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An analysis of induced organizational learning: The case of emerging South African civil engineering subcontractors

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Organizational learning fostered through interactions with other companies can lead to the development of businesses. The objective of the study was to describe interactions between established and emerging contractors in South Africa leading to a better understanding of learning events for the latter. Emerging contractors are owned by historically disadvantaged individuals and marked by low levels of maturity. Through nine case studies, emerging contractors at their core, interactions were mapped out focusing on knowledge transfers from established to emerging contractors. Respective interviews were transcribed and analysed using QSR Nvivo 7. Knowledge transfers, categorized according to content, are described using the role of individuals involved, the nature of knowledge transferred as well as the overall context as main descriptors. Relating these descriptors to an existing established organizational learning model, the induction of knowledge into the emerging companies' own learning mode are described. Differing knowledge appears to enter the recipients' own learning mode at various phases, and the level of prior socialization among actors play an important role in the knowledge transfers. Emerging contractor learn while engaging with established contractors on differing levels. If project-based knowledge transfers are sought for, the descriptors allow for tailor-making contexts which might foster knowledge transfers.

Key words: Organizational learning, project-based industry, knowledge transfers.

INTRODUCTION

Emerging small companies are characterized by low levels of systems and routines within their organization (Churchill and Lewis, 1983). Routines to efficiently deliver the offered product need to develop and are hinged on particular aspects of knowledge needed to run companies. Additionally, in a South African context the term emerging companies describe companies owned by historically disadvantaged individuals (HDIs). The term HDI is used to describe individuals who were discriminated against under the previous apartheid regime; this term thus essentially describes the majority of South Africa's population today, namely the African, Coloured, and Indian ethnic groups, as well as women and disabled people. HDIs were over centuries systematically disadvantaged through the social engineering of the white-minority Apartheid regime. Access to education but also free economic engagement was denied to HDIs for a long period. Following the advent of democracy in South Africa in 1994, these individuals were allowed and encouraged to actively engage in the economy; and access to all levels of education was opened up to them.

In the construction industry, with its traditional low levels of entry barriers, many HDI owned emerging or start-up companies have sought economic opportunities. These companies are characterized by the prominent role of the owner/manager and low levels of available resources. However, the failure rate of particularly this group of construction companies is reported to be high (CIDB, 2004), indicating unsustainable business practices possibly due to a lack of knowledge held by their

key staff. On the other side, South Africa's construction sector also has internationally active companies, well-established with long histories in their existence, and still dominating the local market. Through governmental policies aiming to address the wrongs of the past, namely the Broad-Based Black Economic Empowerment Act as well as the Preferential Procurement Act, HDIs now act in an environment, which is more conducive for the development of these entities. Furthermore, these policies and their coupled regulations, such as the Code of Good Practice on broad-based black economic empowerment (Department of Trade and Industry, 2004), encourage established companies to engage HDI owned and managed companies in their supply chain. In order for emerging HDI owned companies to become competitive, they are required to gain knowledge and skills and project-based interactions of established and emerging companies hold the opportunity for the emerging HDI owned company to learn through knowledge transfers from the established counterparts. However, not all contexts are conducive to learning processes through knowledge transfers. It can safely be assumed that existing contexts of knowledge transfers allow for learning to occur, yet the learning experiences by the HDI owned companies could be further improved upon. An investigation if and how emerging companies currently learn from engagements with established companies is seen as a first step towards understanding current practices and improving these in future.

The work presented is based in the wider academic field of organizational learning and deals in particular with project-based cross-organizational learning phenomena. The underlying research question which guided this study was: How do HDI owned contractors learn while engaging with established companies? The focus of the research was the knowledge transfer itself. Neither the sender's motivation (Osterloh and Frey, 2000), nor the receiver's ability to attain the respective knowledge, that is, absorptive capacity (Cohen and Levinthal, 1990), was the main focus in the investigation. The investigation was focusing on knowledge transfers; motivation and absorptive capacity must however be considered since they form part of the wider context of knowledge transfers. Such an investigation into how newly established companies engaging with established companies learn in project-based industries, with its alliances but also ad-hoc relations, reveals some insights on how to tailor-make more suitable contexts for cross-organizational project-based learning in this industry.

ORGANIZATIONAL LEARNING IN DEVELOPING ORGANIZATIONS

Emerging companies are essentially organization in development. Katz and Gartner (1988), drawing from

McKelvey (1980) derived four properties of emerging organizations. These are: intentionality, resources, boundary, and exchange. Intentionality relates to the purposefulness of setting up a company. Resources relates to the availability of resources (for example, financial, human) to the company. Boundary relates to the demarcation of the company by means of registration (for example, tax, phone book). Exchange relates to the companies activity in the marketplace in terms of transactions. According to Katz and Gartner (1988), an organization-in-creation has reached a stage of a complete organization once all four properties are satisfied.

Churchill and Lewis (1983) developed a maturity model of for small businesses, which can be used as a continuation to the model by Katz and Gartner (1988). This model sees five stages of small business development, namely: existence, survival, success, take-off, and resource maturity. This model has attracted some attention, and is generally regarded as a valid description of business development. However, Sullivan (2000) argues that the development occurs rather in phases than in stages, seeing flowing transitions from one phase to the next.

Many South African emerging contractors have fulfilled the requirements of being organization as per Katz and Gartner (1988) and could be placed in the initial stages, the existence and survival stages of the development model by Churchill and Lewis (1983). The first stage is associated with the company's problem to find customers, as well as problems in delivering the product. The survival stage already shows traces of an established company, companies at this level have sufficient customers and satisfy these by delivering the required product. While the model of Katz and Gartner (1988) is useful to determine if a company is in fact already a company, the model of Churchill and Lewis (1983) gives some insights already in the required routines and affiliated knowledge needed to develop a company. Various ways of ensuring such knowledge exists are possible. The two extremes are internal innovation on the one side and acquisition on the other side. Innovations from within the organization, relying on explorative (March, 1991) routines, are one way to develop the required knowledge base. Knowledge acquisition from outside the company through active interaction is the other way to broaden the company's knowledge base (Nooteboom, 2000). For the former path to knowledge development to exist, a stock of existing knowledge which can be explored must exist.

In emerging companies with few staff members and its owner/manager at its centre such existing stock might be limited; and exploring such might thus not yield the desired results. However acquisition of knowledge appears to be a more suitable approach. Such acquisition can take various forms. Training programmes geared at

emerging companies, but also daily interactions with third parties hold a potential for companies to learn from. In the context of the presented study focus on the latter form of learning: learning while interacting with others.

Learning: The individual and the organization

Writers on organizational learning acknowledge a link between the individuals making up the organizations and the organizations (Kim, 2004; Nonaka, 2004; Schwandt and Marquardt, 2000; Fiol and Lyles, 1985), yet the matter of learning differs for the two entities. In order to understand the link between the individuals and organizations, a distinction between learning individuals and learning organizations must be made (Kim, 2004; Fiol and Lyles, 1985).

A wide range of work delineating individual learning from organizational learning exists, and yet it appears that none of these delineations has found a consensus (Nicolini and Meznar, 1995). The perceived link between the two is evident (Nooteboom, 1999). For instance, Huber (1991), although in general representing a narrow information processing view of organizational learning, links the individuals to the organizations, as he explains that *'individuals … have knowledge about the organization's environment and about the processes…'*. Dodgson (1993) goes one step further as he posits the individuals to be *'the primary learning entity in firms'*. It is the individuals who make up the organizations and who deal with knowledge (Starbuck, 1992). Yet others argue that it is the organization which is driving the learning matter; its routines and history make the organization embody learning in itself (Levitt and March, 1988).

These different points of view on who is the driver can possibly be traced back to the different epistemological perspectives. Easterby-Smith and Araujo (1999) differentiate between the technical and the social perspective on organizational learning; possibly closely related to the two main opposing epistemological paradigms: positivism and constructivism. The former perspective focuses on the information being processed and the organizational processes affiliated with it, and the latter focuses on how the organizational members *'make sense of their experiences at work'* (Easterby-Smith and Araujo, 1999). Huysman (1999) calls this a deterministic as opposed to voluntaristic orientation respectively.

Kim (2004) states that organizational learning is far more complex and dynamic than simply enlarging learning based on an individual to an organizational level. The management of such organizational learning becomes more complicated the larger and more diverse the organization gets. Organizational learning is not the sum of the learning done by the individuals constituting the organization. Organizational learning encompasses a synthesis of the individuals and their context. These two

aspects cannot be differentiated when investigating organizational learning since learning is always context dependent (Nonaka, 1991). In particular, in the case of cross-organizational learning the motivation of the sender (Osterloh and Frey, 2000), the stickiness of knowledge to remain with the sender (Jensen and Szulanski, 2004), as well as the ability to absorb and use the newly acquired knowledge by the receiver (Cohen and Levinthal, 1990) need to be considered.

Emerging contractors can be seen as organizations engaged in constantly changing project environments. Emerging contractors with a low number of full-time employees, often only the owner, could be seen as individuals within the market place. Most contractors however employ workers, either on a permanent, full-time basis, or *ad hoc* for particular projects – thus forming an organization.

The mechanisms of learning are somewhat different depending on whether an organizational (Argote et al., 2000) or an individual (Maschke, 2005) approach is taken. However, as with any other business activities, the impact of the (key) individual on organizational learning ought to be of significance and must be addressed. *'In the early stages of an organization's existence, organizational learning is often synonymous with individual learning'* (Kim, 2004). The usage of a development model of businesses, as presented previously, relies on its assessments of the maturity of businesses on systems in the respective business. It also becomes evident that a social perspective on learning would be more suitable in the given context. Emerging contractors are characterized by a low level of maturity, thus a technical positivistic perspective on learning would result in an analysis of learning in these small organizations beyond their actual reality.

Organizational learning and the emerging company

Organizational learning, as opposed to the learning organization, organizational knowledge or knowledge management, as distinguished by Easterby-Smith and Lyles (2003), focuses on how organizations learn. Schwandt and Marquardt (2000) differentiate between individual and organizational learning. For them, individuals learn in a 'linear' process, while organizations learn in a dynamic non-linear process. Essentially, the collective of individuals with its underlying social dynamics and its participating individuals' influences on the process make up the organizational learning perspective. Organizational learning within emerging developing companies however might reveal different trends as opposed to organizational learning within large corporations. The key-role of the owner/manager of the emerging company needs to be acknowledged, and as such an approach to organizational learning based in

psychology and learning might reveal better insights into organizational learning within emerging organizations.

Defillippi and Ornstein (2003) offer four theoretical perspectives of organizational learning based from a psychological point of view. The first perspective is concerned with how organizations process information, the second introduces a behavioural perspective, the third sees organizational learning as social construction, and the fourth perspective identified by Defillippi and Ornstein (2003) is an action learning or applied learning perspective. While these four perspectives differ from psychological learning cluster theories as presented by Reynolds et al. (2002) when applied to individuals, some concepts appear to be replicated and intertwined on the organizational learning level. Using these four theoretical perspectives as presented by Defillippi and Ornstein (2003) oft-cited organizational learning models can be assessed according to their applicability to emerging contractors and learning while engaging with others.

Argyris and Schön (1978) developed the concept of loop-learning, comprising learning and the degree of reflection on the lesson learnt. Argyris is considered by some authors as the *'father of organizational learning'* (Fulmer and Keys, 2004), or at least as a major contributor to the field by others (Easterby-Smith and Lyles, 2003). The work of March and in particular Levitt and March (1988) are often cited and provide a widely accepted approach to organizational learning – the ecology of learning and learning by experience.

Nonaka and Konno (1998) developed a knowledge creation model that subsequently influenced many other authors. Other prominent authors in the wider field are academics such as Etienne Wenger (*Communities of practice: learning, meaning and identity*) or Peter Senge (*The fifth discipline*). While these authors' contributions to the field are widely acknowledged, the emphasis of their work is however often less on organizational learning and more on the learning organization. This does not imply that their contributions must be discarded here. Aspects of their work relate to organizational learning and these ideas can hence be used too.

The work of Argyris (1977) and later Argyris and Schön (1978) essentially differentiates between various levels at which organizations learn. The first level learning, called 'Single loop learning' describes learning which results in (remedial) action addressing one particular action only – improving upon what has been done before. The next level of learning is 'Double loop learning', in which past experiences are recognized and are not only responded upon, but also addressing underlying problems or assumptions of these. The type of learning described thus requires actors to actively engage with their own routines and to critically reflect upon these. While it is difficult for organizations to especially get employees to engage in double loop learning, the positive use of facilitators of such learning processes is stressed by

Argyris and Schön (1978). In the case of emerging contractors, with little routines and resources available to them, such learning model appears not to fit well. Facilitators are out of reach due to resource constraints, but more importantly routines and processes are underdeveloped and thus difficult to reflect upon anyway.

Levitt and March (1988) describe a more subtle way in which organizations learn. Conscious efforts of learning are less pronounced, but learning from experiences is the crux of their discussion. For Levitt and March learning is embedded in the aspiration of organizations (Prange, 1999) and they emphasize the importance of *'encoding inferences from history into routines'* in organizational learning. Routines are here understood as organizational artefacts ranging from procedures to value systems and paradigms.

The work of March (1991), Levinthal and March (1993) and Levitt and March (1988) on organizational learning stresses the importance of experiences. Trial-and-error based learning with a possible subsequent search for better routines, in cases where the result of the trial-and-error based learning was not satisfactory, are the mechanisms of learning described by Levitt and March (1988). For them, the ever-changing non-static ecology of learning, made up by the market place with its various actors, such as competitors, have a great impact on learning. Companies can decide to exploit proven routines and thus gain some short-term profit, or they can explore better routines which will secure long-term profits by addressing the changing environment; however taking away resources from any exploitation.

The ideas introduced by March and his co-authors link the individual member with the organizations; yet an emphasis is placed on how the organizations learn, seeing the individuals as catalysts for the organizations. The model is a hybrid between organizational learning and the learning organization, as routines are related to the latter, yet these are changes through the former. The routines described by March vary in their matter, ranging from technical routines to philosophical type paradigms of how to work. Arguably, this definition of routines is counterproductive in pinning down the actual learning processes; the definition appears to be too wide (Dodgson, 1993). However, the described process of transferring experiences into organizational routines also implies that actual knowledge is utilized in a more subtle way. It reflects a notion of explicit knowledge being embedded in tacit procedures within an organization. The role of the individual, somehow involved in the learning, is however not clearly defined and explained. In the case of emerging contractors the owner/manager is however expected to be key to any event, including learning. With the focus on organizational routines the discussions of Levitt and March (1988), thus are questionable in the applicability to this context.

A further theory on knowledge within organizations has

been developed by some researchers (Nonaka, 1991, 1994; Nonaka and Konno, 1998; Nonaka and Takeuchi, 1995). Nonaka (1991, 1994) is attributed with introducing the differentiation of tacit and explicit knowledge into organizational learning theories (Gourlay, 2006; Hari et al., 2005). The developed model sees knowledge converting through a continuing spiral of four knowledge conversion stages (Nonaka, 1994). This work has later been extended through work by Nonaka and Konno (1998) to address the physical and mental spaces or contexts where these conversions take place: the Ba's and Basho. These two concepts are abstract and can refer to many facets of the closer (Ba) and wider (Basho) environment of knowledge creation processes. Ba can refer to physical, mental and virtual spaces in which knowledge is created (Nonaka and Konno, 1998). The Basho is the place where entities or individuals meet and interact, the bigger place – similar to the environment of learning highlighted by Levitt and March, but explicitly pointing out the role of individuals. Nonaka's (1991, 1994) work is thus partially set in a social constructivist paradigm. The four conversion stages are: Socialization in the Originating Ba, for which physical proximity of actors is essential, and where ideas and values (tacit knowledge) are shared; externalization in the Interacting Ba which see individuals report upon experiences and thus make tacit knowledge explicit; combination in the Cyber Ba where externalized knowledge is now captured, edited and disseminated in a formal explicit manner and thus presentable to groups; internalization in the Exercising Ba in which the individuals constituting the group make the knowledge their own tacit knowledge through training or repetitive application of the new knowledge. Through subsequent Socialization the experiences with the new knowledge are then shared again, and the spiral continues. This staged model is often referred to as the SECI model, using the abbreviation of the four stages mentioned.

The work of Nonaka (1991, 1994), Nonaka and Konno (1998) and Nonaka and Takeuchi (1995) are not easy to place into any organizational learning perspective provided by Defillippi and Ornstein (2003). It addresses the matter of the nature of the knowledge (tacit vs. explicit) created and thus processed, touches on the actors involved and their shared understanding of matters, acknowledges the change of behaviours through the continuum of the spiral, and in its writing draws from observations of applied learning.

The descriptions given by Nonaka and Konno (1998) of the spaces in which the stages of the SECI model take place make clear reference to the roles of individuals involved and expected dynamics within groups. The model is geared towards understanding knowledge creation within organizations, yet it shows the possibility to connect organizations and its subunits and common learning experiences too. The concept of the Basho – the

greater place of learning, referring to physical but also mental space, provides the setting of any learning through the SECI spiral. Learning experiences of emerging contractors embedded in temporary organizations, which might see a transfer of knowledge from one unit of the temporary organization (that is, established partner) to another (that is, emerging contractor) could possibly be mapped against the extended SECI model with its Ba's. Induced organizational learning through interactions in the Basho can thus possibly be mapped using some of the markers provided by writings of Nonaka (1991, 1994), Nonaka and Konno (1998) and Nonaka and Takeuchi (1995).

METHODOLOGY

The aim of the presented study was to understand how emerging contractors learn while interacting with established companies in the context of civil engineering construction projects. The boundaries between the phenomena under investigation and its context were expected to be blurred, an in-depth understanding of the factors involved in knowledge transfers needed to be developed; a case study approach was thus selected as the most appropriate methodology. Case studies enable an understanding of the interconnection of the phenomena and its context (Mayring, 2002; Yin, 2003). As the contexts and contents of knowledge transfers were deemed to be unique for each case study, a multiple case study approach was adopted. Guided by theory, nine cases across South Africa were then purposefully selected to achieve literal and theoretical replication. The unit of analysis was the emerging contractor with a particular emphasis on the perimeter of the organization and how it interacted in the Basho.

The data required to draw up the rich picture informed the data access and collection strategy. Access to case studies was sought via client bodies (for example, municipalities and public departments) and their agents. A description of the intended research as well as selection criteria (for example, subcontractors, emerging company) for case studies was provided to these parties, enabling them to identify suitable candidates. Proposed candidates for case studies were then scrutinized and consent for participation was achieved prior to the fieldwork.

The main data collection method used was semi-structured interviews, which were later transcribed verbatim for analysis using the NVivio7 software application. Interviews for each case were held with the owner/managers of the emerging companies, main contact person in the respective established contractors' organizations, as well as project client representatives (client as well as appointed agents, that is, engineers). A total of 18 interviews, some of them group interviews with various interview partners of the same background, were recorded and transcribed. A total of 44 respondents / interview partners were heard. Using the various points of view represented by the interview partners, a fuller picture of the wider context of possible knowledge transfers, but also into inner workings of the subcontracting arrangements was explored.

In addition to the interviews, documentation pertaining to the companies, the specific construction projects, subcontracting agreements, as well as governing procurement policies were collected and analyzed to assist in a better understanding of the framework within which the actors connected; this thus rounded up the case studies. This data also assisted in validating data collected during the interviews. The nature of the data collections, with its

Table 1. Profile of emerging companies (case studies).

Profile	Case study								
	EM1	EM2	EM3	EM4	EM5	EM6	EM7	EM8	EM9
CIDB registration	3 CE (pending)	2 CE, GB	1 CE	2 CE	-	N/A	-	1 GB	N/A
Year found (active)	2005	2006	2008	2002 (2005)	2008	2002	2004 (2006)	2007	2009
Permanent employees	16	3 + c.l.	40	4	1 + c.l. (JV)	20	8	1 + c.l.	4
Annual turnover (ZAR)	1.6 mil	1.5 mil	1.2 mil	8 mil	N/A	2 mil	0.15 mil	0.1 mil	-
Current interaction	Sub con-tractor	Sub con-tractor	Sub con-tractor	Sub con-tractor[1]	Sub con-tractor[1,2]	Sub con-tractor[1,2]	Sub con-tractor[3]	Sub con-tractor[3]	Sub con-tractor[3]
Main contractor	ES1	ES2	ES3	ES4	ES4	ES4	ES5	ES5	ES5

c.l. = casual labour / temporary staff; [1] = same client body (A); [2] = same main contractor incl. management team; [3] = same client body (B) and main contractor.

high emphasis on the interviews, is recognized as a limitation of the study in terms of internal validation.

For the analysis of the data, which aimed to connect knowledge transfers to the emerging contractors' SECI spiral, particular attention was given to descriptions of knowledge transfers, their inner setting as well as people involved, including their general relation to each other. The data was thus analyzed using the points given by Nonaka and Konno (1998) on the role of individuals in the Ba, as well as on the type of knowledge traded (tacit vs. explicit). Hence, the analysis of the data was guided by previously established concepts, looking for the emergence of related themes. A total of nine case studies were conducted.

The case studies

Nine civil engineering contractors, spread around South Africa, served as case studies. An overview of these companies is compiled in Table 1. These contractors had only become active construction companies within four years prior the research, and are best described as emerging. They by and large lacked resources, yet the owners' clear intentions for developing the companies was evident. Employee numbers ranged from zero to forty permanent staff, and turnovers varied from ZAR 0.1 mil to ZAR 8 mil. All selected case studies were at the time of the investigation engaged as subcontractors to established com-panies. Eight of the nine respective established contractors were nationally active in South Africa; one established contractor had only a regional presence. The subcontracts awarded to the emerging contractors were

generally concerned with pavements works or storm water works for roads.

The history of engagement between emerging and established contractors varied across the nine case studies. Some pairs had not engaged with each other prior to the current work, others had a long common history and relationship dating to subcontracts prior to the current. The strength and depth of personal relationships between owners of the emerging and employees of the established companies positively related to the common history and track-record. Prior frequent interactions appeared to result in closer contacts of the respective individuals. In particular in cases where prior interactions existed, the general impression of the quality of the cross-company relationship was good. In cases where client bodies introduced subcontractors to the main contractors, combined with no previous encountered interactions, relationships were viewed to be of a poorer quality.

The prior experience of the emerging con-tractors' owner/managers in the construction industry varied.

Their training and work life varied from unemployment without any related training, to an owner with a university level diploma in civil engineering and related work experience. Most owner/managers started their com-panies with a very low level of prior knowledge; short courses assisted some in gaining knowledge.

Within each case study, various knowledge transfers, based on recollections of participants, were found. The knowledge transferred, the learning content, could be classified in three main categories, namely: Finance matters, managerial matters, and technical matters. Within these categories more specific knowledge areas could be

mapped out. An overview of the sub-categories as well as the counts of detection of knowledge transfers relating to any of these sub-categories is shown in Table 2.

The binning of knowledge transfers and its cate-gorization allowed for an initial assessment of the nature of the knowledge into being either explicit or tacit - albeit a simplification of knowledge itself. This simplification is however justified in the light of the SECI model's underlying premise of knowledge as being converted from explicit to tacit and back within the SECI spiral. Considering the nature of knowledge, a closer look into the Ba, as the space of transformation and possible engage-ment, are thus warranted.

The learning experiences – mapping space, role of actors, and nature of knowledge

Exact replication of knowledge transfer events is impossible. Using the multiple case studies, and considering knowledge transfers with the same content some across these case studies, through an exercise of pattern-matching (Yin, 2003) general observations can be made. Using the SECI model with its Ba's and the broader Basho, some knowledge transfers are analysed and presented subsequently. The nature of knowledge is used as the prime determinant of the learning experiences mapped out. In the respective

Table 2. Knowledge content and count of case studies in which knowledge been transferred and recorded.

Parameter	Financial		Managerial				Technical	
	Tender rates	Cash-flow/progress payments	Resource management	Business acumen	Health and safety	Supply chain	Basic tasks	In-sights
Counts	2	4	6	4	5	3	3	4

descriptions of the learning transfers, an emphasis on the space as well as the roles of the actors is given. In order to allow the reader to map the depicted knowledge transfers against the various actors, labels for the emerging HDI owned contractors (EM, Table 1) as well as for the established contractors (ES) are introduced.

Learning about financial management

Semi-formal settings dominated in the reported cases of knowledge transfers relating to financial matters. Typically, the emerging contractors' owner/manager and senior staff of the established company would sit around a table with pen and paper, making sense of tenders and the building up of rates or progress payment claims. Two cases reported upon the emerging contractors frequently seeking the assistance of the contracts manager of the established contractor with regards to building up rates and tendering. In both cases, the actors had previously engaged with each other on similar contracts, and expressed their appreciation and respect of the others' work and knowledge. The owner/managers of the emerging companies also had solid track records in construction, gained prior to their time of becoming business owners.

Descriptions of interactions provided independently during interviews suggest a process of joint enquiry. On an individual basis, in close face-to-face interactions, the established contractor would provide pointers to the emerging partner. These then taken up by the emerging partner and accommodated in their understanding of the matter. An established partner described this: *"I have a couple of instances where he* [the emerging contractor] *came to me pricing jobs, doing quantities, bills, but he actually came to me to ask me to help with a tender. Then I will sit down with him and will help him* (how to) *do the tender." (ES3).*

A basic understanding of each other's approach was a prerequisite for such knowledge transfers. The link of individuals aiming to jointly making sense out of a piece of documentation (for example, tender document) in which each party was based in their own cognitive setting most clearly describes an Originating Ba (Nonaka and Konno, 1998). The knowledge traded in these interacttions can best be described as concepts which can only be partially sketched. These concepts are marked by a

high level of tacitness. The context of the interaction coupled with the nature of the transfer content point to interactions in the Socialization stage based in the Originating Ba.

Learning about progress payments

More formal settings were reported upon in the case of knowledge transfers related to progress payments. In the cases in which no prior engagement was recorded for the case studies the established partners introduced the process to follow for progress claim to the emerging subcontractors. For one case study, a full introductory course aimed at the emerging contractor engaged on a long-term contract was reported upon. Here, the established contractor used its standard documentation and formula sheets to explain the progress payment process to the emerging contractor at the time of the first claim for progress payment.

In subsequent progress claims sometimes showing discrepancies of claim versus approved amounts, the emerging subcontractor and staff from the accounts department of the main contractor would then try to create a better understanding and knowledge of the process via the phone. Here, both parties would use copies of the same documentation to clarify matters and thus to allow for learning by the emerging contractor.

Knowledge transfers related to progress payments were less bound to individuals. The actors reported upon from both sides, emerging and established contractors, changed over time; yet the process of clarifying discrepancies and learning remained unchanged. The forms used for documenting claims were semi-complete and the explicit tools (pen and paper) were used to get the emerging partner to understand the claims and affiliated processes.

The respective knowledge transfers recorded in the case studies appeared to enter the emerging contractors SECI spiral between the externalization and combination stage, between the Interacting Ba and the Cyber Ba.

Learning about business acumen

Knowledge transfers relating to business acumen as well as health and safety matters, both categorized under the

label of managerial knowledge, are interesting and complementing examples showcasing the variety of knowledge transfer mechanisms. Recorded knowledge transfers categorized and labelled as 'business acumen' related to knowledge that led emerging contractors to a change in approach in conducting their business. Health and safety matters refer to contract specific management tools given to emerging contractors ensuring that these contractors comply with occupational health and safety regulations.

In the recorded counts of knowledge transfers relating to business acumen long-term relationships between the sender and receiver of the knowledge underpinned such transfers. A substantive degree of assimilation between the two parties was evident. The common grounds of senders and receivers in terms of training and work experience, a sign of shared cognitive level, further promoted the respective transfers. Furthermore, shared language and socio-cultural backgrounds were evident in the recorded cases. The sender essentially was por-trayed as a role-model like figure for the receiver of the knowledge set; through close interactions the emerging contractors then were able to value traits and acumen of the established partner, allowing them to judge, copy or adopt some of the witnessed acumen. The witnessed business acumen which was internalized by the emerging contractors are highly tacit multi-levelled concepts (believes, ideas, paradigms). Based on the seemingly required close personal relationships between the parties, these interactions appear to be set in the originating Ba.

Learning about health and safety

Reported knowledge gains referring to health and safety matters related to the correct documentation of health and safety matters on construction sites (required in terms of national health and safety regulations). An emerging contractor put it simply: *"More with the management, also with the safety etc. They* [established partner] *have got a Safety Officer that comes and shows us what to do; he has gone through the safety files* [saying]*: Please you need this and this and this, and…" (EM6).* Largely good relations between the owner/ manager of the emerging companies and the health and safety officers of the established companies were reported upon. The knowledge traded proved to be explicit. The established contractor would supply standard forms, which is needed to be completed by the emerging subcontractor. Through the process of filling in and compiling the forms the emerging contractors gained access to valuable standard documentation.

The actual persons involved in the knowledge transfer appeared to be of less importance. The knowledge was highly codified and already available to a larger group of people, and it was ready for transfer to the emerging contractor. The role and low importance of the individuals involved on the side of the established company together with the explicit nature of the knowledge traded point to a knowledge transfer into the emerging contractor's SECI spiral in the early phase of the Cyber Ba, enabling combination of knowledge.

Learning about basic technical matters

Knowledge transfers with a technical content could be separated into to levels or sub-categories: basic task level knowledge and knowledge requiring in-sight. The participants in knowledge transfers relating to basic task level knowledge typically involved the owner/manager as well as one staff member of the emerging contractor, and a representative of the established contractor. A typical scene is painted by an emerging contactor: *"He [the main contractor's surveyor] did show me with my operator...how to swing those things safely so nobody can get injured" (EM5).*

The knowledge traded appeared simple, and the emerging contractors' receiving side consisted of more than one individual. The participant of the sender's side appeared to be irrelevant; any knowledgeable representative from the established contractor could have transferred the knowledge. The knowledge traded appeared to be independent from the individuals involved as the activity itself appeared to be a standard procedure for skilled groups. However, the knowledge traded related to a set of skills that in itself has tacit and explicit content. The transfer thus appeared to be occurring in the early phase of the Cyber Ba within which explicit parts of knowledge can be combined with existing sets of knowledge by interactions of groups.

Learning matters of advanced technical nature

Transfers with higher-level knowledge at its core, labelled in the foregoing 'technical insights', were also captured. Established contractors were reported upon to intervene with existing on-site routines by emerging contractors – seeking to improve these. In the reported cases of such interventions good relations between the actors was evident. The on-site interactions and knowledge transfers that then resulted in an improved understanding of existing routines by the emerging contractor were however marked by clear instructions - highly explicit in nature. A group of the emerging contractors' staff, led by the owner/manager, and a technical manager of the established company, well known to the emerging partner, would typically liaise on site. The nature of relationship, the type of knowledge, and the interactions reported upon place this knowledge transfer in the

Interacting Ba - with prior socialization between the actors being a prerequisite.

Conclusion

Project-based interactions among companies hold the opportunity to serve as a launching pad for knowledge transfers between the interacting parties. The findings from the previous described case studies, focusing on knowledge transfers from established to emerging civil engineering contractors in South Africa, highlight particular aspects and prerequisites for specific know-ledge to be transferred between the parties. The reported knowledge transfers assisted the emerging companies to build their often economically fragile business onto a more solid base though the induction of knowledge into their internal organizational learning cycles.

If fostering of emerging companies in terms of transferring valuable knowledge to these organizations is of interest, some of the previous described transfers and respective contexts can be used to enhance the learning experience by emerging contractors. With clear descrip-tions of knowledge transfer content, role of individuals, as well as overall context, learning in particular knowledge areas can be targeted.

Knowledge transfers are however not without problems. The previous reported knowledge transfers were carefully looked out for; knowledge does not automatically transfer from one party to the other. While difficulties to knowledge transfers were not the focus of the study, some comments on observed obstacles may however be in order. The roles of the persons engaging in knowledge transfer contexts are crucial. A good fit between the main actors, that is, sender and receiver, appears to be of importance. As can be seen on the prevous described example of business acumen, a close personal relationship can be advantageous for know-ledge transfers to happen. A further difficulty observed relates to project specific circumstance. The general approach displayed by the established contractors to the project and its often emerging sub-contractor mirror the likeliness of knowledge transfers to occur. Open and positive contractual relationships assist in knowledge transfers.

The findings of the reported study show an array of knowledge, ranging from highly tacit to highly explicit, that was transferred between parties. A time dependency of particular knowledge transfers, which is evident through the nature of underlying relations and levels of prior socialization, must however be considered when aiming to tailor-make contexts in which knowledge transfers can be fostered. From the results, it can be concluded that cross-organizational project-based learning can be one way forward in empowering emerging companies – growing these to sustainable independent businesses.

The existing stage of the emerging company however needs to be considered, and contexts need to match the respective requirements in terms of knowledge and knowledge transfers.

The presented research work is a mere first step towards mapping cross-organisational knowledge transfers in the context of project-based organisations. Future research into this phenomenon can be notched on various levels. Further case studies might be useful to verify some observed contextual parameters and might add to the validity of the presented findings. These contextual parameters could be cognitive distance between actors, quality of personnel relations, or history of previous interactions. A mix of longitudinal studies and grounded theory work might relinquish useful insights, informing policy makers and contracting organisations intending to lift capacity among emerging HDI owned contractors.

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