

A PRACTICE-ORIENTED CLASSIFICATION OF TACIT KNOWLEDGE FOR THE RESEARCH INTO CREATIVITY AND INNOVATION¹

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ABSTRACT

This paper aims to introduce a new classification which the author has developed from an empirical survey dealing with several roles of tacit knowledge in the musical composition process. The first part presents the main criterion of the classification that is the character of one of the component poles linked by a sort of relation taken to be a source of tacit knowledge. This component pole may be a tool, an environment, another person or a social institution, whereas a person stands as the other component pole. These enable a definition of four types of tacit knowledge: tool-centred, environment-centred, personal relation-centred and social institution-centred tacit knowledge, which are discussed in detail in the second part of the paper. In discussing personal relation-centred tacit knowledge, the author introduces and defines the concept of knowledge exchange. He links the other new concept, that of re-contextualization, with all of the four types of tacit knowledge. In the third part, the author presents three areas of application of the new classification, where these four types of tacit knowledge of a given person can be investigated and described.

Keywords: types of tacit knowledge; component pole of a relation; tacit knowledge, tool-centred, environment-centred, personal relation-centred and social institution-centred; re-contextualization of tacit knowledge, knowledge exchange.

INTRODUCTION

More than half a century after the publication of Michael Polanyi's pivotal oeuvre *Personal Knowledge* (1958), there are a limited number of experiments differentiating various kinds of tacit knowledge. The objective of this paper is to introduce a

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new classification of tacit knowledge based on an empirical survey². The methodology of this new classification cannot follow the ways used in explicit knowledge as empirical relations play a more important role in tacit knowledge. The starting point of this new classification is one of the component poles of the relations from which different types of tacit knowledge come into being, accumulate and are then regularly used. Tacit knowledge is relation-bound knowledge emerging from links of a person to tools, environments, another person or groups of networked people who constitute a social institution or its component parts.

SOME FORMER CLASSIFICATIONS

As first classification, Polanyi introduced the differentiation between passive and active forms of tacit knowledge within his theory. This classification came partly from the area including the use of tools and partly from the structure of perception. In working with a tool, we use, on the one hand, our active tacit knowledge to create some object. In observing an object with our focal attention, we perceive several other objects laying outside the focus with our distal attention, that is, peripherally. The knowledge emerging from the sense impressions of these latter objects constitutes passive tacit knowledge.

There are several ways to classify different forms of tacit knowledge further. Perhaps the easiest is to name them according to the types of explicit knowledge with which they are coupled. In this case, the criterion of classification is the function and name of the explicit knowledge in question. The profession can also be a criterion in the classification of the forms of tacit knowledge. For instance, the craftsmen have their own tacit knowledge enabling them to use their tools.

A CONTEXT-BASED INTERPRETATION AND A CONTEXT-BASED CLASSIFICATION OF TACIT KNOWLEDGE

As my classification is contextualizing in a broad sense, it seems necessary to highlight its link to a trend emphasizing the contextual character of tacit knowledge. Nowadays an alternative vocabulary of tacit knowledge has been introduced in which context has a central role. Especially in French-speaking areas, tacit knowledge is

² I took part in the research project *Tacit Knowing in the Musical Composition Process* funded by the Jubiläumsfonds der Stadt Wien and FWF der Wissenschaftsfond Austria between November 2013 and October 2015. The project was carried out by the Department of the Sociology of Music at the University of Music and Applied Arts in Vienna. I owe Prof. Tasos Zembylas, project leader many thanks for the invitation to his research group.

very often called “contextual knowledge” (Brézillon 2003a, 2003b). Undoubtedly, this name expresses a very important feature of tacit knowledge, although its tacit character meaning that it cannot be verbalized, may rather be put at the forefront. The spreading of the name variant “contextual knowledge” is strongly fostered by a practice according to which teaching of special kinds of tacit knowledge is efficient only if it takes place within the context in which it will be used in the future. In this trend, the concept of context is defined as follows: “Context is what constrains problem solving without intervening in it explicitly.” (Brézillon 2003b:9) Consequently, a problem-solving human act is strongly influenced by implicit effects of its context and this context creates tacit knowledge in the mind of the person creating the action. Teaching in context enables the immediate transfer of the tacit knowledge necessary for problem solving – as it is mentioned by Polanyi in the example of master and disciple of the chapter *Tradition* in his *Personal Knowledge* (Polanyi, 1958) –, avoiding a necessarily heavy knowledge loss caused by the externalization and internalization processes of several elements of tacit knowledge to be used in the given context. For instance, in the work of the emergence service of the Paris metro, which should act under the conditions of unexpected grave traffic problems and other crises, teaching of the implementation of necessary measures to be taken in the context of a real crisis situation is an everyday practice.³ Without any personal handover of tacit knowledge, only a small part that should be made explicit or externalized in advance could be transferred to the learners – and this would constitute the first knowledge loss. After the take-up of explicit knowledge, its internalization into tacit and personal knowledge would necessarily cause a secondary knowledge loss. That is why the contextual manner of learning has a significant benefit over that of explicit knowledge.

The excellent practice of contextual approach efficaciously integrates an important feature of tacit knowledge. In the world of science where production of explicit knowledge has a fairly high value, the expression “tacit knowledge” is, however, certainly more suitable than “contextual knowledge”. In spite of the undoubtedly useful content aspect emphasized by the concept “contextual knowledge”, this expression would be misleading as a general substitution for the name of tacit knowledge. Its content turns out, further, to be limited in the mirror of the discussion of the definitions of four kinds of tacit knowledge proposed by the present paper. Although in a general sense, my present classification is also a contextualizing one as it takes into consideration the other component pole of the crucial relation, as a kind of context, from which tacit knowledge always emerges, I would not wish to reconsider the name

³ I owe Prof. Patrick Brézillon thanks for this striking example. He points out: „The occurrence time of an incident on a subway line is not relevant by itself, but the methods observed for incident solving are different at rush hour or not.” (Brézillon 2003b:9).

“tacit knowledge”. My four-category classification, however, can also be efficaciously integrated into the above-mentioned context-based learning manner.

THE CENTRAL CRITERION OF THE PROPOSED CLASSIFICATION

Actually, the essence of tacit knowledge is knowledge on and within a relation which comes into being between the human mind and body on the one hand, and, on the other, a tool or immobile elements within an environment; and between the elements of behaviour and the act of a person (e.g. a master) and those of the behaviour and the act of another person (a pupil); and the elements of behaviour of a person (e.g. a member of the community) and those of institutionalized events, processes or ceremonies within this community in which its members take part. It is necessary to emphasize that tacit knowledge not only informs us of a relation between a person and, for instance, a tool, but it remains within it, constituting its remaining part, and predetermines the following similar relation of the same person. Taking this into consideration, parents are usually eager to choose the best piano or guitar teacher for their children in order to guarantee the best practice – that is, the best tacit knowledge linked to an instrument – because it is very difficult later to correct a bad practice. From the obtained tacit knowledge, the relation producing new knowledge can be re-built under the conditions of a new act with the previously used tool or a similar one. From these examples on the essence of tacit knowledge but mainly from the empirical materials produced by the above-mentioned survey on the role of tacit knowledge in the musical composition process, it follows that four types of tacit knowledge can be distinguished on the basis of one of the component poles of the relation which comes into being between the person acquiring new knowledge and a tool, or physical environment or another person or a networked group of persons. The first type which is called *tool-centred tacit knowledge* is the tacit knowledge attached or linked to a tool, for instance a musician to a musical instrument, e.g. a violin or piano, or a craftsman to a hammer. The second type called *environment-centred tacit knowledge* because tacit knowledge in this case is attached to several immobile elements of an environment where a human activity takes place. The other two types are based on relations between one person and another or a single person and a networked group of people. Thus the third type can be called *personal relation-centred tacit knowledge* because tacit knowledge and its transfer are embedded in a relation between two persons, most often between a master and a student. Finally, the name of the fourth type is the *social institution-centred tacit knowledge* because a person is linked with an interpersonal and institutionalized group of people that mediates tacit knowledge to the person or this knowledge emerges from their relation based on mutual activities.

TOOL-CENTRED TACIT KNOWLEDGE

In the tool-centred case, tacit knowledge is strongly linked with a tool, and this link is far more dominant when compared to links of the person to other elements in the environment within a given activity. The person dealing or working with the tool obtains new knowledge, the greater part of which is tacit. This knowledge which mostly cannot be externalized can be only activated by the presence, or rather, by the repeated use of the tool.

While using the tool, the person learns not only the physical features of the tool but also the movement and control of the parts of one's own musculature one uses in a semi-conscious or totally unconscious manner. The work of the nervous system and musculature is subordinated to the objective of the activity also integrating the tool itself. The details and consequences of this subordination constitute parts of tacit knowledge attached to the tool in question.

Tool-centred tacit knowledge is of both passive and active nature. If someone observed, for instance, the use of a bow, one has obtained passive tool-centred tacit knowledge. If one also uses it, one already has gained active tool-centred tacit knowledge.

During the research project *Tacit Knowing in the Musical Composition Process*, the composers interviewed often mentioned the use of their instruments in experiments to find and express new musical ideas. Especially those composers who also performed their own works pointed out the importance of playing instruments daily because it strongly supports the maintenance and development of tacit knowledge attached to these instruments.

THE ENVIRONMENT-CENTRED TACIT KNOWLEDGE

Tacit knowledge can also emerge from the relation between the person carrying out an act and the permanent and immobile environment of one's activity. For instance, a marathon runner knowing very well a part of the entire running track has also tacit knowledge attached to its different elements and can use that knowledge to surmount the difficulties. Similarly, a conductor can know a concert hall and its acoustic features well, and consequently, he is also able to rely on this non-verbalizable tacit knowledge during the playing of a piece of music. In an interview made in the framework of the mentioned survey, a composer explained that not only her presence in the standard environment of her usual concerts but also its mere evocation efficaciously fosters her composition efforts and supports her inspiration. Thus the memory-trace of the environment is enough for her to become inspired.

Compared to tool-centred tacit knowledge, this kind of tacit knowledge and its use are solidly bound to a geographical point where the environment in question

lies. In addition, this kind of tacit knowledge is less easily transferred than the tool-centred form because an environment is not movable and cannot be walked around or rotated and, consequently, the tacit knowledge attached to it has quite a rigid structure. Nevertheless, the similarity of another environment can have a role in the activation of this kind of tacit knowledge because the resemblance of details can evoke it. It is necessary to note that sometimes, there is no difference between a tool or machine and a technological or production line. The latter can also be considered as an artificial environment due to its size and immobility.

Environment-centred tacit knowledge also has a passive and an active variant. A person observing somebody acting in a given environment obtains passive environment-centred tacit knowledge. The more the person acting in the environment understands it, the more the observer can learn from his or her activity. The active person, on the other hand, also obtains active tacit knowledge linked to the given environment.

THE PERSONAL RELATION-CENTRED TACIT KNOWLEDGE

The most typical example of this kind of tacit knowledge is the relation between a master and a student. Between them, tacit knowledge appears as personal knowledge to be transferred via personal contacts and common acts. In addition to the transfer of tacit knowledge as personal knowledge, an exchange of knowledge also takes place between the master and student during contact and common acts at an unconscious or semi-conscious level. The concept of knowledge exchange I deduce from a trend of early psychoanalysis that was initiated by the Hungarian psychoanalyst Sándor Ferenczi. Through his regular analytic practice, he discovered that not only the analyst exerts an influence on the patient but *vice versa*. It seems to be obvious that not only dispositions, values and attitudes stream towards the analyst but also knowledge elements. First of all those elements will be exchanged which submerge in the psychoanalytic treatment or which work in an unnoticed way during personal contacts between the analyst and the patient. These knowledge elements also have a role in the maintenance of good contact between the analyst and his patient. Such knowledge elements submerged in the personal contact also appear in the relation between a master and a student.

In the everyday practice of musicians, a special kind of personal relation-centred tacit knowledge emerges during the cooperation between the composer and the members of an orchestra. At the presentation of his new composition, the composer, by taking part in the creation of the performance, begins to understand the special habits and disposition of each musician. This new knowledge is partly tacit and fosters successful cooperation.

It is worth separating tacit knowledge emerging from the relation between two people from that which is based on a relation between a single person and a group of persons constituting an entire social institution or its part. In that case, the person's link to the social institution or its part represented by several networked people is dominant at the expense of personal links to the people embedded in the social institution or to the members of the group constituted by these people. Consequently, the person's knowledge comes from one's experience with the institution. In research, it requires another kind of approach which takes the depersonalized aspects of the fundamental relation to the social institution into consideration. The person contacting a social institution, that is, people functioning and representing it, primarily begins to understand the nature of the network linking its subjects and their relation to it. In the case of social institution-centred tacit knowledge, a person-to-person relation is pushed into the background, whereas the relation of a person to networked people of a social institution is brought to the forefront. In spite of this, knowledge exchange also takes place between the single person and the people embedded in the social institution.

As for the complexity of relations linking a person with a group of people constituting a social institution or its part, there is some similarity between environment-centred and social institution-centred tacit knowledge. This is based on the fact that the former, consisting of many elements, compels the person obtaining tacit knowledge to reach its parts through several channels. Nevertheless, the links of networked persons to their social institution and an outsider as sources of knowledge and the process of knowledge exchange clearly separate social institution-centred tacit knowledge from that which is environment-centred.

While in the case of personal relation-centred tacit knowledge, new tacit knowledge is little structured, the relations of a person to the members of a networked group constituting the part of a social institution, such as the leadership of an association, or to the organisers of an event linked with a network of persons are structured most often in accordance with the rules of social institutions involved. Due to the institutionalized character of this network, as I have already mentioned, the person contacting it has a more depersonalized link to its members than in the case of personal relation-centred tacit knowledge. Thus, for instance, tacit knowledge appears to this person to a small extent from the field of the personal aspects of life.

In the survey on the role of tacit knowledge in the composition process, the composer's link to her or his greater professional audience as a kind of networked social institution was also a source of this kind of tacit knowledge. The majority of composers senses the musical taste of this audience that is heavily based on tacit knowledge. Thus musical taste can also constitute a part of social institution-centred tacit knowledge.

THE USE OF THIS CLASSIFICATION IN PRACTICE

As these four types of tacit knowledge could be applied in the empirical survey entitled *Tacit Knowing in the Musical Composition Process* very efficaciously, we can suppose that this classification is also suitable for other surveys aiming to grasp different sources of a person's tacit knowledge. I will demonstrate this through the examples of an elementary school, a large enterprise and a university. The order of the examples is based on three kinds of difference. The complexity of institutions in these examples is growing. Similarly, the link of the persons to knowledge is more and more complex. Finally, the roles of the persons in the examples are less and less confined. These differences require suitable flexibility in the application of my classification in research.

In an education institution, for instance an elementary school, explicit and expressible relations of a pupil does not guarantee the pupil's clever manipulation of a tool, a good relation to the school as an environment, his good relations with the teacher, and his good orientation within the school as a social institution. Thus a possible research topic might be an investigation into the four different types of tacit knowledge of pupils, linked to their tools as used in the school, to their school as a physical environment, to their teachers, and, finally, to the teaching staff as a social institution. The results will constitute a solid basis in revealing the roots of the pupils' special problems and contribute to the improvement of their school performance.

In an average workplace, for instance in a great enterprise, it proves fruitful to approach the employee's or the worker's tacit knowledge via this four-category classification. The everyday manipulation of tools in the workplace creates tool-centred tacit knowledge of the employee or worker. Regular contact with the physical conditions of the workplace produces environment-centred tacit knowledge. Due to the organization of this workplace, the employee has a rich set of personal relation-centred tacit knowledge elements coming from the links with other employees. Finally, the workplace constitutes that part of an institution (enterprise or factory), and the employee's regular links to it foster the emergence of social institution-centred tacit knowledge.

In a research aiming to reveal the role of tacit knowledge in the innovation processes within a university, the differentiation of these four types of tacit knowledge can be extremely useful because their separate treatment significantly makes the introduction and use of innovation easier. It can also contribute to the efficacious, although partial externalization of tacit knowledge in different situations. Due to his embeddedness into the conditions of a workplace at a university, the innovator should rely on all four types of tacit knowledge. During the organization of a social innovation process, social institution-centred tacit knowledge is of great importance. Similarly, in the field of technology, the innovator must obtain tool-

centred and environment-centred tacit knowledge so as to use the new equipment or apparatus correctly.

CONCLUSIONS

On the basis of a comprehensive empirical survey made on the working methods of Austrian, German and Hungarian composers, I have created a four-category classification which proved to be useful and applicable to the description of different forms of tacit knowledge that exert a strong influence on the composition process. In connection with the new classification, I have also introduced, defined and used both the concept of knowledge exchange and that of the re-contextualization of tacit knowledge. As tacit knowledge is a relation-bound knowledge emerging from a relation between a person and her tool and environment, as well as from her relation with a person or to networked people representing a social institution, it can be stored in memory as a part of these relations. Tacit knowledge can be evoked and re-used as a part of these relations in the original context or a similar one. Re-contextualization, primarily meaning the re-use of tacit knowledge or its setting in a modified but still similar situation, is a key operation in the handling, development and transformation of tacit knowledge. This rule is also valid for the four types of tacit knowledge that have been presented in this study. The act of re-contextualization can also be made with the different types of tacit knowledge, and their re-use, in an original or a new but similar context, will produce similar forms of tacit knowledge if the composition of the component poles of the basic relation does not change.

Although this presented classification does not cover all kinds of tacit knowledge that occur in human life, in my opinion, it enables the conduct of a systematic survey and analysis in different research environments.

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