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## **Articulating knowledge work: the contributions of Activity Theory and task-based knowledge management**

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## Articulating knowledge work: the contributions of Activity Theory and task-based knowledge management

### Abstract

This chapter addresses issues of knowledge work in organisations with a concern that mainstream knowledge management (KM) has fallen short of expectations. The real nature of knowledge work remains hidden, and thus inaccessible, to those who are trying to improve organisational outcomes through KM practices. The authors have conducted independent research within a new discourse on knowledge work in the context of modern complex organisations, the results of which are converging to a common understanding of this critical phenomenon. Their two theoretical frameworks, one task-based and one activity-based, are described here as eminently suited to this research. Two sets of selected published work, each using one of the approaches, are compared using a content analysis tool and the findings are analysed to identify common concepts.

### Keywords

Articulating, Knowledge, Work, Contributions, Activity, Theory, Task, Based, Knowledge, Management

### Disciplines

Business | Social and Behavioral Sciences

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Henry Linger, Frada Burstein, Helen Hasan

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### Abstract

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### Introduction

There is no doubting the potential of Knowledge Management (KM) “to improve organisational outcomes and learning, through maximising the use of knowledge” as defined in the Australian KM Standard (AS5037—2005 p8). However, the initial hype, with expectations of spectacular organisational achievements through KM, has subsided and the shortcomings of hastily adopted KM practices are becoming apparent in many organisations. The authors of this chapter believe that much of mainstream KM has failed to deliver because those implementing KM initiatives have retained a bureaucratic perspective of work as performed by

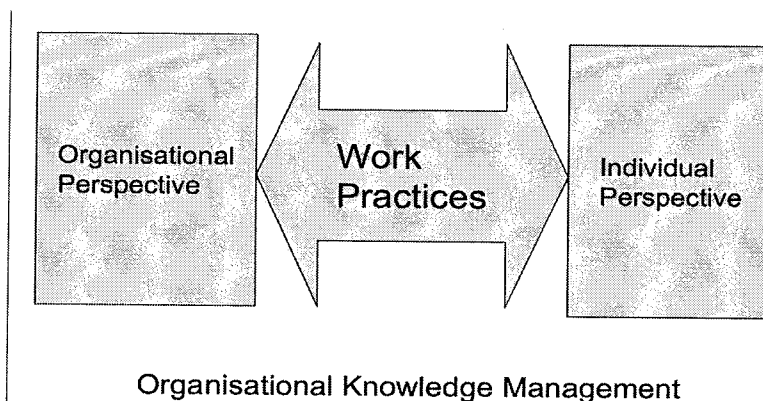
individuals in a formal organisational structure, where knowledge is viewed as a static resource or asset that can be treated in much the same way as any other commodity. As long as organisations retain this perspective, the real nature of knowledge work remains hidden, and thus inaccessible to those who are trying to "improve organisational outcomes" through KM practices.

This chapter begins by addressing issues of knowledge and knowledge work in organisations taking a middle-out perspective, which is neither organisational nor individual, with the objective of opening a new discourse on knowledge work in the context of modern complex organisations. The authors have conducted independent research within this discourse, the results of which are converging to a common understanding of this critical phenomenon. Their two theoretical frameworks, one task-based and one activity-based, are eminently suited to this research and provide evidence that they must indeed contain many closely aligned concepts. The chapter opens up the discourse on contextual knowledge work. The Task-based and Activity Theory approaches to KM are summarised and two sets of selected published work, each using one of the approaches, are compared using a content analysis tool. The findings are analysed to identify common concepts across the two bodies of work and discussed in order to suggest ways to better understand and to articulate critical issues of knowledge work.

### **Knowledge Management in Context**

The development of digital technologies has long been associated with the processing of company data into information to guide strategic decision-making. The popularity of KM came from a widespread recognition of the need to consider knowledge issues, as well as information, in the management of organisations. In the haste to move from a reliance on Information Management to one on Knowledge Management, understandings of critical aspects of knowledge and knowledge work were ignored. Most KM practice and much KM research fell back into the familiar organisational management paradigm shown in Figure 1. The concentration on formal organisational programs aimed at the individual workers ignored the real nature of work practices that reside in a space between the organisation and individual

perspectives. Revealing the nature of this hidden space holds the key to understanding knowledge work and is critical to successful organisational outcomes and learning.



**Figure 1.** Depiction of the state of KM where the pivotal component of work practices is largely ignored, or at least poorly understood in mainstream KM.

#### **Understanding Work Practices**

The study of knowledge, how knowledge is used and ways of knowing have been at the core of the philosophical enterprise across most cultures. However, the current corporate interest in knowledge has been instigated by a realisation that emerging economic theories, coupled with social and industrial restructuring, demand a more rigorous approach to the exploitation of knowledge as an organisational resource. This pragmatic orientation to an age-old philosophical subject has brought with it the need to redefine epistemology and ontology so as to reflect and be constrained by organisational realities. This then is the discourse of knowledge management in an organisational context.

In the past, technology has been effectively deployed to manage explicit knowledge that is already encoded in procedures and information stores. Examples of such deployment include workflow systems, data mining, particularly in the context of decision support, and document management systems. Current accounts of knowledge management therefore focus on the practical management of implicit knowledge, or social capital

(Lesser, 2000b), and in particular the use of information and communications technologies to manage this knowledge. It is therefore not surprising that knowledge management, as an emerging discipline, is predominantly discussed in the context of management theory and information systems.

The overlay of knowledge and technology implies that knowledge management is a construct that can only store, manipulate and disseminate knowledge that is codified and commodified (Whitley, 2000). Furthermore, this construction of knowledge management assumes that organisations are rational and that codified knowledge represents a rational explanation of events. These are necessary assumptions that enable management of knowledge to be directed to the productive function of the organisation (Day, 2001). It is this need to appropriate knowledge for production that is the fundamental rationale of corporate knowledge management.

While improvement in organisational outcomes is the overt goal of knowledge management, the fundamental, underlying subtext is organisational transformation. As John Seely Brown states (1991; p154), "the most important invention that will come out of the corporate research lab in the future will be the corporation itself". This is critical, as the consequences of not articulating the discourse surrounding work practices is an uncertainty that is crippling the most creative members of the knowledge workforce. Knowledge management is at the core of this process of corporate re-invention and must be understood in context to mitigate against the almost certain disaster that will otherwise result from mismanaged organisational transformation.

As indicated in the Introduction to the chapter the authors bring two progressive research frameworks to the study of this critical and complex issue, namely the Task-based and Activity Theory approaches to KM. Each framework will be described in the following section of the chapter but the basic assumption of the authors is that there is close mapping between the core concepts of task and activity. Both Task-based Knowledge Management (TbKM) and Activity Theory place the primary responsibility for a specific production task with the work group performing that task/activity. The two approaches bring to the foreground members of that community and their work practices as they relate to that task or activity. The focus on work

practices reveals how the community and its members conceptualise the work they perform. It also exposes the synergistic roles of the community and its members in the processes of knowledge production and re-production. In particular, the approaches focus on how experiential knowledge is inscribed in information objects and how meaning is ascribed to those objects and shared within the community. Moreover this focus on work practices changes the conceptual frame of reference from an organisational perspective to a task/activity orientation. In this setting, knowledge is seen as the basis of autonomous work, rather than being appropriated into Taylorist forms of production, and the role of ICT is to support such work rather than to control performance.

From this perspective, knowledge management should be seen as the means to evolve and innovate products and/or their production methods. Thus, knowledge work is the phenomenon that is managed rather than knowledge itself.

In summary, the task and activity orientation:

- makes visible the activity system,
- focuses on innovation and learning,
- integrates "doing" and "thinking",
- reveals the personal, social and organisational dimensions of activities,
- defines responsibility, authority and power structures in work practices,
- allows for more flexible network centric organisational structures,
- establishes the design criteria for developing the tools needed by the task/activity.

### **Knowledge Work: Linking the individual to the organisation**

The knowledge worker is, by definition, knowledgeable and astutely aware, not only of the means and purpose of their work, but also its political and social dimensions. While much of this knowledge may be tacit, it is typically shared among the work group and embedded in its culture. However, there is no open dialogue on these issues at the organisational level. Until the full extent of their work practices is articulated, they will remain hidden from the organisational landscape, unappreciated and undervalued. Knowledge workers are thereby trapped in an

outmoded structure where they lack the power to make worthwhile contributions to the process of organisational transformation.

There is a broad expanse of uncharted territory between the real knowledge work that occurs in an organisation and the formal organisational structure and espoused practices. This is often ignored in organisational KM strategies and initiatives which are positioned within existing management programs. These typically assume one of two simplistic views of organisational knowledge: either as the aggregation of individual workers' knowledge or the explicit knowledge stored in organisational documents, databases, manuals, etc.

In implementing KM strategies and initiatives there is a need to re-focus on the complex issues surrounding knowledge work within the organisational context. The roles of the individual knowledge worker should be acknowledged within the collective requirements of their tasks and activities, which include the political and cultural aspects. The contextual nature of knowledge work is either totally ignored or, if acknowledged at all, poorly understood. There is a need to not only increase this understanding through academic research but to articulate it in a way that is readily embraced and implemented in the harsh environment of modern corporate management. The research described in this chapter aims to address this need, as will be described in the following sections.

### **Articulating Knowledge Work**

The authors have produced an extensive body of research that has targeted problems in articulating knowledge work, acknowledging its complexity while at the same time uncovering its extent and importance to organisational performance and sustainability. This body of research has been underpinned by two separate theoretical frameworks that have distinct differences. However, there is sufficient evidence to suppose that they are appropriate and robust to deal with concepts of knowledge work in common ways that are worth exploring. While the significant findings of the research have been widely disseminated, as shown in Tables 1 and 2, the content of the message is slow to penetrate the mainstream of KM research and practice.



**Table 1.** A sample of Task-based KM Research.

Application Area	Task	Issues Investigated
Lexicography	Bilingual dictionary construction from anthropological field notes	Social and cultural aspects of data
Biology	Modelling molecular and cellular biology of HIV	Exploring boundaries of known facts
Immunology	Simulation modelling of the immune response to HIV infection	Testing competing paradigms to explain observed data
Epidemiology	Survey design	Discontinuity in knowledge and data
Banking	Creation of strategy	Creating processes for organizational learning
Meteorology	Weather forecasting	Managing large data holding and resolving contradictions in a distributed environment
Defence	Strategic and tactical HQ operations of army, navy and air force	Learning and knowledge work in a dynamic environment

Source: Burstein and Linger, 2003

**Table 2.** A sample of Activity Theory KM Research.

Application Area	Activity	Issues Investigated
Executive Information Systems	Executive decision making	Performance Indicators, Sense making
Defence	Organisational Learning	Social learning, Networking
Education	Student Learning	E-learning, educational tools
Healthcare Intensive Care	Web-based Information systems	Information Access, Privacy, Community issues, Collaboration
Public Service	Business Process	Information Systems as Tools, Management levels
Marketing	Web-based Communication	Virtual Interaction, Trust

The authors believe that the two frameworks are particularly appropriate to the discourse of knowledge work in that they both encapsulate many of the concepts inherent in knowledge work and the management of such work, i.e. KM. Activity theory is a useful lens to provide a better high-level holistic understanding of organisational knowledge work; and TbKM is a way of conceptualising knowledge work. There is reason to believe that there is considerable overlap of concepts and interpretations that will be uncovered through the analysis to follow.

Our task/activity as authors of this chapter is to produce a shared understanding of our two approaches to KM, identifying and mapping overlapping concepts, revealing gaps and making sense of outlying concepts, in order to increase our understanding of the underlying practice. These processes will be enhanced by exploring the strengths and limitation of each perspective in order to reinforce the common focus. The remainder of the chapter aims to explore a means of articulating the common message of knowledge work via the intersection of the two frameworks.

## **Analysing the Knowledge Work Frameworks**

### **Task-based KM**

The TbKM framework explicitly defines knowledge work along the *thinking* and *doing* dimensions (Burstein and Linger, 2003; Linger et al 2000). Unlike most mainstream KM approaches, the TbKM approach addresses the management of knowledge work rather than knowledge. It is a bottom-up approach that focuses on the practicalities of work activities, as performed by individuals and groups. Thus TbKM is directed to supporting both:

- task performance to achieve organisationally defined outcomes; and
- work practices of actors, including the generation and collection of experiential knowledge associated with task performance, as well as single and double loop learning (Argyris and Schön, 1978).

As knowledge work is by definition a socially situated activity, it implicitly assumes that all actors, in the community defined by the task, interact and communicate. Therefore, the TbKM framework is extended to incorporate a *communicating* dimension. This would define knowledge management along the three dimensions of *Thinking, Doing and Communicating* (Burstein and Linger, 2005).

In TbKM, no distinction is made between an (organizational) *activity* and *task*; and the terms are used interchangeably unless indicated otherwise. Organizational activity, as used here, derives from the Situated Activity Theory proposed by Iivari and Linger (1999) to characterize knowledge work. Such activity differs from the actions of individual actors, as the scope of the activity requires a number of actors for its completion.

The TbKM approach provides an infrastructure for knowledge work where knowledge is seen as a by-product of task performance. This infrastructure allows the knowledge worker to document the task instances in a way that is shareable with other actors performing that task. Thus, TbKM is essentially an implementation of a *knowledge work support system (KWSS)* that systemically preserves knowledge of each instance of the task in a dynamic memory system (Burstein and Linger, 2002). In order to support knowledge work, this memory includes the pragmatic outcomes as well as the knowledge created through task performance. Effective utilisation of this memory is facilitated by TbKM functionality such as reasoning, memory aids, explanation facilities and learning capability. Moreover, the TbKM approach is consistent with reflective practice in that actors are encouraged to reuse and create knowledge through learning as an integral part of the task (Schön, 1991).

### Activity Theory

The Cultural-Historical Activity Theory, referred to here as simply Activity Theory, provides KM research with a holistic explanation and framework for all the meaningful things people do. It provides the research with a unit of analysis, *activity*, which is a dialectic relationship between *subject* and *object* where the *subject* is the person or people engaged in the doing and the *object*, in the sense of "the object of the exercise", encapsulates the purpose and motives of doing. Activities can have individual

or collective subjects, i.e. people, engaged in particular purposeful work so that a different subject or a different object means a different activity. For the purpose of comparison with TbKM this chapter will consider only activities with collective subjects (sometimes called activity systems).

The object of an activity can be real (physical/external) or ideal (psychological/internal) and is separate from outcomes. In relation to KM, thinking, knowing and learning are activities with ideal objects. The dialectic nature of the relationship between the subject and object reflects the active nature of the subject that treats the object of their activity, as something that should be changed in accordance with their motives and purpose. Development of the activity occurs in both the subject and object through interaction and practice.

Activities are actively mediated by the tools used. The concept of tool mediation indicates that tools enable what, and how, activities can be done and activities inform the development of tools. Tools can be *primary* (physical), *secondary* (ideas, models etc) or *tertiary* (cultures, environments, eco-systems). The latter implies that activities are also mediated by the *communities* in which they occur which can be considered both as tertiary tools and sometimes the collective subject.

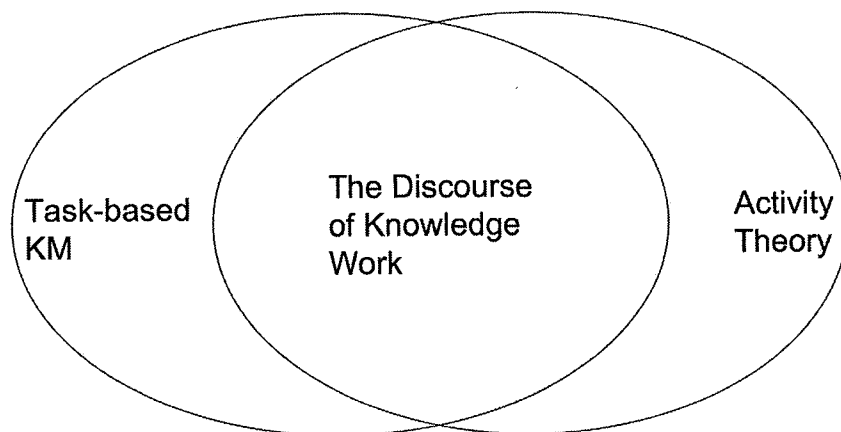
One appeal of Activity Theory to the complex world of KM is that an activity is a high level unit of analysis that is related to purpose and motives. Most activities are poly-motivated; for example, we write a paper because it interests us and we have something we want to say but it also gets us promotion. Activities are performed by sets of *actions*, which relate to a specific goal or *objective* (NOT objects) but are not meaningful in themselves, only in their contribution to the activity. Different sets of actions can be used to conduct the same activity; for example, you might use chalk and talk while I use Power-point slides to teach a class. Under certain *circumstances* actions can be automated to *operations*; for example, changing gears in an automatic car, the spell-checker in Word. Activities – actions – operations form a dynamic hierarchy (Leontiev 1981). What to one person is an action is to another an activity; for example, the photocopying activity of the office assistance is an action or operation of the manager. To this extent activities are culturally and historically situated, i.e. take place in context.

The holistic, dynamic and situated nature of the Activity Theory construct of *activity* is eminently suited to studies of KM in complex and ever changing environments. Activity Theory is compatible with the way people use sophisticated ICT artefacts to manage knowledge acts at the level of individual and group. These artefacts can be primary, secondary or tertiary tools that dynamically mediate activities: ie ICT systems enable and constrain what people can do, but continually evolve with new demands from the activity. Knowledge also grows through the "always active subject" (ie people continually change/grow as they learn through the life of an activity).

## **Mapping the Intersection of the Frameworks**

### **Methodology**

In order to provide empirical data for the comparative analysis of the frameworks a content analysis was undertaken of two sets of published papers, each set containing papers based on one of the two frameworks. The first set contains papers which used the TbKM Framework (Burstein & Linger 2002; 2003, 1005; Linger & Burstein 2001), and the second set is composed of papers using an Activity Theory approach (Hasan 2003; Hasan & Crawford 2003a, b; Hasan & Gould 2001). A context map was generated from each set using Leximancer which is an innovative tool that creates a conceptual map of collections of electronic documents as a way of organising the information contained within them. The relative ranking of concepts and their relationships to tasks, in TbKM, and activity, in Activity Theory, were then used to identify common, corresponding and outlying concepts and located them on the common framework shown in Figure 2.



**Figure 2.** A template for a framework placing the discourse on knowledge work within the overlap of the TbKM and Activity Theory approaches to KM.

### Results

The ranking of concepts of the two sets of documents as produced by the automatic Leximancer analysis are shown in Table 3. Table 4 shows the relationships to the other concepts of the pivotal concept for set, namely 'task' for the TbKM set and 'activity' for the Activity Theory set. These are depicted graphically in Figures 3 and 4 where:

- The brightness of a concept is related to its frequency, i.e. the brighter the concept, the more often it appears in the text.
- The brightness of links relate to how often the two connected concepts co-occur closely within the text.
- Nearness in the map indicates that two concepts appear in similar conceptual contexts, i.e. they co-occur with other similar concepts.

The resulting concepts and relationships were then inspected to identify common concepts, concepts which appeared to map between the two sets and outlying concepts that were particular to only one set. A decision was made to ignore some concepts such as those specific to the individual research domain topics ignored (eg weather and forecasting in the TbKM set) or whose rankings were very minor. The outcomes of this process are

displayed on the common framework as shown in Figure 5 and will now be discussed.

**Table 3.** The Ranked Concepts from the Leximancer analysis.

The TbKM Set			The Activity Theory Set		
Concept	Abs Cnt	Rel Cnt	Concept	Abs Cnt	Rel Cnt
knowledge	451	100%	research	351	100%
management	288	63.8%	knowledge	324	92.3%
task	266	58.9%	activity	254	72.3%
work	214	47.4%	systems	227	64.6%
organisatio	104	23%	management	175	49.8%
forecast	89	19.7%	people	158	45%
support	81	17.9%	community	123	35%
actors	77	17%	information	119	33.9%
approach	74	16.4%	organisation	117	33.3%
models	74	16.4%	work	103	29.3%
learning	73	16.1%	CHAT	68	19.3%
process	72	15.9%	(Cultural-Historical)		
performance	72	15.9%	learning	61	17.3%
framework	67	14.8%	KM	48	13.6%
memory	63	13.9%	tools	44	12.5%
system	62	13.7%	object	44	12.5%
understanding	60	13.3%	performance	40	11.3%
task-based	57	12.6%	processes	39	11.1%
individual	56	12.4%	business	34	9.6%
KM	56	12.4%	practices	22	6.2%
activity	51	11.3%			
decision	47	10.4%			
data	44	9.7%			
weather	33	7.3%			
information	31	6.8%			
research	28	6.2%			
products	23	5%			
range	21	4.6%			

**Table 4.** Ranked Concept Relationships.

Entities Related To Task			Entities Related to Activity		
Concept	Abs Cnt	Rel Cnt	Concept	Abs Cnt	Rel Cnt
knowledge	265	99.6%	research	225	88.5%
management	205	77%	knowledge	205	80.7%
work	153	57.5%	systems	152	59.8%
organisation	81	30.4%	people	117	46%
actors	77	28.9%	management	99	38.9%
performance	72	27%	community	81	31.8%
understanding	55	20.6%	organisational	81	31.8%
learning	55	20.6%	work	70	27.5%
approach	53	19.9%	information	63	24.8%
memory	52	19.5%	CHAT	61	24%
support	49	18.4%	Cultural-Historical		
models	48	18%	object	44	17.3%
process	48	18%	learning	42	16.5%
framework	47	17.6%	tools	42	16.5%
system	45	16.9%	KM	27	10.6%
individual	44	16.5%	processes	25	9.8%
KM	43	16.1%	performance	18	7%
activity	41	15.4%	business	14	5.5%
task-based	38	14.2%	practices	10	3.9%
forecast	35	13.1%			
decision	19	7.1%			
data	14	5.2%			
weather	11	4.1%			
information	10	3.7%			
research	9	3.3%			
products	6	2.2%			
range	6	2.2%			



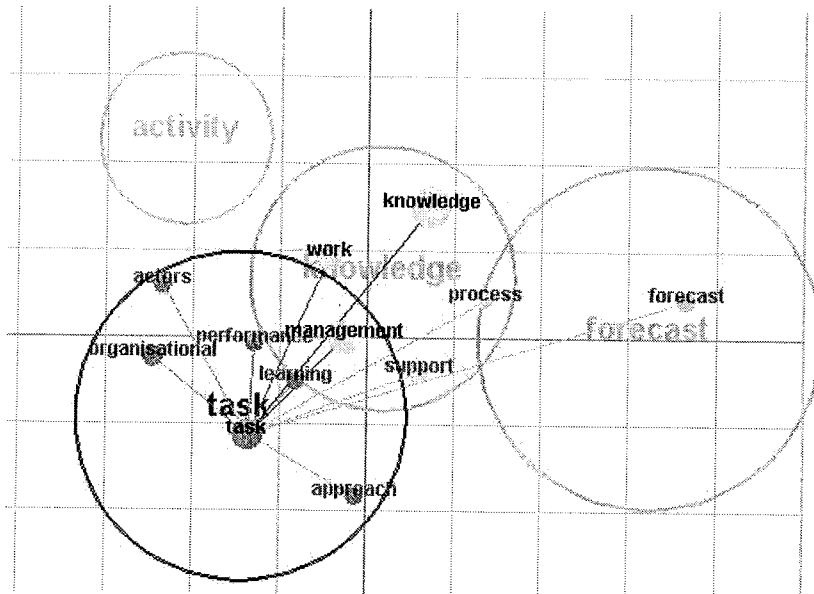


Figure 3. The Leximancer Concept Map for TbKM with the task relationships.

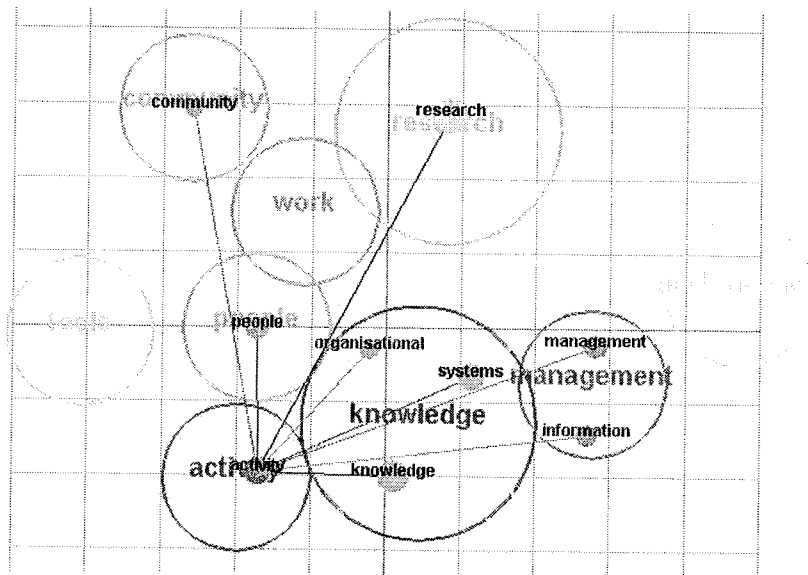
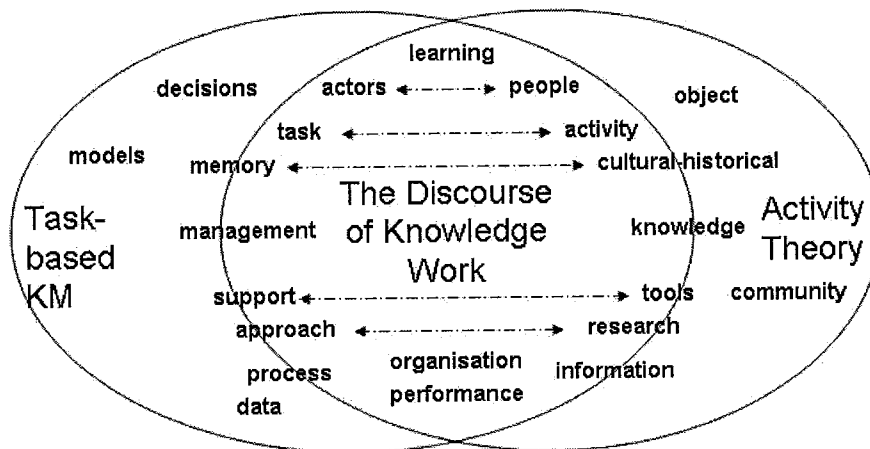


Figure 4. The Concept Map for Activity Theory with the activity relationships

### Discussion

Observations on the similarities between the position and relationships of task, on the one hand, and activity, on the other, in the two concept maps, are as follows:

- Common significant concepts include: work, learning, organisation and performance, as well as, obviously, knowledge and management.
- Mapped concepts based on the expertise and understanding of the authors are: task/activity, actors/people, memory/cultural-historical, support/tools, approach/research.
- Outliers – TbKM: data, models, decisions.
- Outliers - Activity Theory: object (related in Activity Theory to motive and purpose), community.



**Figure 5.** A mapping of concepts from TbKM and Activity Theory onto the common framework of Figure 2.

The concentration of the highly ranked concepts in the overlapping area of the common framework, either as common or mapped concepts, is remarkable. This justifies not only the legitimacy of each of the two approaches as languages for the

discourse on knowledge work but also the value in seeking a common framework from the intersection of the two. In addition to the specific location of concepts on the map of Figure 5, some general observations of the results of the concept analysis are:

- the difference in density of the two sets of concepts,
- the different emphasis in regard to KM - in TbKM task is closer to management, whereas in Activity Theory the concept of activity is more closely related to knowledge.

These observations, together with the contents of the central area of the common framework are now considered and used to suggest a way forward.

### **Towards a Unified Understanding of Knowledge Work**

Although the concept maps for the TbKM and Activity Theory approaches are not identical, they are remarkably similar with some interesting points of difference, which may be, in themselves, an asset to the discourse. For example, the slightly different emphases on KM (TbKM to management and Activity Theory to knowledge) may mean that a more complete picture of knowledge work could come from a synthesis of the two approaches. They may also complement each other in their differing levels of analysis. TbKM with its greater density of concepts brings more detail to the discourse on knowledge work while Activity Theory provides a higher-level, more holistic view. There is no doubt, however, that both provide a language appropriate to a rich discourse on knowledge work. Each framework has a means of visualising the relationships between the elements: human, technical, contextual in working and learning, and each assists with the articulation of the dynamic complexities of knowledge work.

The study reported in this chapter is exploratory but establishes the basis for a coherent discourse of knowledge work. The findings from this exploratory study show large areas of common or matched concepts with strong indications of importance to critical and complex issues of knowledge work, namely: learning, human aspects, tool support, and (historical and cultural) context. This suggests that a more complete analysis of the authors' writing should be subjected to such analysis. It would also be feasible to include some of the fundamental literature that underpins both approaches in such

analysis. This more comprehensive study would establish a common language set for the discourse of knowledge work. This will establish the critical and complex issues of knowledge work and reveal the assumptions that form the basis of mainstream knowledge management practice. This discourse will inform the knowledge management enterprise in order to define the organisational transformation agenda that underpins knowledge management, and the design criteria to implement that agenda.

In conclusion, we believe that this discourse is valuable not only at an abstract, theoretical level, but also in the realm of practice where it may inform the strategic directions of future organisational forms and operations.

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