Unitas: Towards a Holistic Understanding of Knowledge in Organisations – A Case Based Analysis

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Abstract: The aim of the paper is to present a holistic framework of knowledge in organizations. The language of duality and opposites dominates much of the knowledge based literature, whereby knowledge and knowing in organizations are framed as an 'either/ or' discussion (Schultze and Stabell, 2004). This paper questions the usefulness of continued proliferation of such an approach, given the maturing nature of the field of knowledge management, and the ever increasing implementation of knowledge management activities by firms. The paper calls for a more unified interpretation of knowledge in organisations, which reflects the reality of the complex nature of knowledge and knowledge across the multiple levels of the firm. Hence the paper seeks to make a contribution by carrying out a multi case study of knowledge and knowing in organisations at multiple levels of analysis (that is at the individual, group and organizational level), with a view to supporting a unified framework on knowledge in organisations. The resulting framework is titled, Unitas, a conceptual framework on knowledge in organisations. The research was carried out in four case firms, across two industries, these beingmedical devices and pharmaceuticals. Fifty nine interviews were conducted, in tandem with documentation analysis, and observations. The resulting findings were analyzed using an interpretivist position. The paper concludes that multiple perspectives on organisational knowledge and knowledge activity are evident in the case organisations at three main levels of analysis, namely the individual, group and organizational levels. The Unitas framework presents four knowledge positions which are all concurrently active in organizations. The main contribution of the Unitas framework on organisational knowledge is that it provides a holistic interpretation of knowledge and knowing activity in organizations.

Keywords: Organisational Knowledge; Knowledge Based View: Knowledge Strategy; Knowledge Framework; Case Analysis

1. Introduction

Organisations are structured around many understandings of knowledge, including, knowledge as power, knowledge as meaning, knowledge as an asset and knowledge as process. These knowledge typologies co-exist through the many formal and informal networks that comprise the multiple levels of the organisation (Moller and Svahn, 2004). A review of knowledge based research, however, evidences a different story emanating from much of the literature (see for example, Schultze and Stabell, 2004; Evans et al., 2014). To this end, knowledge based research's gravitation toward contradictions, opposites, poles and dualisms, impacts on our understandings of knowledge in organisations. Schultze and Stabell (2004, p. 554) cite how organisational knowledge elements are often represented in an "either/or" language. This leads to the potential benefits from mutuality being overlooked, and in many cases, a trading of broad perspectives for narrow myopia.

Knowledge based research centres primarily on three areas of literature, first, organisational knowledge; second, the knowledge-based view of the firm, and third, the knowledge strategy pursued in terms of how organisations close their knowledge gaps. Within knowledge based research, knowledge is regarded as either objectively or subjectively based: Whereby organisations are seen to focus on either the knowing activity (Spender, 1996a, 1996b; Cook & Brown, 1999; Orlikowski, 2002), or the possession of knowledge (Grant, 1996, 2002; Teece, 2001). Research on the knowledge-based view of the firm is divided along the same dualism lines, with the majority of theorists viewing organisations as operating within a neo-functionalist or constructivist perspective (Schultze & Stabell, 2004). An organisation's dominant position in relation to how it views its own organisational knowledge dictates the knowledge strategy pursued. Here organisations are viewed as dividing their attention between the exploitation and exploration of knowledge (March, 1991). Two dominant streams of research influence are thus evident in the literature, these are presented in figure one below. The propensity of researchers to evidence neo-functionalist or constructivist perspectives on the firm, or to emphasise exploitation over exploration, is dependent on the value attached to organisational knowledge, be it objective or subjective. As the field of knowledge research matures, however, a more holistic and representative perspective on the reality of knowledge and its complexities, in real-world organisations should be presented. The conceptual framework presented in this paper seeks to achieve this aim.

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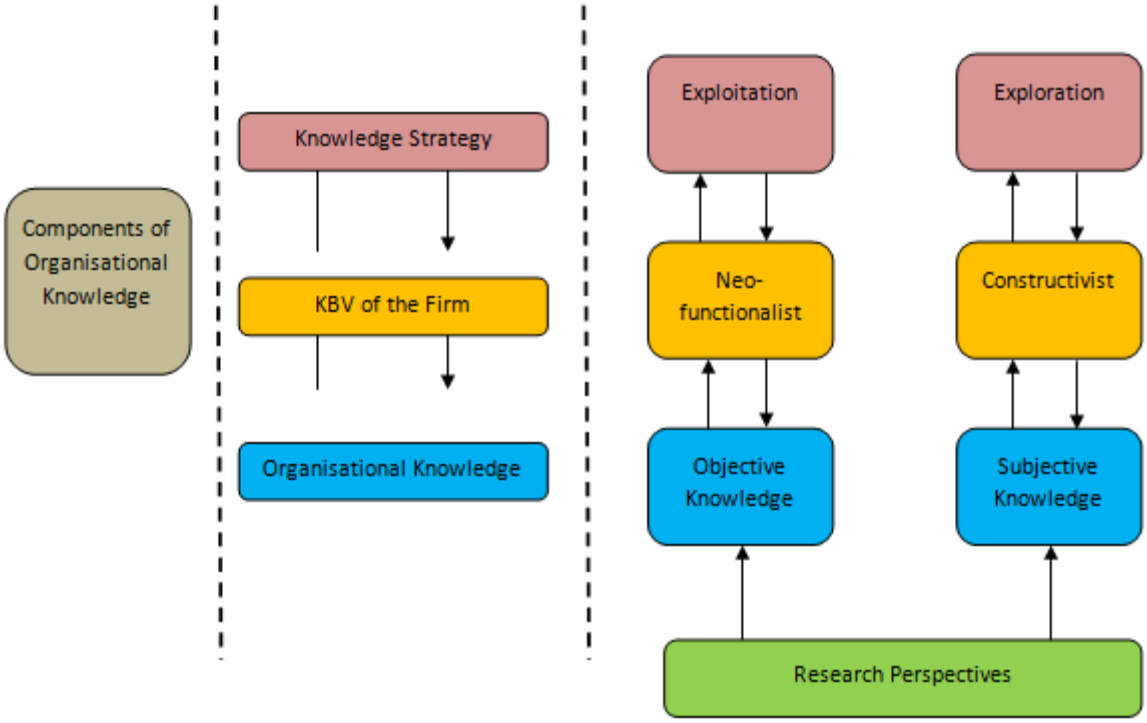

Figure 1: Dominant research perspectives on organisational knowledge

The aim of this paper, therefore, is to explore the concepts of organisational knowledge, the knowledge based view of the firm and knowledge strategy in four case firms, to determine if, in reality, a more all-encompassing view of organisational knowledge is evident. A conceptual framework presenting a holistic view on organisational knowledge is presented. The four case firms are analysed in relation to this framework. To this end, the four firms are analysed within the multi-case study at multiple levels of analysis.

2. Perspectives on Organisational Knowledge

Discussions on organisational knowledge have traditionally centred on the objective, subjective divide. This can be understood as the difference between the verb to know, and the noun knowledge. Authors have primarily adopted one stance or another (Grant, 1996; Spender, 1996b); however, the trend has moved toward commentary on the debate (Cook and Brown, 1999; Orlikowski, 2002), and attempts at reconciliation (Schultze & Stabell, 2004; Evans et al., 2014).

Objective organisational knowledge is a commodity; it is static, taxonomic, and positivistic. Organisational knowledge is objectified most succinctly through the categorisation of knowledge, where the unit of knowledge is emphasised over the knowing action (Grant, 1996; Sveiby, 1997; Teece et al., 1997; Lloria, 2008). Ways of categorising knowledge types include declarative, procedural and causal; conditional and relational (Hislop et al., 2000; Lloria, 2008); know-about, know-how, know-why, know-when and know-with (Sveiby, 1997). Chiva and Alegre (2005) refer to the cognitive possession of knowledge, to this end, knowledge is viewed as something that can be transferred, represented and measured. This view has fuelled, knowledge literatures' fixation with the externalisation of knowledge and the subsequent focus on knowledge management systems (McDermott, 1999).

Blacker (1995, p.1021) summarises the objective approach to organisational knowledge as offering, "*a compartmentalised and static approach to the subject*". Alvesson and Karreman (2001, p.999) refer to knowledge management literature's prevailing view of knowledge as "*objective (justified true belief) and thing-like"*. Likewise, Sawhney and Prandelli (2004) view the objective epistemology of knowledge as being overly concerned with understandings of the validity of knowledge. This trend toward the objective in knowledge management strategy literature emphasises knowledge as something "*explicit that is quite distinct from philosophy or values*" (Pfeffer and Sutton, 1999, p. 92).

Within the subjective view of knowledge, the act or practice of knowing takes precedence, a constructivist perspective is adopted where knowledge is seen to be both dynamic and emergent in nature, while the social aspects of the knowing process are emphasised (Spender, 1996b; Spender and Scherer, 2007). This subjective view of knowledge focuses on the emergent and latent qualities of knowledge, such as "*the traditional conceptions of knowledge as abstract, disembodied, individual and formal are unrealistic*" (Blacker 2004, p. 351). Thus, knowledge is understood to be a creating act, not solely a representation. The subjective view of knowledge reflects the personal element of knowledge inherent in the original intentions of Polanyi's (1969) work. The subjective viewpoint sees knowledge as situated in practice. Research in this area includes the study of communities of practice (Brown and Duguid, 1991), activity systems (Blacker, 1995; Spender, 1996b) and network and relational effects (Dyer and Singh, 1998; Lane and Lubatkin, 1998). This social process perspective views knowledge and knowing as no longer a passive process but an active one, where both the knower and the knowledge become the inputs and constitutes of an action. These active social processes are in turn the basis for a dynamic knowledge-based theory of the firm (Spender, 1996a, 1996b). The network or relational view holds that knowledge and knowing are devoid of the individual context entirely and thus exist solely in distributed networks with emergent, dynamic knowledge existing in the relationship between various entities (Dyer and Singh, 1998; Lane and Lubatkin, 1998). Thus knowledge creation from this viewpoint begins first with the creation of new relationships. To externalise knowledge in any sense one must engage in the act of knowing, pointing to the importance of community or social membership as a context for knowledge generation and combination. Researchers call for a move away from the dominant-objective focus on organisational knowledge literature and to move toward a focus on organisational subjective knowing including McDermott (1999), Orlikowski (2002), Moffett and Hinds (2010), and Moffett and McAdam, R. (2006). Spender (1996a, 1996b) among others argues that knowledge should be regarded as neither an observable nor transferable commodity, and therefore cannot be discussed in objective terms. Given the conversations surrounding nature of organizational knowledge and the objective, subjective divide, the first research question is as follows:

RQ1: What are the perspectives on organisational knowledge, evident in the case firms, at organisational, group and individual levels of analysis?

3. Perspectives of the Knowledge-Based View of the Firm

Eisenhardt and Santos (2001) posit that the knowledge-based view of the firm represents a theory of the organisation. To this end, two perspectives on what constitutes a knowledge based firm have emerged. One field of research, the neo functionalist perspective (Schultze & Stabell, 2004), argues that the knowledge-based view of the firm derives from the resource-based view by extending our understanding of the term resource to include intangible assets such as knowledge (Grant, 1996; Conner and Prahalad, 1996; Grant, 1997; Randall, 2013). Alternatively, the constructivist perspective contends that the knowledge-based view of the firm should be inherently different from the resource perspective (Kogut and Zander, 1995; Spender, 1996b; Spender and Scherer, 2007). Here organisations exist because they exhibit a greater efficiency than the market at generating and transferring knowledge through relational systems; thus organisations are regarded as "repositories of social knowledge" (Kogut and Zander, 1995: 76).

Within the neo-funationalist 'knowledge as resource' perspective, tacit knowledge is aligned with competitive advantage, due to issues of inimitability and transferability. Knowledge is also regarded as an asset, a stock and a resource, and is capable once externalised and codified of being transferred with little importance placed on contextual issues. It is the ownership and coordination of these knowledge based resources which confers advantage (and offers efficiencies above and beyond what could be achieved in the market alone). Grant (2001) highlights the managerial issue of coordinating knowledge resources and knowledge specialists, while, protecting valuable tacit components of knowledge. Links exist between the neo-functionalist perspective and the objective view of organisational knowledge, outlined above.

Within the constructivist perspective, the firm is viewed as an open system, co-evolving with its environment. Knowledge creation results from the relationships that exist between multi-level knowledge-creating systems be they individuals, groups/teams or organisations (Spender, 1996a, 1996b). Knowledge itself is viewed as a dynamic and co-constructed phenomenon (Spender, 1996a, 1996b). Organisational knowledge from this perspective can also be collective, whereby the organisation level itself has a role independent of individual organisational members in knowledge creation, capture and storage or memory (Kogut and Zander, 1992). Researchers align closely with an organisational learning perspective (Levinthal and March, 1993; Eisenhardt and Santos, 2001). In addition, the conception of the firm as composing of multiple social systems reflects research on communities of practice (Wenger, 1998, 2000). Links exist between the constructivist perspective and the subjective view of organisational knowledge, outlined above. Given the discussions surrounding a knowledge based theory of the organization, that is, the

knowledge based view of the firm, and indeed the two dominant perspectives evident in the literature; neo functionalism, and constructivism. The second research question is as follows: *RQ2: What are the perspectives on the knowledge based view of the firm, evident in the case firms, at organisational, group and individual levels of analysis?*

4. Perspectives on Knowledge Strategy

Knowledge strategy is in essence a process aimed at the search for, and creation of knowledge, be that new technical knowledge or new organisational forms (March, 1999). This knowledge search activity allows for organisational self-adaptation, which in turn closes knowledge gaps (Zack, 1999, 2005; Denford and Chan, 2011). To this end, organisations divide attention and resources between two alternative strategies, these being the path-development exploration of new possibilities or the path-dependent exploitation of old certainties (March, 1991; March, 1994). Levinthal and March (1993) found knowledge strategy approaches to be influenced by dominant knowledge perspectives.

Exploitation strategy refers to a concentration of knowledge creation and search activity on technological knowledge similar to the organisations' core knowledge. Knowledge creation predominantly involves the re-use of knowledge already internal to the organisation (Evans et al., 2014). Exploitation, therefore, facilitates competence building through a recurrent concentration on areas of established organisational competence (Baum et al., 2000). In addition, it benefits from relative certainty (Fleming, 2001) and facilitates the development of absorptive capacity (Cohen & Levinthal, 1990). The centralisation of research and development activity has been shown to facilitate exploitation (Tushman, 2003), with exploitation activity resulting primarily in incremental innovation outcomes (Stuart & Podolny, 1996). Organisations with a bias towards exploitation activity risk obsolescence(March, 1994). Firms adopting a 'knowledge as object' perspective exhibit high-use levels of knowledge management systems (McDermott, 1999) and consequently value the re-use and exploitation of knowledge.

Exploration based knowledge creation and search takes place in knowledge domains far removed from the firms' core technologies (Katila & Ahuja, 2002). Exploration has been shown to aid in the creation of architectural competence (Henderson & Cockburn, 1994) and dynamic capabilities (Teece et al., 1997), due in part to its role in radical innovation outcomes. To this end, Rosenkopf & Nerke (2001) demonstrate that consistent exploration achieves better results than internal exploitation. In addition, Henderson and Cockburn (1994) show how organisations that look beyond their areas of core competence and place an emphasis on being part of a wider scientific community generate more patents. Examples of explorative relationships evidenced in the literature include, university-industry partnerships (Laursen & Salter, 2006), partnerships with government agencies and independent inventors (Katila, 2002). An organisation focus biased toward exploration, however, incurs many of the costs associated with search and experimentation without gaining proportionate benefits due to the public-goods nature of the results of exploration (March, 1994). To this end, a study by Katila (2002), found that the optimal time to engage in explorative activity is when the technological knowledge in question is not "new" allowing time for articulation and industry-wide diffusion. As exploration is a system-wide phenomenon however, such a strategy would ultimately result in a decrease in the amount of new knowledge available for exploration (Levinthal and March, 1993). McDermott (1999) found firms where subjective understandings of knowledge were dominant, as exhibiting an enhanced ability to engage in exploration activity. Given the importance attributed to knowledge strategy development and implementation in the literature, especially for those organisations in high-technology andknowledge-intensive industries, the third research question is as follows:

RQ3: What are the perspectives on knowledge strategy, evident in the case firms, at organisational, group and individual levels of analysis?

5. Research Methodology

An exploratory case study design was employed (Yin, 2002). Perren and Ram (2004) suggest the need for case research in studies seeking to build explanations and engage in sense-making. To this end, case research enables clarification rather than measurement (Riege and O'Keeffe, 2007). This is further supported by Yin (2009) who posits the 'what' and 'how' styles of research questions are suited to this type of interpretive and exploratory inquiry. Case research has been used extensively in knowledge management research (see, Hazlett et al., 2008 and Walters et al., 2007). The research was carried out in four case firms which were selected using convenience purposeful sampling. Data for the study was collected over a period of 3 years and data collection methods included the use of interviews, non-participant observation and documentation analysis. A description of the cases selected, and the methods of data collection used are shown in Table 1.

Case	Employees (Subsidiary)	Sector	Interviews	Observations	Documentation Analysis
1	2500	Medical Devices	15	12 Months	✓
2	400	Pharmaceuticals	8	12 Months	✓
3	6000	Medical Devices	22	12 Months	✓
4	550	Medical Devices	14	12 Months	✓

Table 1: Information on case firms and data collection

As the study seeks to understand organisational knowledge across multiple levels of the firm, the interviewees all worked as part of a formal group within their organisation and as such were questioned about their individual work practices and their work in relation to their role within their group and their groups' role within the wider organisational structure. This approach follows other investigations into multiple-level firm analysis (see McAdam et al., 2012).

Miles and Huberman's (1994) method of data analysis was used in this study, incorporating the interdependent processes of data collection, data reduction and data display and conclusion drawing and verification. The steps of data reduction and data display were aided significantly by the use of NVIVO qualitative data analysis software. Topics and categories were constructed from the interview transcripts using NVIVO software for each of the interviews within the cases. The findings were then coded with NVIVO, this was followed by a process of axial coding to reconstruct the data in new ways, to evidence the relationships between the categories. Observational notes and documentation analysis were used to enhance interpretation, check existing ideas and add more depth to findings.

6. Findings

The results of the case research are presented in tabular form (Table 2). This tabular presentation of qualitative research findings reflects Yin (2009).

Research Question	Individual Level	Group Level	Organizational Level
Case 1 *RQ1: What are the perspectives on organizational knowledge?*	*Subjective and objective.* Individual members rely heavily on the co-creation of knowledge through their personal and professional networks, both inside and outside the organization. Many are members of boundary spanning communities of practice. Individual members also engage in the creation of explicit knowledge for the knowledge repository system and engage in extensive knowledge reuse.	*Subjective and objective.* Group members value the social construction of knowledge, while also creating explicit ICT based knowledge sharing resources. The group promotes the use of their knowledge repository system.	*Objective.* Knowledge is viewed an asset to be protected and stored, there is extensive investment in knowledge repository systems and knowledge reuse is promoted.
RQ2: What are the perspectives on the knowledge based view of the firm?	*Constructivist.* Owners are willing to share knowledge and invest heavily in the creation of personal and professional knowledge sharing networks. These networks are active both inside and outside the organization.	*Constructivist.* All members of the APD group simultaneously work across different departments and are thus physically dispersed throughout the organization enabling them to capitalize on system level knowledge flows.	*Neo-Functionalist.* Knowledge is seen as a stock. There is a high level of protectionism in relation to knowledge, with sanctions for breaches in confidentiality. Knowledge sharing relationships are mediated through formal contractual agreements. A history of acquisition activity has been driven by knowledge gaps. The sector as a whole exhibits these same characteristics.
RQ3: What are the perspectives on knowledge strategy?	*Exploration and Exploitation.* Individual members search for process improvement solutions in un-related industries, thus over coming many of the protectionist measures in place at the organizational level. Individual members' also accessed similar technological knowledge to their firms' knowledge base, through their membership of technical communities which spanned the firms' subsidiary network.	*Exploration and Exploitation.* Exploratory level development, with limited problem definition, especially in relation to process innovation facilitating the production of new products transferred onsite. Some exploitation in relation to problem solving on older production lines. Exploitation of knowledge held within repositories accessed across the subsidiary network.	*Exploitation.* The firm level encourages the use of their proprietary knowledge database and innovator system, stores knowledge from within the organization and across its' subsidiary network
Case 2 *RQ1: What are the perspectives on organizational knowledge?*	*Subjective.* Individual members recognize the importance of investing in personal and professional networks as a means of accessing and sharing knowledge.	*Subjective and objective.* The technology transfer protocol which guides the groups work specifies the importance of subjective and objective knowledge. Members are encouraged to develop relationships with suppliers and subsidiary partners, through ongoing site visits. A dedicated knowledge	*Subjective and objective.* The firm invests in the development of knowledge repository systems and support for knowledge reuse. Efforts are made to enable knowledge sharing across the subsidiary network and with suppliers. Site visits are encouraged and communications on

		repository system is also maintained by the group.	developments in other sites are shared with staff on an ongoing basis.
RQ2: What are the perspectives on the knowledge based view of the firm?	*Constructivist.* Owners are willing to share knowledge and invest heavily in the creation of personal and professional knowledge sharing networks. These networks are active both inside and outside the organization.	*Constructivist.* The technology transfer group relies heavily on building informal relationships with other groups both within and outside the subsidiary network. Site visits are extensively used as a mechanism for learning and knowledge sharing. Although engaged in knowledge transfer activity, they viewed their role as more one of reconstruction and recombination, rather than asset transfer. All members of the group also simultaneously work across multiple departments and are thus physically dispersed throughout the organization enabling them to capitalize on system level knowledge flows. The group membership is also fluid.	*Constructivist.* The organization is regarded as open and not constrained by confidentiality. Individual entrepreneurship is encouraged. Culture is viewed as innovative and pioneering. Genzyme actively engages in partnering activity primarily around development and marketing.
RQ3: What are the perspectives on knowledge strategy?	*Exploitation and Exploration.* Individual members closed knowledge gaps, through accessing knowledge from within the Genzyme network related to the previous attempts of technology transfer of one particular product. Individuals also sourced knowledge on process improvements from key suppliers. Individuals sought to solve problems through accessing knowledge through their personal networks, active in unrelated industries as elements of the process involved re-invention.	*Exploitation.* The groups' knowledge strategy is mediated through the technology transfer protocol, which highlights current suppliers and subsidiary network partners as key sources of knowledge.	*Exploitation.* The firm level encourages interaction and knowledge sharing within the subsidiary and supplier network. Partnerships are formed with organizations with a similar knowledge base.
Case 3 *RQ1: What are the perspectives on organizational knowledge?*	*Subjective.* With many communities of practice present within the Innovation Centre employees also create explicit knowledge for the knowledge. Repository system- Agile, with the expectation that the knowledge will be reused.	*Subjective and objective.* Group members value the social construction of knowledge. Members are encouraged to develop relationships throughout the organization however; the centre is lacking a truly dedicated knowledge repository system that is embraced by all- although some are present.	*Objective.* Knowledge is to be captured for reuse and efficiency. There has been significant investment in KM systems such as LINK, Agile, and Compliance Wire in an effort to standardize knowledge at the organization.
RQ2: What are the perspectives on the knowledge based view of the firm?	*Constructivist.* Owners willing to share knowledge in an effort to progress knowledge sharing in the organisation.	*Constructivist.* Within innovation centre (IC) sharing relies heavily on building informal relationships with other groups both within and outside the centre network. Employee presentations and the GOAL programme are extensively used as a mechanism for learning and knowledge sharing.	*Neo-Functionalist.* Knowledge seen as a stock. Individual knowledge owners are identified, and subsequently as early as possible to that knowledge can be standardised and made explicit.
RQ3: What are the perspectives on knowledge strategy?	*Exploration.* Consistently, systems failed to address complex problems- relied on tacit reaction of experts, however this was somewhat hampered by low visibility of experts.	*Exploitation.* Due to senior management prerogative, heavy reliance on exploitative KM systems- especially surrounding reusing older problem solutions.	*Exploitation.* Concentration on technological knowledge similar to the organisations' core knowledge. Partnerships within the organisation's subsidiaries network are encouraged.
Case 4 *RQ1: What are the perspectives on organisational knowledge?*	*Subjective.* Difficulties in interaction with more objective systems approach. Employees rely heavily on the organisational informal networks.	*Subjective and objective.* The 70-20-10 knowledge philosophy is promoted heavily at group level. This means that 10% of the knowledge should be viewed through a technology/formal lens, 20% mentoring and 70% on-the-job.	*Objective.* Knowledge must be standardised and solutions should be customisable from the efforts of standardisation. Significant investment in KM systems such as UPK.
RQ2: What are the perspectives on the knowledge based view of the firm?	*Neo-Functionalist.* Owners hoard knowledge- see it as a personal advantage and power within the organisation.	*Neo-Functionalist.* Groups are very siloed and do not share knowledge- Functional and Subject-matter experts tend to be group leaders and little sharing happens among groups at the functional or divisional level.	*Neo-Functionalist.* Knowledge seen as a stock- huge push to identify knowledge owners and incorporate systems to record and store knowledge.
RQ3: What are the perspectives on knowledge strategy?	*Exploration.* Reviled and abandonment of User Productivity Kit (UPK) in favour of knowledge exploration to solve problems especially within employee personal networks.	*Exploitation.* All-encompass User Productivity Kit (UPK) used for capture training and reuse of knowledge. Training and problem solving also relies on UPK repository.	*Exploitation.* Found that it was better able to solve problems once it used User Productivity Kit (UPK) to capture and standardise knowledge.

Unitas: A conceptual framework on knowledge in organisations

As is evidenced from the extant literature and the findings outlined above, there are multiplicities of knowledge understandings in organisations, and any holistic conceptualisation of knowledge in organisations must therefore start from this premise. Drawing on the three elements of organisational knowledge as discussed and the case analyses as presented, four possible knowledge positions can be mapped. Taken together they present a unified perspective of the multiple knowledge activities happening concurrently in organisations. The conceptual framework represents a 'helicopter view' of organisational knowledge, based on the premise that organizations are understood as knowledge systems evidencing broad perspectives on organisational knowledge and not singular representations. In the conceptual framework on organisational knowledge, outlined below, four knowledge positions are mapped. The objective is not to view one position as dominant, but to recognise all positions as active across the organisation at

any one time. The four positions are social re-users, dynamic creators, asset exploiters and asset creators. Unitas: A conceptual framework on knowledge in organisations is presented in figure 2 below.

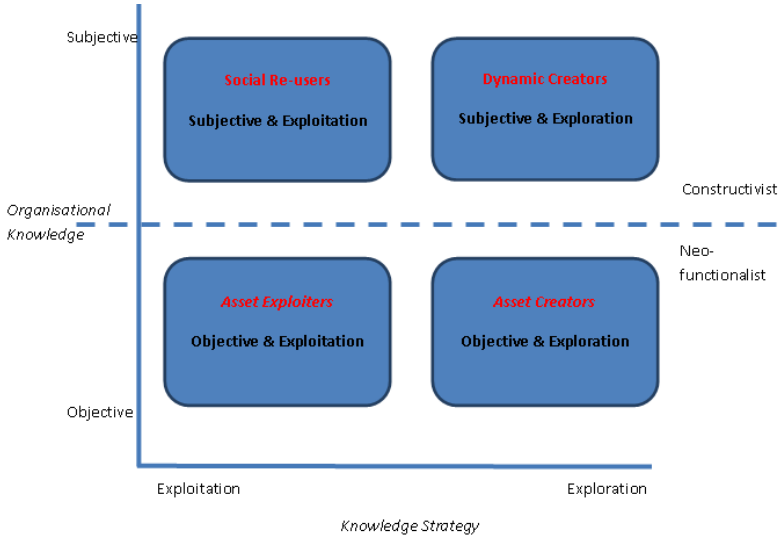

Figure 2: Unitas: A conceptual framework on knowledge in organisations

The framework presents multiple levels of the organisation as existing along a continuum in relation to their use of objective and/ or subjective knowledge, as well as their engagement in exploitation and/or exploration activity. Perspectives on knowledge based view of the firm and thus the organisation of knowledge are inferred from the individual, group or firms' position in the framework. Organisations, groups and individuals can move from position to position over time, and may, inhabit multiple positions at once.

1. Asset exploiters operate within a neo-functionalist perspective on the organisation of knowledge, while viewing organisational knowledge as objective and favouring exploitation activity.
2. Asset creators also operate within a neo-functionalist perspective and view organisational knowledge as objective, however they favour exploration activity.
3. Social re-users view knowledge as subjective and are involved predominantly in exploitation activity; in addition they operate within a constructivist perspective on the organisation of knowledge.
4. Dynamic creators also operate within a constructivist perspective on the organisation of knowledge; they view organisational knowledge in a subjective sense and engage primarily in exploration activity.

7. Discussion and integration of framework

The case analysis demonstrates how the language of opposites, and contradictions present in much of the literature on organisational knowledge, is not evident in the organisations studied. In fact, each of the case organisations presents as a complex picture of multiple knowledge perspectives and actions across all levels of analysis. Practice based descriptive research on knowledge and organisations support this view by evidencing the multiple knowledge discourses at work in firms at any one time (McAdam et al., 2012; Evans et al., 2014). The discussion section is based on the three levels of analysis i.e. individual, group and organisational. Crossan, Lane and White (1999), among others, distinguish between individual, group and organisational levels of analysis in organisational research. The premise of multi-level analysis is that each level engages in distinctive knowledge-based actions, so that there is both knowledge-based activity by levels within the organisation, and by the organisation itself. While knowledge-based activity across each of these levels is distinctive it is also intertwined through bi-directional processes (e.g. Crossan et al., 1999). This further reflects March's (1991) view on the intertwined nature of organisational learning and knowing at multiple levels.

The individual level and knowledge in organisations

Individuals in three of the four case firms viewed knowledge subjectively, while in case firm 1, individuals regarded knowledge as both objective and subjective. Again in three of the four case firms, individuals adopted a constructivist stance on how knowledge is organised and transferred. In case firm four, however individuals adopted a more neo-functionalist perspective. In all four case firms individuals engaged in exploration activity, to this end, Rosenbaum (1991) observes how the role of knowledge workers is often centred on improving firm knowledge. While, Menon and

Pfeffer (2003) also note how an individuals' ability to disseminate new knowledge within the organisation can enhance their perceived status among colleagues. In case firms 1 and 2 this was conducted in tandem with exploitation, while in case firms 3 and 4, exploration was the only approach to knowledge strategy evident. Figure 3 below maps the positions held by the individual level within the conceptual framework. The individual level is evident across all four positions in the framework. Tsoukas and Chia (2002) among others, call for recognition of the role played by the micro-level as the drivers of change in organisations.

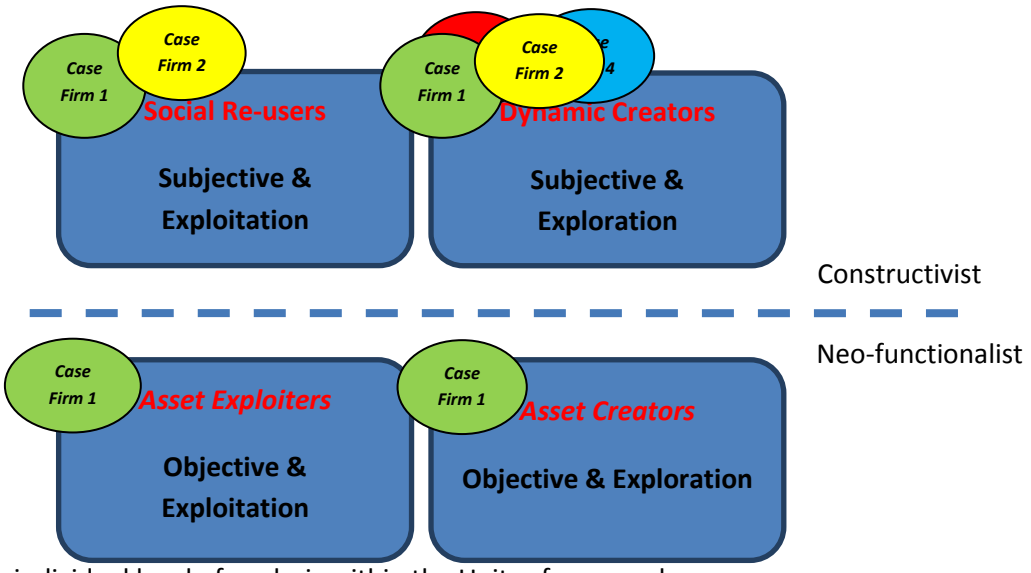

Figure 3: The individual level of analysis within the Unitas framework

The group level and knowledge in organisations

At the group level a combination of subjective and objective knowledge perspectives were evident. In addition, the groups in all four of the case firms engaged in exploitation activity. In all four case firms suppliers were a central source of similar knowledge for the units under study, reflecting studies elsewhere (see Yli-Renko et al., 2001; Dyer and Hatch, 2006). With only one group, in case firm 1, combining exploitation and exploration activity. Three of the case groups studied adopted a networked or constructivist stance on the organisation of knowledge. To this end, Reagans and Zuckerman (2001) found that units in organisations that have more dense networks achieve a highly level of productivity than those in sparse networks. Only case firm 4 adopted a neo-functionalist perspective. Figure 4 below maps the positions held by the groups within the conceptual framework. As with the individual level, the group level is evident across all four positions in the framework.

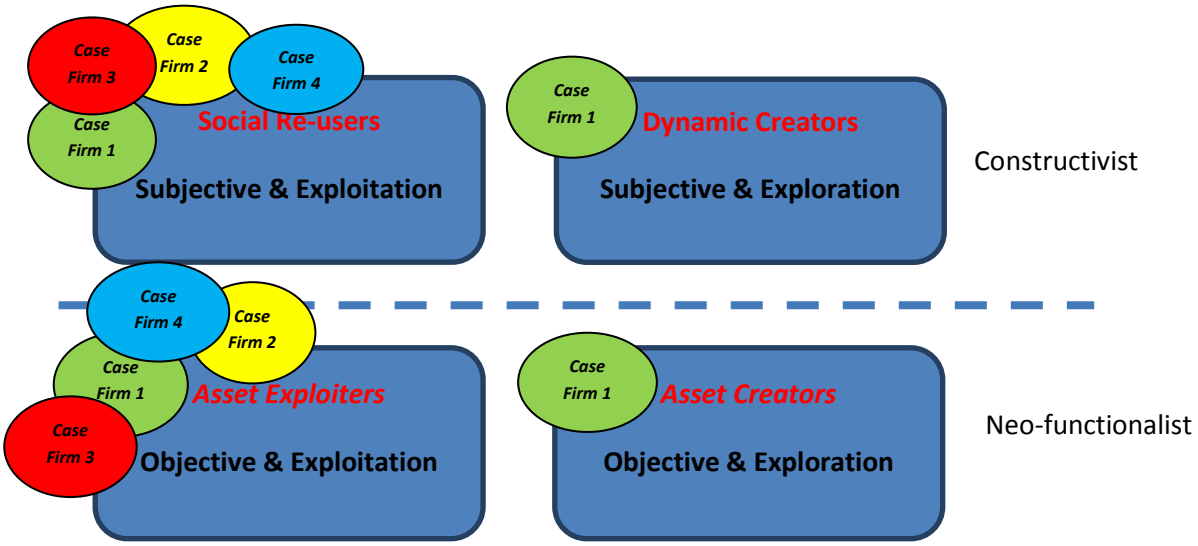

Figure 4: The group level of analysis within the Unitas framework

The organisational level and knowledge in organisations

An objective view of organisational knowledge was dominant in three of the four case firms. All firms also exhibited a neo-functionalist perspective on how knowledge is organised. This is reflected primarily in the acquisition activity evidenced, whereby knowledge is acquired on the market basis (Veugelers and Cassiman, 1999). Case 2 was the exception, as the firm adopted a more balanced view of firm knowledge, recognising subjective and objective knowledge elements, as well as taking a more systems approach to the organisation of knowledge and thus exhibiting a constructivist stance at times. All four case firms adopted predominantly an exploitation based approach to knowledge strategy. As members of subsidiary networks the firms tended to rely on intra-network knowledge transfers of similar knowledge (Gupta and Govindrajan, 2000). This tendency may reflect over-embeddedness in the subsidiary network (Brass et al., 2004). Figure 5 below maps the positions held by the case organisations within the conceptual framework. The firm level is evident across two positions in the framework. It is interesting to note the predominantly neo-functionalist perspective at the firm level, does not deter the group and individual level from adopting a more constructivist and process orientated perspective, reflecting an earlier study by Laursen and Salter (2006), which highlights to propensity of the group and individual level to 'overcome' firm level restrictions in relation to knowledge based activity.

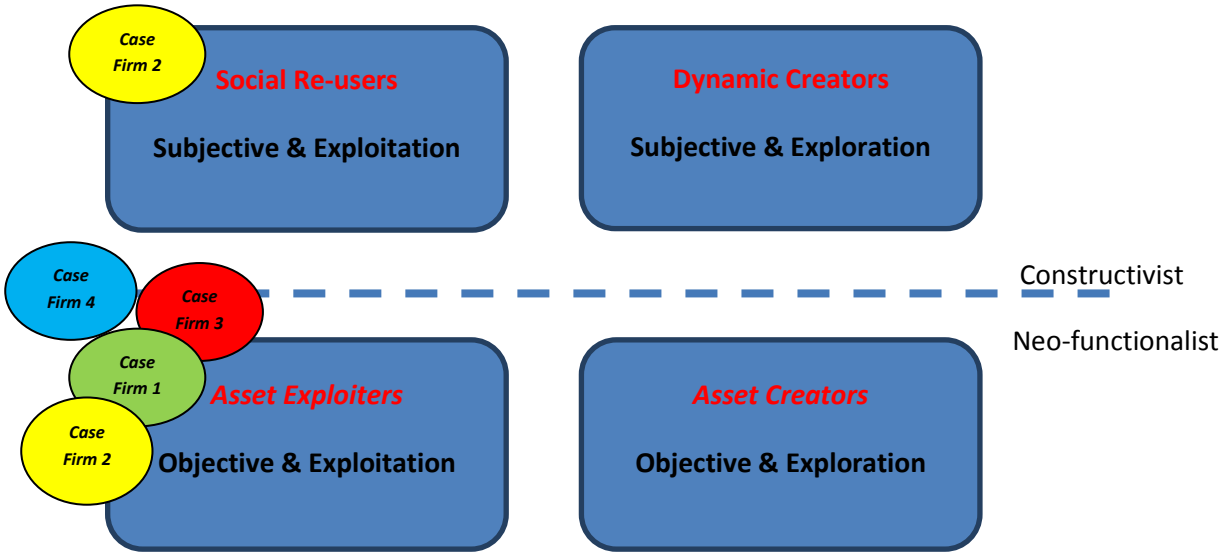

Figure 5: The firm level of analysis within the Unitas framework

Taken across multiple levels of analysis the findings demonstrate the complex picture of organisational knowledge evident in the case organisations.

8. Conclusion

Based on the Unitas framework presented in figure 2, the case findings presented in Table 2 and the case analysis at multiple levels (figures 3 - 5), it is concluded that multiple perspectives on organisational knowledge and knowledge activity are evident in organisations at three main levels, namely the individual, group and organisation. The main contribution of the Unitas framework on organisational knowledge is that it provides a holistic interpretation of knowledge and knowing activity in organisations. To this end it contradicts much of the knowledge based literature, whereby in seeking to enhance understanding through the deconstruction of the concept of organisational knowledge, researchers have in fact invoked simplistic and singular categorisations for something that is both complex and all-encompassing. This exploratory study seeks to build on the work of Schultze and Stabell (2004) among others, and to begin to question the dominant logic of typology and duality evidenced in the extant literature. Given the exploratory nature of this study, the potential avenues for further research are many. Central among which is the development and refining of the theoretical approach to a holistic understanding of organisational knowledge. Such studies could probe the theoretical concepts of organisational knowledge, the knowledge based view of the firm and knowledge strategy by using a wider range of case organisations. In future, it would be useful to expand the sample of analyzed companies outside the two industries to build on the robustness of the findings. In tandem with this, there is an opportunity to develop the Unitas framework further as a knowledge management tool.

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