

Knowledge Society? How can a Society know anything?¹

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Introduction

Knowledge is becoming an increasingly big problem. On the one hand, there is talk of an exponential growth of knowledge, of its generation being accelerated, of changes in how it is communicated and of improvements in how it is evaluated. On the other hand, it is conceded that what is at issue here is not so much knowledge itself but merely the *potential* that knowledge bears. And the problem is that this potential is not, or only insufficiently, being made use of in social systems, whether it be organisations, communities, social networks or society as a whole. As a rule, social systems do not know what they know. Organisations are suffering from this insecurity in particular, for their ability to work (i.e. above all the absorption of insecurity) depends considerably on the ability to select knowledge (Ahlemeyer 2000; Baecker 1999: 69). This is why the new catchword it is hoped will solve the problem is "knowledge management", and it turns both the *cognitive*² and the *communicative* foundations of knowledge into a research topic.

For lack of other options to access the world, knowledge can also be referred to as a "simulation of access to the world" (Nassehi 2000). Unlike with individual knowledge, the most important quality characteristic of social knowledge is that it needs to be communicated in order to have an impact, no matter what that impact may be. And this is precisely where the problem lies. For in their day-to-day actions, social systems have to decide what communicative knowledge they want to resort to, what data they intend to process and what information they wish to draw conclusions from (Baecker 1999:69). They have to make decisions on accepting and turning down communication offers. Moreover, they have to decide what knowledge they wish to introduce into the process of communication and what they do not.

The general problem of knowledge-management in complex social systems or in the whole society is the need to make knowledge generated at a particular point or level in society available to society as a whole. The difficulty here is that its production and use are separate, which results in a fundamental difference between knowledge and lack of knowledge in problem solving situations. Knowledge that is generated in certain contexts is required at another localisation of other contexts (but with similar problems). Often, the potential use of knowledge initially remains concealed from the actors generating it. Although one can make assumptions, one will still not know where and when. What also remains concealed, now albeit from another angle, is whether knowledge required to solve certain problems may have already been acquired in other situations. And here too, the statement applies that one can assume it but does not know where and when. The conclusion to be drawn from this state of affairs is that society does not know what it knows.³

Basically, there is nothing new about this problem. Historically, society always found a way out with hierarchies. Social systems had their defined selection rules. In accordance with their hierarchical level, they knew whom they could get the required (i.e. appropriately pre-selected according to its specific function) knowledge from, and they knew whom they had to pass knowledge processed on this basis on to. Another type of knowledge processing is only relatively young, having emerged with the development of bourgeois society, i.e. just under 250 years ago. It is oriented on the concept of the public and does not work hierarchically. The science system has developed a special type in which scientific discourses that are above all based on texts emerge in thematically focused networks of mutual observation.⁴ However – and this is

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² as has already been the case in Artificial Intelligence and the sociology of knowledge

³ For organisations Luhmann quotes Karl E. Weik: "An organization can never know what it thinks or wants until it sees what it does." (Luhmann 1990: 186).

⁴ However, what is special about the scientific system is not that it produces especially true knowledge (which it indeed does too), but that it always has to formulate knowledge within a relation to non-knowledge. Knowledge has to face critical questions from which research requirements are deduced and on the basis of which applications for third-party funding are formulated. Merton once called this "co-formulation of specific non-knowledge" "organised scepticism" (Luhmann 1995: 177p).

the crucial point – all these forms have collapsed in the course of the information technology revolution (which nobody really believed in but which has occurred nonetheless). Even if it were desirable, knowledge processing would not be able to resort to the old patterns. But what new ones are there?

1. How can a society know anything?

Knowledge is usually linked with action contexts and individual carriers. Knowledge refers to "what the respective actor uses to generate action, behaviour, solutions, etc." (Segler 1985: 138). This is not necessarily restricted to scientifically established insights. Many authors also regard this condition fulfilled when "practical rules and techniques as well as patent recipes, aide-mémoires, views of life, customs, superstitions and religious or mystical notions of all kinds" (Segler 1985: 138) are used.

This approach is (still) dominant in almost all scientific disciplines dealing with knowledge. In addition to philosophy, they above all comprise psychology (cognitive psychology), sociology (sociology of knowledge) and informatics (AI research). Sociology only entered the interaction of these disciplines at a late stage, in correspondence with the degree to which the issue of knowledge was extended to social systems and knowledge was no longer viewed solely as an attribute of individuals or cognitive systems but also as a communicative phenomenon. This perspective had been given hardly any consideration in research done previously, which had been dominated by cognition psychology issues. Although in the mid-eighties, here too, the focus was turned to emergent phenomena⁵, knowledge was nevertheless seen as the product of individual learning and thinking. The subsequent question (and this was above all interesting for informatics) was how knowledge is objectified, i.e. transformed, as context neutral as possible and via suitable presentation and storage, into *information* in order to subsequently be once again turned back into practice-relevant *knowledge* in other contexts. Over the last few years, this double transformation process has been made a subject of research in various fields of informatics (e.g. DataMining, CSCW, Geographic Information Systems). But there too, knowledge is still coupled with single actors who only objectify knowledge when they communicate with others. Here, the chief problem is not so much that of establishing the social character of knowledge but rather its transferability to various social contexts.

From a cognitivist perspective, this approach comes as no surprise, even though a widening of the horizon is implicit in the theoretical approach of Distributed AI (Malsch 1997). It was above all the connectionist line of AI that gave up the attempt in the eighties of the last century to perceive knowledge as a whole consisting of different elements of knowledge. The alternative was to describe it as a neuronal network. The Physical Symbol System Hypothesis (PSSH), which had hitherto been dominant, was discarded (Forrest 1990; Mahr 1989; Neumann 1995; Varela 1990).⁶ What is rather more astonishing is that the sociology of knowledge, which arose in the twenties of the last century, has also addressed the emergence of knowledge at only a very rudimentary level. Although it has taken up the cause of "examining the relations between knowledge and society" (Lieber & Wolff 1972: 929), especially the influence of "non-intellectual factors on thought" (Kurucz 1989: 828), but it has not really developed a genuinely sociological concept of knowledge. Merton holds that the issue is the "existential basis of intellectual products", their latent and manifest interrelations. Mannheim had also spoken of the "Seinsverbundenheit des Wissens", of knowledge being tied to an existential context. But here the emphasis is always on the knowledge of individual actors. The social character is addressed when the "exchange of knowledge" among the individuals is taken up. Although Stehr explicitly speaks of "collective knowledge", he defines it as the "cumulative ability to act" (Stehr 1994: 213).

On the other hand, reference is often made in everyday language to collective actors as if they disposed of a common knowledge of action. "The stock market rapidly responds to reductions of interest rates" or "the

⁵ This view particularly came to the fore in the fourth phase of the disciplinary development of AI, which dealt with topics such as how knowledge was situated and distributed (Görz 1995).

⁶ The debate at the time focused on the issue as to whether the approaches up till then to model intelligence by reconstructing the processes of symbol processing in a cognitive system could be promising. The notion of characterising intelligent systems as an instancing of a physical, symbol-processing system is confronted with the connectionist position of tracing the symbol processing of cognitive systems back to the neuronal processes on which it has been established and of modelling these processes. This objective is based on the hypothesis that cognitive systems consist of a multitude of simple subsystems in a massive parallel interaction relation and form a highly networked structure (Charniak & McDermott 1985, Lischka & Diederich 1987; Palm 1988).

country has to nail its colours to the mast" or "The consciousness of the working class is changing" are phrases in which this is reflected. Are these merely metaphorical formulations? Or is a phenomenon expressed in them that can clearly be experienced practically but has not yet been described adequately with scientific means?

2. On the social character of knowledge

The possibility of social knowledge is already considered in European philosophical tradition. While knowledge is not linked with individual actors here, it is clearly associated with the transcendental subject. Knowledge is described as "the sum of insights on the world the individual or society dispose of respectively of objectively real objects as perceived by the subject acquiring insights (objects, process, structures) (...) and the self-insight of the subject" (Thom 1990: 903). Knowledge is understood as the condensation of observations the correspondence of which with the facts one could be certain of. Knowledge is valued more than opinions or faith.

With Kant (Kant 1781), the conditions of acquiring insights that are inherent in all individuals and the way that they are made use of act as a basis for the possibility of knowledge coinciding at societal level. Since reason can only recognise what it produces according to its own construction, the object is, as it were, modelled. This means that in Kant's view, the generation of knowledge is a synthetic process of associating intellectual functions that are given a priori (power of judgement) with pure perception (spatial and temporal ordering of what has been perceived – Thom, p. 907). With Hegel (Hegel 1970), "the constitution of knowledge" implies working historically with concepts in the process of human development.

Today, it is still common to define social knowledge as a "possibility". Stehr refers to knowledge as an "action resource" (Stehr 1994), while Bechmann & Stehr speak of it as the possibility to "get something going" (Bechmann & Stehr 2000). But how does the possibility of knowing something become real knowledge? According to Stehr, objectification processes occur as social communication progresses when knowledge is stored in a textual, language or graphic form, i.e. when it is represented symbolically. This is how society is supposed to succeed in establishing an enormous "amount of objectified knowledge" (...) that acts as a mediator between humans and nature (Stehr 2000: 78p.).

But is this really knowledge? Max Weber already pointed out that increases in knowledge by no means represent "an increasing general knowledge of living conditions" but "knowledge of or trust in being able to acquire this knowledge at any time if one wants to (...)" (Weber 1973: 594). If knowledge is defined by how it relates to practice, then storing knowledge in the shape of data, texts and illustrations can initially result in nothing but information. For that person who has generated the information it represents *knowledge* (due to its context-related significance). But this need not be the case for others. As soon as the elements of knowledge have been de-contextualised, i.e. liberated from a specific action context, knowledge assumes the form of symbolic representations. If memos or copies of agreements are made and other documents are stored in an organisation, this is information, not knowledge. Only when this information is once again brought into a context, e.g. for a consultation or as a reminder of a deadline that is expiring knowledge will be reconstructed. Based on this reconstructed knowledge, the respective organisation or the clerk responsible in it now has a more or less adequate action resource at his disposal. The respective clerk will not lose this knowledge as long as he can remember. The situation is different for the organisation. As soon as the respective clerk leaves the organisation for whatever reason, this knowledge is no longer available to the organisation. Nevertheless, it still disposes of the information in the filing cabinet that enables it to generate new action knowledge. Knowledge cannot be "objectified" in the narrow sense. The only way to try this is to deprive it of its knowledge character.

3. Communicating knowledge as a double transformation

This is also the reason for the disillusionment of initial AI euphoria in the field of knowledge representation for expert systems in the eighties. The attempt to transfer knowledge from human actors to machines, i.e. to transform it into information, met with only limited success. In particular, what is referred to by Polyani (Polyani 1967) as "tacit knowledge" jibs to a large degree at being transformed into a symbolic

representation.⁷ Corresponding basic assumptions in AI that situations can be described with terms used for identifiable facts with well-defined features had already been criticised in the eighties (Dreyfus 1979; Searle 1986; Winograd & Flores 1986). The connectionist line in AI in particular rejected the Physical Symbol System Hypothesis, i.e. the notion that knowledge was established mentally in the shape of symbolic representation and could thus be explicated via the formal manipulation of symbolic representations on the basis of rules. In contrast, connectionism does not regard mental processes as being represented by units but by the (parallel) interaction of units within a network. This was inspired by the model of the nerve cell. In a similar way to with the cell, there are threshold values and activating values as indicators for the passing on of information. The system's behaviour is not governed by rules. Rather, the individual representatives are themselves active, generating their own particular connectivity patterns as a consequence of learning processes in which the operations link up. Here, it is *emergence* that assumes a central role (Varela 1990).

So every attempt to communicate knowledge involves a twofold transformation. First of all, knowledge has to be turned into information. And then, someone has to transform this information into new action knowledge. This is the eye of a needle that social knowledge has to go through. With regard to selection required here, Luhmann distinguishes between three steps. First, information is generated, second, a suitable medium of transmission needs to be selected, and third, the information has to be understood. Provided that the conditions mentioned are fulfilled, Luhmann calls this three-step selection process "communication". Although the resulting product can be referred to as a "condensation of observations" (Luhmann 1990: 123), this still does not solve the problem of "fluidity and contextual intensity" (Willke 2001: 79). In this theoretical framework Willke regards communication referring to common contexts of experience as the indispensable prerequisite for the development of social knowledge. Only when information has been integrated into a "community of practice" of immediate and interactive common experiencing can "collective knowledge" be formed (Willke 2001: 90).

4. Knowledge as a condensation in the communicative space of society

Foucault suggested a theoretical description of such a "community of practice" in his theory of discourse (Foucault 1981). Foucault intends to describe knowledge as a quasi-objective fact, as a "fait social" in Durkheim's sense, and separates it from its subjective carriers. He views the social discourses as subject-free systems of statements representing part of the cultural knowledge system of society. These linguistic structures are the carriers of action in society.⁸ Discourses are combinations of statements, linguistic systems, in which several statements are linked up with each other according to certain rules, forming a specific coherence that Foucault calls a "discursive formation", following the Marxist term of societal formations.⁹ To Foucault, a discourse is a flow stretching over time and space, a highly selective organisational form of linguistic events, that is constituted by "a number of series of signs (...), provided that they are statements, i.e. provided that they can be attributed special existential modalities", and "that they belong to one and the same formative system" (Foucault 1981: 156). Discourses have a contingent factuality that is external to subjects. In addition to the meanings that they have been assigned by the subjects immediately involved in the discourse, there are meaningful contexts that need to be "excavated".¹⁰

Knorr-Cetina (Knorr-Cetina 1999) describes an example of such communicative practice contexts in a comparative sociology of science study on knowledge production in the fields of high energy physics and molecular biology.¹¹ She describes a form of knowledge production in which the individual vanishes as an

⁷ In his own theoretical framework Luhmann redefines Polany's term "tacit knowledge" as "structural coupling of thinking systems (conscious) and communicating systems (society) (Luhmann 1990: 41p).

⁸ Foucault combines this perspective with a critique of society in which the social individuals are observed as persons affected by discursive chains of events. The individual subjects are viewed as if they were subordinated to comprehensive linguistic rules. The critical potential of discourse analysis then lies in the reconstruction of the formative rules of the discourse that link up the individual statements in a system.

⁹ For Foucault, the "discursive formations" are the "historic a priori", i.e. the totality of conditions given in a certain epoch or situation for the formation of statements and discourses. He focuses on the discursive regularities in their openness, changeability and diversity. There are also non-discursive practices, such as house rules, institution rules, highway codes, service rules and regulations, etc.

¹⁰ This is why Foucault also refers to his method as "archaeology".

¹¹ Her central concept is that of culture. In contrast with Foucault, who concentrates on the objectified forms of knowledge – albeit in its discursive distribution – she also wants to explain the process of making, generating and

epistemological subject. "Papers reporting experimental results will have all members of the collaboration listed on the first page(s) of the paper" (Knorr–Cetina 1999: 167). In some projects, there are two or three pages with several hundred names.

Habermas is somewhat more sceptical. He also regards common communicative practice as the crucial issue. However, he distinguishes between life–world "background knowledge" and "rational knowledge". We normally use background knowledge "without being aware of the possibility of its being wrong. Assuming that all knowledge is fallible and is known as such, background knowledge does not constitute any knowledge at all in the narrow sense. It lacks reference to the possibility of becoming problematic because it is only confronted with criticisable claims of validity the moment it is uttered but no longer acts as a life–world background in this moment of being put into context but decomposes in its modality as background knowledge. Background knowledge as such cannot be falsified. It decomposes as soon as it enters the whirlpool of options to become problematic by assuming a thematic character" (Habermas 1992: 39). This decomposition that Habermas refers to is obviously the key problem. Does this imply that the possibility of social knowledge is restricted to immediate interaction contexts? If this is the case, how can social knowledge be thought at all?

Of course social knowledge cannot mean that everyone knows and thinks the same. Rather, the issue is that of knowledge that is condensed in the communicative space of society (Nassehi 2000). From a cybernetic angle, this refers to what is seen by what observers in this way and not in any other way under what circumstances. In order to give any answer to this question, one has to have access to the observations of others. Thus social knowledge cannot have any meaning other than that of the construction of a recursive network of autonomous systems each of which has its own modes and results of observation. Only via such a network can the world observe itself and learn to know what it knows.¹²

It seems that the crucial point of the Knowledge Society will be that of networking knowledge (Castells 2000) (Messner 1995; Stefik 1999). Generating, processing and communicating knowledge no longer follows the old patterns of industrial society (above all the hierarchical modes of establishing and distributing knowledge). Over the last few years, network structures have come to the fore more and more. Networks are to make knowledge on problems and problem solution strategies that has been generated individually and in a decentralised way available to society and enable it to flow into concrete decision–making processes wherever these may be in progress in the world.

It must be a question of further research activities to assess how successful a cybernetics of knowledge can be in complex social systems, above all in organisations, but also in networks of various kinds. And here, one issue at stake is that of to what degree new technologies in information and communications can help us understand the emergence of knowledge in social structures and, as a consequence of this, employ knowledge more efficiently.

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using knowledge. To her, knowledge is more than just a sort of product. This is why the method Knorr–Cetina favours is not an archaeology, as is the case with Foucault. She works with ethnographic methods. Oral statement at the Symposium "Szenarien der Wissenschaft" in Munich, 28th October 2000. Knorr–Cetina, K.: *Epistemische Kulturen*. Presentation at the Symposium "Szenarien der Wissensgesellschaft" in Munich, 28th October 2000.

¹² Cf. also reading on the network society – Castells 2000; Messner 1995; Stefik 1999.

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