A conceptual framework of contextual factors affecting knowledge transfer using meta-synthesis method

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Abstract

Since knowledge is currently considering as one of the most critical resources in organizations, knowledge management has an essential role in organizational success. Recently knowledge transfer has become a fast growing, innovative and essential research theme in the management domain. This paper proposes a comprehensive framework to have effective knowledge transfer in projects, especially transactional projects. We firstly explore, verify, and map out the key factors affecting knowledge transfer in organizations within the last decade. Secondly, a meta-synthesis approach is conducted by adopting "Wash and Downe's" seven-step method to determine the relevant, vital factors. We identify thirty-nine effective factors classified into four categories named individual, organizational, technological, and transnational factors. The first three types of factors are effective for knowledge transfer in any projects; however, transnational factors are involved primarily in transnational projects. A breakdown structure of these factors is presented as a coherent framework. Lastly, the paper concludes with a discussion of emerging issues, new research directions, and the practical implications of knowledge transfer research.

Keywords: Knowledge transfer, contextual factors, transnational projects, meta-synthesis

1- Introduction

Knowledge is undoubtedly one of the most valuable and exclusive human's assets. Although it is presumably as old as human being's existence and the initial known theories return to influential Greek philosophers such as Plato and Aristotle, nowadays the definition of knowledge has been developed, and it is known as the most valuable asset for managers and organizations. In other words, it is widely accepted that knowledge as a valuable asset has a fundamental role in competitive and dynamic economy (Davenport and Prusak, 1998) (Foss and Pedersen, 2002)(Grant, 1996)(Spender and Grant, 1996) Therefore, organizations should pay attention to both staffs in order to choose employees with specific and desirable knowledge, skills and abilities as well as their training system. Besides, it is essential for an organization to consider how to transfer knowledge and expertise from experts to other employees who need to gain related knowledge (Hinds et al., 2001). Since knowledge can be transferred across cultural and national boundaries which are geographically dispersed units and organizations (Duan et al., 2010), it is also extremely important to understand how efficiently and effectively knowledge can be transferred from an organization or its subunit to another one. Therefore, knowledge transfer has been recently considered as one of the most commonly discussed activities in the process of knowledge management involving several activities (Ford, 2001). Four levels of knowledge transfer are defined in (Duan et al., 2010), named individual level, intra-organizational level, inter-organizational level, and transnational level. In a transnational level, knowledge workers may be dispersed through both virtual working practices and throughout the organizations.

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In this study, we attempt to link the discussion of knowledge transfer with the research about transnational projects. Given the definition by the book named "A Guide to the Project Management Body of Knowledge" written by Rose, a project is a temporary endeavor undertaken to create a unique product or service, or a unique result. The nature of projects represents a definite end and start.

As it is defined in (Adenfelt and Lagerström, 2006), a transnational project is a cross-border organizational unit composed of members with different nationalities, who work in dispersed business units and functions, and thereby possess knowledge for solving strategic tasks in the Multi-National Corporations (MNC). In (Duan et al., 2010), Transnational Knowledge Transfer (TKT) is defined as knowledge transferring across different countries, or across-borders which happens through different aspects of corporates such as MNC, transnational organizations, International Joint Ventures (IJV), and international projects supported by governments. Regarding cross-cultural, political, economic, and geographical distances, TKT as a cross-border knowledge transfer faces extra challenges than local knowledge transfers within an organization or a project. Furthermore, theories of local knowledge transfer which are compatible and suitable at the local, individual, intra- or inter-organizational and projects level cannot be directly applied to the global TKTs (Duan et al., 2010), while there are some gaps in understanding of transnational knowledge transfer. It is worth mentioning that one of the significant barriers to effective knowledge management is inadequate understanding factors which affect knowledge transfer in transnational projects. Besides, it is crucial to have a clear understanding of the factors affecting knowledge transfer in projects to enhance organizational performance as the outstanding goals of both knowledge management and knowledge transfer. So, recently several researchers have recognized and discussed different factors which conceptually effect knowledge transfer, and they argue to empower these factors in order to achieve effective knowledge management practice (Schomaker and Zaheer, 2014)(Makela et al. 2007)(Mian et al. 2008)(Jasimuddin et al. 2015)(Welch and Welch, 2008)(Ahmad, 2017) Nevertheless, a few types of research consider all influential factors surrounding the knowledge transfer process to affect the performance of transnational projects. Hence, a clear and unified list of these kinds of factors is essential for an organization to improve its performance in knowledge management practice. Moreover, this list helps the organization not only to have a better knowledge transfer mechanism but also to reap its benefits (Yahyapour et al. 2015).

In this paper, we firstly introduce a list of influential factors by exploring the concepts and the relations among different factors affecting knowledge sharing and transferring through transnational networks to fill the gap that currently exists. Then, we present a comprehensive framework to guide further empirical studies. To the best of our knowledge, the relevant literature reveals that few researches emphasized on a set of effective factors to combine and introduce them in a unified, coherent framework in a way that most of the studies in this area have focused on one type of factor on knowledge transfer. This paper presents a set of factors impacting knowledge transfer according to the extensive overview of qualitative and quantitative studies. The presented factors are classified along with three dimensions named the individual, organizational and technological. Moreover, this study concerns transnational projects which are organized within a multinational corporation and has its own specific features which make knowledge transfer difficult to apply to them. So, our classification of effective factors also includes a fourth dimension named transnational factors, which is specifically to be considered in transnational projects. In sum, the primary purpose and objective of this paper is to present a unified and coherent framework for the identification and classification of factors affecting transnational knowledge transfer. Based on this goal, the scope of the research is defined, and we use a meta-synthesis method to compare, interpret, convert and combined previous frameworks presented during the last fifteen years in the literature. During combining various existing qualitative and quantitative studies by using a systematic approach, new subjects and metaphors are discovered, and also a new classification mechanism is presented to categorize the effective factors in knowledge transfer in a coherent framework.

The paper is organized as follows: In the next section, the previous work on knowledge management and also transnational knowledge transfer are reviewed. Section 3 describes our research methodology. In section 4, the data analysis and our proposed qualitative meta-synthesis procedure consisting of seven main steps are explained. Section 5 lists and classifies all obtained effective factors and presents our comprehensive framework. Finally, the paper is concluded in section 6.

2- Literature review

There is no specific definition available for knowledge despite its popularity. First of all, for developing a new approach for knowledge management, we must first know what the knowledge is. Knowledge can be defined as a "justified personal belief." As the researches indicated, knowledge is the most influential factor in continuous innovation and success (Drucker, 1999)(Kogut and Zander, 1992)(Nonaka and Takeuchi, 1995). In (Koskinen and Pihlanto, 2008), Koskinen and Philanto defined knowledge as an individual's perception, skills, and experience, which are typically what experiences the person's perspective contains in the form of meanings. They underlined one important aspect of knowledge, which is the dependency on the personal and social context an individual is embedded in (Lindner and Wald, 2011).

Knowledge management is a collection of processes that oversee the creation, propagation, and leverage of knowledge to accomplish organizational objectives (Pina et al. 2013). There have been several models of knowledge management life cycle in the literature which were proposed to highlight the important aspects of KM. The more generalized one is the model proposed by (Davenport and Prusak, 1998). It has three main steps named generate, codify/coordinate, and transfer. On the other hand, the model proposed by (Ward and Aurum, 2004) has seven steps entitled as create, acquire, identify, adapt, organize, distribute, and apply. Unlike traditional knowledge management that emphasized on technology or ability for building systems to process efficiently and leverage the knowledge, people and actions are more important elements within modern knowledge management (Ismail Al-Alawi et al. 2007). So, the two most important factors in the successfulness of knowledge management are the process of knowledge sharing and transfer. In literature, the term of knowledge sharing is associated with other knowledge processes such as knowledge flow, transfer, learning, creation, and distributed collaboration (Razmerita et al. 2016). Although some researchers equated knowledge sharing with knowledge transfer, these terms are different. Knowledge sharing as an important process of social interaction in organizations occurs at individual, group or organizational levels (Razmerita et al. 2016), whereas knowledge transfer occurs at a higher level. It typically has been used to describe how knowledge can exchange between different units, divisions, or organizations rather than individuals (Wang and Noe, 2010).

Knowledge transfer is a process by which 1) an organizational unit (e.g., a group, department, or division) can pass its experiences to another one, 2) organized information and skills can be systematically exchanged between entities, 3) the knowledge movement can occur between or among individuals, teams, groups, or organizations (Duan et al., 2010). Here, we use the term of knowledge transfer when discussing studies that measure both knowledge sharing and transfer.

This paper concentrates on the factors affecting knowledge exchange in transnational projects. The transnational project is defined as "*a cross-border and temporary organizational unit composed of individuals of different nationalities, working in different cultures, business units, and functions, thereby possessing specialized knowledge for solving a common strategic task in the MNC*" (Adenfelt and Lagerström, 2006).

As projects often have different functional backgrounds belonging to the characteristics of different business units, they would have a diverse source of knowledge (Adenfelt, 2010) (Hanisch et al. 2009). Each project, based on its nature, has some challenges because a diverse group of individuals from different functional areas should work together for a finite period of time to accomplish common and specific objectives. Transnational projects would face additional challenges because of its basic properties such as physical distance, cultural diversity, language barriers, and technological infrastructure differences (Adenfelt and Lagerström, 2006). In other words, transnational projects can be considered temporary units setting up in the present, where there are some barriers for their members to share and create knowledge because they are geographically dispersed, speak different languages, and barely know each other in advance. Here, we focus on the question of how various facets of distance (spatial, cultural and linguistic) influence knowledge transfers within transnational projects.

With the development of knowledge transferring researches, different scholars offered different views on influencing factors in the knowledge transferring process. In (Duan et al., 2010), Duan et al. explored and verified the key factors affecting TKT success. These factors are categorized in four classes: 1) *Actors* which are involved in the knowledge transfer process and are always central. Three kinds of actors are generally identified, named sender, recipient, and intermediary actors. 2) *Context* where the interaction takes place. Transferring knowledge is contextually bounded, means the process of knowledge

transfer is constrained by the contexts in which it is embedded. 3) *Content*, which should be transferred between actors. 4) *Media* by which the transfer is carried out.

In (Pablos, 2006), the author analyzed knowledge transfers in transnational corporations; he classified knowledge according to strategic value and uniqueness into four types of knowledge: Idiosyncratic knowledge (low value, high uniqueness), Ancillary knowledge (low value, low uniqueness), Core knowledge (high value, high uniqueness), and Compulsory knowledge (high value, low uniqueness). He also revealed that the transfer is affected by the properties of knowledge (tacitness, social complexity, causal ambiguity) and the absorptive capacity of the receiver unit. Additionally, knowledge transfer is also affected by organizational cultural distance and national cultural distance (Pablos, 2006). Mei et al. (2007) considered the competence, culture, resource, strategy, and organization relationship as the main influencing factors to analyze the project management knowledge transferring. They also established a context-based model with these five context dimensions, which formed a pentagon as the scope of the knowledge context.

Ismail Al-Alawi et al. (2007) investigated the role of certain factors in organizational culture in the success of knowledge sharing. Their research findings indicated that trust, communication, information systems, rewards and organization structure are positively related to knowledge sharing in organizations. Pérez-Nordtvedt et al. (2008) examined the impact of knowledge characteristics, recipient learning intent, source attractiveness, and relationship quality on the effectiveness and efficiency of knowledge transfer based on a sample of 102 US organizations. Findings indicated that recipient learning intent and source attractiveness positively impact the effectiveness of knowledge transfer. Furthermore, their results highlighted that the quality of the relationship between the source and the recipient has a strong positive impact on both the efficiency and effectiveness of cross-border knowledge transfer.

Cheng et al. (2008) explored the influence factors of knowledge transfer in project management in five categories: 1) knowledge characteristics, 2) characteristics of the knowledge source, 3) characteristics of the knowledge acceptor, 4) relationship between the two sides, and 5) gap between the two sides. Abdul Hamid and Salim identified seven knowledge transfer components named the source, receipt, knowledge, organizational, communication, relationship, and project nature (Hamid and Salim, 2010). In another research (Qi et al. 2010), the author examined what factors affect knowledge sharing in project teams; they divided them into three groups: individual characteristics, knowledge, and contextual factors.

Dawes et al. (2012) explored the nature of transnational public sector knowledge networks (TPSKNs). They defined three layers of complexity of contextual factors, affecting the individual participating organizations, which include national, organizational, and information context. They organized nine categories of distance: cultural, political, intention, organizational, relational, knowledge, resource, physical, and technical. The authors stated that there are a set of contextual distances between the actors in the different countries that influence and are influenced by interactions among participants as they seek to produce results (Dawes et al. 2012). The motivational factors affecting the knowledge sharing through an intra-organizational were investigated by Vuori and Okkonen in (Vuori and Okkonen, 2012). These factors are classified into seven categories: 1) contributing to organization's success, 2) getting incentives and rewards, 3) feeling empowered, 4) getting knowledge in return, i.e., reciprocity, 5) boosting own reputation, 6) adding value to knowledge, and 7) trusting that sharing is worthwhile.

Specific studies on cultural issues and knowledge transfer within MNC have been conducted by (Lucas, 2006), (Yeow and Blazjewski, 2007), (Fong Boh et al. 2013). In (Bengoa et al. 2015), the authors developed a holistic conceptual framework and provided a synthesis of factors, which could only be found so far in a scattered manner in the literature consist of skill, motivation, National Culture, Corporate Culture, Strategy Resources & Infrastructure, and Knowledge Content. Gopal et al. (2015) proposed a model of knowledge transfer effectiveness that consisted of four types of contexts: knowledge context, team context, technology context, and organization context. Razmerita et al. (2016) divided the effective factors through knowledge sharing into three categories named individual factors, organizational factors, and technological factors.

Figure 1 provides an overview synthesis of knowledge transfer components and factors introduced by different researches in the literature of knowledge transfer and sharing in a scattered manner.
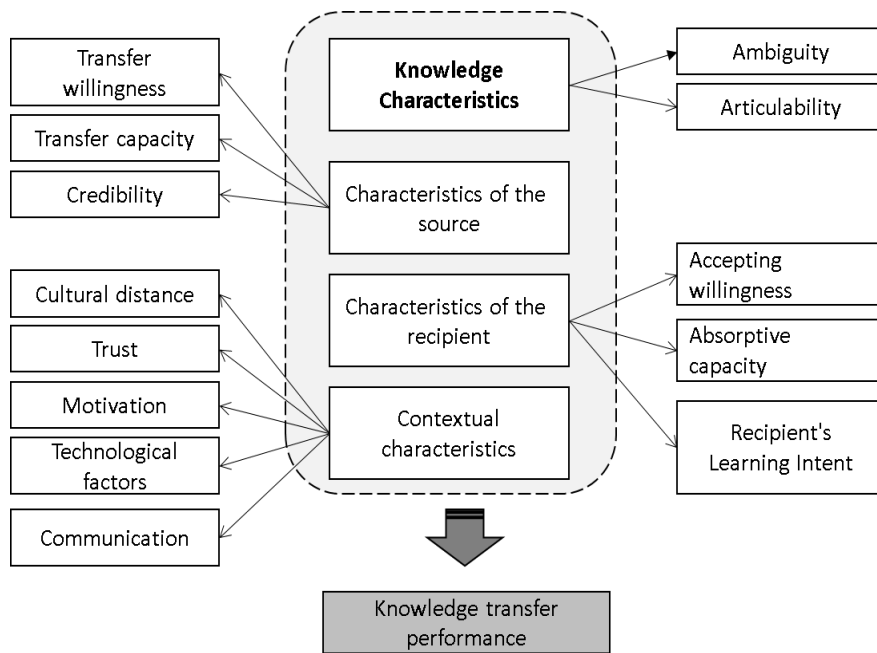
Fig 1. Knowledge Transfer Components

3- Research methodology

The literature review has identified a wide range of factors affecting knowledge transfer across different nationalities and cultures. Based on an extensive overview of qualitative and quantitative studies, we aim to identify a set of factors that impact knowledge transfer in transnational projects.

Noblit and Hare (1998) stated that *"when we synthesize, we give meaning to the set of studies under consideration, we interpret them in a fashion similar to an ethnographer interpreting a culture."* According to this statement, they proposed a method named meta-ethnography to synthesize qualitative research. The work became popular, and other researchers used it as a template for subsequent endeavors (Jensen and Allen, 1994) (Britten et al. 2002). Their method has since been referred to as the meta-synthesis method (Kepreotes, 2009). The meta-synthesis method has the potential to revolutionize qualitative research utilization (Sandelowski and Barroso, 2007). It can also be useful to integrate the findings of quantitative and qualitative studies (Urquhart, 2010).

Although there are various approaches based on meta-synthesis varying in their procedure with different steps (Barnett-Page and Thomas, 2009) (Mays et al. 2005), all of them focus on providing a framework for answering questions about what works for whom, when and how (Urquhart, 2010).
In contrast to meta-analysis, the intent of meta-synthesis is interpretive, rather than aggregating. It attempts to integrate results from some studies which are different but inter-related. Examples from the literature indicate that some aspects of this technique are not yet fully established (Walsh and Downe, 2005). In other words, meta-synthesis is neither an integrated review of literature done on a given topic nor a secondary data analysis applied on primary data from the selected studies. Indeed, it is an analysis of the finding of these studies (Zimmer, 2006). Meta-synthesis focuses on three-fold purpose, theory development, high-level summarization, and generalization, to provide more access to the findings for practical applications (Sandelowski and Barroso, 2007)

Through an extensive literature review using the terms 'meta-synthesis' and 'meta-analysis' and follow-up 'berrypicking' procedure, Walsh and Downe (2005) developed and proposed a seven-step approach for the meta-synthesis: (1) framing a meta-synthesis exercise, (2) locating relevant papers, (3) deciding what to include, (4) appraising studies, (5) comparing and contrasting exercise, (6) reciprocating translation, and (7) synthesizing translation. This paper adopts the qualitative meta-synthesis method presented by Walsh and Downe (2005). Here, we aim to develop a comprehensive framework which unifies the previous studies focusing on extraction of effective factors in knowledge transfer domain, especially

applicable in transnational projects. Therefore, we utilize the meta-synthesis method to integrate and analyze the quantitative and qualitative findings of prior research in this area and put forth a more comprehensive and clear vision of the concept.

4- Data analysis

Our proposed qualitative meta-synthesis procedure consisting of seven main steps is outlined in Figure 2, and it is explained in detail as follows.

4-1- Framing a meta-synthesis

Like any research method, an appropriate and well-developed research question gives direction to the meta-synthesis. After determining the initial purpose of the research synthesis study, the parameters that constitute the inclusion criteria for the research should be clarified. This helps to know what studies in literature should be excluded. So, we first clarify the four main parameters: initial topical (*what*), population (*who*), temporal (*when*), and methodological (*how*).

Our study is farmed by the questions which include the useful factors and concepts in knowledge transfer through transnational projects that are currently available in the literature. Researches often use these factors to produce a common frame of reference that can be used for knowledge transfer. The studies which we examine in this research ranged between 2002 and 2017. Based on these issues, our research questions which guide our study about knowledge transfer in transnational projects are:

- *RQ1*. What are the factors affecting knowledge transfer in transnational projects between 2002 and 2017?
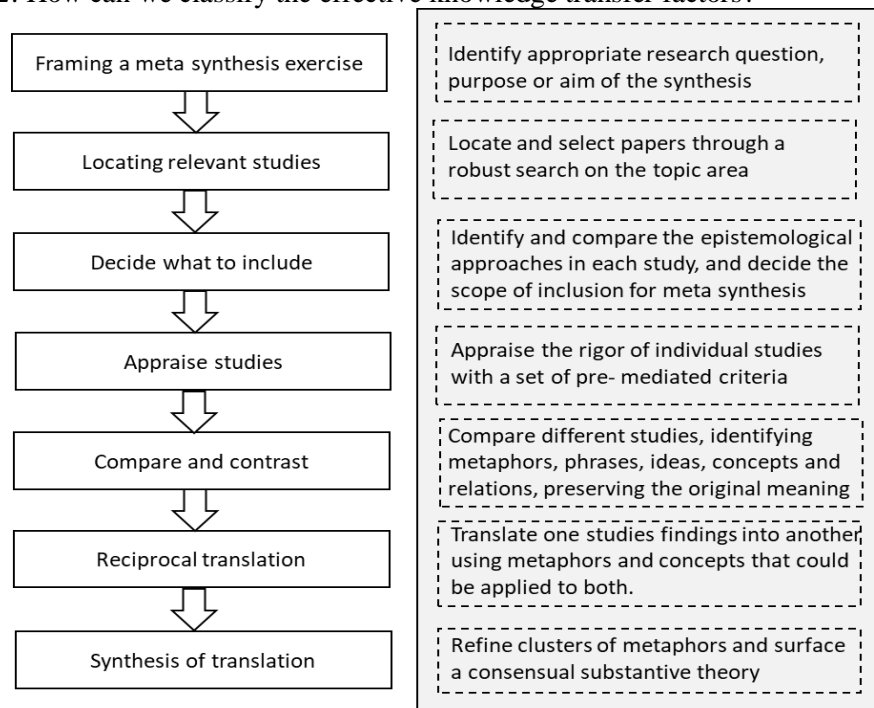- *RQ2*. How can we classify the effective knowledge transfer factors?

Fig 2. Meta-synthesis procedure for this study adopted from (Walsh and Downe, 2005)

4-2- Locating relevant studies and deciding what to include

After framing the qualitative meta-synthesis by determining the research questions, firstly relevant studies should be recognized, and then those which are more relevant and useful should be decided to be included. To do so, a systematic search has been carried out to find the articles related to the research question by selecting valid and relevant scientific journals and databases, as well as choosing the right keywords. We use two search strategies to identify related articles: Firstly, a systematic search is conducted in seven electronic databases named Emerald, Science Direct (Elsevier), IEEE, Academic Search Premier (Ebsco), Sage Publications, Springer, and ProQuest. The primary keywords used to search scholars through these databases are "knowledge transfer" and "knowledge sharing" combined with

"transnational project," "multinational project," "international project," and "international corporation" keywords. Secondly, we review the reference list of searched articles, i.e., using backward tracking of citations, to identify and acquire additional related studies. Then, we scan the titles and abstracts of the additional articles to find out if they reveal our investigation questions and whether they satisfy the inclusion criteria outlined for our meta-synthesis.

The primary search provides 372 articles from all of the aforementioned databases. In each appraising step, some articles omitted based on their relevancies on the main topic. At the initial step, we reviewed the abstract of the 372 articles and screen out those that are not directly related to knowledge transfer factors. Finally, 90 related articles focusing on knowledge transfer remain.

To answer the investigation questions, a set of inclusion and exclusion criteria should be specified. Here, the inclusion criteria of selected research papers are: 1) their findings, 2) written in English, 3) emphasizing on the key factors affecting knowledge transfer in transnational projects and 4) published between 2002 and 2017.

4-3- Appraisal studies

Through the appraisal phase, low-quality studies should be screened out. Critical appraisal is a systematic process used to qualify research articles to find the usefulness and validity of their findings. Indeed, it is an essential process in a systematic review of studies to prevent the inclusion of poorly conducted articles where they are likely biased (Duan et al., 2010). In this step, we investigate the relationship between the related articles, which are selected through the previous step, and our research questions and also their conformity with the inclusion criteria. Then, we use the Critical Appraisal Skills Program (CASP) as well-known and helpful tools for quality assessments of studies. This tool presents a series of questions by considering three broad issues; *rigor*, *credibility*, and *relevance*. Reviewers are asked ten questions concerning aims, methodology, design, subject recruitment, data collection, researcher-participant relationship, ethics, data analysis, statement of findings, and value of research. In addition to writing comments on each of these issues, the reviewers are asked to assign a score from 1 to 5 to each of these criteria (Young and Solomon, 2009).

Figure 3 summarizes the process of selecting the appropriate articles through previous and these steps. In the previous step, we find 372 nearly related articles by searching based on the keywords mentioned above. After reading their abstraction and considering their relevance to our research questions, 90 studies remain. In this step, the full text of these articles is reviewed, and their conformity is deeply examined deeply with our research questions and the inclusion criteria. 53 studies of remained studies are eliminated. Among the 37 remaining articles, three articles were evaluated qualitatively as very good by utilizing the CASP tool, ten as good, and twenty-four as average articles.

4-4- Compare and contrast, determining how models are related or different

In this step, we start from the in-depth reading of every related article determined through two previous steps. Then, we compare and contrasted them to each other to determine how their proposed models are related or different. To make a pairwise comparison, a grid linking concepts to themes are firstly generated by comprehending the author's usage of key metaphors, phrases, ideas, concepts, and relations, then the key concepts are tabulated against each study. As Jensen and Allen (1994) explained, this is a two-part process where first the primary concepts are captured, and then a rational relation among selected research studies is provided with the proximity of the concepts which are identified in the process.
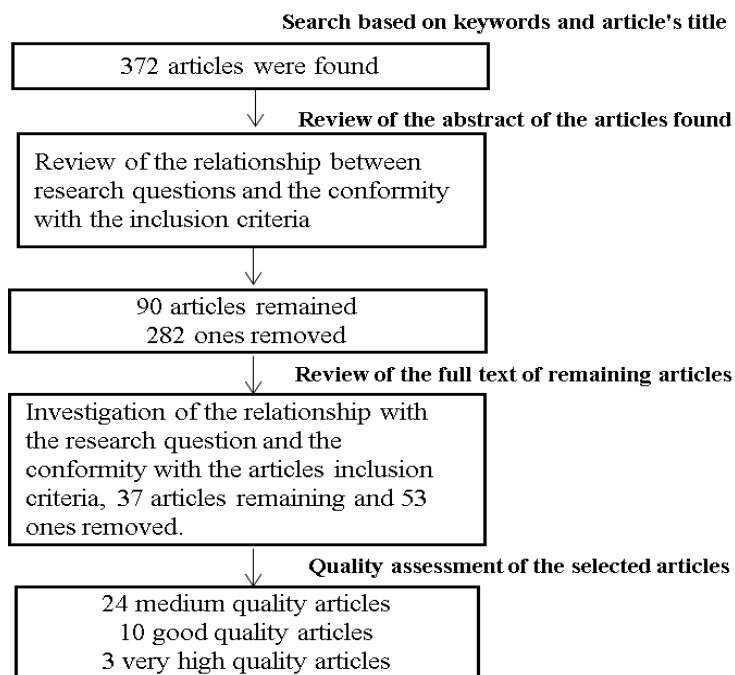
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┌─────────────────────────────────────────┐
│        372 articles were found           │
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                    ▼        Review of the abstract of the articles found
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│ Review of the relationship between       │
│ research questions and the conformity    │
│ with the inclusion criteria              │
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│        90 articles remained              │
│        282 ones removed                  │
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                    ▼    Review of the full text of remaining articles
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│ Investigation of the relationship with   │
│ the research question and the            │
│ conformity with the articles inclusion   │
│ criteria, 37 articles remaining and 53   │
│ ones removed.                            │
└─────────────────────────────────────────┘
                    │
                    ▼    Quality assessment of the selected articles
┌─────────────────────────────────────────┐
│       24 medium quality articles         │
│       10 good quality articles           │
│       3 very high quality articles       │
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Fig 3. The process of search and selection of appropriate articles

4-5- Reciprocal translation

In this step, the concepts and themes are extracted by reading the full text of selected research studies. Then, we put them into a reciprocal translation process that reveals concepts by the open-coding method. In this type of coding, a code is devoted to every one of the raw findings obtained from the articles. As the first step of coding, it is necessary to identify similar codes and merge the codes with common content. These similar codes are grouped as super-codes which are named concepts. A concept is part of the data that a researcher determines as important content to be mentioned. In the second step of coding, the relationship between the codes is identified, and the relevant codes are placed in one group and form categories. Finally, a code is dedicated to each category to find the patterns.

4-6- Synthesis of translation

The last but not the least step is synthesizing the obtained concepts to illustrate new or underlying dimensions for a common frame of reference. For this synthesis, the contradictions and overlaps should be identified and accommodated. In this paper, all the key factors that affecting knowledge transfer are derived from previous research and a code is dedicated to each one. Then the codes that overlapped with each other were identified, and the overlays were removed. The codes with similar content were recognized and categorized as same concepts. The output of this step is identifying 39 different codes and consequently recognizing four different concepts called "contextual knowledge transfer factors." Finally, the identified factors and categories are re-examined, the relationships between them are determined, and we reclassify them into four main "impacting factors" categories of individual factors, organizational factors, technological factors, and transnational factors. Table 1 refers to the breakdown structure of key factors affecting knowledge transfer in transnational projects. The final framework of meta-synthesis is presented in the research findings section.

Table 1. The breakdown structure of "contextual factors affecting knowledge transfer"

Concepts	Codes	Recent References
Individual factors	Promotion	Vuori and Okkonen (2012),
	Social rewards	Wasko and Faraj (2005), Chennamaneni et al. (2012), Moskaliuk et al. (2014), Razmerita et al. (2016), Hsu et al. (2007)
	Trust	Bakker et. al. (2006), Mooradian et. al. (2006), Wu et. al. (2007), Sajeva (2007), Al-Alawi et. al. (2007), Hsu et. al. (2007), Mu et. al. (2008), Ma et. al. (2008), Tong and Nengmin (2009), Wu et. al. (2009), Wang and Noe (2010), Qi et. al. (2010), Babalhavaeji and Kermani (2011), Sharon et. al. (2011), Hassandoust et. al. (2011), Mueller (2012), Nooshinfard and Nemati-Anaraki (2012), Wickramasinghe and Widyaratne (2012), Moskaliuk et. al. (2014), Raab et. al. (2014), Killingsworth et. al. (2016).
	Perception	Wang and Noe (2010)), Babalhavaeji and Kermani (2011), Nooshinfard and Nemati-Anaraki (2012).
	Attitude	Cheng et al. (2008), Wang and Noe (2010), Babalhavaeji and Jafarzadeh Kermani (2011), Hassandoust et al. (2011), Nooshinfard and Nemati-Anaraki (2012), Killingsworth et al. (2016).
	Communication	Vries et. al. (2006), Kogut and Zander (1992), Jonsson and Kalling (2007), Al-Alawi et. al. (2007), Cheng et al. (2008), Frey et. al. (2009), Bresman et. al. (2010), Hu and Xue (2010), Mueller (2012), Nooshinfard and Nemati-Anaraki (2012), Fletcher-Chen (2015), Gopal et. al. (2015).
	Motivation	Babalhavaeji and Jafarzadeh Kermani (2011), Ipe (2003), Jonsson and Kalling (2007), Cheng et al. (2008), Wang and Noe (2010), Qi et. al. (2010), Mueller (2012), Vuori and Okkonen (2012), Nooshinfard and Nemati-Anaraki (2012), Killingsworth et. al. (2016).
	Justice	Ma et. al. (2008), Qi et. al. (2010).
	Empowerment	Ma et. al. (2008), Qi et. al. (2010).
	Job satisfaction	Vries et al. (2006).
Organizational factors	Organization culture	Schlegelmilch and Chini (2003), Bock et. al. (2005), Pablos (2006), Wang and Noe (2010), Dawes et. al. (2012), Hassandoust et. al. (2011), Nooshinfard and Nemati-Anaraki (2012), Michailova and Minbaeva (2012), Ajmal and Koskinen (2008), Ajmal and et.al. (2009), Ajmal and Helo (2010).
	Organization reward system	Bartol and Srivastava (2002), Liebowitz (2003), Al-Alawi et al. (2007), Sajeva (2007), Chennamaneni et al. (2012), Wang and Noe (2010), Lpe (2003).
	Motivation	Ipe (2003), Lin (2007), Mukamala and Razmerita (2014), Abdul Hamid and Salim (2010), Bengoa et al. (2015)
	Management support	Connelly and Kelloway (2003), Lin (2007), Jonsson and Kalling (2007), Wang and Noe (2010), Wickramasinghe and Widyaratne (2012), Nooshinfard and Nemati-Anaraki (2012).
	Organizational structure	Liebowitz (2003), Liebowitz and Megbolugbe (2003), Kim and Lee (2006), Jonsson and Kalling (2007), Yang and Chen (2007), Al-Alawi et. al. (2007), Greveson and Damanpour (2007), Hooff and Huysman (2009), Frey et. al. (2009), Willem and Buelens (2009), Wang and Noe (2010), Mueller (2012), Nooshinfard and Nemati-Anaraki (2012), Gopal et. al. (2015).
	Organizational commitment	Hooff and Ridder (2004), Lin (2007), Dawes et al. (2011), Sajeva (2007).
	Opportunities to Share	Lpe (2003).
	Leadership characteristics	Frey et al. (2009), Wang and Noe (2010), Qi et al. (2010), Mueller (2012).
	Strategy	Mei et. al. (2007), Bengoa et. al. (2015).
	Organizational relationship	Mei et. al. (2007), Pérez-Nordtvedt et. al. (2008), Ma et. al. (2008).
	Control mechanism	Gang and Bosen (2010), Bresman et al. (2010).
	Training	Jonsson and Kalling (2007).
	Team orientation	Mueller (2012).

Table 1. Continued

Concepts	Codes	Recent References
Technological factors	Social networks	Inkpen and Tsang (2005), Chiu et al. (2006), Chow and Chan (2008), Noorderhaven and Harzing (2009), Wang and Noe (2010), Vuori and Okkonen (2012), Nooshinfard and Nemati-Anaraki (2012)).
	ICT	Schlegelmilch and Chini (2003), Syed-Ikhsan and Rowland (2004), Hasty et. al. (2006), Adenfelt and Lagerstrom (2006), Al-Alawi et. al. (2007), Van den Hooff and Huysman (2009), Frey et. al. (2009), Gang and Bosen (2010), Liang et. al. (2010), Nooshinfard and Nemati-Anaraki (2012), Gopal et. al. (2015).
	Availability of ICT	Connelly and Kelloway (2003), Yang and Chen (2007), Dawes et al. (2012), Nooshinfard and Nemati-Anaraki (2012).
	Training	Chow and Chan (2008), Moskaliuk et al. (2014).
	Overload information	Sajeva (2007), Paroutis and Al Saleh (2009).
	Usability	Sajeva (2007), Vuori and Okkonen (2012), Lin (2007).
Transnational factors	Language	Sunaoshi et al. (2005), Kayes et al. (2005), Makela et al. (2007), Welch and Welch (2008), Ambos and Ambos (2009), Schomaker and Zaheer (2014), Fletcher-Chen (2015), Ahmad (2017).
	Cultural distance	Dawes et. al. (2012), Adenfelt and Lagerstro¨m (2005), Ambos and Ambos (2009), Duan et. al. (2010), Makela et. al. (2007), Jasimuddin et. al. (2015), Bengoa et al. (2015), Fong Boh et,al.(2013), Pablos (2006), Vuori and Okkonen (2012), Welch and Welch (2008), Gang and Bosen (2010), Raab et. al. (2014).
	Geographical distance	Hansen and Lovas (2004), Jonsson and Kalling (2007), Ambos and Amb (2009), Ganga and Bosen (2010), Raab et al. (2014), Jasimuddin et. al. (2015), Dawes et. al. (2012), Duan et al.(2010).
	Time zone	Gang and Bosen (2010).
	Relational distance	Dawes et. al. (2012), Duan et al. (2010), Jasimuddin et. al. (2015), Gang and Bosen (2010), Fletcher-Chen (2015), Pérez-Nordtvedt et. al. (2008).
	Policies and laws	Duan et. al.(2010).
	Technical distance	Duan et. al. (2010), Dawes et. al. (2012), Adenfelt and Lagerstro¨m (2005), Makela et al. (2007), Bengoa et al. (2015).
	Knowledge distance	Duan et. al. (2010), Dawes et. al. (2012), Bengoa et al. (2015), Pérez-Nordtvedt et. al. (2008).
	Organizational distance	Dawes et. al. (2012), Bengoa et al. (2015), Makela et. al. (2007), Ismail et, al. (2016), Pablos (2006), Killingsworth et. al. (2016).
	Intention distance	Dawes et al. (2012).

5- Discussion

An effort to identify the factors affecting knowledge transfer in transnational projects discussed in the literature between 2002 and 2017 is made. Previous literature has identified a wide range of factors affecting employees' knowledge transfer behavior across different industry sectors and business cultures. The breakdown structure of our extracted effective factors which encompasses four concepts is shown in table 2. These important concepts in our proposed framework are *individual factors*, *organization factors*, *technological factors*, and *transnational factors*. The following subsections explain these factors in details.

Table 2. The breakdown structure of "contextual factors affecting knowledge transfer"

Concept	Codes	Issues
Individual factors	Promotion	Defining Knowledge Transfer and Sharing in Promoting Organizational Position
	Social rewards	The importance of social rewards such as praise, recognition, and attention
	Trust	Creating trust in sharing knowledge by reducing the fear of losing the value of individual
		Creating trust between employees and also employees to the organization
	Perception	The employees' perception of the importance of knowledge transfer and the definition of the priority of knowledge transfer in the minds of employees
	Attitude	The Impact of Individual Beliefs on the Usefulness of Knowledge Transfer
		The Attitude of employees to the organization about recording and transferring their knowledge
	Communication	Persuading employees to communicate with their colleagues
		Creating an atmosphere of intimacy and comfort for employees to enhance communication
	Motivation	Strengthening the internal and personal motivation of the staff
		The individual's belief in the effectiveness of knowledge activities
	Justice	The beliefs of employees about justice and equality of the manager
	Empowerment	Creating a sense of independence and empowerment in the staff
	Job satisfaction	Employees are eager to transfer their knowledge according to their level of satisfaction with the organization
Organizational factors	Organization culture	Institutionalizing the culture of knowledge transfer, like a daily or weekly process
		Implementing organizational culture that promotes innovation, learning, and sharing of knowledge
		Create a culture of trust between the organizations and the staff and respect for intellectual property rights
	Organization reward system	Create a supportive environment for knowledge transfer and encourage employees with cash bonuses
		Collective encouragement and non-monetary incentives
	Motivation	Creating job security and eagerness in employees by managers
		Motivate staff to encourage them to knowledge transfer
	Management support	Support of chief management of KM strategy
		Awareness of managers about details
	Organizational structure	The lack of a concentrated organizational structure (creating an open workspace for interactions)
		Design employees interactions in the organizational structure (creating a work rotation in staff descriptions)
		Define a separate knowledge management team in the organization
		The existence of informal channels of communication and informal meetings in the units
	Organizational commitment	The commitment of individuals to the organizational success of knowledge transfer
		The level of employees committed to the organization's demands
	Opportunities to Share	Create time and space for daily interaction and brainstorming sessions
		Existence COP to Encourages employees to communicate with one another
	Leadership characteristics	Leadership style in Knowledge Management and Supportive Managers of Knowledge Activities
		Strategic orientation of organization leaders and commitment of senior executives to the realization of knowledge management processes
	Strategy	The consistency of a knowledge management system with the vision, mission and organizational values and strategies and goals of the organization.
		The alignment of the goals of transfer and acquisition of knowledge with the organization's business strategy and orientations

Table 2. Continued

Concept	Codes	Issues
Organizational factors	Organizational relationship	Creating a passion for employees to interact more and increase the quality of communication
	Control mechanism	The appointment of senior managers to monitor and track the process of knowledge transfer and knowledge management practice
	Training	Creating training groups between employees
		The definition of practical workshops and forums to share knowledge
	Team orientation and collegiality	Defining employees in multiplayer groups to the purpose of knowledge interaction
		Encouraging employees to workgroup and upgrading their skills in group interactions

Concept	Codes	Issues
Technological factors	Social networks	Define the appropriate social networks for employees to use in the process of knowledge transfer
		Usability of programs and employee familiarity with updates and functionality of programs
	ICT	Availability of hardware and software infrastructures
		Strengthen the channels of transmission of knowledge and information in a user-friendly program
		Ability to easily import and extract information and knowledge from programs
	Availability of ICT	Ease of use for employees
		Ability to set access levels for different levels of organizations
	Training	Create workshops to learn how the program works
		Providing specialized films and animations of activities
	Overload information	The large volume of information available causes confusion in the acquisition and transfer of knowledge.
	Usability	The impact of the type of networks and software used for knowledge flow
		The presence of guidance and proper definition in different parts of the program
Transnational factors	Language	Definition of a common language for the sake of communication
		The proximity of the language of two sides makes it easy to communicate.
		Language diversity increases the quality of discussions.
		The use of technical and technical words and the use of language media in cases of use
		Language policy (simplification of words and relaxation speed communications) and confirming questions in cases of ambiguity
	Cultural factors	Differences in culture make a difference in perceptions of people
		The existence of team-mates with common culture increases the eagerness of the knowledge process.
		The common background of national culture, beliefs, values, perceptions and common practices is useful in transmission.
		The degree of difference between the views of the individual concerning individualism or group-based vision of organizational power
		The importance of efforts to align the cultures
	Geographical distance	The existence of the spatial distance of the knowledge transfer process effects
		The spatial distance between knowledge exchanges is prevented by staff and, in the event of long-time interaction, the transmission is discouraging.
		Distance creates distrust and lack of enthusiasm for the knowledge transfer.
	Time zone	The difference in time zones makes it difficult to interact
	Relational distance	Time and rate of previous interactions of individuals in the transfer
		It is more difficult to establish a relationship in the first time, and the duration of the collaboration creates more ties.
	Policies and laws	The existence of intellectual property in knowledge creation and privacy protection laws
		The lack of sufficient legal frameworks in contracts and the existence of restrictive legal infrastructure
		Ineffective implementation and frequent changes in the legal infrastructure

Table 2. Continued

Concepts	Codes	Issues
Transnational factors	Technical distance	The difference in IT infrastructure and the level of knowledge of the parties' technical sides is affecting the knowledge transfer process
		The degree of complexity of the infrastructure (issues arising from differences in software and hardware and data)
		Program and infrastructure standardization
	Knowledge distance	The distance between knowledge (the difference in the present knowledge of the two sides of the project) influences the learning process
		If there is a common knowledge base, the transfer of surplus knowledge is more straightforward.
	Organizational distance	The degree of lack of solidarity and cultural difference between project partners
		Differences in values, structure, and trends in the organization of the parties
		Differences in goals and how organizations decide
	Intention distance	Differences in missions and goals of organizations
		It makes it difficult for the parties to transpose the conflicting interests.
		The definition of guidance and control mechanisms to transfer knowledge

5-1- Individual factors

Individual-based factors as our first concept have a crucial role in knowledge transfer. These factors are listed in table 2. Some important factors included in this category are *trust*, *personal motivation*, *personal communication*, *social reward*, and *personal perspectives*. Organizations should work on building mutual trust with individuals, and individuals with their co-workers. As it is shown that an individual's trust to both her/his co-workers and organization makes the knowledge transfer process more effective, organizations should work on building mutual trust with individuals, and individuals with their co-workers. Moreover, personal perspective, the way an individual communicates with other co-workers, and creating a friendly environment for co-workers to communicate with each other is beneficial factors to have effective knowledge transfer in projects. Proper individual categorization based on their personalities would be effective because people are willing to communicate with those colleagues who share similar personalities. To improve the status of knowledge transfer, the organization should provide employees' job satisfaction. Therefore, they feel that they face justice, and their efforts in transferring knowledge are not useless. This results in promotion in their job.

5-2- Organizational factors

Organizational-based factors are very effective and important in creating a suitable platform for knowledge transfer. This category consists of 14 factors in our framework. The most significant factors in this category which should be taken into consideration when organizations decide on its desired knowledge transfer process are *organizational structure*, *reward system*, *organizational culture*, *leadership characteristics*, *motivation*, and *management support*. Organizations should work on enhancing the cultural status of employees to establish a culture of knowledge transfer as a valuable act. Furthermore, a non-concentrated organizational structure might increase the opportunities for communication exchange and eventually would lead to increasing knowledge transfer within the organization. It is important to motivate employees by providing a sense of job security to encourage them to transfer knowledge. So, it would be beneficial to define a reward system. Organizational strategies for knowledge transfer, as well as leaders and managers' behavior, would have a direct effect on employees' behavior.

5-3- Technological factors

In order to perform knowledge transfer in organizations, the context to make it possible is crucial as well as individual and organizational factors. So, technological factors such as *ICT*, *social media*, and the availability of modern related *technologies* are of paramount importance. The software and hardware infrastructure are necessary for employees not only to use their knowledge but also to reuse it later. For this purpose, defining suitable social networks where employees can communicate with each other and share their opinion and knowledge makes the knowledge transfer process easier. These infrastructures must be defined in the organization properly and should be accessible for everyone. Infrastructure could be taught to employees by performing workshops or using animations.

5-4- Transnational factors

In addition to the factors mentioned above, which are effective for knowledge transfer in any projects in organizations, other factors are involved especially in transnational projects. These factors are classified as transnational factors; some of them could be *language* and *geographic distance*, *cultural difference*, *time zone difference*, *communication distance*, *policies and rules*, *knowledge distance*, as well as *technical*, *organizational* and *intentional distance*. In international projects that people who are involved have diverse nationalities, so knowledge transfer is troublesome due to their differences. To have an effective knowledge transfer in this type of projects, organizations should take attention on both the employees' differences and the source of such differences to lessen and moderate them. For example, to avoid potential miscommunication, each party should use technical and understandable words. Additionally, language strategies should be performed to simplify the lexicon used in conversations. Considering the cultural differences between different nationalities, it is needed to work on cultural barriers and avoid personal judgment as much as possible. Geographical distance and time difference make knowledge transfer even more difficult. Therefore, channels should be defined to enhance the interactions of all employees. The existence of different policies and personal benefits could make each party unfaithful in knowledge transfer. So, the rules and outlines of transferring should be well defined in contracts. Knowledge transfer would be even more problematic if there is a huge difference in the current knowledge of each party involved in the performance of the project.

To analyze the findings and a better understanding of our research implications, our framework of factors affecting knowledge transfer is mapped in figure 4.
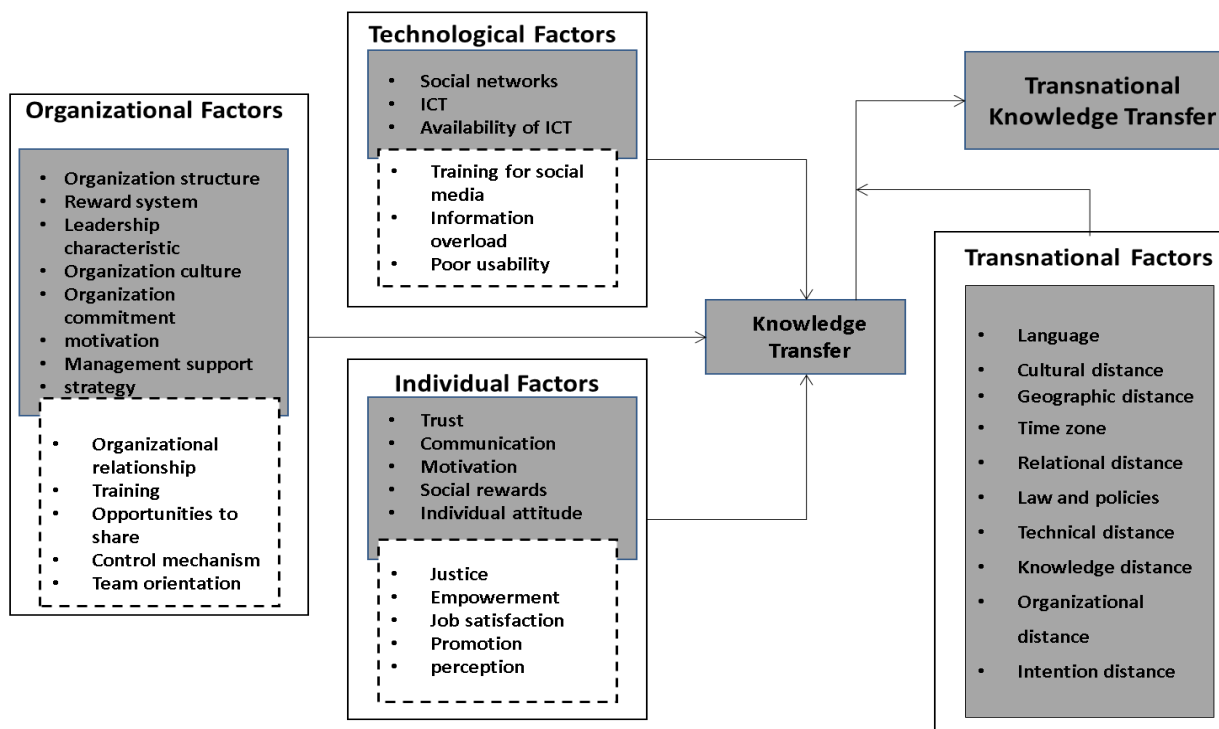

Fig 4. A framework of contextual factors affecting knowledge transfer in transnational projects

5-5-Validity and reliability of the framework

In addition to CASP, we use another method for assessing the quality of the content by comparing our opinions with another expert's in order to control extracted concepts. To do so, we use the method of agreement between two experts. A number of selected researches in the literature were provided to an expert in the knowledge management area and ask him to identify and classify the codes independently without knowing the primary categorization which we have done. Then, our categories were compared with the categories done by the expert. Regards to the similarity of two categories which calculated based on Cohen's kappa coefficient (equation 1), we can measure the reliability of our obtained category. As seen in table 3, we have created 39 categories, but the other expert has created 42 categories, of which 35

categories are common. As equation 1 shows, the value of the Kappa coefficient is equal to 0.82 that according to table 4, this value is at the level of the excellent agreement.

Table 3. Crossing by the researcher and the expert

		Researcher View		
		Yes	No	Total
Expert View	Yes	A = 35	B = 3	38
	No	C = 4	D = 0	4
	Total	39	3	N = 42

$$observed\ agreement = \frac{a+d}{n} = \frac{35+0}{42} = 0/83$$

$$agreement\ chance = \frac{A+B}{N} \times \frac{A+C}{N} \times \frac{C+D}{N} \times \frac{B+D}{N} = \frac{38}{42} \times \frac{39}{42} \times \frac{4}{42} \times \frac{3}{42} = 0/0057 \qquad (1)$$

$$K = \frac{observed\ agreement - agreement\ chance}{1 - agreement\ chance} = \frac{0/83 - 0/0057}{1 - 0/0057} = 0/829$$

Table 4. Kappa Indicator condition

Status Agreement	Numerical Value of Kappa Indicator
Poor	Less than zero
Unimportant	Between 0 - 0.2
Fair	Between 0.21 - 0.4
Good	Between 0.42 - 0.6
Valid	Between 0.61 - 0.8
Excellent	Between 0.8 – 1

6- Conclusion

This study employs a meta-synthesis approach to compare and contrast factors affecting knowledge transfer in different/related projects. Meta-synthesis is a relatively new approach in synthesizing results of studies. Based on a systematic investigation of factors currently available in the literature, a common frame of reference for knowledge transfer development is developed and presented as a result. This frame of reference consists of four themes, named individual, organizational, technological and transnational factors, with 39 elementary concepts. Besides, it can provide a good departure point for future work in knowledge transfer, both academically and practically.

According to the commonly used two-step process of analysis, we measured the credibility and validity of the framework. To preserve the accuracy of the measurement, each variable's indicators of existence were extracted solely from the literature from the work of previous researchers. Moreover, wherever necessary, the variables were measured through direct questions. Comparing the direct-questions' responses with the average responses helped verify the accuracy of the findings. The credibility of the framework, which is usually used to test the reliability, is to measure the internal consistency of the results. In this paper, the Kappa coefficient is used to analyze the credibility. The value of the Kappa coefficient is equal to 0.82 which shows the level of the excellent agreement.

The result of this study contributes to knowledge transfer development. We provide a synthesized conceptual framework that can be used by future researchers to evaluate different factors. Furthermore, it

provides both a roadmap and various possible starting points for thinking about strategic directions for organizations interested in cooperating of transnational projects. Our comprehensive framework embraces individual, technological, organizational, and transnational affecting factors altogether, combining themes and concepts found in recent 16 years' worth of research and practitioner literature on developmental models of transnational knowledge transfer.

Based on the review of the articles and the results of this paper, future studies can also be conducted:

- To identify individual factors affecting knowledge transfer.
- Optimal solutions to maximize the impact of each factor in a qualitative way.
- To identify content factors affecting knowledge transfer

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