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December 2003

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### Recommended Citation

Young, Regit and Letch, Nicholas, "Knowledge Contexts-Through the Theoretical Lens of Niklas Luhmann" (2003). *PACIS 2003 Proceedings*. 40.

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# Knowledge Contexts: Through the Theoretical Lens of Niklas Luhmann

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## Abstract

*Context is considered to be an important aspect of knowledge work. However, understanding of knowledge context is dominated by a perspective that assumes that context can be predefined and applicable to all knowledge work. In this paper it is argued that this approach cannot accommodate the dynamic and emergent nature of knowledge work. Using Niklas Luhmann's socio-theoretical concepts, a definition of knowledge context is developed which extends current understanding and addresses the shortcomings of the conventional approach.*

## Keywords

Knowledge management, knowledge context, knowledge environment, Niklas Luhmann, system differentiation, autopoiesis

## Introduction

As organisations begin to embrace Knowledge Management, numerous organisational researchers have turned to the concept of “context” to increase their understanding of the way the environment influences knowledge management practices (Nonaka and Konno 1998, Teece 1998, von Krogh et al. 2000, etc). However, there appears to be no single definition of context and the concept is treated differently by various authors. Consequently, understanding of the concept of is somewhat fragmented and can be viewed from multiple perspectives.

What is common to most examinations of knowledge context is an assumption of a universal representation. That is for any organisation, a knowledge context can be predefined and applied across all knowledge work. In this paper it is argued that this approach cannot accommodate the dynamic and emergent nature of knowledge work. Using Niklas Luhmann's socio-theoretical concepts, a definition of knowledge context is developed which extends current understanding and addresses the shortcomings of the conventional approach.

## Conventional Approaches to Knowledge Context

The word “context” is derived from the Latin *texere*, which in a general sense refers to circumstances or events that form the environment within which something exists or take

place. Context can also be seen as representing the particular set of conditions within which action / interaction strategies are taken (Strauss and Corbin 1990); or “as a wider view, a setting, statement, or body of information that explains or gives meaning to words, ideas, or actions” (Cohen 1998:30).

The most pivotal approach to context in the knowledge management domain derives from Nonaka and Konno’s concept of ‘*Ba*’ - the physical, mental and social space surrounding knowledge activities (1998). Nonaka suggests that there are three kinds of ‘*Ba*’ (interacting, cyber and exercising) that affect the transformation, transfer and application of explicit and tacit knowledge. These concepts have been used as the basis for defining “knowledge enablers” (von Krogh, et al. 2000) that can serve as primers for an organisations’ knowledge management strategies.

Similar to “*Ba*” is the idea of a “knowledge ecology” which adopts a systems approach to address context (Cohen 1998). A knowledge ecology is a dynamic system that develops and changes to maintain the balance between structure and spontaneity (Brown 2002). From this perspective, the focus of management shifts from the individual to the community of practice.

Another approach to context has been to adopt a more specific perspective in which the “context” derives from the application domain. For example, the context of the financial services sector or the software development industry. Arising from this approach, application domains are represented with notions such as “knowledge in context” (Teece 1998) or knowledge is evaluated based on the domains represented, for example, “knowledge in action” (Schön 1983).

Technology and management practices are critical elements in the implementation of knowledge management initiatives. In a practical sense, these elements together form the conventional view of context whereby designed artefacts and practices have some influence over the actions of knowledge workers. For example, technology is seen to contribute to the structural dimension needed to mobilise social capital for the creation of new knowledge (Gold et al. 2001) and management practices will often have implications for the collaboration and sharing of knowledge across internal organisational boundaries (O’Dell and Grayson 1998).

A common approach to the implementation of KM practices is to design an environment conducive to knowledge work. Knowledge workers are conceived as working within a given mental-physical space that can be managed. Knowledge workers are assumed to be able to collectively make sense the surrounding conditions, and subsequently, conduct their activities accordingly. In practice, objectives such as “setting” (Petrash 1996) or “providing” (Nonaka and Konno, 1998) a context for knowledge creation, or emphasising the “management” of context through manipulating structures and knowledge workers (Von Krogh et al 2000), necessarily separates knowledge workers from their environment (figure 1).

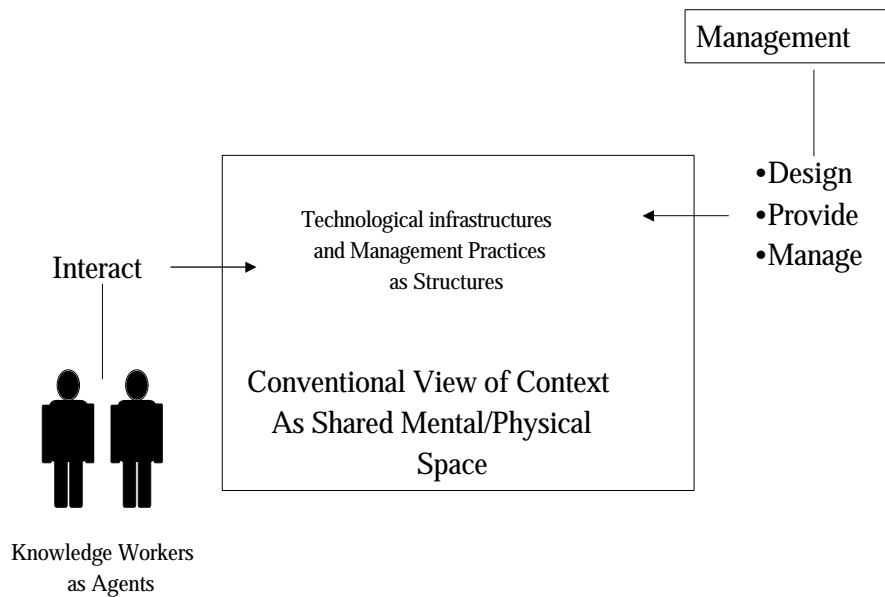


Figure 1: Conventional view of context in the knowledge management domain.

In practice, these structures are largely assumed to be given and stable, and are assumed to be universal across all knowledge activities. A stable structure also suggests a stable knowledge process whereby knowledge is seen as a fixed commodity, ready to be appropriated. This perspective is perpetuated by the myriad of frameworks suggested to manage the knowledge resource (eg Teece 1998; Leonard 1995).

## The Complexity of Knowledge Processes

In the conventional view of context, the environments are largely assumed to be given and stable, and their influence is considered to be universal across all events in an organisation. For example, von Krogh et al. (2000) suggests the notion of a *right context* that involves organisational structures that foster solid relationships and effective collaboration. The underlying assumption is that there is an ideal environment to be constructed. Through socialisation and interaction within such an environment, a context of shared meaning or shared mental space can be achieved (Nonaka and Konno 1998; Senge 1990). This view of a universal context is however an oversimplified perspective of how context influences knowledge work.

## The Multiplicity of Knowledge Processes

The first simplification inherent in the universal context approach relates to the complex social nature of knowledge work. Under the broad research tradition of the sociology of knowledge (eg. Berger and Luckman 1967; Holzner and Marx 1979), organisations are viewed as “knowledge systems” encompassing a collection of social activities enacted as “knowledge processes” (Holzner and Marx 1979). These knowledge processes are frequently identified as:

- Construction – The process through which new material is added or replaced within the collective stock of knowledge.

- Organisation – The process in which bodies of knowledge are related to each other, classified and integrated.
- Storage – The process whereby observations and experiences that have been tested and socially ratified are stored.
- Distribution – The process of channelling knowledge to needy recipients.
- Application – The process whereby knowledge is applied in practice (Holzner and Marx 1979).

These five processes highlight the functional demarcation of knowledge work, thereby contesting the idea of a universal context in the conventional sense. Orlikowski (2000) for instance suggests that multiple contexts emerge from the repeated interaction between structures and actors. This emergent perspective of context is more representative of the multiplicity of knowledge processes rather than a scheme that is explained by predefined, universal structures.

## **The Constitution of Meaning in Knowledge Processes**

A second shortcoming of the universal approach to context derives from its treatment of the processes by which knowledge workers make sense of their activities. Sense-making is fundamental process in knowledge work (e.g. Thompson and Walsham, 2001; Cohen 1985; von Krogh, et al. 2000) and the constitution of meaning is a critical aspect of this process. Shared mental space in the conventional sense, not only provides a shared knowledge space, it also promotes understanding and therefore provides justification for the activities of KM. For example, shared vision refers to the shared operating values, a common sense of purpose and a basic level of mutuality (Senge 1990) whereby organisational members reference their activities.

However, the problem with the universal approach is that a universal meaning arising from a single shared mental space or vision is debatable. For example, organisational meaning and motives are not easily diffused across all organisational members (Corbett and Scarbrough 1992). Furthermore, while context is latent in, and defined by, the circumstances of shared communication, context-dependent meaning is solely assigned by individuals (Thompson and Walsham 2001).

In addition, the notion of a shared mental space and shared meaning may even be considered to be undesirable because it can act as a form of oppression and unlikely because it is highly questionable whether individuals' values, norms, ideologies can be uniform and unvarying within any population (Flood 1999). This inevitably suggests that the meaning constitution of knowledge work should be seen as a collection of different meanings rather than consensual, shared meaning.

The conventional assumption of a universal context is a reductionist representation of human knowledge workers. Under such schemes, there are many "model citizens" for KM. For example, the "responsible" (Drucker 1993), and the "self-transcending" (Nonaka and Konno 1998). With each management attempt to devise a strategy to create model knowledge workers, individuals are portrayed as malleable, changeable, and manageable - ultimately indistinguishable from other resources

## Knowledge Worker Interaction with Designed Artefacts

A third criticism of attempts to design a universal context is that these efforts base their implementation entirely on the ability of workers to interact with and react to the environment. However, studies of the motivation of workers to engage with knowledge management systems and knowledge activities (Huber 2002; Constant et al. 1994), suggest that knowledge workers do not always interact with their environment and may choose to ignore the designed artefacts. Furthermore, there is evidence indicating that workers sometimes proactively deploy “defensive routines” to circumvent interaction with implemented KM systems (Barley 1986).

Another view is that knowledge workers may not be conscious of their environment at all. According to Heidegger (1962), objects of usage seldom become the “objects of consciousness” until they need to be addressed. Actors engage the world through projects and tasks, which in turn influence their understanding of the artefacts and their use within their environment (Cass 1998). Consequently, knowledge worker awareness of their environment may sometimes be overwhelmed by the inertia of the activities they are engaged in. Therefore efforts to design a universal context may be misguided.

## Luhmann’s System Differentiation and Autopoiesis

Given the foregoing critique of the conventional approach to knowledge context, there is a need to extend current perspectives on knowledge context to account for the multiple and complex nature of knowledge work. In the following sections, two streams of theoretical insights from the work of Niklas Luhmann (1927-1998) are used to develop an approach to knowledge context that accommodates this complexity.

Luhmann’s radically functional approach is well suited to explain the effects of functional dynamics of various knowledge processes (eg creation, transfer, store, etc.). In addition, the sense-making processes of KM activities which have been the subject of discussion of several KM researchers (e.g. Thompson and Walsham, 2001; von Krogh and Roos 1995; Cohen 1985) can also be understood in terms of Luhmann’s conceptualisation of communication in which the production of communicative events is a selection of events and possibilities that constitute meaning (Mingers 1995). By conceptualising a system of communication through time, Luhmann’s approach also supports the historical and emergent nature of knowledge (McDermott 1999; von Krogh and Roos 1995).

## Differentiation of Systems

The first major stream of Luhmann’s work that we can apply in developing a definition of knowledge contexts is drawn from his Theory of General Systems (Luhmann, 1982). In Luhmann’s general system, human actions are organized and structured. A social system emerges if these structured and organized actions become interrelated. Consequently, the relationships arising out of the many facets of a social system inevitably generate a system of complexity with which actors within the system have to deal. Based on Ashby’s “law of requisite variety” (1956), for the system to survive, it must somehow match its complexity to that of the environment. This is achieved by increasing the internal complexity via internal differentiation. So in Luhmann’s view of a society, the society can achieve internal differentiation through three basic nested social systems:

- An all encompassing societal system which uses highly generalised symbolic codes, such as money and power;

- An organization system that coordinates the actions of individuals with respect to specific conditions; and
- An interaction system that emerges when actors are co-present and perceive each other.

At each level differentiation is based on the subsystems' selections of generalised symbolic codes in their operations along three dimensions (temporal, material and symbolic). Therefore, how we can tell two internal subsystems apart is through how these sub-systems recognise and use symbols in their functional duties. For example, the symbol of power is used in organisations to reach binding decisions; the symbol of money may be used to resolve disputes in the legal system, etc.

This functional approach to conceptualising knowledge contexts is well suited to explain the effects of functional dynamics in various knowledge processes. For example, the processes of knowledge creation and knowledge application differ in functionality and make use of different symbolic codes. Validity is a dominant symbolic code in the knowledge creation process and profitability is a dominant symbolic code in the knowledge application process.

## Autopoietic Social System

The second stream of Luhmann's work that can be applied to the definition of knowledge contexts has its foundation in the concept of autopoietic systems. Broadly speaking, an autopoietic system is an organisationally closed (as a unity), but interactively open system that is self-producing. Using its output as input, the system continuously produces its own constituents in a circular organisation (Maturana 1978). This stream of Luhmann's work assists with dealing with the problems encountered in using a universal context approach because of the constitution of meaning in knowledge work and knowledge worker interaction with designed artefacts.

The focus of Luhmann's theory is on the interactive construction of social meaning at the macro-social level. Luhmann (1986) argues that in social systems, communication is the mode of autopoietic reproduction.

A communication event consists of 3 communication elements: information, utterance and understanding.

- Information is the content of communication, underlining what the communication is about.
- Utterance is the presentation of communication, encompassing the mode and media of communication.
- Expectation is the interpretation of communication, leading to understandings that affect the reproductions of further communication.

Here, communication is considered at two levels – a message with meaning and a message with information. Given the macro-social level of analysis, communication in this sense resides in the social system and is not amongst individual people. The interaction of individuals purely serves as data to the social system. In fact, Luhmann maintained that people, their action and their consciousnesses are all external to an autopoietic social system (Luhmann 1989). Accordingly, an agent's action will not affect the system until that action becomes the subject of communication. For example, the act of writing this paper and its presentation at a conference, does not ensure that the meaning within this paper is a constituent of the "social system of KM". It is only when the meaning of this paper is used in

the interactive constitution of other meanings in the social system of KM, that its meaning can be considered as part of the system. That is, only when and if this particular paper is cited by subsequent papers and research in the domain of KM, can its meaning be considered to be part of the social system of KM.

In Luhmann's terms, the constitutions of meaning are based on a network of selected communicative events relating to the system in question. The perpetuation of communicative events is seen as a network of events through time, each referring to other and past communicative events for its reproduction. Since each event is instantiated in time, the events are unique and therefore the network only consist of *differentiated* events, rather than a patterned structure that emerged over *repeated* social interactions.

Rather than universal meaning within shared mental space being predefined in the conventional sense, social meaning within knowledge work can be seen as a network of interactively constituted meanings. Furthermore, since the interaction between designed artefacts and knowledge workers depends on the knowledge worker's selective understanding of the artefacts based on the constituted meaning, the way that knowledge workers interact with designed artefacts (predefined context) is viewed as a selection from the environment rather than predetermined interaction.

## Defining Knowledge Contexts: A Luhmann Perspective

In this section a definition of knowledge context based on Luhmann's concepts is presented to illustrate their applicability and to demonstrate how this view of context is can extend the conventional view. Figure 2 diagrammatically represents this extended definition of knowledge context.

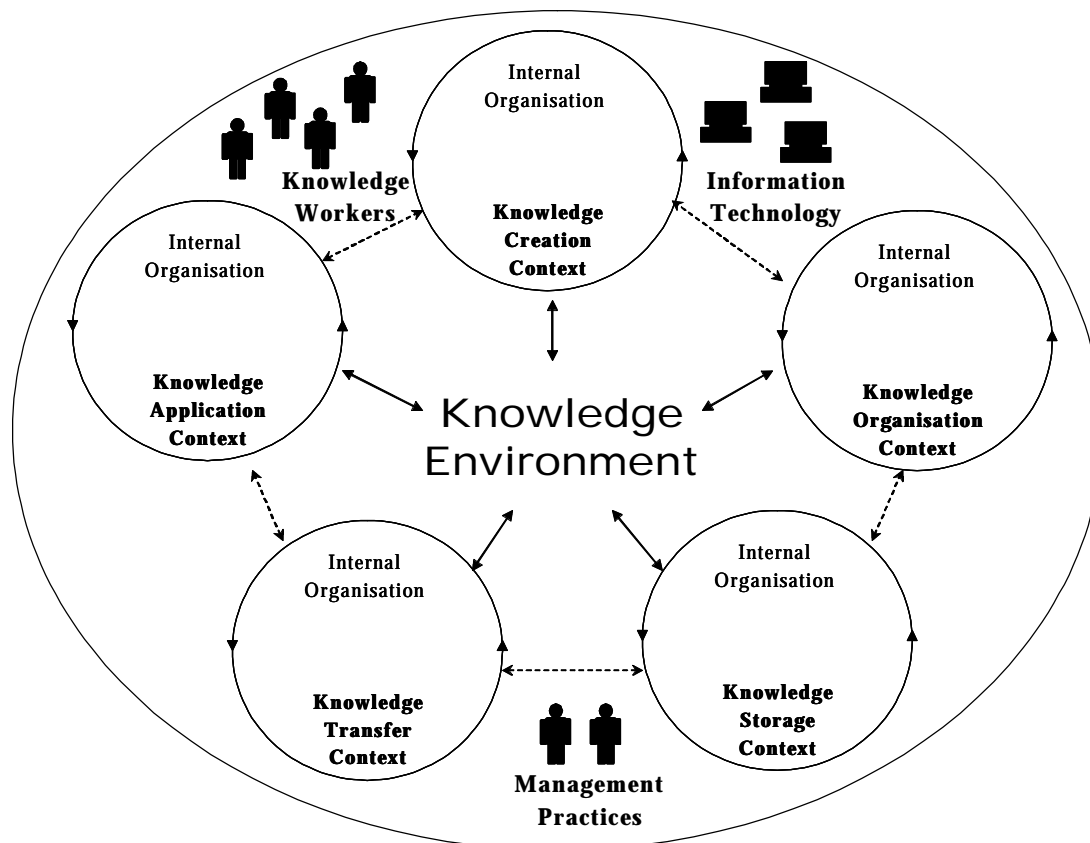


Figure 2: Knowledge Contexts and Knowledge Environment.



In our definition, knowledge contexts are separated from the knowledge environment. The knowledge environment comprises the knowledge workers, knowledge management practices and the technological infrastructure and artefacts designed for knowledge management activities.

As opposed to the conventional view of a universal context, the use of the term “contexts” is an important aspect of the perspective taken here. In adopting Luhmann’s scheme, social systems and subsystems emerge as a result of functional differentiations. With respect to a knowledge environment (a social system), the functional differences arising from the needs of the various knowledge processes (creation, application, storage, etc.) give rise to a variety of knowledge social subsystems, each having its unique dynamics that define the activities as well as the rules governing these activities. This approach is similar to research in “situatedness” which suggests that the conventional view of knowledge context is more akin to the concept of “situation” which comprises everything while “context” consists of specific aspects that characterise a situation (Lueg 2002). Using Luhmann’s scheme, it is the functional differences of knowledge processes that characterise a situation in knowledge work. Therefore as depicted in figure 2, a differentiated context exists for each knowledge process.

Knowledge contexts defined as such are seen as autopoietic systems being organisationally closed but interactively open to the knowledge environment. To these contexts, environmental or situational conditions (including human and management actions) are just data, selectively internalised. There is no predefined input or output to the contexts. The way in which individuals, technology and management practices within each context relate and self-organise themselves with respect to the functional needs of the knowledge processes cannot be affected directly by the external influences without selection. That is a context as a subsystem selectively interacts with the environment. For example, the decision to apply knowledge in a particular way or to adopt certain technology for knowledge transfer; are in essence selected by the context rather than predefined by the environment.

Selection of interaction by a context can be with the environment or with other knowledge contexts. With each selection, a communicative event occurs and a sequence of events forms a network of differentiated communicative events (see figure 3). This network of events demonstrates the autopoietic nature of knowledge contexts. Each knowledge context is able to use a communicative event to produce further communicative events and as such is represented as circular in figure 2.

Furthermore, selections by knowledge contexts are based on the interactively constituted meanings within these contexts. Since the meaning within each context is constituted via a network of differentiated communicative events through time (figure 3), meanings are also seen as being dynamic rather than predefined. For example in knowledge creation, yesterday’s brilliantly conceived idea might not, following further discussion, seem as brilliant today.

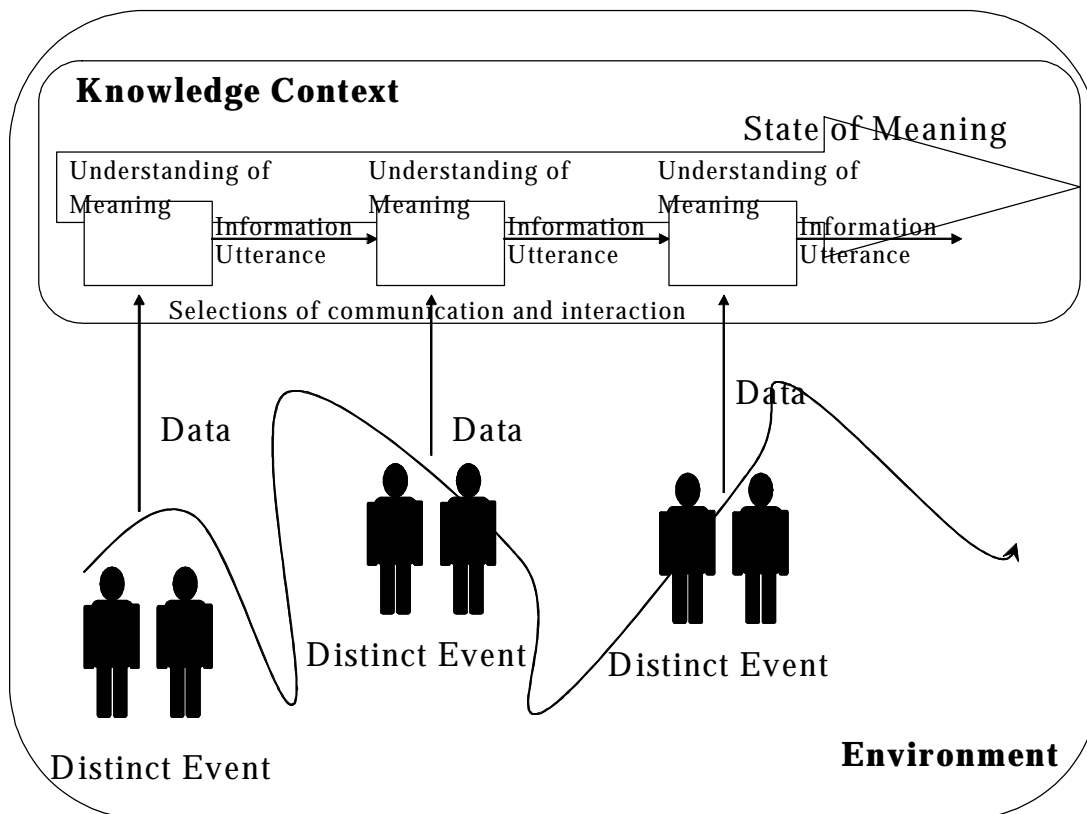


Figure 3: Meaning Constitution in Knowledge Context.

## Discussion

Two major implications for knowledge management initiatives are presented by adopting the above definition of knowledge context. Firstly, KM initiatives must recognise that designing an environment for knowledge management practices must cater for the variability of knowledge processes. Therefore, KM programs need to be sensitive to the individual functional requirements of each process.

Secondly, organisations have to consider the individually assigned (and consequently interactively constituted) meaning of KM implementations and how these meanings can affect the selection of workers' actions and interactions. Given that the interaction between knowledge workers and technological artefacts is selective, a KM initiative should appreciate that knowledge workers cannot be managed or induced into interacting with a KM system unless they choose to do so.

## Conclusion

Although it is widely recognised that understanding the contextual factors of knowledge management is important, the conventional view of knowledge context adopts a universal approach which implies static and predefined structures. However, it has been argued in this paper that this approach cannot accommodate the dynamic and emergent nature of knowledge work. The definition of context based on Luhmann's socio-theoretical concepts presented in the preceding sections, extends current understanding of knowledge contexts and addresses the shortcomings of the conventional approach.

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