Knowledge worker control: understanding via principal and agency theory

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Abstract
Purpose – The growing prominence of knowledge workers in contemporary organisations has led to a considerable amount of research into their role and activities, however, despite this growing interest, there remains a lack of clarity regarding the relationship of knowledge workers to management. This paper aims to respond by investigating the features of knowledge work that impose barriers to traditional managerial control methods and exploring the extent to which alternative approaches to influence are available to knowledge work managers, and the circumstances under which these different approaches are indicated.

Design/methodology/approach – The paper utilised agency theory to investigate the implications of knowledge asymmetry in principal-knowledge worker exchanges, and argues against the utility of models of control based on principles of scientific management on which agency models are typically based, towards models of control based on reciprocity and commitment.

Findings – The paper has two main outputs. First, it argues that situations in which knowledge-based specialists are hired to perform tasks requiring expertise can be viewed as principal-agent exchanges (Mills) and are therefore open to analysis through an agency theory lens. The second endeavour is to discuss the implications of knowledge asymmetry in principal-knowledge worker relationships for managerial control and influence, and posit alternative modes of managerial control based on normative influence and valiant rewards. Further, it develops propositions relating to the factors likely to moderate the utility of each managerial influence strategy.

Originality/value – By undertaking this investigation, the paper responds to calls by Frenkel et al. to understand process and dynamics of control in managing knowledge workers. It moves away from models of control based on principles of scientific management on which agency models are typically based, towards models of control based on reciprocity and commitment. It develops testable propositions regarding specific sources of influence in knowledge work and the circumstances under which the employment of these influence strategies is indicated. This responds to calls by authors such as Tampoe; and Lord to develop a detailed understanding of the manner and extent to which influence strategies need to complement specific knowledge worker characteristics.

Keywords Knowledge organizations, Managers
Paper type Research paper

Introduction
Despite considerable disagreement about the nature and extent of the shift from routine operational tasks to complex, analytical work (2004; Thompson and Warhurst, 2005), there is evidence that, across varied industries, work increasingly entails problem solving and the production of knowledge (Barley, 1996a; Fleming et al., 2004). Workers carrying out these tasks, defined as knowledge workers, require specialised tacit knowledge, undertake thinking and the analysis of symbols as their core process,
and produce knowledge and ideas to solve complex problems (Fisher and Fisher, 1998; Reich, 1991). The growing prominence of knowledge workers in contemporary organisations has led to a considerable amount of research into their role and activities. Despite this growing interest, there remains a lack of clarity regarding the relationship of knowledge workers to management (Benson and Brown, 2007; O'Donohue et al., 2007; Sharma, 1997). This is partially attributable to the assumption of a linear progression from modern labour-based work to post-modern knowledge-based work, which limits the extent to which researchers have attempted to learn from past management models and theories (McGrath, 2005), and also to the separation of knowledge from the knower in much research and the resultant focus on mechanisms through which knowledge is codified in a form that allows exploitation by the organisation (Darr and Warhurst, 2008; Scarbrough, 2003; Wison, 2002). The consequence of these two research trends has been limited attempts to utilise extant theoretical apparatus and previous managerial models to examine the relationship between manager and knowledge worker (Benson and Brown, 2007; Sharma, 1997). This paper responds by investigating the features of knowledge work that impose barriers to traditional managerial control methods and exploring the extent to which alternative approaches to influence are available to knowledge work managers, and the circumstances under which these different approaches are indicated.

By undertaking this investigation, we attempt to advance the research on knowledge work in several ways. First, we respond to calls to investigate the relationship between managers and knowledge workers (Drucker, 1999). To achieve this, the present study utilises agency theory to investigate the implications of knowledge asymmetry in principal-knowledge worker exchanges. In doing so, this paper applies a powerful economic theory to a relationship that has been underanalysed, and makes explicit the role of knowledge in an agency relationship of growing significance. Second, we respond to calls by Frenkel et al. (Frenkel et al., 1995b), to understand process and dynamics of control in managing knowledge workers. We move away from models of control based on principles of scientific management on which agency models are typically based, towards models of control based on reciprocity and commitment. We develop testable propositions regarding specific sources of influence in knowledge work and the circumstances under which the employment of these influence strategies is indicated. This responds to calls by authors such as Tampoe (1996) and Lord (2004) to develop a detailed understanding of the manner and extent to which influence strategies need to complement specific knowledge worker characteristics.

This paper is divided into three sections. The next section argues that situations in which knowledge-based specialists are hired to perform tasks requiring expertise can be viewed as principal-agent exchanges (Mills, 1990) and are therefore open to analysis through an agency theory lens. Agency theory is a useful framework through which to investigate knowledge work management issues as it is concerned with the mechanisms through which principals (in this case managers) ensure that agents (in this case knowledge workers) are influenced towards sanctioned goals as opposed to self-interested pursuits. The second section discusses the implications of knowledge asymmetry in principal-knowledge worker relationship for managerial control and influence, and posits alternative modes of managerial control based on normative
influence and valent rewards. The third section develops propositions relating to the factors likely to moderate the utility of each managerial influence strategy.

**Agency theory and principal-knowledge worker exchanges**

Agency theory has emerged as one of the most influential economically based theories of dyadic contractual relationships (Eisenhardt, 1989; Jensen and Meckling, 1976). Agency theory defines a problem structure that is endemic to a wide range of economic relationships. While agency theory has been applied to professionals, recognised as a prominent category of knowledge workers (Sharma, 1997), and to relationships characterised by knowledge asymmetry (Phelps, 1992) it has yet to be explicitly applied to management-knowledge worker exchanges.

Agency theory is based on the relationship between one party, the principal, who designates certain tasks and decisions to another party, the agent (Jensen and Meckling, 1976). If one views the manager/employer as the principal and knowledge worker as the agent, the relationship fits well within agency theory models and lends itself to analysis from this perspective. The knowledge worker is contracted by their employer to undertake action on the employer’s behalf. The focus of agency theory stems from assumptions that the agent will behave opportunistically, particularly if their interests conflict with the principal, and that the principal is in a weak position to control opportunistic behaviour because of information asymmetry, that is limited access to information regarding the real value of the agent’s skills and work (Eisenhardt, 1989; Zajac and Westphal, 1994). These conditions set up the agency problem in which agents engage in behaviours pursuant to their own goals and in consequence negatively affect the principal. In order to protect the interests of the principal and minimise adverse affects on their welfare, certain measures are suggested to guard against sub-optimal actions and outcomes associated with the agent self-interest. Typically these measures are monitoring and metering (Ouchi, 1978). Monitoring involves observing the agent to ensure that their actions are consistent with the principal’s goals and metering involves establishing contracts that reward agents for achieving desired goals and penalising them for acting in ways that do not progress the principal’s goals (Jensen and Meckling, 1976). These approaches to control reflect bureaucratic, industrial mode managerial activity that focuses on supervising work processes (Karreman and Alvesson, 2004). In this type of technocratic control, managers work to develop systems and arrangements that focus behaviour and measure outputs through, for example, standardisation of processes and direct supervision of procedures and outputs (Mintzberg, 1983). Although “principal-knowledge worker” relationships share many of the characteristics of other agency exchanges, the very nature of knowledge work means that there are significant differences. These differences place severe constraints on managerial ability to harness traditional managerial methods of control, and, in fact, make it undesirable to endeavour to do so.

One of the most significant differences between traditional agency exchanges and those involving knowledge worker agents is that, where a knowledge worker is the agent, division of labour is also a division of knowledge (Sharma, 1997). Unlike the work arrangements to which conventional management theories refer, that of the machine worker, with knowledge work, the resources that are critical for organisational success reside within employees heads and are largely tacit and
The process of knowledge work – symbolic analysis (Reich, 1991) – means that the employee controls and owns the means of production (Drucker, 1998). As a consequence, the output or product of knowledge work, ideas, is almost impossible to monitor and, therefore, to influence effectively (Chauvel and Despres, 2002). In principal-knowledge worker relationships, the principal depends on the specialised knowledge of their agents to assess situations critically and to apply their skills in a manner that serves the interests of the principal manager. Since knowledge workers possess the specialised knowledge required to solve problems and make informed decisions, managers have both a dependency on their knowledge worker employees and an expectation that these knowledge workers will undertake the rigorous analyses necessary to make appropriate decisions on complex matters. In this agency relationship, the problem of information asymmetry is amplified by imperfect distribution of knowledge, termed knowledge asymmetry. Even when the principal manager is able to monitor the agent knowledge worker’s actions, the assessment of these actions typically requires knowledge or technical skills that are not available to the principal (Pontes, 1995; Profili and Sammarra, 1999). As Sharma (1997) notes, they are also limited ex-post in their ability to specify the type, quality and quantity of service actually required. In the case of professionals dealing with lay principals, the principals may not have an understanding of the practice types and levels that are necessary to achieve performance standards (Mills, 1990). This is compounded by the lack of a linear relationship between knowledge worker effort and outcome due to the possibility of incalculable intervening factors, which makes it difficult to determine the contribution of knowledge worker actions, and the causal link between these actions and final performance (Rueschemeyer, 1983; Sharma, 1997). However, despite the negative consequences, we argue that the features of knowledge work that contribute to knowledge asymmetry also contribute to the competitive value of knowledge work to the organisation.

The following section first describes the sources of knowledge asymmetry between workers and managers. These sources stem from both the type of work and context within which knowledge work occurs. Once we have established the socially complex nature of knowledge work, we further argue that the factors that contribute to such social complexity are a source of causal ambiguity that protects the process and outcome of knowledge work from competitor imitation and therefore provides substantial value to organisations.

Knowledge asymmetries between knowledge workers and principals originate with the appointment of the knowledge worker, as specialised knowledge is the reason for employment in the first place, and continue to evolve as the process of knowledge work constructs further specialised and tacit knowledge. Both the type of work performed by knowledge workers and the context of this work progressively increases knowledge asymmetry.

Frenkel et al.’s (1995a, b) model of knowledge in work provides a framework to explore the sources of knowledge asymmetry associated with the type of work undertaken by knowledge workers. Frenkel et al. (1995a, b) suggest that the act of work exists in three dimensions: form of knowledge (contextual or abstract and theoretical), creativity and skill (action centred, intellective and social), and posit that knowledge work reflects a movement from routine work to more creative, knowledge-focussed activity involving intellective skills and skills in dealing with ambiguity and...
uncertainty (Frenkel et al., 1995b p. 786). Citing Myers and Davids’ 1993 work, Frenkel et al. (1995b) describe contextual knowledge as that which is conceptual, not easily generalizable, and which may often remain tacit. While this contextual knowledge is rarely absent in knowledge work, it is the application of theoretical or abstract knowledge, defined as “... a body of codified concepts and principles applied to a particular field of endeavour” (Frenkel et al., 1995b p. 779) that particularly marks high-end knowledge workers (Drucker, 1998). Frenkel et al. (1995a, b) also suggest that the role of creativity is a key distinguishing factor of “high end” knowledge work. Creativity is essentially problem solving, a process that involves pulling together often disparate elements of a situation, creating a new understanding (sense-making) (Dervin, 1992, 1998; Weick, 1995), then forming a new view from which a decision can be made. This process is akin to what Alvesson (2004) sees as a central feature of knowledge workers working lives: The resolution of ambiguity (Alvesson, 2004). This ambiguity in the working life of knowledge workers takes many forms. It may be central to problem solving in the creation of something of value to an organisation’s clients, or it may be, as noted by Robertson and Swan (2003), that the internal workings of a firm create a level of ambiguity that individual knowledge workers are left with a degree of self-assuming autonomy that they are quite comfortable and productive with (Robertson and Swan, 2003). Intellecitive skills too are focussed toward the resolution of ambiguity. As the term suggests, these skills flow from the intellectual capacities of knowledge workers, their capacity for “… reasoning based on abstract cues, explicit inference, synthesis and systemic thinking” (Frenkel et al., 1995b p. 780, from the work of; Hirschhorn, 1984; and Zuboff, 1988). In summary of this perspective, “Knowledge workers rely predominantly on theoretical knowledge, and their work requires a high level of creativity for which they mainly use intellect skills” (Frenkel et al., 1995b, p. 780). Recent research supports the assertion that knowledge workers, such as money market dealers and systems developers, consistently apply contextual and theoretical knowledge, and utilise analytical skills and a relatively high level of creativity in their work (May et al., 2002).

Managerial understanding of their subordinates work is initially constrained by the knowledge differences associated with specialist skills that form the basis for the knowledge workers employment in the first place. However, when the application of contextual and abstract knowledge, intellecitive skills and creativity skills are significant factors in work, this understanding is reduced further by the level of autonomy typically associated with knowledge work (Drucker, 1998) and the limited extent to which managers are involved in the knowledge work of their subordinates (Sharma, 1997). As they engage in their work, analyse, synthesize, and solve complex problems, knowledge workers continue to refine their understanding and create new knowledge, based on their interaction and practice (Bhatt, 2000).

The previous discussion argues that knowledge asymmetry is a pervasive element in manager/knowledge worker relationships. As noted by Barley (1996b): “When those in authority no longer comprehend the work of their subordinates, hierarchical position alone is insufficient justification for authority, especially in technical matters” (p. 437).

**Influence and motivation of knowledge workers**

Two main directions have emerged in research into knowledge worker management. The first of these, focuses on normative influence, both professional, and
organisational. The second focuses on rewards associated with work outcome and opportunities for growth. We propose that these two research directions inform a model of knowledge worker management as depicted in Figure 1. The following sections develop propositions relating to each of four categories of influence.

The impact of normative influence on knowledge workers has been discussed in research on the professions, and in research into the adoption of normative influence strategies within organisations. Although many knowledge workers are not part of occupations traditionally encompassed in the notion of profession, there is an increasing recognition of the professional nature of knowledge work groups such as human resource management, information technology work, librarianship and management consulting as well as a growing recognition of the occupational nature of knowledge work (Claus and Collison, 2004; Goode, 1961; McKenna, 2006). The normative influence of professional community membership incorporates self-control through the internalised values of the community as well as the external controls associated with peer scrutiny towards the protection of professional reputation (Sharma, 1997). Self-control is consequent to the internalisation of a professional culture encompassing core values and expectations (Armstrong, 1984; Green and Weber, 1997; Jeffrey and Weatherhold, 1996). Formal professional associations are also argued to be external mechanisms of control in that they facilitate and often mandate peer scrutiny, which allows comparison against ethical and professional standards (Sharma, 1997). Much has been written about the coercive pressures to conform to professionals’ constituent expectations (DiMaggio and Powell, 1991). Threatened penalties, damages to reputation and possible expulsion all act to establish control within professional organisations. In addition, adherence to normative standards promoted by professionals is a substantial source of legitimacy in professional communities (Dingwall and Lewis, 1983). In response to normative isomorphic forces, professional knowledge workers acquiesce to preferred choices, promoted by their

![Figure 1. Sources of managerial influence on knowledge workers](image)
community (DiMaggio and Powell, 1983; Moore, 1970). This leads to the following proposition:

\[ P1. \] Knowledge workers are less likely to behave in a self-interested manner and more likely to be motivated towards the achievement of organisational goals when engaged in a professional community.

The utilisation of professional controls through organisational design is reflected in the professional bureaucracy. Evidence exists to support the effectiveness of professional middle managers as enforcers of professional normative standards, with authority to monitor and influence professional subordinates (Currie and Proctor, 2005). Effective professional middle managers have been found to utilise their professional and organisational status to advocate professional values in conjunction with the adoption of a strategic, organisation-wide focus (Currie and Proctor, 2005). In addition, managers may be able to explicitly draw on discipline-related codes of conduct developed by professional associations and apply those codes via bureaucratic actions (Barley and Kunda, 1992). Normative influence in professional bureaucracies is also enhanced through being associated with the reduction of knowledge asymmetry through the employment of knowledge worker supervisors and middle managers (Freidson, 1984; Mintzberg, 1995). This leads to the following propositions:

\[ P2. \] Knowledge workers are less likely to behave in a self-interested manner when their immediate supervisor is a member of the same occupation.

The availability of profession-based control mechanisms is dependent on congruence between the objectives and values of the organisation and occupation, which is limited in many organisations. In an effort to harness the controlling impact of professional institutions, contemporary organisations have attempted to development internal communities, within which normative influence is towards organisationally mandated behaviours and goals (Barker, 1993), either through the creation of a culture-based community across knowledge intensive organisations, or through the creation of an enclave within an organisation (May et al., 2002). Within such enclaves, co-workers acted as controlling influences, which results in peer censure when norms were contravened, and self-discipline. Barker (1993) critically identifies a means of control labelled “concertive”. Through teamwork and associated interdependence between knowledge worker colleagues, Barker describes the development of “peer control”, echoed in the concept of clan control (Ouchi, 1979), which is based on implied goal congruence between colleagues and motivation to comply due to interdependence and shared interests. This leads to the following proposition:

\[ P3. \] Knowledge workers are less likely to behave in a self-interested manner and more likely to be motivated towards the achievement of organisational goals when they work in an organisation in which shared values emphasise collegial interdependence and goal congruity.

The second research theme that has emerged in study of knowledge worker control and influence is centred on the characteristics of knowledge workers themselves and associated job and work design-related strategies. Research across a broad range of knowledge worker groups indicates the tendency towards key characteristics, specifically altruism, and the priority of meaningful work and the opportunity for
growth (Ghoshal and Moran, 1996; O'Donohue et al., 2007; Tampoe, 1996). The majority of this work explicitly advocates the value of intrinsically rewarding work and ideologically valuable outcomes in motivating knowledge workers. For example, writing on the psychological contract of knowledge workers, O'Donohue et al. (2007) argue that knowledge workers are influenced by an “ideological” contract through which managers establish a connection between work and a highly valued cause. Through contribution to important societal ideals, organisations meet their knowledge worker employees’ need for meaning, which has been identified as key to the motivation of professional workers (Herzberg, 1968a, b). Research indicating that ideological rewards influence compliance in work that advances a “cherished ideal” because meaningful work is intrinsically rewarding (Blau, 1964), is supported by recent findings of affective commitment engendered in knowledge workers subsequent to opportunity to make a contribution that transcends the organization (O'Donohue et al., 2007). This leads to the following proposition:

\[ P4. \quad \text{Knowledge workers are less likely to behave in a self-interested manner and more likely to be motivated towards the achievement of organisational goals when they work in an organisation, which is perceived to contribute to valued outcomes.} \]

In addition to contribution to valued outcomes, research indicates that knowledge workers perceive organisations as a source of development, and that reciprocity is engendered from organisational investment in knowledge worker assets (May et al., 2002). The intrinsic nature of work in terms of its challenge and associated learning opportunities has been identified as the most valuable aspects of knowledge work content in a number of studies (Herzberg, 1968a, b; Horwitz et al., 2003; May et al., 2002). Studies that have investigated factors that motivate separately from those that attract knowledge workers have found that while remuneration is a significant influence in attracting workers, it is not an effective retention or influence strategy (Horwitz et al., 2003). The provision of advancement opportunities has been identified as the key determinant of employee motivation (Lock, 2003) necessitating continuous capability development opportunities over conventional training (Horwitz et al., 2006). For example, a survey of 2,296 knowledge workers indicated that consideration of developmental and educational opportunities, informed work-related decisions for 93 per cent of respondents (Jackson, 2000). This leads to the following proposition:

\[ P5. \quad \text{Knowledge workers are less likely to behave in a self-interested manner and more likely to be motivated towards the achievement of organisational goals when they work in an organisation, which contributes to their professional development.} \]

Discussion

Implications for theory and research

We attempt to make three key contributions to the literature on managing knowledge work. First, we respond to Tampoe’s (1996) suggestion that the management of knowledge workers represents a significant departure from the relationship typically referred to in research on organisational structure and management styles, and provides a challenge consequent to both the content and process of knowledge work (Drucker, 1999). This study took a proactive approach to integrate diverse research
findings into a series of propositions related to the impact of knowledge work and knowledge worker characteristics as sources of management influence. This addresses the call to investigate sources of managerial influence in knowledge work (Drucker, 1999) and specifically responds to calls to study opportunities for principal control in cases of knowledge asymmetry (Sharma, 1997). By examining the model and its constituent propositions, we provide a framework that will assist future research.

Second, the propositions that we have developed provide insights into the role of normative influence and intrinsic motivation in the process of managing knowledge work. Researchers have suggested that professional institutions provide a powerful normative impact on values, expectations and consequent behaviour. Our research investigates the impact of such acknowledged sources of normative influence for knowledge work management, and contends that normative influence can constitute a controlling element in organisational environment even outside the parameters of traditional professional work. To date, research on normative influence has been an under-recognised element knowledge work. In this study, we took the initiative by developing testable propositions in order to understand its potential antecedents and consequences. Third, this study also discusses the impact of intrinsic rewards in knowledge worker management. Research has previously noted that knowledge workers prioritise opportunities for growth, development and contribution to valued outcomes. Our research goes beyond this observation by developing an argument connecting these priorities to managerial effect.

**Implications for practice**

Besides the theoretical contributions, we believe that these propositions have important practical implications. The propositions build on the premise that managers can have a significant impact on knowledge work, despite the inherent challenges associated with knowledge asymmetry, by taking advantage of the tools inherent in the nature of knowledge work and characteristics of knowledge workers. We propose that managers can influence knowledge workers indirectly by harnessing the normative influence of professional association, and directly by creating knowledge worker enclaves in which peer control and self-management “pull” workers towards sanctioned behaviour and outputs. We further propose that managers can motivate knowledge workers by attaching organisational goals to valued outcomes and by providing opportunities for development and growth. We suggest that organisations should provide managers with sufficient resources and support that enable them to create environments indicated by these propositions.

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