

# Being and Knowing – Ontological Perspectives on Knowledge Management Systems

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**Abstract:** This paper undertakes an ontological analysis of knowledge management systems from two perspectives: Popperian and Heideggerian. Earl's taxonomy of knowledge management schools is used as the proxy for the variety of systems that can be found in practice. The paper takes two contrasting ontological systems to identify generic strengths and weaknesses at the level of the School. The argument is made that many of the issues and difficulties frequently encountered in organisations are unlikely to have managerial or technological solutions as they are ontologically implied by the very systems themselves.

**Keywords:** Knowledge management systems, ontology, Popper, Heidegger

## 1. Introduction

Knowledge management systems have developed within organisations ostensibly as a source of competitive advantage. Some scholars have suggested that a poor understanding of the philosophical underpinnings of knowledge management systems has led to an unbalanced focus upon the managerial and technological aspects of the system, and a relative neglect of the human and knowledge aspects (Firestone and McElroy 2005). The epistemological foundations of such systems have been described as problematic in the literature (Earl 2001; Blackman and Henderson 2005), but the ontological basis of the systems is hardly explored at all. This paper should be regarded as a preliminary exploration to determine whether or not such a philosophical inquiry is likely to identify interesting and novel dynamics of knowledge management systems, and potentially identify areas of weakness or strength in the development of knowledge management tools.

In this paper we wish to open such a study by seeking out some ontological perspectives on the knowledge management systems identified by Earl (2001). Popper (1979) is a natural candidate since his focus is on problems, and his approach has been found useful in this context elsewhere in the knowledge management literature (Blackman, Connelly and Henderson 2004; Firestone 2003). For the purposes of contrast Heidegger's (1962) ontological approach is based on individuals rather than problems, and his approach identifies tensions between humans as individuals and people as elements of an organisation. The paper briefly outlines each of Earl's Schools and then goes on to give an ontological interpretation from Popperian and Heideggerian perspectives.

## 2. Earl's schools

### 2.1 Systems school

The Systems School of knowledge management attempts to capture specialist knowledge and make it available to other specialists or qualified people with need of such knowledge. The system aims to improve, "specific knowledge – intensive work tasks and particular sorts of decision making" (page 218). Such knowledge management systems can capture knowledge "not only from objective data...but also from experience gained through practice" (page 219) provided that these can be accurately coded and validated. For example, the knowledge creation process, as Earl describes the system used by Xerox, begins with a problem – a photocopier repair technician realises that he does not know how to correct a novel fault, and there is no solution in the manual, nor in any other resource he has. There is nothing to do but learn how to fix it for himself. By a mix of trial and error, rational deduction and good fortune, he creates a workable solution. His new knowledge is then formalised into a code that is recognised by the technical and human systems that will record and assess his knowledge. Thereafter it can be assessed and, if validated, used by his peers.

## **2.2 Cartographic school**

In the examples given by Earl, the seeker is prompted to seek knowledge as a result of ignorance or uncertainty. However, the knowledge management systems in themselves will not contain the knowledge that the seeker needs, but it will contain the identity of an expert knower. Thus knowledge management systems classified as Cartographic identify where novel knowledge is held, that is to say they map the location of specialist knowledge in an organisation. Cartographic systems have particular strengths where knowledge is tacit, and thus cannot be captured in a Systems School approach, so that a successful outcome is an informed conversation with an expert rather than direct access to a solution or critical data. That said, the choices between Cartographic and Systems School solutions may depend more upon an organisation's "preference for human, not technology-mediated, communication and exchange" (page 221) as much as contingent choices.

## **2.3 Process school**

Knowledge management systems from this School are derived from the intention of providing relevant knowledge to operating personnel, and contextual and best practice knowledge to managers. The objective of such intention is the continuous improvement of business and management processes. Earl describes such a system in place at Frito-Lay where sales data was captured in the field and consequent sales analysis was made available, "not only to headquarters marketing executives, but also to field sales managers and their teams.... Sales management was no longer top-down, nor was it bottom-up – it was collaborative to ensure two-way knowledge flow" (page 222).

## **2.4 Commercial school**

This knowledge management system seeks to exploit knowledge and intellectual property directly, rather than through its mediating effect upon organisational processes and products. A discovery – which may be empirical in a technical context – is constructed into a protective patent or other similar defensible form. Thus knowledge is exploited by restriction (not shared, as with other knowledge management systems) and regulated by a business model under the direction of a specialist corporate intellectual management group.

## **2.5 Organisational school**

The focus of the Organisational School is the importance of sharing or pooling knowledge in a learning community by strengthening interaction between the holders of different types of knowledge. It seeks to capture what is known, where this can be codified, and who knows what, whether this is emergent or tacit. The recognition of the importance of the relationship element in knowledge creation (identified in the Cartographic School) leads to a focus upon ways to encourage individuals to actually communicate directly with each other. Developing communities-of-practice as well as more technological systems such as video-conferencing does this. It is critical that the organisation already has a predisposition towards networking and sociability. The knowledge management system does not create this predisposition, but can facilitate virtual teams, learning communities and common interest groups. In some systems at least (Earl describes Shell) a human moderator regulates membership and seeks to know who knows what and what is known.

## **2.6 Spatial school**

This School is built upon the premise that modern commercial buildings, technology and practices – offices grouped by function and hierarchy – are not particularly conducive to conversation, interaction, learning and sharing. Modern technology may enhance this tendency; email, Systems and Process Schools of knowledge management systems may deplete the richness of knowledge exchange and spontaneity of community. The School does not critique the drive for efficiency that may create such social distances; rather it asserts that some spaces must be designed to facilitate more informal interactions and "unexpected and stimulating encounters with others" (page 226).

## **2.7 Strategy school**

All of the knowledge management systems discussed are capable of supporting a competitive strategy in some way or another. All are capable of developing the superior knowledge upon which any sustained competitive advantage is likely to rest. However, the claim made by this School is that knowledge and intellectual capital are the key elements of value creation and competitive advantage. The tools and techniques described in other Schools are subsumed under a strategic umbrella that begins with traditional corporate rhetoric, in terms of mission and objectives. However, the point of difference between the Strategy

School and traditional corporate planning is, “[a] raising consciousness about the value creation possibilities available from recognising knowledge as a resource” (page 228). In the section above we have outlined the nature of Earl’s typology of knowledge management systems. In the following section we consider the impact of Popper’s ontological worlds on the systems and the knowledge that they are thought to provide.

### **3. Popper’s ontological worlds**

Popper distinguishes between three ontological worlds. World 1 consists of the physical world of objects and states. World 2 concerns the subjects that consists of consciousness, of subjective experiences and understanding. World 3 consists of objective knowledge; knowledge which is independent of the knower. In making his position clear, Popper distinguishes between: “(1) knowledge or thought in the subjective sense, consisting of a state of mind or of consciousness or a disposition to behave or to react, and (2) knowledge or thought in an objective sense, consisting of problems, theories and arguments as such” (Popper 1979, pp.108-9). He then argues that: knowledge in this objective sense is totally independent of anybody’s claim to know; it is also independent of anybody’s belief or disposition to assent, or to assert or to act. Knowledge in this objective sense is knowledge without a knower: it is knowledge without a knowing subject (Popper 1979, pp.108-9).

The object matter of World 1 is independent of anyone’s claim to know it. World 1 objects can only be known by individuals since organisations have no mental states with which to know. Both object and subject of World 2 can only exist at the level of the individual for the same reason. The collective articulated knowledge that can be shared amongst individuals is that of World 3 alone since this exists independently of individuals and consists of sales ledgers, post project evaluations, minutes of meetings, training manuals and similar documented material. However, growth in objective knowledge is, for Popper, the outcome of ‘interaction between ourselves and the third World’ (1979, p.112). Ourselves, in this case arise from the meanings and interpretations from the mental states and activities in World 2. If recorded in a Boardroom paper or memo, for example, it becomes an addition to World 3 which not only contains knowledge either embedded in structures or encoded in documents but also interpretations and truth claims. The point is that World 3 does not merely contain objective facts, but also objective fictions, stories and mistakes.

#### **3.1 Knowledge in popper’s worlds**

##### *3.1.1 Systems school*

The database is of knowledge in World 3, made up of ideas developed in World 2 about effects of actions in, and on, World 1. The process of establishing knowledge depends upon World 3 processes of codification and validation. In Earl’s (2001) example these draw upon the World 2 experiences of other suitably qualified experts, but although highly desirable, this is not inevitably the case and may conceivably lead to knowledge based on coding and validation criteria.

##### *3.1.2 Cartographic school*

This is a map existing in World 3 of people in World 1 who have World 2 knowledge about a given issue. There is no certainty that any new knowledge will be created unless a need for it is experienced in World 2 and interaction occurs. Knowledge transfer is based upon interactions within World 2. The directory of expertise is not in itself directly validated (as in the case of the systems school) so that the incentives for claiming such expertise may be problematic. This requires a user to develop World 2 knowledge about the directory and the various claims for knowledge made by those within it.

##### *3.1.3 Process school*

Here the knowledge management systems responds to well-defined situations in World 1. Processes can be triggered by World 1 states and process knowledge can be used in World 2. With well-defined problems there may be World 3 procedures for identifying and minimising disruptive effects. With ill-structured problems there are likely to be unforeseen W1 outcomes detected in World 2 which may lead to circumnavigation of the knowledge management systems if it is not possible to develop World 3 solutions of enough flexibility. Where circumnavigation is used, the processes and the resultant information will be lost to a Process School knowledge management system but may well be identified in other types of system.

### 3.1.4 Commercial school

This is a knowledge management system, which assumes that tacit knowledge held by employees in World 2 has been made explicit in World 3 in a protectable and merchantable way. Interactions between World 3 and the remaining worlds occur after the moment of sale: normally beyond the domain of this knowledge management system.

### 3.1.5 Organisational school

This knowledge management system is seated firmly in World 2 as it is about facilitating and enhancing interactions between individuals: including overcoming obstacles to communication in World 1. The whole praxis of the School is about developing interactions between Worlds and interpreting new knowledge. New ideas will need to be shared through World 3 for the knowledge management system to work, but the knowledge itself will be verified pragmatically by its utility in action.

### 3.1.6 Spatial school

This is about creating space to think, not actually about the knowledge itself. The knowledge management system assumes that people in World 1 will create knowledge in Worlds 2 and 3 when World 1 spaces facilitate and require interaction.

### 3.1.7 Strategic school

Individuals present World 2 knowledge of World 1 (products, buyers, competitors etc.) to World 3 knowledge management systems. Senior managers pooling their World 2 knowledge to create a strategic plan in World 3 use this. This plan (with a complementary change management process) brings about the mental states (in terms of knowledge and motivation), structures and processes to enact the World 3 strategy in World 1.

### 3.1.8 Implications

Accessibility and validation are two key elements of a knowledge management system. Popper's worlds formalise some insights into the performance of each of Earl's Schools in respect of knowledge location and validity as shown in Table 1 below.

**Table 1:** Earl's taxonomy within popper's ontology

	World 1	World 2	World 3	None
Location of Knowledge		Cartographic Spatial Organisational	Systems Commercial Process Strategic	
Validation of Knowledge	Commercial Strategic	Cartographic (through the utility of experts)	Systems Process	Spatial Organisational

Clearly the most formalised knowledge management systems, the systems and process schools, remain in World 3 for both accessibility and validation – the system itself sets the rules for both. Commercial and Strategic systems are formalised in the creation of knowledge, but whether this knowledge is accurate or useful depends upon factors beyond the control of the knowledge management systems and the firm itself; the market and the future respectively. More tacit and intuitive knowledge cannot, by definition, be stored and validated in World 3. Thus cartographic, organisational and spatial systems can be validated, if at all, by outcomes alone. The finding that knowledge is difficult or impossible to validate convincingly is not a critique of any particular knowledge management system, or knowledge management systems in general. It merely reflects the nature of the knowledge that the system purports to manage and the nature of the managerial problems faced. Malhotra (2001) grapples with similar issues when reviewing the successful implementation of knowledge management systems. In addition to what is known and can be managed by knowledge management systems, there is also a need for processes of ongoing learning and unlearning, characterised as loose-tight: "Such systems are loose in the sense that they allow for the continuous re-examination of the assumptions underlying best practices and re-interpretation of this data. Such systems are tight in the sense that they also allow for efficiencies based on propagation and dissemination of the best practices" (Malhotra, 2001, 329). Consequently, loose systems trigger knowledge creation and renewal whilst tight systems are focused upon efficiencies, dissemination and optimisation.

**Table 2:** Loose/tight systems within popper’s ontological worlds

	World 1	World 2	World 3
Tight		Cartographic	Process Systems Commercial Strategic
Loose		Organisational Spatial	

The properties of loose and tight here refer to the operation of the knowledge management systems, rather than to the problems at hand. Thus the Cartographic School is tight in the sense that the directory identifies and disseminates the location of expertise, although the problems under consideration might have loose properties. Organisational and Spatial Schools tend to be amorphous in that they are based upon spontaneous, context specific interactions that may be applied to a wide variety of problems. Those classified as tight in World 3 are likely to be applied to well specified problems, the although Process and Systems have the potential of self referentiality. This potentially dangerous drawback to such systems is noted elsewhere in the literature (Firestone, 2003). The Strategic School systems are the greatest curio. There is a great deal of stakeholder pressure to articulate and manage strategy processes and a knowledge management system has an important role to play. Consequently there is pressure to run a tight system focused upon a clearly articulated strategic plan. However, where there are looser problems facing an organisation it is at least possible that adherence to Strategy School knowledge management systems may undermine emergent ‘skunkwork’ projects, which depend upon informal (loose), political networks rather than information. Consequently, the knowledge management system may be instrumental in deflecting energy from action and experimentation towards information gathering and processing. The conclusion drawn from this analysis is that the majority of these Schools have their ontological foundations in the apparently objective knowledge of World 3. It would appear that most knowledge management systems systems assume that World 3 is reflecting knowledge created in World 2, but there is little to force testing and/or verification within some of the Schools. Similarly, knowledge management systems understate the problematic links from World 3 to World 2. This may be a complex derivation of organisational ‘GIGO’ but in an understandable language.

The fragile ontological links between worlds have serious repercussions for the effect of the knowledge management systems and its contents when the creation of new knowledge is considered. Only one School, Organisational, supports and ensures the interaction of Worlds 2 and 3 in a conscious way. Other Schools might reflect upon knowledge in World 2 but it is perfectly possible that the knowledge in World 3 is fundamentally flawed and subjective, belonging more rightly in World 2 and in need of testing and verification. Moreover, because there is no forced interaction between the Worlds it is likely that new knowledge is created and deployed outside of the knowledge management systems, unless management systems or some other cultural ideofact restrict managerial action to what is known in the knowledge management systems.

#### 4. A Heideggerian perspective

For Heidegger, knowledge is not a set of correct axioms or descriptions that relate to an external world, such as Popper’s World 1, but rather a series of interpretations that can be contingent, inconsistent and fluctuating at the level of the individual. As such, knowledge cannot be accurately captured and stored as knowledge management purports to do. That is to say, in Heideggerian terms, the fundamental premise of knowledge management removes knowledge from the domain of human existence, objectifies it and assigns it to an entity, the organisation, which cannot actually have any knowledge. Rather, knowledge management systems should be seen as tools, ready or unready at hand, for the completion of some task in the same way that a spanner contains no intrinsic knowledge of nuts, but is fashioned by a community that has a common heritage that requires individuals to complete tasks involving the tightening and loosening of nuts. Similarly, the individual centred definition of knowledge management systems as a tool creates no definitional difficulty for the Organisational School, since this does not make claims for knowledge above the utility it may serve, and individuals are not compelled to use or contribute to the system. It is simply a tool that compensates for the geographical dispersal of a community (not a good thing in itself for Heidegger). The Systems School, although apparently a problem solving tool, adds a complication through the need to codify the experiences of individuals into standardised, objective inputs and outputs. It is entirely possible that the requirements of codification come to define what knowledge is, the problems that are faced and the way the knowledge will be used. If this is too prescriptive, the knowledge management systems may become a tool ‘present at

hand', that is available but unhelpful in the same way that a wrong sized spanner is present but unready. One would imagine that with sufficient skill a seeker of knowledge can break the 'code', and in practice this may be no more than irksome rather than obstinately negating the work at hand.

Heidegger also helps to identify a further problem with such knowledge management systems. For Heidegger, a tool assists a person. With the Schools discussed above, there might be a tendency to substitute communication for knowledge between community members. Information and "solutions" may be passed between members without either reflecting deeply. For example, the Xerox technician described in the Systems School above may have learned many things from his initial failures to fix his problem. He will have become a better technician whether he finds a solution or not. However, other technicians may default to the solution in the knowledge management systems without gaining the deeper knowledge and experience. In this sense, the knowledge management system impoverishes rather than enhances technicians. This tendency to substitute knowledge with communication is likely to be most debilitating where the knowledge management systems needs to be used to develop meaning; particularly in the Strategy and Commercial Schools. Both concern problems where important information is not knowable in any conventional sense. Within the Commercial School, the market is the arbiter and false beliefs run aground quite quickly. Unfortunately, the Strategy School concerns itself with problems that do not have an end point as such; the future is always about to happen next. It is here that the novel and superficial is most likely to appear important. As Heidegger puts it, "Idle talk is something anyone can rake up; it not only releases one from the task of genuinely understanding, but develops an undifferentiated intelligibility, for which nothing is closed off any longer" (1962, p.213). That is to say the clarity, convenience and novelty of communication masquerading as a knowledge management system may assist in the eviction of a deeper understanding.

Further problems of a different kind occur in the Strategic School. Since strategy purports to be concerned with management over time, we might expect that Heidegger's work would have particular purchase. Since the organisation cannot have a sense of purpose for itself, authentic strategy is a behaviour located at the level of individuals creating a collective destiny or heritage over time, and not at the directional or rhetorical instigation of the firm itself. For Heidegger, an individual's sense of time is emotional, self-aware and part of a pattern of communication and interaction. The Strategic School replaces this with an objectified focus on chronological time, the firm, its customers and rivals. Consequently, a Heideggerian approach would not expect this objectified knowledge to play any significant role in bringing about individual commitment to a change in behaviour for anyone without a direct interest in such changes. The objectification of human action creates problems for the Process School, since the individuals working in the systems are objectified both by definition, and by the output of the School. That is to say, those people who are processed by the School become tools themselves. This may actually reduce the capacity and willingness of individuals to create further knowledge – a point also revealed by Maturana's notion of robosphere (Maturana and Bunnell 1998). It may be a little romantic to characterise this as a further movement from leaping ahead, where actions for others (such as in a team) are based upon achieving desirable, improving goals, towards leaping in, where completion of a set process is regarded as satisfactory, regardless of outcomes in the short and long term. In managerial terms, the scope for organisational learning is much reduced.

## **5. Concluding thoughts**

This paper aims to open up a debate concerning the ontology of knowledge management. We have examined the ontological assumptions of knowledge management systems under both Popper and Heidegger. There are some surprising similarities in the assessment of some knowledge management Schools, and striking differences in others. Curiously, none of Earl's Schools seem to satisfy an underlying philosophical proposition that would give confidence to the accuracy (or truthfulness) of the knowledge it purports to manage. This would imply some kind of pragmatic choices about knowledge management that limit what can be done to a great deal less than what can be said. The differences between the two analyses can probably be derived from Popper's wish for knowledge that corresponds to an external reality, while Heidegger's knowledge is an intrinsic part of humanness. This would presumably extend to an overall judgment about knowledge management systems themselves. Popper's focus on problem solving would presumably view knowledge management positively; subject to certain skepticism about the validity of the knowledge held. That is to say that difficulties with knowledge management systems are seen as somewhat technical, concerning validity and verification. A firm that succeeded in using knowledge management systems skeptically might develop a competitive advantage by a more circumspect appreciation of the knowledge in these various systems, or at the very least reduce a firm's susceptibility to fashionable management projects (including knowledge management, paradoxically). For Popper, such an approach would be based around deliberate attempts to disconfirm (or falsify) what was taken for granted, rather than

seeking confirming evidence for current articulated beliefs. This falsification would be particularly important for World 3 knowledge and its transformation to and from World 2, to provide ever less inaccurate knowledge of World 1. To some extent, this would reduce (although not eliminate) some of the concerns raised about the status of knowledge in the knowledge management systems described above. However, at present there seems little enthusiasm for systems designed to challenge knowledge in knowledge management (or management generally).

Heidegger, on the other hand, would question the ontological basis of both the literature and the practice of knowledge management. The ontological basis of any tool is the human structures that bring forth its necessity. However, knowledge management, in both the literature and in practice, tends to focus upon ontical properties of materiality, such as the hardware and software specification, coding systems, physical location of people, classifications of systems (such as Earl 2001) and so forth,. There is an equivalent dislocation of the problems and issues to be solved, since organisations are not alive they cannot have problems, missions and objectives. Only humans can have such things, consequently, the literature to date objectifies people and their activities in terms of required organisational behaviour, creating an alternative, unreal world of expectations of workers, knowledge and knowledge management systems. Within this narrative, the human structures of an alternative ontology of knowledge management as currently conceived can be glimpsed, in terms of the power or status a knowledge management system might confer on interested individuals, and the comforting (though debilitating) assurance that someone, somewhere, is using the system to work out what is going on.

In summary, this paper has contrasted two ontological examples to the study of knowledge management. No doubt other approaches would reveal interesting thoughts overlooked here. The chief contribution is through its discussion of limitations to what can be achieved within any of Earl's Schools of knowledge management systems. In all cases, these limits to what can be achieved by the systems are constrained by the ontology of the knowledge that they contain. This is hardly surprising, but nonetheless it might be a useful reminder that improvements in both technology and management systems will not solve inherent weaknesses. Popper provides a means of enhancing the effectiveness of knowledge management systems through skepticism; paradoxically eliminating some knowledge managed through falsification. Heidegger offers a more challenging set of insights by drawing attention to the divergence between humans as they are required to be by these systems, and actual people that design and operate such systems.

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