

Abstract:

Globalisation is the key driver in the development of a globally differentiated network economy. Globalisation itself is constituted by three subprocesses: 1) internationalisation (development of new activities abroad), 2) global network development, and 3) global evolutionary dynamics. Although contributions in the area of Knowledge Management enriched the study of the evolution of firms to a large extent – particularly in the field of learning – the contribution to the study of international or global processes is still limited. This paper serves to underpin contributions from knowledge management literature with ideas from other disciplines, such as social systems theory, interpretative view or evolutionary organisation theories in order to provide a more solid theoretical basis. The paper argues that four of five evolutionary motors (teleological, Lamarckian, dialectical) are implicitly already reflected by literature while the fifth one (autopoietic reproduction) still waits for a reflection in international knowledge management literature. This paper serves as a starting point by providing an overview on existing approaches and their contribution to an evolutionary view in international management.

1 Knowledge in the global context

Globalisation in recent history has been particularly marked by the extension and integration of informational and knowledge processes on a worldwide scale. For example, MNEs are establishing and expanding R&D abroad, benefiting from the possibilities offered by information and communication technologies to internationalise the learning processes along the whole of the value chain (Cohendet/Joly 2011: 63, 80). The emergence of global communication and knowledge networks is part of the evolution of society in general and of economy as a social subsystem in particular. From the perspective of the main social actors, i.e. organisations it is important to reflect the individual embeddedness in such a stream of globalisation forces while pursuing the own, individual genesis and value generation. In the following, knowledge in the global context hence will be analysed from both the integrative economic perspective and the individual firm perspective.

• Knowledge in the global economy

Globalisation is driven by self-fuelling dynamics. As a consequence, the ‘geography’ of the production of knowledge is going to be drastically modified. In general, exploiting global markets further enhances globalisation. Development of and introduction of innovations, particularly when done with speed and regularity, further contribute to environmental dynamism (Hitt et al. 1998: 39). In recent years the *interconnections between geographically different parts of the world* have considerably increased and this has also *multiplied learning opportunities*. The learning and the globalising dimensions of the world economy strongly reinforce each other (Lundvall/Archibugi 2001: 2), leading to the integration, expansion, and

creation of social systems on the global level. Historically, however, most social systems have national origins and thus encountered nationally based imprinting at their founding. An observation of knowledge in the globalising economy has to include the national origins its constituting social systems.

Collis (1991: 51) argues that the historical evolution of a firm constrains its strategic choice and that complex social phenomena, or invisible assets can be a source of sustainable competitive advantage. A firm's country of origin will hence directly affect its choice of strategy. Even as a firm internationalises, it remains imprinted by its early developmental history and domestic environment (Kogut 1993: 137). From a knowledge-based perspective, FDI is the extension of organising principles and capabilities of the firm across countries. Intangible assets represent the cumulated capabilities of the firm. Part of the capabilities of a firm consists of its relationships with other firms and institutions. In the early history of firms, the predominant factor in these relationships is that they are usually contained within borders of a single country (Ibid. 143). Once a start-up firm begins to grow, its reliance on the collection of technological skills of individuals shifts to the important task of creating organising recipes. These recipes are adopted from the current agreement on what constitutes best practice. The disposition of the availability of knowledge is determined by the structure of social relations. In an international study, Lane (2001) describes different national learning styles characterising supplier networks in Germany, Great Britain, Japan, and the U.S. with different predispositions within dualities such as internal/external learning, centralisation/decentralisation, and symbiosis/arm-length style. Supplier networks in these countries expose idiosyncratic learning styles with some opening and convergence due to globalisation forces (Ibid. 711).

Zaheer/Zaheer (1997) showed that both national industry arrangements and national cultural factors account for country level effects on information seeking leading to the conclusion that '*one cannot underestimate the influence of country-level effects on firm behaviour*' (Ibid. 95-97). A study by McKendrick (2001: 307) suggests that firms from the same nation are likely to adopt similar global strategies initially, but that, over time, the industry as a whole converges on the same blueprint for action. At the same time, however, strategic focus and organisational characteristics moderate national influences. Through processes of selective imitation, firms from the same nation will initially adopt similar global strategies but over time the industry as a whole converges on the same blueprint for action. Yet the emergent global strategy is likely to be pioneered and transmitted by only a subset of national firms that operate in the same strategic space and possess similar organisational characteristics. By contrast, late adopters share similar characteristics regardless of nationality (McKendrick 2001: 331). Bensedrine/Kobayashi (1998: 51) make a similar observation on the level of industry evolution. In their empirical study of the

chlorofluorocarbons (CFCs) industry firms' strategies differed most of the time but homogenised when national institutional contexts converged.

- **Cultural differences**

A basic influence on the (re-) production of knowledge in the global context is caused by different national or ethnic cultures. Knowledge itself is a symbolic representation of meaning and therefore directly an element of culture. The traditionally dominating influence of national, ethnically, or religious-based cultures has been increasingly complemented by the impact of professional, scientific, or other subcultures. Nonetheless, socialisation of individuals and imprinting of organisations are still dominated by these general building blocks of social meaning structures.

Culture involves far more than general values and knowledge that influence tastes and decisions; it defines the ontological value of actor and action (Meyer et al. 1994: 18). Cultural differences often seem to be a residual category to which people attribute problems in the absence of a supportive context (Kanter/Corn 1998: 42). This gives rise to questions about the usefulness of the 'cultural differences' approach, e.g. as technical orientation can override national orientation and similar educational experiences, e.g. of specialists, can erase ideological differences. Cultural value issues and issues of '*difference*' in general are more apparent at early stages of relationships than later, before people come to know each other more holistically (Kanter/Corn 1998: 24-26).

Processing of knowledge is highly influenced by the cultural context. Empirical studies suggest that the international context multiplies the difficulties in knowledge transfer (Bendt 2000: 111, 184). A basic cause of such intercultural difficulties are perception gaps (Arvidsson 1999: 96). Within the internationalisation process, new, culturally distant engagements have to be integrated in the evolving meaning and activity structure of a firm. A common assumption about internationalisation processes is that firms initially operate locally and that their knowledge reflects their operations in their local contexts. This knowledge is embedded in the routines and administrative structure developed to manage domestic operations. When they go abroad, firms base their activities on these established routines and on their embedded knowledge, which frequently does not aid in the understanding of situations and conditions in specific foreign markets (Eriksson et al. 2001: 23). In the final stage of the sequential internationalisation process, the learning from the foreign market is transferred internationally and influences the accumulation and recombination of knowledge throughout the network of subsidiaries, including the home market (Kogut/Zander 1993: 636). After globalisation has become fully institutionalised, the role of cultural barriers and learning may become less prominent (Barkema et al. 1996: 155, 163).

2 Globalisation knowledge of firms

Globalisation knowledge of firms may be differentiated along the three basic dimensions of globalisation: internationalisation, networking, and evolutionary dynamics (Borghoff 2005). In the following, the management of knowledge will be discussed within these three dimensions.

2.1 Internationalisation knowledge

Factors such as the duration of foreign operations (Erramilli 1991), the firms' size and age, and the number of foreign countries in which they operate (Barkema/Vermeulen 1998) seem to influence the accumulation of knowledge. In a series of articles, Eriksson et al. (1997, 2000, 2001) expanded the concept of experiential knowledge and integrated research from organisational learning and the knowledge-based view of the firm. For example, an empirical study of 362 service firms by Eriksson et al. (1997) delivered evidence for the assumption that the level of risk perception of international activities is continuously decreasing along the internationalisation process. The findings indicate that accumulated internationalisation experience that affects both business knowledge and institutional knowledge is not related to specific country markets. It is a firm-specific experience relevant to all markets.

The international learning process is not confined to the individual experiences of decision-makers but is accompanied by an institutionalisation process of international management (Eriksson et al. 1997: 352). Eriksson et al. (2000) examine the effect of variations in the geographical scope of international business operations on experiential knowledge development in the internationalisation of the firm. Experiential knowledge is assumed to have three interrelated components: *internationalisation knowledge*, *business knowledge*, and *institutional knowledge* (Ibid. 26). Barkema et al. (1996: 163) showed that acquisitions and joint ventures are the types of ventures where firms reduce cultural barriers through learning, with the success of later ventures increasing with the amount of previous FDI of the firm. Learning from previous FDI largely concerns learning about foreign organisational cultures. Andersson et al. (1997: 81) further argue that there are two contextual dimensions impacting on acquisition behaviour and its consequences: extent of previous relationships between the acquiring and the acquired companies and psychic distance.

Exposure to variation enables internationalising firms to accumulate knowledge from a richer variety of business and institutional actors, so that a double-loop learning process more easily evolves in such firms. Exposure to a richer set of business actors and institutional environments may set in motion a process whereby the internationalising firm's current assumptions regarding business and institutional

actors are confronted with a new reality. The feedback process from this questioning may force the firm to reconsider and amend its existing theory-in-use as well as its organisational practices and strategies, compelling it to develop new technological solutions, products, and ideas. A richer knowledge set has a positive effect on the future internationalisation of the firm, because there is a higher probability that the new knowledge required for a new situation may bear some similarity to the current stock of knowledge at the firm (Eriksson et al. 2000: 30-31). Bilkey (1978) and Naidu/Rao (1993) argue that the experiential knowledge that firms gain in the early years of internationalisation is extremely important for their subsequent resource commitments in the international market. Sullivan/Bauerschmidt (1990) also found that managers' perceptions of barriers hinge on their past experience.

2.2 Global network knowledge

MNEs are international traders in information (Magee 1977: 334). MNEs are also networks of capital, product, and knowledge transactions (Gupta/Govindarajan 1991: 770). Nonetheless, or '*curiously, there has been little explicit attention given to the resource based view of the firm in the MNE literature*' (Birkinshaw 2001: 387).

Kogut/Zander (1993: 625) view firms as '*social communities that specialise in the creation and internal transfer of knowledge*'. MNEs hence arise out of their superior efficiency as an organisational vehicle by which to transfer this knowledge across borders. In a similar vein, Oliveira/Child (1999: 3) conceive of companies as 'stocks of knowledge' as well as 'flows of knowledge'. MNEs then represent 'dynamic learning networks' (Ibid. 8). From this perspective, what will determine the firm's success is its efficiency in the knowledge management and learning process. Lessard/Amsden (1998: 67) define a global learning organisation as '*one that has global cognitive scope*'. Following this definition, learning on a local-for-local basis in a variety of locations does not qualify as global organisational learning. The firm must somehow be able to exploit the multi-point nature of learning and transform it into an economy of scope. MNEs as '*multi-country firms*' operate in a variety of markets and technological contexts and face especially high costs, as well as potentially high benefits, related to integrating and diffusing knowledge that is culturally, geographically and politically disparate (Ibid. 69). The MNE is potentially a unique learning organisation because of its exposure to multiple learning stimuli and knowledge contexts, where learning tends to be more tacit than explicit and, therefore, more in need of learning-by-doing than formal arm's-length instruction (Ibid. 71).

The international setting is interesting as it illustrates the difficulty of learning when the requisite institutional mechanisms are not well developed. This difficulty is greater when new organising practices must be learned, as opposed to the imitation of technologies, because these practices are likely to be embedded in the social network

and values of individual countries. The learning of new organising principles is both more transparent and yet more difficult across the borders of a country than of a firm (Kogut 1993: 148).

MNEs establish international networks to support the process of technological accumulation and learning (Cantwell 1995: 37). Tacit capability embodied in the collective skills and organisational routines of the firm is the product of continual problem-solving and learning which is enhanced in a MNE through combining complementary awareness of technological development in an international network. While technological advantage or competence forms the essential basis of the competitiveness of MNEs in world markets, the international network of MNEs help to reinforce such capability through mutually oriented learning between affiliates, and an enhanced ability to engage in purposeful R&D (Cantwell 1995: 46).

Two basic questions in international business concern the acquisition of local knowledge by MNEs and the contribution of the latter to the local technological process. The results of an empirical study by Almeida (1996: 162) confirm the local character of both learning and contributing by MNEs. The findings suggest that foreign firms are aware of the difficulty of learning from afar, and use local plants to upgrade the technological ability in fields, which may be weak in their home countries. The findings also suggest that foreign firms may not be targeting just regions but specific firms in their learning efforts. The study also confirmed the suggestion that MNEs contribute to local technological development in the form of knowledge exchange (Ibid. 163).

The *MNE creates value from knowledge* not only through its ability to exploit economies of scale and scope in knowledge from deploying its knowledge assets in multiple geographical markets but from its ability to acquire knowledge in different locations and to combine these different types of knowledge (Almeida et al. 1998: 121). Hence, the greater the complexity of the product or service being delivered, the more likely is it that the MNE is the preferred organisational form of knowledge transfer (Ibid. 137).

Still, MNCs face the problems and opportunities inherent in globally distributed knowledge. Thinking and acting parts of the corporation are both geographically diffused, and the scattered '*brain*' proves a significant obstacle to clear hierarchical structure. Internationalisation means a quantum leap in uncertainty and change. This makes a '*freezing*' of the structure more difficult (Hagström/Hedlund 1998: 171). Weick/van Orden (1991: 49) contend that globalisation involves at least two basic themes: making sense of turbulence, and creating processes that keep resources moving. As MNEs may confront dangers that arise from two major forces, cognition (incomprehensibility) and structure (tight coupling), the search for remedies needs to

focus on ways to facilitate sense making and comprehension, and on organisational form and design (Ibid. 50).

2.3 Knowledge in the evolutionary dynamics of firms

In evolutionary terms, MNEs have three basic advantages in the evolution of their meaning system or, in terms of the knowledge-based view, in knowledge creation:

- *generation of variety*:
 - variety in environmental stimuli: MNEs as '*global scanners*'
 - joint knowledge creation: MNEs as '*knowledge creating networks*' (Westney/Zaheer 2001),
- *dispersed innovation centres*: MNEs as a '*global selection regime*' (Ibid.), and
- *implementation and diffusion of innovation*: MNEs as a '*global retention mechanism*' (Borghoff 2005).

Globally operating firms can tap into local networks and gain idiosyncratic knowledge from locations all over the world. MNEs can do this on the basis of an internal network of subsidiaries. Increasingly, also SME can access and integrate dispersed knowledge through co-operations and the use of information and communication technologies (ICT). In a study by McKenney et al. (1992: 285), face-to-face communications were found to serve as a context-creating medium, while e-mail proved to be a context-reliant medium. Face-to-face interaction and observation is a better mechanism for the transfer of tacit knowledge and taken-for-granted understandings than electronic media often relied on heavily to co-ordinate geographically dispersed teams (Argote 1999: 111, Nonaka 1991). Electronic media are more effective at augmenting existing relationships (Argote 1999: 181) and dominate standard processes in and between firms. Nohria (1992: 304) argues that network organisations cannot be built on electronic networks alone. At the core, the network organisation depends on a network of relationships forged on the basis of face-to-face interaction. This network of relationships serves as the substrate on which the electronic network can float or be embedded. Intercultural differences make networking even more difficult so that 'rich media' should be used to build a consensual basis across important network positions.

MNEs that are able to learn from the globally dispersed subsidiaries achieve a higher performance (Tienessen et al. 1997: 386). In contrast to some established literature on MNEs, Sölvell/Zander (1998) suggest that MNEs are not particularly well equipped to continuously transfer technological knowledge across national borders and that its contribution to the international diffusion of knowledge has been overestimated. The nature of the innovation process suggests that all international innovation projects are associated with increasing costs and lengthened development times. As the MNE becomes more firmly established in foreign (local) innovation systems, a process by

which large and well-established subsidiaries become less prone to share and diffuse their core capabilities accompanies this process of local adaptation (Ibid. 404-405).

Particularly globally operating firms often complain that they have lost sight of their internal competencies and knowledge assets in important areas. The understanding of the relevant knowledge environment is also critical in this case (Probst et al. 2000: 70-71). Instruments like knowledge maps, knowledge topographies, maps of knowledge assets and a geographical information system may facilitate the integration of 'islands of knowledge' (Ibid 75-77).

With regard to knowledge diffusion, empirical studies prove that (1) articulated knowledge is more easily transferred internationally, (2) the absorptive capacity of the recipient is crucial for transfers, (3) causal ambiguity hinders transfer, and (4) actual implementation and use of transferred practices depend on the recipients' internalisation of the basic meaning of the transferred capability (Arvidsson 1999: 30).

Given the restricted reach of central direction and influence in knowledge transfer, Gupta et al. (1999: 206) stress the importance of feedback-seeking behaviour in MNEs. Feedback from other organisational units in an MNE is regarded essential for innovation and co-ordination. Studies by Simonin (1999, 1999a) point to the critical role played by knowledge ambiguity as a full mediator of tacitness, experience, complexity, and cultural and organisational distance on knowledge transfer. When knowledge is not or cannot be codified in a meaningful way, learning from experience and learning by doing in the presence of knowledgeable partners become a *sine qua non* for circumventing ambiguity and favouring knowledge transfer (Simonin 1999a: 611, 614)

3. Global reproduction of knowledge

Knudsen (1995) proposes that in social evolutionary theory, the firm is modelled as a 'hereditary mechanism' that may accumulate more and more complex behavioural patterns over a period of time. From this perspective, the organisational structure of a firm therefore can no longer be regarded as determined by a rational view on its transaction costs, but rather by its accumulated competencies or capabilities (which cannot be assumed to be exogenously given). The knowledge or competencies of the firm are accumulated during its lifetime, either through its individual trial-and-error learning or through social learning (learning by imitating older and more experienced organisations). Such learning processes are typically assumed to be path-dependent (Knudsen 1995: 144-145). Coriat/Dosi (1998: 111) stress that *'firms are behavioural entities embodying specific and relatively inertial competences, decision rules and internal governance structures, which, in the longer term, co-evolve with the*

environment in which they are embedded. The strength of norms, routines, corporate cultures resides precisely in their persistence and reproduction over time'. Knudsen criticises that the competence-based view did not explicitly deal with the question how the development of an organisation can be modelled as a continuous exchange between the latent competence level (*meaning system*) and the morphological or manifest organisation level (*action system*). That is, how can the knowledge perspective and the exchange perspective be united in one and the same model if the interplay is to be modelled as a cumulative process of growth (Knudsen 1995: 146). An adequate study of organisations requires a genetic and developmental approach, an emphasis on historical origins and growth stages. There is a need to see the enterprise as a whole and to see how it is transformed as new ways of dealing with a changing environment evolve (Selznick 1957: 141).

In social systems, blind evolution based on external selection is complemented by intended evolution, which depends basically on purposive behaviour and strategic choice. As far as the organisational decision-making is concerned, the problem is therefore first of all to build a common knowledge basis, a common language that enables communication and co-ordination. At the same time members of the organisation, who are involved in learning, do modify their own knowledge basis. Individual knowledge and organisational knowledge co-evolve through a process of mutual adaptation (Dosi/Marengo 1994: 169). The system builds an internal language, a common knowledge basis that adapts to and co-evolves with the information-processing capabilities of both the management and other decision units. To exploit a regularly changing environment, a large amount of knowledge about the environment is required: the organisational knowledge bases must distinguish between the states of the world and connect them diachronically. By partly *decentralising the acquisition of knowledge* about the environment, it is possible to achieve higher levels of sophistication in the organisational model of the world, provided the co-ordination mechanisms are powerful enough to enable the organisation to solve conflicts of representations (Ibid.). The decentralisation of knowledge acquisition can also be a source of loss when it is more effective for the organisation to rely on a robust set of routines. In the case of limited environmental changes, decentralisation of knowledge accumulation can disrupt organisational coherence around a robust set of routines. This requires strong co-ordination in order to make the entire organisation implement coherently such a set of robust routines and favours structures that integrate the accumulation of knowledge and emphasise horizontal co-ordination around a unique shared body of knowledge. A major consequence of this tension is the balancing of the duality 'exploitation vs. exploration' of knowledge in organisational learning (Ibid. 172). All the described demands resulting from intended evolution constitute central tasks of what is termed '*knowledge management*' in organisations. It represents the teleological motor in knowledge evolution. Two other motors frequently used in knowledge-based models are the dialectical motor and the

Darwinian motor of variation and selective retention. These three motors will be outlined explicitly.

Of course, knowledge may also be subject to life cycles, particularly in technology-related areas. The existence of such regular life cycle in knowledge reproduction in different industries or areas may have a significant impact on organisational form and transformation. However, in contrast to literature on technological change, life cycle motors are not explicitly integrated in knowledge-based models. In a way, they may be identified in the circular learning model (e.g., Probst et al. 2000) but do not appear explicitly in any study. The autopoietic reproduction of knowledge, which describes the cognitive process of learning itself by the processing of meaning on the basis of guiding differences still has not been adopted explicitly but is implicitly announcing its existence in the concepts of path-dependence and trajectories in the knowledge evolution independent of teleological influence. Both life cycle and autopoietic mechanism will not be outlined in detail due to the missing integration in knowledge-based models. Nonetheless, both mechanisms are essential in the observation of evolutionary processes and should not be excluded from future research.

3.1 Teleological motor: Knowledge management

Knowledge management may be conceived as the teleological motor in the evolution of knowledge-based social systems. Von Hayek argues that there is beyond question a body of very important but unorganised knowledge which cannot possibly be called scientific in the sense of knowledge of general rules: the knowledge of the particular circumstances of time and place. It is with respect to this contextual knowledge that practically every individual has some advantage over all others in that he or she possesses unique information of which beneficial use might be made, but which use can be made only if the decisions depending on it are left to him or are made with his active co-operation (von Hayek 1945: 521). As a consequence, we must show how a solution is produced by the interactions of people each possessing only partial knowledge. There is a consequent need for a process by which knowledge is constantly communicated and acquired (Ibid. 530). The task of strategic management from this perspective is organisation making – to create and maintain systems of shared meaning that facilitate organised action (Smircich/Stubbart 1985: 724). The overriding organisational design objective is creating a shared knowledge base and getting those involved in joint activities on the same wavelength. In heterogeneous firms, e.g. those that primarily grow through mergers and acquisitions as well as in the international context, this may be a very time-consuming process (Foss 2002: 159).

On a technical level, knowledge management is often described as sequential or circular information processing (Probst et al. 2000, Choo 1998). Three levels of needs and resources are common to all modes of organisational information processing:

cognitive, affective, and situational (Choo 1998: 236). Although an organisation processes information in the three modes of sense making, knowledge creating, and decision making, organisational knowing occurs when the three modes of information generation and use are linked together in a single, broader process by which the organisation socially constructs meaning (Choo 1998: 237). In order to facilitate the firm's evolution, Spender (1996: 58-59) proposes that interpretative flexibility, boundary management, identification of institutional influences, and the distinction between the systemic and componential aspects of an activity system are key heuristics for knowledge-based management and the key to operationalising a knowledge-based theory of the firm (Ibid.).

- **Knowledge management as intentional organisational learning**

The evolution of organisations described by Campbell (1960) may be described in the form of organisational learning. Organisational learning may be conceived as changes in the range of potential behaviours, or generally as changes in knowledge (Argote 1999: 16). Organisational learning means the process of improving actions through better knowledge and understanding (Fiol/Lyles 1985: 803). Organisational learning may be differentiated in 'cognition development' (meaning system) and 'behaviour development' (action system) (Ibid. 806). Learning hence may be located within the evolutionary interplay of meaning and action.

From an evolutionary perspective, learning may be conceived as an increase in the resonance capacity and self-complexity of a social system. Meaning structures are reproduced in a process of variation and selective retention. The social system derives these new properties from the generation and diffusion of sense within communication- and action-based feedback loops. Meaning structures, or knowledge assets in the terminology of the knowledge-based view, are the products of a learning process. It is important to note that learning can be as much competence destroying as it is competence enhancing. Unlearning as well as *learning* is required to drive a firm around the social learning cycle. How easily knowledge assets are dislodged is both a function of what they are embedded in as well as of the forces of codification, abstraction, and diffusion acting upon them at a given point (Boisot 1998: 268). Learning is a process of trial, feedback, and evaluation. If too many parameters are changed simultaneously, the ability to ascertain cause-effect relations is confounded because cognitive structures will not be formed and rates of learning diminish as a result (Teece et al. 1994: 17). *If something was totally new, we would be even unable to perceive and recognise it.* Learning and innovation are rooted in accumulated knowledge structures, which provide orientation and coherence. The rates and direction of learning are shaped by the internal norms of behaviour of individual organisation. Learning takes place in the space of 'representations' and cannot be reduced to mere information gathering (Dosi/Marengo 1994: 166-167).

Hitt et al. (1998: 37) stress the increasing value of *meta-learning*, which involves the simultaneous conceptualisation of different and contradictory forms of knowledge. On the other hand, the increasing ‘dynaxity’ (Kastner 1992) of the social environment increasingly impairs the perception of clear causal relations and thus of learning. As a consequence, ‘superstitious learning’ may occur when the subjective experience of learning is compelling, but the connections between actions and outcomes are misspecified (Levitt/March 1988: 325). For example, in an organisation that is invariantly successful, routines that are followed are associated with success and are reinforced; other routines are inhibited. This may happen even without an actual causal link between routine and success. Particularly in the intercultural context cause-and-effect explanations may often be misguided because of fundamentally different meaning structures in which actors are embedded. Actions or circumstances that an actor may even not be aware of may cause unexpected reactions from interaction partners. Such situations may constitute serious obstacles to the globalisation process of organisations.

- **Levels of learning**

Learning is a process, taking place in cognitive systems, i.e. individual actors. Social learning hence depends on the interplay of different individuals. As Simon (1991: 125) notes: *‘All learning takes place inside individual human heads; an organization learns in only two ways: (a) by the learning of its members, or (b) by ingesting new members who have knowledge the organisation didn’t previously have. But what is stored in any one head in an organisation may not be unrelated to what is stored in other heads; and the relation between those two (and other) stores may have a great bearing on how the organization operates’*.

In a process of intersubjective sense making, individuals seek cognitive congruence in their social interactions (Sanchez 2001: 12). Merali (2001: 41) emphasises the importance of the achievement of congruence in the cumulative action-perception cycles that underpin transformative processes in organisations. From this perspective, organisations that are good in learning from their experience continually renew their perceptions of their competitive context and their organisational capabilities through their experience in undertaking action in that context. Intersubjective sense making is seen as the key mechanism for maintaining congruence between the actions and perceptions of the action-perception cycle (Ibid.)

However, in a multiactor setting, learning requires the co-ordination of the individual learning processes, each based on a different set of representations. This multiplicity of representations raises the problem of co-ordination in organisational learning but may also be a source of learning if the variety of organisational knowledge can be exploited. On the one hand, co-ordination benefits from a large and consistent ‘shared

representation'; on the other, commonality of knowledge reduces the scope for learning from diversity (Dosi/Marengo 1994: 166-168).

Connerton (1989) argues that social memory, such as an organisation's culture, is largely collective, implicit, articulated, conveyed in and reconstituted through its social practices. Applying the *Vygotskian learning theory* to the organisation, Spender (1998: 428) contends that it is the collective activity-based knowledge that supports the objective rational reasoning. The key to managing the process of implicit learning lies in generating directed activity. In the case of collective knowledge, the learning depends on face-to-face interaction. The geography of collective knowledge then is determined by the geography of personal interaction (Ibid. 429). Internationally operating firms therefore have to ensure that the geographically dispersed units build and reproduce a consensual domain based on a *core of collective knowledge* that is communicated by personal interaction. Self-similar management practices can be an effective way to simplify management throughout the company at the same time that local variety grows. If all managers use the same terminology for knowledge creation, communication among people from different business units and countries will be much easier (von Krogh et al. 2000: 222). Perhaps the only way to achieve the shared understanding of knowledge creation in a large corporation is through overall company training programs (Ibid. 223), indicating the intensity and costs a comprehensive knowledge management may require.

With regard to the evolutionary interplay between an organisation and its environment, Merali (2001: 43) contends that the prevailing 'wisdom of action' in an organisation is concerned with maintaining congruence between an organisation's identity and its external spatio-temporal context. The organisation's sense of identity grows out of the interactions between a body of implicit practices and its environment. The tacitness of much collective knowledge has two tremendous impacts. *First*, learning tends to develop cumulatively and to follow specific path-dependent trajectories. The accumulated competencies and routines are not always consciously chosen among alternatives but basically evolve through incremental steps of trial and error. The learning path may open some and close other options for future developments. Since learning is cumulative, the capacity for learning depends on the complexity of what has already been learned. *Second*, competencies to develop, absorb, and use knowledge are differentiated between firms and locations. The diversity of variability in learning trajectories followed by firms means that the competencies and routines accumulated by each firm tend to be highly differentiated.

3.2 Evolutionary motor of knowledge reproduction

In contrast to biological systems, social systems dispose of means for intentional variation, selection, and retention. For example, as early as 1939, Schumpeter (1939) proposed a taxonomy of technological change based on three stages: invention,

innovation, and diffusion. These stages resemble the described evolutionary process of variation, selection, and retention. *Variation* may be generated internally (e.g. invention) or externally (e.g. adoption of knowledge). *Selection* can be differentiated in *external selection* (e.g. by the market) and *internal selection* (decision-making). *Retention* takes place as *codification* and *diffusion*, or generally as *institutionalisation*. From a rational management perspective it is also termed *implementation*.

3.2.1 Variation: Knowledge creation and adoption

Variation in the knowledge structures of organisations may take the form of internal and co-operative knowledge creation or knowledge adoption from external sources. Important insights on the latter mechanism have been described explicitly within the realm of isomorphism as explained by institutionalisation theory. On the operational level, knowledge adoption plays a major role in studies on benchmarking and business process reengineering within management literature. In theory, knowledge creation is a subject basically in literature on innovation and technological change, much less within organisation theory. On the operational level, knowledge creation is an important subject in strategy, human resource management (creativity, motivation), and, of course, in knowledge management.

There are several ways of explaining the emergence of a new pattern of competencies or capabilities (Fujimoto 1998: 19): a) random trials; b) rational calculation; c) environmental constraints; d) entrepreneurial vision; e) knowledge transfer. Selection environments affect firms' incentives to augment capabilities and to develop specific competencies (Teece et al. 1990: 18). Within the global context, considerable evidence suggests that there are differences in the approach to competence creation taken by firms from different national cultures. Four of the most frequently mentioned are:

- Processes which underlie the basic purposes for which economic activity is undertaken and the results which are sought;
- time horizons within which goals are to be achieved;
- the urgency with which activities are undertaken;
- the way in which organisations are designed to produce objectives (McGrath et al. 1995: 84).

Due to globalisation dynamics, economic success depends increasingly on companies' capability to innovate rapidly and to develop continuously new products that meet market demands. This capability depends on the learning capabilities. Global innovation competition can be seen as the key driving force behind the new developments that are likely to enlarge the learning capability of companies and thus increase and accelerate companies' innovation activities. These new developments include a change in the nature of work, the introduction of new organisational forms, the increasing application of information technology and a growing investment in

human resources (Schienstock 2001: 164). Building networks of innovation with other firms has become increasingly important for competence building, which has in turn an increasingly collective effort, reflecting the co-operation and networking between formally separate firms (Lundvall 2001: 278).

In almost all cases of innovation, the successful commercialisation of an innovation requires that the know-how in question be utilised in conjunction with other, complementary capabilities or assets (Teece 1986: 288). The ownership of complementary assets - particular when they are specialised or co-specialised - help establish who wins and who loses from innovation. Imitators can often outperform innovators if they are better positioned with respect to critical complementary assets (Teece 1986: 304). Teece (1987: 189) suggests that according to the dominant design paradigm, innovators and first movers have great advantages in profitability. The contrary is true, when such innovations are easy to copy. Generally, successful commercialisation of an innovation - which generally is based on know-how that is partly codified and partly tacit - requires that the know-how in question be utilised in conjunction with other capabilities or assets, i.e. complementary assets (Ibid. 191).

Firms in dynamic industries, such as high-technology firms, are increasingly characterised by 'semi-permeable boundaries' in hybrid organisational arrangements. For example, many firms have access to their partners' internal information systems through electronic mail networks. This facilitates communication and work in joint development projects. Employees may become a temporary employee of the partner for a limited period of time – forging crucial relationships and gaining access to vital information about the partner's culture and modus operandi Bahrami (1996: 66). Bahrami contends that the resulting organisational systems can be best depicted as 'bi-modal' – in that they accommodate opposing tendencies and yet function as coherent and cohesive concerns. Signs of bi-modality were commonly observed in broaching three types of tension: centralisation versus decentralisation, stability versus change, and uniformity versus diversity (Ibid. 67).

Firms in dynamic industries need flexible organisational systems, which can *balance dialectical forces* – facilitating creativity, innovation, and speed, while instilling co-ordination, focus and control, and the staying power to withstand periods of adversity. In a study of Bahrami (Ibid. 57, 60), many firms proved to be both structured and yet chaotic; they had evolved dualistic organisational systems, designed to strike a dynamic balance between stability on the one hand, and flexibility on the other. While 'bedrock structures' are quite stable and subject to inertial forces, many firms compensate this relative inflexibility by using overlays of temporary project teams and multi-functional groups (Ibid. 61). The coherence of diverse actors, capabilities, and assets is particularly important in a temporal perspective. Organisational actors need to develop a feeling for direction. Particularly the signals individuals receive

about the expectations for innovation play a role in activating or inhibiting innovation (Kanter 1996: 103).

Continuous innovation in dynamically-competitive environments tends to be the result of the development and extension of a continuing core of capabilities rather than the constant creation of new capabilities (Grant 1996: 382). Important for successful innovation from a temporal perspective is hence the 'flow' of innovation. Innovation is best cultivated in organisations where the growth rhythm of innovation is well understood (Kanter 1996: 125).

- **Innovation in the global context**

Internationalisation itself may be conceived as an entrepreneurial and innovative process. *Knowledge-based networks* enable these firms to manage the flow of knowledge and shape technological trajectories, remain flexible, and widen the knowledge base (Mytelka 2001: 140-141).

According to Nohria/Ghoshal (1997: 12-15), MNE's structure as a differentiated network involves directing attention to four key features. The *first* is the distribution of resources among various national organisational units that can be viewed as nodes in this multinational network. The *second* structural feature is the nature of various headquarter-subsidiary relations. As in federative networks, the structural arrangements and degree of control the head office exercises over each subsidiary may vary significantly. The *third* structural feature is the extent to which the various subsidiaries are normatively integrated through various socialisation mechanisms. This structural dimension focuses on the degree of organic solidarity and shared values that bind together the different organisational components of the network. The *fourth* important feature is the communication flows that animate the network.

The four distinct features of MNEs are also supposed to be the major factors that influence an MNE's capacity to foster *distributed innovation*. The main leverage is assumed to lie in enhancing the communication densities within and across the organisation's internal and external boundaries (Nohria/Ghoshal 1997: 89). MNEs must maximise their 'combinative capacity' (Kogut/Zander 1992) – the ability to generate innovative combinations based on knowledge and capabilities distributed throughout the multinational system (Nohria/Ghoshal 1997: 23). As environmental demands evolve over time, managers need to adopt a dynamic view of their organisational capabilities (Ibid. 190).

Nohria/Ghoshal (1997: 47) assume that the distribution of assets and slack resources within an MNE significantly influences its innovative potential. An empirical study by the authors provided evidence that the more widely distributed the slack resources, the more likely it is that innovation would be created throughout the MNE. The

authors assume that the *effect of organisational slack on innovation is inverse U-shaped*. Organisational slack is expected to encourage experimentation and the initiation of projects while it also encourages complacency and discourages discipline (Ibid. 57, 63-64).

Information is transformed whenever it is transferred, and information interpretation requires the development and use of a mutually validated grammar for creating meaning out of ambiguous and equivocal information. It is in creating this shared meaning system that the networking mechanisms and organisational processes may play a vital role. It is plausible that the information flows that formal structure attempts to induce can actually function properly only when the lateral processes needed for interpretation are also in place (Nohria/Ghoshal 1997: 148). *In MNEs, interpersonal networks are vital* because they serve as the glue that holds these vast geographically dispersed and internally differentiated organisations together. Interpersonal links act as integrative mechanisms because they are conduits for information exchange. They build trust and shared values Nohria/Ghoshal (1997: 151).

Unlike large MNEs, small domestic firms are *less likely to dispose of the relevant assets*. They have to either build them up or develop coalitions with owners of the specialised assets (Teece 1987: 212). Similarly, systemic innovations are supposed to be best appropriated by large, integrated organisations, whereas small entrepreneurial firms are most effective in the exploitation of autonomous and more radical innovation (Murray/Worren 2001: 140, 142). Contrary to this traditional wisdom, global co-operations and networks of SMEs increasingly drive innovation on global scale and trigger change in many industries. Particularly information and communication technologies (ICT) have an important impact on the development of such global interorganisational networks.

3.2.2 Selection

Selection means a differential elimination of certain types of variations. External selection is caused by forces external to an organisation that affect its routines and competencies, and structures. *Contingency theory* gives an overview over external and internal influences determining organisational traits. *Institutionalisation theory* explains organisational mechanisms, which lead to the institutionalisation of new or copied traits. *Population ecology* provides valuable insights about the external selection and the evolution of comps. In contrast to the ecologist perspective, internal selection is driven by forces internal to an organisation affecting the same traits (Aldrich 1999: 26-30), but subject to intentional selection. Intentional selection in organisations takes the form of rational choice, or, as a process, of decision-making.

Within the globalisation process, organisations belong to the most influential actors, bundling the activities of up to several hundred thousands of individuals. MNEs constitute the largest economic organisations, spanning national, regional, cultural, and religious boundaries and may be termed ‘global selection regimes’. MNEs have reached the maximum, worldwide extension. They dispose of the necessary variety to organise global production and exchange processes and to co-ordinate activities of globally–dispersed actors.

Within a firm a hierarchy, decision-making is subject to centralisation and thus may work as a mechanism of allopoietic organisation between hierarchical levels. On the system level, decision-making is also the core mechanism of intended evolution within the autopoietic and thus intrinsic organisation of social systems. Decision-making selects expectations and thus both provides expectations with structural value and transforms meaning into action. In this context, decision-making in the production and organisational capabilities in the reproduction of organisational meaning and action may be regarded as ‘conveyor belts’ between the two system levels. For example, Iansiti/Clark (1994) conceive the integration of action and knowledge level by organisational capabilities and problem solving activities as the key dynamic capability. Of course, this process is increasingly complex within globally operating organisations and central to intended, intrinsic selection.

As there is no guarantee for perfect rational choice, organisations have to maximise the probability of meaningful behaviour by facilitating rational planning, incremental development, and creative mixtures in the garbage can. *‘Organisations thus may integrate both intended and emergent processes in decision-making and strategy formulation’* (Huber/McDaniel 1986: 579).

The increasing dynamic and complexity induced by globalisation causes new challenges for organisational decision making as formal planning encounters limits and selection requirements call for more symbiotic solutions. In fact, decision-making comes closer to organisational transformation itself. The difference between decision-making on the level of the meaning system and the implementation of chosen alternatives on the level of the action system has become too inflexible. Action and meaning generation have become more closely interwoven within the described process of ‘liquefaction’ characterising the inter- and intraorganisational world. Generation and selection of new meaning is more closely linked to organisational ‘morphing’ itself.

Empirical studies by Bourgeois/Eisenhardt (1988) and Eisenhardt (1989) provided evidence that within such a turbulent environment, *selection by decision-making* is particularly influenced by *dynamics*. The studies showed that successful executive teams in successful firms make fast decisions, using extensive information within

their decision-making processes. In contrast to less successful firms, information is processed on a real-time basis. Another characteristic of successful firms proved to be the simultaneous generation of alternatives, i.e. of variety. The advantage of this behaviour is a more intensive comparison of strengths and weaknesses of the alternatives and a reduction of the escalation of commitment to any one option. The pursuit of multiple options reduces the psychological stake in any one alternative and allows for a quick shift between positions in case of unexpected feedback. It facilitates the option to include or substitute for elements of different alternatives depending on the situational development (Bourgeois/Eisenhardt 1988: 826-31, Eisenhardt 1989: 549, 558). In the extreme case, hidden options provided by such strategic variety might even become the main alternatives. In general, a larger pool of strategic options provides more evolutionary capacity. A higher capacity of experimentation and conflict resolution increases the speed of decision-making and supports a broader and more differentiated decision-making fundament.

A globally operating organisation must have greater adaptive capabilities. It must be able to process and sort out a larger number of environmental complexities. It must also have the capability of detecting shifts in environmental factors that have strategic implications and be capable of responding strategically to the altered environmental state (Jones et al. 1992: 223). Firms from different cultural backgrounds seem to cope with these requirements quite differently. When consensually agreed upon, well-defined standards are available for evaluation; decision-making outcomes will be based on those standards. Conversely, in absence of such criteria, processes of social influence will account for more of the variance of decision outcomes. Particularistic criteria derived from social familiarity and social influence will be used more in decision-making under conditions of uncertainty (Pfeffer et al. 1976: 227-228). To the extent decision outcomes are consequential, as in the allocation of critical or scarce resources, there is more incentive for participants to use social influence and social relationships to affect decision outcomes (Ibid. 242).

3.2.3 Retention

In the retention phase, new and positively selected knowledge is stored within the meaning structure and eventually implemented on the action level. On the level of meaning - or, from the knowledge-based view - on the level of knowledge, we have to address two basic mechanisms of knowledge retention: codification and diffusion.

- **Codification**

Codification on the level of information and knowledge may be conceived as a kind of formalisation and serves to co-ordinate the activities of different organisational actors. Routines and activity patterns may be standardised this way. Codification may be conceived as an instrument of institutionalisation and thus of the diffusion and

retention of knowledge. Codification provides standards, e.g. for the transfer of best practices, and keeps the firm from reinventing the wheel again and again.

The increasing ways of codifying knowledge – especially by information and communication technologies – thus contribute to enhancing the generation of knowledge externalities (Cohendet/Joly 2001: 69). Information technology and the new economy have a contradictory impact on the codification of knowledge. On the one hand, it makes it less costly to codify knowledge and in some areas also much more attractive to do so. On the other hand, the use of information and communication technology has its major impact that it speeds up change and it increases complexity of the knowledge base. Tacit knowledge therefore becomes more valuable as it is helpful in locating, selecting, and using information, providing a frame of reference for change processes (Lundvall 2001: 276).

In general, an increasing degree of codification allows for an increasing degree of retention and thus for an increase of organisational complexity. On the other hand, an increase in the capacity for variation and selection increases organisations' capability for change.

- **Diffusion**

Positively selected variations - such as innovations – deliver the raw material for the successful exploitation of the competitive advantages they may provide. Conceição/Heitor (2001: 88) contend that *'the mere production of skills and ideas is well rewarded economically ... However the substantial gains in wealth and knowledge generation are to be found in the usage and diffusion of knowledge'*.

The ability to transfer best practices internally is critical to a firm's ability to build competitive advantage through the appropriation of rents from scarce internal knowledge. Contrary to conventional wisdom that blames primarily motivational factors, a study by Szulanski (1996) provides evidence that the major barriers to internal knowledge transfer are knowledge-related factors. These factors determine the 'internal stickiness' of knowledge. The notion of internal stickiness connotes the difficulty of transferring knowledge within the organisation (Ibid. 29).

Information and knowledge, or what Soete (2001: 26) calls the new dimension of the process of globalisation, refer in the first instance to the intangible part in the fabric of international relations and transactions, based primarily on the internationalisation of information and knowledge. Being intangible, these transactions no longer only reflect the financial counterpart of the real trade and investment flows but include now a variety of transactions some of which do not in the balance of payments. These international intangible exchanges affect in very different ways the dynamics of trade and FDI flows. The common denominator is the widespread use of information and

communication technologies. Giving an example of the ambiguous effects these new technologies cause in the diffusion of knowledge, Wigand et al. (1997: 330) describe the emerging 'media paradox', meaning that decentralisation, linking, and internationalisation go hand in hand with increased travel activities and intensified use of telecommunication media among management. As knowledge is context-dependent, the transfer of knowledge has to be accompanied by the transfer of contextual information in order to ensure an adequate understanding. This also demands for the choice of adequate forms of communication. On the organisational level, interaction and the construction of a common filter of perception facilitate interpretation (Bendt 2000: 174).

The transfer of complex knowledge may also call for transfer loops and the use of 'rich' communication media. Richness is the medium's capacity to change understanding. According to this perspective, face-to-face interaction is the richest medium, followed by videophone and video-conferencing, telephone, electronic mail, personally addressed documents, and unaddressed documents.

Media richness and organisational climate are particularly important in cross-cultural communication as a message suffers from both the lack of exact translation and loss of meaning when it is decoded in another culture. The source uses a particular cognitive framework consisting of categories and their associations, organised into schemata that have affect attached to them, forming values, attitudes, expectations, norms, roles, and reflecting unstated assumption, all embedded in a social context. These are elements of subjective culture and they shape the encoding of the message. When the message gets to the other country the local elements of subjective culture shape the decoding (Triandis/Albert 1987: 265).

In addition, knowledge being created around the globe is not migratory because it is highly embedded in complex social interactions and team relationships within organisations. Lam (1997: 975) argues that the problems of knowledge sharing and transfer within the global context are amplified because of the greater diversity of knowledge and organisational systems and their socially embedded nature. Incompatibility in the knowledge structures and work systems between partner firms can generate many difficulties and conflicts in joint work. The different degree of tacitness of knowledge can also cause asymmetry in knowledge transfer.

Subramaniam/Venkatraman (1999: 374) contend that not much is understood about how organisations leverage knowledge across borders to create competitive advantage. An empirical study by the authors provides evidence that leveraging tacit knowledge significantly influences a firm's global new product development capability. This is facilitated by rich information-processing mechanisms (Ibid. 390). The study further confirms that those firms that effectively leverage knowledge

regarding tacit differences among countries – or knowledge that is difficult for others to acquire and leverage – are more likely to possess greater global new product development capabilities. By leveraging tacit overseas knowledge, organisations can use the global new product development process to build rare and difficult-to-imitate resources that produce competitive advantage (Ibid. 391).

3.3 Dialectical knowledge reproduction

Globalisation is by no means a linear, unidirectional trend, but rather forms a part of a contradictory development, both economically and politically (Genosko 1997: 295). The characteristics of the globalisation process have important implications for knowledge management in MNEs. One main aspect lies in the dialectical character of this evolutionary process. A fundamental building block of learning is recognising and integrating differences: the greater the differences, the greater the challenge and the opportunity (Tienessen et al. 1997: 391).

In terms of the evolutionary social systems theory, meaning-based systems reproduce themselves by processing meaning according to guiding differences. Nonaka et al. (2000:7) propose a similar argument from the knowledge-based view. In this view, knowledge is recursively reproduced, going through two seemingly antithetical concepts such as order and chaos, micro and macro, part and whole, mind and body, tacit and explicit, self and other, deduction and induction, and creativity and control (Ibid.). Nonaka et al. argue that the key in leading the knowledge-creating process is dialectical thinking, which transcends and synthesises such contradictions (Ibid.). Nonaka/Takeuchi (1995: 236) emphasise that the starting point toward building a conversion is to recognise the need to transcend beyond dichotomies. As an example, Nystrom/Starbuck (1984: 56) contend that the Chinese exhibited great wisdom when they formed the symbol for crises by combining the symbols for danger and opportunity. On the contrary, Western thinking is generally assumed to be dominated by a dichotomous worldview, which may be traced back to Cartesian dualism or split (Nystrom/Starbuck 1984: 56).

On balance, the dialectical view on knowledge evolution is still underdeveloped although research in the field of multinational networks shows that the choice of basic dualities like “global integration vs. local adaptation” may provide valuable perspectives in the observation of global organisational evolution.

Conclusions

The knowledge-based view of management provides a rich tool kit for the conceptualisation and description of evolution on the level of the meaning system. A broad variety of knowledge-related properties of organisations and organisational facilitators offer concepts for the conceptualisation and operationalisation of the firm’s meaning system from a rational, allopoietic perspective. Other levels of

meaning, which are more tied to the level of emotions, motivations, interpretations, or expectations are not explicitly included in this canon of concepts and may appear as a residual in the category of '*implicit*' knowledge. However, these meaning levels may be increasingly complemented in future research in order to complete the scope of meaning systems described by the knowledge-based approach. A further strength of the knowledge-based view is that a link between the meaning and the action system is facilitated by a couple of concepts such as capabilities, routines, communities of practice, or absorptive capacity. Even the learning process is often described as being structurally linked in an interplay with action, e.g. learning-by-doing and thus corresponds with evolutionary and system-based approaches. Its already eclectic character allows for the integration of concepts from complementary theories, which may provide more theoretical scope and rigour to the main pillars of the knowledge-based view.

From a dynamic perspective, the knowledge-based view is dominated by teleological mechanisms, which are typical for a management point of view. The main question followed by most studies therefore is how knowledge can be intentionally managed by processes of learning. The knowledge-based view differentiates levels of learning, learning strategies, and learning processes. These concepts offer instruments for knowledge management. In recent years, dynamics are also increasingly observed in terms of VSR and dialectical mechanisms. Particularly the path-dependent character of learning processes may be supported by also integrating the autopoietic motor in knowledge evolution.

On the level of international management, the knowledge-based view does not only offer the possibility to apply dynamic concepts to the global level (e.g. global diffusion of best practices) but also provides valuable contributions to internationalisation and global network perspectives. Internationalisation has already been described as a learning process by the learning-based stage model. Internationalisation may be conceived as an extension and differentiation of the meaning or knowledge system to the global level. FDI may be conceived as the extension of the firm-specific knowledge base to other countries and internalisation of foreign firms as the internalisation of foreign knowledge. On the level of global networks, MNEs may be conceived as global learning networks with all properties and processes differentiated on global level. Increasingly, global networks of SMEs develop and operate on the basis of ICT so that knowledge management increasingly becomes an interorganisational issue on global level. The study of such phenomena therefore calls for the development and application of theories that provide instruments independent of organisational and national or cultural boundaries.

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