

The Essence of Knowledge Management: A More Appropriate Understanding of Knowledge¹

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Abstract: We contend in this presentation that more sustainable and successful Knowledge Management (KM) solutions can be built by using the principles of Knowledge Engineering (KE) to understand knowledge in a more appropriate way. We will basically explore five aspects of practical knowledge relevant for promoting the essential Human Factors (HF) involved in KM tasks:

1. the value and function of knowledge
2. the motor and mechanism of knowledge
3. the two states and 3 conversions of individual knowledge
4. the logic of networking (natural organisation of knowledge)
5. the handling of knowledge (wheel of knowledge)

and then explain their consequences under the form of five principles that we suggest could be used as leading criteria for designing and evaluating KM solutions and systems in a way more appropriate for implementing the recognition of the essential role of people.

Website: <http://www.fhbb.ch/weknow/vico/>

1. Introduction

Thank you very much Ron for your introduction and for inviting us here at KM2002. It is a great honour for us to have the opportunity to contribute to this Conference together with such famous speakers like Etienne Wenger, David Snowden, Ron Young and others.

What do we mean by essence of KM (it would be interesting to hear from you in an interactive session)? In the KM literature you can find expressions like „knowledge sharing is (CoP are) the essence of KM“, with the meaning of "essential solution" or "essential method". But in our use it means something different, something like the DNA ...

⇒ it is present in each project step or solution component

⇒ and determines them.

This DNA of KM is the answer to the question "What do we mean by knowledge?" („What is knowledge?“). Everyone involved in KM answers it tacitly but nobody deals explicitly with it. In fact KM people tend to delegate this job to professional philosophers. We claim that **KM people should become aware of how they look at knowledge** (we should not delegate this job) and we have made the first step!

Our presentation of this first step is articulated in four parts:

1. Sibylle will begin by telling the story of her experiences with practical, commercial KM and sketch how she discovered that it is necessary to deal explicitly with this "DNA of KM";
2. Based on my experiences with Knowledge Engineering I will then present why our established way of looking at knowledge is not appropriate for KM purposes
3. and propose an alternative view that we call the „constructive“ view of knowledge;
4. and finally Sibylle again will explain 5 practical criteria - deduced from this view - that you could use for designing or evaluating sustainable KM solutions.

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Sibylle's Story

Ladies and gentlemen, the story of my experiences with practical Knowledge Management begins at the point when at the Basel University of Applied Sciences I decided to do my diploma project in the domain of "interactive teamwork" and "knowledge communities".

My project began with the opportunity to support the process of designing a knowledge community within an internationally active swiss company based in Basel. I can well remember my first meetings with the heads of IT, corporate communication and controlling. Each of them had his own understanding of Knowledge Management and of course highly individual requirements for a Knowledge Management system. At that moment I already noticed that in order to work effectively we needed to clear up the concept of "Knowledge Management".

During my education at the Basel University of Applied Sciences I had already worked with groupware tools of all kind, standard and self-developed, I had done comparative analyses of such tools and also studies on subjects like interface design etc. But in those meetings I was faced with a kind of problem that had remained hidden to my "technological" perspective up to then. During interviews with potential users of the new system my attention was again and again attracted by the individuality of each person – there were internet cracks who would have preferred to perform the whole communication only by electronic media but next door there were project leaders who were questioning the whole initiative without seeing any need for such a tool and expecting only extra work. Also the question of "knowledge ownership" was interpreted in a very individual way.

The deeper I looked into the structures of a learning organization, the clearer I saw that I knew still too little about really living systems. I realized that I had to step back and deal with the "essence of knowledge management" and also with "knowledge" itself even if it was uncomfortable for me – because for my diploma I had to deliver in relatively short time both a practical and a theoretical work. I had to change my priorities and to deal first with questions like:

- ⇒ How does knowledge function actually?
- ⇒ What is the mechanism of knowledge?
- ⇒ Which are the main states and transformations?
- ⇒ Which is the logic of networking?
- ⇒ How do we deal with knowledge?

And most important of all, what is actually the role of people in knowledge management systems?

While working on this topic, in a newspaper in the column of the letters to the editor I found a contribution by a Knowledge Management professor who described precisely **my insight that the essence of Knowledge Management is our understanding of knowledge**. In that moment I knew that, nevertheless, I could not be on the wrong way. With the support of this professor and of well known sociologists, E-business specialists, knowledge management experts who deal daily with questions of knowledge and with the background of my experience in adult education and as interaction leader, I developed Vico and Co., a workshop devoted to the "essence of knowledge management". You have certainly already understood that the writer of the mentioned letter to the editor was professor Bettoni, who will now present our suggestions for a "more appropriate understanding of knowledge".

2. Lesson from Knowledge Engineering and Art

Thank you Sibylle, for your story. The essential role of people has been recognized since the beginning of KM but the implementations are still unsatisfactory. Our Workshop "Vico & Co" emphasises the central role of people in KM but in a different way than this has been done up to now. We think that we can improve this situation by means of lessons that we learned from Knowledge Engineering.

KE (an Artificial Intelligence technique) is basically the art of making explicit the tacit knowledge of experts (employees, associates) by means of models which are suitable for automation. Examples of knowledge automation are the automatic assessment of tax returns, automatic diagnosis of machine faults, automatic programming, etc. I have about 15 years of experience in making explicit the tacit knowledge of experts and the main lesson that I have learned in this time is that:

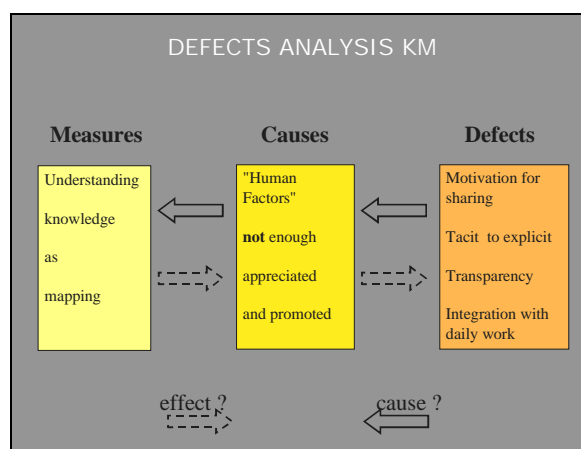
⇒ succesful KE is possible but requires an understanding of knowledge which promotes the relevant human factors involved. Sibylle had similar experiences in art consulting and art education.

What we claim now is that the same lessons and suggestions are valid also for KM.

3. Defects analysis of Knowledge Management

In this analysis we try to understand what influences, what determines some major defects (obstacles, problems) of KM, like

- missing motivation for sharing
- difficulties in the transformation of tacit to explicit knowledge
- lack of transparency in knowledge stores and "information architectures" (taxonomies, ontologies)
- insufficient integration of KM tasks within business processes, etc.



We suggest that a main cause is that the relevant human factors (HF) are not enough appreciated and promoted and we see a reason for this in our established way of looking at knowledge in which we are convinced (have the illusion) that our knowledge

- corresponds to reality
- is the logic of reality
- and that we can access and extract this logic from there

When we work at the meta-level of knowledge (= anything we do in KM / knowing "about" knowledge, instead of knowing about any other topic or object), then this view (this "measure") becomes a big handicap. Why? Because of the influence of this measure on the human factors!

4. Lesson from Cybernetics

Regarding the influence of our conception of knowledge on the HF we have learned from Cybernetics - precisely from Humberto Maturana [Ma88, Ma98] and Walter Freeman [Fr00] - that understanding knowledge as mapping (as "logic of reality") NEGATES the human factors (negates = obstructs the progress of the person in the direction of her basic human tendencies; see the humanistic school of psychology [Mas54], [BA72]). Why? Because when I understand my knowledge as LOGIC OF (corresponding to) reality, then I follow a path of objectivity in which:

1. I implicitly deny the power to choose (determinism instead of free choice)
2. I implicitly formulate a demand for obedience (awarely or unawarely). I implicitly propose my knowledge as an argument, that the other will not be able to deny. Knowledge of this kind becomes an argument to force the other, to compell the other, to do as I say!

On this basis of **Determinism and Obedience** I cannot really respect the person in front of me (employee, associate, partner)!!! So Determinism and Obedience are the two great obstacles to knowledge sharing, to CoP, to the improvement of knowledge processes (in which the person is involved) in general.

Which are the alternatives? How should our understanding of knowledge be?

5. Knowledge as Construction

The alternative that we propose is articulated in 5 aspects of knowledge, five characteristics essential to the goals of overcoming determinism and obedience and instead awarely and explicitly promoting human factors.

5.1 Value and Function of Knowledge

In business we are interested in the value of knowledge. And what determines the value of knowledge for a knowledge owner? It is its function (1st essential aspect). And what is then the function of knowledge?

We follow in our approach a school of knowledge research initiated by the Swiss psychologist Jean Piaget in the 30^{ies} in Geneva, the so-called "Constructivism", which suggests that [G196]:

- the function of knowledge is the **adaptation** (makes adaptation possible)
- to what? to situations: the knowledge owner **adapts to** what he or she perceives, lives, as a certain situation (and situations are experiences of events! If a meteorite comes down now and hits me, you can experience it as perturbation in space or as divine punishment, like in the Middle-Age, or ...)

What matters this in a business? Adaptation is important not only for KM but also for managing structural capital or for making new or modified products possible (and also services, processes, networks, ...). But how does adaptation work? What drives & controls adaptation? Which is the core mechanism?

5.2 Motor and Mechanism of Knowledge

Again following Constructivism we suggest that:

- the core-mechanism of adaptation is the "**construction**" of *viable* experiences (consistent, coherent, valid).
- The construction of viable experiences is driven and controlled by factors like intentions, interests, wishes, hopes, expectations, etc. which are very specific to each knowledge owner

These *human factors* are highly individual and make that the knowledge (logic) of every single person is also highly individual: so it cannot be the logic of reality, it can much better be the logic of experiences. Adaptation and construction create the experiential worlds in which every single person lives.

What means "construction" here? We are not saying that the mind creates reality! We use "construction" in a similar sense like engineering, where it is used for activities like planning, design, building and testing.

In the case of cognition we say that the brain "constructs" its knowledge in the sense that it can **know** only what it has **determined** (i.e. only what it has done by planning, designing, building and testing its acts). The first who formulated this in such a way was the Italian philosopher Giambattista Vico about 1710 [G196].

Notice that our constructions are not arbitrary! So, do not worry. Why? For 3 main reasons:

- ⇒ because we do **not create** reality, our constructions are merely experiences (artistic experiences, engineering experiences, manufacturing experiences, financial experiences, etc.)
- ⇒ because we **rely** on them as tools for achieving something
- ⇒ and because we **test** them against the results of what we have achieved.

Recent developments in brain sciences show an increasing tendency to determinism: the denial of the possibility of choice. This is the (logical) consequence (and demonstration) of the underlying assumption that knowledge is the logic of reality. But we are not like stones rolling downhill (Spinoza): the power to choose is an essential and unalienable property of human life [Fr00]. It is the fundamental human factor!

6. Example: Common daily words

As an example of what "construction" means, let us take something from daily life (what we daily do is namely what concerns all of us), for instance two common daily words, "look" and "see". These are two very interesting words (because they designate two coupled experiences which take place one after another and are dependent of each other). They are useful to recall us the fundamental insight that

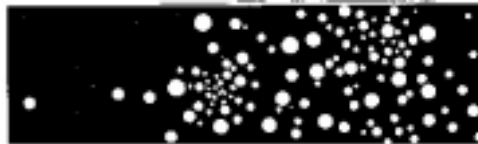
what we see depends on how we look!

The same happens with 2 other words, namely "listen" and "hear": how I listen determines what I hear. Language hence embodies in such words-pairs already since thousands of years Vico's insight that everything we know (the *what*) is determined by what we do (the *how*, our way of knowing) and not by what is given (the indefinite something). In 5 words: the how determines the what.

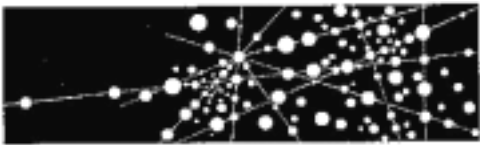

But then we have an important consequence: that the "what" cannot be the logic of reality! Example: When I say that light is both a wave and a stream of particles then this so-called "dualism" is not in nature it is in our minds (as logic of our experiences).

7. Example: Multiple perceptions

How should we understand knowledge (I say this instead of saying "what IS knowledge") if it is not appropriate to understand it as "logic of reality"? Look at the following picture of the firmament: is this "Chaos" or "Cosmos"?



It depends on how we look. We can of course look at it as "chaos"

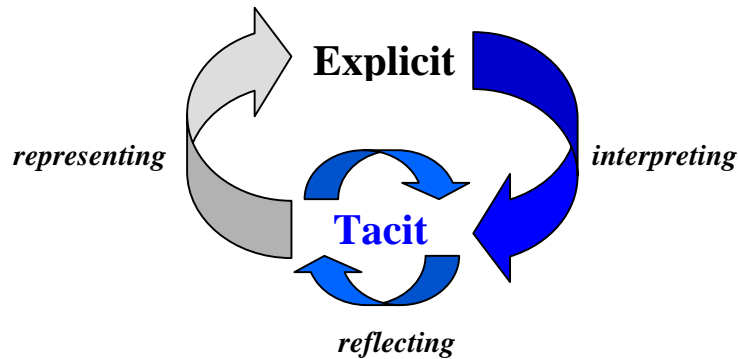
... but also as LINEAR order:	... or as CIRCULAR order:
	

....or in many other different ordered ways (SPIRAL order, COMBINED order, spiral and linear) and these multiple perceptions (knowledge) are always the logic of your experience, not the logic of reality. This is suggesting to you, that it is more appropriate to understand knowledge as **logic of experiences!**

8. States and Transformations

Knowledge can be distinguished in two states, tacit knowledge and explicit knowledge. Tacit knowledge, the "treasure in our heads" (consists mainly of experiential knowledge)

- is generated as a result of **construction** and *not* of mapping processes
- adapts itself dynamically to all situations, belongs to his or her constructor and goes with him or her every evening home.



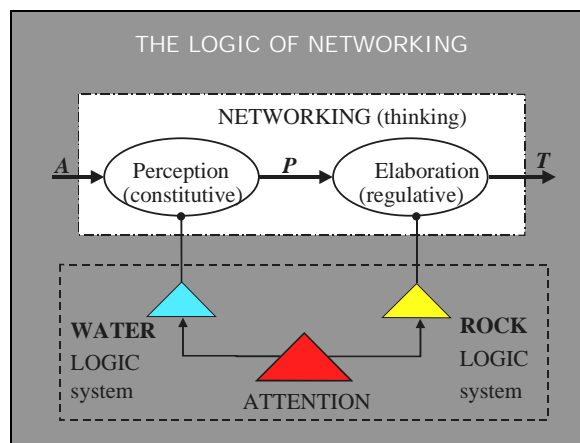
Tacit knowledge is generated in any individual either from available tacit knowledge ("reflecting") or from explicit knowledge ("interpreting") and constitutes "a kind of living structure that grows and changes, yet endures" [Fr00, p.9].

Explicit knowledge is generated by embodying the living, dynamic tacit knowledge in material carriers (artifacts). Such artifacts are for instance manuals, laws, reports (documents of any kind, incl. diagrams and drawings), procedures, organizational methods and structures, equipments. Explicit knowledge is so to speak "frozen" tacit knowledge, its shadow, and we could well call the conversion from the tacit to the explicit state either "mapping" or "representing" or "embodying".

Together the 3 transformations (interpreting, reflecting and representing) constitute the process of thinking. A crucial point is now the logic of this process. Why? Because it determines the networking (natural organisation of knowledge).

9. The Logic of Networking

In the following simple diagram the process of thinking ('intelligere' = inter + ligare) has been distinguished in two subprocesses, perception and elaboration (knotting a necktie in the morning: P = learn to knot the tie / E = make the knot every day without looking at, automatically).



Surprisingly perception is far more important for knowledge (& goals). But traditional thinking - according to E. de Bono - is focused exclusively on elaboration and dislikes the vagueness, subjectivity and variability of perception.

In our tradition, elaboration consists basically in the use of argument and reason with the goal of "falsification": i.e. demonstrating the contradictions of a position or showing that something is false. Reality

is proposed as the Universal Absolute that has to be used as reference. "I am right - you are wrong" [Bo92] condenses the essence of the "logic of elaboration" (rock logic, because like a rock it is permanent, hard, has a definite shape).

Luckily perception has another logic, the logic of pattern-building systems, but we ignore it. Why? Because we have never understood perception! Like water fits in a bowl or bottle, similarly the patterns that perception constructs are not right or wrong, they simply "fit" in the situations and circumstances that the person lives, experiences (water logic).

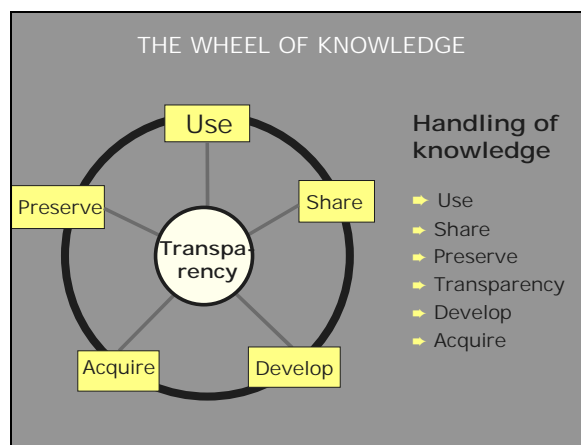
And also conceptualization (categorization) works within the same "water logic": this is the main reason why perception is more important for knowledge than elaboration. For example: this room can be conceived as a "part" (of the building) or as a "whole" (in relation to the floor, roof, walls, etc.), depending on what fits in what the person lives, not depending on "Reality". We, with our conceptual operations can flexibly adapt our perception and conceptualization to "fit in the bowl". This "operational" perspective is the pioneering contribution of Silvio Ceccato (1914-1997) and his Italian Operational School [Gi96], [So83].

10. The Wheel of Knowledge

The name "Knowledge Management" misleads many persons involved in KM (critics, users but also developers) to think, knowledge itself (thinking, understanding, perceiving, etc.) is meant to be the straight object of management measures. This view leads then to the conclusion that KM is nonsense because "knowledge cannot be managed".

Looking at the goal of KM (collective availability, access and utilization of individual knowledge) from our constructive perspective we see that not knowledge itself, but the *handling of* knowledge should be regarded as the object of management tasks and measures. The overall task of knowledge management then is not to organize knowledge but to *organize the handling of* knowledge (i.e. organizing knowledge processes).

At our institute we have developed a roadmap model for KM projects which integrates a model of knowledge processes that we call "Wheel of Knowledge".



The specific feature of this process model is that it has the process of "Knowledge Transparency" in its center (this process is the dynamic view of what at TFPL is called "Information Architecture") and 5 other knowledge processes on the ring around it.

11. Message for KM2002

In summary: in order to advance the person in the direction of his or her tendencies in the context of KM initiatives we propose to understand knowledge as construction:

- *Main function:* Adaptation to situations as they are lived
- *Core mechanism:* construction of viable experiences

- *Interpretation*: a construction process where we choose how to look at something and this determines what we see
- *Representation*: not the same but the inversion of interpretation
- *Logic of networking*: the pattern-building processes of perception and conceptualization operated by the knowledge owner are more important than elaboration
- *KM main task*: organisation of knowledge processes with knowledge transparency at the center

The application of this approach to KM projects must influence all levels of the projects: for this reason we have derived from our view of knowledge a set of 5 principles to be used as practical criteria for evaluating KM measures at any stage in the roadmap of a KM project. Sibylle - who is the most practice-oriented of us - will now explain these 5 practical criteria.

12. Leading principles of CKM

There are five basic, fundamental (essential) principles of Constructive Knowledge Management (CKM). Why five? Because we look at KM as a tool as powerful for changing business life as the human hand. And there are five fingers on a human hand. So, we will use the hand as a symbol of CKM.



1. **CONSTRUCTIVE**: We can look at a banana and an apple as being the same thing (food) and we can look at an apple and a billard ball as being different things. *What* we see (food, apple, ball) depends on *how* we look at: this is what *constructive* means. The act of "looking at" is represented by the index finger, because that is the finger we use to point to what we have given a meaning (source of different or similar visual stimuli).



2. **INSEPARABLE**: The act of looking at is determined by intentions, interests, wishes, hopes, expectations, etc. These *human factors* are highly individual and make that every person is inseparably bound to his or her knowledge (logic). This is represented by the second finger because this finger is the longest of the hand and this principle the most important of all five.



3. **BALANCE**: In order to avoid the separation of an employee from his or her knowledge a balance between intrinsic economic constraints and human-social requirements must be maintained. This is the energy of

CKM activities and is represented by the third finger. We do not notice this finger much - but it there all the time. So the balance must also be there.



4. NEGOTIATION (PACT): A further contribution to avoiding the separation of an employee from his or her knowledge can be obtained if firms negotiate with their employees a new pact, one could say a "knowledge contract" summarized in the sentence: "You let your individual knowledge flow, we appreciate, promote, protect it and let the company's knowledge flow". This is the little finger of the hand, to remind us that even a limited, reduced pact (negotiation) is important. Eventually, negotiation by negotiation, the pact can contribute to bigger and bigger effects.



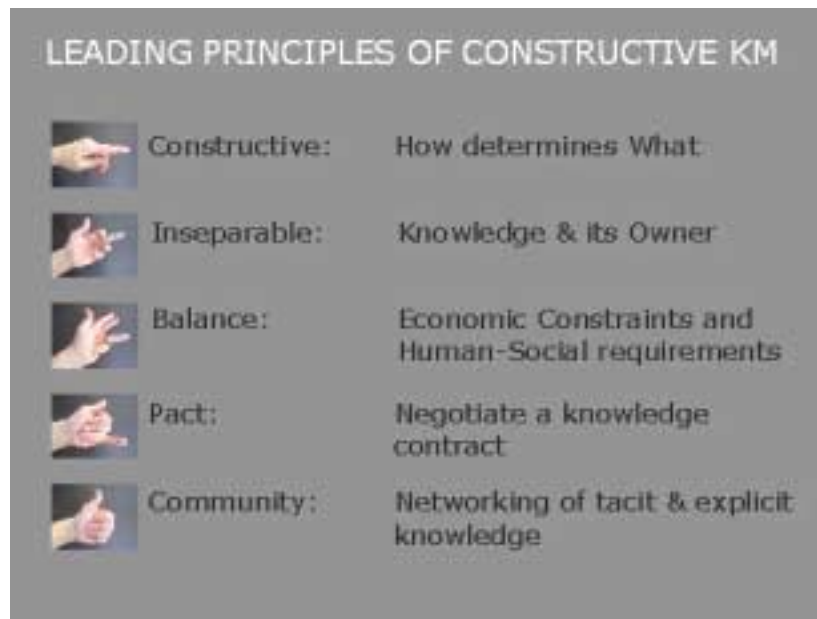
5. COMMUNITY: Without community there can be no effective knowledge management. Community provides steady networking between the two states of knowledge (tacit and explicit) and continuous cooperation between individual knowledge workers. Community is the thumb of the hand, because without the thumb the hand is useless.



Concluding remarks

Our contribution to a "new knowledge era" can be summarized in four points:

1. the DNA (or essence) of KM is our tacit conception of knowledge (Sibylle's story);
2. the established way of looking at knowledge is not appropriate for KM (based on our experiences in art and engineering) because of its implicit Determinism and Demands for Obedience;
3. the alternative that we propose is the constructive conception of knowledge, because it promotes the human factors, particularly the fundamental respect of the persons we interact with;
4. from this conception we can deduce 5 practical criteria that are useful for designing or evaluating sustainable KM solutions and measures (at any stage in the roadmap of a new generation KM project).



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