

In Search of the Golden Mean: The Ambivalence of Knowledge Explication

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Abstract: Knowledge Management (KM) tends to regard the explication of knowledge as thoroughly positive. In this paper, we argue that this attitude rests on misconceptions regarding the nature of implicit knowledge and knowledge explication. Rather than following undifferentiated imperatives to maximise the amount of explicit knowledge, practitioners of KM are better off considering the ambivalent effects of knowledge explication. For this purpose, we suggest applying the *Tacit Knowing View* (Neuweg, 2004) and Contingency Theory to the problem of determining the right level of explication. The paper is divided into four parts. In the first part we trace KM's need for the explication and formalisation of knowledge. In the second part, we address theoretical misconceptions. First, we apply Ryle's finding that sloppy language use may lead to illegitimate assumptions toward explication. Secondly, we argue that, albeit superficial references to the work of Polanyi can be found throughout KM, actual epistemological positions rather seem to follow Popper. In the third part, we systematise limitations, problems, and side effects of explication. In the fourth part, we suggest the heuristic concept of explication optima as a framework for developing KM activities.

Keywords: tacit knowing, implicit knowledge, know-how, knowledge management, knowledge explication, knowledge elicitation, explication optimum, contingency theory, Michael Polanyi, Gilbert Ryle

1. The desire for knowledge explication

1.1 Explicating the tacit as a basic strategy in knowledge management

Although there is no single definition of Knowledge Management (KM), most approaches share the interest in managing individual and organisational performances. In the end, it is important what organisations *do*, not what they *know*. If performances are continuously successful, *know-how* is ascribed to the relevant person or organisation. This focus on (actual) practice and (latent) know-how causes frequent references within KM-literature to the work of Michael Polanyi.

Polanyi's analysis of the nature of knowledge is closely connected to the concept of *tacit knowing*. Tacit knowing (or *implicit knowledge*) is practical by nature. It is knowledge which manifests itself in behaviour in a wider sense, that is, in the processes of perception, judgement, anticipation, thought, decision-making or action. And just as important, it is not, not completely or not adequately explicable (verbalisable, codifiable, objectifiable, formalisable, technicisable) by the subject and, under some circumstances, not even by the analytical observer (Neuweg, 2008). With this in mind, Polanyi (1958/1998) strongly criticised the tendency to make knowledge impersonal.

In contrast to Polanyi's position however, KM holds impersonal knowledge in high esteem. In order to manage know-how, its transformation into explicit knowledge (*externalisation*, or, as we would prefer to say, *explication*; Nonaka and Takeuchi, 1995; Davenport and Prusak, 1998; Probst, Raub and Romhardt, 2000; Hakanson, 2007) has been pointed out as a basic strategy since KM's early days. Though the tacit is generally valued and assumed to resist complete codification, it would be preferred in explicit form. At times mainly economic reasons are thought to limit explication: "In principle, most forms of economically significant knowledge can be articulated and codified. Whether or not such articulation will take place depends on costs and incentives" (Hakanson, 2001, p29). Hedlund (1994, p76) even goes so far as to regard organisations as "articulation machines". And indeed, the "drive to codify" (Roberts, 2001) has led to huge advances in generating explicit knowledge (see Liao (2005) for an overview of expert systems).

In more recent times, however, researchers are becoming more sensitive to the limits of explication (see Cowan, 2001 and Busch & Richards, 2005 for *Artificial Intelligence* perspectives). Complementary, Turner and Minonne (2010) argue that the dominant focus on problems of capturing, organising and retrieving explicit knowledge "has led to the simplistic misconception that Knowledge Management only involves the capture, or downloading, of the content of employees' minds" (p161).

In this paper we argue that undifferentiated strategic recommendations to maximise the amount of explicit knowledge in organisations are simplistic and potentially destructive for KM's goal to manage successful performance. Essentially, we argue that the lack of a more differentiated stance towards explication originates from fundamental misconceptions of implicit knowledge and thus knowledge explication. These misconceptions seem to derive from unsystematic and superficial references to a many-faceted theoretical background. As a consequence, knowledge explication cannot appear in its ambivalence and hence is not seen as a difficult decision problem.

The paper is divided in four parts: Within this first part, we describe desired effects of knowledge explication. In the second part, we trace misunderstandings in the dominant view on implicit knowledge and knowledge explication. Based on the analysis of Gilbert Ryle and Michael Polanyi, we unfold a different view of knowledge explication. This view allows for the systematic inclusion of limits, problems, and side-effects in the reflection upon knowledge explication. These are discussed in the paper's third part. In the final part, we suggest replacing the criticised idea of an explication *maximum* with the heuristic concept of an explication *optimum*.

1.2 Reasons to advance knowledge explication

Explication and formalisation have important advantages for organisations. We now take a closer look on some of the main benefits of codifying know-how in symbolic representations.

Shifting from Performance to Competence by Grasping the Rule

Performances are surface instantiations of a competence which exists on a deeper level (Chomsky, 1978/2005). Every practice exhibits just a facet of know-how and is inevitably bound to a specific context. Therefore, it loses a substantial part of its value when contexts change. This is the focus of *formalisation* as a special form of explication. Formalisation aims at directly codifying the competence to generate successful practices under varying circumstances. Therefore, rules that appear to govern the successfulness of practice are extracted. In its crystalline form, the competence (sic!) can be added to organisations' explicit, collective knowledge base. Since the competence is no longer held by individual practitioners but by the rule system, it can be made available to instruct anybody to generate performative practices wherever and whenever needed.

Transferability and Replicability

This idea to replicate practice by transmitting the *rules of practice* is hardly new but bears resemblance to classic ideas of management and organisational studies: Formalisation is closely associated with standardisation, codification, knowledge distribution, programming of the organisation and mechanisation. Explication enhances transferability and replicability which are important prerequisites for expansion: "Unless able to train large numbers of individuals or to transform skills into organizing principles, the craft shop is forever simply a shop. The speed of replication of knowledge determines the rate of growth" (Kogut and Zander, 1992, p25). Whereas explicit knowledge is easily and asynchronously transmittable over long distances, the transmission of implicit knowledge is regarded as "slow, costly, and uncertain" (Grant, 1996, p111).

Reduction of Complexity

Human capacity in information processing is limited. Hence, organisations must ensure a minimal quality and rationality. Therefore, it is necessary to reduce complexity. Formalisation seeks to remove ambiguity (Roberts, 2001, p111) and to provide standard procedures to replace decision making, planning, coordination, or instructions. Even for complex tasks, such as cancer detection, approaches that rely on explicit procedures rather than implicit knowledge are becoming more and more reliable (Iwai & Ishino, 2009).

Reflection and Learning

It is not possible to reflect upon one's own implicit knowledge in its "natural state". Following Popper (1972, p25), only objective insights can be reflected upon and criticised. To become objective, knowledge needs to be expressed verbally or printed out. In this sense, explication may crack ineffective trial-and-error-cycles. "Considerable empirical evidence supports the notion that the understanding of processes, both in production and in management is the key to process improvement. In short, an

organization cannot improve what it does not understand. Deep process understanding is often required to accomplish codification" (Teece, Pisano and Shuen, 1997, p525). Hence, explication offers opportunities for innovation and learning on both individual and organisational level.

Control and Power

Explication aims to affect the balance of power within an organisation. Often individuals benefit from uncodified knowledge which is exclusively under their control. KM aims to raise the proportion of explicit knowledge in relation to implicit knowledge (Reinhardt, 2001, p143), thus shifting know-how within an organisation from individual to organisational level. Apart from power interests, this offers two advantages: First, organisations become less vulnerable to *knowledge retention* (see Levy (2011) for a review). If individuals leave, organisations do not lose competencies but only performances which can be easily replicated (see Levy (2011) for a review of current approaches). Second, the explication of competences allows hiring less qualified and therefore less expensive workforce. Since the origins of organisational theory, mechanisms have been intended to replace individuals' skills (e.g, Ure 1835, p20; Taylor, 1911). Contemporary approaches aim to expand this idea even to lower and middle management (Kieser and Walgenbach, 2003, p36).

2. Tracing some misunderstandings

The strategy to focus on explication rests on the belief in the usefulness of explicit knowledge for the purpose of managing practice. This belief itself is based on the assumption that implicit knowledge is the cognitive authority governing the generation of successful performative practices. Hence, successful performances are the outer instantiations of successful knowledge. Understandably then, processes are believed to be best managed if only the "knowledge" "behind" these processes was explicated ("elicited") and distributed. Not surprisingly, explication aims to illuminate this knowledge-base behind practice. Thus, it is recommended to explicate as much as possible of this competence.

However, this position is not universally accepted. In line with others (e. g. Tsoukas, 2003, Virtanen, 2011) we advocate the consideration of a solid theoretical body in order to judge explication's potentials in the light of its limitations, dangers, and side-effects. In order to develop a systematic perspective on explication, it is necessary to rely upon what we call "the tacit knowing view" (Neuweg, 2004, 2008). This view rests on an interdisciplinary groundwork. Important areas of inquiry are, above all, philosophy and epistemology (e. g., Ryle, 1949/2000; Wittgenstein, 1953/1973; Polanyi, 1958/1998, 1966/1983, 1969; Bourdieu, 1990; Schatzki, Knorr Cetina and von Savigny, 2001), cognitive science and artificial intelligence (e. g., Searle, 1983; Suchman, 1987; Dreyfus, 1972; Dreyfus and Dreyfus, 1986), theoretical psychology (Nisbett and Wilson, 1977), experimental psychology (e. g., Reber, 1989, 1993; Berry, 1997), sociology of science (e. g., Fleck, 1935/1979; Kuhn, 1970), sociology of knowledge (e. g., Collins and Kusch, 1998; Collins, 2001, 2010), and research into professional expertise (e. g., Schön, 1983; 1987; Benner, 1984; Dreyfus, 1982), as well as technical and vocational education and training (e. g., Eraut, 1994, 2000; Neuweg, 2001).

This interdisciplinary groundwork forms the background to the following analysis. We will reflect upon the status of implicit knowledge as well as the nature of explication. Our first argument is concerned with the assumption that successful practice can be theorised as mere knowledge application. Here, we apply Ryle's argument that sloppy language use can lead to illegitimate standpoints toward explication. Based hereon, we refer to the work of Polanyi for a different understanding of implicit knowledge and explication.

2.1 A category mistake at the root of mis-conceptualising explication

Although the philosopher Gilbert Ryle does not broach the issues of implicit knowledge or knowledge explication, his analysis is important for our concern. Based on Ryle's analysis we argue that the idea of implicit knowledge as a substance behind practice rests on a *category mistake* which itself can be traced to sloppy language use. Before taking the case to implicit knowledge, we briefly summarise Ryle's analysis.

For Ryle, it is important to distinguish episodic and dispositional words. By saying that the glass broke because it was fragile, we provide a dispositional explanation (Ryle, 1949/2000, p43), not referring to what happened in the particular episode when the glass actually broke but to a general characteristic of the glass. Alternatively, we can argue that the (fragile) glass broke because it was hit by a stone.

Both explanations belong to different categories. Episodic explanations refer to events or processes that preceded the episode. Dispositional explanations in contrast do not refer to anything prior to the event itself. Therefore it is crucial not to mix up both categories.

When we say John Doe acted *cleverly*, *cleverly* refers to his disposition. Herewith, we admit that John Doe was not only clever in this particular episode but that cleverness is one of his general attributes. If one mistakes *clever* for an episodic word one comes to conclude that there must have been an additional event prior to the actual episode. Thus, any instance of *cleverness* would require a process of “clevering” prior to acting cleverly. Hence, there must have been an unobservable (maybe even inaccessible) mental activity prior to the observable action itself. Thus, the observable cleverness is seen to be caused by an inner mental cleverness. Therefore, if only this inner knowledge base was explicated, one would gain immediate access to the competence at work.

However, inner processes of “clevering” need not exist. “When we describe a performance as intelligent, this does not entail the double operation of considering and executing” (Ryle, 1949/2000, pp29-30). The process was introduced by us when we mistook *clever* for an episodic word. If we had taken *clever* for the dispositional word it is, there would have been no reason to claim any process of “clevering” every time John Doe is clever. Regardless of such semantic considerations, the question what happens within his head must be answered empirically. However it must not be taken to be already answered.

Ryle’s analysis helps to reframe some well known obstacles of explication (e.g., Collins, 1985, see below): Rather than being minor barriers, they result from a fundamental misconception. The reason for our inability to properly illuminate the knowledge base “behind” practice might be that there exists none of the suggested form or relevance. Know-how, as exhibited in practice, must not be understood as the mere application of explicit or implicit knowledge. Rather, the dispositional term *know-how* refers to practice itself. Therefore, there is no legitimation to conclude that know-how necessarily results from any knowledge substance “behind” practice.

Nonetheless, it is legitimate to extract rules from practices – as long as these are not meant to represent “underlying” processes to practice. Rather than eliciting a mental substance, the rules are correlates of practice. The rule system simulates externalisations of expertise. However, it does not refer to episodic processes in the expert’s head when she acts *as if* applying the rule system. Although extracted from her practice, the rule system should not be assumed to cause her practice. Further, it is illegitimate to conclude that subjects necessarily would need to know these rules in order to be able to perform accordingly (for a detailed analysis see Neuweg, 2001, 2004).

2.2 Polanyi or Popper: Epistemologically, one has to decide

Grant (2007) analyses citations within KM publications and concludes that Polanyi’s work is among the most cited references. However, he goes on, it “has frequently been misinterpreted” (p173). In order to rectify basic lines of argument within KM, we, along with others (e.g. Miller, 2008; Güldenbergh & Helting, 2007), propose to refer to the original positions in epistemology. We suspect that, although Michael Polanyi is often referred to as one of KM’s favourite patrons, the real one is Karl R. Popper. This position nicely complements the distinction between *objectivist* and *practice-based* views of knowledge (Ferguson et al., 2010).

Popper (1972) promotes an “epistemology without a knowing subject”. He claims the existence of three worlds (Popper, 1972, pp106-108): “world-1” representing the physical world, “world-2” consisting of subjective mental conditions and traits (including any know-how potentially resisting explication), and “world-3”, where objective knowledge exists independently from individuals. In particular, Popper (1972, p118) claims the autonomy of world-3 from world-2; a position with massive consequences in favour of KM’s assumed potential. For Popper, if all machines and tools (world-1-objects) as well as our whole personal knowledge of how to use them (world-2-objects) were destroyed but not our libraries (world-3-objects) and our ability to learn from them, the old world (world-1 and world-2) could be rebuilt. Apparently, this mirrors the conviction that companies are able to replicate practice qua explication in different places with different individuals.

However, those who implicitly follow Popper must not explicitly refer to Polanyi, for whom complete objectification means inevitable loss of knowledge: “I think I can show that the process of formalizing all knowledge to the exclusion of any tacit knowing is self-defeating” (Polanyi, 1966/1983, p20). It is

not by chance that Polanyi's opus magnum is entitled *Personal Knowledge*. Following Polanyi's line of argument, Popper's claim that world-3-knowledge can survive on its own, has to be refuted, as world-2-know-how cannot be captured objectively. Rather, for Polanyi, human dispositions and meaning (as part of world-2) are not transferable in purely explicit ways. Reversely, objective knowledge cannot be understood on purely explicit ways. Instead, a joint history of socialisation is necessary. Collins (1985) gives a vivid illustration. A Canadian laboratory succeeded in constructing a particular laser. Other labs failed to replicate the laser, even when specific instructions were sent. In each case the laser could only be made to work following a visit to or from the originating lab and with the aid of very close contact and dialogue. This is in line with Polanyi who "watched in Hungary a new, imported machine for blowing electric lamp bulbs, the exact counterpart of which was operating successfully in Germany, failing for a whole year to produce a single flawless bulb" (Polanyi, 1958/1998, p52).

3. Limits, problems, and side effects of explication

In order to develop a systematic perspective on explication it is necessary to analyse the whole process, from practice to practice (see Figure 1). It is only by integrating the receivers' end that the potentials of explication can be judged appropriately. This third part of our paper is divided in three steps that follow the newly framed process: First we discuss chances to capture know-how in codified knowledge ("explication"). Second, we switch to the learners' end to analyse necessities for understanding and making use of codified knowledge ("understanding and resubjectivation"). Finally, we address consequences of explication ("modification").

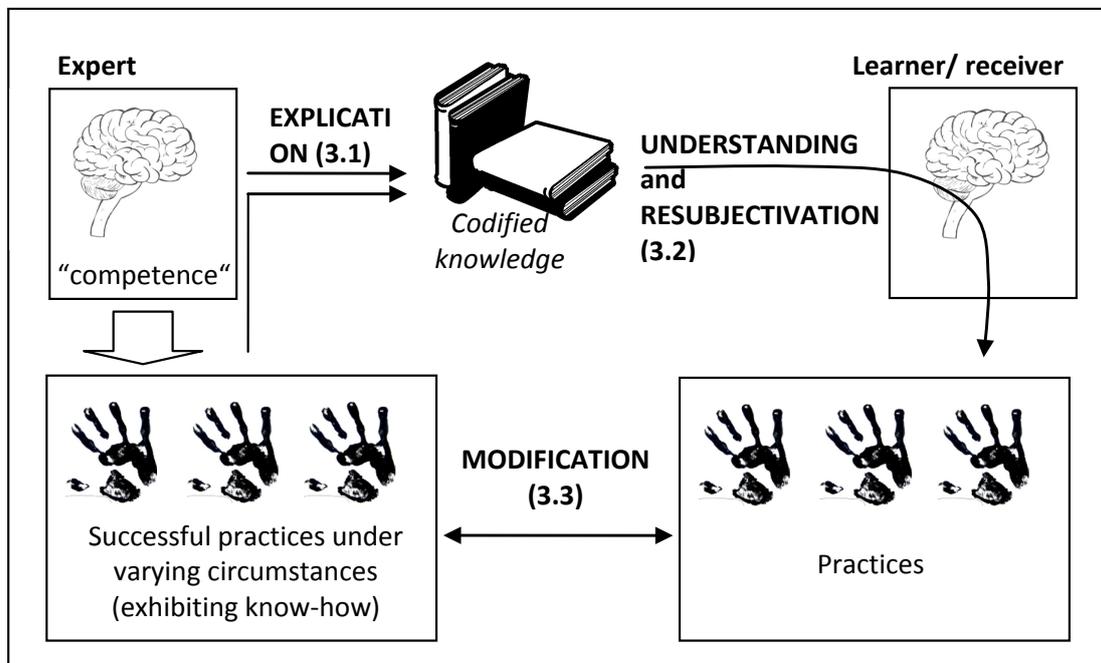


Figure 1: Limitations, problems and side effects of knowledge explication

3.1 Explication

Defects with regard to the articulation of knowledge of one's practice are well known. There is an "area where the tacit predominates to the extent that articulation is virtually impossible" (Polanyi, 1958/1998, p87). Polanyi gives skills and connoisseurship as examples for this "ineffable domain". Within KM however, it seems to be tempting to exclude such phenomena from enquiry and to persist in explication strategies: "Many basic human faculties – such as that of speech, the use of grammar or muscular motion – are not accessible to consciousness, and can therefore not be articulated. However, the analysis of these and other 'natural' human faculties, although significant in areas such as neurology, linguistics and philosophy, would seem to fall largely outside the realm of economic enquiry." (Hakanson, 2001, p5).

It is important to overcome this temptation. As the phenomenon of ineffability is a universal characteristic of experts (Dreyfus and Dreyfus, 1986; Neuweg, 2008), we strongly recommend considering it. The difficulties of experienced experts to report mental precursor- or accompanying processes and structure of their actions (see Nisbett & Wilson, 1977 for psychological evidence) suggest that the

concept of knowledge application may not apply to significant forms of skilled action, above all that of the true master with her expert eye. There is a tacit component even in the most abstract forms of judgment and action. Take, for example, our ability to reason correctly without considering the rules of logic, the art of applying theories of different kinds in a context-sensitive way, or the ability to maintain intelligent practices for which there are hardly any written rules at all; e. g., the practice of invention.

Regardless of actors' defects of articulation, in some domains it is not even possible to appropriately *model* expertise as knowledge application. Schön (1983) argues that the understanding of expertise as "technical rationality" is implausible in many real-life domains where problem-solvers must cope with complex, uncertain, instable, unique, and value-conflicted demands. Collins and Kusch (1998) relate their thesis about the non-substitutability of experience and socialisation by instruction (*irreplaceability thesis*) particularly to so-called 'polimorphic actions' the competent execution of which assumes an understanding of the relevant context which can be acquired only through membership of a community of practice and which, as a result, can neither be simulated mechanically nor taught through the imparting of knowledge of rules.

Even if rules can be established, their application to real-world contexts inevitably requires intelligent users. Acting successfully requires interpreting the rules according to the context at hand. The skill to interpret however cannot derive from the rule itself. Hence, one cannot detach intelligence from individuals. Codified competences remain incomplete in a fundamental sense.

Common to these lines of argument is the conviction that expert perception, thinking and acting prove to be situated, related to special cases and context-sensitive, so that their flexibility and underlying situative understanding cannot be exhaustively modelled in terms of rules. The fact that the expert answers the question 'By what in general does one recognise this or that situation and what in general must be done in it?', by saying 'it depends', marks the central difference between him and a mere novice 'working-to-rule' (Neuweg, 2008).

3.2 Understanding and resubjectivation

Even if explication were successful, the usefulness of distributing explicit knowledge is still doubtful. In order to make use of it, receivers must "resubjectivate" this objective world-3-knowledge (i.e., rules, ideas, theories) into their personal world-2-know-how. Only then, knowledge guides practice. However, this process is far from being trivial. In order to make use of it, explicit knowledge must be understood. Thereby it is not sufficient to merely receive syntax. Understanding requires unlocking *meaning* rather than being receptive. Thus, explication is never *complete*. Rather it is *sufficient*, if those intending to benefit from codified knowledge have unlocked its meaning.

Due to this crucial role of meaning, Polanyi – very different to many KM theorists (e.g. Nonaka and Toyama, 2003, p9)¹ – does not see a dichotomy between implicit knowledge and explicit knowledge. For him, they are "not sharply divided. While tacit knowledge can be possessed by itself, explicit knowledge must rely on being tacitly understood and applied. [...] A *wholly* explicit knowledge is unthinkable" (Polanyi, 1969, p144). All knowledge is fundamentally tacit, because deprived of their tacit coefficients, all spoken or written words would be meaningless.

Therefore, with regard to the relationship between words and the world, we will always find some dual movement of comprehension – and if the two fall wholly apart we risk the danger of a lack of comprehension in both realms. To illustrate this dual act of sense reading, Polanyi uses the vivid example of a medical student attending a course in X-ray diagnosis of pulmonary diseases. He watches shadowy traces on a fluorescent screen and hears the radiologist commenting to his assistants. At first he can see nothing that is talked about nor does he understand the language used. But as he goes on listening for a few weeks the pictures begin to make sense – and so do the comments made about them: "Thus, at the very moment when he has learned the language of pulmonary radiology, the student will also have learned to understand pulmonary radiograms. *The two can only happen together*. Both halves of the problem set to us by an unintelligible text, referring to an unintelligible subject, jointly guide our efforts to solve them, and they are solved eventually together by discovering a conception which comprises *a joint understanding of both the words and the things*." (Polanyi, 1958/1998, p101, emphasis ours).

¹ Among those resisting the simplistic distinction are Jimes and Lucardie (2003).

But not enough that throughout the process of reception and understanding we must rely on a shared experiential background between knowledge-possessor and knowledge-receiver – even if receivers grasp the meaning of explicit knowledge, understanding words does not imply proper usage of rules. Contextualising knowledge to concrete situations cannot be learnt explicitly. That is why learning to perform in real life contexts often requires implicit learning. Learners have to experience (learning by doing) or observe (apprenticeship) what had not and cannot be captured in rules. This is necessary, even if rules were conveyed and it is even more vital in cases where no rules are available: “An art which cannot be specified in detail cannot be transmitted by prescription, since no prescription for it exists“ (Polanyi, 1958/1998, p53).

As a consequence, KM should not aim one-sidedly for the production of explicit knowledge but ought to facilitate *learning from explicit knowledge* and *implicit and informal learning* as well. Only then explicit knowledge contributes to successful performance.

3.3 Modification

So far, we have asked if practice can be explicated. We then discussed the value of explicit knowledge from the learners’ end. In a third step we now examine whether explicit knowledge may affect existing and newly learnt practices. Attempts to codify largely intuitive practices may affect these practices. Beyond, practices that are learnt explicitly by the submission of knowledge may differ from those that are learnt implicitly by experience and imitation.

In any case, the effects of codification are ambivalent. Bourdieu (1990, p80) argues that “codification is a change of nature, a change of ontological status”. As explication therefore may irritate or even deform practice, he calls for a theory of unintended consequences (p79). We now systematise some unintended effects of explication.

Eroding Communication Structures and Tacit Mechanisms of Coordination

In many cases explication desires to substitute face-to-face communication by the transmission of codified knowledge. Programs and technical artefacts are meant to supersede socialisation, self-coordination as well as personal instructions. This view however promotes the erosion of communication structures and tacit coordination mechanisms in organisations. Among others, Schön (1987, p102) urges that fine-tuning and nuances are lost in explication which otherwise were preserved or even promoted. In particular, the suspension of personal contacts is likely to affect the development and preservation of trust. Within KM research, the importance of trust for knowledge sharing is universally accepted (e.g. Lin, Wu & Lu, 2012). However, trust is not only necessary in the process of *creating* explicit knowledge but is also indispensable to processes of *relying* on explicit knowledge. Any explicit program is endangered to collapse since its interpretation and adaptation is based essentially on trust. Therefore organisations need to complement explication strategies with the care for a unifying organisational culture and ought to retain chances for personal contacts (e.g. Ybarra & Turk, 2009). Information technologies should not be used to substitute personal contacts but to augment and promote them.²

Paralysis through Analysis

Attempts to codify may positively affect practitioners’ focus on their own practice. However, sometimes it is better to not focus on what one is doing. The centipede easily masters its feet as long as it does not start thinking about it. As soon as it does it gets paralysed and tips over its own feet. In organisations something similar may happen if employees are urged to provide excessive documentation. These obligations may retroact and thus affect practices, leading to less intuitive – and therefore often worse – decisions. Such developments give birth to compulsive organisations (Kets de Vries and Miller, 1984).

Handicapping Experts’ Personal Growth and Reduced Quality in Decision Making

² Hansen, Nohria and Tierney (1999) identify two strategies of IT use in companies: *Codification strategies* – in the sense of Popper – aim to detach knowledge from its possessor by articulation and electronic filing. *Personalising strategies*, in contrast, follow Polanyi’s assumption that knowledge sticks to persons and can be transmitted through personal contact only. Here, technology has to provide information of “Who knows what?” and stimulate personal contacts via e-mail, phone, or video conferencing.

Dreyfus and Dreyfus (1987) model expertise as a development process progressing from applying others' rules ("novice") via rational planning ("competent") to intuitive modes of action ("expert"). Organisations with a high degree of articulation force experts to perform more or less novice-like. This is particularly problematic in poorly structured domains where judgement modes of experts and novices greatly differ. Here, the limitations of explicit knowledge limit the quality of expert practice. The heavy use of formalisms may also cause problems in strategic decision making where decision-makers must cope with ambiguity and uncertainty (Roberts, 2001, p111). Here, it may be beneficial to *leave* explicit processes (Schön, 1983, 1987).

Learning and Innovation Constraints

Know-how develops with practice. It is never complete but notoriously "open". "To a partly novel situation the response is necessarily partly novel, else it is not a response" (Ryle, 1979, p125). This initiative momentum cannot be preserved in rules, which are notoriously inert due to their retrograde nature. According to Bourdieu (1990, p84), one strength of formalisation is to relieve users from being creative. Hence, programs facilitate application. This is effective in many cases. However as soon as more than application is necessary, programs not only fail to provide what is needed but often constrain initiative. "The excessive codification of knowledge may lead to knowledge becoming more static since its interaction with tacit knowledge may be reduced" (Roberts, 2011, p110). Thus, organisations find themselves in another situation where they must master the balance of *exploration* and *exploitation* (March, 1991, Gupta, Smith & Shalley, 2006, Lui, 2006, Donate & Guadamilla, 2011). Successful organisations are particularly endangered by the *competency trap*. Understandably, their wish to capture successful practices causes formalisation. Whereas expertise sensibly adapts to circumstances, rules are inevitably less context-sensitive. Over time, the application of rules may be mistaken for original expertise if members rely blindly on the "successful" body of rules (the body must be successful since it derives from successful practices) and adapt reality to rules rather than the natural way around. While this may be satisfying in the short run it is critical over time (Kieser, Beck and Tainio 2001, p616).

In innovation management, in particular, the consequences of a reductionist approach to KM undermine its original goals. The danger lies in separating the skill to create new knowledge from the skill to use existing knowledge. This is the blind spot within Nonaka and Takeuchi's (1995) knowledge creation (sic!) model. We accept that new knowledge cannot derive from explicit knowledge which is why the spiral starts within the implicit. However, the model remains blind to retroactive effects of explication on the power of creating new knowledge. To use one of the examples of the authors: In a world of bread making machines people lose their power to develop bread making techniques (and themselves) further. Almost tragically, the spiral of knowledge creation is endangered to be a spiral of knowledge demolition.

This Janus-face of explication is already inherent in Weber's (1922/1978) characterisation of bureaucracies in which efficiency, precision, and determination go hand in hand with complete ignorance towards change and individuality. In contrast to Weber's bureaucracies however, contemporary capitalistic companies face a trade-off between conserving and losing knowledge, which is at the very heart of explication's ambivalence. While the first objective requires retaining existing knowledge, the latter requires the opposite to allow the organisation to remain flexible and capable of creating *new* knowledge.

Deskilling Workforce

Formalisation transforms fluid individual expertise into crystalline organisational capability. If successful, the "process intelligence" (Reinhardt, 2001) would be transferred to an organisational level. Then, even children could perfect the necessary skills remaining on individual level (Ure, 1835, p20). "And that's what [McDonald's] is, a machine. You don't have to know how to cook, you don't have to know how to think. There's a procedure for everything and you just follow the procedures." (Garson, 1998, p17, citing a McDonald's employee). Here, explication's ambivalence reappears: It aims for foolproofness but – at the same time – ensures the proliferation of fools. The wish for less qualified and thus less expensive employees may come back like a boomerang at times.

Increased Likelihood of Imitation

The unintended effects of explication may contradict the resource-based view of organisations. Often both, organisations as well as their competitors fail to analyse the basis of competitive advantages which have been built in long years of experiential learning (Grant, 1991, 1996; Teece, Pisano and Shuen, 1997). Intransparency ensures the tacitness of advantages and therefore their exclusivity for the firm. To promote codification contradicts KM's original intentions to protect competitive advantages³: Explication, originally undertaken to promote replication at lower costs, raises the probability of unintended knowledge transfer to the outside (Grant, 1996, p111; Teece, Pisano and Shuen, 1997, p524; Aidemark, 2009, p4): „In the efforts to speed the replication of current and new knowledge, there arises a fundamental paradox that the codification and simplification of knowledge also induces the likelihood of imitation” (Kogut and Zander, 1992, p18).

4. Optimising one's explication policy

In many respects explication is necessary and helpful. However, it may be accompanied by serious side effects. In order to master this ambivalence it is necessary to abandon the view of explication as a panacea for KM-related problems. Rather, a balancing strategy is necessary (see Sanchez, 2005 for the distinction in 'tacit knowledge' versus 'explicit knowledge' approaches to KM) in order to best serve organisational performance (see Edmondson et al., 2003 for an insightful case study). We close this paper by proposing the idea of a heuristic optimum of explication and by naming important desiderata.

4.1 Underexplication, overexplication, and the state between

Obviously, organisational cultures differ in the way they deal with the problem of knowledge explication. "Implicit" cultures are characterised by deregulation, spontaneity, movement, volatility, trial-and-error-attitude, strong orientation on social relationships, care for open social culture, cooperative leadership, teamwork, a climate of trust, appreciation of impulsiveness, of improvisation, of risk-taking attitude, and of innovation. "Explicit" cultures, in contrast, are characterised by large numbers of defined procedures, extensive planning, data orientation, quantifying attitude, solid and often slow decision making, continuity, caution, precision, dispassion, and objectivity.

Whereas this typology is descriptive, the concepts of underexplication and overexplication are prescriptive. In a state of *underexplication* growth at scale is hindered, planning is not coordinated and employees lack orientation. The organisation in question would therefore benefit from higher explication levels to promote knowledge distribution and to raise organisational performance and efficiency. However, there is a state of "too much" where explication causes demolition and the retention of practices provokes the loss of competences. The organisation reaches the level of *overexplication*. It tends towards hyperreflexivity, bureaucracy, slow reactions, repressed innovation, climate of control, and extensive legitimating duties as well as towards deskilled and unmotivated workforce. Here, less explication would best serve organisational performance and development.

Given an *optimal level of explication*, organisations balance the advantages and disadvantages of explication. They are coordinated efficiently and rely broadly on algorithms and routines; at the same time, they remain spontaneous and changeable. Thus, they are both reflective and fast reactive. Their members are provided with a healthy level of orientation but granted space for decision, innovation and development.

An important desideratum would be the development of tools to diagnose organisations' level of explication, especially a system of reliable indicators for states of under- and overexplication. While it appears fairly easy to name indicators, it is far more difficult to develop procedures to merge them validly and usefully into total figures representing and assessing the overall level of explication. On the one hand important qualitative indicators result from ethnomethodological and phenomenological microanalyses of the relevant organisation and its structure. On the other hand it is equally important to relate the analysis to quantitative data in order to compare organisations. Further research is called for to identify valid indicators and propose algorithms to usefully merge (subjective) qualitative and (objective) quantitative data.

³ Halawi, Aronson and McCarthy (2005) take a more optimistic perspective on this matter.

4.2 Contingency theory as a framework for searching for the golden mean

Recommendations in regard to the proper “amount” of explicit knowledge within the firm need to consider the specific circumstances of organisations (Woodward, 1958). One strategy cannot fit the manifold circumstances relevant to the optimal explication level. Rather, explication optima are *situated*. Therefore, we appreciate current approaches (e.g., Cruywagen, Swart and Gevers, 2008 as well as Sanchez, 2005) and urge for the systematic (re)integration of Contingency Theory (Pugh, 1981; Kieser, 1985; Donaldson, 2001).

The identification of factors determining the optimal level of explication in a given organisation would allow developing heuristics for KM activities. Finally, we suggest some variables affecting the optimal level of explication:

- **Organisation size:** For Weber (1922/1978), very large companies are unrivalled in their firm bureaucracy. Some correlation of 0.6 is found between scales of size and scales of programming and codification (Kieser and Walgenbach, 2003, p209, 261, 314, 322). Recent approaches in KM reflect the specific situation and needs of small organisations (e.g. Evangelista et al., 2010).
- **Growth period:** An organisation’s attitude towards knowledge is expected to evolve with age and scale. In different periods different mechanics and principles support growth as well as affect the dealing with crises. Among these are: pioneering spirit, creativity, strict leadership, delegation, autonomy, coordination, control, bureaucracy, lean management (Greiner, 1972). Hence, a different level of explication is optimal in different periods.
- **Product mix:** Hansen, Nohria and Tierney (1999) recommend “codification strategies” for organisations producing standardised products. On the other hand they favour “personalisation strategies” for those providing tailored products. Generally spoken, organisations dealing with more structured problems show/require higher levels of explication than their counterparts.
- **Environment’s dynamics:** Generally, higher explication levels are expected for organisations in static environments characterised by little change on both buying and sales markets as well as continuous production procedures as opposed to organisations in highly dynamic settings under strong pressure to innovate.
- **Organisational culture:** Organisations with strong cultures may have low explication levels because their culture is homogenous anyway. Peters and Waterman (1982) argue that fewer manuals, organisational charts, and fixed procedures are required in coherent organisation cultures (pp102-103). Similarly, Kieser and Walgenbach (2003, p202) suppose that strong cultures allow a reduction of coordination by programs.
- **Knowledge culture:** This specific part of organisational culture refers to attitudes towards knowledge, know-how and decision-making. As it reflects the psychological demands of its members, its analysis requires psycho-analytical approaches such as the classification in paranoid, compulsive, dramatic, depressive, and schizoid organisations (Kets de Vries and Miller, 1984). Here, higher explication levels are expected for obsessive and schizoid organisations.

With regards to the implementation of an “explication policy”, there might be only one piece of advice which is independent of the circumstances at hand: Be careful.

5. Conclusion

“Although, the codification of knowledge is highly beneficial, we must remain alert to the dangers of neglecting the tacit dimension” (Roberts, 2001, p111). In this paper we argued that the neglect may originate from dominant theoretical positions within the field of KM. In particular, we claim a *category mistake* to cause problematic concepts of implicit knowledge and knowledge explication. Crucially to KM, these theoretical positions imply recommendations that cannot do justice to the strategic challenge of deciding an organisation’s explication policy.

In contrast, we proposed a Polanyi-derived view on implicit knowledge (*Tacit Knowing View*) which provides a theoretical basis to integrate the whole panorama of explication-related phenomena, including limits, side-effects and problems. Hence, knowledge explication becomes visible as ambivalent endeavour. As a consequence, the *Tacit Knowing View* implies different strategic recommendations: Rather than to uniformly follow an imperative to *maximise* the amount of explicit knowledge, one better strives for an organization’s *optimal* level of explicit knowledge. In order to advance this perspective, we recommend Contingency theory as a framework and suggested several desiderata.

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