externally competitive in order to attract and retain competent staff, and sensitive to employees’ perceptions of internal equity.

(b) They will be perceived as rational within their organizational context, administered in a consistent way over time, and be contributors to the company’s strategic direction.

(c) They will be constituted in a new order of thinking that makes cultural, socio-political and work challenge issue primary (original emphasis) and pay, bonus and incentive schemes secondary.

Taken together, these principles operationalize the fundamental importance of ‘fairness’ in compensation systems (Harvard Business Review 1997). Compensation systems must embody both distributive (principal a) and
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procedural justice (principal b). Moreover, such systems need to go beyond the typical focus on pay and benefits to recognize that intangible rewards such as autonomy, independence and recognition/appreciation also have a role to play in the organization’s reward system.

Suggestions for Research and Practice

Our proposed model of knowledge work in organization is based on a great deal of empirical research. Yet, there are as many questions raised by the model as are answered by the model. Each of these provides some impetus for future research.

First, the explicit proposition on which our model is based is that knowledge work is an inherently discretionary activity. That is, we suggest that knowledge work is somehow different from physical work, and that this difference is crucial to understanding how to manage knowledge work. Our model is based on the suggestion that organizations ‘manage’ knowledge work by creating the conditions that enhance employees’ ability, motivation and opportunity.

A rival hypothesis is that knowledge work is no different from physical work. Organizations can get employees involved in knowledge work by the creation of organization policies (e.g. policies on knowledge sharing) or through reward and punishment systems (e.g. financial penalties for not complying with knowledge sharing policies). The relative effectiveness of a ‘commitment’ versus a ‘control/compliance’ orientation in enhancing knowledge work in organizations is an empirical question. If we are correct, then coercive or control-based policies will ultimately fail because of the organization’s inability to control the quality of the resulting effort.

Secondly, we suggest that ability, motivation and opportunity create the proximal conditions for knowledge use in organizations. Yet the relationships between these three conditions remain unspecified. For example, does a high level of ability coupled with a high level of motivation compensate for a low level of opportunity? In adopting a multiplicative framework, we have implicitly assumed that all three conditions need to be present for knowledge work to occur. The validity of this suggestion remains open to empirical test.

Finally, and perhaps most importantly, the propositions comprising the model must be evaluated across a wide range of workers and organizations. We have assumed that knowledge work can be understood in the abstract as the use of knowledge in organizations. Yet whether knowledge use among IT professionals is the same as knowledge use among assembly line workers is a testable question. More importantly from our perspective, whether the propositions comprising the model can account for any such differences remains the central test of model validity.

In developing suggestions for research, we naturally consider the validity of the assumptions underpinning our model. Three such assumptions are identified above, and each has implications for research on organizational knowledge use. Having said this, we also believe that our model has implications for organizational practice.

Most importantly, we believe that our model of knowledge use in organizations emphasizes knowledge work as organizational behavior. As a result, our focus is on improving the management of human resources within organizations and, through these improvements, stimulating greater knowledge use. Pfeffer and Sutton (2000) point to the knowing–doing gap that exists in many organizations. That is, organizations know what to do but simply do not do it for a variety of reasons. We believe that the most substantial implication of our model for organizations is not the identification of ‘new’ practices. Rather, our model highlights the importance of doing what we know works (i.e. implementing what we know to be the most effective human resource practices).
Summary and Conclusions

In this paper, we addressed the concept of knowledge work in organizations. We began by reviewing definitions of 'knowledge work' and 'knowledge workers' and concluded that there are few grounds on which to justify these designations as categorical labels. Rather, we suggest that knowledge work is a dimension of work and that all employees in organizations may engage in certain forms of knowledge work (although the extent to which employees are so engaged is expected to vary both within and across occupations). We further defined four types of knowledge work in organizations: finding, creating, packaging and applying knowledge.

Central to our definition of knowledge work is the notion that the use of knowledge in organizations is a discretionary behavior. As such we proposed a model suggesting that employees are likely to engage in using knowledge to the extent that they (a) have the ability to do so, and (b) have the motivation to do so. Leadership, job design, social interaction and culture (organizational expectations and reward structures) were identified as potential predictors of ability and motivation. As such, these areas present as the most likely focus of interventions designed to enhance knowledge use in organizations. If Drucker (1999) is correct in his identification of enhancing knowledge workers' productivity as a survival challenge for organizations, then the proposed model targets the most efficacious means of ensuring firm survival and growth.

References


Note

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