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The Concept of 'Knowledge Creating': Re-conceptualising the Problems of Knowledge Transfer and Creation Processually

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The Concept of ‘Knowledge Creating’: Re-conceptualising the Problems of Knowledge Transfer and Creation Processually.

Introduction

How knowledge is created remains the subject of much debate (Kuhn, 1962). In fields of management, organisation studies and knowledge management, the hegemonic approach to studying the role of knowledge in management, and how it comes into being has predominantly been influenced by a knowledge transfer agenda. Recent attempts to explore a specific theory of knowledge creation (Nonaka, 1994) per se, have continued to rely on assumptions inherited from this knowledge transfer agenda. Here ‘events of transfer’ have been replaced with an emphasis on ‘events of creation’ suggesting that events of organisational knowledge creation require similar solutions to those addressing problems of knowledge transfer. This presents theoretical, philosophical and indeed methodological problems for researchers who argue different and often conflicting understandings of what ‘knowledge’ is and how it comes into being.

Two arguments become important. The first addresses the implication of shifting the theoretical lens to that of knowledge creating distinct from knowledge transfer and/or knowledge creation. This paper’s contribution is in highlighting the limitations, not only of knowledge transfer agenda but also the dominant theory of knowledge creation; itself born out of a knowledge transfer agenda. In contrast to these approaches the theoretical and conceptual attributes for a knowledge creating research agenda are identified and combined. With the rise of process theory, and processual approaches to understand organisational phenomenon (Pettigrew 1997), the dynamics of processes facilitating ‘knowledge creating’ remains poorly understood representing a gap in scholarly research. By adopting a processual view of knowledge creating, this paper re-focuses the research question by asking ‘how can organisational processes facilitate the creating of knowledge over time?’ This requires use to overcome problematic assumptions about creation or transfer of knowledge occurring as an event or at an observable point in time i.e. *creatio ex nihilo*.

The second argument addresses a rationale for considering the university-industry context as an appropriate one for providing substantive data on knowledge creating processes. Heretofore the problem of narrowing the theory-practice divide, and overcoming the dual hurdles of rigour and relevance in research has been predominantly been tackled as a problem of improving knowledge transfer. Arguments preoccupied with narrowing this divide have received varying degrees of scholarly attention. This papers contribution is in shifting the theoretical lens to that of knowledge creating and in highlighting the resultant implications for future research. By combining a processual understanding of knowledge creating, within a theory-practice divide context, the reconceptualised research question of ‘how organisational processes facilitate knowledge creating over time?’ can be explored. This paper concludes by highlighting attributes for knowledge creating. Their collective contribution opens up avenues for new and viable directions for research on knowledge in management.

From Knowledge Transfer & Creation to Knowledge Creating

Fields of management, including knowledge management (KM), have traditionally followed linear, causal and deterministic approaches to their treatment of knowledge. Within the KM cycle the stages of managing knowledge are broken down into variations of ‘creation’,

'capture', 'acquisition', 'storage', 'transfer' and 'dissemination' (Awad & Ghaziri, 2004; Hislop, 2013). These causal and linear descriptions find their origins in the information processing paradigm used as a means to inform rational decision making (Simon, 1945 p.120; 1973 p.488; Simon, 1979) as well as behaviourist approaches (Argote & Greve, 2007; Cyert & March, 1963) which when combined emphasise the quality of inputs, processing and outputs adopted in early systems thinking (Von Bertalanffy, 1972). Cognitive theories such as the garbage can model relating to decision making also emphasise this inputs-outputs view (Cohen, March, & Olsen, 1972). More specifically behaviourist approaches in the field of organisation learning, not only focus on learning from within but also learning from the experience of other organisational units, including the processes which facilitate or impede knowledge transfer (Argote & Greve, 2007 p.342). Combined these assume that by enhancing inputs and improving the management of *transfer* there will be improved outputs. As a consequence these Carnegie School theories have arguably contributed greatly to a knowledge transfer agenda, e.g. knowledge flows and exchanges (Argote, 1999; Gavetti, Greve, Levinthal, & Ocasio, 2012 p.17; Gavetti, Levinthal, & Ocasio, 2007 p.527), which focuses on moving knowledge to those that most need it (Table 1).

While much research emphasises knowledge transfer, little is known about the first stage in the KM cycle; knowledge creation. Attempts to address this lack of focus on knowledge creation (Nonaka, 1994; Nonaka, Byosiere, Borucki, & Konno, 1994; 1995; Nonaka & Takeuchi, 1996; Nonaka, Toyama, & Byosiere, 2001; Nonaka, Umemoto, & Senoo, 1996; Nonaka, von Krogh, & Voelpel, 2006) have highlighted that organisational knowledge creation has been virtually neglected in management studies (Nonaka & Takeuchi, 1995 p.xiii). They argue that "*at the core of the new theories is the acquisition, accumulation, and utilisation of existing knowledge they lack the perspective of "creating new knowledge"* [emphasis in original] (Nonaka & Takeuchi, 1995 p.49). One reason is that any focus on creation has arguably been subsumed and supplanted by a knowledge transfer research agenda. Whereas logically 'creation' is the first and most important part of the KM cycle, due to disciplinary constraints the KM field has tended to focus on measurable aspects of inputs and/or outputs (Nonaka et al., 1996) across the stages of the KM cycle e.g. the transfer of, or the event of creation of a patent is used as a proxy for understanding creation (Agrawal, 2001; Agrawal & Henderson, 2002; Bogner & Bansal, 2007; DeCarolis & Deeds, 1999).

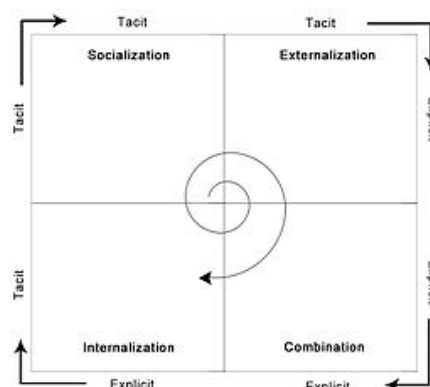


Figure 1: The SECI Model

Research on knowledge creation theory argues that the dynamic nature of organisations suggest they should be studied from "*how it creates information and knowledge, rather than*

with regard to how it processes these entities” (Nonaka & Takeuchi, 1995 p.15). Here the managerial problem/goal becomes one of how organisations create rather than transfer knowledge (Table 1). Nonaka et al in attempting to address this presented a theory for knowledge creation, popularly referred to as the SECI Model (Nonaka, 1994; Nonaka et al., 1994; Nonaka & Takeuchi, 1995), which focuses on processes of ‘socialisation’, ‘externalisation’, ‘combination’ and ‘internalisation’ (Figure 1). It assumes that knowledge is created through a spiral or pattern of “*dynamic interaction of subjectivity and objectivity*” (Nonaka & Toyama, 2005) that become amplified (Nonaka, 1994). Here creation is predicated on a principle of knowledge conversion or interaction from tacit to explicit knowledge and a principle of amplified from individuals to the wider organisation. While this approach successfully highlighted the question of ‘creation’ it arguably remains hampered by a number of problematic assumptions and shortcomings linked to its knowledge transfer heritage (Gourlay, 2006; Kaufmann & Runco, 2009).

The first assumption is that knowledge is an object that can be converted from its tacit to explicit form. This has increasingly been criticised in the literature as it assumes that the tacit nature of knowledge should or could be converted to explicit knowledge for knowledge creation to occur (Gourlay, 2006; Tsoukas, 2009a p.161). Gourlay notes that Nonaka & Takeuchi have implied that the traditional Western view of knowledge i.e. cartesian split between subject and object, has effectively prohibited questions about knowledge creation in favour of questions on transfer, as knowledge is seen as something objective that already exists either in the environment or in the organism. Gourlay claims that this has contributed to knowledge transfer becoming a dominant focus within KM research. Conversion or convertibility within the tacit-explicit process (Figure 1) is also reminiscent of the input-process-output perspectives associated with knowledge transfer. Secondly, in spite of Nonaka and Takeuchi’s efforts to focus on the creation rather than the transfer of ‘existing’ knowledge the SECI model also assumes that knowledge is pre-existing in its tacit form and that creation occurs when it enters the SECI process, is converted into an explicit form which is amplified and thus transferred or distributed across the organisation. Individually created knowledge as a basis of “*unfettered individual creativity*” (Tsoukas & Mylonopoulos, 2004 S4) is not acknowledged requiring an event of amplification before creation can be identified. Arguably if tacit knowledge is assumed to be entitive i.e. an object, and pre-existing this contradiction would undermine the very definition of ‘tacit’ i.e. that I know more than I can say (Table 1). A third point is that within the KM cycle those who discuss creation have tended to focus their data collection on transferring explicit entities i.e. patents, which they claim ‘create’ something dynamic after an event compared to conditions before (Table 1). This tendency becomes more acute where researchers claim to pursue processual approaches while over emphasising ‘events’, ‘objects’ and explicit knowledge in their data hampered by a dominant focus on transfer based assumptions. Organisational learning theory is arguably a case in point where processes or learning become reduced to discussions linked to discrete transfer (Argote & Greve, 2007 p.338 & 342). Fourthly, knowledge creation like knowledge transfer is understood as a single event occurring in space and time i.e. an eventual perspective of explicit knowledge creation (Hautala & Jauhiainen, 2014). This presents empirical challenges for observation research required to capture creation at an exact time and/or event and implies that conditions before and after this event are less important. Indeed the focus on events of creation, like events of transfer, causes difficulties from an ontological and epistemological perspective (Chia, 2013) implying something from nothing or what is termed ‘creatio ex

nihilus' (Tsoukas, 2009a). Research using an eventual perspective of knowledge creation must identify a criterion that clearly shows 'something from nothing'. This is demanding, potentially requiring longitudinal field work with fine-tuned data collection methods, requiring extremes in serendipity under experimental conditions. Identifying created knowledge and devising appropriate methods to capture this event still evades researchers, especially within the social sciences, and is compounded by philosophical discussions on the nature and quality of knowledge itself. Cognitive and linguistic research focusing on the emergence of new meaning or distinctions reflects this eventual conceptualisation of knowledge creation at a point in time (Dionysiou & Tsoukas, 2013; Tsoukas, 2009a; Tsoukas, 2009b).

Whereas the discussion around 'creatio ex nihilo' or events can be seen as an ontological and epistemological discussion, the practicalities linked to the calls to focus on process oriented research and knowledge (Grover & Davenport, 2001) encourages use to ask 'what are the processes associated with knowledge creating over time?' Even within the field of KM such limitations have been acknowledged with increasing calls for a process framework focusing on the "*knowledge process and the context in which that process is embedded*" in organisations suggesting a need to broaden the debate beyond a mere focus on discrete transfer (Grover & Davenport, 2001 p.12). For this reason this paper highlights a need to focus on identifying likely processes facilitating the creating of new knowledge rather than identifying a point of creation of new knowledge (Table 1).

In support of this Nonaka has also alluded to the need to focus on processes stating that "*although a great deal has been written about the importance of knowledge in management, relatively little attention has been paid to how knowledge is created and how the knowledge creation process can be managed*" (1994 p.16). This provides a rationale for considering a processual approach beyond that of knowledge creation per se to that of 'knowledge creating' and serves to distinguish a knowledge creating research agenda from that of a transfer/creation agenda. A number of characteristics informing data collection and analysis, for knowledge creating now become evident.

- i. Knowledge creating occurs over time and while including events of creation does not unduly emphasise the identification and measurement of these events of creation i.e. creatio ex nihilo.
- ii. Knowledge creating does not assume the pre-existence of knowledge in contrast to knowledge transfer and creation approaches. Here the research focus shifts from events of transfer and creation to considering knowledge as it emerges within processes over time.
- iii. The nature of knowledge is not confined to explicit knowledge. Also tacit knowledge does not require conversion and/or amplification for creating to occur.
- iv. Knowledge creating accepts that varying degrees of knowledge quality need to be catered for beyond criteria linked to events of transfer or creation (Gibbons et al., 1994 p.8).
- v. Knowledge creating is associated with the facilitating or enabling of processes.

	Knowledge Transfer	Knowledge Creation	Knowledge Creating
Managerial Problem	Improving the management of knowledge is a problem of transfer.	Improving the management of knowledge is a problem of creation	Improving the management of knowledge is a problem of facilitating knowledge creating over time (Grover & Davenport 2001).
Management Goal	Successful transfer, exchange or distribution of timely knowledge to those who need it. Measured using criteria of transfer events. Intentionality is high.	Successful creation of knowledge. Measured using criteria of events of creation i.e. patents (Agrawal 2001). Intentionality is evident	Successful knowledge creating by facilitating conditions for processual creating over time. Intentionality may not be evident.
Nature of Knowledge: Tacit versus Explicit Knowledge	Knowledge assumed to pre-exist, is explicit/objective and capable of being codified ready for transferring (Nonaka & Takeuchi 1995, p.49).	Knowledge often assumed to pre-exist in a tacit form but requires conversion into explicit knowledge and amplification beyond the individual (Nonaka 1994, Nonaka & Takeuchi 1995). Creation is of explicit/ objective objects converted from tacit knowledge or knowledge that is capable of being codified.	Knowledge does not necessarily pre-exist but is created and/or recombined processually over time and space i.e. knowledge creating (Chia 2013). Creating of knowledge is not confined to explicit knowledge but includes tacit knowledge which might not be converted or amplified.
Research Methods / Data	Data is explicit, causal, deterministic and measurable as events of transfer. Linear descriptions of inputs, process and outputs (Nonaka et al 1996) associated with the information processing (incl. systems thinking) paradigms (Simon 1973, Von Bertalanffy 1972).	Data is explicit and measurable as an event of creation - sometimes described in a linear fashion. Tacit knowledge as an input requires conversion into explicit knowledge to yield a quality output e.g. event of creation.	Focuses on data in non-linear processes, includes tacit knowledge which is difficult to measure. The focus is on how processes unfold rather than on the inputs and outputs.
Conversion / Convertibility	Transfer is of explicit knowledge i.e. knowledge that has already been converted to explicit codified knowledge.	Creation of knowledge is when knowledge is converted from tacit to explicit and/or amplified beyond the individual within an organisation (Gourlay 2006, Tsoukas 2009 p.161).	Creating is not reliant on the assumption of converting tacit to explicit knowledge or the need to amplify knowledge beyond the individual within an organisation.
An Eventual Perspective	Transfer understood as an event in time and space that can be measured using relevant criteria (Agrawal 2001).	Creation is understood as an event in time and space that can be measured using relevant criteria i.e. 'creatio ex nihilo' (Chia 2013, Tsoukas 2009a, 2009b).	Creating is understood as a process over time and space which may include but not dependent on an event of creation i.e. creat-ing over time.
Quality Control	Transfer of measurable units of explicit knowledge	Creation of measurable units of explicit knowledge.	The evaluation and quality of knowledge is distributed across multiple stakeholders including users of research.
Nature of Interaction	Interaction is uni-directional focusing on transferring / distributing timely knowledge to those who need it.	Interaction is uni-directional focusing on the creation of timely knowledge by converting tacit into explicit knowledge AND amplifying this knowledge from the individual to the organisation.	Interaction is understood as processual occurring over time and in multiple ways.

Table 1: From Knowledge Transfer & Creation to Creating

In conclusion, within this first foundational argument a gap in scholarly research has been identified by distinguishing knowledge creating from transfer/creation research agendas. This highlights a gap in scholarly research to address the meaning and implications of a knowledge creating research agenda. Guided by the discussion above and in an attempt to answer the question as to how organisational processes facilitate knowledge creating over time we now turn to identify attributes for knowledge creating (Table 1).

Creating Knowledge – A Theory AND Practice Perspective

The second argument considers the context for studying knowledge creating. The university-industry relationship has received significant attention in scholarly research as a context for how knowledge is created (Agrawal, 2001; Agrawal, 2002; Barnes, Gibbons, & Pashby, 2002; Etzkowitz, 1998; Gibbons et al., 1994; Medsker & Morrel, 1989; Nowotny, Scott, & Gibbons, 2001; Owen-Smith, Riccaboni, Pammolli, & Powell, 2002). Research on the dynamics of this relationship has tended to focus on three broad research themes; the importance of narrowing the theory-practice divide; the difference between pure versus applied research as a relevance issue; and the reduction of perceived gaps between academics and practitioners (Agrawal, 2001; Ankrah & Al-Tabbaa, 2015; Pettigrew, 1997).

As different university-industry relationships have received varying degrees of attention, discussions have been characterised by two main assumptions across these three research threads. Firstly, efforts to solve the theory-practice divide problem and reduce the gaps between academics and practitioners has been characterised as a knowledge transfer problem, with knowledge from science needing to be relevant and transferred to society. Secondly, the problem to narrow this divide remains the responsibility of the university. Empirical research on university-industry knowledge transfer has tended to focus either on firm or university characteristics (Agrawal, 2001). While the research agendas are similar they reflect different perceived research problems.

Firm based research focuses on improving their absorptive capacity as the means to improve knowledge transfer. Research questions relate to how efficiently firm's can absorb new knowledge by taking advantage of geographically placed knowledge spillovers. Firm's connectivity to universities is argued as an important bases for increasing their capacity to absorb new knowledge (Cohen & Levinthal, 1989, 1990; Easterby-Smith, Graca, Antonacopoulou, & Ferdinand, 2008; Lane, Koka, & Pathak, 2002; 2006; Lane, Salk, & Lyles, 2001; Lim, 2009; Zahra & George, 2002). By investing resources that facilitate absorptive capacity knowledge transfer is improved (Agrawal, 2002; Nieto & Quevedo, 2005; Van den Bulte, Lievens, & Moenaert, 2001). Resource to develop research patents is one such activity (Agrawal & Henderson, 2002) found to improve organisational performance (Bogner & Bansal, 2007; DeCarolis & Deeds, 1999). A firm's ability to engage in joint research projects and absorb knowledge spillovers is argued as a means to increase their capacity for newly transferred knowledge (Barnes et al., 2002; Cockburn & Henderson, 1998; Cohen & Levinthal, 1989, 1990; Lim, 2009; Todorova & Durisin, 2007).

In contrast, university based research is preoccupied with improving engagement with society by transferring knowledge. To narrow the theory-practice divide and improve academic-practitioner relationships (Bartunek, 2007; Hughes, Bence, Grisoni, O'Regan, & Wornham, 2011; Rynes, Bartunek, & Daft, 2001) it is important that the transfer of knowledge, or indeed its conversion from pure to applied knowledge, should become a priority as a means to speed

up societal knowledge creation (Rynes et al., 2001 p.347). The issue here is that transfer is again conflated with creation across and within these debates on improving academic-practitioner engagement. With the need for increased social and financial accountability (Gibbons et al., 1994 pp.7-8), the appropriateness of many university based research activities has been called into question i.e. whether universities should focus on pure research, with no clear application or return on investment, versus doing applied research focused on relevance to society and opportunities for commercialisation and application. As a metric measuring the success of knowledge transfer channels, the number and commercialisation of patents from university start-ups (Agrawal, 2001; 2002) is an example of this focus on transfer. Other research has focused on metrics linked to incubation centres and supports for entrepreneurs (Agrawal & Henderson, 2002), as well as the importance of collaborative R&D projects (Rogers, Carayannis, Kurihara, & Allbritton, 1998) to produce public knowledge (Agrawal, 2002; Barnes et al., 2002; Cohen & Levinthal, 1989). Other university activities such as teaching, publishing research, attending conferences, developing knowledge networks and promoting academic consultancy have also come under scrutiny as fruitful avenues to improve academic-practitioner engagement through transfer (Hughes et al., 2011).

In this context engagement is simply about improving how close academics can get to the reality of business on a practical level so as to improve knowledge transfer to practitioners. This calls into question the role of universities and specifically the agenda of business schools in narrowing this gap and improving transfer (Huff, 2000; Huff & Huff, 2001). One approach is to overcome or balance the dual hurdles of 'rigour' and 'relevance' in research (Pettigrew, 1997) so as to become more accountable to society's needs (Gibbons et al., 1994; Nowotny et al., 2001; Nowotny, Scott, & Gibbons, 2003), narrow the theory-practice divide, improve academic-practitioner engagement, and facilitate continued innovation and creativity (Van De Ven & Johnson, 2006; Van De Ven & Poole, 1995). Only through close engagement can knowledge be effectively developed, transferred and exchanged (Van De Ven & Johnson, 2006).

In a societal sense the importance of university-industry relationship is in how it improves what is termed knowledge production. The concept of the triple helix argues that by increasing the density of relationships between government, science and society produced knowledge through the commercialisation of research and fostering of university innovations can be improved (Leydesdorff & Etzkowitz, 1998). A modal theory of societal knowledge production (Mode 2) advances the argument that by increasing interactions between government, employers and society (Gibbons et al 1994) we can address not only the knowledge transfer problem by narrowing the theory-practice divide but also improve a generalised sense of how society creates of 'produces' knowledge. Combined these two ideas provide us with a starting point beyond that of the knowledge transfer agenda. The application of Mode 2 principles have overlapped with and informed much of discussion on university-industry relationships (Bartunek, 2011; Van Aken, 2005).

In contrast to Mode 1, a number of Mode 2 attributes suggest ways to understanding a concept of knowledge creating. First, societal knowledge production occurs in a context of application, distinct from Mode 1, where knowledge is produced in isolated academic environs removed from society. This focus on application speaks to the pure versus applied debate where the quality of knowledge is evaluated along lines of relevance. In addition this highlights processes of engagement, over discrete transfer as a basis for knowledge creating. Second, the

authors argue that due to the massification of education, societal knowledge production is increasingly being produced in practice (Gibbons et al 1994 pp.3-4). This allows for and requires the inclusion of diverse stakeholders opening up opportunities for transdisciplinary research (1994 pp.4-6). Their inclusion addresses pressures for social and financial accountability and encourages researchers to focus on applied and/or relevance based research questions. They claim that for Mode 2 “*working in the context of application increases the sensitivity of scientists and technologists to the broader implication of what they are doing*” (1994 p.7) and facilitates the emergence of complex questions about socially acceptable research and the quality of knowledge produced. Third, the quality of knowledge is thus broadened to “*incorporate a diverse range of intellectual interests as well as social, economic and political ones*” (1994 p.8). The quality of knowledge and how it is evaluated therefore needs to be broadened (Table 1) beyond a singular academic standard associated with Mode 1.

By focusing our attention on the need to narrow the gap between science and society, between theory and practice, pure and applied research, and improve engagement between academics and practitioners, we can overcome the dual hurdles of rigour versus relevance. The solution offered here across these threads is however heavily influenced, and arguably hampered by a knowledge transfer agenda to narrow this divide. As a problem of knowledge transfer it assumes that practical knowledge is derived from research knowledge and that narrowing this divide remains a problem of improving unidirectional transfer of explicit knowledge from academics to practitioners who can use it (Table 1). Here much of the responsibility rests broadly on the ability of the university to engage with and transfer its knowledge to society (Peluchette & Gerhardt, 2015 p.415). The discussion on Mode 2 societal knowledge production, distinct from Mode 1, provides potential avenues to theorise about knowledge creating. These include a focus on increasing holistic engagement through communication with practitioners in application over engagement as mere unidirectional and discrete transfer. Also important is the inclusion of multiple stakeholders. By understanding relevance we can become sensitivity to how the quality of knowledge is assessed in practise (Table 2).

Attributes Informing this Study	Mode 2 Knowledge Production
A Context of Application	Knowledge production (Mode 2) is increasingly coming from a context of application rather than from an isolated academic environ (Mode 1).
Inclusion of Multiple Stakeholders	Due to the massification of scientific knowledge, and increasing opportunities for transdisciplinary research, multiple perspectives should be acknowledged.
Focus on Applied Knowledge	By including diverse stakeholders a sensitivity to socially acceptable research producing applied knowledge increases in importance.
Quality of Knowledge	The quality of applied knowledge is assessed from multiple perspectives.
Density of Communications	Increasing the density of communications is argued as a basis for knowledge production.

Table 2: Attributes from Mode 2 Knowledge Production Literature

To compliment the Mode 2 knowledge production’s emphasis on engagement a second argument on engaged scholarship has garnered much attention. Van de Ven (2007) argues that the difference between practical and scholarly knowledge within the rigour versus relevance debate has been misunderstood. In its place he suggests a process of engaged scholarship focusing on a strategy of arbitrage (Van de Ven, 2007). While relational scholarship has been discussed elsewhere (Bartunek, 2007) the authors here claim that “*exhortations for academics to put their theories into practice and for managers to put their practices into theory may be misdirected because they assume that the relationship between knowledge of theory and*

knowledge of practice entails a literal transfer or translation of one into the other” (Van De Ven & Johnson, 2006 p.808). In response to criticisms of engaged scholarship (McKelvey, 2006) the authors distance themselves from the knowledge transfer agenda as a failed solution to narrowing the theory-practice divide (Van De Ven, 2006). Instead they argue for a pluralistic and complementary view of knowledge from science and society involving an approach of knowledge co-production or co-creation (Peluchette & Gerhardt, 2015 p.416) among academics and practitioners involving negotiation and collaboration where they draw upon a notion of intellectual arbitrage which they say “represents a dialectical method of inquiry where understanding and synthesis of a common problem evolve from the confrontation of divergent theses and antitheses” (Van De Ven & Johnson, 2006 p.809). They add that an arbitrage strategy is essentially a pluralistic methodology and acknowledge that a problematic interpersonal aspect of arbitrage is the presence of conflict, but that conflict represents the “generative mechanism of a dialectical process of inquiry” (p.809). Consistent with the Mode 2 argument by using this arbitrage strategy the authors argue that the dual hurdles, of rigour and relevance, is surpassed and that the theory-practice divide is narrowed not by literal knowledge transfer alone but by engagement (Table 3).

Attributes Informing this Study	Engaged Scholarship
Engagement as Arbitrage NOT Transfer	Engaged scholarship involves a “strategy of arbitrage” that is relational with knowledge flows going in both directions rather than a unidirectional transfer of knowledge from universities to society. This incorporates knowledge coproduction, negotiation and collaboration.
A Context of Implication	The context of implication of research for users should be included (consistent with Mode 2 Knowledge Production arguments).
Inclusion of Multiple Stakeholders	Difference opinions of academics and practitioners (across the theory-practice divide) should be acknowledged to implement a strategy of arbitrage.
Pluralism	A pluralistic & complementary understanding of knowledge should be considered having methodological implications i.e. multiple methods should be considered.
Dialectical Method of Inquiry	A strategy of arbitrage involves a dialectical method of inquiry which is understood as generative.

Table 3: Attributes from Engaged Scholarship Literature

A third but complimentary argument to overcome the dual hurdles of rigour versus relevance debate as an issue of literal knowledge transfer has focused on the repurposing of Mode 2 knowledge production to ensure that universities and business schools remain relevant i.e. the relevance of the academy debate (Bartunek, 2011; Huff, 2000; Starkey & Madan, 2001). To maintain the role and relevance of business schools as knowledge producers in society various stakeholders’ interests should be aligned within research (Bennis & O’Toole, 2005; Hambrick, 1994; Mohrman & Edward E. Lawler, 2012; Van Aken, 2005) consistent with the engaged scholarship debate. By advocating the application of a Mode 2 approach it is asked what are “the key issues that need to be considered in the discussion of relevance and knowledge creation” (Starkey & Madan, 2001 p.S4) and/or what impact has research from business schools had? Three attributes, similar to the Mode 2 attributes discussed above, are suggested (Table 4). First, they call for increased dialogue between managers and academics about specific needs arguing that through a mutually beneficial process of “joint development” the nature of knowledge would emerge (2001 p.S4). Second, how we evaluate appropriate knowledge should be connected to action. They argue that action should be informed by both theory and evidence within the decision making process (2001 p.S6). Third, so the research process can respond to their increasingly sophisticated demands, additional

stakeholders at various stages of the research process, as well as users of research, need to be acknowledged (2001 p.S13 & S18).

Attributes Informing this Study	Relevance of the Academy
Inclusion of Multiple Stakeholders to Ensure Relevance	By including multiple stakeholders research interests can be aligned and the relevance of research to multiple stakeholders should be acknowledged. Reflexivity & Sensitivity – due to the need for social and financial accountability sensitivity to the broader “implications” of research should be acknowledged.
Increasing Dialogue	By increasing the density of communications, dialogue between academics and practitioners can ensure a process of “joint development”.
Focus on Action	By focusing on knowledge related Action, knowledge is evaluated in relation to decision making, practice and a context of implication (consistent with Engaged Scholarship).

Table 4: Attributes from ‘Relevance of the Academy’ Literature

The three broad arguments presented here can be relied on to advance, in a practical way, the question as to how organisational processes facilitate knowledge creating over time? In support of this processual view of knowledge creating three additional, and complimentary, arguments were presented (Tables 2-4). The highlighted attributes provide us with insight into the dynamics associated with knowledge creating. The next section synthesises these attributes into a coherent theoretical framework.

Discussion: A Revised Strategy and Research Agenda

By reviewing broader discussions drawn from the university-industry relationship literature three related and intertwined bodies of literature were identified; Mode 2 knowledge production; engaged scholarship; and the relevance of the academy. When collectively combined these advocate a shift away from a knowledge transfer agenda. The above attributes also highlight the importance of a processual perspective on knowledge creating highlighted in the first part of this paper. The attributes for a knowledge creating research agenda can be summarised as follows;

- i. *A Context of Application:* research on processes facilitating knowledge creating overtime needs to be conducted in a context of application or implication rather than an isolated academic environ (Tables 2 & 3). The university-industry relationship is prominently highlighted as an appropriate context.
- ii. *Diverse & Multiple Stakeholders:* Multiple perspectives need to be accommodated in the research process to ensure the relevance of research (Tables 2, 3 & 4).
- iii. *Processual Understanding of Knowledge:* Knowledge is understood from a processual perspective (Table 1), and reflects an emphasis on applied relevant knowledge for all stakeholder including users of research (Tables 2,3 & 4).
- iv. *Evaluating Knowledge:* As a consequence research must accept the variability in the ‘quality’ of knowledge (Table 2).
- v. *Dialectical Engagement:* A relational approach to engagement, or a strategy of arbitrage, should be accommodated by adopting a dialectical method of inquiry (Table 3) due to the increasing density of communications (Table 4). The assumption that narrowing a theory-practice divide is a problem of literal or discrete transfer is avoided.
- vi. *Action:* Knowledge creating is linked to action informed by both theory and empirical knowledge from practice (Table 4).
- vii. *Plurality of Methods:* Pluralistic approaches, beyond simple functionalist approaches, needs to be considered (Table 3) consistent with the processual understanding of knowledge reflecting variability in ‘quality’ (Table 2).

These attributes allow us to address a revised research question around how organisational processes facilitate the creating of knowledge overtime. In addition they highlight the dynamic nature organisational knowledge creating and raises questions about how to facilitate the dynamics of knowledge creating processes. From the previous sections three main gaps representing a potential the contribution of this paper can be identified.

First, scholarly research has not considered a processual approach to knowledge creating. Current research on 'creation', is hampered by conceptualisations linked to knowledge transfer. Knowledge creation is seen as an event; where knowledge is converted into an explicit form and requires amplification within organisations. Paradoxically knowledge is assumed to pre-exist in a tacit form (Table 1). Whereas processual approaches have been called for, 'knowledge creating' as a concept has not been considered fully in scholarly literature. Here the research question, in relation to the managing of knowledge becomes a problem of how knowledge creating is facilitated rather than how it is literally or discretely transferred.

Second, the discussion above focuses on improving the academic-practitioner relationship by narrowing the theory-practice divide, and overcoming the dual hurdles of rigour and relevance as a transfer problem. The contribution made here is that in taking a holistic processual approach beyond a narrow focus on events per se a more complete understanding of dialogical forms of engagement resulting in arbitrage is advanced.

The main contribution however is in advancing theory building to address a significant gap in scholarly literature. The attributes above highlight philosophical as well as methodological assumptions that can inform empirical research on processes of knowledge creating distinct from previous research agenda linked to knowledge in management (last column of Table 1)..

Conclusion: A New Direction for Research

By asking how we research processes that facilitate the creating of knowledge over time we shine a light on how successful previous research traditions on knowledge transfer and knowledge creation have been. In so doing we highlight some shortcomings in existing theory and research practices linked to how knowledge is researched in fields of management. The need to further explore processual understanding of knowledge creating was presented. The university-industry context, while not the only context, provided a mature context to position this conceptual discussion. Finally this conceptual paper positioned itself more in the area of incremental change rather than in the realm of the destruction and recreation of new paradigms or paradigm shifts (Kuhn, 1962). In so doing this paper contributes to debate on how knowledge is researched in management.

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