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A CONCEPTUAL FRAMEWORK OF KNOWLEDGE TRANSFER FROM THE CONSTRUCTION COMPANY TO THE HOST COMMUNITY

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Knowledge transfer and management in organizations throughout the world is a competitive advantage. It is what the organization knows, how it uses what it knows and how fast it can discover something new, be it in acquisition of technology for innovation, or business activities development, studies have been undertaken in this area to examine knowledge transfer and management process in the organisation. But little is known about the effectiveness of knowledge transfer by construction companies to the project host communities. Therefore, this paper builds on existing concepts of knowledge transfer and diffusion of new ideas and offers a conceptual framework of knowledge transfer and its diffusion from the construction industry to the project host community. The conceptual framework identifies stages of Knowledge conversion and diffusion and factors that are expected to enable the transfer process at different stages. The framework also shows the inter-relation between Knowledge transfer and diffusion by combining the theory of Nonaka & Takeuchi on knowledge creation and shearing with Everett Rogers's innovation decision theory. This has been achieved by first, reviewing and discussing theories relating to diffusion of new idea (NI) and knowledge transfer (KT). Secondly, the paper evaluates the interrelation between knowledge transfer and diffusion of new ideas. Thirdly, it establishes a connection between knowledge transfer and diffusion of new ideas. Finally, it brings the latter in the context of construction industry. This paper has demonstrated that a construction firm that is able to create and improve its Knowledge base and transfer such new Knowledge to the community in which it finds itself, would have much collaboration and a peaceful atmosphere to carry out its corporate goals or complete its project within schedule.

Keywords: Knowledge transfer, Diffusion of new idea, construction health and safety, Conceptual framework

INTRODUCTION

The concept of organizational knowledge as a foundation for global competitiveness is of significant theoretical importance (Liyanage et al 2009). Unstructured transfers of Knowledge routinely take place within and across organizational boundaries, whether the process is actively managed or not (Davenport and Prusak 1998). Some researchers argue that after an appropriate Knowledge has been selected, transfer of such Knowledge is an unsure process, Gilbert and Cordey-Hayes (1996); Nonaka and Nitsuguchi (2001); Liyanage et al (2009). They further suggest that, for knowledge to be transferred successfully, a context of understanding should comprise mechanisms for both knowledge sharing and adoption. This paper is based on an ongoing research project that can help construction companies transfer knowledge from the construction companies to their host communities. The two main processes in this context are knowledge transfer and diffusion. This paper attempts to bring these two together in

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transferring the knowledge of health and safety from the construction companies to their project host community.

There are many conceptual frameworks on knowledge transfer and management in the organization, but the literature which this research has so far reviewed or read has not dealt with transferring and managing knowledge from the construction industry to the project host communities of the construction activities. Some of the theories and frameworks on organizational Knowledge transfer found in literature are Remenyi et al. (2002); Alavi and Leidner, (2001); Szulanski, (2000); Argote & Ingram, (2000); Epple et al. (1996) and Attewell, (1992). These authors looked at the ability to transfer and manage knowledge from one unit to another in an organization alone, which they all concluded to have contributed to the organizational growth and performance. Other authors such as Nonaka et al. (2000); Argote and Ingram, (2000); as well as Liyanage et al. (2009) tend to look at how organizational knowledge is transferred through the various units and managed within the organization in the area of business management. Some also looked at innovation diffusion in the construction industry e.g. Shibeika, (2014); Fellows & Liu, (2012); Esmaeili et al. (2012); Kale & Arditey, (2010); Taylor, (2007), Dubois and Gadde, (2002) as well as Arditi and Tangkar (1997). These and many other researchers have done extensive work in the area of knowledge management and transfer in the construction industry, organizational behaviour, human management, diffusion studies and technological innovation management.

But all their works have been centred within the organization or inter intra firm alone, not linking this organizational knowledge to the communities neighbouring these organizations. Hence the need for a framework that is construction specific and capable of transferring knowledge from the industry to the community since construction companies operate within these communities. Szulanski (1999), argues that the mere possession of potentially valuable knowledge assets somewhere within an organization does not necessarily mean that other parts of the organization benefit from that knowledge. The construction industry is noted for its fragmented nature coupled with various project stakeholders from inception, finance, design, procurement, construction and post construction stage. The construction industry is viewed as one of the difficult social systems when it comes to knowledge transfer by many authors such as, Widen et al., (2009); Manley, (2008); Ende, (2006); Larsen, (2005); due to its various stakeholder involvement. Although the fragmented, temporal and various stakeholders are seen as major barriers to knowledge transfer in the construction industry. This paper argues that these weaknesses are as well major strengths in the diffusion paradigm. When it comes to knowledge transfer beyond the organisational settings and reaching out to different professionals and non-professionals throughout different projects settings the construction industry stands tall in diffusion new ideas.

This paper is developed based on a review of empirical and theoretical studies already published. Past researches on knowledge transfer and diffusion in and outside the organization were obtained primarily from research databases including Google scholar, Taylor and Francis, Emerald Insight, Research Gate, IGLC Science Direct and other internet sources. The initial descriptors used for the search were Knowledge transfer variables, innovation Diffusion variables, organizational Knowledge transfer and, Knowledge transfer in the construction industry. The initial descriptors were used to search the databases. A total of 50 articles were reviewed for the research in order to establish a connection between knowledge transfer and diffusion. To identify the

variables to a successful knowledge transfer, and identify variables to a successful diffusion process. And to understand the theories behind organizational knowledge management and transfer in the construction industry.

LITERATURE REVIEW

KNOWLEDGE

Nonaka & Takeuchi (1996) theorized that Knowledge is created and improved when it flows between different levels of organization between individuals and groups. This theory states that for a knowledge transfer to be successful, it must go through socialization, externalization, internalization and a confirmation process.

Socialization: from tacit to tacit is a process of sharing experiences and thereby creating tacit knowledge such as shared mental model and technical skills. An individual can acquire tacit knowledge directly from others without using language but through observation, imitation and practice (Nonaka & Takeuchi 1996).

Externalization: from tacit to explicit is a process of articulating tacit knowledge into explicit knowledge concepts. It is a typical knowledge creation process in that tacit knowledge becomes explicit, taking the shapes of metaphors, analogies, concepts, or models (Nonaka & Takeuchi 1996).

Combination: from explicit to explicit is a process of systemizing concepts into a knowledge system. This mode of knowledge conversion involves combining different bodies of explicit knowledge. Individuals exchange and combined knowledge through such media as documents, meetings, telephone conversation, or computerized communication networks (Nonaka & Takeuchi 1996).

Internalization: from explicit to tacit is a process of embodying explicit knowledge into tacit knowledge. It is closely related to learning by doing, when experience throughout socialization, externalization, and combination are internalized into individuals, tacit Knowledge (Nonaka & Takeuchi 1996).

What is Knowledge?

According to Nonaka and Takeuchi (1995), knowledge in contrast to information, is about actions, beliefs and commitment as it is dependent on the perspective or intention of individuals. What knowledge and information have in common is about meaning. They further opined that knowledge and information need to be seen in a specific context and relations as they depend on particular situations and evolve dynamically through social interactions of individuals. Knowledge is a fluid mix of framed experiences, value, contextual information, and expert's insight that provides a framework for evaluating and incorporating new experiences and information (Davenport and Prusak 2000). Duguid (2002) stated that knowledge means a knower who is able to offer it to its direct environment e.g. teams, networks and other surroundings. Davenport and Prusak (2000) argued that knowledge is rooted in information and information is in turn originated from data.

Knowledge Transfer in context

Knowledge transfer (KT) is an area of knowledge management concerning the movement of knowledge across the boundaries created by specialized knowledge domains (Carlile & Rebentisch, 2003). The concept of knowledge transfer is derived from the field of innovation. Knowledge transfer is the movement of knowledge from one place, person ownership to another (Liyanage et al. 2009). According to Liyanage

et al (2009), any transfer must involve more than one party. There must be a source, the original holder of the knowledge) and the destination (where the knowledge is transferred to).

A good knowledge transfer means that transfer results in the receiving unit accumulating or assimilating new knowledge (Nonaka & Takeuchi 1996; Nonaka 1994). Knowledge transfer involves either keenly collaborating with others and sharing what one knows, or actively referring others to learn what they know. When people in a social setting identify knowledge that is critical to them, they can use knowledge transfer systems to acquire that knowledge. They can then improve it through reinvention and make it available through diffusion for others who need it. Since knowledge transfer (KT) involves networking and encourages having close ties with people to share knowledge between and within a social system, it can be identified as an act of communication (Paulin & Suneson 2008).

Forms of knowledge

The distinction of knowledge dates to the philosopher Michael Polanyi. He opined that knowledge can be categorized into two arrangements: explicit knowledge and tacit knowledge. Some authors argued that, tacit and explicit knowledge are not totally separated but mutually complementary entities (Nonaka & Takeuchi, 1995; Lahti and Beyeclein, 2000; Nonaka and Nishiguchi 2001; Zack, 1999; Chini, 2005). They further stated that human knowledge is created and expanded through social interaction between tacit and explicit knowledge. This means that for there to be knowledge transfer in any way or form, these two knowledge conversions must be present.

Tacit knowledge according to Polanyi (1966) is a nonverbalized, intuitive and unarticulated knowledge. It's a knowledge that resides in human brain and cannot be easily captured or codified according to Nonaka and Takeuchi (1995). Tacit knowledge in nature is complex and many at times, impossible to capture and diffuse, but compared to explicit knowledge, it adds more value to the holder. Explicit knowledge on the other hand, is the knowledge that can be articulated in formal language and easily transmitted among individuals and social settings. It is knowledge that is codified and can easily be understood because it can be codified and carried out through formal and methodical language in books, databases and libraries (Zack, 1999).

Knowledge Conversion

According to Carlile and Reberich, (2003), knowledge transfer is the movement or transferring specialist knowledge across boundaries. Liyanage et al. (2009) also argued that successful knowledge transfer is when the transfer results in the receiving unit accumulating or assimilating the new knowledge. Ryu et al., (2003) stated that knowledge transfer and sharing is a person-to-person process. Truch et al., (2002) is also with the opinion that knowledge transfer is a two-way process. This involves both the source (supplier of the knowledge) and the adopting unit (the receiver of the new knowledge.)

Nonaka & Takeuchi (1995) came out with four modes of knowledge conversion and transfer as shown in figure 1 below

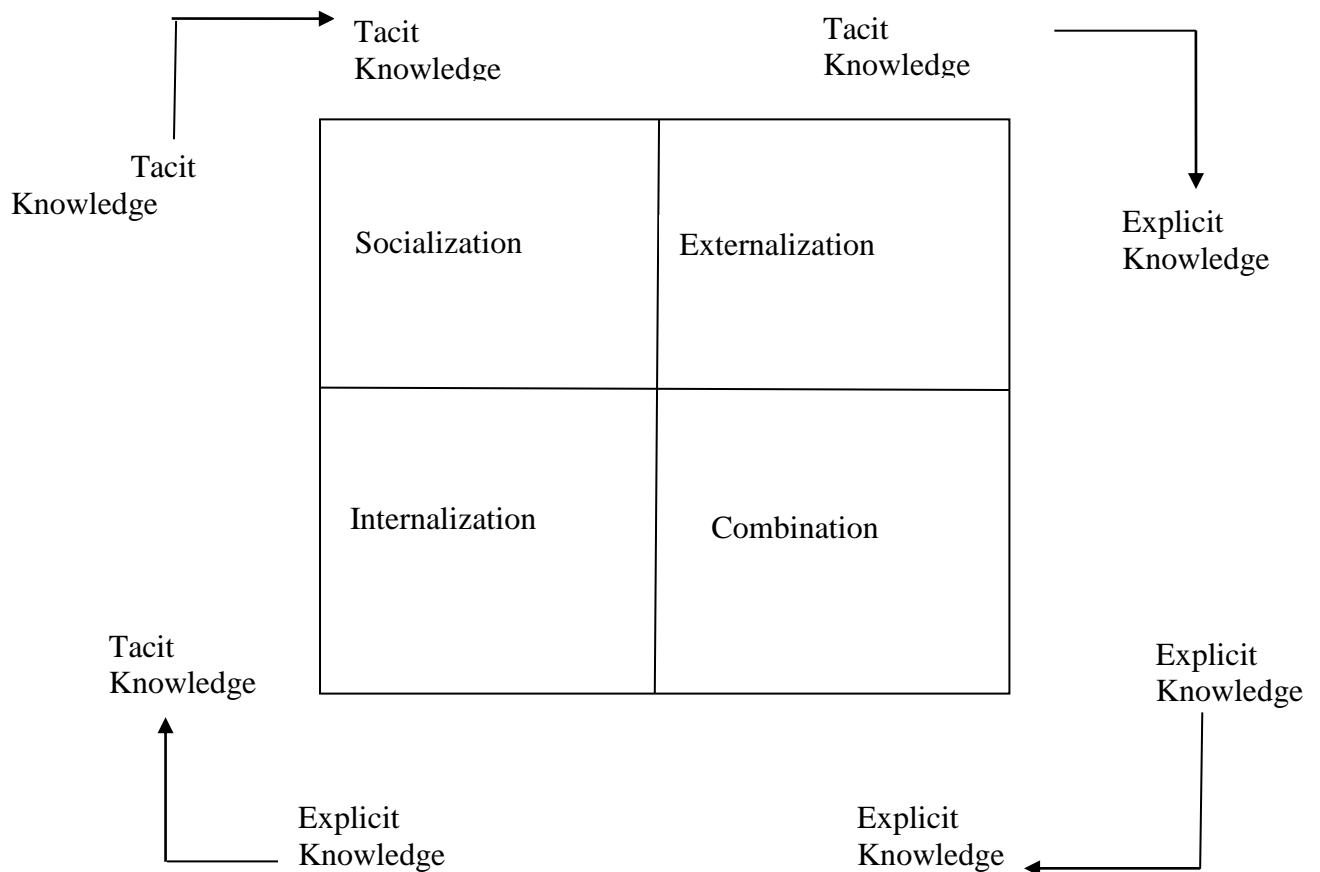


Figure 1: Knowledge conversion model (Adopted from Nonaka and Takeuchi)

DEFINITION OF DIFFUSION

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers 1995, 2003). Diffusion is also defined as the process in which technological innovation and managerial innovation have been introduced into work processes and adopted by a specific group or across the whole organization (Green and Hevner, 2000; Bresnen and Marshall, 2001) According to Koebel, (1999, 2008) diffusion involves communicating a new idea to the target adopters. According to Rogers (1995), it's a special type of communication, in that the messages are concerned with new ideas. Rogers (1995) defines communication as a process in which participants create and share information with one another in order to reach a mutual understanding. This means that two or more individuals exchange information with one another to move towards one another or part. (Rogers 1995; Toole, 1998; Sexton, 2004).

Innovation Decision

Innovation decision is the process through which an individual or other decision-making unit passes from first knowledge of innovation, to forming an attitude toward the innovation to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision (Rogers 1995). Rogers further argued that the innovation decision process consists of a series of actions and choices over time through which an individual or an organization evaluates a new idea and decides whether or not to incorporate the new idea into ongoing practice. Rogers (1995) in his seminal book on innovation diffusion opines that individual decision about an

innovation is not an act but a process that occurs over time and consists of a series of actions. What is the exact nature of the sequential stage in the process of innovation decision making? The model of knowledge transfer and innovation decision conceptualized in this paper consist of the five stages, Knowledge, Persuasion, Decision, Implementation and Confirmation.

Knowledge stage; this consist of the innovation-decision process as beginning with the knowledge stage which commences when the individual or other decision-making unit is exposed to the innovation or new knowledge existence and gains some understanding of how it functions (Rogers and Shoemaker 1971; Rogers 1995). Rogers further state that, an individual plays a passive role in being exposed to knowledge awareness because one becomes aware of an innovation quite by accident, as one cannot actively seek an innovation until one knows that it exists.

Persuasion stage; at the persuasion stage in the innovation decision process the individual forms a favourable or unfavourable attitude towards the innovation. Whereas the mental activity at the knowledge stage was mainly cognitive or knowing, the main type of thinking at the persuasion function is effective or feeling. Until the individual knows about a new idea, he or she cannot begin to form an attitude towards it (Rogers and Shoemaker, 1971; Rogers, 1995). Rogers further noted that at the persuasion stage is where an individual becomes more psychologically involved with the innovation; he or she seeks information about the new idea.

Decision stage; the decision stage in the innovation decision process occurs when an individual or other decision-making unit engages in activities that lead to a choice to adopt or reject the innovation. Adoption is a decision to make full use of an innovation or reject the innovation as the best course of action available (Rogers 1995). Rogers argues that most individuals will not adopt an innovation without trying it first on a probationary basis to determine its usefulness in their own situation. He further state that this small-scale trial is often part of the decision to adopt, in order to decrease the uncertainty of the innovation for the adopter.

Implementation stage; implementation occurs when an individual or other decision-making unit put an innovation into use. Until the implementation stage, the innovation-decision process has been a strictly mental exercise. But implementation involves overt behaviour change, as the new idea is put into practice (Rogers 1995). Rogers postulates that a certain degree of uncertainty about the expected consequences of the innovation still exists at the implementation stage, even though the decision to adopt has been made previously. Because an individual particularly wants to know the answers to such question as 'where do I obtain the new idea'? 'how do I use it'? And what operational problems am I likely to encounter, and how 'can I solve them'? As a result, active information seeking usually takes place at the implementation stage also.

Confirmation stage; at the confirmation stage the individual or other decision-unit seeks reinforcement for the innovation decision already made, but he or she may reverse this decision if exposed to conflicting messages about the innovation. The confirmation stage continues after the decision to adopt or reject for an indefinite period (Rogers 1995).

According to this theory, potential adopters of an innovation must learn about the innovation, be persuaded as to the merits of the innovation, decide to adopt, implement the innovation and confirm, reaffirm or reject the decision to adopt the innovation.

THE NEED FOR CONSTRUCTION SPECIFIC KNOWLEDGE TRANSFER

The need for construction specific knowledge transfer stems from its fragmented nature, it is also noted as a very complex industry when it comes to knowledge transfer. Construction projects are temporary and unique in nature different from other industries. Jian Sun and Xu Ren (2014) corroborate this assertion by arguing that, construction project teams are temporary and consist of multidisciplinary teams. They further argue that, after the completion of a project, parties involved move on to new and different projects. And so knowledge gained or transferred is lost and the lessons learned are dispersed at the end of that project (Jian Sun and Xu Ren, 2014).

The assertion of this author implies that after one project is completed the purpose of knowledge transfer and assimilation is defeated because teams involved in the knowledge transfer exercise are temporal unlike other industries. Furthermore knowledge transfer in other industries cannot be adopted wholly in the construction industry because they turn too focused on inter-intra firm knowledge transfer and management alone. Bosch and Postma (2010) noted that, the knowledge of collaborative network in the construction project is difficult to transfer, since it depends on the ease of communication and intimacy of the overall relationship between the source unit and the recipient unit. Lindner and Wald (2011) also added that, construction organizations often have a lack of natural mechanisms of learning which makes the transfer of knowledge difficult. Hence the need for construction specific knowledge transfer that builds on experiences of knowledge transfer in other industry.

Factors such as global competition, strategic unions, corporate strategies, and project delays as well as community involvement in today's construction projects have led firms to come out with innovative ways to enhancing their organizational image. According to Eliufoo, (2005) the use of joint investment and access to markets around the world reveal that Knowledge transfer is becoming increasingly significant in the industry. In the Knowledge base theory, Knowledge transfer and its application especially are considered the main factors of competitive advantage and organizational performance improvements (Alavi & Leidner, 2001).

MAKING A CONNECTION BETWEEN KNOWLEDGE TRANSFER AND DIFFUSION

There is the need for a connection between Knowledge transfer and diffusion of innovation because a process between the supplier (construction company in this case) and the adopter (the community) from the onset to the end of a diffusion process must be well correlated to avoid failure of adopting a new idea by a decision making unit or an adopter.

The framework below shows the inter-relation between Knowledge transfer and diffusion a combination of the theory of Nonaka & Takeuchi knowledge creation and shearing and Everett Rogers's innovation decision theory. It also introduces transformation in the middle which means that after a new knowledge have been transferred and diffused there must be a transformation in the adopting or receiving unit. As noted by Nonaka & Takeuchi (1995) and as shown in figure 2, there are several processes to a successful Knowledge transfer and diffusion which must be satisfied in order to achieve a successful Knowledge transfer and diffusion, these

variables are explained as depicted in the conceptual framework developed below in figure 2.

EXPLANATION OF THE VARIABLES IN THE FRAMEWORK

The framework proposed in this paper has seven main constructs that are supposed to be the main players in transferring, knowledge from construction companies to their host communities. These are discussed in the ensuing subsections.

The change agents

The change agent in this framework is the construction company because most construction projects happen in communities. Construction activities are amongst one of the industries that has a negative impact on the environment in which it occurs therefore its prudent for the industry to compensate for its adverse impact on the people leaving in and around the project sites hence the change makers.

Transformation

Transformation introduced in this framework is the successfulness and effectiveness of the knowledge codification, transfer and diffusion from the change agent (Construction Company) to the potential adopter (the host community). This means a good and successful knowledge transfer and diffusion must result in a change in attitude and knowledge on the part of the receiving unit. However, before this can be successful, there are some very vital drivers or actors that must be in place to enable its success.

Influential factors

The intrinsic influences for a successful knowledge transfer are persons specific because all persons have different rate of absorption. Some persons are able to codify and understand new knowledge faster than others. Also cultural norms in some communities facilitates the acceptance of new ideas while others does not. It also depend on opinion leaders like the chiefs and elders who are respected in most societies as people look up to them or consult them before making decisions. Other factors are peer networks community networking and interpersonal networking. These factors are also very vital in influencing others to changing their lifestyle.

Continuous collaboration and networking

Continuous collaboration and networking in any diffusion and knowledge transfer process is needed for reinforcement of the transferred knowledge. This is because, for one to accept to imitate what another person does, there must be a mutual trust and understanding between the holder of such new knowledge and the receiver. There should be continuous collaboration between the two sources throughout the transfer process from the onset to avoid discontinuation of the transferred knowledge because all persons are somehow risk averse.

Knowledge transfer variables

Knowledge transfer variables in this framework are Socialization, Externalization, Internalization and a combination of these variables are the systems in which knowledge is codified in the minds of persons. As the codification is going on formally or informally one must get close to another to be able to know what the other person is doing. Health and safety knowledge has been codified in the construction industry tacitly or explicitly between the workers. For example, most of the skilled and non-skilled labour is recruited at where the project is taking place. These groups

of persons are trained formally in HSE, they intend go home with this knowledge and consciously or unconsciously transfer the new knowledge to their families.

Socialization is the process of sharing tacit knowledge through observation, imitation, practice, and participation in formal and informal communities and this agrees with Professor Albert Bandura's socialization theory which says that an individual learns from another by means of observation. In other words, one observes what another does and then does something similar. Externalization usually begins with building a field or special interaction between the source and the receiver, in this case construction workers (change agents) and the community (adopters). The externalization according Nonaka and Takeuchi is seen in the process of concepts creation and is triggered by dialogue or collective reflection. Internalization is the process of embodying explicit knowledge into tacit knowledge. Nonaka and Takeuchi (1995) argue that knowledge is created and improved when it flows between different levels of a social system and between individuals and groups. Combination as indicated by Nonaka and Takeuchi (1995) is the process of integrating concepts into a knowledge system to integrate multiple bodies of explicit knowledge. They further opine that, it is important to consider that all the four phases of knowledge exchange must be satisfied to achieve a successful knowledge conversion within and across a social system.

Innovation decision variables.

The innovation decision in this framework is also made up of knowledge, Decision, Persuasion, Implementation and a Confirmation process. These variables are also very vital elements of the framework. In the first place, the host communities must first know of the existence of the HSE knowledge before taking decision to even ask of its merits and demerits or what it is. From this point onwards is when they may be persuaded to either try the new knowledge or not. At this point it is an individual decision process by the person to implement or try the said new knowledge to see whether it would suit him or her. Following this, he or she would either confirm to use the new knowledge or reject it entirely.

It can be helpful for a decision unit to identify and acquire externally generated knowledge that is crucial to them. The greater the effort, the more quickly the decision-making unit or an individual will build its knowledge-base. However, there are limits to a decision unit's or an individual's ability to achieve this speed. In the decision stage, during Knowledge diffusion, the adopter (receiving unit) needs to take the decision to adopt or reject the new idea. This process becomes crucial because it recognizes the potential benefits or disadvantages by associating with its needs and already existing Knowledge and if it turns to be more advantageous to the existing Knowledge, only then it becomes a knowledge that is usable for the receiver to adopt.

The implementation or knowledge application stage is the most significant stage during a knowledge transfer process. Literature has shown that no other process in the Knowledge transfer paradigm leads to improved performance. Improvement occurs only when Knowledge transferred from the source to the receiver is successfully applied or used at where it's required. Confirmation or a successful adaptation and reinforcement depend on successful communication of the Knowledge transferred and the adopters possessing adequate absorptive capacity to be able to receive and apply the new idea. Knowledge transfer has been regarded as a one-way process where the receiver usually takes the bulk or all the benefits. However, this study argues that the source, being the construction industry, also benefits from the Knowledge transferred

because they are giving back to the society and in return get back the peaceful and well collaborated environment to carry out their corporate goal.

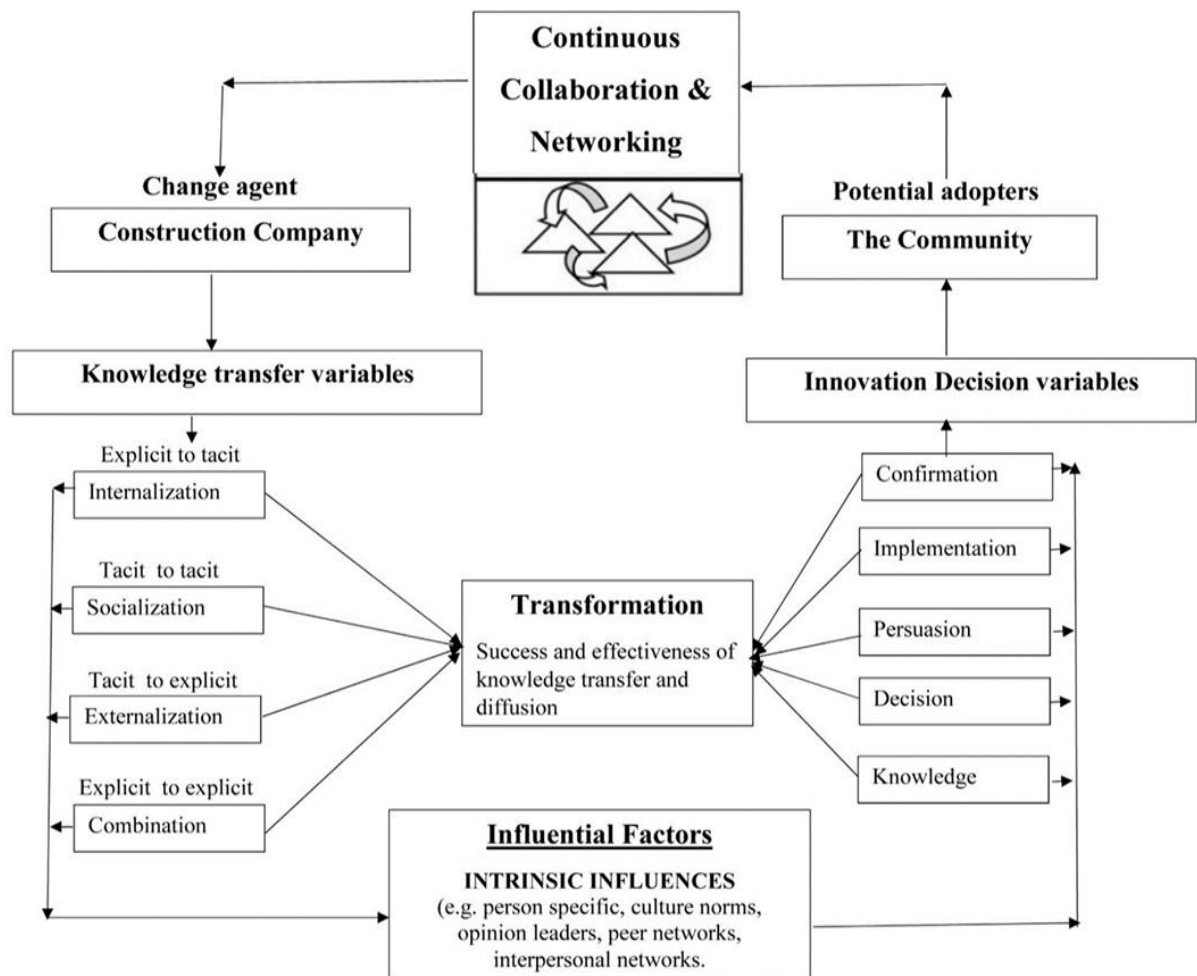


Figure 2: Knowledge Transfer and Diffusion – a Conceptual Framework

DISCUSSIONS

The introduction of health and safety among the project host communities involves the need to influence potential adopters, who are in this case the individual in the communities. Accordingly, an understanding of the diffusion behaviour of these individuals in the social system is relevant so as to manage the diffusion process adequately given the importance of diffusion of a new idea and innovation to organizational competitiveness and improvement as well as the importance of construction to national growth and development. This framework is not limited to health and safety alone but to other improved knowledge in the construction industry but health and safety is one of the most important subject matters which has a forward and backwards linkage with the national economy in the developing countries and for that matter Africa as well. The knowledge of health and safety in the host communities has the potential of improving to a large extent most of the prevailing issues confronting the host communities that militates against their welfare.

This research argues that for there to be a smooth transfer of health and safety from the construction industry to the community, it is important for the Knowledge to be transferred first and then diffused among the social system (the community in this

case). But for the process to be successful, there are several variables where sub-processes of knowledge transfer (KT) can be interrelated with the diffusion process (figure 2). First it is the knowledge awareness stage where the whole adoption process starts, because knowledge awareness will be helpful to identify whether and where a new idea exists. It presupposes a great level of participation from the source and the receiver and requires a strong inter personal relationship between the two parties. A Knowledge transfer process can be stifled if the adopters are unwilling to collaborate due to uncertainty of the outcome of the new idea since all persons are somehow risk averse.

The research further argues that, the practice of health and safety must provide the project host community with the perception that the adoption would better improve their wellbeing than they are currently without it this must not necessarily be so different than their way of leaving and should be built in their existing practices. The adoption and practice of health and safety practice must be presented to the project host community as consistent with their cultural believes and societal customs. This research is in agreement with the postulation of Rogers that an idea that is not compatible with the norms and values of the host community will not be adopted as rapidly as a new knowledge that is compatible. The health and safety introduction to the community needs to be easy for the receiving unit to understand and it should be done by people who are well vested in HSE practices. Some ideas are readily understood by most members of a social system, others are more complicated and will be adopted more slowly. In general, new ideas that are simpler to understand will be adopted more rapidly than knowledge that requires the adopter to develop new skills and understanding.

Letting the community have practical hands on safety drills prior to adoption of the new idea will allow for improve self-efficacy. Also, new idea that can be tried on the instalment plan will generally be adopted more quickly than knowledge that is not divisible. The idea of the need for health and safety improvement among the Ghanaian community must be presented in a way that the results are observable to others or late adopters. Rogers (1995) argue that the easier it is for individuals to see the results of a new knowledge, the more likely they are to adopt. Rogers (1995) concluded that a new knowledge that is perceived by receivers as having greater relative advantage, compatibility, trial-ability, and observer-ability and less complexity will be adopted more rapidly than other new ideas. He further argue that these are not the only qualities that affect adoption rates, but past research indicates that they are the most important characteristics of innovations in explaining rate of adoption.

CONCLUSIONS

In conclusion, this research aims at bringing the construction industry closer to the communities in which they operate, by transferring its health and safety Knowledge to that community. The research has shown the process of Knowledge transfer from the construction industry and its successful diffusion in the community. The view of Knowledge transfer and diffusion presented in this framework is consistent with theoretical evidence on Knowledge transfer and diffusion, which shows that transfer often occurs but it is incomplete unless it is diffused among the social system. The framework presented here provides a deeper and logical understanding of the conditions under which Knowledge transfer and diffusion occurs and the variables that can stifle, as well as enable the transfer and diffusion process. The framework advances theory about Knowledge transfer outside the construction industry and

provides logical insight for its diffusion among the community. The framework shows a dual role of continuous collaboration between the communities and the construction companies and intrinsic influences such as; cultural norms, opinion leaders, community networking and personal networking, as enablers and the same time as barriers to a successful Knowledge transfer and diffusion. Because these variables link the construction workers or the construction company's units to that of the community's units to new sources of Knowledge and aids the conversion of such new Knowledge.

This research has a number of implications for the industry. It has demonstrated that a construction firm that is able to create and improve its knowledge base and transfer such new knowledge to the community in which it finds itself, would have much collaboration from the community to perform its corporate goals. The framework has the potential of providing the industry with a peaceful atmosphere in carrying out project and completing them within schedule. The framework also has the potential of militating against community protest against project therefore given companies that do so a competitive advantage than companies which does keep their acquired knowledge internally. The frame work provides the industry with construction specific external knowledge transfer and diffusion that is needed to improve communities and the industry as a whole.

Further research should be conducted to identify the relative impact of the concepts introduced in this paper on Knowledge transfer outside the construction industry. Research should also be conducted to assess the extent to which the framework addresses Knowledge transfer and its rate of diffusion within a heterogeneous society. A more thorough understanding of how these variables interacts to drive Knowledge transfer and successful adoption would enable the industry to begin to predict the time needed to transfer Knowledge from the construction industry to the community and its rate of adoption. The construction firms should not be seen as a separate entity from the communities since they are interwoven. Once the framework proposed in this paper is expanded and validated, it would act to counter most community protest against construction projects causing delays and sometimes resulting in financial loses to the contractors and also facilitate the recruitment of people leaving in and around the project catchment area which would result in the improvement of their living standards.

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