

Some Provocations Concerning the Foundations of IC and KM Research

Anthony Wensley¹ and Max Evans²

¹Department of Management, University of Toronto Mississauga, Canada

²School of Information Studies McGill University, Montreal, Canada

anthony.wensley@utoronto.ca

max.evans@mcgill.ca

Abstract: The overall objective of this paper is to propose and discuss some provocative questions about the foundations of IC and KM research. These provocations primarily, but not exclusively, address issues with respect to the ontologies and epistemologies that underlie these areas of research. The nature of knowledge and its articulation lies at the heart of concerns with the current theories underpinning IC and KM and, indeed IC and KM research generally. Such concerns also raise interesting issues about many existing research studies in IC and KM. Of particular concern are the ways in which the terms 'knowledge' and 'intellectual capital' are defined (or not defined) and explored. It is critical that generally agreed on definitions of key concepts are identified so that firm foundations exist as a basis for empirical investigations. However, it is argued that these definitions are likely to be open-ended and need to recognize that, at least with respect to value, the definition of relevant concepts is radically dependent on context at many different levels. From a definitional perspective IC and KM are intertwined and overlapping. Furthermore, to the extent that one of the dominate objectives of the management of IC and KM is the creation of value the contribution of the components of IC and KM is intimately related to the individual, group, organization and social context within which such management takes place. Although this paper offers provocations with respect to the current state of IC and KM research, it also provides some suggestions as to potentially fruitful extensions of existing research. One stems from a nuanced consideration of knowledge and the interaction of knowledge and IC in generating value. It is suggested that much insight can be gained through a renewed consideration of such disciplines as Economics and Organizational Studies. The paper concludes by proposing that IC and KM researchers refocus both on the intersection between the two research areas and the nature and value of knowledge.

Keywords: Intellectual capital, Knowledge, Knowledge management, Theory, Value

1. Introduction

As researchers working in both IC and KM research, we have had over 50 years of experience of conducting research in the KM and IC domains and other associated fields. Throughout our journey we have been increasingly concerned with the relative lack of detailed discussion of the foundations of IC and KM research. We acknowledge that many of our colleagues have provided valuable insights into these concerns (e.g. Kianto et al. 2020, Vielma, 2007, Viedma and do Rosario-Cabrita, 2023) however we contend that there is a need to reconsider a variety of fundamental issues with respect to the foundation of IC and KM research particularly pertaining to the ontological and epistemological aspects of these research projects. Furthermore, with respect to the fact that IC and knowledge research are studied with a view to how they allow organizations to achieve objectives as creating value (economic and otherwise), achieving resilience or sustainability, there is a need to conduct research that elaborates on the contribution of knowledge and IC to these objectives.

2. Classification and the Development of Theory

In many ways, since the time of Aristotle (2023), classification has been seen to a fundamental precursor to representing and referring to the world and creating the basis for developing theory. Typically, classification results in a taxonomy. Classification involves the identification of referents through their location within a taxonomy. At the most basic level being able to refer to the world and communicate requires the making of distinctions – to distinguish between what is and is not (Spencer-Brown, 2008). Furthermore, the basis for such distinctions will be characteristics of the referent in question. Although this is a precursor stage to the formulation of theory such classification may not be based on an underlying theory or lead to one that links deeper concepts to surface characteristics. However, an appropriate taxonomy may provide the ground for theorising about deeper concepts and their relationships to surface characteristics. It is interesting to note that in the case of Linnaeus fortuitously the surface features he sought to use to develop a taxonomy of living things could later be associated (generally) with genetic theory (Paterlini, 2007).

In addition to identifying basic referents of interest it is typically of interest to identify how such referents are interrelated and related to other higher-level concepts such as outcomes, values etc. Integral to these concerns is how we may go about establishing the existence of such referents, their characteristics and the relationships to other concepts. Thus, both ontology and epistemology are key aspects of theories – thus,

central questions that we must answer in developing the foundations of any theory are: What are the basic referents of the theory and how do we learn about them?

As a starting point for investigating the foundations of IC research it is appropriate to review approaches that have been adopted to develop taxonomies of IC components and investigations as to the characteristics of IC components, their interrelationships and their relationships to higher level concepts such as value, sustainability, resilience and competitive advantage.

3. The Challenge of Developing a Taxonomy for IC?

Expanding on the discussion in the preceding section to provide an adequate foundation for any theoretical study it is necessary to develop an appropriate ontology which initially involves establishing appropriate classification(s) utilizing taxonomy(ies) for what is referred to by the portmanteau concept – IC. The initial impetus to identify IC was the failure of economic theory to adequately provide an explanation for the economic value derived from traditional capital. This led to a distinction being proposed between Tangible Capital and Intangible Capital. There are many closely related definitions of Intangible Capital an example of which is '[i]ntangible capital is generally defined by what it lacks—that is, as productive capital that lacks a physical presence' (Crouzet et al. 2022). In IC research Intellectual Capital (IC) was initially further decomposed into Human Capital, Customer Capital, Social Capital and Structural Capital which itself can be decomposed into Process Capital, Organizational Capital and Innovation Capital (Edvinsson and Malone, 1997). Andriessen (2001, p. 204) notes that, at least at this 'early' stage of development there is probably no generally agreed 'standard' theory of IC whilst observing that existing classification schemas (as of 2001) generally "break down the total [intellectual] capital of a company into its contributing parts, the human capital and structural capital" (ibid. p. 205). However, he also notes that "this is a very useful way to define what we are talking about, but at the same time it hampers us in seeing the wood from the trees" (ibid. p. 205).

Fairly early on Bontis (2001) had concerns as to the non-standardization of the definition of IC and its components and subcomponents. In the same volume However, this seems to have had relatively little effect since some years later Roos and Pike (Roos and Pike, 2007, p. 11) opine that 'the devotion of numerous paragraphs or even entire sections [in IC research publications] to a discussion of taxonomy ten years after the two most popular systems were first published seems absurd'.

Marr and Moustaghafir (2005) review a range of published research to explore the concept of IC. It is instructive to note that of the 938 papers selected only 55 provided useful definitions of IC. From their sample they provide 'guidance' with respect to identifying the components of IC namely: employees' skills and know-how, organizational culture, relationships with stakeholders, organizational image and reputation, technological infrastructure, intellectual property rights, and practices and routines. There is relatively little discussion as to the structural relationships of the subcomponents of IC, the characteristics of each of the subcomponents or how they can be utilized to create value.

A later and truly impressive literature review (Pedro et al., 2018) concludes that "[components of IC] formed of human capital, structural capital and relational capital is the [research approach] showing a convergence of the majority of authors analysing empirically the main components of IC". However, it should be noted that many researchers have expanded to overall concept of IC. Thus, additional components have been added such as Green Capital (Chen, 2008). Other researchers have expanded the components of IC considerably to include such components as Technical Capital and Spiritual Capital (Kahn, 2015). In addition, issues relating to the cross-cultural comparison between IC components have been investigated by Inkinen et al. (2017).

In reviewing the direction of IC research to date at least four distinct issues can be identified. In the first place although it seems that there is some coherence with respect to the subcomponents IC new components are being added without clearly identifying their relationship to existing subcomponents. For example, Chen introduces the concept of Green Capital and decomposes it into green human capital, green structural capital and green relational capital. There is a need to articulate the ontological/conceptual structure of IC even though such a ontological/conceptual structure is likely to be open ended. Without a articulated ontological structure it is difficult to see how a reliable epistemological basis for IC can be established.

In the second place there is a need to articulate the interrelationships between the different subcomponents of IC particularly in the way they jointly relate to the achievement of goals such as the creation and capture of value. In the analysis of the contribution of IC and its subcomponents to the creation of value.

Thirdly, the current approach to developing a conceptual structure for IC leads to assumptions that IC and its subcomponents are distinct entities in so far as they allow organizations to create value. However, this does not allow for the recognition that, at the very least, considering knowledge as a component of IC, the value of IC is radically dependent on context. The recognition that IC can be represented by stocks and flows does not help.

Fourth, although knowledge is often referred to as having 'something to do' with IC and the creation of value the part played by knowledge is rarely investigated in detail apart from observing that one component of IC may be knowledge or that Human Capital includes the knowledge and skills of employees.

To go beyond the superficial, albeit one that has been empirically quite productive, there is a need to further establish how the components and subcomponents of IC lead to the achievement of overall goals such as the economic performance or, more generally, the creation of value.

Many researchers have indicated the interweaving the concepts of IC and KM. Kianto et al. (2020) argue that the two concepts are intimately linked. In the following section the linkages between the concepts of IC and KM are explored by considering extant research conducted by IC and KM researchers.

4. How are IC and KM Related?

In many ways IC and KM research sprang from the same root, at around the same time, and claim common pre-cursors (e.g., Bontis, 1998, 2001; Edvinsson and Malone, 1997; Stewart, 1997). However, in the last quarter century these research disciplines seem to have drawn apart as has been noted by Lambe (2023, p. 202-3).

IC researchers have largely explained IC as a combination of organizational knowledge and knowing capabilities (e.g., processes) that enable organizations to derive value from organizational knowledge (Bontis, 1998; Nahapiet and Ghoshal, 1998). Furthermore, IC may act as basis for the addition of value to the organization, potentially leading to the establishment of competitive advantage (e.g., Bontis, 1998, 2001; Edvinsson and Malone, 1997; Stewart, 1997).

In contrast, the focus of much KM research has been to consider the nature of knowledge. Initially focus was placed on the distinction between tacit and explicit knowledge (Nonaka et al, 1995) and to a somewhat lesser extent, implicit knowledge. Initially, in its early stages KM research was somewhat focused on existing and new digital technologies and the extent to what they facilitated the creation, capture, and dissemination of knowledge.

This second generation of KM research inevitably brought with it deeper considering of the human involvement in KM and the production, management, and utilization of knowledge (McElroy, 2003 McElroy et al., 2006). Thus, the second generation of KM research recognized social and organizational contexts, closely interweaving KM with the IC literature, even if researchers didn't necessarily articulate this connection. This research did not classify all knowledge as inherently valuable but rather tried to explain how organizational knowledge can be turned into valuable knowledge through dynamic capabilities that facilitate the acquisition, combination, and sharing of knowledge to support decisions and processes that create value for the organization. Typically, this value was measured primarily in terms of organizational financial performance.

In addition to insufficient attention being paid to the part that knowledge plays in facilitating the linkage between IC and value there has been insufficient attention paid to the different types of knowledge encountered in organizations and their characteristics.

In similar vein, much recent research into, for example, knowledge hiding has addressed individual, organizational, and social perspectives, which often involve components of IC directly or indirectly (Tokyzhanova and Durst, 2023).

The above discussion suggests the need to explore, with a more critical eye, where and how KM and IC are closely interweaved both in terms of their components and how they organizations combine them to generate value. As observed by McElroy et al. (2006), Kianto et al. (2020), Albertini (2016), Reed (2000) and Reed et al. (2006), components of IC and knowledge are intimately interweaved It is proposed that one starting point is the proposal that KM is focused on the management of knowledge, which is embedded in IC (or articulated through IC) to create value which may be economic value, social value or other value outcomes. This is discussed in the following section.

5. What is the Knowledge?

Kianto et al. (2020) note that “knowledge itself is an extremely complex and problematic concept that has been discussed in a multitude of disciplines, from philosophy to accounting and from information science to anthropology” (p. 2). It can be argued that each discipline brings with it a different definition of knowledge, and taxonomy of knowledge, and identifies different characteristics of knowledge.

Mokyr (2002), an economic historian, introduces the concept of ‘useful knowledge’ but does not provide a detailed definition. One can probably infer that ‘useful’ knowledge is that knowledge which enables the creation of human value. It leads to actions that create human value. In this context human value could be considered to refer to economic value, social value or other bases of value.

Mokyr (2002) separates into Omega, O, knowledge and Lambda, L knowledge. Broadly speaking Omega, O knowledge not only involves facts and empirically ‘validated’ regularities but also folk theories, myths, facts, etc. L knowledge is procedural knowledge or knowledge of how to get things done and is based on O knowledge. Mokyr (2002) focuses on knowledge that allows human to intervene in nature and interact to create value. Mokyr alerts us to the need to recognize the different types of knowledge that can be combined to create value and the limited importance of such concepts as truth.

In a further recognition of the richness of the concept in group and organizational settings an individual may acknowledge many different types of knowledge which may well interact when the individual acts (or interacts) with others in a group action situation. Individuals are members of many different “epistemic cultures” (Knorr-Cetina, 1999) which have their own definitions of knowledge and approaches to the ‘construction’ of knowledge (often unstated). Thus, different knowledge communities may have radically different ontologies and epistemologies, as well as ways of dealing with important aspects of knowledge, such as uncertainty and vagueness in different ways. Furthermore, it is likely that there are many different knowledge communities that a particular individual participates in that have different perspectives on what constitutes knowledge.

Many groups within an organization may need to collaborate to create a product or service which generates value. Different groups or, ‘knowledge communities’ may well subscribe to different ontologies and epistemologies. As Wittgenstein notes that this may result in different groups having a different ‘world view’ or a view of what we can know, the limits of our knowledge, and the criteria that are relevant to our claims to know something (discussed extensively in Korber, 2018 and Tsoukas, 2019).

To communicate and coordinate their actions groups must find some way of reconciling their world views. One way that organizations can better deal with or process of reconciling different epistemologies of knowledge is by using ‘boundary spanners’ who can interpret the knowledge provided by different knowledge communities (see, for example, Stafford et al., 2017). These individuals can, for example, recognize the unexpressed level of uncertainty in one community’s knowledge when decisions are processed, or the tentative nature of knowledge provided by one knowledge community versus another. However, in many areas we need to explore how individuals and groups of individuals collaborate with a focus on knowledge and IC. Rather than examining ‘knowledge sharing’ it is necessary to investigate the types of knowledge that are shared and their characteristics and the process of knowledge sharing. In addition, knowledge sharing is essentially an interaction between individuals which may involve extensive exploration, explanation and negotiation.

6. How does IC Contribute to the Creation of Value and What Part Does Knowledge Play?

As noted above and observed by McElroy et al. (2006), Kianto et al. (2020), Albertini (2016), Reed (2000) and Reed et al. (2006), the components of IC and knowledge are intimately interweaved. Clearly, the simple possession of knowledge does not create value for the organization. It is the articulation of this knowledge that creates, markets and supports products and services that potentially create value for the organization. Thus, knowledge or, more generally IC has value in an organizational setting only to the extent that it leads to action(s) that result in the creation of value. Thus, for example, human capital is valuable since humans are knowledgeable, have the capability and the opportunity of interacting with other humans, and can access and interpret information available in the organization’s information system to create products or services, marketing campaigns, business strategies that add value. Furthermore, it is the complex interweaving of IC and knowledge in a rich social context that leads to the creation of value. The rich social context that needs to be

considered embraces not only the context(s) within which the individual operates but also the organizational context(s) and the context(s) within which the organization operates.

For example, a better understanding of the ways in which human capital interacts with other components of IC and other organizational resources to create value can potentially provide a rich range of insights. These insights may provide an indication of ways in which the organization can increase the value it creates through paying close attention to the knowledge that it has/utilizes, and its present IC. One way in which this can be done is using 'thick' studies of organizations. Investigating how individuals manage IC and actively make decisions to utilize IC to engage in actions to add value.

However, alternative approaches to the measurement of value may be utilized as in the case of Responsible Knowledge Management (Durst, 2024). Furthermore, knowledge and IC may have value to the extent that they provide a path to future valuable knowledge and IC.

As noted above, perhaps, the central problem associated with the valuation of knowledge, and the various components of IC is that their value is radically contextual. As indicated above the value of knowledge depends on the knowledge already available to the organization (at all levels, individual, collective and organizational), and the specific components of IC in place in the organization. As indicated above, there has been extensive work on developing approaches to valuing IC (see, for example, Kianto et al. 2020) but typically these approaches are focused on a financial reporting or economic perspective and therefore, essentially providing some measure of economic value. Apart from ignoring issues such as ambiguity and uncertainty which are likely to have a significant impact on value. Furthermore, they are generally focused on the value of IC, as it presently exists in an organization, rather than the value of IC in generating future valuable options (see Kogut and Kulatilaka, 2001). There is clearly a need to investigate how IC and knowledge jointly create value and consider other definitions of value beyond economic value.

7. How are 'Significant' Empirical Results Obtained Based on Fuzzy KM and IC Concepts?

In the case of knowledge, as noted above it is likely to be the case that what represents 'knowledge' to one individual in a particular context is not necessarily knowledge to another individual in a different context. A similar point can be made at the collective and organizational level. This should give researchers pause, as one would expect the 'world model' of individuals in radically different industries or domains to be different. Thus, the epistemological support, degree of agreement, or tightness, to use Mokyr's (2002) terminology relating to the concept of knowledge may differ between individual, groups, and indeed organizations. In addition, the components of IC may differ significantly. These differences would need to be captured at an individual and collective level. As if this wasn't enough to keep KM theoreticians and empirical investigators up at night, the term knowledge does not necessarily carry the same meaning(s) in different languages or cultures. At a minimum it would be helpful when using terms like 'knowledge' to explore with subjects studied of such behaviours as knowledge sharing and knowledge hiding how they interpret the term knowledge.

However, it is commonly the case that when KM or IC research is replicated in different cultures and industrial domains, the results are often similar, if not identical. How can this be when there is little coherence between either the components of IC or, more fundamentally, the nature of knowledge?

As the beginnings of an explanation of the consistency of empirical results it is possible that in any context individuals interpret the term knowledge as that which contributes to the ability of the individual, collective, or organization to achieve its objectives. This seems to be a relatively unexplored area of research.

8. A Path Forward by Aligning IC and KM Research

It has been noted that there are fundamental challenges both with respect to the ontologies and epistemologies that underpin both IC and KM research. In addition, from the standpoint of the generation of value the context within which knowledge is articulated through IC is rich and multidimensional. Thus, it seems unlikely that concepts that are developed in IC and KM can be limited in their dimensionality. This would seem to be a characteristic of research in the social sciences. At the very least this is likely to mean that explanation and prediction in the sense used in empirical sciences is simply not possible. Perhaps the best that can be done is to specify the nature of the rich contexts that seem to generate the successful creation of value. Such definitions will not be precise but will allow significant flexibility as human actors interact with the knowledge and IC in action.

One observation is that the arbitrary separation of IC research and KM research has reduced the contribution of both research domains and limited the valuable synergies presented. It has been noted that empirical research seems to have confirmed the importance of a variety of factors relating to IC and KM yet establishing the significance of this is contentious, as the definition of terms used in the empirical analysis often have an inherent vagueness or are inadequately articulated. Both IC and KM research could benefit with a deeper level of analysis of the terms that are used and, through this, an appreciation of the interweaving of IC and KM (see, for example, McElroy et al., 2006 and Kianto, et al., 2020) and the rich contextual relevance.

A further concern is that, in paying insufficient attention to the multi-dimensional and contextual nature of the fundamental foundational concepts of IC and KM research agendas have been unnecessarily restricted. For example, the part played by ambiguity and uncertainty in the ability of IC and knowledge has been inadequately explored. Thus, it may be possible to revisit prior research for new insights or more likely to implement new research agendas to explore these issues among others. Furthermore, much extant research in other related disciplines which could have contributed to enriching the IC and KM research agendas has also largely been ignored. It is worth noting that computer science research in general, and AI in particular is replete with relevant and applicable knowledge. Indeed, when reference is made to 'artificial knowledge' in recent KM research (Bratianu and Paiuc, 2025) it seems necessary that work relating to the representation of knowledge in Knowledge Based systems is reviewed. Finally, in developing theory there is a need to pay much more attention to the epistemological and ontological foundations of IC and KM.

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