



TECHNOLOGY, INNOVATION AND KNOWLEDGE TRANSFER: A VALUE CHAIN PERSPECTIVE

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ABSTRACT

Technologies in the Fourth Industrial Revolution blur the lines between the physical, digital and economic field across national boundaries. Knowledge, innovation and technology produce economy for countries. Society would benefit from a clear understanding of the contemporary state of technology readiness and adoption, and their converging impact and value on the factory floor, firms, industries, society. Scholars demonstrated that technology, innovation and knowledge play a significant role in value creation. Even though few research has been carried out, no studies have been found explaining how owners would manage innovation and knowledge vision and turning them successfully into organizational performance by creating values. Therefore, in this paper the authors are stating about the research problem of not understanding the process. Knowledge is that which is known, by its very nature it depends on thought and it is also transferred by thought, thought and behaviour both based on values. Transfer of knowledge is understood as moving of knowledge from lower to higher agency levels in explicit or tacit form. Moreover, the innovation lens captures the perspective of value creation.

The main purpose to develop a better understanding has reached, also a view towards generating discussion and debate in this important research area. Practically in order to transfer knowledge there is a need for proficient owners. A future development will be a cross-national research, involving action research strategy which offers a unique opportunity to bridge the large and growing divide between the vast majority of research that is conducted and the usefulness of that research for organizations.

Keywords: Technology, Organizational performance, Knowledge transfer, Supply Chain, Value creation

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1. INTRODUCTION

“Products are physical manifestations of knowledge, and their worth largely, if not entirely, depends on the value of the knowledge they embody.”

Dorothy Leonard

The principal component of value creation (Wahl, 2011, 2012), productivity and economic growth is knowledge. Drucker (1993) argued that, in the, knowledge society, the basic economic resource is no longer capital, natural resources or labour but is, and will be, knowledge (Drucker, 1993). The knowledge-based theory of the firm (Kogut & Zander, 1992) considers knowledge as the most strategically significant resource of the firm. Knowledge transfer is currently receiving considerable attention, from both academics and practitioners of corporate governance. Knowledge transfer embodying comprehensive learning, reflected in the changes in the strategic thinking, culture, and problem-solving techniques used by a firm (Grant, 1996). The prominence of small groups, often temporary, in innovation indicates that this is the level at which much of knowledge transfer and learning take place (Hedlund, 1994). The transfer of knowledge can also be accomplished through individuals, for instance simply by movement of individuals between various organizational locations and such mechanism is efficient since it allows both the transfer of tacit and as well as explicit knowledge (Almeida & Kogut, 1999). A deeper understanding of the knowledge transfer process requires a multi-level and multi-disciplinary approach.

Most of the global problems involve multilevel approaches, yet most of the research uses a single level of analysis. Multilevel research addresses the levels of theory, measurement, and analysis required to fully examine research questions. Far too little attention has been paid to multiple levels of analysis, and interdisciplinary research (Aguilera & Jackson, 2010). Knowledge transfer is inexpensive and actors within the group have a sufficiently overriding commonly valued purpose (Nickerson & Zenger, 2004). An issue concerns the linkage between innovation, knowledge transfer and values. If the primary resource of the firm is knowledge, if knowledge is owned by employees, if most of this knowledge can only be exercised by the individuals who possess it, then the theoretical foundations of the shareholder value approach are challenged. Lack of clear property rights results in ambiguity over the ownership of knowledge. (Grant, 1996) However, the ‘enlightened shareholder value’ approach represents an attempt to strike a balance between innovation and knowledge (Andreadakis, 2011).

On the other hand, Baregheh, Rowley and Sambrook (2009) collected as many as sixty definitions of innovation published from 1934, relating to several disciplines (business and management, innovation and entrepreneurship, and technology, science and engineering).

It is obvious that enlightened, proficient ultimate owners know what performance they want to have from the company in the long run – diverse personal, social, political, and economic values, succeeding in a dynamic business environment only if they invest those same values (Wahl, 2011, 2012; Banerjee & Wahl, 2016). The role of owners and top management in articulating the organisation’s knowledge vision (Wahl, 2015b) is

emphasised, as is the important role of middle management (knowledge producers) in energising *ba* (Nonaka, Toyama, & Konno, 2000).

Although some research has been carried out on importance of understanding and predicting both individual and group behaviour and identifying methods in which behaviour can be modified or changed (Bandura, 1986), how organisations actually create and manage knowledge and innovation dynamically (Nonaka, Toyama, & Konno, 2000), how knowledge is transferred across national boundaries (Carlile, 2002, 2004; Wang & Fagerlin, 2013), also understanding the owners' role and behaviour on individual, firm and societal levels (Wahl, 2011, 2012), no studies have been found which explaining how owners' constructing a knowledge vision and innovation and turning it successfully into organizational performance by capturing values. Therefore, the authors are stating the research problem of not understanding the process of knowledge and innovation transfer across national boundaries, and asking three related research questions.

RQ 1: How are technology, innovation and knowledge transferred across national boundaries?

RQ 2: How to operationalize the relationships between owners, what are the general and significant attributes and their dimensions?

The main aim of this paper is to solve the stated problem, and develop a better understanding about technology, knowledge and innovation, knowledge transfer – behaviour, and knowledge vision. It builds on the interplay between explicit and tacit knowledge at different levels of analysis: the individual, the network, the small group, the firm, task, and the society domain.

The present paper is organised as follows. Section 2, "Theoretical framework: Knowledge, knowledge assets, knowledge transfer and innovation" begins by defining the key constructs that underscore the process of knowledge and innovation transfer from a holistic perspective. Relevant theories and evidence relating to the constructs are reviewed. Section 3, "Discussion: Understanding the process of knowledge transfer across national boundaries" presents the model of knowledge transfer and operationalizing the relationships between owners. Hypotheses are tested against empirical ownership data. Section 4, "Conclusions and recommendations," concludes the paper with a summary of contributions and future research.

2. THEORETICAL FRAMEWORK

1. Knowledge is that which is known

Here reviewing the state of the art relevant to the problem and presenting the major ideas. In terms of defining knowledge offers Grant (1996) a simple tautology that knowledge is that which is known. Other sees knowledge as the act of having a clear and justifiable grasp of what is so or of how to do something. Here is knowledge based on understanding or skill, which in turn are based on thought, study, and experience. Knowledge is a justified true belief, a dynamic human process of justifying personal belief toward the truth (Nonaka & Takeuchi, 1995) to reflect the context in which knowledge exists. Western epistemology has traditionally viewed knowledge as explicit, where truthfulness is the essential attribute of knowledge (Nonaka, Toyama, & Konno, 2000).

The literature has clearly recognized the epistemological distinction between knowing how (implicit or tacit knowledge) and knowing about facts and theories (explicit knowledge) which is captured by distinctions between subjective vs. objective knowledge, personal vs. propositional knowledge, and procedural (tacit) vs. declarative (explicit) knowledge (Grant, 1996). The ontological dimension ranges from the individual at one end of the range and

moves from there to team, group, organization and beyond. “A spiral emerges when the interaction between tacit and explicit knowledge is elevated dynamically from a lower ontological level to higher levels” (Nonaka & Takeuchi, 1995, p. 57). Knowledge is created in the spiral that goes 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; the key in leading the knowledge-creating process is dialectical thinking, which transcends and synthesises such contradictions (Nonaka, Toyama, & Konno, 2000).

Explicit knowledge is objective and rational knowledge that can be expressed in words, sentences, numbers, or formulas (context-free), involving theoretical approach, problem-solving, manuals, and database (Nonaka, 1994). It is systematic and articulated (verbally or in writing) knowledge which is easily communicated in the form of codified procedures, computer programs, patents, drawings etc. This kind of knowledge can thus be transmitted across individuals formally and easily (Pan & Scarbrough, 1999). Easily transferred, and used to share through low-information-richness mechanisms (e.g. post, e-mail, manuals). Explicit knowledge can be coded (theoretical knowledge) in writing or symbols. But only a small part of our knowledge is explicit; “we can know more than we can tell” (Polanyi, 1966, p. 4), he explains the importance of tacit knowledge with the following example: „You can identify one face out of thousands, but it is nearly impossible to give an adequate description of this face to another person, so that she is able to identify the face.” Explicit knowledge has the character of a public good (with the exception of patents or copyrights) (Osterloh & Frey, 2000).

Tacit knowledge is context-specific, subjective and experiential knowledge that cannot be expressed in words, sentences, numbers, or formulas (Nonaka, 1994). It is personalized knowledge (stored within individuals, developed through action) that is hard to formalize and communicate and deeply rooted in action, commitment and involvement in context (Polanyi, 1966). It cannot be codified and can only be observed through its application and acquired through practice, its transfer between people is slow, costly, and uncertain (Kogut & Zander, 1992). It involves intangible factors embodied in personal beliefs, experiences, and values, and is therefore difficult to exploit organizationally, even clearly articulated, because appropriate knowledge from someone else means having a shared code or mental model that enables the other to understand and accept that knowledge (Pan & Scarbrough, 1999). Beliefs are ideas about how true it is that things are related in particular ways. Unlike values, beliefs refer to the subjective probability that a relationship is true, not to the importance of goals as guiding principles in life. (Schwartz, 2012) Cognitive skills (beliefs, images, perspectives, mental models), and technical skills (craft, know-how) (Nonaka, 1994) are involved.

A practical view of knowledge is that tacit and explicit knowledge are not absolute opposites, but that they form a spectrum and understanding them is best archived at the extremes of the spectrum (Botha, Kourie, & Snyman, 2008), and this distinction should not be understood as a dichotomy but rather as a continuum (Zander & Kogut, 1995). Polanyi (1966) argues that the sharp distinction between tacit and explicit knowledge does not exist and that “all knowledge is either tacit or rooted in tacit knowledge!” (Polanyi, 1966, p. 7). Even if knowledge has been articulated into words or mathematical formulae, this explicit knowledge must rely on being tacitly understood and applied. Polanyi (1966) also argues that every aspect of knowledge, including explicit dimensions, is accrued over time. In a strict sense, tacit knowledge is inherently non-transferable but it becomes explicit once it is transformed. Tacit knowledge is an indispensable component of explicit knowledge. (Polanyi, 1966) The critical distinction between the two dimensions of knowledge lies in transferability and the mechanisms for transfer across individuals, across space, and across time (Grant, 1996).

Knowledge, by its very nature, depends on thought; it is produced, analysed, comprehended, organised, evaluated, maintained, and transformed by thought. Knowledge can be acquired only through thought. Knowledge exists, properly speaking only in minds that have comprehended and justified it through thought. (Paul & Elder, 2002) This is embrained and embodied knowledge. Embrained knowledge is “formal, abstract or theoretical knowledge,” such as scientific knowledge. Embodied knowledge, is based on practical experience and is applicable only in certain situations. (Lam, 2000) Practical knowledge (highest form of knowledge) or „know how“ has always been important, as it remains open to the lenses offered by new experience (Kakabadse, Kakabadse, & Kouzmin, 2003). Thought, human life, and action are based on human values (Paul & Elder, 2002). Knowledge has the active and subjective nature represented by such terms as commitment and belief that is deeply rooted in individuals“ value systems (Nonaka, Toyama, & Konno, 2000). The Schwartz (1992) theory of basic values defines ten broad basic values (self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism) according to the motivation that underlies each of them. These values are likely to be universal because they are grounded on one or more of three universal requirements of human existence that they help to cope with: needs of individuals as biological organisms, requisites of coordinated social interaction, and survival and welfare needs of groups. (Schwartz, 1992)

The role of the individual as the primary actor in knowledge creation and the principal repository of knowledge are essential to piercing the veil of organizational knowledge and clarifying the role of organizations in the creation and application of knowledge (Grant, 1996). While most explicit knowledge and all tacit knowledge are stored within individuals, much of this knowledge is created within the firm and is firm specific, this „organizational knowledge“ is created through the interactions of individuals (Grant, 1996). Knowledge resides not only at the individual level. From a social perspective, knowledge is also understood as constructed in the spaces between people or institutions and organisations. Working with knowledge in this sense means appreciating knowledge as a practice rather than a possession (Cook & Brown, 1999), negotiated and co-constructed, and produced through communities of practice. Communities of practice accumulate and develop new information through the sharing of knowledge (Nonaka, 1994). Organizational knowledge needs to be seen as inscribed in conversations and social interactions within communities rather than as a resource that is disseminated from sender to receiver. This view has been recognized by a number of earlier works (e.g. sense-making, communities of practice, story-telling, communities of knowing). (Pan & Scarbrough, 1999)

Explicit, tacit, individual and group knowledge are distinct forms of knowledge, each doing work the others cannot. While individuals possess part of what is known about a given domain, a body of knowledge is possessed by the organization and is drawn on in its actions, just as knowledge possessed by an individual is drawn on in his or her actions. (Nonaka, 1994) However, at the collective level exists encoded knowledge which is information that is “codified and stored in blueprints, recipes, written rules and procedures”, and embedded knowledge as the “collective form of tacit knowledge residing in organizational routines and shared norms”. (Lam, 2000)

Routines are defined as behaviour that is learned, highly patterned, repetitious or quasi-repetitious, founded in part in tacit knowledge (Winter, 2003). Organizations are seen as learning by encoding inferences from history into rules and routines that guide behaviour; learning has extensively been described as a process of encoding of lessons into routines (Levitt & March, 1988). Norms are standards or rules that tell members of a group or society how they should behave. Our values affect whether we accept or reject particular norms.

Because norms prescribe behaviours with specific consequences, we are more or less inclined to accept them depending on whether these consequences are compatible or in conflict with our valued goals. More generally, because norms are social expectations, we are more or less inclined to accept them depending on how important conformity vs. self-direction values are. (Schwartz, 2012) The social cognitive theory provides a framework for understanding, predicting, and changing human behaviour, identifying human behaviour as an interaction of personal qualities (e.g., knowledge, emotions, cognitive development), behaviour, and the environment (Bandura, 1986). This theory is helpful for understanding and predicting both individual and group behaviour and identifying methods in which behaviour e.g. knowledge transfer can be modified or changed.

3. DEVELOPMENT OF KNOWLEDGE ASSETS

Despite the widely recognised importance of knowledge as a vital source of competitive advantage, there is little understanding of how organisations actually create and manage knowledge dynamically. Nonaka, Toyama and Konno (2000) see an organisation as an entity that creates knowledge continuously. They define knowledge creation as: “A continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world, and new knowledge ... one also transcends the boundary between self and other, as knowledge is created through the interactions amongst individuals or between individuals and their environment” (Nonaka, Toyama, & Konno, 2000, p. 8). Using its existing knowledge assets, an organisation creates new knowledge through the SECI process that takes place in *ba*. The model of knowledge creation (Nonaka, Toyama, & Konno, 2000) is consisting of three elements: the SECI process (socialization, externalization, combination, and internalization), knowledge creation through the conversion of tacit and explicit knowledge; *ba*, the shared context for knowledge creation; and knowledge assets, the inputs, outputs and moderators of the knowledge-creating process.

The knowledge creation process is a spiral that grows out of these three elements. The knowledge created then becomes part of the knowledge assets of the organisation, which become the basis for a new spiral of knowledge creation. Dynamic capabilities research emphasizes the importance of knowledge assets and learning for understanding firm performance differences (Zollo & Winter, 2002). Knowledge assets are the inputs, outputs and moderating factors of the knowledge-creating process. The knowledge-creating process should become a discipline for organisation members, in terms of how they think and act in finding, defining and solving problems. In knowledge creation, micro and macro interact with each other, and changes occur at both the micro and the macro level: an individual (micro) influences and is influenced by the environment (macro) with which he or she interacts. However, the knowledge-creating process is not confined within the boundaries of a single company. The market, where the knowledge held by companies interacts with that held by customers, is also a place for knowledge creation. It is also possible for groups of companies to create knowledge. If we further raise the level of analysis, we arrive at a discussion of how so called national systems of innovation can be built, (Nonaka, Toyama, & Konno, 2000), and how knowledge is transferred across national boundaries.

1. Knowledge Transfer across National Boundaries

The most common label used to describe the movement of knowledge is knowledge transfer. However, there is a range of theoretical positions dealing with transfer of knowledge multiple definitions of each. Transfer of knowledge understood as moving of knowledge from lower to higher agency levels (individual, small group, organization, and inter-organizational domain) in explicit (e.g. drawings) or tacit (face-to-face contact, teaching, skills) form (Hedlund, 1994), also as the domain specific knowledge transferred across the syntactic boundary (Carlile, 2004). Taking a pragmatic view of knowledge and boundaries Carlile (2002, 2004) suggests three progressively complex boundaries of knowledge in innovation processes: a) syntactic, b) semantic, and c) pragmatic boundaries and ways of crossing these boundaries correspondingly are knowledge transfer, transition (translation) and transformation. At a firm level, a dynamic capability can be thought of as a collection of different combinations of capacities and abilities that can be used to share and assess knowledge across the various types of boundaries. However, a „capability“ is the potential to do certain things, not the things that are done (Dougherty, Barnard, & Dunne, 2004).

Common knowledge (language, other forms of symbolic communication, commonality of specialized knowledge, shared meaning, and recognition of individual knowledge domains) comprises those elements of knowledge common to all organizational members: the intersection of their individual knowledge sets. The importance of common knowledge is that it permits individuals to share and integrate aspects of knowledge which are not common between them. The four mechanisms for integrating specialized knowledge are: rules and directives, sequencing, routines, and group problem solving and decision making. The primary task of management is establishing the coordination necessary for this knowledge integration. Organizational capability is the outcome of knowledge integration: complex, team-based productive activities are dependent upon firms“ ability to harness and integrate the knowledge of many individual specialists. (Grant, 1996) Properties of knowledge at a boundary are difference, dependence, and novelty (e.g. actor is unfamiliar with the common knowledge) (Carlile, 2002). When common lexicon sufficiently specifies the differences and dependencies of consequence at the boundary, the boundary proves „unproblematic. “ The primary concern is one of „processing“ or transferring knowledge across it. A relational understanding of knowledge at a boundary also specifies at a very concrete level the relationship between knowledge and power, accumulations of knowledge determine who has power and influence in relationship between actors. Even when actors have equal ability to use a common knowledge to effectively share and assess each other’s domain-specific knowledge, power is still being expressed. (Carlile, 2004)

Although common lexicon has been identified as a useful way of crossing knowledge boundaries, the national border poses another difficulty in crossing these boundaries in innovation processes. Despite the language barrier, the absorptive capacity of corporations, the willingness to share and learn and receive knowledge, time and distance, as well as culture differences between home country and host countries can also influence how these boundaries can be crossed. At both individual and organizational levels, knowledge absorption depends upon the recipient’s ability to add new knowledge to existing knowledge. Absorptive capacity is defined as “the ability to recognize the value of new external information, assimilate it, and apply it to commercial ends” (Cohen & Levinthal, 1990, p. 128). Insufficient knowledge base, willingness to share (motivation), and cultural meanings of common lexicon are the main obstacles for knowledge transfer across national boundaries. (Wang & Fagerlin, 2013)

4. TECHNOLOGY, KNOWLEDGE AND INNOVATION TRANSFER ACROSS NATIONAL BOUNDARIES

1. Model of Knowledge Transfer across National Boundaries

For better understanding the process of knowledge transfer across national boundaries, constructing a model (Figure 1). The knowledge transfer itself cannot be observed and measured, however its inputs and outputs can be both observed and measured (Osterloh & Frey, 2000). The model's inputs are owners' cross national personal constructs, in the form of cognitive, affective, and biological events. Environmental constructs are representing the environment, and behavioural constructs are representing the behaviour.

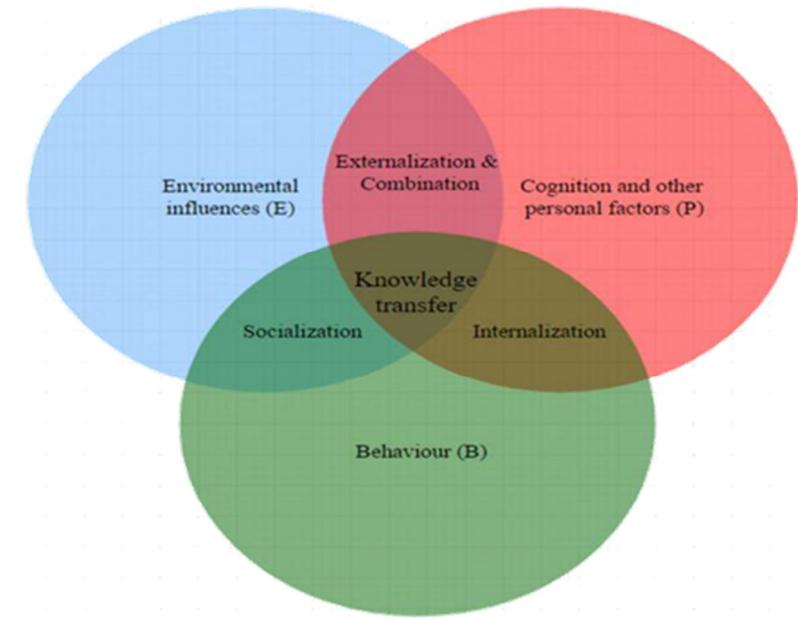


Figure 1 Model of Knowledge Transfer across National Boundaries

Source: Authors' illustration

Internal environment (culture, resources, and structure) and external environment (task environment, societal environment, natural environment), cross-border knowledge transfer faces extra challenges due to political, economic, cross-cultural, technological, and geographical gaps. More specifically the language barrier, the absorptive capacity of corporations, insufficient knowledge base, the willingness to share and learn and receive knowledge (motivation), time and distance, as well as culture differences between home country and host countries (cultural meanings of common lexicon) are the main obstacles for knowledge transfer across national boundaries (Wang & Fagerlin, 2013). *Ba* (specific time and space) is a place where information is interpreted to become knowledge, it is a shared context in which knowledge is shared, created and utilised (Nonaka, Toyama, & Konno, 2000).

When trying to explain why individuals behave as they do, people often refer to attitudes, beliefs, traits, or norms. Values vary on importance as guiding principles in life. Values are one important, especially central component of our self and personality, distinct from attitudes, beliefs, norms, and traits. Values are critical motivators of behaviours and attitudes. (Schwartz, 2012)

$$B = f(P \times E) \quad (1)$$

The inputs of the model are explained using the social cognitive theory (Bandura, 1989) which favours a model of causation involving triadic reciprocal determinism. In this formula (1) of reciprocal causation, behaviour (B), cognition and other personal factors (P), and environmental influences (E) all operate as interacting determinants that influence each other bidirectional.

The B↔E segment of reciprocal causation in the triadic system represents the two-way influence between behaviour and the environment. In the transactions of everyday life, behaviour alters environmental conditions and is, in turn, altered by the very conditions it creates. The environment is not a fixed entity that inevitably impinges upon individuals. But most aspects of the environment do not operate as an influence until they are activated by appropriate behaviour. The aspect of the potential environment that becomes the actual environment for given individuals thus depends on how they behave. Because of the bidirectionality of influence between behaviour and environmental circumstances, people are both products and producers of their environment. Through their actions, people create as well as select environments. Thus, behaviour determines which of the many potential environmental influences will come into play and what forms they will take. Environmental influences, in turn, partly determine which forms of behaviour are developed and activated. The growing recognition of reciprocal causation has altered the way in which socialization is viewed. (Bandura, 1989)

Socialization represents the interaction between individuals through mechanisms mainly such as learning by doing, observation, imitation or apprenticeships. Sharing and creating tacit knowledge through direct experience (empathizing). Perceiving reality as it is from activities; empathizing, resonating, recognizing and foreseeing; and transferring tacit knowledge. (Nonaka & Takeuchi, 1995) For example values are transmitted to the next business generation through the socialization process (Dietrich, 2003). When managers create a work environment that allows peers to understand craftsmanship and expertise through practice and demonstrations by a master, transfer of tacit knowledge takes place (Nonaka, Toyama, & Konno, 2000).

The E↔P segment of reciprocal causation is concerned with the interactive relation between personal characteristics and environmental influences. Human expectations, beliefs, emotional bents and cognitive competencies are developed and modified by social influences that convey information and activate emotional reactions through modelling, instruction and social persuasion (Bandura, 1986). People also evoke different reactions from their social environment by their physical characteristics, such as their age, size, race, sex, and physical attractiveness. People similarly activate different social reactions depending on their socially conferred roles and status. Thus, by their social status and observable characteristics people can affect their social environment before they say or do anything.

Externalization is articulating tacit knowledge through dialogue and reflection (conceptualizing). Here articulating tacit knowledge using symbolic language; and translating tacit knowledge into a concept or prototype. (Nonaka & Takeuchi, 1995) Externalization does not recognize that in the course of making one's knowledge explicit, different interests are often revealed that create barriers to developing shared meanings. Under these circumstances creating common meaning is not possible; what is required is a process in which actors negotiate and are willing to change the knowledge and interests from their own domain. (Carlile, 2004)

Transferring is the way of crossing a syntactic boundary (information-processing approach) creating common language using taxonomies, storage and retrieval technologies (Carlile, 2004). A syntactic capacity requires the development of a common lexicon (e.g. databases or common technical terms) for transferring domain specific knowledge. The

knowledge transfer process depends on individual factors (skills and expertise), organisational factors (structure and policy) and technological factors (available IT systems) which results in innovation capability (Carlile, 2004). Among all the other factors that influencing knowledge transfer in order to cross syntactic boundaries, the absorptive capacity of the receiving units stands out as the most significant determinant of knowledge transfer (Gupta & Govindarajan, 2000).

Combination is systemizing and applying explicit knowledge and information (modelling). Here creating relationship and hypothesis among concepts; modelling, prototyping; communicating and sharing explicit knowledge; and editing and systemizing explicit knowledge. (Nonaka & Takeuchi, 1995) Combination involves combining explicit knowledge through meeting and conversation or using information systems. In the combination mode, different explicit knowledge is bundled together, mainly by the exchange of documents, computerized communication, or formal education, thus, the body of explicit knowledge becomes enriched and systemized (Osterloh & Frey, 2000). Owners and managers are engaged in planning strategies and operations, assembling internal and external data by using published literature, computer simulation and forecasting (acquisition and integration), managers build and create manuals, documents and databases on products and services and build up material by gathering management figures or technical information from all over the company (synthesis and processing), and engage in the planning and implementation of presentations to transmit newly created concepts (dissemination) (Nonaka, Toyama, & Konno, 2000). Transferring knowledge is not an efficient approach to integrating knowledge; if production requires the integration of many people's specialist knowledge, the key to efficiency is to achieve effective integration while minimizing knowledge transfer through cross-learning by organizational members (Grant, 1996).

Translating is the way of crossing a semantic boundary (interpretive approach) creating shared meanings in community of practice or cross functional teams using boundary spanners or translators (Carlile, 2004). A semantic capacity develops common meanings for identifying novel differences and dependencies and translating domain specific knowledge (Carlile, 2004).

The $P \leftrightarrow B$ of reciprocal causation reflects the interaction between thought, affect and action. Expectations, beliefs, self-perceptions, goals and intentions give shape and direction to behaviour. (Bandura, 1989, p. 3) What people think, believe, and feel, affects how they behave (Bandura, 1986). The natural and extrinsic effects of their actions, in turn, partly determine their thought patterns and emotional reactions. The personal factor also encompasses the biological properties of the organism. Physical structure and sensory and neural systems affect behaviour and impose constraints on capabilities.

Internalization means learning and acquiring new tacit knowledge in practice (practicing). Here embodying explicit knowledge through experimenting, hypothesis testing and reflection; and contemplation in action. (Nonaka & Takeuchi, 1995) When knowledge is internalised to become part of individuals' tacit knowledge bases in the form of shared mental models (theories) or technical know-how, it becomes a valuable asset (Nonaka, Toyama, & Konno, 2000). Owners and managers search for and share new values and thoughts, and share and try to understand management visions and values through communications with fellow members of the organisation (personal experience, real world knowledge acquisition) (Nonaka, Toyama, & Konno, 2000).

Transforming is the way of crossing a pragmatic boundary (political approach) creating common interests to share and assess knowledge, using prototyping and other kinds of boundary object. A pragmatic capacity establishes common interests for making trade-offs and transforming domain-specific knowledge. When different interests arise, developing an

adequate common knowledge is a political process of negotiating interests, making trade-offs between actors, and defining common interests. (Carlile, 2004)

Inputs are followed by the process of knowledge transfer itself, and finally resulting in the output measured by performance. Performance is in form of personal-, social-, political-, and economic values, and feedback learning and change in knowledge transfer. At the base of knowledge-creating processes are knowledge assets, firm specific resources that are indispensable to create values for the firm (Nonaka, Toyama, & Konno, 2000). The feedback loop is learning, and change in individual and group behaviour, the knowledge is transferred and new knowledge assets are created.

2. Operationalization of the relationships between owners, general and significant attributes and their dimensions

An operational definition is how to measure and thus define a construct. This means providing a clear definition, and designating a particular measurement instrument to represent the construct. The research comes down to examining relationships among theoretical constructs by measuring variables that correspond to those constructs and looking at statistical correlations among the variables. Quantitative analysis is based on positivism, which stresses the production of knowledge through exact measurements and use of numeric variables.

The model of knowledge transfer across national boundaries states that the model's inputs are owners cross national personal constructs, in the form of cognitive, affective, and biological events. Environmental constructs are representing the environment, and behavioural constructs are representing the behaviour. Inputs are followed by the process of knowledge transfer itself, and finally resulting in the output measured by performance, in form of personal-, social-, political-, and economic values. The verbal model (Figure 1) must be translated into a quantitative model. The general and significant attributes are personal factors (how? and why? e.g. knowledge, expectations, attitudes, individual values, skills, expertise, level of education, power, will, motivation, trust, diversity), environmental factors (who? what? when? e.g. social norms, absorptive capacity, change, legal system, per capita income, language, infrastructure), and behavioural factors (e.g. skills, practice, proficiency, routines, rules). Performance can be measured by profitability. With the help of these attributes, the similarities and differences between the actors" must be adequately grasped. These properties and their dimensions are elaborated and dimensionalised during the process of analysis by means of collected data and theoretical knowledge. In order to stay sustainable and be able to develop further there is a need for professional corporate governance and also proficient ultimate owners.

Research design needs clear objectives derived from the research problem to specify sources of data collection, to consider constraints and ethical issues, and valid reasons for the choice of design (Saunders, Lewis, & Thornhill, 2015). The chosen research strategy is case study, using mixed methods, and it can be categorised as an explanatory, cross-sectional research project. Case study research strategy is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially because the boundaries between phenomenon and context are not clearly evident (Yin, 2009). Heterogeneity sampling was used in the research; it is used because the primary interest is getting a broad spectrum of cases. Standardised interviewer administered questionnaires were used, with a total of 109 questions. Questions were asked in English and in Estonian, and where necessary, used translations into English. The portrait ownership questionnaire(POQ) includes short verbal portraits of different owners. Each portrait describes an owner's goals, aspirations, or wishes that point implicitly to values and behaviour. For each portrait, respondents answer: "How much like you is this person?" They check one of six boxes labelled: very much like me, like

me, somewhat like me, a little like me, not like me, and not like me at all. The similarity judgments are transformed into a 6-pt. numerical scale. Note that respondents are asked to compare the portrait to themselves rather than themselves to the portrait. Interviewers were well-trained management students from Tallinn University of Technology, Estonia and Jawaharlal Nehru University, India, data quality issues and interviewer proficiency are important considerations. All questions were pretested on students and academic personnel. The interviewing period lasted from 04.11.2013 to 04.04.2016. Secondary data consists of documentary and multiple sources (Central Commercial Register, Credit Information Services, and Estonian Central Register of Securities). All material and data are entered into an MS Excel case database. All chosen cases ($n = 211$) are thoroughly described, starting with owner's personal data, followed by value issues; then categories and subcategories of owners' will: legal status, economic goal, role in governance and management, contribution to the realisation of a business idea, investment horizon, participatory rate, attitude toward risk, country of residence, involvement, and proficiency are described. Thematic case analysis, case contrasts, and analysis of empirical regularities were done. Based on the research problem, 83 general and significant attributes are those related to values, will and proficiency.

For computer analysis Microsoft Excel, PALaeontological STatistics PAST ver. 3.14 (Hammer, Harper, & Ryan, 2001), and The Waikato Environment for Knowledge Analysis WEKA ver. 3.8.0 (Hall, Frank, Holmes, Pfahringer, Reutemann, & Witte, 2009) were used. Quantified data is entered as a matrix and recorded using numerical codes. Codes are entered for all data values. Data is checked for errors, cleaned, pre-processed, and transformed – min-max normalization. Correlation analysis is one of the most useful statistics; here a single number describes the degree of relationship between our variables. Our POQ using Likert scale from 1 to 6 being an example of the second indicator type (ordered discrete values). While technically the Likert scale item is ordered, using it in parametric tests is only valid in some situations if assumptions about normal distribution, sample size is large enough, continuous indicators, and dependencies between the observed variables are linear. PAST computes Mardia's multivariate skewness and kurtosis, with tests based on chi-squared (skewness) and normal (kurtosis) distributions. If at least one of these tests show departure from normality (small p value), the distribution is significantly non-normal (Hammer, Harper, & Ryan, 2001), this is the case. WEKA's visualisation panel shows a scatter plot matrix for all the attributes, colour coded according to the currently selected class (Hall, Frank, Holmes, Pfahringer, Reutemann, & Witte, 2009), unfortunately only respondent's age and the year of graduation and the length of employment with present employer showing a linear correlation. Therefore, the authors are choosing the non-parametric Spearman's ρ rank-order correlation coefficient, it identifies whether two variables relate in a monotonic function and measures the strength of association between two ranked variables, only identifying the strength of correlation where the data is consistently increasing or decreasing. In other words, a monotonic relationship is a relationship that does one of the following: as the value of one variable increases, so does the value of the other variable; or as the value of one variable increases, the other variable value decreases.

Spearman's ρ s given in PAST in the lower triangle of the correlation matrix, the significance p (uncorr) is computed using a two-tailed t test with $n-2$ degrees of freedom, given in the upper (Hammer, Harper, & Ryan, 2001). Statements having a weak positive or negative association of ranks ($-0.3 < \rho < 0.3$), and strong positive or negative association of ranks ($-0.7 < \rho < 0.7$) were excluded from further analysis. Statements having a moderate positive or negative association of ranks ρ between 0.3 and 0.7 (0 and -0.7), and being significant (p (uncorr) < 0.01) were analysed as followed.

Analysis of empirical regularities showed that statements measuring basic human values, there was significant moderate positive association of ranks ($0.36 < \rho < 0.54$). Taken together, these results suggest that our data is supporting Schwartz (1992) theory of basic human values. Additionally, a significant moderate positive association of ranks ($\rho = 0.46$) was found between motivational type of value Self-Direction (SD) characterised by creativity, freedom, independent, curious, choosing own goals, and entrepreneurial capability to create and develop new products, services or markets, by using “innovative capabilities”. Achievement (AC) characterised by successful, capable, ambitious, influential is associated ($\rho = 0.36$) with achieving power through reward e.g. money, praise, attention etc. Stimulation (ST) characterised by daring, a varied life, an exciting life is associated ($\rho = 0.37$) with high quality defined as a characteristic or feature that someone or something has and meets the needs exactly.

Benevolence (BE) characterised by daring, a varied life, an exciting life is associated with employees are the most important as stakeholder ($\rho = 0.36$), and “innovative capabilities” ($\rho = 0.37$). Those capabilities are associated with providing training and development for employees for further advancement ($\rho = 0.53$), and believe that employees should receive information and guidelines to perform well ($\rho = 0.39$). The last is associated with importance that employees deserve recognitions for extraordinary performance ($\rho = 0.63$).

Universalism (UN) characterised by broadminded, wisdom, social justice, equality, a world at peace, a world of beauty, unity with nature, protecting the environment is associated ($\rho = 0.38$) with that revenue is raising in an ethical way. What is interesting in this data is that, if both current earnings and capital gains are important to the owners, than the revenue is more important than achieving power ($\rho = 0.49$), power is less important than revenue ($\rho = -0.43$).

One-way ANOSIM (Analysis of Similarities) is often used as a statistical method to aid hypothesis testing e.g. H_0 : There is no monotonic association between the two variables in the population at significance level α . If $p < \alpha$ we can reject H_0 . The first step in hypothesis testing is to set a research hypothesis: when owners are proficient, their corporations' performance increases. Proficiency is measured by education level, languages, hobbies, stakeholders' importance, contribution, ethics, diversification, share of ownership, founder, consensus, active, professionalism, capable (independent variables). Performance is measured by number of employees, company's annual turnover, balance sheet, market value (dependent variables). Whilst quantitative research has some dilemma, issue or problem that it is trying to research, the focus in hypothesis testing is to find ways to structure it in such a way that we can test it effectively.

H_0 : There is no monotonic association between the performance and proficiency in the population at significance level ($\alpha = 0.01$).

H_A : There is a monotonic association between the performance and proficiency in the population at significance level ($\alpha = 0.01$).

ANOSIM is a non-parametric test of significant difference between two or more groups; the distances are converted to ranks. The test is based on comparing distances between groups with distances within groups. Large positive R (up to 1) signifies dissimilarity between groups. The one-tailed significance is computed by permutation of group membership, with 9,999 replicates. (Hammer, Harper, & Ryan, 2001) The statistical analysis shows using Bray-Curtis similarity index that the significance level is below the cut-off value we have set ($R = 0.65$; $p = 0.004$). The author rejects the null hypothesis (H_0) and accepts the alternative hypothesis (H_A).

To analysis the Portrait Ownership Questioner (POQ), Schwartz's (2012) theory of basic values was chosen to operationalise relationship among owners. The result clearly identifies the ownership value that is Achievement (AC). Another important finding was that owners and are remarkably deviating from the students when Benevolence (BE) and Self-Direction (SD) are concerned. This finding suggests that the beauty of nature and the arts, unity with nature and environmental protection are less important for owners. These findings may help us to understand of ownership values in the corporate governance field, which explains owners' motivational bases of attitudes and ownership behaviour.

5. CONCLUSIONS AND RECOMMENDATIONS

The conducted research allows making several conclusions and recommendations. The research problem of not understanding the process of knowledge transfer across national boundaries has been solved. The asked research questions have been answered, and the main purpose to develop a better understanding reached. The objective was to present a model of knowledge and innovation transfer with a view towards generating discussion and debate in this important research area. Scholars demonstrated that knowledge plays a critical role in innovation (Panigrahi, Tripathy, & Das, 2017). The significance of knowledge vision is expanded at the same time that insights from that owners' knowledge also increased.

The research process revealed the level of development particularly when considering the literature in terms of the specific focus of this research: innovation and knowledge transfer across national boundaries towards capturing values.

However, the main limitation of this paper first one relates to the primary dataset which was collected depending on a pilot study in Estonia and India, and it can pose some limitations for generalisation of the result. So, the authors recommend, it would be interesting to assess data from worldwide value survey to know the worldwide ownership values precisely on the global corporate governance field.

Action research strategy offers a unique opportunity to bridge the large and growing divide between the vast majority of research that is conducted and the usefulness of that research for organizations. A mixed approach has the greatest potential to yield the insights needed both to improve theory development and testing and to improve organizational decision making. Supporting and encouraging action research and researchers offers a potential win-win whereby scientific knowledge is expanded at the same time that actionable insights from that knowledge also increase. If that knowledge is incorporated into course curricula and used to engage students and organizations, academic institutions' ability to attract and retain high-quality students and to promote themselves in the business community more broadly will also increase. (Zhang, Levenson, & Crossley, 2015) The most optimum research setting would be for example that personal, environmental and behaviour related issues are asked from owners. Probably is the most important actor in multilevel knowledge transfer a proficient owner.

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