

# Management of the knowing and the known in transactional theory of action (TTA)

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## **Introduction**

It is generally agreed among second-wave research workers in the field of knowledge management that knowledge is not just something people possess, or which is deposited on written media after undergoing a process of codification. As Amin and Cohendet (2004) have stated, for example, there are three misconceptions which have to be corrected before one can address knowledge management issues:

1. *“the vision of knowledge as a simple stock resulting from the accumulation of information in a linear process;*
2. *the hypothesis that any form of knowledge can be made codifiable;*
3. *the vision that knowledge is limited to individuals;*
4. *the idea that knowledge is limited to something that people possess”* (Ash and Cohendet 2004, p.17).

In the present paper, it is proposed to adopt the "pragmatic" epistemological approach (Pierce 1978, Dewey 1938) I have been using to develop a theoretical psycho-socio-economic framework for transactional action analysis. After presenting this theoretical framework, I will introduce the following new analytical categories, which provide means of correcting the misconceptions pointed out by Ash and Cohendet: the distinction between the knowing and the known, the various forms of tacitness resulting from compilation, volatility or confinement and the diverse remedial knowledge management strategies available, such as conscientizing explicitation, documentarisation, theorizing abstraction, deductive standardization and paradigmatic conversion. Lastly, I will take this analysis as a starting-point for discussing the ideas about tacit knowledge put forward by Nonaka and Takeuchi (1997), who seem in my opinion to place too much emphasis on the individual and mental dimensions.

## **Elements of a transactional theory of action**

The transactional analysis of action tends to regard activities of many kinds as transactions, regardless of whether they are carried out between separate “persons” or whether they involve one and the same person engaged in an internal dialogue. This approach is in line with several theoretical schools of thought in the fields of psychology and social psychology, such as symbolic interactionism (founded mainly by G.H Mead, 1934) and the theory of activity, a term covering the work of psychologists such as Vigostky (1934) and Leontiev (1981), but which also includes, in the present case, that of linguists such as Bakhtine (1977). Contrary to what is generally held to be the case in the field of economics, transactions are not only commercial and contractual activities, but can be defined as activities generating new material

and/or semiotic forms which are mediated by a wide range of media including the physical environment, malleable objects, and transcription substrates.

The concept of transactions developed by Bentley and Dewey (1949) differs from that of interactions in that it denotes creative encounters as the result of which a new production is created and each of the selves involved has been transformed (according to these authors, interactions do not necessarily involve the production of an original work or the transformation of the selves concerned<sup>1</sup>). For present purposes, we have assumed all creative transactions to lead to the two-fold transformation of both the semiotic or material work and the selves, the contours of which are redefined (Zacklad 2005 and Fig. 1). The self can be either an individual or a collective entity and the transactors can be either separate people or the same person engaged in a kind of internal dialogue<sup>2</sup>.

All non-automatic, non-routine actions will involve at least two transactors, who intentionally respond to a need by putting together a work or a production. Transactions are therefore always bound to be mediated. The validity of the productions to which they give rise is attested by the fact that they are consumed or used in some way, either quasi-immediately or after some time has elapsed, depending on how closely located the two selves are in space and on the perennality of the medium used to convey the productions (Fig. 1).

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<sup>1</sup> In many of the approaches to which symbolic interactionism has led, interactions have been taken to correspond to a creative transaction where the selves are transformed by the exchange. The transactional theory of action can be viewed on these lines as an extension of symbolic interactionism, and creative transactions as forming a sub-set of the interactions described in this context. Reverting to Dewey's original expression has enabled us to develop a number of specificities which symbolic interactionism did not bring to light, by focusing on the structure of relations based on producer/ beneficiary (or client/ supplier) logics (although the roles are liable to be quickly reversed) and especially, on the production of works of a technical or institutional kind which will be perpetuated far beyond the meetings in question, which it is indispensable to take into account in analyses of this kind.

<sup>2</sup> The word "dialogue" is used here in the broadest sense: to cook a good meal for oneself is also a transaction.

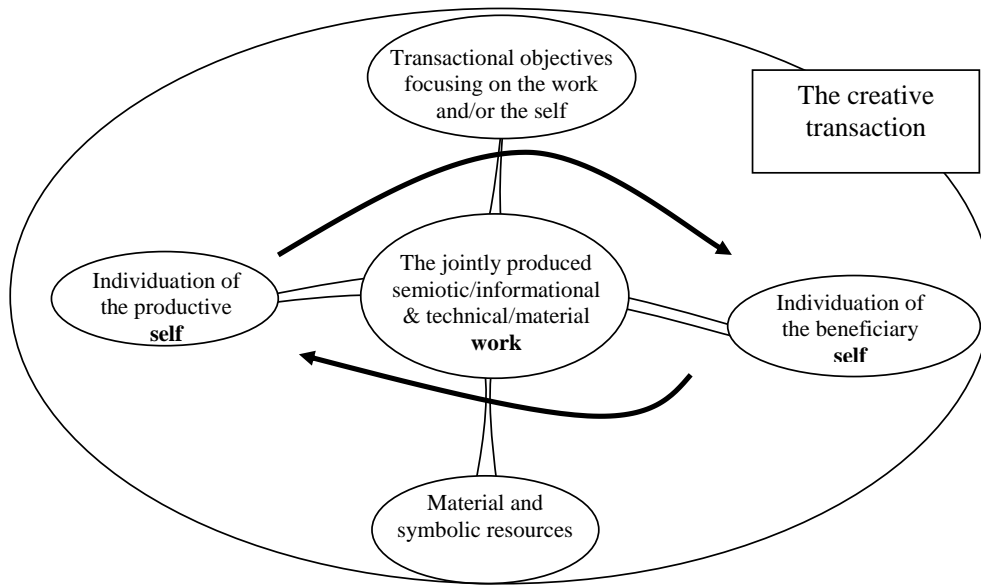


Fig.1. Diagram of the components of a creative transaction: the roles described here correspond only to the initial phase: in a complete transaction, the beneficiary self responds by adopting a symmetrical position conducive to joint semiotic production.

Transactions take place in transactional situations: these situations influence the transactions, and *vice-versa*.

Transactional situations include the following components:

- the transactors: one or more producers and one or more beneficiaries consisting of individual or collective selves;
- the parameters of the transactional situation, according to the acceptance of this term in the field of pragmatic discourse analysis (parameters such as common objectives, the social relations between the producers and the beneficiaries constituting the selves, the specific spatio-temporal framework and the environmental setting, the resources available, etc.);
- the productions conveying semiotic contents to the beneficiaries via a material substrate which has been transformed by the producers for the benefit of the receivers (cf. the definition of the knowing below).

### Regulatory semiotic productions

In the particular case of semiotic productions, a distinction can be made between two kinds of works, which can play different roles in transactional activity. Some works are destined for third parties, whereas others are intended for the producer himself as means of regulating his own transactional activities. In the context of a collective self, the distinction between productions, depending on whether they are intended mainly for internal or external use, rests on the distinction between transactions carried out within a network of participants pursuing similar goals in one or several common fields (whereby they construct a common collective self) and transactions between more distally positioned transactors who nevertheless have

similar interests in common<sup>3</sup>. The former might be said to resemble "intra-organisational" transactions, whereas the latter resemble "inter-organisational" ones, those of a commercial kind, for example (although this is only one of the many possible cases).

Regulatory productions, which are often of a semiotic nature, are therefore works intended for a single individual or collective self, who is both the producer and the beneficiary or user at the same time. They either involve relations between selves<sup>4</sup> (inside a collective self) or facilitate the creation of symbolic or material works of other kinds. This distinction between semiotic productions intended for third parties (which are often co-produced with the third parties) and regulatory semiotic productions intended for internal use (which are co-produced with the transactors forming the collective self) is similar to the distinction made by Schmidt and Simone (1996) between cooperative work and the articulation of cooperative work, for example. It also corresponds partly to the "work organisation" concept defined by De Terssac (2003), who extended Reynaud's theory of *régulation autonome* (Reynaud 1989). However, all these authors focus mainly on the regulation of the social relations between transactors (which comes under the heading of self-centred objectives in the present study). In the transactional theory of action, the regulation deals also with the characteristics of the work, and hence with the media, at the semiotic/informational or technical/material level.

It is worth noting that regulatory semiotic productions are not always strictly internally generated. Some can be created by other producers and be directly assimilated by the knowing beneficiary. Lastly, all semiotic productions providing resources for internal purposes in transactional activities do not necessarily serve as regulatory principles governing rules or discourse<sup>5</sup>. Some of them are used in various ways to develop those aspects of the self involving more subjective feelings of pleasure and other emotions such as those elicited by artistic semiotic works (singing a song, for example).

### **Self-centred and work-centred objectives and synthetic or analytic approaches**

Since the aim of all transactions is to transform a medium for the production of a work and to gain the self-satisfaction deriving from the process of individuation and the acquisition of new social and cognitive skills<sup>6</sup>, these two objectives are bound to be interdependent. However, depending on the context, the mode of regulation underlying this activity will give priority to either self-centred objectives or work-centred objectives. This opposition constitutes our first analytical category.

Secondly, the distinction can be made between transactional activities that make it possible to acquire specific skills for directly transforming media and selves using a design in the context of a design oriented approach, and transactional activities that make it possible to understand more clearly the factors on which action depends from a more general point of view. I have called the former type of approach synthetic, since the emphasis is placed in this case on developing artefacts (and symmetrically, on using or consuming them) and on the skills

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<sup>3</sup> See in particular the details of the FANA (Fusion, Articulation, Negotiation and Alliance) model dealing with all the possible configurations, in (Zacklad 2005).

<sup>4</sup> Thus constituting an internal self inside the collective self.

<sup>5</sup> Rules result from a process of deductive standardisation, and discourse from a process of theorising abstraction (cf. below).

<sup>6</sup> Social skills include authority and sympathy, whereas cognitive skills include sensori-motor, affective and intellectual skills (cf. below).

required for these purposes<sup>7</sup>. I have called the second approach analytic, since the emphasis is placed in this case on understanding the factors responsible for situations and defining the rules or laws they obey, rather than focusing on designing symbolic or material artefacts.

Performing any action requires bringing both of these approaches into play alternately: to pilot work on efficient, functional lines, it is necessary to perform explanatory analyses, whereas understanding situations in depth requires having gained experience of the successes and failures of previous design projects. Depending on which of these approaches is used, the final goal will therefore be said to be either analytic (based on a more contemplative attitude) or synthetic (based on a more practical kind of attitude). These approaches also correspond to different regulatory paradigms.

<i>Focus</i>	<i>Approach</i>	Analytic (descriptive and comprehensive processes)	Synthetic (prescriptive and design oriented)
Self-centred objectives		<b>Anthropic</b>	<b>Legal-Psycho-Managerial</b>
Work-centred objectives		<b>Epistemic</b>	<b>Techno-Instrumental</b>

Tab. 1 :JATE – The four classes of regulatory paradigms.

If we cross these two dimensions, self-centred vs work-centred and the analytic vs synthetic approaches, we obtain four large classes or paradigms (which one might call poles of attraction defining a space within which many different hybrid paradigms can evolve). These regulatory paradigms define the JATE<sup>8</sup> matrix (table 1). To obtain a finer analysis, it is also possible to refine the issue of self-centred or work-centred objectives by breaking down the objectives in the self-centred case into *social* or *cognitive* and in the work-centred case, into *material* or *semiotic*, which yields a set of eight issues (table 2). Each of these issues can then be matched with the corresponding scientific class of problem, in terms of specific scientific disciplines (although the scientific approach is not in fact the only possible basis for defining underlying regulatory principles). Table 2 gives the breakdown based on scientific disciplines, and figure 2 gives the orientations of the regulatory procedures, using the same symbols as those used in figure 1.

### The JATE matrix of regulatory paradigms

**Legal-Psycho-Managerial Paradigm:** regulatory rules and discourse have self-centred objectives: the receivers benefit in terms of the use they make of the work, and the producers benefit in terms of the satisfaction they feel when the outcome nicely meets the requirements as well as the internal production criteria. This paradigm involving a synthetic approach is based on the use of prescriptive rules and discourse, and the goals of the transaction tend to be more design oriented. The objectives are social (reputation, responsibility, property, etc.) and cognitive, in the broadest sense of the term (satisfaction and well-being, understanding and intelligence). Regulatory rules and discourse link up with current research on action in the human and social sciences<sup>9</sup>, and in the fields of law (rights, obligations, duty, legitimacy,

<sup>7</sup> In line with H.A. Simon “Sciences of Artificial” (Simon 1996).

<sup>8</sup> In (Zacklad 2005), the approach was slightly different: in that study, the objectives were crossed in the SEPI matrix with the level of reflexiveness.

<sup>9</sup> See, for example, “Sciences of Design” according to Simon (1981), which ranges from pedagogical methods to civil engineering, but the modes of the relations with "objects" naturally differ in each case.

property...), psychology (motivation, expectations, representations, understanding...), management studies (responsibility, incitation, reputation, delegation, strategic positioning, performance, etc.) and politics (representativity), for example.

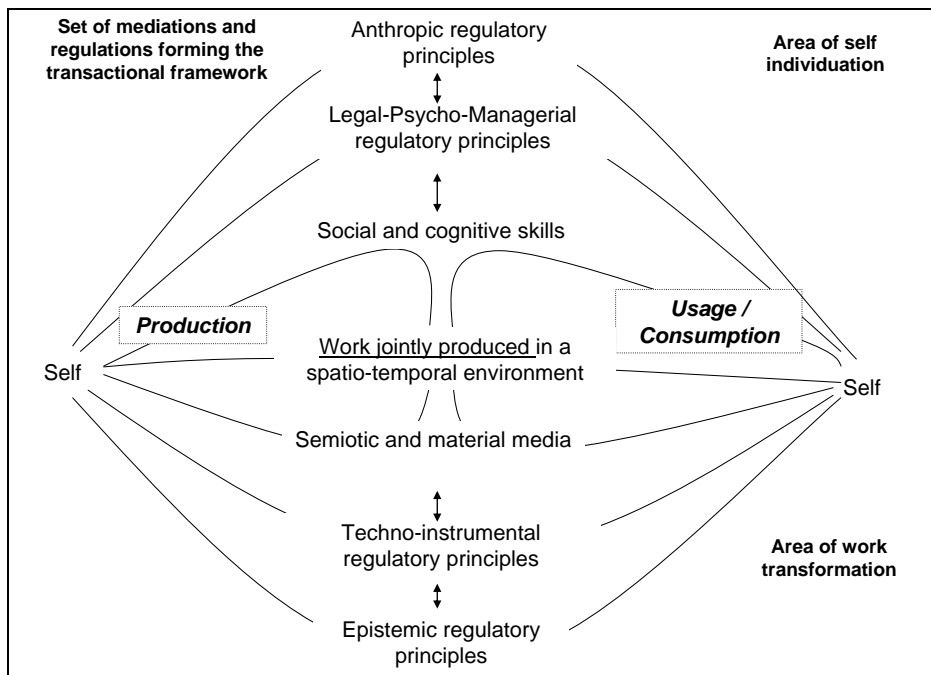


Fig. 2: JATE - Orientation of the various types of regulatory paradigms

**Anthropic paradigm:** the rules or regulatory discourse are also centred on the selves and their productive and consummatory activities. However, since these rules involve an analytic approach, they are oriented rather towards describing situations and their determinants so as to establish the underlying laws. They can be in line with the same disciplinary approaches as those mentioned above (law or psychology, for example), but from a less prescriptive angle. They also link up with topics addressed in other disciplines such as sociology (identity, membership, social norms, justification, forms of organisational regulation, etc.), history (tradition, culture, civilisation, etc.) and economics (macroscopic regulation, sectorial analysis, etc.).

Procedure	Analytic (descriptive and comprehensive)	Synthetic (prescriptive and design oriented)
The focus		
Self-centred objectives	<b>Anthropic</b>	<b>Legal-Psycho-Managerial</b>
Social skills (and identities)	Social sciences dealing with the determinants of collective action (sociology, history, economics, anthropology, philosophy, law principles, human geography, etc.)	Social sciences sociales dealing with practical modes of regulating collective action (management, applied law, applied social psychology, etc.)
Cognitive(sensory-motor, affective, intellectual) skills	Human sciences dealing with the determinants of skills and learning processes (cognitive psychology, the ergonomical psychology <sup>10</sup> and development, psycholinguistics, etc.)	Human sciences dealing with practical modes of using cognitive skills: pedagogical methods, applied clinical psychology, ergonomics, human resource management, etc.
Work-centred objectives	<b>Epistemic</b>	<b>Techno-Instrumental</b>
Symbolic aspects	Describing "languages" and the underlying principles: linguistics, history of art, mathematics, philosophy, etc.	Applied Art in the widest sense (content engineering, grammar and prescriptive rhetoric, technical design, modelling methods, medical semiotics, etc.)
Material aspects	Science of materials (physics, astronomy, geology, chemistry, biology, etc) with a descriptive approach (finding the laws of nature).	Engineering sciences dealing with materials (medical and pharmacological techniques, mechanical, chemical, biological and civil engineering, computer and electronic engineering, etc.)

Tab. 2: JATE – Examples of the scientific and technical disciplines associated with various types of regulatory paradigms.

**Techno-Instrumental procedures:** the rules and regulatory discourse belonging to this paradigm focus on the attributes of the work produced and on their coherence in the framework of a set of closely related works. When the approach is synthetic (prescriptive and design oriented), this category includes all the sciences of design making it possible to produce and analyse the medium involved in the transactions at the symbolic or material level. At the symbolic level, these issues link up with disciplines bearing some relation to art in the widest acceptance of the term, including literature, rhetoric, music, graphic art, dance, architecture, urbanism, industrial design, the functional analysis of industrial systems and services, medical semiology, etc. At the material level, the links are with disciplines such as the branches of engineering providing means of implementing applied art projects: these range from medical techniques to computer engineering, via civil engineering, biological engineering and printing techniques.

**Epistemic paradigm:** this paradigm is based on an analytic approach and therefore tends to be fairly descriptive and comprehensive. At the symbolic level, it includes disciplines dealing with the systems of language and the underlying linguistic, philosophical and mathematical principles, as well as other disciplines such as the history of art and epistemology. At the more material level, they include the many disciplines dealing with the physical, chemical and

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<sup>10</sup> Ergonomics (which deal with legal-psycho-managerial matters) differ from ergonomical psychology (Hoc & Darses 2004), since the latter places more emphasis on the interdependence between cognition and professional activities at the most fundamental level.

biological properties of the substrates conveying symbolic contents, which are not viewed from the engineering angle, but in the hope of finding laws accounting for the phenomena observed.

### ***Knowledge management: tacitness of the known and the knowing***

The question as to what status knowledge should be given in transactional theory of action cannot be addressed without giving some thought to tacit knowledge, which has rather paradoxically been said by some authors to be one of the most crucial forms knowledge. The concept of tacit knowledge, which was introduced by Polanyi (1966), gained increasing popularity as the result of the studies published by Nelson and Winter (1982) in the field of economics and those of Nonaka and Takeuchi (1997) in the field of management science. Nelson and Winter explained company performances in terms of the ability to use routines which have become automated, as defined in cognitive psychology. This introduces the idea of tacitness, which is particularly difficult if not impossible to detect, describe and isolate from the context.

There has been a great deal of debate on the question as to whether knowledge is intrinsically or necessarily tacit (as Nelson and Winter claimed), or whether all knowledge can be potentially codified if sufficiently large efforts are made to formalize it (as suggested by Cowan and al. (2000), who belong, according to Nightingale (2001), to the “strong codification” school of thought). However, as Polanyi has pointed out, there exists no explicit knowledge which is not rooted in tacit knowledge: *“Hence all knowledge is either tacit or rooted in tacit knowledge. A wholly explicit knowledge is unthinkable.”* (Polanyi 1969 p. 144). As Rammert (2002) has explained, Polanyi’s idea is that any new explicit knowledge which develops entails the concomitant development of associated tacit knowledge, of which scientific research itself makes considerable use.

Without taking sides at this stage in the debate, I suggest making a two-fold change of perspective. First of all, the tacitness of knowledge seems to raise various questions about the causes and the effects. Rather than adopting any conclusive opinion about tacit knowledge, it seems to be more appropriate to put forward the more relativistic idea that knowledge is to some extent tacit, but not intrinsically so: it is tacit only under specific conditions and in specific contexts. Secondly, I have decided to replace the term “knowledge” by the more complex concepts “knowing and known”: both of these categories are liable to be tacit in some ways, but according to significantly different modalities.

### **The knowing and the known**

In agreement with Dewey and Bentley (1949), I would say that “knowledge” is a particularly polysemic, ambiguous term. The substitute terms used by these authors, mainly in the framework of the semiotic activities of the subject, are those I have adopted here: the *known*<sup>11</sup>, facts established as the result of a transactional process (which can be regarded as a process of

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<sup>11</sup> *“Known: Environmental phases of transactionally observed behaviors. In the case of namings-knowings the range of the knowns is that of existence within fact or cosmos, not in a limitation to the recognized affirmations of the moment, but in process of advance in long durations”*(Dewey & Bentley 1949). One way of understanding this definition of the known is to take it to consist of the components of the transactional situation which co-determine the transaction process without depending directly on the short-term actions of the transactors, but which are the naturalized outcome of their past actions.

inquiry) and the *knowing*<sup>12</sup>, which denotes the active phase in the transformation of the environment, in the naming of things by the subject, which does not leave the transactors unchanged (a transaction<sup>13</sup> being by definition a process of mutual transformation between the situation and the transactors).

In the framework of our transactional approach to action, I will therefore adopt these two terms. I have defined **the known** as the *valid product of a transactional activity transformed into a resource*<sup>14</sup> for carrying out further transactions, taking the form of either a “work” (when the media used are external ones) or a “self” (acquiring a better level of individuation (by acquiring recognised cognitive and social skills)).

**The knowing** corresponds here to a set of *interdependent transactional activities, the objectives of which focus on both the work and the self in a given situational framework*. If we extend the definition of the transactional situation given above, the *transactional framework*<sup>15</sup> can be said to have the following components:

- a *network of transactors* consisting of several individual or collective selves having specific cognitive and social skills<sup>16</sup>, who are linked together by their common transactional commitments<sup>17</sup>,
- and meet up on a spatial or virtual *territory* defining the spatio-temporal constraints imposed on these encounters and the access to resources;
- using these instrumental, convertible, energetic and motivating *resources* (inside a territory) in some way, focusing on either the material (technical or “basic material”) or the symbolic (informational or semiotic) aspects;
- its activities are regulated by *rules or discourse* (constituting the symbolic regulatory resources) defining the *relations* (contractual, hierarchic, etc.) between the transactors, the modes of *access to resources*, the modes of transformation (*design*) and of reception (*usage or consumption*) of these resources;
- for the purpose of producing *works* and *selves* in keeping with the transactional objectives by transforming a medium (convertible resources) and developing the requisite cognitive and social skills in the transactors (the work and the selves being liable to constitute new resources in another knowing activity, where they will be transformed into a “known”).

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<sup>12</sup> « *Knowings: Organic phases of transactionally observed behaviors. Here considered in the familiar central range of namings-knowings. The correlated organic aspects of signalings and symbolings are in need of transactional systematization with respect to namings-knowings* » (Dewey & Bentley 1949).

<sup>13</sup> “*Transaction: The knowing known taken as one process in cases in which in older discussions the knowings and knowns are separated and viewed as in interaction. The knowns and the named in their turn taken as phases of a common process in cases in which otherwise they have been viewed as separated components, allotted irregular degrees of independence, and examined in the form of interactions*” (Dewey & Bentley 1949).

<sup>14</sup> Cf. in particular Billaudot (2004) on the product-into-resource conversion process aspect of economic activity.

<sup>15</sup> The transactional framework corresponds to the parameters shared by several similar transactional situations.

<sup>16</sup> When a network of transactors constitutes a collective self (when several individuals set up interdependent relations), it can become a “social world” as defined by Strauss (1993), with whose work we have not made any systematic comparisons here. We often speak, however, about a “community” to designate a network of collective transactors, where several individuals make mutual commitments.

<sup>17</sup> Contrary to what occurs in the case of “social network” models, it is not the frequency of the interactions which defines the network of transactors, but their commitments, which can sometimes be made by representatives of the transactors themselves.

According to the transactional theory of action, in cases where the known is tacit, the products of some transactional activities do not constitute resources which can be easily used by performing further activities within either the same transactional framework or a different one. The transactions can be successful without their products being easily re-usable in further transactions. The work produced can be too local, for example, to lend itself to being re-utilised. To solve this problem of product-into-resource conversion, special investments have to be made in the management of the known. This transformation is all the harder to perform as the products of the other transactions are carried out later in time or by a heterogeneous network of transactors.

The knowing also includes many tacit aspects, not only from the point of view of an external observer, but also from that of the transactors involved. The tacitness of the knowing is rather problematic when its potential for action, and hence its capacity to produce works is put at risk. The tacitness can reside in the various components of the transactional situation, the network of transactors involved, the characteristics of the territory, the type of resources, and the rules and regulatory discourse adopted. Changes in one or other of these components (a change of territory, changes in the network of transactors, the disappearance of resources of some kinds, etc.) can actually jeopardize the knowing.

### **Typology of the forms of tacitness**

The tacitness of the knowing and the known can depend on various factors, which need to be differentiated because they require different management strategies. These strategies, which are based on the main knowledge management strategies used by practitioners and/or mentioned in the literature in the fields of information science, management science, knowledge engineering and ergonomical psychology, can be applied *a priori* to issues concerning both the known and the knowing, although the meaning of tacitness probably differs slightly from one issue to another. The tacitivity can result from:

- the **compiled** nature of the knowing resulting from the automation of the transactional activities;
- the **volatile** nature of the known resulting from lack of investment in the final or intermediate products;
- the **confined** nature of the knowing and the known resulting from the difficulty of extending the activity of the knowing and that of conveying the known to other territories and other transactors.

### ***Remedial strategies for dealing with compilation and volatility***

#### **Compilation: the conscientising explicitation of automatisms and routines**

The compilation of transactional activities, which is one of the most frequently addressed issues in knowledge management studies, due to the fact that for the transactors themselves, both the works produced and the transactional framework in which the knowing occurs are implicit. Compilation results from the automation of a whole chain of transactions and micro-transactions, where the regulatory principles underlying the activity are rarely explicitly stated<sup>18</sup>, in terms of the identity of the transactors involved, the relationships between them, the characteristics of the territory, the nature of the resources mobilised and those of the work produced.

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<sup>18</sup> Each set of regulatory principles constitutes one of the paradigms included in the JATE matrix.

The corresponding knowledge management strategies are knowledge elicitation strategies which lead the transactors to view their practices more objectively and reflexively so as to bring to light the underlying “rules”. These rules, or discourse, can bring to bear on various components of given transactions:

- the technical resources (instrumental resources, for example) and the exact know-how required to use them can be defined more clearly;
- the transactors can be seen, for example, to form a relevant community of practice (a network of transactors);
- the real value of the intermediate productions constituting necessary steps towards creating the final end-product can be properly recognized;
- and the skills mobilised and developed by the transaction can be properly defined, making the professionalism required to perform the transaction show up in a new light.

### **Volatility: documentarisation strategy and organisational memory**

The question of the volatility or forgettability of the transactions is of a different kind from the compilation issue. In the case of forgettability, a work produced may have been clearly perceived as such, and may not necessarily have been produced by performing a chain of automated operations. However, for various reasons, the most common of which is temporal dispersion, the work or the intermediate product is in some way lost to the producers as well as to the beneficiaries. Even if it has not been lost for good, attempting to bring it back into sight can seem to require too much effort to be worthwhile in comparison with adopting alternative means.

One of the reasons for the volatility of the known is the ephemeral nature of the substrates on which semiotic productions are based. This can be so, for example, in the case of discourse which has had useful effects but which, since it has not been retranscribed, has been partly forgotten by the transactors. In this case, having recourse to techno-informational instruments making it possible to record or retranscribe the whole semiotic production process can certainly be worthwhile. In some cases, however, even in the presence of a long-lasting substrate making “substitutive mediation” of the transaction process possible (Zacklad 2004b, 2006), the most valuable fragments of the semiotic content cannot be readily extracted from the body of the content (single sentences from a long text, for example).

Documentarisation provides a useful strategy here. This procedure consists of endowing long-lasting substrates with “*specific attributes which can be used to facilitate (i) their management along with other substrates, (ii) their physical handling, which is essential to be able to navigate at the semantic level within the semiotic contents, and (iii) guiding not only the receivers, but also of the producers themselves around the substrate by drawing up one or several maps of the semiotic contents as an aid to semantic navigation*” (Zacklad 2004b, 2006). When the substrate is a digital one, various techno-informational instruments are also available to assist transactors in their search for the contents they require. A large proportion of document oriented knowledge management strategies based on information technology and knowledge engineering is based on methods of this kind.

The volatility of the known can sometimes be detrimental to intermediate productions in the context of a changing transactional framework: project structures can dissolve, internal restructuring can occur, and territories can shift. Various knowledge management strategies can be used in these cases. In the field of “rational design” (Moran & Carroll 1996), for example, it is proposed to re-trace the series of arguments which led to a decision being reached at committee meetings and to schematise this process in graphic terms. The idea here is not just to find the end-product but to also bring to light the process involved, so as to

define the intermediate stages and the decisions (intermediate productions) as well as the players involved. Methods on these lines have been extended so as to be able to identify the transactors and the roles they play in decision-making processes (Lewkowicz & Zacklad 2000, Bekhti & al. 2001). When forgettability is about the competences of the members of the organisation for similar reasons to those given above, it can be worth drawing up internal “yellow pages” of internal skills (Cahier & al. 2001).

### ***Confinement of the knowing and the known***

Confinement is the lack of “transferability” of a known or a knowing from one territory to other larger territories, or from one community of practice forming a network of transactors to other broader communities. The spatial and social aspects of this problem are often interdependent: exploring a new territory means making new encounters, and meeting new transactors means exploring new territories. When the known is confined, it can constitute a resource within a given territory for a given community, but it cannot be easily exploited in other contexts. When the knowing is confined, transactional activities can be carried out in a given local setting by a given community,<sup>19</sup> but coordination problems are bound to arise when it is proposed to extend these activities to include other transactors or to relocate the transactions.

There are other issues underlying (and often also resulting from) that of territorial and social extension: they focus on new resources, new forms of regulation, etc. The difficulties associated with the confinement of the known and the knowing are of the kind encountered in industry and service<sup>20</sup>: the development of new forms of coordination between entities as the result of restructuring, the transfer of know-how to customers, the integration of new members, some of whom may have been relocated, and at a more mundane level, the retirement of colleagues can also destabilise a community, as can the transfer of a business to a different environment.

When knowledge management comes up against confinement problems (managing the transformation of a small community occupying a small territory into a large collective occupying a larger territory, for example), it has to deal, in terms of transactional theory, with the *spatio-socio-temporal distribution of transactions* (Zacklad 2004b, 2006), using suitable remedial coordination strategies. Because of the way in which the knowing activities are distributed, the producers and beneficiaries of transactions sometimes do not occupy the same spatio-temporal framework. The intermediate productions therefore have to be given a more long-lasting form so that the transaction can be initiated, interrupted, updated and repeated in all the configurations involving the presence and/or absence of the beneficiaries and the producers. On the other hand, in some contexts, other producers and beneficiaries can sometimes replace those who initiated the transaction and take over their role(s), providing social means of extending the transaction.

The distribution of the known corresponds to the distribution of production in the economic acceptance of these terms. The question of distribution links up with the above-mentioned distinction between transactions taking place within a single collective self and those involving more distal transactors sharing similar interests<sup>21</sup>. The question of the conversion of

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<sup>19</sup> Or for a given individual self.

<sup>20</sup> See for example (Du Tertre 2001) on the provision of services of an immaterial and relational kind, which are strongly involved in creative transactions.

<sup>21</sup> Or when a work which has been produced through an internal dialogue between the creator and himself is to be presented to an external audience.

products into resource as far as the distribution of the known is concerned arises mainly in the second case, because the conditions under which the work is produced involve less proximity with the potential beneficiaries or less commitment to the transaction on their part. These issues have often been addressed in studies on the sociology of innovation rather than knowledge management studies<sup>22</sup>.

### **The typology of knowledge transferability strategies (dealing with confinement)**

In (Zacklad 2006), eight prototypic strategies were described for coordinating distributed communicational transactions, such as documentarisation and the intensified use of techno-informational equipment. I will now present three new "knowledge transferability" strategies relating to the distribution of the knowing and the known in heterogeneous territories and communities, in addition to the conscientising explicitation and documentarisation strategies already described above (which can also be useful in the framework of confinement problems, but which are not directly relevant to this issue<sup>23</sup>). These strategies are not exactly equivalent to those previously described (Zacklad 2006), especially as coordination strategies are also suitable for use in situations where the pattern of distribution of the transactions is of a less intense kind than that observed in knowledge management situations, and the problems which arise relate only to works of a semiotic nature<sup>24</sup>.

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<sup>22</sup> See, for example, the question of setting up socio-technical networks in Latour (1989) or translation networks in Callon (1986).

<sup>23</sup> The links between the eight coordination strategies presented in my paper on DofAs (Zacklad 2006) and the present knowledge management strategies are as follows: (1) standardising transactional situations corresponds to the deductive standardisation of the knowing, (2) mnemotechnic ritualisation corresponds to the opposite operation to conscientising explicitation, (3) formalising rules of expression corresponds to the deductive standardisation of works of a semiotic kind, (4) abstraction of semiotic contents corresponds to theorising abstraction (5) substitutive mediation, (6) documentarisation, (7) the intensified use of technico-informational equipment and (8) substitutive coordination correspond to the prerequisites for extending documentarisation in the ways suggested here (via the substrates of semiotic works). Paradigmatic conversion has no equivalent (it corresponds to the "change of epistemic focus" mentioned in Zacklad 2004a).

<sup>24</sup> Involving mental operations and representations associated with intellectual or aesthetic matters.

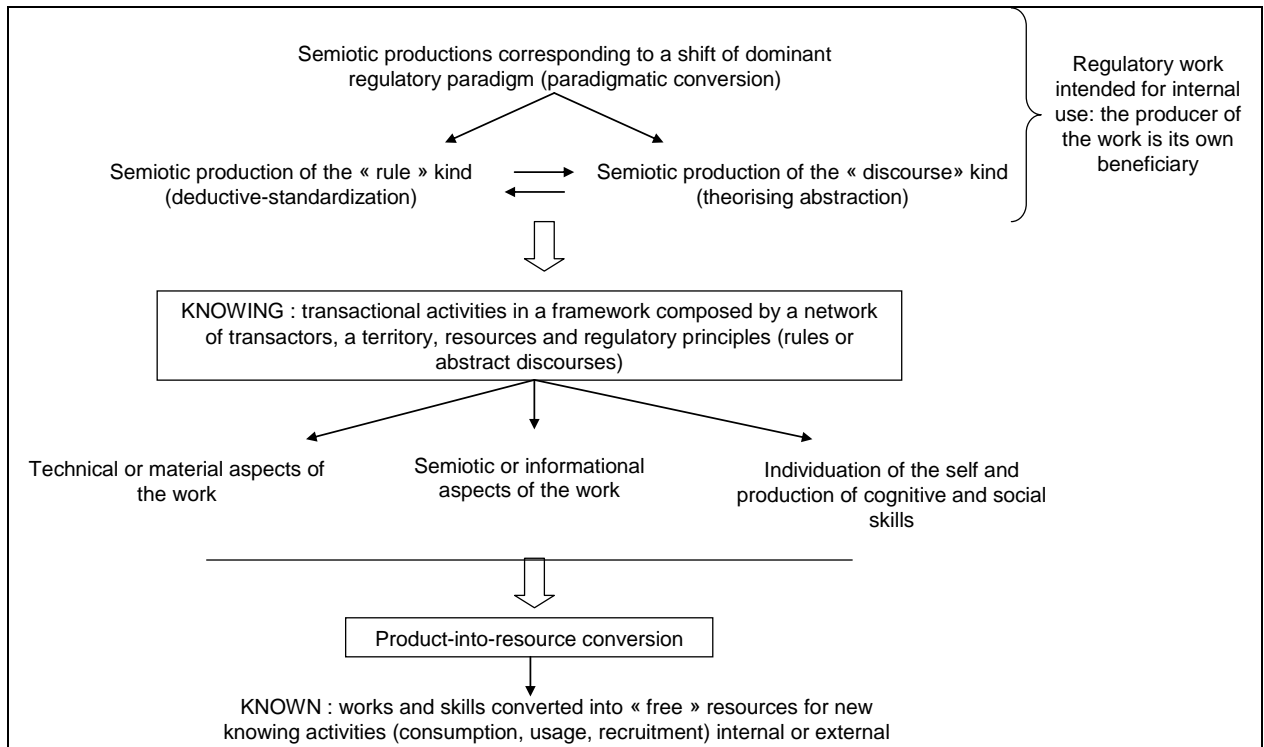


Fig. 3: Semiotic productions associated with the regulation of the knowing.

The three main types of knowledge transfer strategy are (1) *deductive standardisation*, (2) *theorising abstraction* and (3) *paradigmatic conversion* strategies. In all three cases, the approach consists of describing some of the parameters of the transactional framework more explicitly, or in other words, making the transactors more aware of these parameters via the semiotic productions involved and the representations they elicit, although they are liable to revert to being subsequently more implicit as the result of the automatizing-routinizing processes. These three strategies require the making of semiotic productions such as rules for *normalisation and standardisation* and discourse for *theorising abstraction* purposes. *Paradigmatic conversion* also includes discursive productions intended to justify changing the main regulatory paradigm used to perform a given knowing activity.

### ***Deductive standardisation and theorising abstraction strategies***

All transactional activities transform a medium (design of the work) with a view to having effects on the transactors (design of the self). A medium has two important aspects: the symbolic (semiotic or informational) aspect corresponding to the “symbolic effects”<sup>25</sup> and the material (technical or basic material) aspect corresponding to the “energetico-libidinal effects”<sup>26</sup>. Via its material composition, a medium acts as a substrate for the semiotic and communicational content, thus facilitating the operation of the symbolic effects intended by the producer. Conversely, via its symbolic nature, the medium will serve to express the material aspects, thus facilitating the production of the energetico-libidinal effects intended by

<sup>25</sup> Involving thought processes and the subsequent mental representations associated with intellectual or aesthetic issues.

<sup>26</sup> At the level of motor activity and motion, food intake, muscle potential and sensory amplification, protection, sensations of comfort and wellbeing, sexuality etc.

the producer<sup>27</sup>. These regulatory principles can therefore apply either to the work at the symbolic or material level or to the self, thus transforming individual social and cognitive skills (cf. Fig. 4). The effects on the self can be distinguished in turn depending on whether they result from productive or receptive activity.

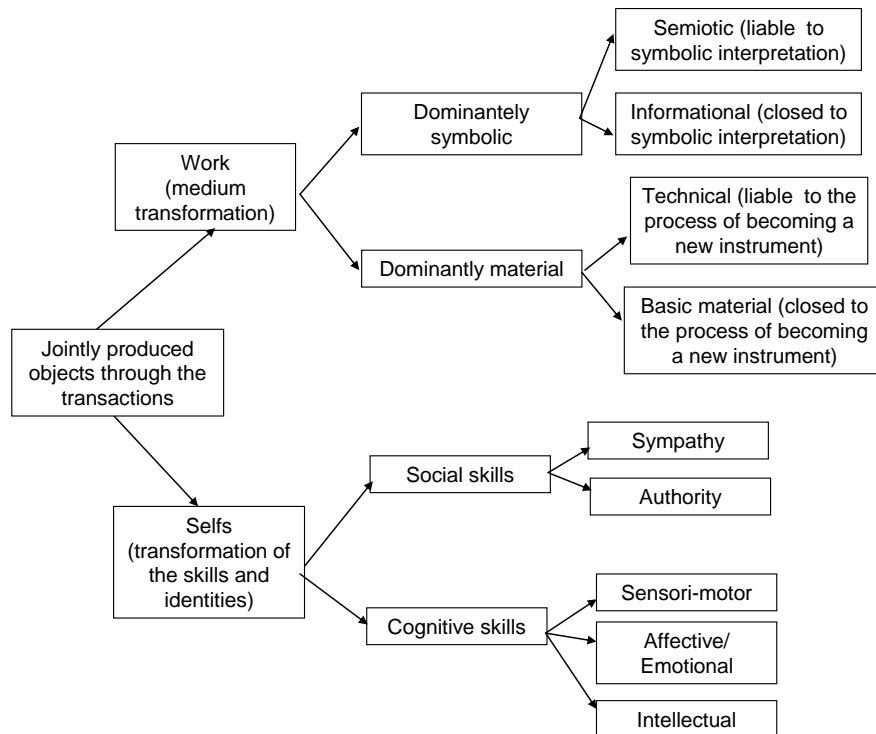


Fig. 4: Types of (co)-productions in a creative transaction.

Table 1 gives some examples of regulatory discourse focusing on the semiotic or technical aspects of the work and on the effects produced on the selves of the transactors in the framework of creative knowing activities such as “cooking a good meal”, “organising a brainstorming session”, “drawing up a digital document”, “making a new tool”, “dispensing physiotherapy care” or “diagnosing a disease”. If one views these regulatory semiotic productions as discourse, they can be seen to have a general scope, whether they yield a theory in the scientific sense, a methodology in the technological sense, or a mythic narrative.

These productions all result from the *theorising abstraction* activities we will deal with below. They can also take the form of “rules”, or regulatory semiotic productions which can be both more local and more normalised or standardised, depending on the situations to which they apply. The generation of “rules” of the kind we are talking about here results from *deductive standardisation* activities, which have been given this name because they consist of applying theorising discourse to specific situations (table 2 shows how general regulatory

<sup>27</sup> This reciprocity in communicational transactions may seem rather paradoxical, since it suggests that the sign is intended to promote the energetico-libinal effects of the substrate. However, from the pragmatic point of view, any language act is performed for perlocutory purposes including both the symbolic effects (mental thoughts, representation, etc.) and the energetico-libidinal effects (pleasure, displeasure, excitement, motility, etc.). Since all communicational transactions require a material substrate (sound vibrations, sheets of paper, etc.), the form of expression (the “meaning” conveyed) can be said to also be intended to appropriately orient the energetico-libidinal reception of the gestures shaping the substrate in order to elicit the feelings intended by the producer. Since communicational transactions are mainly semiotic, their symbolic function predominates rather than their material function, unlike transactions such as those involved, for example, in assisting the task of moving a heavy object.

discourse can be transposed into regulatory rules for preparing a meal and drawing up a document).

Type of object with which the discourse deals	The work		The self
	Regulatory discourse about the semiotic aspects of the media (the expressive function of the material dimension)	Regulatory discourse about the technical aspects of media (the substrate function of the semiotic dimension)	Regulatory discourse about the cognitive and social effects on the selves of the transactors: beneficiaries (B) and producers (P).
Type of knowing activity			
Cooking a good meal (the technical aspects predominate)	Description of the occasions on which the dish is prepared and the cultural and gastronomic aspects	Description of the ingredients, the visual and gustative aspects, the steps involved in cooking the dish, etc.	B: the nutritional, gustative and social effects on the selves – P: the cooking skills and their recognition
Organising a brainstorming session (the semiotic aspects predominate)	Description of this type of meeting, from the point of view of the objectives, the stakes, the method of chairmanship used, etc.	Description of the type of meeting from the point of view of the location of the participants, the substrates available, the time allotted to each speaker, etc.	B: the intellectual, affective, and social effects on the participants P: the chairmanship skills and their recognition
Drawing up a digital document (the semiotic aspects predominate)	Description of the rhetoric objectives, the type of arguments to be used, the length, the style, the terminology, etc.	Description of the software program to be used, the format, the means of access, the typographic options, the numbering, etc.	B: the effects on the reader at the intellectual, emotional and social levels P: writing skills and their recognition
Producing a new tool (the technical aspects predominate)	Description of the purpose of the tool, its design, its ergonomics, etc.	Description of the dimensions of the tool, the arrangement of its components, its physical interactions with the substrate and with the user, etc.	B: effects on the user in terms of the potential for action and the social aspects, etc. P: engineering skills and their recognition
Dispensing physiotherapeutic care (the technical aspects predominate)	Defining the gestures and words required to set up a restorative and preventive relationship with the patient	Defining the gestures required to create physical interactions with parts of the patient's body, their intensity, force levels, etc.	B: effects on the patient who is the beneficiary at the sensory and psychological levels – P: therapeutic skills and their recognition
Diagnosing a disease (the semiotic aspects predominate)	Defining the semiology of the symptoms viewed as a form of expression of the disease	Defining appropriate perceptual and exploratory gestures, possibly using various instruments, etc.	B: intellectual and emotional effects on the the patient who is the beneficiary, and/or on his family – P: therapeutic skills and their recognition

Table 3: Some examples of regulatory discourse in various fields.

Rules for preparing a culinary speciality	Rules for classifying dishes and the situations in which they are customarily served in a given cultural context.	Rules governing the preparation of the food and the way the ingredients are combined.	Social rules governing the consumption of the food and the division of the work (design)
Drawing up a digital document	Rules governing the mode of expression: plan, terminology (thesaurus), etc.	Rules governing the formats, the typography, the numbering, etc.	Social rules governing the modes of reading and the recognition of the authors

Table 4: Examples of translation into rules in two of the fields featured in the previous table.

### ***Abstract discourse versus rules***

*Theorising abstraction* and *deductive standardisation* can be said to be opposite operations. Operations of the first kind start with a series of local rules and yield a systematic, all-inclusive regulatory type of discourse (scientific theories, technological methodologies and mythic narrative, for instance), whereas those of the second kind start off with theories and use them to deduce more directly usable rules rooted in the target situations. Each form of expression (regulatory, theorising discourse and standardised rules) has its own advantages and disadvantages in terms of their transferability and confinement. In other words, each of them is consistent with some kind of universality, but carries corollary risks of self-enclosure.

In the case of regulatory theorising discourse, the risk of cognitive confinement is due to the difficulties involved in appropriating "theories" and the fact they may lead to a rather exclusive picture of things. On the other hand, their abstract nature makes them potentially applicable to a larger number of situations, making for great freedom of interpretation in the implementation of knowing activities. Theorising discourse is more closely confined at the social level (in terms of the circle of transactors involved) but more widely applicable.

Regulatory rules tend to run the the risk of cognitive confinement because they are too concrete to be easily transposable to other situations, or too sensitive to changes in the environmental conditions. In addition, they can seem to be rather unjustified and hence to lack coherence. One of their main advantages is that because of their concrete nature, they are accessible to a large number of transactors and require less interpretative effort. The rules are less potentially creative in this case for dealing with the issues arising in various situations, but they can be more widely distributed at the social level.

### ***Theorising abstraction***

Knowledge transfer strategies help to compensate for the disadvantages of each of the forms taken by regulatory principles. The theorising abstraction strategy compensates for the fact that the "rules" used by the transactors are often perceived as being too numerous and to lack coherence, and for the fact that theories officially recognized in an organisation may not seem to be in keeping what is actually practised. Developing a theory accounting for all situations liable to enhance the potential of the knowing is a project which relates to knowledge management strategies based on organisational learning theories (Argyris & Schön 1974).

In some cases, it can be worth replacing a theory by another more suitable one. For example, Argyris & Schön have suggested that consultants can help actors become aware of the theories in use (which they implicitly apply in their practice) by analysing them more consciously and realising that they are often inconsistent with the explicitly espoused theories, and making them change their representations and practices. The important point in this approach is making the knowing realise how it represents its own activity, what regulatory principles it obeys and how systematic these principles are.

Theorising abstraction is not necessarily very formal. Regulatory procedures of the anthropic or legal-psycho-managerial kind, for example, can take the form of an account of the past history of a collective undertaking, which makes the present activities meaningful. The main point here is acquiring detachment from the rules from the emergence of regulatory discourse of the theorising kind. These rules generally have a local colour which tends to make them rather tacit (their premises are not explicit because of their indexicality). Theorising abstraction provides modes of collective regulation where the observance of local rules of adhesion is replaced by a more general kind of discourse, which is therefore more easily transposable to situations having similar deep structures (Zacklad 2004).

### ***Deductive standardisation***

In some cases, the systematic use of theorising discourse leads to the confinement of regulatory principles because they are difficult to interpret. Deductive standardisation provides a means of translating high-level principles into concrete situations. This procedure yields the definition of rules, the premises and conclusions of which link up with the tangible characteristics of the transactional framework. Triggering the rules makes it possible to define procedures, and the complementary use of documentarisation strategies based on long-lasting paper or digital media will make these procedures publicly accessible (cf. Schmidt & Simone 1996 on the publicly accessible nature of coordination mechanisms).

Deductive standardisation also makes it possible to suggest modes of regulation compensating for the cognitive confinement to which abstraction is liable to lead, by placing special emphasis on standards and norms. Using rules of his kind leads to setting up informational infrastructures (Bowker and Star 1999), which induce forms of coordination based on standardisation (Mintzberg 1979), which in turn end up by becoming tacit although they initially resulted from deliberately thought-out projects. In the end, the application of deductive standardisation can lead to designing quite tangible architectures and instruments which impose material constraints on collective activities, just as the spaces of which buildings consist can either promote or prevent contacts between the occupants, and the functions available in a software program make only some specific data processing operations possible and not others.

Deductive standardisation thus makes it possible to remedy some forms of confinement of the knowing by defining universally accessible rules, informational infrastructures and technical devices. As a corollary, it also contributes to enclosing practices in narrowly stereotyped transactional frameworks, from which it will be possible to escape only by undertaking a whole new process of theorising abstraction prior to introducing new forms of knowledge transfer into unexplored social and territorial domains.

### ***Paradigmatic conversion***

As we have seen above, the regulation of knowing activity is a component of one of the paradigms defined in the JATE matrix. Although all knowing activity involves both the production of a work and the transformation of selves, it tends to privilege a type of regulation based on the characteristics of the work in hand and on achieving self-satisfaction, as well as favouring either a synthetic kind of approach (a prescriptive, design-based approach) or one of a more analytical kind (a more descriptive and comprehensive type of approach), depending on the context. The tacitness of the knowing often results here from priority being implicitly given to a specific regulatory paradigm, whereas the transactional situation actually requires a change of paradigm to be made to enable the knowing to escape from confinement.

One could give many examples of knowledge management problems where a change of paradigm should have been made, resulting in various shifts in the JATE matrix:

1) A purely *techno-instrumental* procedure which does not make the *legal-psycho-managerial* aspects of the knowing clearly visible (requiring a type 1 paradigmatic conversion, as shown by the arrow in figure 5).

- Example: in many cases, engineering departments do not manage to grasp the strategic, political and legal implications of the projects on which they are working, which fail although the producers are convinced of their own technological excellence.

2) Conversely, a purely *legal-psycho-managerial* type of regulation which does not take the *techno-instrumental* factors into account (requiring a type 2 paradigmatic conversion).

- Example: many managers with no training in Information and Communication Technology are unable to grasp how this field contributes to knowing activity within their team (just as many heads of sales departments do not have a sufficiently close understanding of the technical characteristics of the products they market).

3) A *legal-psycho-managerial* type of regulation, which has no idea of the *anthropic* factors involved (requiring a type 3 paradigmatic conversion).

- Example: managers attempting to apply an exogenous management theory to a group whose cultural background is unfamiliar to them (and *vice-versa*, those focusing on cultural authenticity without perceiving the management and/or legal issues at stake).

4) A *techno-instrumental* type of regulation which overlooks the *epistemic* factors (requiring a type 4 paradigmatic conversion).

- Example: a technical department may not manage to develop an innovative product based on upstream research redefining the problem, which would help to solve recurrent problems or meet the needs of specific customers, (or *vice-versa*, an upstream research department may not be aware of the engineering constraints and therefore unable to transform ideas into innovative products).

<i>Approach</i>	Analytic (descriptive and comprehensive approach)	Synthetic (prescriptive and design oriented approach)
<i>Focus</i>		
Self-centred objectives	<b>Anthropic</b>	<b>Legal-Psycho-Managerial</b>
Work-centred objectives	<b>Epistemic</b>	<b>Techno-Instrumental</b>

Fig 5. Paradigmatic conversions required to deal with the examples given above.

Lastly, a paradigmatic conversion can also be said to occur when the main regulatory principles pertaining within a paradigmatic class undergo a radical change, which transforms the nature of the objects under consideration. For example, in the framework of *legal-psycho-managerial* procedure, the shift from a centralised, top-down mode towards a more decentralized, bottom-up one can also be said to be a form of paradigmatic conversion.

## Conclusion

The next step will be to assess this attempt to revisit the topic of the knowing and the known, by making comparisons with various other theories, such as those developed in the fields of management science and economics. Although I cannot discuss these questions in depth here, it is proposed to conclude the present paper by dealing with one of the specificities of the present approach to knowledge management strategies (which is summarised in figure 6). In particular, I do not subscribe to the essentialist picture of tacit versus explicit knowledge on which the approach adopted by Nonaka and Takeuchi was based (1997)<sup>28</sup>. The latter authors assume tacit knowledge to be an individual matter, whereas the explicitation of knowledge involves a process of externalisation and codification, which can be further reinforced by the process of documentarisation which enables the players to reappropriate codified knowledge more easily.

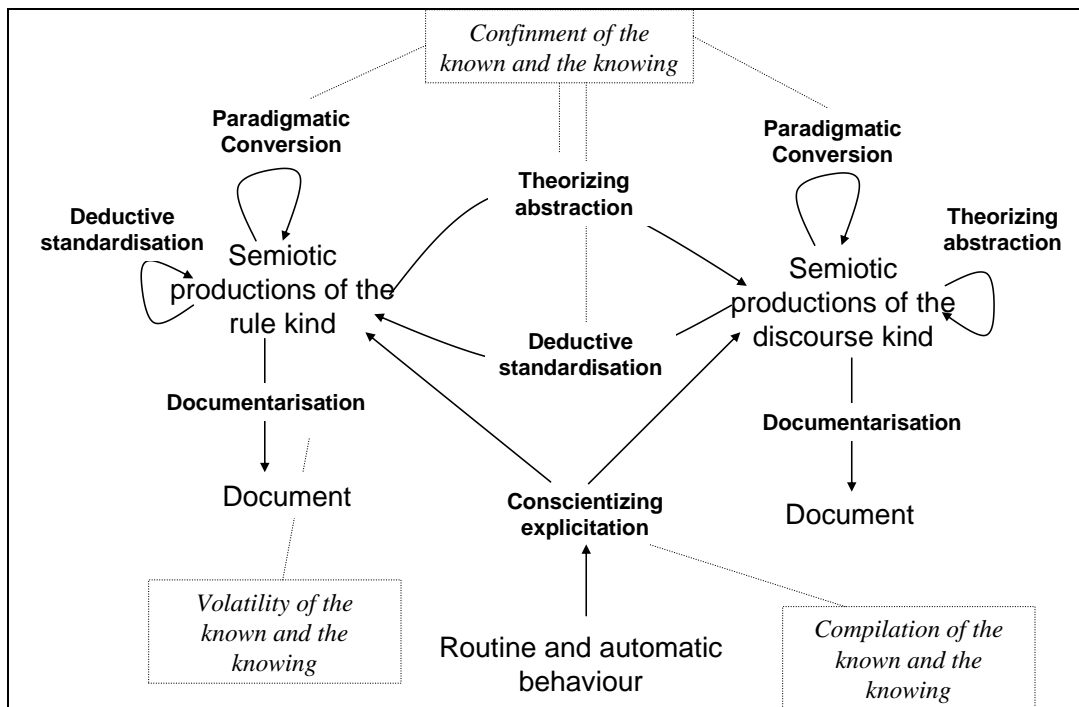


Fig 6. The five knowledge management strategies presented here.

According to my own view of tacitness, which is a more relativistic than ontological one, the tacit aspects of the knowing and the known are no more intrinsically individual than the explicit aspects are. It is worth noting that conscientising explicitation deals first and foremost with the conditions under which sequences of transactions occur, depending largely on collective factors<sup>29</sup>. Conscientising explicitation is not so much a question of the transition from individual mental learning to collective knowledge, but is rather intended to bring to light the shift from the modes of regulation implicitly underlying actions, especially collective actions, to other modes, where the determinants of the regulation are more explicitly expressed.

This difference between approaches can be illustrated even more clearly in the case of the confinement of the knowing and the known. In the framework of the present approach, the

<sup>28</sup> See also in similar lines Tsoukas (2002) and Day (2005).

<sup>29</sup> Transactions either occur between selves corresponding to separate individuals or apply to the same person engaged in an internal dialogue with himself (see above).

tacitness of the knowing and the known is held to be problematic only in contexts involving the social or territorial enlargement of transactional objectives (see above on the issue of the tacitness resulting from the product-into-resource conversion which serves as the starting-point for new transactions). The tacitness is therefore not an intrinsic characteristic, but depends on the goals pursued, the network of transactors potentially involved and the characteristics of the transactional framework. As we have seen, depending on the case in hand, the transferability of the knowing and the known, i.e., its explicitation and use in the pursuit of new goals, will require the production of theorising discourse and standardising rules, or paradigmatic conversions making it possible to radically transform the actors' perception of the implications and the modes of regulation underlying their transactions.

On the above lines, an alternative path to that proposed by Nonaka and Takeuchi in their theoretical study might be proposed for interpreting the differences between the Japanese and Western styles of knowledge. Rather than stating, as the latter authors have done, that the difference between the two cultures is that Western countries are inordinately fond of explicitness, whereas the Japanese rely more on tacitness, I would say that the difference can be explained in terms of the use of different regulatory paradigms and whether they tend to be more synthetic than analytical, or in terms of the choice of communication modalities within a given type of paradigm: working towards a local consensus or acting out controversies.

As regards confinement, it is precisely because Western scholars have found the regulatory procedures favoured by the Japanese difficult to apprehend that they have labelled them as "tacit"<sup>30</sup>. In other words, the modes whereby Japanese organisations function are not in fact more tacit than elsewhere, if one defines tacit as the mental interiorisation of rules. However, they may involve the use of regulatory paradigms which, although they are perfectly explicit to the actors themselves, have yielded modes of organization giving these communities greater local autonomy than firms in Western countries usually enjoy: a point which seems to have escaped members of the "business school" attempting to define the official Japanese doctrines accounting for innovation processes<sup>31</sup>.

Lastly documentarisation does not systematically transform tacit aspects into explicit ones. Its purpose is to combat the volatility of the known by working on the media so as to permit the subsequent use of semiotic productions. However, despite the fact that documentarisation plays an essential role in facilitating access to distal transactions and preserving the history of these transactions for a network of transactors distributed in time and space, it does not suffice to solve the problems associated with compilation and confinement we have been discussing here.

It is worth mentioning in connection with compilation that a statement can appear highly laconic to a receiver who is not familiar with the context, and that preserving this statement on a long-lasting substrate, as occurs in the case of a transcription, will do nothing to change this state of affairs. A similar point can be made about confinement, in that making the semiotic productions resulting from transactions more widely accessible is not the same thing as transforming semiotic contents in response to the needs of audiences other than those for which they were initially intended. This objective can be achieved only via a process of exegesis or interpretative commentary, which can also possibly be associated with new re-documentarisation activities yielding a result which differs from the original version.

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<sup>30</sup> According to me Nonaka and Takeuchi are quite in line with Western managerial and psychological theories (see their psychological references for example).

<sup>31</sup> A tendency which is now widely recognised in the context of the promotion of "communities of practice", for instance, as previously pointed out by Nonaka and Takeuchi themselves.

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