Employee's Tacit Knowledge Dependence and Utilization in Turbulent Environments: A Developing Country Perspective of Improvisation

Awais Ahmad

MSHR 2K18

A thesis submitted to NUST Business School for the degree of Master of Science in Human Resource Management

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Table of Contents

Abstract

In the age of globalization and knowledge economy, organizations face fierce competition. Organizations use both tangible and intangible resources for competitive advantage. One of those resources is knowledge itself. Knowledge has been divided into two parts namely; explicit and tacit knowledge. Explicit knowledge is known as codified knowledge available in the forms of manuals, formulas, and standard operating procedures. Tacit knowledge is embedded in employee's observation experiences and practices. The research identified that 90 percent of knowledge used in an organization is tacit knowledge (Wah,1999b; Bonner,2000a; Lee,2000). However, there is a scarcity of research on the contextual factors of tacit knowledge utilization which can benefit organizations and employees in today's knowledge economy. The purpose of this study is to explore the contextual factors of tacit knowledge utilization in a turbulent environment so that, organizations ensure those factors for the utilization of tacit knowledge, as an asset, for competitive advantage. Moreover, organizations do not always work in a stable environment. They may face different challenges such as infrequent demands from different stakeholders such as suppliers, customers, and governments, etc. (King and Ranft, 2001). Such a situation represents uncertainty where preplanned routines do not work. In such a situation, organizations need to become flexible to coup with the uncertainty. Organizations respond to such evolving and changing situations through improvisation. The ability of the organizations and their employees to deal with complex and uncertain situations creatively and professionally is termed as improvisation. That is why it is important to study the role of tacit knowledge and improvisation in turbulent situations. Therefore, the objectives of the study were: 1) To explore the contextual factor influencing tacit knowledge utilization in a turbulent environment2) To understand the phenomenon of tacit knowledge in leveraging improvisation. Semi-structured interviews and observations are used for data collection. For results and analysis, Thematic analysis has been used by using Atlas.ti software. The results reveal different contextual factors such as individual-level factors, group-level factors, organizational level factors, community-level factors, and situational level factors in rescue organizations which help employees to utilize their tacit knowledge. Such tacit knowledge utilization in turn leads to employee improvisation during an

uncertain situation where preexisting routines do not work. The schematic representation of the study is shown in Figure 1.

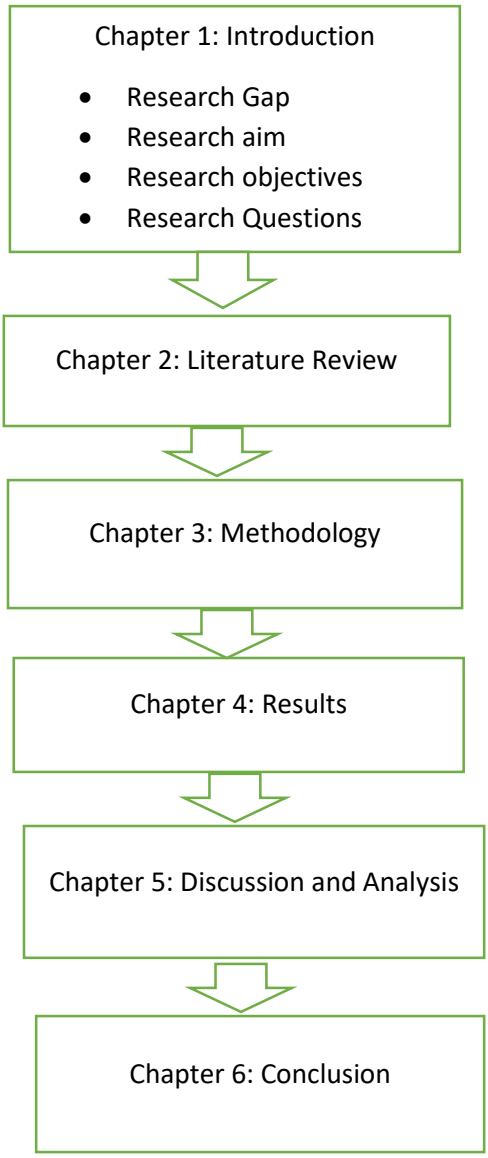


Fig 1 Schematic representation of thesis

1.Introduction

The knowledge-based view (KBV) of the firm posits that, like other resources, knowledge is one of the most vital resources of the firm for maintaining a competitive advantage in the age of fierce competition. (Grant,1996). The firm's success is dependent on how knowledge is linked and integrated with the organizational capabilities (Aadegbembo et al., 2020; Grant & Berry 2011).

In recent times, organizations invest their energies to manage knowledge to gain a competitive advantage (Sechhi & Camuffo, 2020). Knowledge is considered a people-dependent activity and is independent of information technology (Davenport and Prusak,2000). Knowledge has been divided in many ways but Nonaka and Takeuchi (1995) divided knowledge into two types: tacit knowledge and explicit knowledge. Tacit knowledge is considered as unspoken wisdom accumulated through observation and experience in the hearts and minds of employees over the period of time (Katoma and Hendrix,2014). It is hard to recognize and difficult to communicate. Despite utilizing the tacit knowledge in daily routines yet individuals are unaware of its presence (Ball and Gotsill,2014). On the other hand, explicit knowledge can be articulated formally and can easily be shared and transferred. It is also known as a codified form of knowledge (Kianto,2008). Codification of explicit knowledge may occur in many ways such as formulas, manuals, standard operating procedures, and soft wares (Chathoth et al., 2003: Zahra et al., 2009; Otto, 2019).

With the advent of globalization and changing technologies, organizations need to become flexible to anticipate the change. Organizations respond to such evolving and changing situations through improvisation. Improvisation is ranging from small adjustments to the routines to altogether change in the intended strategy (Moorman & Miner,1998). The ability of an organization and its employee to deal with complex and uncertain situations creatively is termed as improvisation (Magni, Provera., & Proserpio, 2010). Moorman and Miner (1998) defined improvisation as "composition and execution converge in time". Medonc et al, (2001) suggested the

definition of improvisation as, ‘reworking knowledge to create new action or ideas to meet the objectives in a given situation’. According to this definition, past training and experience have importance in improvisation. Similarly, tacit knowledge accumulates in the minds of individuals and organizational memory because of past experience and training. Therefore, it is important to study the role of tacit knowledge and improvisation in turbulent situations.

1.1 Research Gap

The effect of documented knowledge (explicit) on employee improvisation has been studied in the study of Nisula & Kianto, (2015). Their study has shown that documented knowledge helps in employee improvisation. The contextual factor of explicit knowledge has been studied by Cheuk et al (2017). So, there is a need to explore the phenomena of tacit knowledge utilization in improvisation. So, this study fills the existing literature gap in the following ways.

Firstly, Cheuk et al (2017) have studied the contextual factor of explicit knowledge utilization while the phenomenon of tacit knowledge utilization is still understudied and researchers have equally emphasized explicit knowledge (Nonaka & Takeuchi,2004; Teerajetgul et al.,2008). Tacit knowledge is a more valuable resource of organizations that are embedded in the minds of employees; therefore, it is vital to study it in a turbulent environment because in such environment employee mostly depends on their past experiences and knowledge due to limited time and resources.

Secondly, researchers have studied the contextual factor of improvisation in many disciplines such as in music (Sarath., 2013), theater (Curtin et al., 2015) crisis management (Rankin, Dahlbäck, & Lundberg, 2013), and in management sciences (Moorman & Miner, 2019). The findings identified a positive relationship between explicit knowledge and improvisation (Nisula & Kianto, 2015) but in tacit knowledge context, the phenomenon of improvisation is understudied.

Thirdly, given on the dynamic or uncertain environmental, inherited resource constraints and lack of knowledge and infrastructure, the developing economy will offer a fertile ground to study the phenomenon in rescue organization.

1.2 Aim of the research

Since, knowledge creation, dissemination, and utilization is a human and personal act and such characteristics of knowledge (tacit) make it context-dependent (Polanyi,1996; Baskarada & Kronois,2013). So, the relevancy of knowledge in one context may be irrelevant or insignificant in other contexts (Lee & Yang, 2000). Therefore, studying contextual factors of tacit knowledge utilization as well as improvisation is an important phenomenon. Thus, as organizations are working in an uncertain environment need some improvisations to cope and adapt to their environment. The following are the research objectives.

1.3 Research Objective

- To explore the contextual factors influencing employee's tacit knowledge utilization.
- To understand the phenomenon of tacit knowledge in leveraging improvisation.

1.4 Research Questions

- What contextual factors influence tacit knowledge utilization by employees in a turbulent environment in a developing country context?
- How tacit knowledge utilization leverage improvisation in a turbulent environment with inadequate resources?

1.5 Structure of the Thesis

Chapter one contains the introduction of the topic along with the research gap, research aim, research objectives, research questions, and precise methodology. Chapter 2 is all about literature on the phenomenon under observation. Chapter 3 contains a detailed methodology and philosophical orientation of the study.

Chapters 4 and 5 explain the results and analysis of the study. Chapter 6 describes the conclusion, theoretical and managerial implications, study limitation, and future research direction.

CHAPTER 02. LITERATURE REVIEW

2.1 Knowledge Management

In 1989, an association of companies in the USA had started the management of knowledge. Knowledge Management (KM) articles started appearing in different journals such as Harvard business review, Saloan management review, organizational science, and others. “The Fifth Discipline” was the first book on Organizational learning and knowledge management.

There has been a unanimous agreement among scholars that knowledge is an important element for today’s organization. According to Asrar-ul-Huq (2016), knowledge serves as a blood for an organization which means that knowledge is needed for the survival and growth of an organization in a dynamic business environment and competitive times. Despite the bourgeoning interest, there is no convergence on the definition of the term knowledge management. Although. the word knowledge can be traced back to the writings of ancient authors (Ryle, 1949; Polyani.1967). Some of the important definitions of Knowledge management have been listed are the following:

Authors	Definitions of KM
Alavi & Leindner (1999)	“A systematic and organizationally specified process for acquiring, organizing, and communication both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work”.
Lai & Chu (2000)	“An organized and systematic process where individuals undertake a significant role in acquiring, organizing, storing, sharing, utilizing and renewing both tacit and explicit knowledge, using resources such as technology to leverage organizational performance and knowledge assets”.

Snowden (2000)	"Identification, optimization, and active management of intellectual assets, either in the form of explicit or tacit knowledge possessed by individuals or communities.
Liss (1999)	"KM is a formal, directed process of determining what information a company has that could benefit others in the company and then devising ways of making it available"
Turban & Aronson,(2002)	"KM is a process that helps identify, select organize, disseminates and transfer of memory that resides in the organization in an unstructured manner"

From the above definition, it has been cleared that KM requires the identification of knowledge as well as the application of that knowledge in an organization. The ways of managing knowledge in an organization may be different but the ultimate aim of all such organizations is the application of that knowledge to achieve specific outcomes. For the attainment of such an outcome, the role of Km has been increased in recent years. Several authors have stated the reasons and factors behind the development and application of knowledge management (Shujahat et al., 2017; Karlinsky- Shichor & Zviran, 2016' Geisler et al., 2015). Interestingly, these scholars have identified more or less similar elements for the advancement of knowledge management (Asrar-ul-Huq et al., 2016; Dalkir,2011). One of the substantial factors is the enhancement of international trade and globalization (Dalkir,2011). This has increased the dependability of organization on one another as well as competition and rivalry against each other. Another factor is the movement of organizations towards the lean organization design to deliver better and quicker product and services. (Geisler and Wickramasinghe,2015).

According to Hislop et al (2018), KM helps the firms to respond to the dynamic nature of today's environment without relying on third-party data. According to him, firm craves for keeping and storing such information which

would be a source of strategic value, and try to hide such information from the competitors, and thus, the KM system enables the flow of knowledge through a systematic approach (Yee et al., 2019).

The field of KM is emerged equally in academic research as well as in practice over the period of time (Lang, 2001; Lesseure and Brookes, 2004). Having the different outcomes of KM, it can be concluded that it helps the organizations to improve their performance by identifying, sharing, and applying the collective knowledge to make effective decisions (Borkman et al., 2004 & Nissen, 2005). Similarly, several authors have recognized the KM as a source of competitive advantage apart from the mere success of the organization (Caor et al., 2013; Garavan et al., 2007). It can provide an ability for the organization to innovate and respond to the fast and dynamic environment (Sandhawalia and Dalcher,2011). Consequently, KM has been on the list of managerial agendas because of its importance (Von Krogh,1998). Knowledge management has been considered as a part of productivity and it is an important aspect of the global economic environment that is why today's organizations are creating and leveraging data, information, and knowledge at an extraordinary pace (Drucker, 1993).

Knowledge management practices are fragmented in disaster management literature (Mohanty et al., 2006). That is why, knowledge and experiences of emergency handlers resides in individual sphere. Koria (2009) have conducted a case study revealed that rescue organizations were unable to capture, store and utilize knowledge obtained from numerous experiences. As a result, experiences, operations and implemented modalities confined to the individual domain as a tacit knowledge (Seneviratne,2012). Knowledge management implementation depends on information technology, people and processes. Literature has identified four common practices for the implementation of knowledge management practices. These practices are people oriented, process, technological and goal centric KM practices. Literature has showed that people oriented KM practices were linked with innovation; it has been mentioned that people oriented KM practices enhance knowledge process such as acquisition, creation and dissemination of knowledge (Oktari et al., 2020) which increase innovation skills of rescue workers.

In natural disaster, literature has revealed two KM systems that can be executed during natural calamity. These two systems are: lesson learned (LL) systems and web 2.0. LL system enables organizations to share and utilize (reuse) knowledge obtained through experiences (Weber at el., 2003). LL systems can be explained in terms of stories constructed in a predefined structure. This system has been implemented in NASA and US army. NASA kept all the data and records about its operations, administrative, training, safety and employees via Lesson Learned Information System (LLIS) (Martin ,2012). In 1985, the Center for Army Lessons Learned (CALL) was established to collect and record lessons learned during simulated combat exercises. Web 2.0 is another KM system can be utilized in disaster management and NGOs (4). It is appropriate for NGOs because NGOs have high number of volunteers which can be linked through web 2.0. Volunteers during calamity can share, utilize and create knowledge through interaction in web 2.0 technologies.

In nutshell, the purpose of KM is to share the right amount of information and knowledge with employees at the right time (Wang,2001). In the contemporary era, knowledge management is not only considered as a practice of scientific philosophy, but also an important requirement of globalization. Moreover, it is a process where employees share their knowledge with organizational knowledge and simultaneously increase their personnel knowledge from organizational knowledge (Liyanag, Elhag, Ballal, & Li,2009).

2.1.1 Philosophy of Knowledge

Without going deep into the notion of knowledge, Stanmark, (2000) opined that Knowledge management literature has relinquished the positivistic interpretation of knowledge which were of the view that knowledge is based on obsolete truth or knowledge is objectified and monistic. The KM researchers adopted interpretivistic views of knowledge. According to this view, there are various types and forms of knowledge (Spender, 1998). For instance, according to Nonaka et al (1998), there is two forms of knowledge viz. tacit and explicit knowledge. Choo (1998) based on Boisot's (1995) knowledge typology clarified the distinction between tacit, explicit, and

cultural knowledge. Spender (1998) classified individual and collective knowledge in addition to explicit and tacit knowledge. Blackler (1995) suggested a number of tacit knowledge such as encoded, encultured, embrained, and embedded knowledge. It is noteworthy to mention here that all the above works of scholars have been built on Polanyi's (1986) influential work on knowledge. Interestingly, the distinction between explicit and tacit knowledge is not directly identified from Polanyi's work. The phenomena of tacit knowledge in management science have been founded in the series of lectures of Michal Polanyi's book "Personal knowledge, towards a Post Critical Epistemology 1958". According to him, knowledge is the interplay of tacit and explicit knowledge. Both of these are associated and are inseparable. According to him, all the knowledge is either tacit or embedded in tacit knowledge (Polanyi, 1969, p.144).

In short, Polanyi did not make any distinction between tacit and explicit knowledge and therefore he identified that tacit and explicit knowledge is inclusive and should not be treated as separate and distinct types of knowledge.

2.1.2 Michael Polanyi's Philosophical Notion about Tacit Knowledge

The concept of tacit knowledge was popularized by Michael Polanyi in his book "the tacit dimension'. According to him, a person's knowledge has two stances or directions namely: the proximal and distal. The proximal stance of knowledge reveals that an individual is unable to explain or articulate his foreknowledge and understanding. The distal stance of knowledge reveals that an individual is aware of his knowledge and can easily explain and articulate. These two stances are complementary to each other. According to him, there are four characteristics of tacit knowledge. These aspects are ontological, semantic, phenomenal, and functional aspects (Botwinick, 1986). The ontological aspect is the ability to comprehend something in its whole context. The semantic aspect the transfer of meaningless feelings into meaningful ones, which means that the ability of an individual to understand something that is itself meaningless but can find meaning from it. The phenomenal aspect of tacit knowing – is personal intuition or gut feelings. The functional aspect refers to the person's physical skills to get the desired outcome (Polanyi, 1966, p.13). He illustrated the four expect within the organization through

examples. The functional tacit knowledge is that when an engineer knows how to use and handle certain tools. The phenomenal tacit knowledge is that knowledge when an engineer sees a problem and instantly knows which tool is to be used to solve the problem. The semantic aspect of tacit knowledge is the ability of the engineer to propose meanings for the tools- these tools are meaningless pieces but for them, these tools have different uses. The ontological aspect of tacit knowledge is that when the engineer faces a new problem and immediately resolve the problem through its results and consequences and foresee the problem as a whole. He believed that it is difficult to explain this knowledge but it can be manifested through actions. Dzekashu (2009) explained Polanyi's concept---when a person possesses tacit knowledge, he/she is likely to act and use his/her body to explain that knowledge while it is difficult for him/her to convey this knowledge through words. Polanyi's idea was further expanded by Nonaka.

2.1.3 Ikujiro Nonaka

Nonak (1991) seconded with Polanyi's notion of tacit knowledge and expanded the phenomenon further. He mentioned that tacit knowledge can be converted into explicit knowledge. He explained this through a model famous as the SECI knowledge spiral model shown in Fig 1(a). The word SECI represents socialization, externalization, combination, and internalization.

According to this model, when a trainee acquires the trainer's tacit knowledge, the trainee gets the ability to articulate that tacit knowing. In socialization, there is the interaction between a trainee and the trainer. Through this interaction, knowledge, and experience is shared and transferred from the trainer to the trainee through observation and practice. The second step of this model is externalization.

The third step of the knowledge spiral model is a combination. In this step, the knowledge which has been externalized is combined with other explicit knowledge to get an understanding of the whole. In the last step, the overall knowledge becomes useful to the trainee during the internalization process. Therefore, trainees become able to have in-depth knowledge.

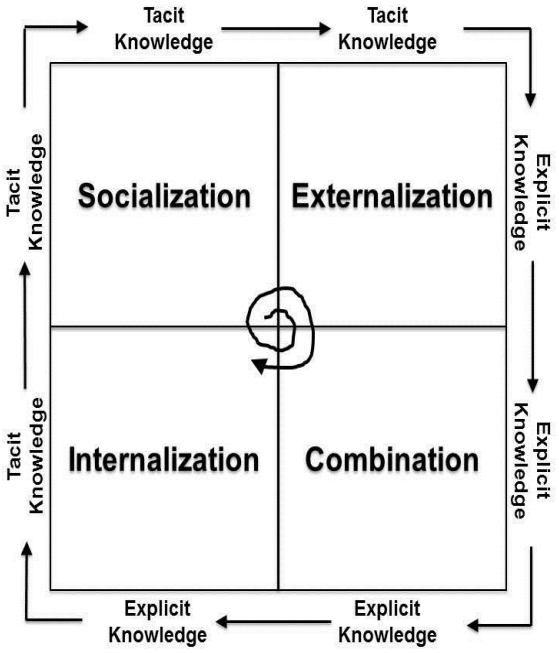


Fig 1 (a) Adopted from Nonaka and Takeuchi (1995)

2.2 Different Views about Tacit knowledge

There are multiple views of tacit knowledge in terms of its conceptual notion. Few of them have been enlisted below from the literature.

1. The first view stated that tacit knowledge is a portion of that knowledge that is not codified (Boisot, 1995; Davenport & Prusak, 1998 and Nonaka & von Krogh, 2009). This epistemological view considers tacit as a direction reverse to explicit knowledge and divides knowledge into two types viz. tacit and explicit knowledge. This study has adopted this view.

2. The second notion regarding tacit knowledge considers it as tacit- ineffable. It would be futile or useless to convert tacit into explicit (Tsoukas, 2006;410; Cook 7 Brown, 1999; Jones & Miller, 2007.
3. The third view stated that when any knowledge is applied to any context. The part of tacit knowledge that is being utilized on the overall knowledge remains ineffable and it cannot be codified. The uncodified part of knowledge is known as "meta tacit" (Collins, 2010 pp.88-96). He elaborated on the type of tacit knowledge which cannot be explicable.

2.3 Types of Knowledge

knowledge has been divided into two types by many authors and there have been streams of research on both types of knowledge. Similarly, Nonaka and Takuechi (1995) divided the knowledge into two types namely; tacit and explicit knowledge.

Explicit knowledge is that knowledge which can be codified and stored in an organization's databases and humans mind in the form of data, formulas, standard operation procedures (SOPs), and manuals for reuse purposes (Kotlarsky et al., 2014). Explicit knowledge does not need a direct transfer from the person who possesses this knowledge (Zahra et al., 2009). Explicit knowledge is also known as codified knowledge. Tacit knowledge is that knowledge that is embodied in human minds and it is one's personal knowledge (Gourlay,2002). Individuals gain this knowledge through experiences and observation over the period. According to Polanyi (1967), tacit knowledge developed from learning, observation, and practice which become engrained in the minds and actions of individuals. Individuals apply this knowledge even though they cannot formally express it (Carla and Jacson,1998). Starmark (2000) also endorsed similar views regarding the division of knowledge. According to him, explicit knowledge is the one that can be captured and codified into procedures, rules, and manuals and can easily be transferred. While tacit knowledge is embedded in an individual's minds and exists in their hands which can be manifested through actions of individuals (, 2000).

This study has incorporated the concept of tacit knowledge from Stephen Gourlay's definition of tacit knowledge and defined it as “a form of knowledge that is highly personal and context-specific and deeply rooted in individual experiences, ideas, values and emotions” (Gourlay, 2002.p 24).

2.4 Importance of Tacit knowledge

Michael Polanyi termed tacit knowledge as personal knowledge and quoted it as “We can know more than we tell” (Polanyi,1967). According to him, every bit of knowledge has “knowing what” and “knowing how”. Knowing what means that something knowable while knowing how means something which is embedded in action. Both of these are distinct things. One can be shared discursively while others can be shared via actions (Zaim et al., 2015). Baumard (1999) stated that tacit knowledge is a very important aspect of organizational knowledge as experiences of an individual’s rest on it and is helpful in the management of daily activities of employees. Because of the nature of tacit knowledge, it can be shared through storytelling, interaction among individuals, sharing experiences (Leonard and Sensiper, 1998). Tacit knowledge, as an internal one’s knowledge, is subjected to external environmental conditions that shape the tacit knowledge, which in return either support or pose challenges to completing a task. It is a potential asset and can be used in developing human resource capabilities especially from within the organization. Nevertheless, it can also be acquired from outside of the organization through various processes like the process of adaptation (Rumanti et al., 2013). Firms can identify and exploit the existing knowledge of employees to gain organizational efficiency and competitive advantage (Kang,2007). Organizational success is possible through the knowledge and capabilities of individuals. The presence of tacit knowledge in an organization can greatly affect the core competencies of an organization (Koskinen, K, 2007).

Rescue teams not only possesses factual knowledge but also procedural knowledge (Khalid et al., 2016). One of the example of procedural knowledge being utilized in rescue organizations specially in floods disaster is the delivery of supplies to the targeted area. Workers and volunteers needed to know what supplies are needed and

how to distribute supplied to the affected place. It is important for organization to have well organized system to mobilize worker's knowledge for organizational performance.

Studies on knowledge management in nonprofit organizations (NPOs) are scars as compared to business and private organizations (Oliveira,2019). NPOs generates and utilize tacit knowledge through interaction of individuals which is called social interaction (Ragsdell et al., 2016). As a result of socialization, knowledge is shared and new knowledge is created (Nonaka and Takeuchi,1995). The interaction among employees occurs in formal and informal way. sharing same office, working together and walking inside and outside of office helps in generating tacit knowledge.

According to regsdell et al (2016), tacit knowledge is created in three ways.

A: Creation of internal knowledge: This type of knowledge is created through interaction of individuals. It is created in the form of informal networks and share and utilize knowledge through collaboration and communication. Knowledge created in this way is valuable to the organization because it is specific and relevant to the organizational context.

B: Learning through action: Learning occurs in human minds. Employees gain knowledge through experience and shared this knowledge to then new employees working under them.

C: Acquisition of External Knowledge: Knowledge is also obtained and created by interaction with stakeholders. In non-profit organizations knowledge is created and transferred through interaction with communities

2.5 Knowledge and its Context

Knowledge utilization always has context because the nature of knowledge is contextual and largely embedded in human acts (Baskaraada & Koronios, 2013) and therefore, knowledge utilization is different from one context to the other context (Lee & yang, 2000). Context, within knowledge management, is an individual construct. For example, a situation handled by an individual needs personal interpretation for that situation

(Augier et al., 2001). The definition of context for this study is adapted from the study of Cheuk et al (2017) who stated that "The set of circumstances or facts that surrounds a particular event, situation, etc." It is difficult for the people to comprehend the rationale of the knowledge without adequate contextual knowledge and therefore may not adopt it (Kwan &n Balasubramanian, 2003). Knowledge providers either present this contextual information or it can be extracted by the user from the reuse situation (Ackerman, 1996).

2.6 Knowledge Utilization Process

There are multiple processes for the utilization of knowledge. One such knowledge process includes the identification of knowledge clients, knowledge needed for these clients. The identification process is very crucial for the utilization of knowledge (Teece, 1998; Von Kroogh et al., 2001).

Coordination and governance are other processes for the utilization of knowledge. As the variety or heterogeneity knowledge and the individuals who hold the knowledge need coordination for the utilization of knowledge for the success of the firms. Here, governance of knowledge means coordinated transaction and constructed interaction because such efforts help in the exposition of knowledge (Antonelli,2006; Moon, 2011).

According to Antonelli (2006) Building relationships is yet another important process for the utilization of knowledge to internalize critical knowledge during mergers and acquisition and takeovers. It is also important because it is rare for the firm to possess complete knowledge. Firms needed new knowledge beyond its boundaries (Lin & Wu, 2010). Social networking and building relationships increase knowledge activities and knowledge of disseminating culture (Ramanigopal, 2013). Mutual respect, trust, shared vision, shared context are the main features of knowledge networks (Moitra & Kumar, 2007).

2.7 Knowledge Management Perspective of Knowledge Utilization

Diehr et al (2017) stated that many researchers have used different concepts to the notion of knowledge utilization. Such views were supplied by Becker et al (2006) that the knowledge utilization field is diverse and

fragmented. Diehr et al (2017) enumerated several concepts regarding knowledge utilization in their studies. A few of them are; Knowledge management perspective, knowledge transfers perspective, and commercial exploitation perspective, etc. For this study, the concept of knowledge management perspective for knowledge utilization is relevant therefore, it is worth mentioning here.

Knowledge management literature has adopted different approaches for knowledge utilization because resources utilized by the knowledge-intensive firms are intangible in nature and for that, there is a need for a specialized form of management (kjaergaard, 2003). KM is important for such firms to attain their objectives (Zabala et al., 2005). KM approaches help the organization in creating, dissemination, and utilizing knowledge in such a way that adds economic value to the firms (Clarke & Rollo, 2001). According to Goh (2005), knowledge utilization is practiced in three major fields such as human capital, intellectual, and structural capital. According to him, the utilization of knowledge should aim at building knowledge networks, collaborative knowledge strategy, and human technology solutions.

2.8 Success Factors for Utilization of Knowledge

Utilization of knowledge yields a different outcome. For instance, one of the success factors for the utilization of knowledge in solving customer's problems. To solve the problem of customers, the organization needs specific task-related information from the firm's customers. The success of the problem-solving capacity of the firms grounded on the interaction between the firm and its customer. Through this interaction, firms respond to customer feedback (Verona et al., 2006; Consoli & Hortelano, 2010).

Another success factor of knowledge utilization is the ability of an organization to absorb the knowledge and ability to innovate from existing knowledge assets (Chen et al., 2010 & Huang 2017). The absorptive capacity of employees is necessary for the integration of external knowledge (Spithoven & Teirlinck, 2010). The absorptive capacity of the organization is the ability of an organization to combine the existing internal knowledge with external new knowledge to improve performance or to create solutions (Teigland & Wasko, 2003). Other factors

that have been mentioned in the literature are the reputation of the knowledge provider (Weiss et al., 2008; Zhuge and Guo, 2007). There are three different dimensions of reputation. The effective, the cognitive, and the normative dimension of reputation. A high number of the reputation of employees indicates the quality of the firm's management. (Schwaiger & Raithel, 2014). Firms can enhance their reputation while disclosing their knowledge. This also denotes that they are more competent than other organizations (Muller & Penn, 2006). Organizations give rewards based on what they know. The expectation of getting recognition, reputation, and appreciation are some of the advantages of knowledge disclosure (Zhuge & Guo, 2007).

Rewarding knowledge sharing among employees engenders cooperation and mutual trust (Holste and Fields, 2010), and in turn, reward act as a stimulus for disclosure of knowledge. (Zhao et al., 2012). Organization rewards could be extrinsic in the form of cash (Moitra and Kumar, 2007). Knowledge provider can be motivated by intrinsic rewards in the form of recognition, enhancing self-efficacy or confidence (Kankanhalli et al. 2005).

2.9 Factors affecting Tacit Knowledge Utilization

The research identified various factors affecting tacit knowledge utilization in an organization. However, only the study of Koskinen, (2003) has opined four factors for the estimation of tacit knowledge utilization in an organization. His model of tacit knowledge utilization combined different studies which have revealed different factors of tacit knowledge utilization. Some of these factors have stronger and some have a weaker scientific background. He declared that although these factors are generic but helpful in evaluation tacit knowledge in an organization. Additionally, he said, for success, organizations do not have equal need either equal time for tacit knowledge, His four factors of tacit knowledge utilization are: memory, communication, motivational, and situational system. He divided factors into internal and external factors. Internal factors are memory, communication, and motivation while external factors are situational systems namely leadership and culture. His model is represented in Fig 2. He illustrated the model with the help of an example and the model represented three-dimensional space to estimate the role of tacit knowledge in an organization.

Example 1 (see figure 2 point A). The company has ample relevant experience and staff have the opportunity for face to face to interact with each other and with other stakeholders but there is a lack of staff commitment to the goal. As a result, the company does not use its whole tacit knowledge.

Example 2 (see figure 2, point B). In this case, the company has relevant experience as well as staff commitment. However, staff are far away from one another and have low face to face communication. As a result, the company is unable to use the whole tacit knowledge effectively.

Example 3 (see figure 2, point C). In this case, the company has staff commitment towards goal and provides ample opportunity for face to face interaction but the company is lacking in relevant experience. As a result, the company faces difficulties in attaining its goals.

Example 4 (see figure 2-point D). In this scenario, the company has committed staff, possess relevant experience, and provides face to face interaction among staff and stakeholders. Here, tacit knowledge is maximally utilized by the company

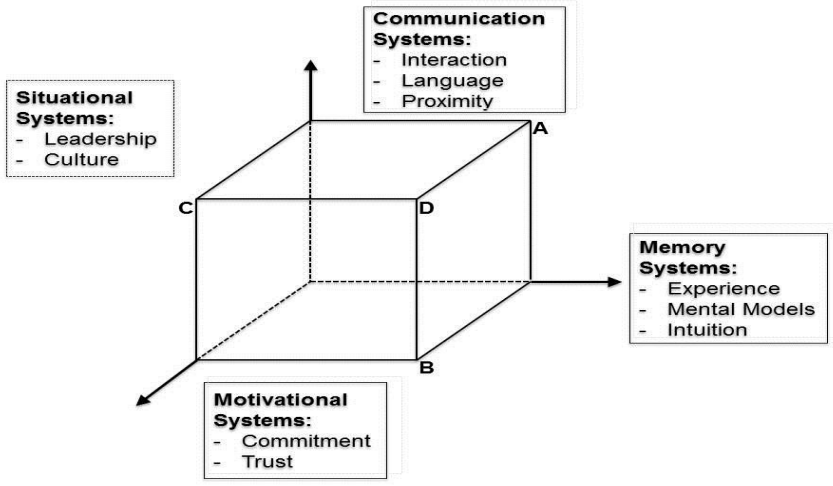


Fig2 Model for estimation of tacit knowledge utilization (Adopted from Koskinen, 2003)

These are not the exhaustive list of contextual factors of tacit knowledge utilization and are based on the conceptual understanding of the Koskinen. His study has taken into account only factors within the organization. Therefore, it is imperative to take further study on the contextual factors of tacit knowledge to get an in-depth analysis of the phenomenon.

2.10 Improvisation

Organizational improvisation is an interdisciplinary concept that lacks a comprehensive definition (Hadida et al., 2015). However, Improvisation is a Latin word that means 'make preparation for'. improvises is its derivative which means unforeseen (Oxford Dictionaries). Organizational improvisation is that when it is done by either organization or members of organizations. Therefore, improvisation occurs in individuals, between two individuals, or among many individuals (Hadida et al., 2015). Magni et al (2009) also defined improvisation as an adaptive reaction towards unpredicted and unexpected circumstances. Improvisation occurs when the situations prevent the organization to deploy known procedures. It is not possible for the organizations to developed procedures for the very situation and therefore they need to rely on improvisation (Woods & Hollnagel, 2006; Magni et al, 2010; Vera & Crossen,2005).

According to Cross e al (1997), most of the researchers defined improvisation with reference to time. They defined Improvisation as "intuition guided action in a spontaneous way". Moorman & Miner (1998a) define it as "the degree to which composition and execution converge in time. Miner et al, (1997) termed improvisation as unprompted and novel action. Mayer (1998) defined improvisation as" Solving problems in nick of time. Cunha et al., (2003, 2009) defined the term as "Conception of actions as it unfolds, drawing on available resources (bricolage). The current study has incorporated Cunha et al definition for this study. The above-stated definitions of improvisation converge on three elements such as time constraint, the juxtaposition of planning and execution, and deviation from existing practices (Storseth et al., 2009).

2.10.1 Correlation of Improvisation with Other Concepts

Although scholars have a diverse opinion on the definition of improvisation they have unanimous agreement on various properties of improvisation (Vera & Crossen,1999). Three elements of improvisation have been documented by academics at the University of Wisconsin in 1998. These three elements are creativity, intuition, and bricolage. It means that improvisation needs creative thought, joint with intuition in solving a particular problem. Bricolage means that using the resources available at times of a situation and improviser use that resources for the resolution of a problem (Moorman et al, 1998). Some researchers have stated that improvisation is overlapping with individual creativity (Montouri, 2003: Fisher & Amabile, 2009) but improvisation is a dynamic construct that is necessary for dealing with paradox and complex situations. In improvisation, the genesis of an idea, promotion of the idea, and implementation of the idea occur simultaneously and innovative behaviors are embedded in improvisation. Moreover, the main feature of improvisation is real-time response or spontaneity which is absent in creativity (De Jong & Den Hartog, 2008).

There are numerous ways to tackle uncertain and unplanned situations such as adaptation, creativity, and innovations but the element of temporal convergence makes the concept of improvisation unique (Chelariu et al., 2002). The temporal convergence means happening of planning and execution in real-time. Therefore, time pressure is an important attribute of improvisation (Moorman & Miner, 1998; Vera & Crossen 2005). According to Hodge & Ratten (2015), the study found three ingredients of improvisation from the literature but they are not sufficient for improvisation individually. These three ingredients are; creativity, adaptation, and innovation. All these become transformed into improvisation if they have to be performed hurriedly.

A) Creativity

Alone creativity is not improvisation because creativity needs extra resources; it requires careful planning; it requires time but improvisation cannot be elicited by cautious planning and does not have time for planning. However, improvisation possesses creativity as it produces novel developments.

B) Adaption

Adaption may not become improvisation as it is the product of planning and can be delayed until the best form of adaption has been excavated. But improvisation contains adaption as improvisers apply new concepts or novel ideas to adapt to the new situation

C) Innovation

Innovation alone cannot be improvisation as is the process of deliberate planning and performed over a period of time to the desired outcome. But innovation is part of improvisation as both possess novel ideas and produce novel results.

2.10.2 Importance of Improvisation

The nature of response management needs to deals with complexity and unforeseen circumstances. In such a situation teams must need to have adaptive skills to adjust to new situations (Weick & Sutcliffe, 2015; Cutter et al., 2010). Improvisation is considered instrumental where preplanning does not work and employees require to act without planning. Improvisation is recognized as a response to a crisis (Wachtendorf, 2006). Because of the failure of preplanned response, rescue teams need to produce novel actions by shifting through various plans and practices (Mendonca and Wallace, 2004). Therefore, Mendonca and Fiedrich (2006) stated that improvisation is context-dependent and constraint-bound action. They identified two stages of improvisation. The first stage is the identification of a situation where pre-planning does not work or due to the prevailing situation. The second stage is concerned with the creation of new responses to solve the problem. The new responses range from slight adjustment to the desertion of all pre-existing plans (Moorman & Miner, 1998).

According to Magni et al (2009, p,1044) spontaneous and creative behaviors in improvisation are important for both practitioners and scholars. It signifies a plausible reaction when a firm faces a difficult situation or emergent issue. The emergent issues may be infrequent demands from different stakeholders such as suppliers,

customers, and governments, etc. (King and Ranft, 2001). Such a situation represents uncertain or turbulent environments faced by organizations. Spontaneity and creativity require to the organizations because, they do not always rely on routines (Fisher, 2012). It is a fact that organizations do not operate in silos. They face uncertain complex situations in the age of globalization where organizations have transcended the boundaries of other countries. The concept of improvisation has been acknowledged conceptually and empirically which has a great impact on dealing with ambiguous and complex situations (Cunha et al, 1999 & Vera et al, 2004). This makes improvisation an inevitable strategy to cope up with certain situations (Tortter et al,2013). That is why organizational practices are in place to handle such situations by rendering improvisation.

Based on previous research of Moorman & Miner (1998a); Brown and Eisenhardt (1998), Crossan (2004) presented various factors that significantly impact effective improvisation. They have identified three factors which are— real-time information, a communication Experiential culture, and memory. Real-time information means that very little time lag between occurrence and reporting (Eisenhardt,1989). Experiential culture is a culture where actions are being promoted to be performed in an organization. Memory describes that stored information which would be brought before taking an action in an organization (Walsh and Rivera, 1991).

In other studies, antecedents were mentioned which helps in individual improvisation. Such antecedents are skills (Fisher & Amiable,2009; Vera Crossan,2005). Experimentation beyond the structures (Johnstone, 1979; Kamoch, Cunha & Cunha, 2003) and self-efficacy (Magni et al., 2010). Apart from individual properties, the workplace environment has an impact on employees' innovative behaviors and improvisation (Nisula et al 2015). Literature has captured team as well as organizational factors that serve as antecedents of individual improvisation. For instance, organizational Structure (Rankin et al., 2013), management practices (Lorenz & Lundvall, 2010), and organizational support (Jung et al., 2008; Yuan & Woodman, 2010), and team climate (Anderson & West, 1998). Only study found in knowledge management which shows individual workplace improvisation and its impact on KM practices.

In addition to individual propensities, the workplace contextual issues impact employee creativity, innovative behavior, as well as on improvisation. The wide body of literature has captured both team and organizational factors as antecedents of individual creativity and innovative behavior such as organizational structure (Damanpour, 1991), organizational culture (Mumford et al., 2002), organizational and team climate (Anderson & West, 1998; West, 1990), organizational support (Jung et al., 2008; Yuan & Woodman, 2010) and managerial practices (Lorenz & Lundvall, 2010). However, only in one study (Magni et al., 2009) individual improvisation was studied as a dependent variable. The study found team behavioral integration and team cohesion to have a positive influence on individual improvisation (Magni et al., 2009). Consequently, there is a need to study the antecedents of employee workplace improvisation, and the effect of the KM practices on it (Nisula et al 2015). However, the various studies which have shown the role of tacit knowledge and explicit knowledge on radical as well as incremental innovation (Wang & Noe,2010; Koskinen, 2002).

2.11 Turbulent Environment

As literature has revealed that knowledge is a crucial asset for the organization. The three facets of knowledge such as how the knowledge is acquired, how it is stored and utilized, how it is accessed, and transferred in real-time. The aspect of the utilization of knowledge in real-time is a matter of interest for this study. The knowledge that cannot be accessed promptly, and not available instantaneously in times of crisis is simply useless. Organizations require relevant, timely knowledge to make key decisions. In the military, accurate and timely information is the matter of life and death (Jones et al.,2012). Such turbulent and high-velocity environments form the basis of this study because employees rely on their tacit knowledge for the resolution of the problem in uncertain situations.

The turbulent environment was first described by Emery et al (1965) and Terreberry (1968). They opined that organizations face four types of environments based on the degree of connectedness among the elements of the environment. These four environments are namely: “placid, randomized” (where goods and bad are relatively

fixed but distributed); “placid, clustered” (where goods and bad are relatively fixed but clustered); “disturbed reactive” (relative different from the former two environments) the last type of environment is the turbulent environment. Terreberry (1968) explained the last environment thoroughly. According to him, the “turbulent field is that the accelerating rate and complexity of interactive effects exceed the component system, capacities of prediction and, hence, control of the compounding consequences of their actions. The turbulent environment is complex and where change is rapid in the environmental components. In the turbulent environment, the pace and magnitude of change are unpredictable, Firm with dynamic capabilities increases innovation, and performance in such an environment, and competitor’s ability to imitate get decreases Lichtenthaler (2009). Jones et al (2012) stated that the pace and magnitude of change in a turbulent environment gives a distinctive position to the acquisition, storage, utilization, and dissemination of knowledge. While stable organization do pot put pressure on the organization to the development and refinement of knowledge. In such a situation, tacit knowledge utilization plays a crucial role. A higher turbulent environment means higher instability whereas a less turbulent environment means a minimum rate of change and instability (Song et al 2016; Wallace et al., 2010). According to Wallace et al (2010) in a highly turbulent environment, organizations need to utilize more information and create more alternatives as compared to those organizations which are operating under a less turbulent environment.

Although Creation, utilization, and dissemination of knowledge are considered a strategic asset for the organization yet organization faces difficulties in obtaining, utilizing, and transferring the knowledge in the organization over time to yield the benefit of knowledge. While, it is easy to create, share, and utilize explicit knowledge. That is why, the focus of this study is on an understanding of contextual factors of tacit knowledge and how this knowledge leverages improvisation especially in a turbulent environment (Joe, 2012).

CHAPTER 03. METHODOLOGY

This chapter will delineate the research methodology for this study. It will explain the research philosophy, research design, evaluation of various kinds of approaches used in management sciences. Furthermore, it will elucidate the research method used for this study.

3.1 Types of Research

Business research can be divided into three types namely: descriptive, exploratory, and causal research. Descriptive research is a kind of research used to describe a phenomenon understudied. It is very structured, conclusive, and preplanned in nature. The survey questionnaire technique is used to gather the data. (Neuman, 2005). Like descriptive research, causal or explanatory research is quantitative in nature. It tries to measures cause and effect relationships. Therefore, is also structured and preplanned having definite research questions. It either tests or explicates a theory (Neuman, 2005). Surveys and experiments are used to collect the data. Exploratory research aims at ascertaining new ideas and gives detailed insight into the phenomenon. It helps in clarifying the research problem and provide alternative strategies to a problem being studied (Saunder et al., 2011). This research is carried out when there is little understanding of the subject. In quantitative studies, it is used to formulate and test the proposition and answers how, where, and what types of questions. In qualitative research, it is used when research is carried out based on interviews, phenomenology, and case studies, etc. It is used to formulate and answer questions such as how and why and what can also be included as long as it explores the phenomena. Exploratory research is used in this study based on the identification of gap from the literature to get the detail and in-depth insight about the research problem such as factors of tacit knowledge utilization and how tacit knowledge leverage improvisation in the real-time scenario. It is used to formulate and answer questions such as how and why. Also, what can be included as long as it explores the phenomenon.

3.1.1 Quantitative and Qualitative Research

According to Cresswell (2013), strategies of inquiry and methods give direction to research approaches which are then transformed into practice based on selected approaches which may be either qualitative, quantitative, or mixed-method. Strategies of inquiry help us what processes should be used in research design. According to him, a quantitative study helps in testing theory by establishing the relationship of various variables. Different instruments are used to measure the relationship and then data is gathered and analyzed by adopting various statistical methods. Experiments and surveys are common methods of quantitative studies among others. True experiments are steered on the subject by establishing various conditions (Cresswell, 2013). In the survey, a questionnaire is used to gather the data from a given sample of the population. It is then generalized to the whole population (Neuman, 2005). Neuman (2005) identified that variables and their inter-relationships are the key elements in a quantitative study. Variables relationships are explained based on establish hypotheses. These hypotheses are then subjected to statistical testing through surveys or experiments. A large sample is drawn from the large population to test a theory to generalized the whole population. Hence, the main objective of the quantitative study is to get statistical results to show the relationship among variables. In this study, the characteristics and biases of the researchers are unknown to the participants. Creswell (2013, p.4) describes qualitative is grounded on words, sound, feelings, and life experience which are non-numerical and unquantifiable. A qualitative study cannot be analyzed through mathematical techniques. According to him, qualitative research is used for exploring and understanding the meaning, individuals, or groups assigned to the social or human problem.

Qualitative research allows the participants to answer the question according to their understanding and perception. In this type of research, the researcher explains the phenomena in the research setting. Researchers describe the phenomena in great detail while confined himself in the research settings. This type of research is flexible in nature and the researchers are not worried about the generalization of findings. According to Milena et al (2008), there are different methods of qualitative research, and utilization of these methods depends on the

subject or discipline. Based on the above discussion, this study has adopted a qualitative research methodology based on research problems and objectives to get a deeper understanding of the problem. The following section will explain the research design for the study.

3.1.2 Ethical consideration of the research

The following ethical consideration have been maintained throughout the study.

Initially, obtained a latter from supervisor wherein mentioned the purpose of the study that is undersigned by supervisor in an official notepad. We reached out to the head of the organization under study. After getting his consent we were allowed to conduct a study in respected organization. Before taking any interview, we asked respondent willingness for the interview and recorded the interview with their permission. We captured picture during the task where we were allowed to take. It is the organizational policy to not make videos during emergency situations so we abide by that policy throughout the research.

3.2 Research Design

In a qualitative study, the role of researchers has central importance because the researcher makes the world visible through the interpretation of the phenomenon under study. It allows the researcher to devise an inductive approach so that concepts and explanations of the phenomenon spring from the data itself (Bogdan and Biklen,1992). The research method has opted based on its suitability to the research topic to find a description and interpretation of the specific problem. The methods have no supremacy but some methods are more suitable for a specific study as compared to other methods (Creswell, 2013). The qualitative research approach is best suited when the phenomenon under consideration is underexplored and little research has been carried out and there is no secondary data is available.

Literature has shown a variety of qualitative approaches among them ethnography, ethnomethodology, grounded theory, thematic analysis, phenomenology, symbolic interaction and case study approach. In ethnography, the researcher gets involved in the culture and actively participates with the participants. It assesses what people do in a social setting. Phenomenology pays attention to the lived experiences and subjective

experiences of participants. The main aim of phenomenology is the description of a particular issue (Creswell, 2013). Symbolic interaction pays attention to the individual's interaction and the meaning they attach to their experiences through symbols. Ethnomethodology describes how individuals utilize their routine conversation to build a worldview. Grounded theory is a qualitative approach and inductive in nature. It is a systematic way of analysis. It generates codes from the data which are then combined to form categories or family. The relationship among these families gives a cohesive explanation of the problems. Case study approach is used to get in-depth comprehension of complex social interactions.

3.3 Research Approach: Case Study Method

The exploratory single embedded Case study approach has been used to get a deeper insight into the phenomenon under study. The embedded case study has chosen because the study has a single unit of analysis with different cases of emergencies. According to Yin (2003) Case study approach is useful to answer the how and why part of the question which is relevant to the current study. It also assists to cover the contextual conditions of the phenomenon which is the aim of this study. This method can be used when the boundaries between phenomenon and context are not clear. As tacit knowledge is context-dependent. Therefore, the case study approach is helpful to study tacit knowledge phenomena within the rescue team. The rescue team utilizes their tacit knowledge based on the specific situation which will be helpful to study improvisation. The unit of analysis is individual employees who are deployed in the field operations that is why we have chosen embedded case study. There are three types of field employees in the rescue team namely; dread rescuer/firefighting, medical staff, and divers. A single case study approach has been adopted for this study. In a single case study, research is designed within a single organization. It helps to get a deeper understanding of the phenomenon. The rescue organization has been chosen as a case study because they do perform their task in uncertain situations where employees mostly rely on their experiences (tacit knowledge) to perform their job and can provide a reasonable context for studying contextual factors of tacit knowledge utilization.

3.4 Data Collection

The most common technique to gather data in qualitative research is the interview (Charmaz, 2014). For this study, interviews have been conducted along with field observation to extract in-depth knowledge from the respondents. According to Rubin and Rubin (2012), the interview is flexible in nature and can provide the opportunity to get back to the interviewee for clarification of some data. They went on saying that it helps to get rich data for theory building by explaining the phenomena sequentially. In nutshell, the interview provides needed knowledge about the phenomena through interactive communication. There are various types of interviews but this study has adopted semi-structured interviews with open-ended questions for the eliciting of data. Semi structure interview helps in maintaining the research in the right direction by providing flexibility to explore the phenomena under study. The researcher has initially conducted 19 interviews but three interviews have been set aside because there was background noise and employees left the interview as they have to respond to the emergency call. The researcher has conducted two months' observation in organizational as well as during rescue activity. This study has covered 10 incidences on the field because the purpose was to investigate various factors influencing tacit knowledge utilization and to see other factors/codes which employees have overlooked during interviews. Researcher stopped taking further interviews when the data get saturated. According to Cresswell, (2013), interviews can be stopped when the interviews no longer provide new insight. The population of the study was selected based on the value of the research questions. The participants were field employees from different departments namely: firefighting, dread rescuer, transport department and medical staff. The field staff was chosen because these are the employees who have direct involvement in the rescue incidents to utilize their tacit knowledge based on their past experiences and knowledge; hence, a purposive sampling technique has been used for data collection. According to Marshal and Rossman (2011), purposive sampling provides shrewd information. Face to face interviews was taken in their respective office vicinity. The interviews were not incident specific however, incidents were analyzed to triangulate with interviews to get broader contextual factors of tacit

knowledge utilization. Table (3.1) provides detailed information about the participants along with their experience and field of knowledge.

Interviewees	Year of Experience	Expertise
1	12	Fire Fighter
2	07	Dread Rescuer (DR)
3	07	Dread Rescuer
4	08	Road traffic accident (RTA)
5	08	Dread Rescuer
6	08	Dread Rescuer
7	12	Dread Rescuer
8	11	Road traffic accident (RTA)
9	07	Diver
10	03	Dread Rescuer
11	07	Dread Rescuer/Firefighter
12	08	Dread Rescuer/ Firefighter
13	03	Diver
14	03	Dread Rescuer/ Firefighter
15	08	Diver
16	08	Diver

Table (3.1): Details of the Participants

Before conducting interviews, participants were briefed about the purpose and aim of the research and questions have been shown to them before the interview. Their consent has been obtained for recording the interview. Notes (memos) were also taken during the interviews and observations to note down the important points that could help in data analysis and to probe questions related to other aspects. Interviews have been taken in the local language as employees were more comfortable in the local language. Later on, the interviews were translated into English with the help of an English professor. Moreover, themes have been generated to analyze the data by using thematic analysis through ATLAS.ti. Interview questions are attached in Appendix (A).

3.5 Data Analysis procedure

Thematic analysis has been used to analyze the data. Braun & Clark (2006) defined thematic analysis as "It is a method for identifying, analyzing, organizing, describing, and reporting themes found within data set". It is useful for organizing the data. Firstly, codes have been generated from the data. Similar codes are grouped together to make a theme which subsequently helps in reporting (King, 2004). In a thematic analysis, researchers search for identifying the common threads across the gathered data. Qualitative analysis of data consists of: identification of themes and patterns that unearth the participant's perspectives (Berg, 1989). A detailed explanation of the analysis process is discussed in this section. For analysis, ATLAS.ti software has been used in this study. It helps in the arrangements of the data into codes, themes, and categories.

According to Muhr and Friese (2004) ATLAS.TI helps in arranging data into codes and themes which could be shown in the form of maps. It provides well organized and systematic methods for data coding and data analysis which in turn helps in creating quality of study and rigor (Piecka, 2008). This software helps a researcher to gather all the transcribed files into one location; it provides efficiency in the coding process by linking different codes; it helps in written memos and notes and links them with quotations. In nutshell, it replaces the manual record-keeping and arduous paperwork. It is worth noted that this software does not do coding for a researcher but facilitate the researchers to arrange the data systematically. It simplifies the laborious task of coding and tracking the coding by integrating the transcribed files (Sailllard, 2011; Friese, 2014).

3.5.1 Coding with Software ATLAS. Ti

Noticing things, collecting, and thinking about things (NCT) analysis can help in coding the data in ATLAS. ti (Friese,2014). NCT model of coding consists of Three elements namely; Noticing things, collecting things, and thinking about things. The arrows in the figure show that the process is non-linear and one can move back and forth between these three elements. NCT model is shown in Figure (3.2)

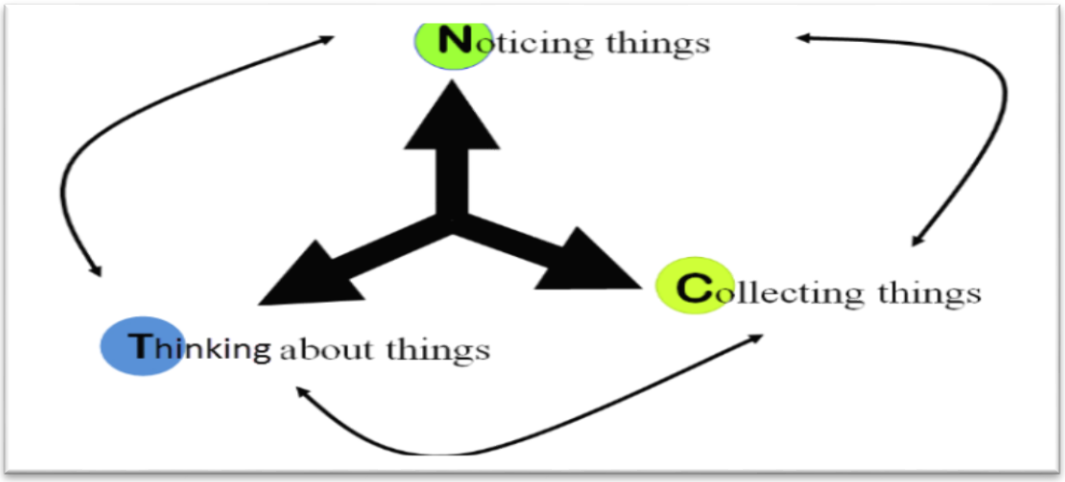


Fig (3.2): NCT Model (Source:http://www.quarc.de/qualitative-data-analysis-withatlasti/companion-website/figures/chapter-5.html)

The detail of three elements of the NCT model are given below

1. Noticing thing: The researcher probes the important, relevant, and unique things in this stage from the data. To note down the interesting things, codes to be assigned to these interesting things.
2. Collecting Things: When the data collection and coding process goes on, the researcher finds things similar to those noticed earlier in the first stage. The researcher gives the same name to similar things. For different and unique aspects, he can give a new name to the code. Thus, researchers look for similar and different codes during the analysis process. It is to be noted that data should be analyzed carefully when

comes to assigning names to the codes. Sometimes a code fits in the earlier noticed thing so, instead of assigning another code name, the researcher should have assigned an earlier code name to such things. Computer software helps in recollected the earlier codes on the bars of the code. This method helps in preventing too many codes and can direct the codes towards answering the research questions. This study has incorporated the Charmaz approach that is, initial coding and then focused coding which has been endorsed by Fries (2014).

3. Thinking about things: Researchers need to get absorbed in thinking from the outset of the coding process. It helps in assigning good names to the code, establishing the relationship between the codes, and developing families from the codes. This stage helps in finding patterns and establishing and integrating categories from the codes to portray a detailed picture to answer the research problems.

In short, these three elements can be applied in ATLAS.ti. The first step in ATALS.ti is creating a project file. The transcribed file and observation notes are then uploaded in the created project file. After doing this, one can start the coding process (Noticing, collecting, and thinking about the things). Moreover, researchers can write memos which help in jotting down the researcher's idea to expound the patterns and relationship emerged during the coding process. These memos help in discussing the finding and results of the study. The entire process when applied in an actual situation, can be summed up like figure (3.3). The figure depicts that the entire process is non-linear in approach.

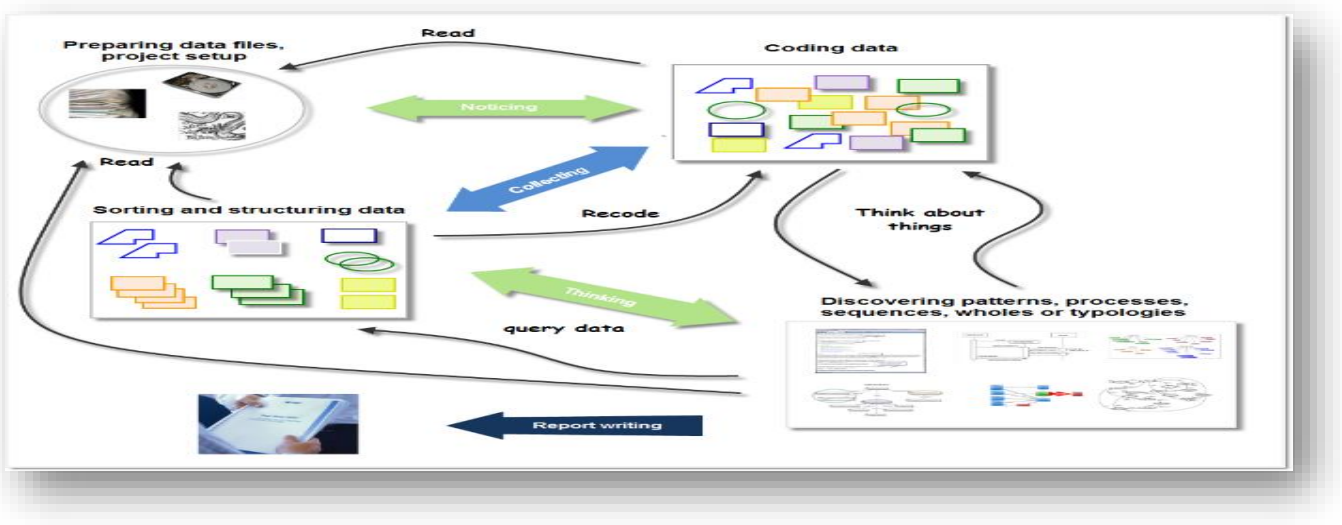


Fig (3.3)

(Source:http://www.quarc.de/qualitativedataanalysiswithatlasti/companionwebsite/figures/chapter-5.html)

ATLAS.ti offers a simple and easy method for data coding. Figure (3.4) presented a snap of coding options which are free code (enter code name), in Vivo code, auto code, and select a code. Most of the codes in this study are open codes. However, some codes are in Vivo in nature as it has been extracted from the original data because of its appropriateness to use it as a code. **"**Select cod from the list" is another option of coding. Here researchers can give a code name to a specific sentence from already generated codes if deems fit a specific sentence. The process of naming a code, changing a code name, and merging a code goes on along with data collection and analysis. The software also provides memo writing option Fig (3.5). This option would help the researcher to jut down an important idea during the data analysis phase. This would help in maintaining the thought process of researchers which would be beneficial for theoretical sampling. Along with the above-stated functions, the software also provides a network view to visualize the data.

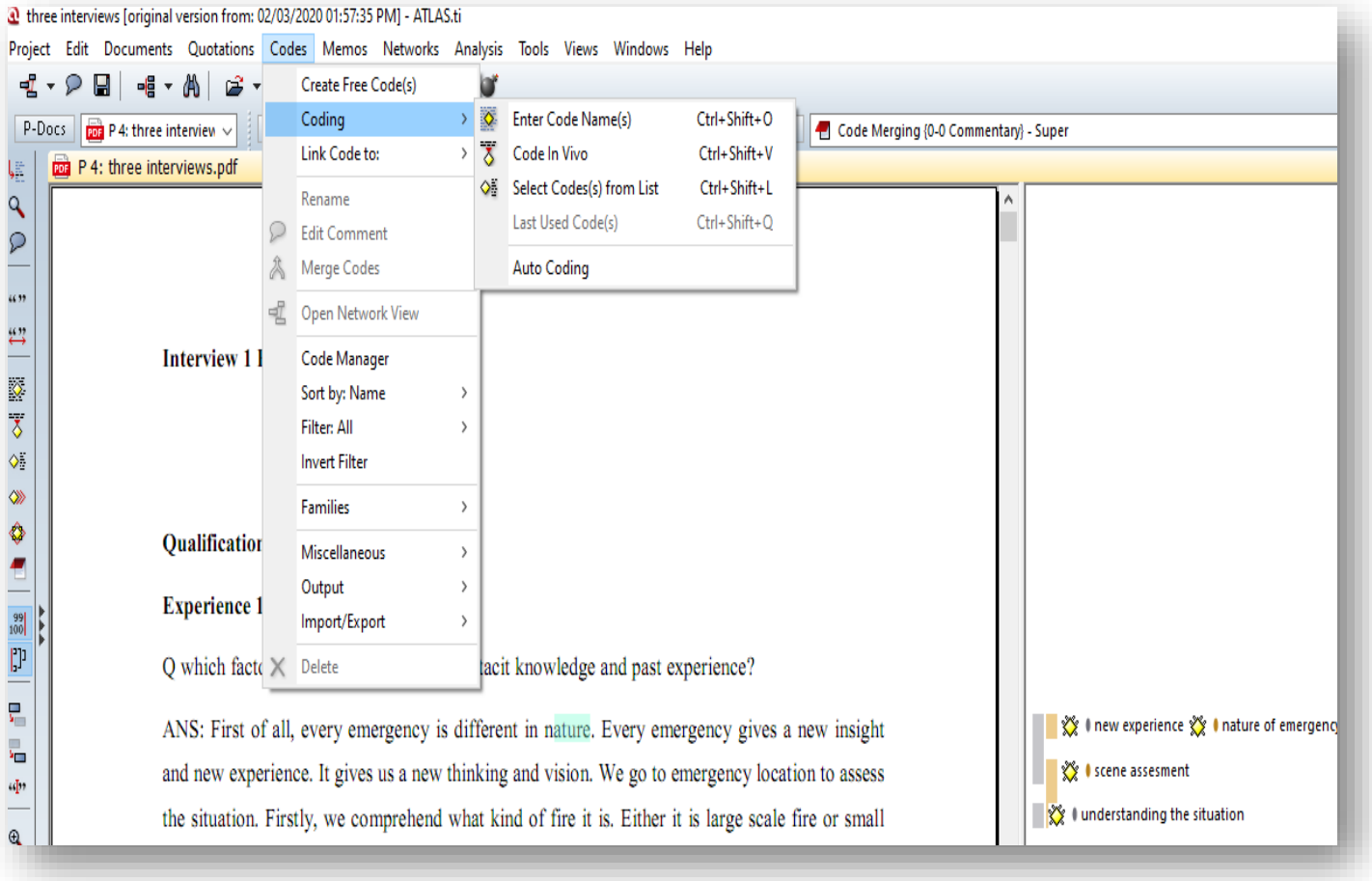
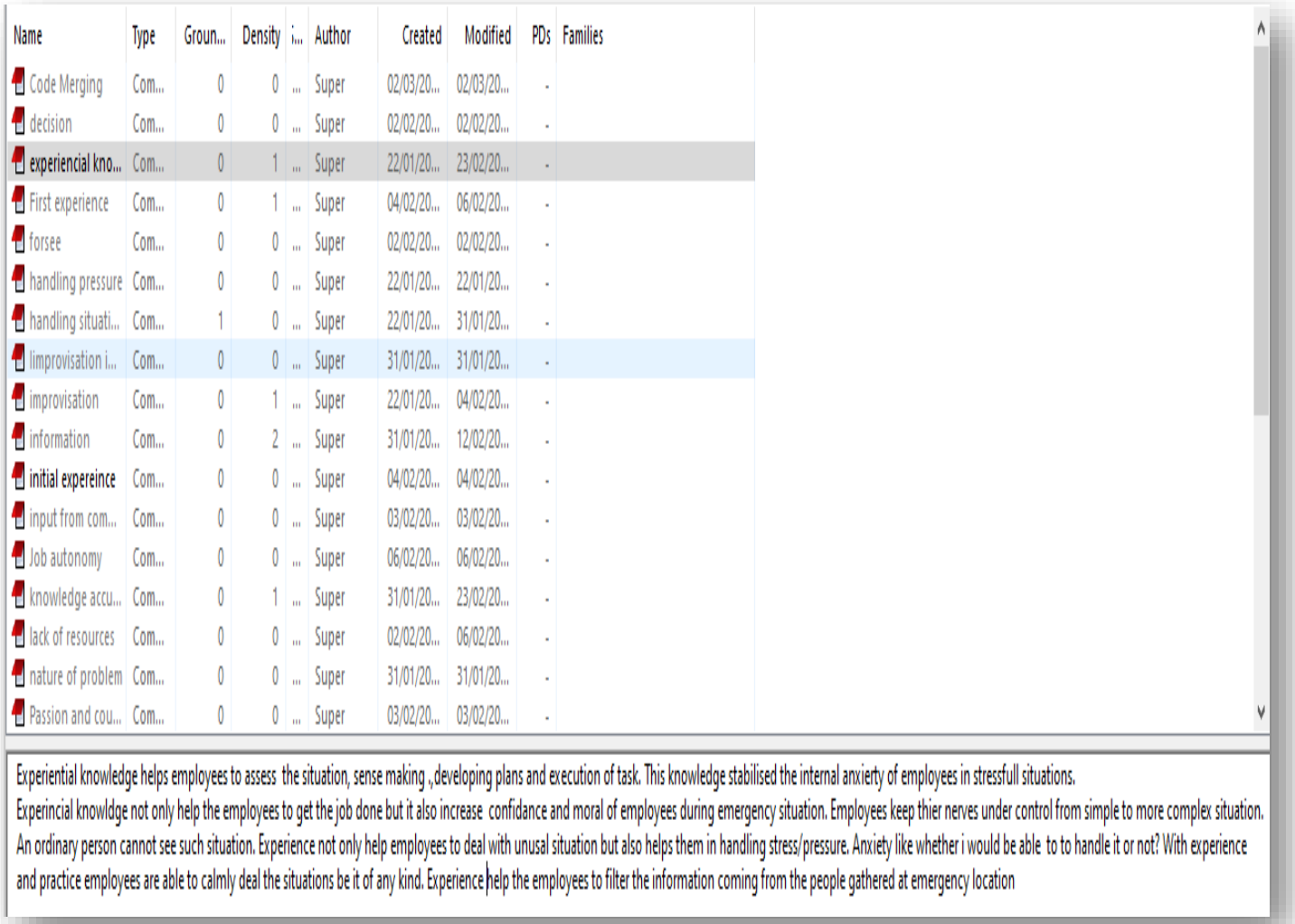


Fig (3.4) Coding option of ATLAS.ti.



Name	Type	Groun...	Density	i...	Author	Created	Modified	PDs	Families
Code Merging	Com...	0	0	...	Super	02/03/20...	02/03/20...	-	
decision	Com...	0	0	...	Super	02/02/20...	02/02/20...	-	
experiencial kno...	Com...	0	1	...	Super	22/01/20...	23/02/20...	-	
First experience	Com...	0	1	...	Super	04/02/20...	06/02/20...	-	
forsee	Com...	0	0	...	Super	02/02/20...	02/02/20...	-	
handling pressure	Com...	0	0	...	Super	22/01/20...	22/01/20...	-	
handling situati...	Com...	1	0	...	Super	22/01/20...	31/01/20...	-	
limprovisation i...	Com...	0	0	...	Super	31/01/20...	31/01/20...	-	
improvisation	Com...	0	1	...	Super	22/01/20...	04/02/20...	-	
information	Com...	0	2	...	Super	31/01/20...	12/02/20...	-	
initial expereince	Com...	0	0	...	Super	04/02/20...	04/02/20...	-	
input from com...	Com...	0	0	...	Super	03/02/20...	03/02/20...	-	
Job autonomy	Com...	0	0	...	Super	06/02/20...	06/02/20...	-	
knowledge accu...	Com...	0	1	...	Super	31/01/20...	23/02/20...	-	
lack of resources	Com...	0	0	...	Super	02/02/20...	06/02/20...	-	
nature of problem	Com...	0	0	...	Super	31/01/20...	31/01/20...	-	
Passion and cou...	Com...	0	0	...	Super	03/02/20...	03/02/20...	-	

Experiential knowledge helps employees to assess the situation, sense making ,,developing plans and execution of task. This knowledge stabilised the internal anxierty of employees in stressfull situations.
Experincial knowldge not only help the employees to get the job done but it also increase confidance and moral of employees during emergency situation. Employees keep thier nerves under control from simple to more complex situation. An ordinary person cannot see such situation. Experience not only help employees to deal with unusal situation but also helps them in handling stress/pressure. Anxiety like whether i would be able to to handle it or not? With experience and practice employees are able to calmly deal the situations be it of any kind. Experience help the employees to filter the information coming from the people gathered at emergency location

Fig (3.5) Memo writing in ATLAS.ti

Atlas. ti Shows semantic networks consists of nodes and links. The code signifies the nodes while links show the relationship among the codes (Friese, 2014). The Network views show the relationship between textual data or the codes. It shows a clear picture of the interrelationship of codes. Researchers can easily drive meaning out of the network. Otherwise, just looking at the codes creates confusion. Figure (3.6) shows the group-level factors of tacit knowledge utilization. How these factors are linked with each other and with tacit knowledge utilization. The network view also shows the frequency of the codes in the data.

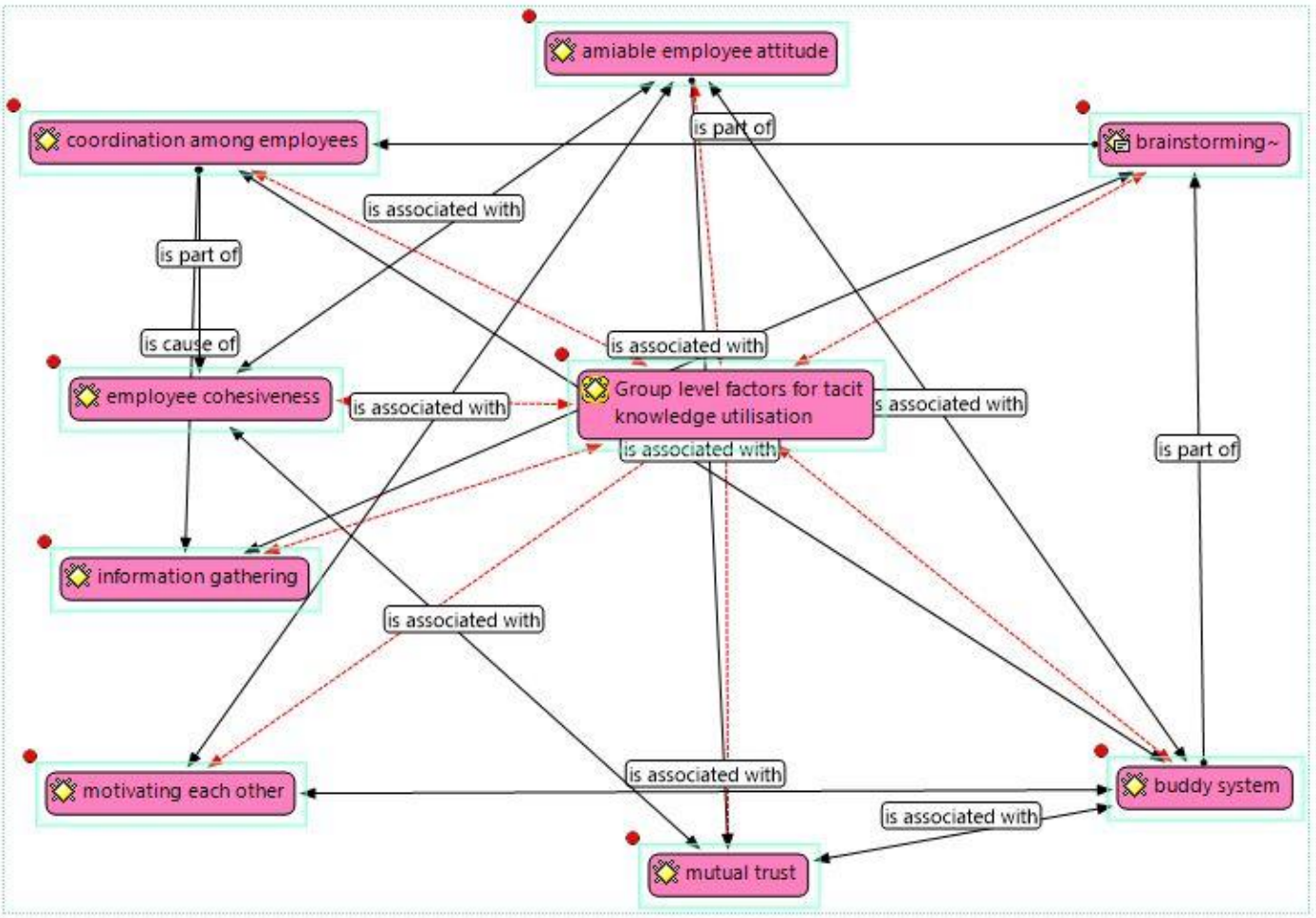


Fig (3.6) Network view of Group level factors of Tacit Knowledge Utilization

3.6 Research Validity and Reliability

In quantitative research, reliability refers to whether the results are replicable. Validity means whether the research instruments help in achieving the research objective. In other words, whether the instruments accurately measure what it envisioned to measure (Joppe, 2000). In qualitative research, these terms are used differently as researchers are unconcern about the replicability of the results (Glesne & Peshkin, 1992). According to Mertens, (2014) in qualitative research, the quality of results relies on the trustworthiness and authenticity of the data. Trustworthiness is an umbrella term for gauging credibility, dependability, transferability, and confirmability. For trustworthiness, interviews, pictures, and observations have been conducted in the field setting as well as in the organizational setting. Pictures and observations confirm the trustworthiness of interviews because it has depicted what the interviewees have said during the interview. These terms provide authenticity to other researchers.

Credibility is defined as the embeddedness of findings and results in the data. In other words, how confident the researchers about the accuracy of findings. How the researchers know the results and findings are true and accurate. In the qualitative study, triangulation methods show the credibility of the research. Therefore, to increase the credibility of the research member checks (triangulation) could be performed (Guba and Lincoln, 1989 & Mertens, 2014). As in this study, participants verified the transcribed data and which were incorporated after getting the feedback from the participants. Transferability shows how generalizable the findings of the study in other related circumstances and contexts (Martens, 2014). Though it relies on the reader to evaluate the level of similarity, nevertheless, the researchers need to provide a thick discerption of findings so that it may be applicable in a similar situation. Various measures have been taken to increase the transferability of this study, for instance, verbatim, triangulation, and peer reviews. Writing exact quotations from the interview transcription to provide a thick discerption of the data to develop an understanding of the phenomena. The findings and the results had been shared and argued with supervisors and GEC members to develop interpretations and conclusions. These methods would increase the validity and transferability of the study. Confirmability means how neutral the findings and results of the study. In simple words, the findings are derived from the participant's response which is not based

on the researcher's inspiration (Mertens, 2014). This has been achieved in this study by providing an audit trail by highlighting every step of data collection and data analysis. According to Neuman, (2005) Dependability means the relevance of the inquiry process. This study has used a systematic approach for thematic analysis to obtain true findings. Therefore, keeping in view the above discussion, this study has accomplished the criteria of credibility and validity.

In short, the focus of this chapter was on the methodology part, wherein, detailed procedure of data collection and analysis has been explained. The rationale behind the thematic procedure was discussed. After that, the data collection process and details of the participants were described. For the collection of data, semi-structured interviews and observation has been conducted. Along with data collection, coding process, memo writing, and network view of Atlas.ti were explained and shown in pictorial form taking snaps from the original transcription. This study at the end described, how credibility and validly have been established for the current study. The next chapter will delineate the results and analysis of the study.

CHAPTER 04. RESULTS

Results and analysis have been explained in this chapter using ATLAS.ti software. The following were the main research questions.

- What contextual factors influence tacit knowledge utilization by employees in a turbulent environment in a developing country context?
- How tacit knowledge utilization leverages improvisation in a turbulent environment with inadequate resources?

To get the answer to the above-mentioned research questions, data were collected over a period of two months by conducting interviews and observations. The coding process was initiated by creating a folder named "Interview Three" in ATLAS.ti. After uploading the primary document, following the Charmaz (2014) approach coding process was initiated. The researcher performed the initial coding process by doing line by line coding of the data. After completing the coding system, families have been created following the process of data analysis by Friese (2014). Families have been formed according to the codes which emerged from the data. Codes that signified similar phenomena were clubbed together under one family name. A family named "Group-level factors of tacit knowledge utilization" covering all the codes which described the group factors of tacit knowledge utilization. Figure (4.1) displays a variety of codes that explicate the group level factors of tacit knowledge utilization in the turbulent environment. Initially, there were few codes in this category, more codes have been generated by doing line by line coding as the data collection proceeded further. The data which explained the similar concept was given the same code name as coded earlier and given a new name to the new concept emerged from the data. During the coding process, few codes were merged and changed where deem necessary. For example, helping one another was changed into an "amiable employee attitude", since it signifies the same phenomena. Later on, an amiable employee attitude was merged with employee cohesiveness because it is an overarching term.

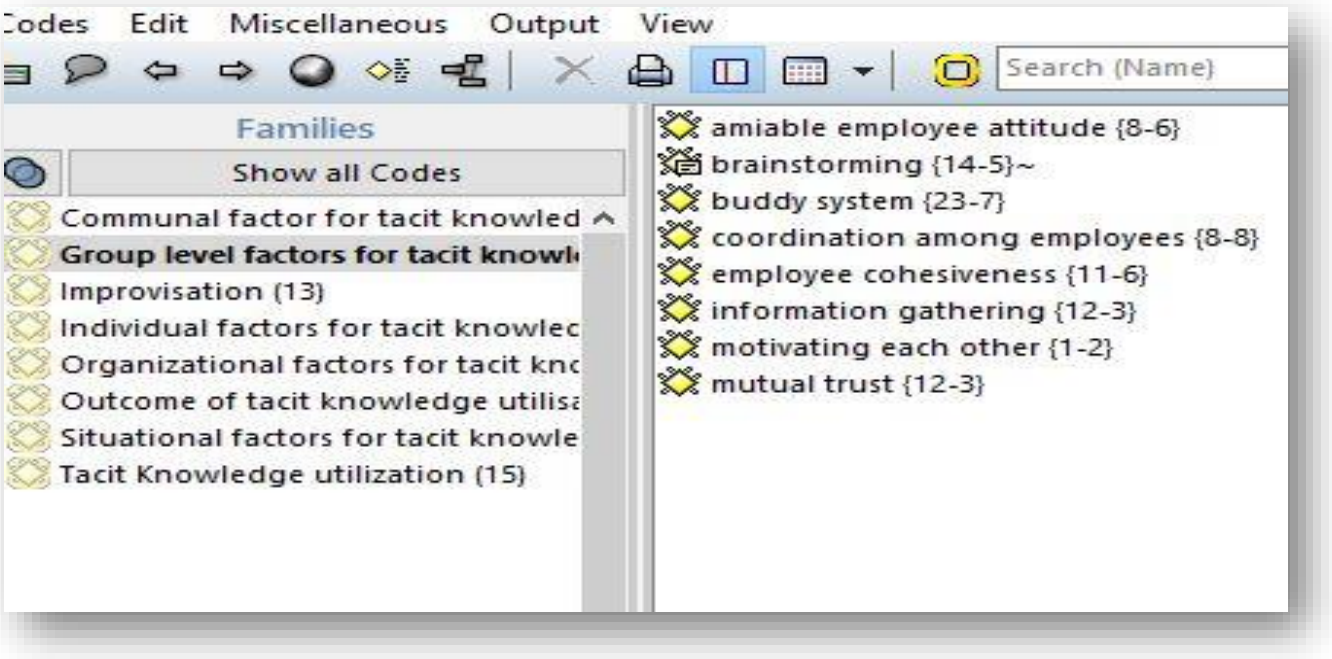


Fig. (4.1) List *of the codes of family Group level factors for tacit knowledge utilization*

The above-stated family consisted of eight codes as revealed in figure (4.1). The left sides of the code's bracket show the frequency of the codes meaning by how many times a code has emerged in the data. In the "Buddy system" of the theme "group-level factors of tacit knowledge utilization" shows 23 which is the frequency of the code. The right side of the frequency shows the density of the code. How many times this code is linked with other codes, memos, and quotations. These eight codes describe how tacit knowledge is being utilized at the group level. For instance, the "buddy system" explains that in rescue employees worked under this system as they individually cannot perform emergency cases. In a firefighting case, one cannot control the hose because of the water pressure. They needed a group of members to perform their activity. Similar is the case with the rescue and water emergency response team. The researcher has also written memos to explain the codes where needed. Figure (4.2) shows the memo writing of the code "seat of fire"

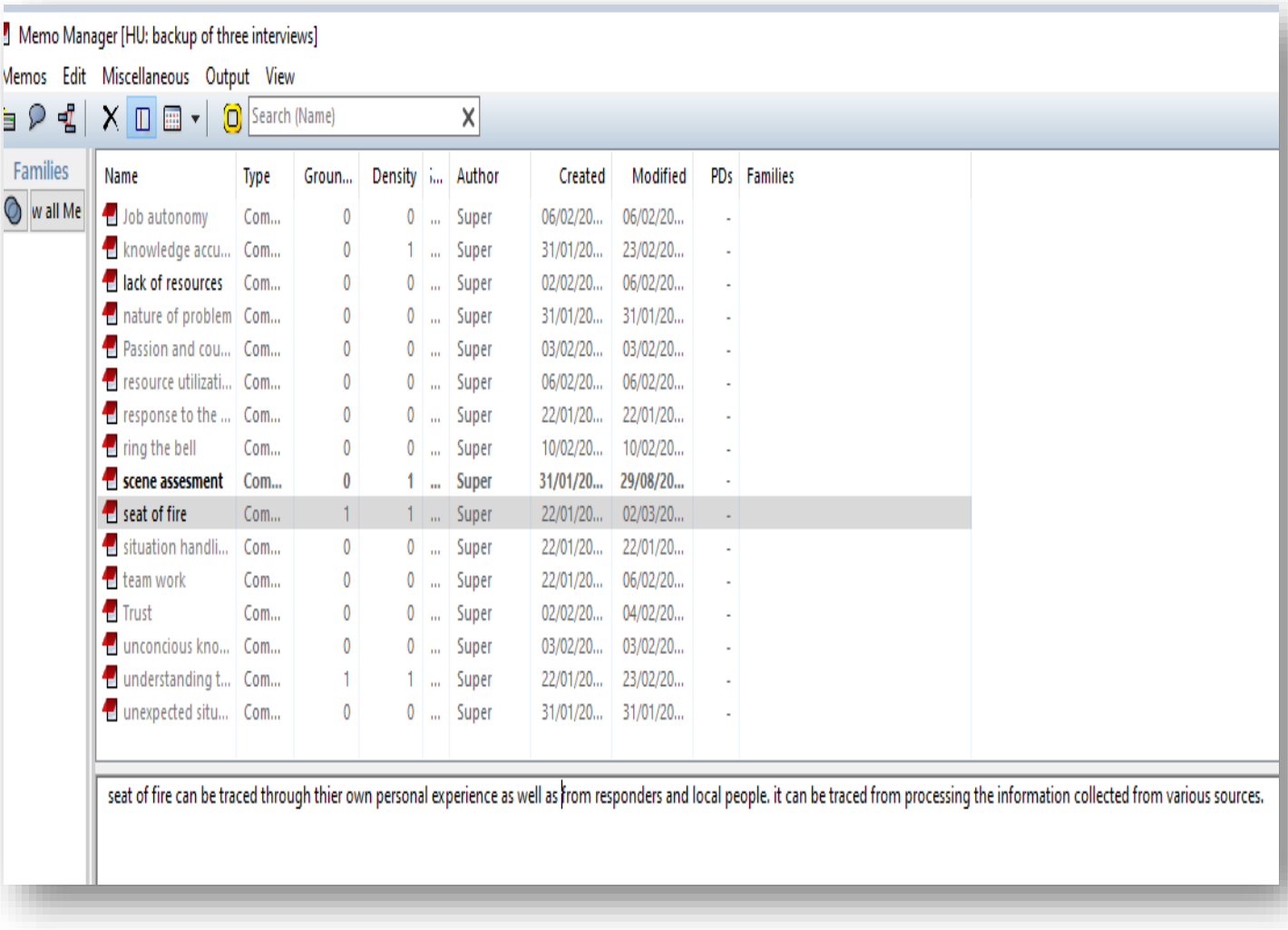


Fig. (4.2) Memo writing during the data analysis process

The network view feature of the software (ATLAS.ti) has been used to visually describe the relationship between codes and families. The network view of the codes for group-level factors of tacit knowledge utilization is shown already in Figure (3.6). In the same vein, all the codes were grouped, created families, written memos, and drawn visual representation of the codes were performed for data analysis. The main families that were developed from the data set on research questions are the following:

1. Communal factors for tacit knowledge utilization
2. Group level factors for tacit knowledge utilization
3. Individual-level factors for tacit knowledge utilization

4. Situational factors for Tacit knowledge utilization
5. Organizational` level factors for tacit knowledge utilization
6. Tacit Knowledge Utilization and Improvisation

A detailed explanation of these families was written in the next section. The entire discussion revolved around the codes which have created the aforementioned families. Therefore, families reveal the crux of the entire study.

4.1 Communal Factors for Tacit Knowledge Utilization

This theme contains seven codes. The dominant codes are; coordination with community, social interaction, emotions of the people, people concern, and criticism from people. Figure (4.3) shows seven codes and the relationship between these codes has been shown in figure (4.4) in the network view of the Atlas.ti. Generally, in most of the organization, employees perform their jobs without having input from society. Emergency response teams in real-time situations incorporate communal views during an emergency. Many interviewees have seconded that the utilization of their experience or tacit knowledge needs community involvement. Community as a first respondent (prerequisite) provides basic information to the emergency room. The emergency room as per the guidelines of first respondents deploys its staff according to the information they received from the first respondent. Interviewee 2 stated the role of community in the emergency case as:

"When we get on location, we seek advice from the community. We do take their input where necessary. As they are familiar with the geography, terrain, and nature of the incidents. For example, in the fire case, we get information about the seat of fire from the community or first respondents. It is easy to extinguish the fire if we can find the seat of fire". Seat of fire is the location from where body of fire ignites.

The community provides basic information about the nature of the incident being the first respondent of the situation. Rescue teams do not have time to see the location and then mobilize the resources accordingly. That is why they relied on the information of the community. Although they cross verify the information through different sources in the quickest possible way. They still mobilize their resources to perform their task if failed to cross-

check the information which has received from the community. Interviewee six also confirmed the stance of the first interviewee in these words

"It is impractical for the staff to be available in each emergency to provide first-hand information. We need to rely on the community's information. These are the people who inform us about the incident. We do cross-check the information from different sources. For example, sometimes we receive calls from multiple people who witness the incident. We also cross-check the information by calling the first responder who has informed us about the emergency. We do take their input to successfully achieve the objective".

Community support and information helps in the utilization of employee's tacit knowledge in such a case. Being a collectivist society, employees also try to handle the situation by risking their lives. Interviewee 4 described such a situation in the following words:

"People around us in the emergency area help us to rescue people and property. Like if there is a fire case, people help us in rescuing individuals from the area where the fire is not yet caught. In such a situation, people get involved in that activity. They also help us If we get a limited number of rescue staff". However, the organization does not always take communities' help in physical activity because the community is not as trained as employees are. To halt the people from the emergency area they take help from police to cordon off the area. Sometimes, people give unnecessary information to the employees which can distract them from the task at hand. The employees filter unnecessary information during an emergency. Interviewee 9 describes such a situation in the following words

"The annoying thing is the wrong ideas from people. Everyone wants to share their opinion. In such a situation we do not give ear to useless suggestion. We have had tackled hundreds of emergencies and know which suggestion to take which suggestion to drop."

Although with the community's information and help, the emergency team utilizes their experience and knowledge to cope with the emergency. There are certainly other reasons from the employees' perspective which

are, the emotion of the people", people's concern and, "unusual expectation of the people which compel employees to utilize their knowledge. Being a member of the collectivist society, most of the emergency employees have a personal rapport with the community as most of the employees are aboriginal. In such a situation, employees perform their duty as well as try to go beyond their duty to come up with the expectation of society. In such a situation, employees utilize their knowledge and experience to the extent which even can pose a challenge to the employees. In simple words, the emergency staff goes beyond certain SOPs to save the people and their property. Such views were seconded by interviewee six in these words

"*There was a fire incident in a nearby home. ------The tenets were the new couple who got married two days ago. The bride was out of the home but when she saw her room has caught fire, she went into the room to save her gold property. We heard her screaming. At that moment, I wore only firefighting jackets and long shoes only. I knew that to enter into the house was very risky to my life but her screaming and situation made me fearless of the danger"*

In rescue SOPs, they need to save their life first as this way they able to save more people and property. In a critical situation, rescue employees do not take care of their life to save people and property. Interviewee three stated that

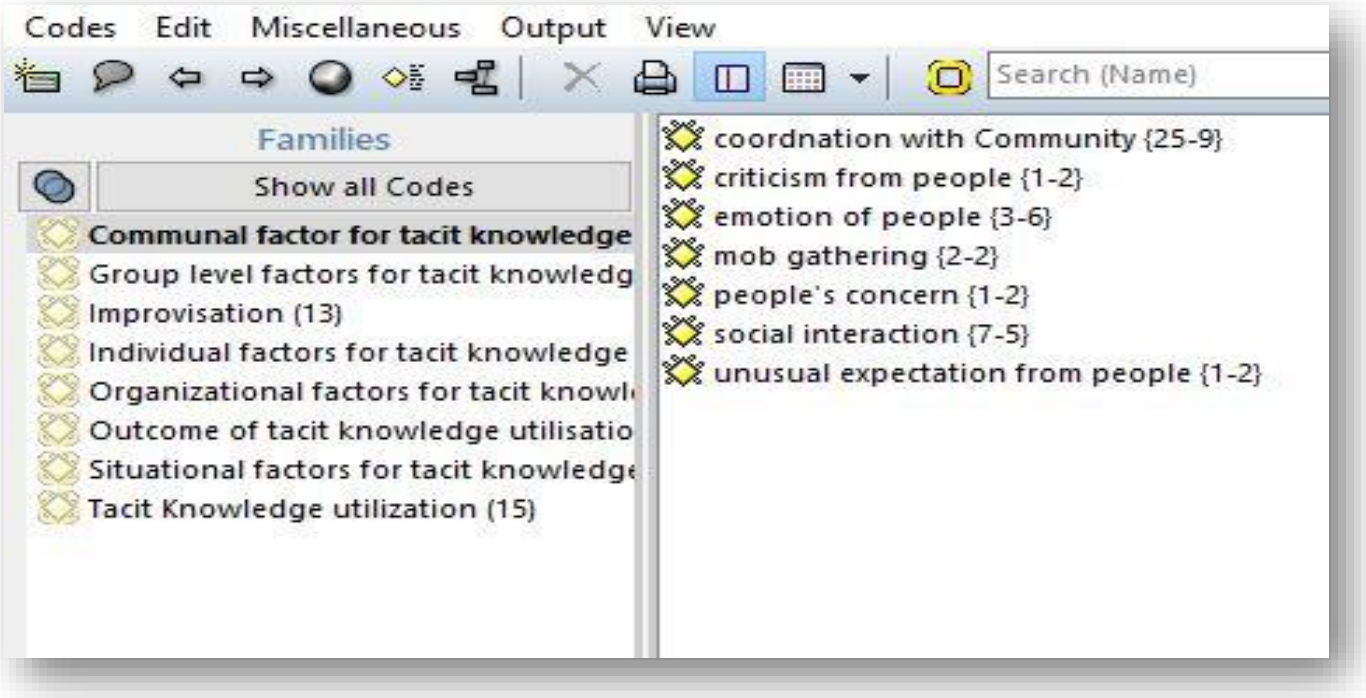
"The emotions and the situation of kinships, wife or children, etc. compel us to perform our job to the fullest. Being human, we cannot leave them in the lurch. Being a Muslim, we consider it our obligation to help others without taking care of their own life".

The above-mentioned factors trigger employees to improvise under resource and time constraints because of fellow-feelings and consciousness of the people's life and property. However, sometimes communal factors halt employees to perform their tasks. In Western countries, people do not gather at the incident site. But in Pakistan, the mob gathers at the site and initiate rescue task by themselves. In such situations, the community's involvement not only obstructs the job performance of the employees but also cause injuries to the injured persons

because they aren't as trained as rescue teams. Moreover, the unusual expectation arising from the employee's rapport with the community also waste employees' time. People dial rescue numbers for petty issues such as drainage issues etc. To halt people from the emergency task, the rescue team takes help from the police.

There are multiple factors which help employees to utilize their tacit knowledge which is, initial information about the incident, people's concern and emotions of the people. They utilize their knowledge relying on past experience and the community's information and suggestion. The negative externalities of community involvement are the unusual expectation from the rescue teams, people criticism during the task, and floods of information and suggestion of the people.

P1: In a collectivist society, community involvement discrediting negative externalities helps the emergency employees to utilize their tacit knowledge more effectively.



Communal level factors for TKU codes Fig (4.3)

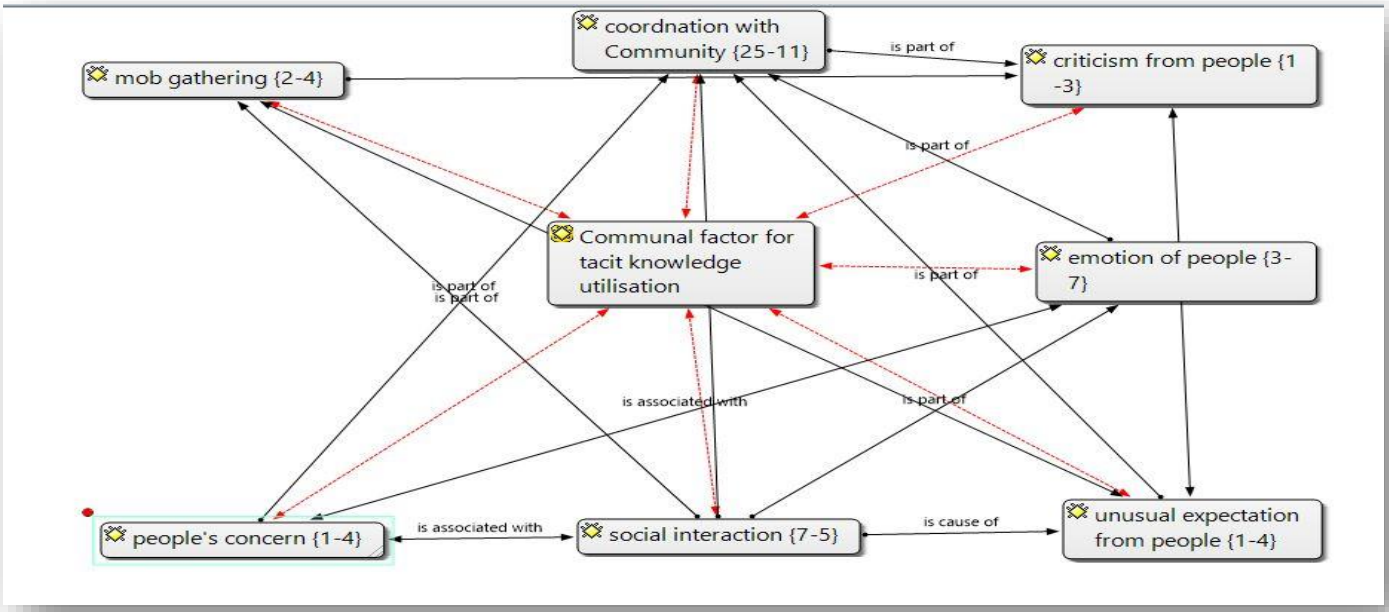


Fig (4.4) Network view of the Communal factor for TKU

4.2 Group-level factors of tacit knowledge Utilization

The second category is the group level factors of tacit knowledge utilization. Interviewees disclosed interesting insight on this phenomenon. Eight codes have been added to this category. "Buddy system" and "employee cohesiveness" are the most dominant codes of this category. There was a consistent response from the interviewees. These codes and network analysis of code are shown in figure (4.1) and (3.6) respectively. Rescue organization has a buddy system for performing rescue functions. In an organization, teams have been divided according to their functions. They perform their function in the buddy system. In the buddy system, there were at least two employees to perform their job. This system has engendered many fellow feelings necessary for performing a life-risking task. Interviewee one described it in this way:

"*We are dealing with emergencies through teamwork. They cannot be handled individually. and if there is no coordination and cooperation within the team then it might be possible that we fail to deal with the emergency".*

From the above statement of the interviewee, for utilization of their tacit knowledge, whether individual or group level tacit knowledge, rescue employee needs to do their task in teamwork. The nature of the task requires teamwork and the organization has foster teamwork in a variety of ways, such as creating a buddy system for employee performance. Secondly, there is no hierarchy during the real-time emergency. The group choose a leader among themselves and divide the task according to the nature of the emergency. Even drivers of the vehicles take part in the emergency activity and gave significant input in the decision making. In rescue, every employee from top to bottom had to go through six months training course and have the ability to deal with any emergency be it an officer or driver. Interviewee 2 describes this in this way.

"Consider this buddy system as a universal phenomenon in rescue organizations across Pakistan. That is why we perform our task in a team to help each other and to perform our duty to the fullest to save people's lives and their property. In an emergency, we perform our job as one united team irrespective of the ranks of employees. Sometimes drivers give a more rational opinion than the other employees ".

To utilize the tacit knowledge, a well-coordinated system is needed right from the to the emergency room until completion of the job. This study has revealed the kind of coordination and communication needed in real-time scenarios. Interviewee 14 describe the phenomenon in these words:

"Coordination is critical in rescue jobs. Without coordination, we cannot do the planning and execution of the task. Coordination is required to perform our job. Sometimes, we are at the emergency site and still in touch with the emergency room to inform about the resource needed and also apprise them about the situation".

Coordination helps employees to utilize their knowledge in various ways. Coordination is needed right from the planning phase to the implementation phase. During the planning phase, coordination among employees helps in brainstorming which is another dominant code of group factors of tacit knowledge utilization. Brainstorming leads towards the implementation phase as the team has chalked out a plan during brainstorming to tackle the issue. Interview three has opined about the brainstorming in the following words

"We usually moved to the emergency in a team. We have to decide and act at any cost. We exchange ideas during such situations. So through ideas, we can solve the case having an emergency in front of us. Ideas come forth through brainstorming and then we implement the most viable idea".

In one incident rescue team has to pull out a car out river. The road was 100 feet above the river. During such a moment, employees share their ideas and finally reached at a conclusion. A picture is shown in exhibits.

P2: Coordination among employees engenders mutual trust among employees.

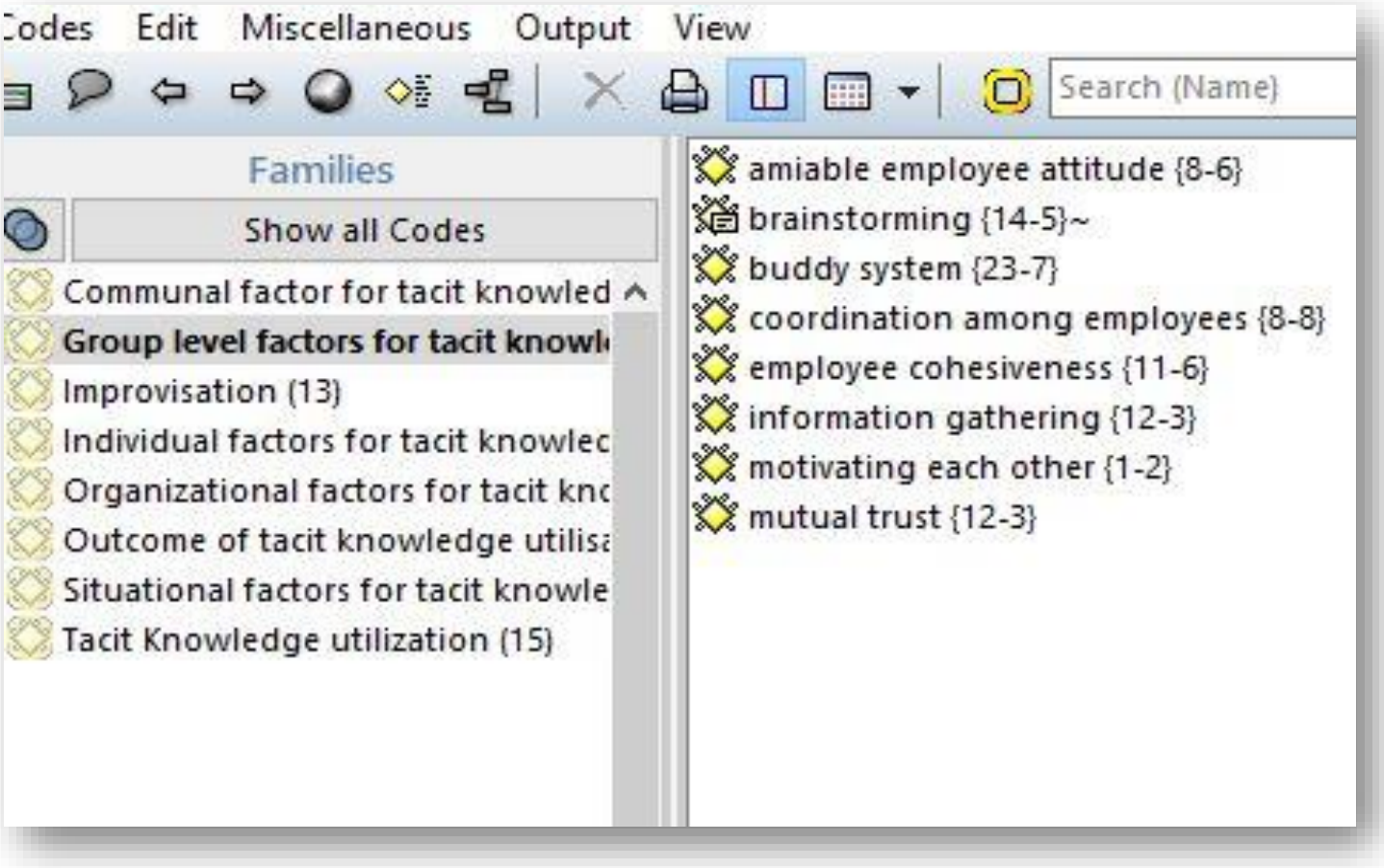


Fig. (4.1) List *of the codes of family Group level factors for tacit knowledge utilization*

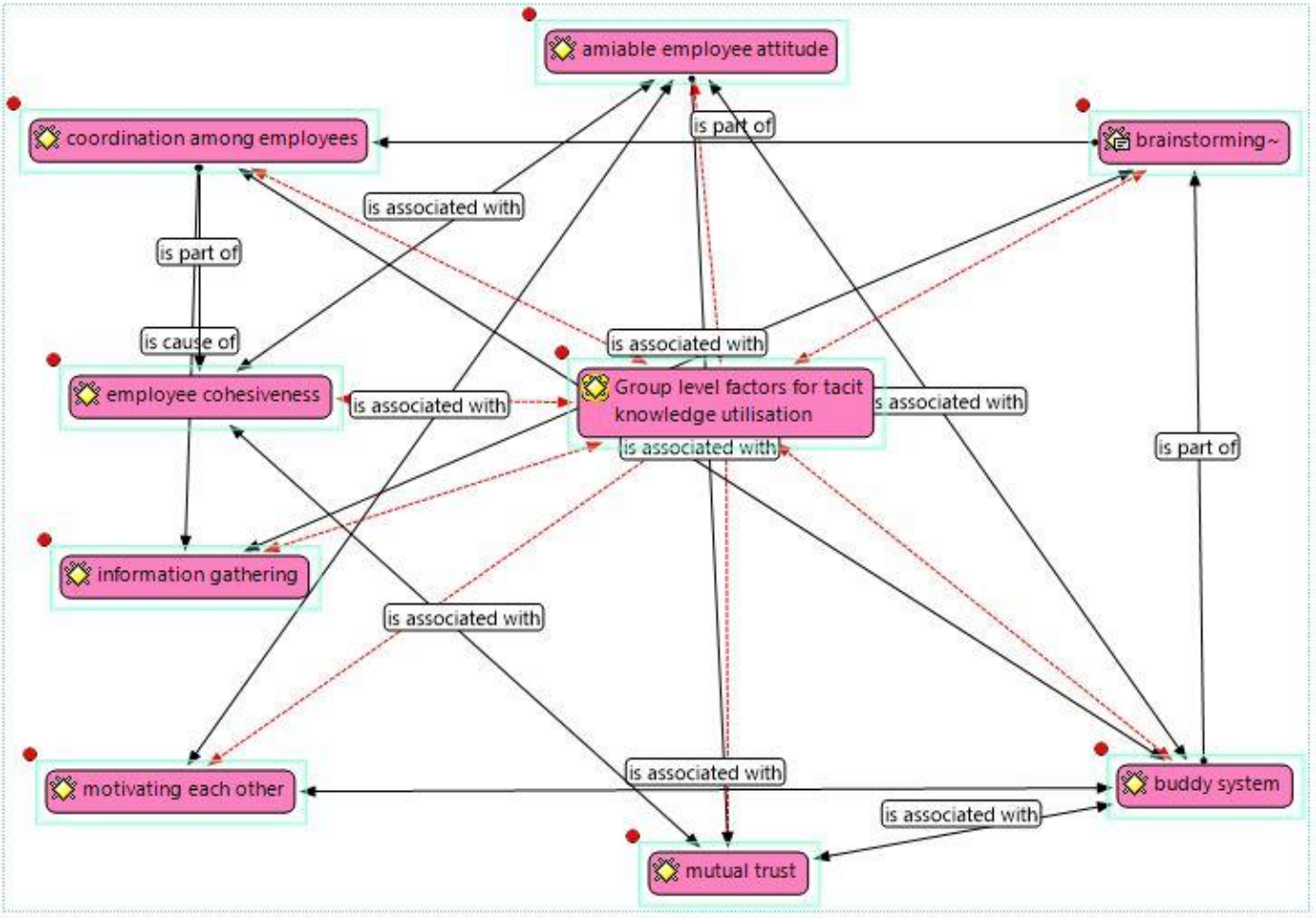


Fig (3.6) Network view of Group level factors of Tacit Knowledge Utilization

4.3 Individual-level factors for tacit knowledge utilization

In this category, 14 codes have emerged from the data. Codes and relationships among these codes have been shown in figure (4.5) and (4.6) respectively Individual factors have shown interesting factors for tacit knowledge utilization. These factors help in the utilization of knowledge that has been accumulated in the mind of employees. Contrastingly, there are few codes which prevent emergency employees from performing their task. These preventing factors of knowledge are, low level of trust in their abilities, less experience, nervousness, and lack of

emotional stability in the field of emergency. Some dominant codes in this category are: Sense-making, common sense, emotional stability, trust in oneself, mutual trust, commitment to the job, and some compassion elements such as concern for others, save property, save human life, and self-satisfaction. Sense-making, common sense, concern for others, and trust in oneself (own skills) are antecedents as well as outcomes of employee's experiences in the emergency field. The more an employee serves time in the emergency field the more he engenders the aforementioned qualities. These individual factors are the prerequisites for performing an emergency task. Interviewee 8 put this in the following words:

"Now we have a sense about the emergency as how should we go about to perform the task at hand. In our minds, the scenario is already constructed before we reach that place. Because in training we are exposed to such simulated scenarios time and again. On the ground, we are facing such things repeatedly".

It means due to experience and practical knowledge rescue employees construct a scenario before actual scene assessment.

In the same vein interviewee 4 described it in the following words:

"In an emergency, if you are in your senses then you can find a solution speedily and safely. But if at that location you are double-minded and confused then you cannot perform your task as per the requirement of the task".

It means that knowledge confusion arises if employees are less experienced and will represent less emotional stability.

Interviewee 9 share the same views as:

"We got a call from an emergency room that a guy has jumped into the river. If we went into the exact jumping place, we could not find it. We went way away from the place where he initially jumped. As the river has flowing water. As soon as we saw him, one of the rescue workers jumped into the river carrying a rope with himself. He brought the guy out of the water. We gave him first aid. This way the life of the boy was saved. It

was our common sense that we went far away from the initial jumping point otherwise the guy would have been drowned by the river".

Common sense is acquired by exposing oneself to such situations time and again. Emotional stability is another factor that helps in utilizing one's tacit knowledge in rescue tasks. interviewee 1 stated that

"I experienced a variety of situations ranging from simple to serious one. some situations I had felt that now death is certain but we managed to survive. To perform rescue tasks one needs to have emotional stability as we see human life and property in distress".

Most of the employees were in agreement with these idiosyncratic characteristics as a means to achieve ends. The absence of these factors leads an employee towards the abyss. Putting it in other words, lacking emotional stability, common sense, and trust in oneself (knowledge and skills) creates anxiety, fear, and nervousness. These are also some dominant codes that emerged out of data. Mostly, naïve employees usually have such feelings which are impediments in performing emergencies. The less experience an employee has in an emergency, the more he feels anxiety, nervousness, and fear. Therefore, the organization needs to send an experienced employee with a recently recruited employee. Employees during the interview stated that in the initial phase of their duty they have gone through such situations. Interviewee 5 elaborated it as:

"*Experience matters a lot. One can quickly perform one's job being used to handle the situation routinely. One can handle the situation calmly without being perplexed in a tense situation". A new person becomes nervous initially and does not able to make decisions quickly by himself".*

It means for decision making, a vital part of the emergency, employee needs to stabilize their fear, anxiety, and nervousness. Interviewee 15 stated

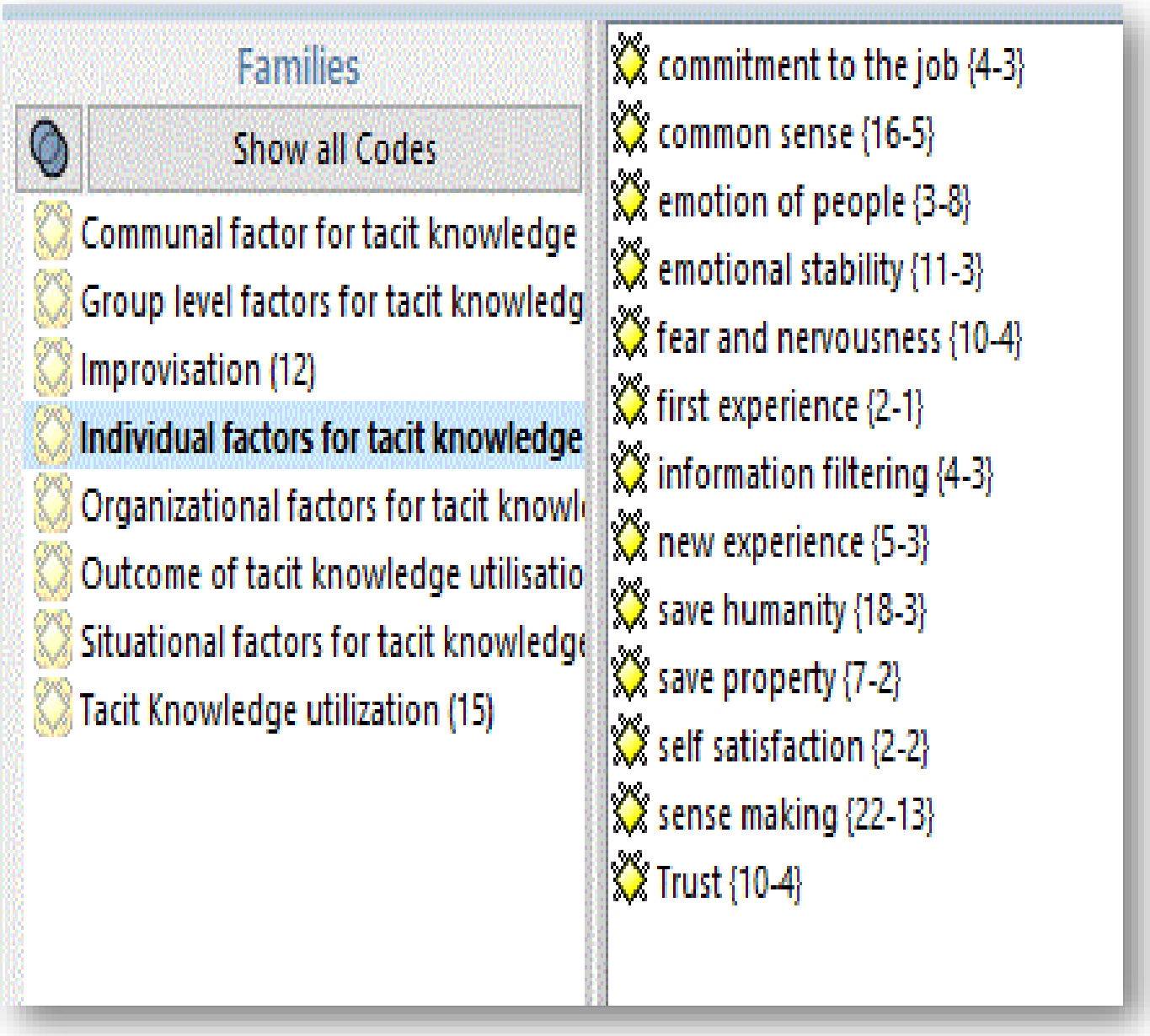
"In my initial days on the field, I felt huge pressure to tackle the situation. I relied on other persons for their help but now with time, I can easily handle the situation without being perplexed."

As employees go through different emergency cases they get used to the situations. After the accumulation of a handful experiences, they can control their nerves even in severe emergency cases. Interviewee 8 compared his first experience with accumulated experience in the following words:

"My first duty was in an emergency in minor OT. A patient was admitted there and thieves had injured him with an axe. The moment I saw him, I got fainted. That day and now, I feel great differences in terms of handling the situations".

In short, emergency employees either need to possess certain idiosyncratic characteristics or need to obtain such characteristics with time to perform emergency tasks calmly. Such characteristics have emerged from the data which are common sense, emotional stability, and trust in one's skills. Certain compassioning traits are also prerequisites to perform their job by putting their utmost efforts into the task in hands such as feelings for others, the safety of property, and the life of the people. Having a collectivist society, these employees go beyond their official SOPs to save the people and their property.

P3: The more rescue worker faces different situations the more he becomes emotionally stable, makes sense of the situation, and trusts his instinct and vice versa.



Codes of Individual level for TKU Fig (4.5)

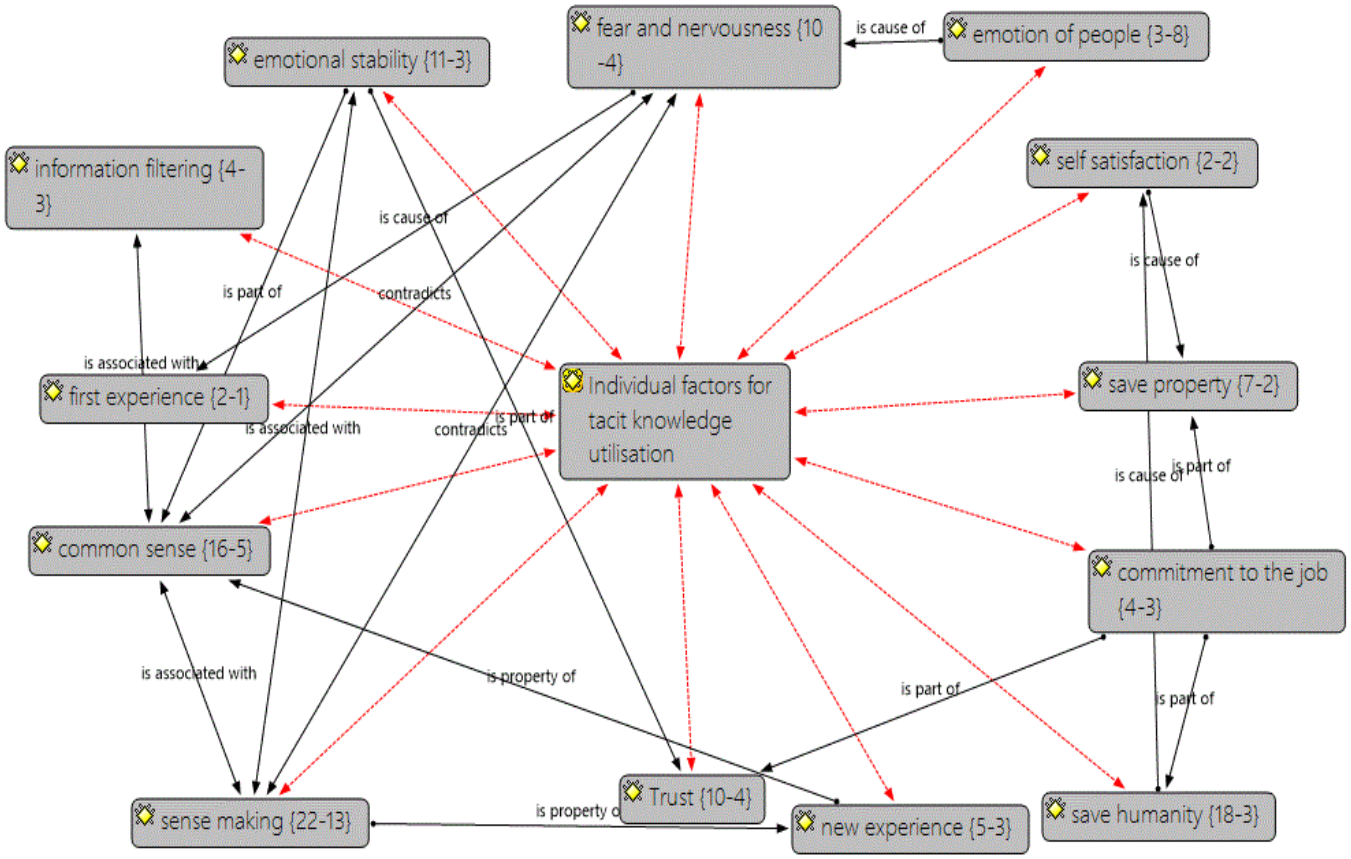


Fig (4.6) Network view of Individual factors of TKU

4.4 Organizational level factors of tacit knowledge Utilization

This family contains seven codes. Codes and linkages of these codes are shown in figure (4.7) and (4.8). The dominant codes are resource availability, lack of hierarchy, coordination among employees, coordination with other departments, amiable employee attitude, and employee cohesiveness.

For tacit knowledge utilization in rescue, certain basic resource availability is the most important factor which assists employees to utilize their knowledge. Employees needed those resources to perform their tasks efficiently and timely. Certain basic resources are vehicles, fire extinguishers, and safety kits, etc. These are the prerequisites for tacit knowledge utilization. Lack of hierarchy is the most interesting code which is the antecedent of other

organizational factors such as amiable employee attitude, an informal conversation among employees that provide the basis for employee cohesiveness.

Interviewee 8 describes the lack of hierarchy in the following words

"Organizations provide resources to deal with the situation. On the field, we do perform our job as a team. There is no discrimination between seniors or juniors. Whoever gives sensible advice, we are open to taking it up for decision making".

In the same vein interviewee 9 seconded the above views by stating:

"We perform our task as a team. During our movement, we brainstorm if we face a difficult situation. We take opinions from staff irrespective of their ranks. This job requires experience and a lot of sense-making so everybody can provide a good and rational input".

Job autonomy is another important factor that enables employees to utilize their tacit knowledge. There are certain SOPs that has to be followed by the field employees such as wearing personal protective equipment and saving their own life first. On the matter of execution, organizations have given autonomy because rescue teams have to make decision on spot which is a leading factor of job autonomy. The organization provides equal training for a period of six months for every employee whether he is a field officer or office staff. Because of this, every employee is capable of performing their task. This autonomy empowers employees to utilize their knowledge according to the situation which is appropriate at times of calamity. Interviewee 11 describes job autonomy in the following words:

"*Well, we have to follow certain SOPs in general. In handling the situation, we are free to use whatever available resources. As every situation is different from other situations so it is on our discretion to decide on the spot according to the situation".*

P4: Organizational work environment fosters amiable employee attitude which helps in tacit knowledge utilization in a turbulent environment

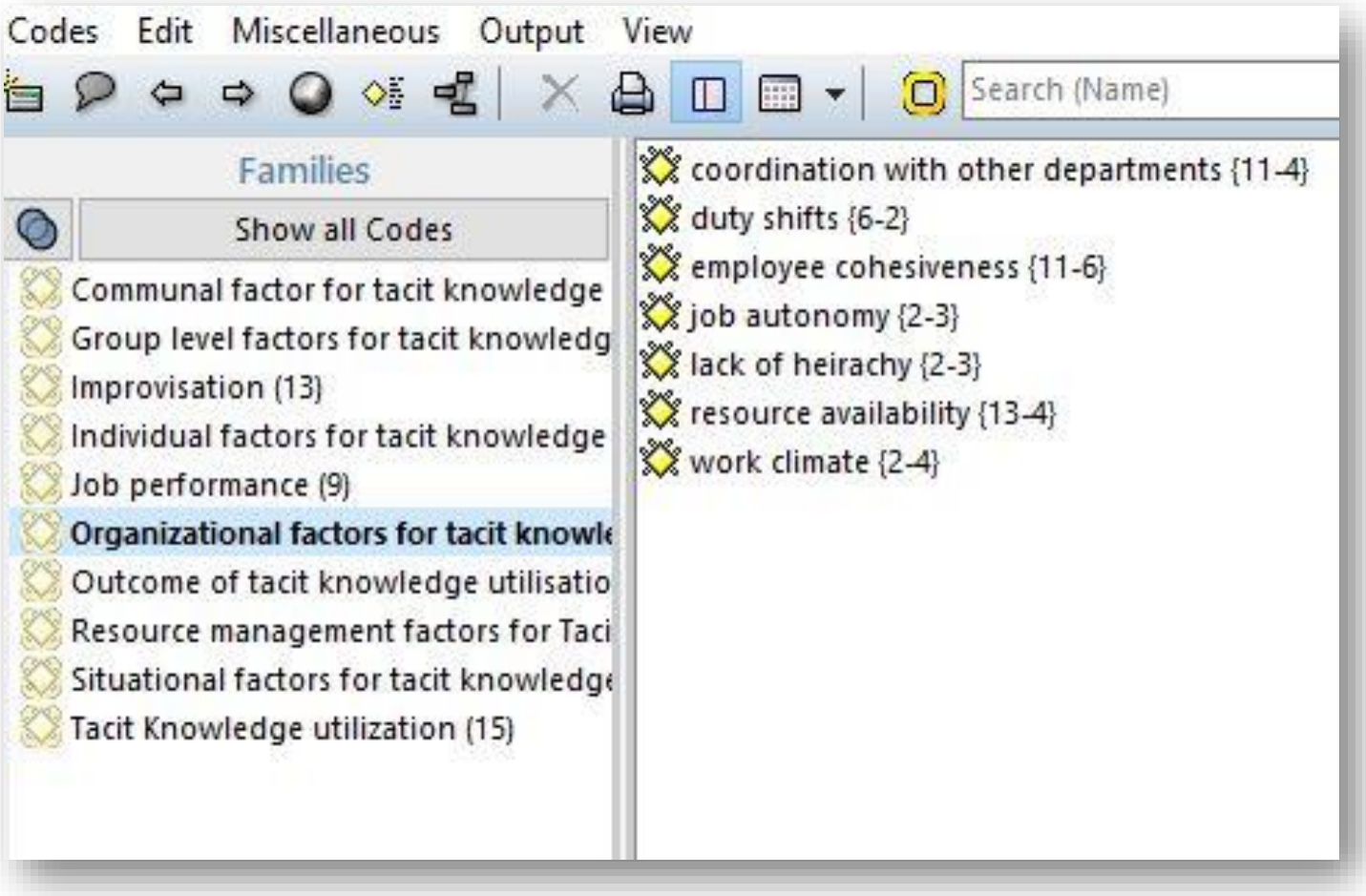


Fig (4.7) Codes of Organization level factors for TKU

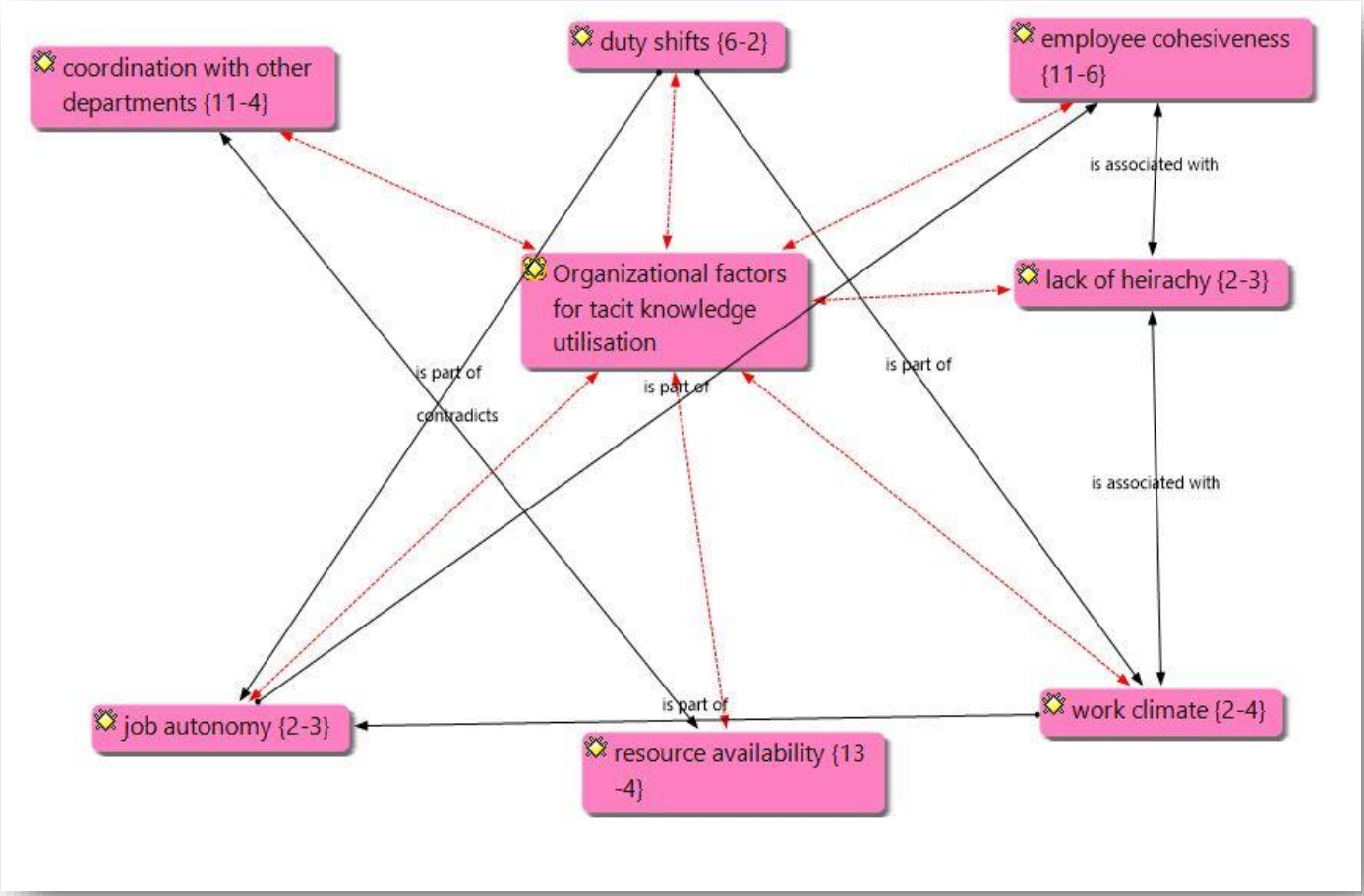


Fig (4.8) Network view of the organizational level factors for TKU

4.5 Situational factors for tacit knowledge utilization

In this category, twelve codes have emerged from data. These codes and relationships among these codes have been shown in fig (4.9) and (4.10) respectively. The dominant codes of this family are: nature of the emergency, situation handling, unusual situations, vague information, resource constraint, resource availability, understanding the situation, resource immobility, time constraint, coordination with community, unusual situation sense-making, and understanding the situation. Situational factors help the employees to use their past knowledge. Every situation has a different nature and requires different sense-making techniques and different ideas for its

solution. Situations are very from simple to complex and require different strategies. Employees are confronted with such varying degrees of emergency tasks in their job. Interviewee 15 describes it in this way:

"First of all, every emergency is different in nature. Every emergency gives new insight and new experience. It gives us new thinking and vision. We go to the emergency location to assess the situation. Firstly, we comprehend what kind of fire it is. Either it is a large scale fire or small scale fire. Whether should we control it by using which available resources. This all depends on the situation. From situations to a situation, we use our knowledge to tackle the emergency effectively".

Interviewee 7 put this in the following words;

"When we go to the place of incident, on ground things are quite different from what we had previously imagined or what has been informed to us".

It means that lack of information or misinformation put employees to rely on their common sense and intuition to perform their job.

The respondent sometimes does not paint a clear picture of the situation. Interview 13 revealed the reason for this misinformation in the following words.

"The caller (first respondent) is usually so much in the panic that he is unable to tell us as to what is the real situation".

In one situation, the emergency room received a call that a fire incident took place nearby village. Employees drove to deal with the situation. Upon reaching there, they found that vehicles cannot move to the targeted place and could not able to carry a water tanker. Luckily, gas cylinders were available. Field employees reached there by foot and extinguished fire through cylinders.

In such a situation, employees face what they could not imagine. It pushes employees to go out of the box to get a solution. Sometimes they relied on improvisation which will be discussed later.

There are multiple factors which either halt employees from utilizing tacit knowledge or push employees to go for alternate solutions (utilize tacit knowledge) in case of resource immobility or resource constraints. One of

the factors which halt resource utilization is the terrain and geographical locations of the area. Gilgit is situated in mountainous regions having three mountainous ranges such as the Karakorum, Hindukush, and Himalayas. In such terrain, it is difficult for the rescue operation teams to carry and utilize all the resources which are required for the attainment of their task. In such a case, they either need to utilize resources available in their surroundings or to improvise to achieve their goals. In simple words, it means that despite having resources, employees are unable to carry (resource mobility) resources to the target location. In such a situation, they rely on alternate resources or improvisation.

Interviewee 4 describes such a situation in the following words

"Emergency room brief us about the emergency. They get firsthand information from the caller. According to the situation, we move the respected staff. We have equipped vehicles in

place; we have a boat. But this boat is of no use. The flow of the river is very high that we are

unable to operate the boat. We adopt certain measures to handle the situations. We do have improvised boats for such situations.

Therefore, rescue employees not only rely on the existing resources or resources provided by the organization but they also count on resources found around the emergency area. They think for out of box solutions. It means such a situation helps them to utilize their tacit knowledge (past experiences, observations) for finding viable solutions. Such views are also described by interviewee 10 in the following words:

"A helicopter was crashed in Nalter. We covered one and a half kilometer distance on foot as it was a hilly area and there was no road to that place. We could not move stretchers there. A helicopter could not have landed because of the nature of the landscape. in such a situation of the time, we relied on the resources available around us. We got few sticks from a nearby place and we put off our shirts and made an improvised stretcher and placed dead bodies over them and carried them down to the nearby hospitals".

If the rescue workers find resources are needed during the emergency, they coordinate with the emergency room for further deployment of resources as well as staff. Such types of decisions are based according to the nature of

the emergency. Most of the interviews endorsed that they are in shortage of resources most of the time. Such shortage of resources may either be a material shortage, time constraints or maybe due to terrain and geographic location and nature of the emergency. they are unable to deploy already existed resources. In such a moment, they do improvise to deal with the calamity.

Being a developing country and lacking in technology, the use of technology is next to none. They do not use technology to track the incident place to reach on time. For this, the organization has other plans in place to avoid finding a location issue. The organization select drivers from the local areas in which the rescue office is based. This is the one-way organization that compensates for technological unavailability. Therefore, drivers use their tacit knowledge to locate the area of the incident quite successfully. Having said that, resource management is one of the important factors for tacit knowledge utilization.

Therefore, rescue workers use their tacit knowledge according to the situations. These situations help employees to accumulate more knowledge and experience to handle various situations. Situational factors sometimes trigger other aforementioned factors to handle situations such as coordinating with other departments, coordination among rescue team members, and help from the community. For example, if there are a fire case and the organization alone cannot control the situation because of having 3 to four water carrier vehicles. In such a situation they coordinate with other departments to use their vehicle. Mostly they call the military for such kind of help. In such a high time, employee coordinate constantly with office staff and brief about the situation.

P:5 The more the environment is turbulent the more employees utilize their knowledge.

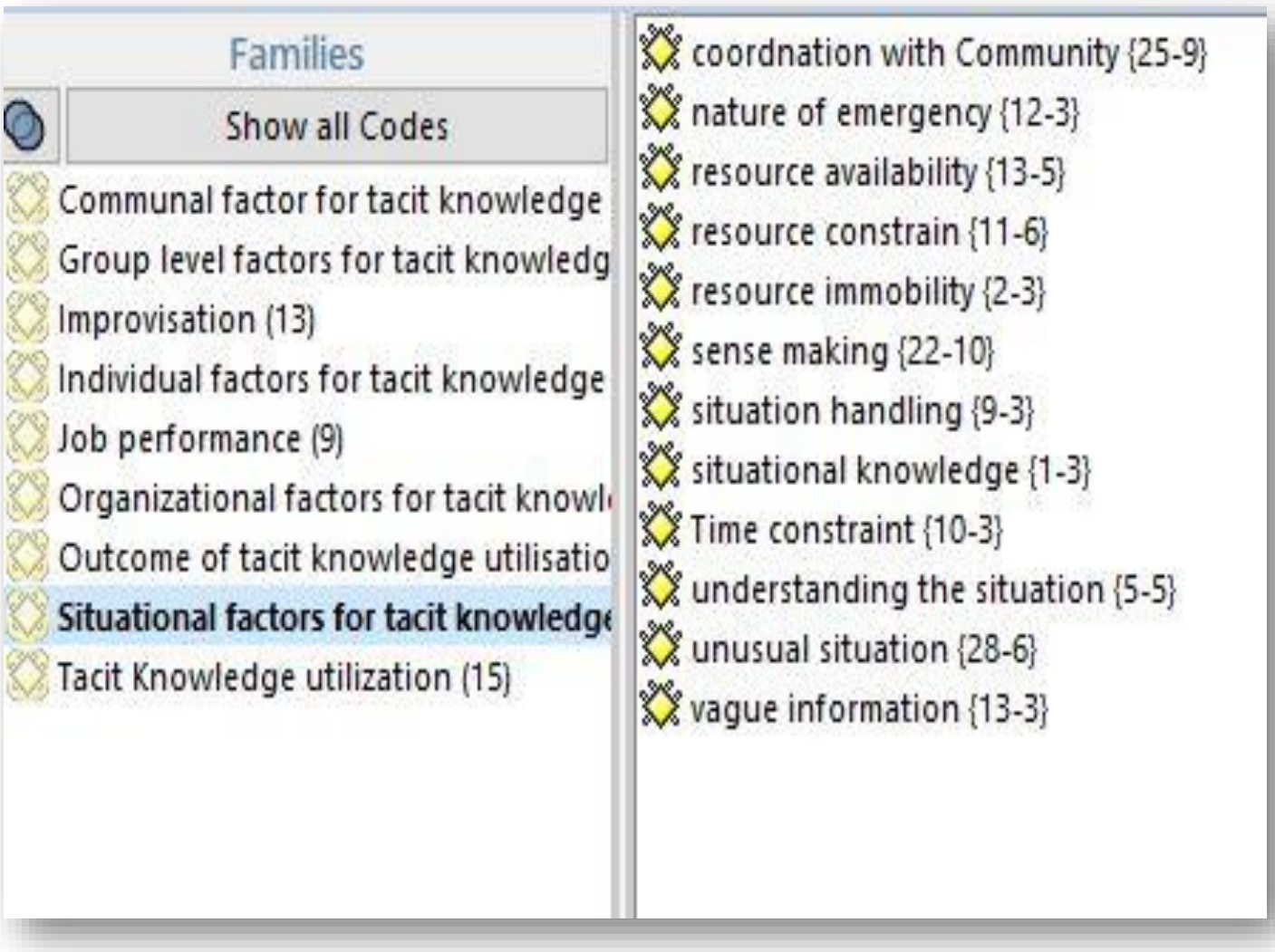


Fig (4.9) Situational factor of TKU

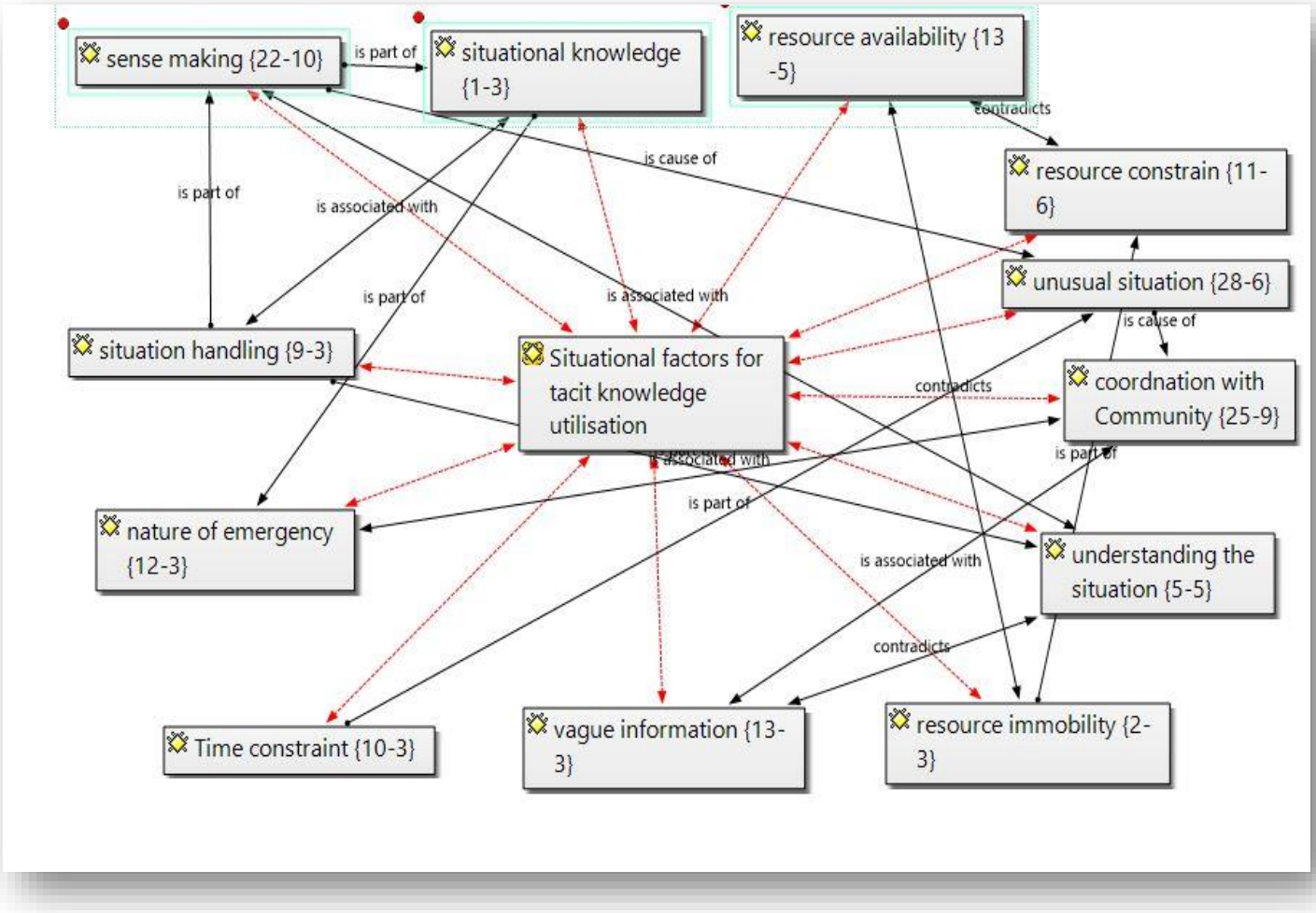


Fig (4.10) Network view of the codes situational factors for TKU

4.6 Tacit Knowledge Utilization and Improvisation

The following paragraph will answer the second research question of this study that is: How utilization of tacit knowledge leverage improvisation?

The answer to this question has already been answered in an indirect way which can be manifested from the conceptual framework of Tacit knowledge utilization (TKU). However, for distinction, some of the critical aspects and linkages between tacit knowledge and improvisations have been expounded in the following paragraphs.

The improvisation family contains twelve codes. These codes and relationships among these codes are shown in the figure (4.11) and (4.12) respectively. The dominant categories in this theme are: planning and execution, tacit knowledge utilization, resources at hand, resource availability, unusual situation, scene assessment, buddy system, and brainstorming. Improvisation plays an important role in the rescue team. As rescue teams have to deal with difficult and unpredictable situations arise from the natural as well as a man-made calamity. In this study, improvisation is one of the dominant codes spring from the data. It appeared in the text 26 times. It shows that rescue teams perform their job while resorting to improvisation due to many reasons. One of the reasons is difficult and unforeseen situations where routines and pre-approved solutions do not work. Secondly, they improvised because of a shortage of time in real-time situations as it is a matter of people's lives and property where a single second makes a huge difference. Another reason is the unavailability of resources, infrastructure, immobility of resources due to the physical nature of the geography of the area, and lack of technology. Interviewee 16 described one of the reasons for improvisation as

"We do not have buoyancy compensator which helps to thrust the body of diver upward from the surface of the water. In such cases we improvised. I used to go into the water carrying one end of the rope for dead body searching. When I reach down the surface of the water, I shake the rope and the one end of the rope is on the hand of the staff standing outside of water. The person understands that I have reached the surface of the water. We plan before going into water that from where to start the search and where to end. If I go against the plan, the staff outside water holds back the rope. This holding back cue means that I need to change the direction. When I find the body in the water, I shake the rope for a few seconds. They understand that I got the body and they start pulling me out of water."

Interviewee 10 described a situation where immobility was the reason for improvisation in the following words

"In Nalter valley a helicopter was crashed and it was heavy raining. We covered one and half hour distance on foot as it was a hilly area and there was no road to that place. We could not move stretchers there. The

helicopter could not have landed because of the nature of the landscape. in such a situation of the time, we got few sticks from a nearby place and we put off our shirts and made an improvised stretcher and placed dead bodies over them and carried the dead bodies to the hospitals."

All the improvisational act performed by employees in an emergency case are mentioned in this section.

It is worth mentioning here an example of a problem which the rescue team is facing daily generally in Pakistan and specifically in Gilgit Baltistan. The organization receives hundreds of fake calls. Sometimes people call the emergency number just to kill their boredom because the call to the emergency number is free of cost. This issue has been reported on several renowned T.V channels of Pakistan. The rescue workers came up with different ideas to sort out the problem. One was to launch an awareness session regarding the seriousness of the issue. After the awareness session, the number of calls increased. Employees can differentiate between fake calls and real calls through sense-making and institutions as a result, they are now able to decode a fake emergency call and a real emergency call. During the interview, they described that in a real emergency, the first responders seem very perplex and speak in a much-hurried way. In contrast, in a fake emergency call, the first responder is quite calm and speaks at a normal pace. However, they do not rely on this because it can risk people's lives and property. They do call again to the same responder. In most of the fake calls, the responder does not pick the call for the second time because of the fear that he may not get caught. Although, fake calling is an unlawful act and is punishable under the law. Secondly, the emergency room confirms it from different sources. Being a backward area, if the rescue team goes for tackling the fake emergencies then the real emergency could not be tackled because the resources are already being deployed. It is to be noted that the rescue organization receives multiple emergency calls daily. If they respond to fake calls, then they would not be able to help the people who are in real trouble.

Interviewee three quoted improvisation example as

"*As we do contain resources to manage and control the situation. But sometimes we do not carry all the necessary equipment because of the nature of the emergency. A helicopter crashed in hills where we had planned*

to bring the dead bodies down the hill but luckily helicopter reached the location and recovered all the dead bodies. In this incident, dead bodies were trapped within the helicopter, there we used iron parts of airplanes as a cutter to extract the bodies. We do have cutters in the rescue vehicle but at that time we cannot move vehicles to the location".

Interviewee 12 narrated one example of improvisation as:

"In some cases, we assess the nature of fire with its color. Now, we can tell the nature of fire by its color because of experience. In one situation, there was a fire in polyester beds. Its smoke was very bitter. The quantity of smoke was very high. There was so much smoke that people could not stand in the street. I had a staff with me as a firefighter, because of smoke we could not perform our tasks. If we find the seat of the fire, we can quench the smoke. We reached the location through the self-breathing apparatus. finally, we reached the fire seat through coordination at that moment and within a second we controlled the situation"

Interview 14 stated:

"Once we got a call. our main motive is to save a life whether human or animal. a lamb was fallen inside the boring. We went to the emergency site Then we found that it was 50 to 60 feet deep and 1.5 feet wide. Now from the point of view, we didn't have any such equipment to deal with that. Luckily there was a construction site nearby. Then we got steel-bars from them. They were there available in large numbers and were also in the lightweight. We constructed a hook out of it and dropped it with a rope bind to it. And we pulled out the lamb safely".

Interviewee 4 describe an improvisation example as:

"Yearly, we provide community awareness sessions with schools and colleges. we sometimes visit to revise the training session. On such visits, a girl told us that during the off-time of school a lot of rush had taken place on the stairs and one girl was fell from the stairs. we did not have anything. As you have told us in your last training that how to make a splint in an emergency. We put off shoes and socks. We tied his broken bone with shoes and socks to stabilized her broken bone. if they had not done that her injuries would get severe".

The above discussion manifests that some stimuli trigger employees to go for improvisation to handle that particular situation. Past literature has explained the reasons for improvisation too. The organization which is confronted with unexpected situations needs instant action and pre-approved solutions cannot work well. (Moorman and Miner, 1998b). In such situations, some multinational companies resort to improvisation (Steinbock, 2010, p.107). Rescue teams do improvise in such situations where they find it difficult to reach a certain conclusion for the situation at hand. During interviews and field observation multiple examples of improvisation had been gathered. These employees improvised by using their past knowledge and experience (tacit knowledge) in unforeseen and complex situations. The following paragraph will describe how tacit knowledge leverage improvisation in a real-time scenario.

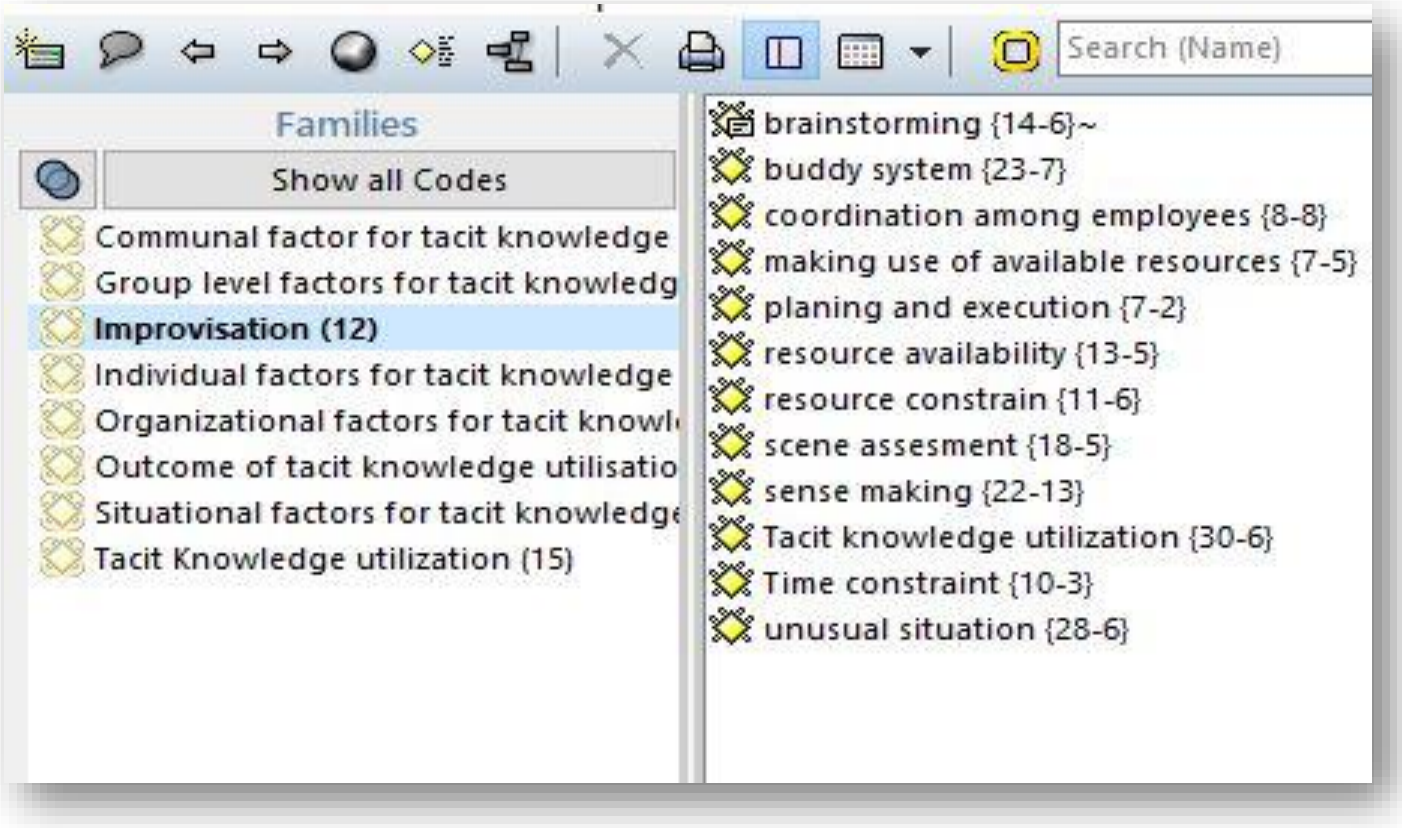


Fig (4.11) Codes of family Improvisation

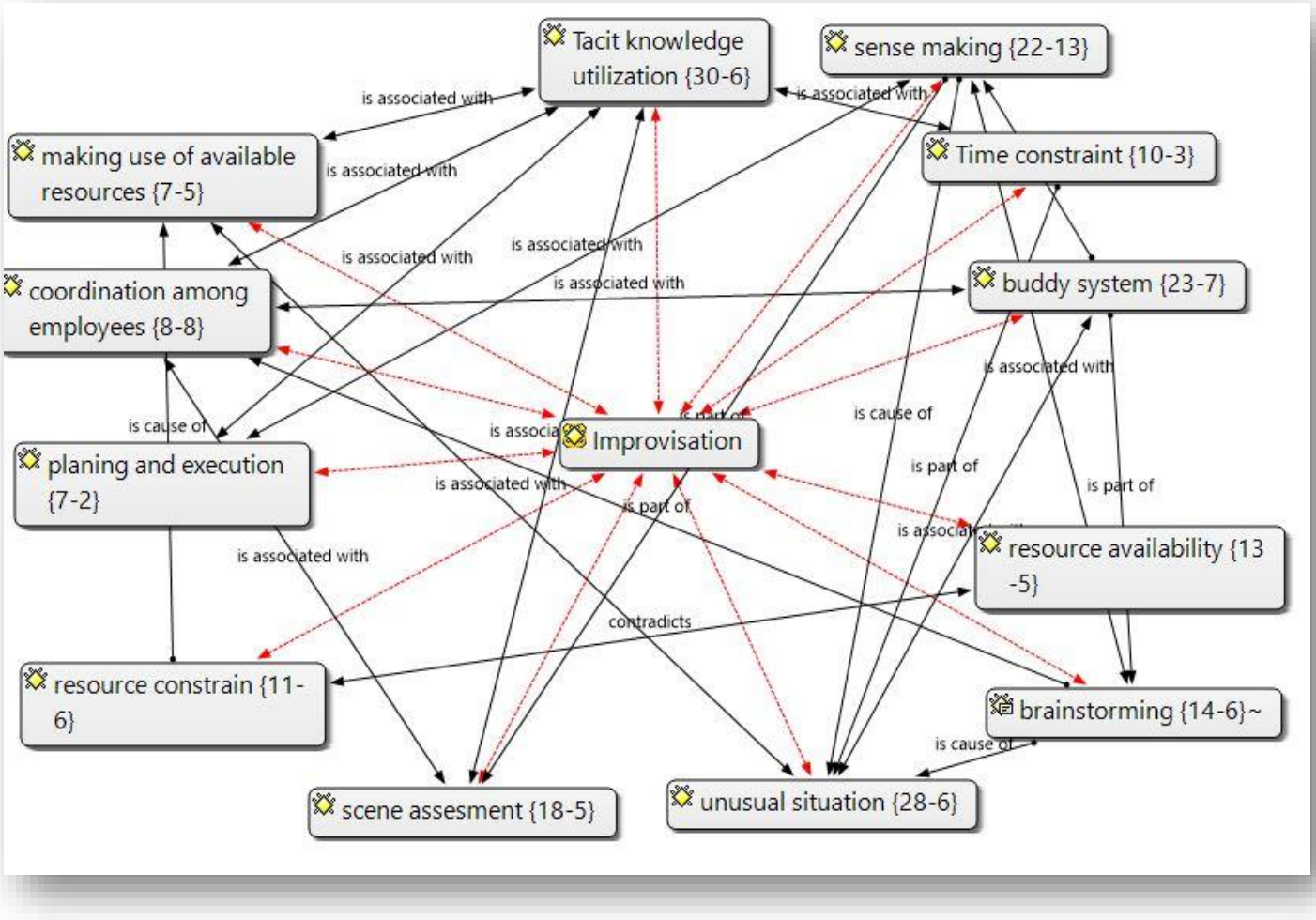


Fig (4.12) Network view of Improvisation

4.6.1 Socialization

The researcher has put all the codes together which are constituent of socialization. Brainstorming, buddy system, sense-making, and coordination among employees are codes that have been added under the umbrella term 'socialization'. During an unusual situation, employees brainstorm ideas by coordinating with each other. Here, employees share their tacit knowledge and seek viable ideas to reach a certain solution. Interviewee 3 describe brainstorming in the following words:

"We usually moved to the emergency in a team. We have to decide at any cost. We exchange ideas during such situations. Through ideas, we can solve the case".

Such views are consistently reported by the respondents. Interviewee 4 explained the brainstorming process as:

"If confronted with an unusual situation, we do brainstorming. Ideas are shared between teams. Sometimes local people also get into it to give their viewpoint. Through brainstorming we get solutions"

The Buddy system is another important element of socialization. Rescue teams work as a team and they termed it as the buddy system. They cannot go to the field alone. They come to gather to brainstorm ideas. Interviewee 1 stated:

"Because the emergencies are dealt with through teamwork. They can't be handled individually. and if there is no coordination and cooperation within the team, then it might be possible that they might fail in dealing with the emergency".

Interviewee 5 concluded:

"*Teamwork has a vital importance in our job. In high accident cases, each second is important for the life of victims. That is why we do perform our job in teamwork".*

The Buddy system is an enabler for brainstorming.

Sense-making is another dominant codes spring from the data. The rescue teams making sense of the situation through scene assessment. By utilization, their past knowledge and experience employees make sense of the situation. During the brainstorming and idea-sharing phase, rescue teams try to make sense of the situation. They reflect on past similar events and try to solve the current problem.

Interviewee 15 revealed one of the incidents of sense-making in the following words:

"The presence of the mind is necessary for performing our task. We got a call from the control room for a water rescue. When we were on location, a girl has already jumped into the river and in the middle of the river, she sat on the stone. We thought that she is now safe and planning to get her out of that situation. Meanwhile, she jumped again onto the river. Luckily, we had everything with us like a life jacket, rope, etc. we were four

employees at that time. She was sixteen years old. If I jumped to the area from where she jumped would be a futile attempt. I could not reach her in such a situation. So I ran along with the river and when I was ahead of her, I jumped into the river. Her angle was towards the shore and finally caught her hand and took her out of water".

Coordination is another important factor in tacit knowledge utilization. Coordination plays a vital role in improvisation. Employees coordinate with each other to get the job done. They require coordination from idea generation to the execution of the plan as it requires mental as well as physical efforts of the employees. An example of coordination has been mentioned above by interviewee 16. Interviewee 11 told about the importance of coordination in rescue teams as:

"When we go to the emergency, we assign tasks to each other. coordination is necessary for our job like one can be assigned a task to unfold hose and the other has to do firefighting".

4.6.2 Identification of the problem

Identification of the problem is an important step in unpredictable situations. It leads towards solutions otherwise it is very difficult to find a solution without finding a problem. Organizations try to find a problem before going for a viable solution. Problem identification help in seeking alternatives to get a solution. In rescue operations, rescue workers first try to find the problem before trying to reach some conclusion. For finding a problem, rescue teams use a specific term "Scene assessment". Through scene assessment, rescue teams try to find problems. Like in the Fire incident, they assess the seat of the fire. It is very easy for them to extinguish the fire if they come to know about the seat of the fire. Otherwise, they spend a lot of time to extinguish the fire without knowing the location of the fire. They find the seat of fire through getting information from the first responder (eyewitnesses) or through sense-making and collective intuition which is critical for tacit knowledge utilization. For example, if the home is set on fire, rescue teams try to search for a kitchen because it is most probably the cause of the fire. Similarly, for improvisation, the identification of the problem is most important. If the problem is being identified, then the team would be able to see whether they need to improvise or they can

handle it with pre-existing routines and with the resources at hand. Interviewee 3 describe the problem identification process as:

"During the fire emergency, we do scene assessment and try to find the seat of the fire. Things get under control when we find the seat of the fire. Our experience, knowledge, and from eyewitnesses we find the seat of fire".

In the same manner, Interviewee 14 described the situation as:

"There was another fire case we had confronted with and is still unforgettable. If I reflect on that situation, I wondered how we did it. There were 17 oil tankers. Taliban came there and opened bullets fire on oil tankers. These were NATO oil tankers. Five oil tankers were blown up but twelve oil tankers were saved. Different rescue vehicles were moved to the incident place. It took almost one and a half hours to reach the destination. We were surprised to see the situation. It was a huge fire. Security guards were killed who were on duty. We assessed the situation and planned according to the situation. As five oil tankers caught fire. Through the mud and soil, we set up a barrier between the oil tankers so that fire could not be spread anymore. This way we saved 12 oil tankers after 12 hours of firefighting."

Here the rescue teams identified the problem that they have to save other oil tankers and reach the decision that a bar has to be created among the oil tankers for that fire should not be spread further. That bar was made of soil and mud. Interviewee 11 describe how they can apply their tacit knowledge in a problem-solving situation in the following words:

"*We make plans regarding the type of emergency and categories of fire by using our past expertise and knowledge. As different types of fire need different kinds of activities. If a fire is caught in flammables liquids (petrol etc.), then we use AFFF (Aqueous film forming foam) fire extinguisher because foam makes a seal over the liquids and stops further re-ignition. As three elements are needed to ignite the fire that is; heat, fuel, and oxygen. If we remove oxygen from the surrounding then fire becomes extinguish, this process is known as smothering. So according to situations, we deal it".*

Hence, the rescue team's experience, observation, and sense-making (Tacit knowledge) assist in improvisation through problem identification.

4.6.3 Nature of Emergency

The nature of emergency has emerged as a dominant code consistently. These interviewees described that every emergency is different which increases the horizon of their experience. Accumulation of experience means that employees have much knowledge and expertise related to their domain. The nature of the emergency affects the level of improvisation. The rescue employees who had spent various emergencies exhibits spontaneity in times of crisis. Interviewee 1 explained the nature of the emergency in the following words:

"First of all, every emergency is different in its nature. Every emergency gives new insight and new experience. It gives us new thinking and insight. We go to the emergency location to assess the situation. Firstly, we comprehend what kind of fire it is. Either it is a large scale fire or small scale fire. Whether should we control it with which types of hose. This all depends on the situation. From situations to the situation, we use our knowledge to tackle the emergency effectively".

The minor level of improvisation happens when the team improvises within existing processes. During the observation, it has been noted that the emergency room has a bell. This bell has three meanings for field staff. If the bell slightly rings, it means that a road accident has occurred. With this bell, the medical staff goes to deal with the emergency. Similarly, if the bell rings for a longer time means that there is a fire emergency and firefighters would go for firefighting. In the same vein, In the same vein, if the bell rings repeatedly which signifies that dread rescuers will go for handling the situation. As every single minute is important for the organization the emergency room comes up with this minor improvisation.

In a highly complex situation, employees altogether rely on novel actions. Novel actions are produced if the employees possess a high level of experience and practical knowledge. Interviewee 2 described such situations in the following words and explained how they handled that specific situation.

"For example, In Sharoot near Thana, a boy jumped into the river for a bath during summer and drowned. On location, we found that there was no place to run the boat, and also it was impossible to take the boat inside. In such a situation, we gathered a few rods and tires tubes to build a boat. We got Bamboo poles from a nearby place to look for a dead body. We attached a sickle at the end of the bamboo to make a hook so that we could find the corpse easily. Doing one and half hour activity, we were unable to get the body out of water. As the dead body gets stuck with anything down the river. A slight touch on the dead body through bamboo helps to raise the body from the surface of the water. One of our experienced employees reached the location. He collected a few basics information about the boy such as from where he jumped in. Through a handmade boat and bamboo, he got the dead body out of water. He told us that you people were unable to get the body because you put the bamboo straight into the river. As this river has a high flow so you need to put the bamboo a slight vertical to the ground so that it could reach the surface of the water. He took only ten minutes to get the task done.

Interviewee 6 stated about the nature of the emergency in The fire incident cases as:

"We the dread rescuer and firefighter in emergency cases sit on the vehicle as soon as we receive a call from the emergency center. We wear personal protective equipment in the vehicle. Verbally we do not need to decide on the vehicle. Upon reaching the location, we assess the scene and nature of the fire. Whether it is A class fire, B class fire, or C class fire. Through cylinder and dry chemical powder, we extinguish the fire. Class a is all about the fire on solid materials such as wood, paper, etc. Class B - fires involving flammable liquids such as petrol, diesel, or oils. Class c fire is about the fire in electrical appliances and cannot be extinguished with water. We do not have time to take time and to make a decision. In seconds, we decide roles to do the job".

In short, the nature of the emergency has a great impact on the level of improvisation. Various level of improvisation needs a various degree of improvisation. For high and complex situations need a higher level of knowledge and expertise. Tacit Knowledge is utilized in each level of improvisation at the same time new knowledge is being created at the same time. It can be concluded that the higher the level of complexity higher the level of tacit knowledge is required as a result high level of improvisation can be achieved. This has been

endorsed by the researchers in their study that improvisation can be achieved by the real-time combination of knowledge (Weick, 1998; Cunha et al., 1999; Vera & Crossan, 2005).

4.6.4 Resource Constraints

Resource constraints are another dominant codes of this study. Rescue teams improvise when they face resource constraint situation. The resort on improvisation during such a situation. Resource constraints include lack of technology, lack of material resources such as machinery, tools, and apparatus required during an emergency, and lack of time. In such a situation, employees rely on resources at hand or resources around them. Interview 3 stated:

"If we talk about resources, it is a separate question that at government level what resources are available. But the majority of the situations are unexpected. Now, natural resources if they are available we exploit them. Natural resources, for example, anchor point when we are ascending or descending from a hill then the most important thing for us is the anchor point with which we tie our ropes and reach the exact point. If we are in such a situation where no anchor point is available. if a tree is nearby we can treat it as our anchor point. A pillar could be our anchor point".

Interviewee 2 explained how they deal with resources constraint situation during an emergency where they made a boat with the available resources at hand.

In the same vein interview 11 described a situation of improvisation in the following words:

"A person was trapped under the bridge. He fixed him with a broken pillar of the bridge. The situation was like to provide safety to him while keeping our-self safe. We have to make a seat harness. We make it through the rope. We do not have time to call for an ambulance or to take help. So we decided to take a seat harness through rope and D ring".

Interviewee 1 stated about the resource constraint situation and how they improvised in such a situation in this way:

"Once we got a call. our main motive is to save a life whether human or animal. a lamb has fallen inside the boring. We went to the ground. Then we found that it was 50 to 60 feet deep and 1.5 feet wide. Now from the point of view, we didn't have any such equipment to deal with that. Luckily there was a construction site nearby. Then we got steel-bars from them. We constructed a hook from a steel bar and dropped it with a rope bind to it. And we pulled out the lamb safely".

The most important resource constraint is time in an emergency. The rescue teams have time pressure to deal with an emergency. Due to time pressure, they do not call back to the emergency room for more resources. They exploit the resources at hand if it is manageable for them. Time is a crucial element that is why planning and execution happen simultaneously which is an important definition of improvisation according to Moorman and Miner. Interviewee 11 described another example of improvisation by utilizing the existing resources in the following words.

"On one more occasion, the bridge was collapsed due to a natural calamity. we had to carry an appendicitis patient to the hospital. It involved a high-risk task. There was no proper road to walk. We made a bridge through the crane ladder. This ladder was available in our organization. we crossed the area by crawling on the ladder. In eight years of experience, we faced a lot of situations.

Based on the above result, this study has formed a research framework which has been shown in fig (4.13)

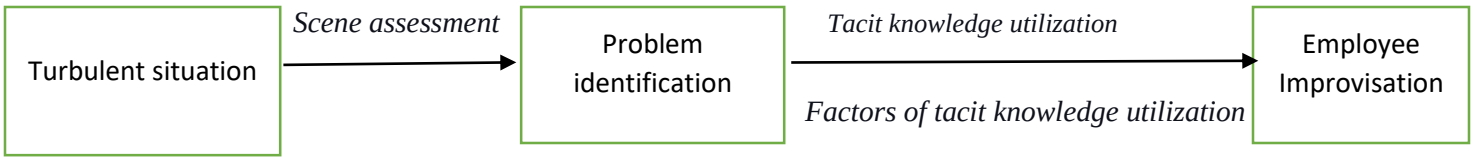
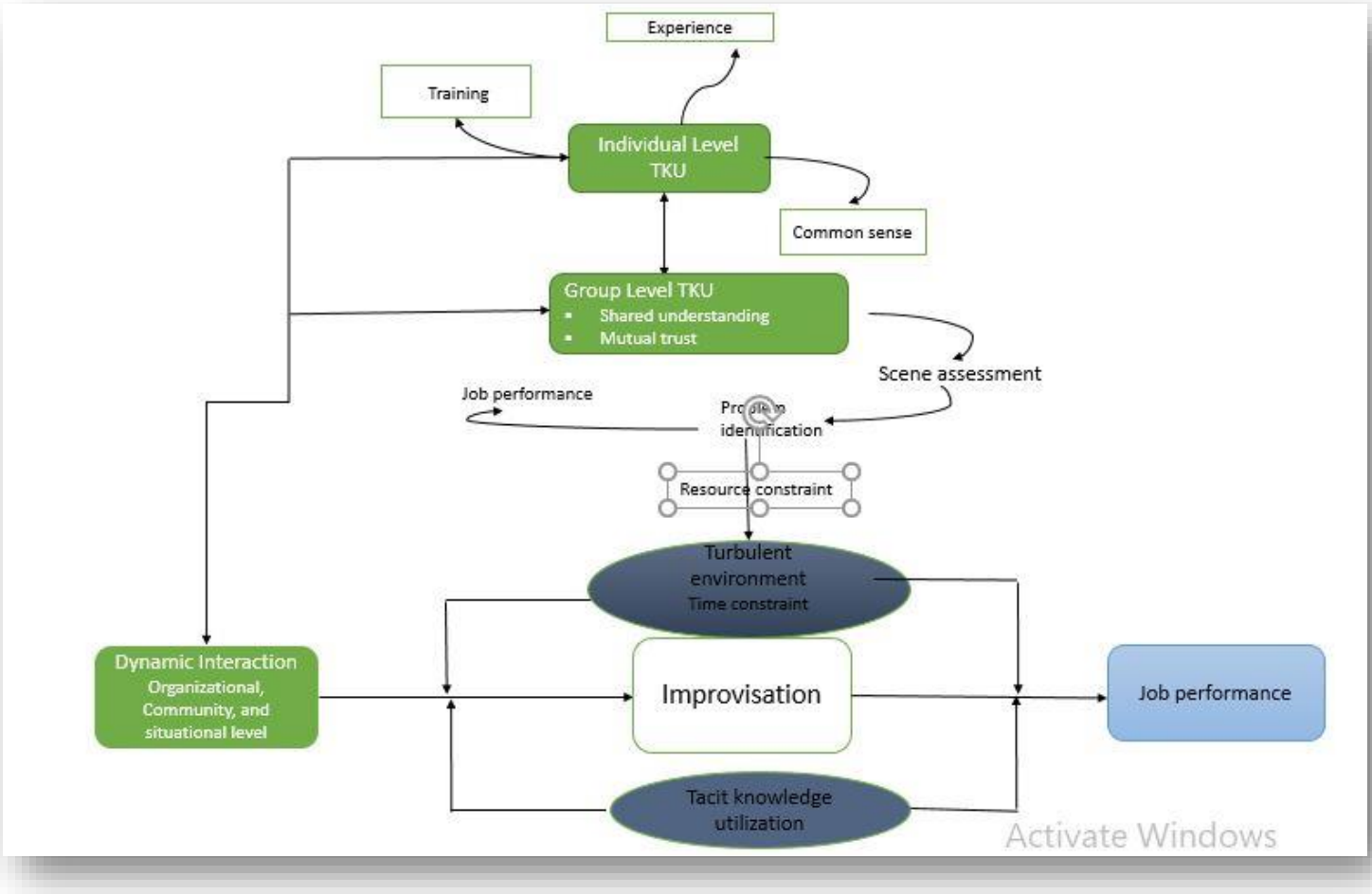


Fig 4.12 Research Framework

a comprehensive model has been developed in order to get a clear picture of the whole study that is shown in Fig (4.13**)**



Tacit knowledge utilization in rescue teams in Turbulent Environment Fig 4.13

The study has developed five categories which are Individual level TKU, Group level TKU, Communal level TKU, Organizational level TKU, and Situational level TKU. The aforementioned individual categories are interlinked with each other. Individual level factors help employees to utilize their tacit knowledge when they are performing their duty as a teammate. As a result, dynamic interaction takes place between the stakeholders where all the stakeholders utilize and share their knowledge and expertise according to the situations. If the rescue workers face time and resource constraints during turbulent and complex situation they resort to improvisation.

The prerequisite for improvisation in rescue organizations are time constraint, resource constraint (Immobility of resources and unavailability of resources) and turbulent environment.

Chapter 05. Discussion and Analysis

Knowledge has been divided in many ways but Nonaka and Takeuchi (1995) divided knowledge into two types: tacit knowledge and explicit knowledge. Tacit knowledge is considered as unspoken wisdom accumulated through observation and experience in the hearts and minds of employees over the period (Katoma and Hendrix,2014). It is hard to recognize and difficult to communicate. Despite utilizing the tacit knowledge in daily routines yet individuals are unaware of its presence (Ball and Gotsill,2014). Tacit knowledge is important for organizational success because it contains the skills, expertise, and experiences of the employees which become a source of competitiveness (Gloet & Samson, 2016). Organizations lost such competitiveness if knowledge is hoarded by employees (Bhattacharya et al., 2019). That is why organizations need to foster such an environment that accelerates the creation and utilization of knowledge (Newman & Newman, 2015; Gonzalez, 2016). Knowledge utilization and transfer occur in an ad hoc manner in today's organization. It occurs through feedback, advice, and in everyday conversation among employees (Becker & Gassmann, 2006). It is very difficult to establish the utilization of knowledge in an organizational setting (d'Aspremont & Bhattacharya,2000). That is why it is imperative to acknowledge different factors of knowledge utilization (Dier et al., 2017). The following paragraph will highlight the important factors of tacit knowledge utilization.

Factors identified in this study are; individual level, group level, organizational level, communal level, and situational level factors of tacit knowledge utilization. Individuals need to have a certain characteristic to utilize

their tacit knowledge in emergency cases. Sense-making, common sense, emotional stability, and trust in one's skills. Emergency employees face such situations where routine practices do not work. They need to make sense of the situation based on their past experiences. In such a situation, employees focus on certain cues because they cannot focus on everything. Making sense is an important individual characteristic because in an emergency there are information problems such as inaccurate, unreliable, and delayed information to respond to the situation. Employees use their knowledge to respond to the emergency when facing a lack of information (Muhren et al., 2010). An employee who does not trust his skills cannot perform rescue functions because it is a matter of people's life and property. Longstaff & Yang (2008) opined that trust is an important factor in an emergency case. Employees who are naive lack trust as a result they are unable to utilize their past knowledge (Training knowledge) in a real-time scenario. Having a lack of experience in emergency employees become nervous are the barriers to tacit knowledge utilization. With the passage of time and experiences employees overcome fear and nervousness. One of the important individual factors of TKU is the commitment of employees. Employees who are emotionally attached to their organization are most likely to share and utilize their tacit knowledge (Lin, C.P, 2007). Rescue workers are committed to their job because of the greater cause and therefore, exert their utmost efforts to save people's lives and property. Moreover, the emergency team either need to possess certain idiosyncratic characteristics or need to obtain such characteristics with time to perform nerve-racking task calmly. Such characteristics have emerged from the data which are common sense, emotional stability, commitment, and trust in one's skills. Certain compassioning traits are also prerequisites to perform their job by putting their utmost efforts on the task in hands such as feelings for others, protection of people's lives, and the property, being a member of a collectivist society.

When this individual-level characteristic of employees combines, as a team member, foster certain antecedents to process their past knowledge and experience in real-time situations. These antecedents are coordination, mutual trust, employee cohesiveness, and an amiable employee attitude. To utilize individual knowledge and expertise in a team requires coordination. Past studies have found a positive relation between team

coordination and knowledge utilization (Faraj & Sproull, 2000; Michinov et al., 2008). Heterogeneity of knowledge and the people who possess knowledge need coordination for the firm's success (Antolli, 2006; Moon,2011). According to Reagans et al (2016), a high level of coordination in teams leads towards a high level of knowledge utilization. They went on to say that such teams where coordination is high performing better than those teams where there is a low level of coordination. Rescue teams start coordinating with another when they receive an emergency call in the emergency room. During coordination employees do brainstorming by acquiring relevant information and process that information during idea generation for solving the problem at hand during an emergency. Antolli, (2006) described that heterogeneity of knowledge and the people who possess knowledge needs coordination and minimal structure for the firm's success. According to Moon (2011) Governance structure consists of quasi-hierarchies, constructed interactions, and coordinated relations for the exposition of knowledge.

This coordination mechanism engenders an amiable employee attitude and mutual trust. Mutual trust is an important element in emergency teams. It is a prerequisite for collaboration in an emergency as employees are risking their lives during emergencies (Kapucu,2006). According to Longstaff & Yang (2008) trust improves coordination and communication in emergency and lack of trust enhances the need for preparedness before an emergency. The pre-planned activities do not work in an emergency case.

Sometimes organization nurtures certain behaviors in teams through giving job autonomy, lack of hierarchy, Flexi works hours (duty shifts), an amiable work environment that fosters coordination, an amiable employee attitude, and mutual trust among employees. Coordination is necessary for the sharing of tacit knowledge in uncertain situations. Employees are open to sharing tacit knowledge when there are intrinsic or extrinsic motivations. In rescue cases, the intrinsic motivation of rescue workers is to save humanity.

There are two reasons for the lack of organizational hierarchy in a rescue organization. One of the reason is that the organization is newly formed and lack organizational structure. In Pakistan, the government has strict hierarchies under which employees perform their functions. The second reason is that employees perform their job in real-time situations. In such a situation, employees do not receive orders based on hierarchy. They perform

their job as a team. They choose one leader during the planning phase of the task so that he will take follow-up whether things going in the same direction which they have planned. Any member can become a team leader in such situations. The third reason is that all the field employees share the same living room irrespective of their ranks during office hours where they share stories and personal life matters. These employees have built a personal level of rapport with each other. They share the same living room because of a lack of infrastructure. Lack of hierarchy engenders fellowship among the employees. The outcomes of lack of hierarchy are amiable employee attitude and informal conversation which leads towards group cohesiveness.

The organization even allows employees to exchange their duties because the organization does not want to increase its cost. For example, if an employee wants to go home due to any reason, he can ask his colleague to perform his duty. This inculcates a fellow feeling and amicable work environment among these employees. The organization has adopted another mechanism to avoid employee shortage during an emergency. The work environment fosters employee creativity. Employees who are working in an environment that has a formal structure, routinized task, strict hierarchies, and regulations do not exhibit creative behaviors (Dul & Cevlan, 2011). Support of the work environment is necessary for generating new and useful ideas (Woodman et al, 1993; Amiable et al., 2005). Resource (material and immaterial) availability is also an important factor for TKU. Rescue employees carry certain resources according to the nature of the emergency which helps in the utilization of their tacit knowledge. Lack of hierarchy, exchange duty, job autonomy, and resource availability at the organizational-level factors that help employees utilize their tacit knowledge in the form of coordination, communication, and mutual trust, in an emergency.

There are multiples reasons that the organization takes helps from the community. One of the reasons is that being the first respondent, the community provides initial information on which organization takes action accordingly. Pakistan being a collectivist society, people by themselves try to help the emergency team. Emergency teams sometimes needed them if there are few emergency staff. Accelerating the community response in emergency teams is a critical factor (King,2007). Collaboration and interaction with the community increase

community response. This coordination and interaction generate community response as a result chaos of emergency would be directed into focused efforts (Dandoulaki & Halkia, 2010). Emergency employees engage with community members formally and informally. Formally, they engage with them during awareness sessions. Being a member of the same community, they develop informal engagement with them. Dominant codes of family "community" emerged during the study were; community involvement, coordination with community, and emotions of the people. The emotion of people who are in distress triggers employees to utilize their knowledge to help the people and take them out of such a situation. Thus, community involvement helps in the utilization of employee's tacit knowledge by giving them firsthand information and lend their helping hand when field staff is less during the emergency. Employees keenness to help the community by utilizing their experience and observation during the turbulent situation because of the personal level of rapport with them.

This study has found some factors that halt employees from utilizing their tacit knowledge. The factors which are a hindrance to tacit knowledge utilization are; unusual expectation from rescue employees, mob gathering, and unnecessary information from the community. People dial rescue numbers for petty issues like drainage issues, etc. unnecessary information during emergencies by giving their feedback and interrupt them during their job performance. These employees are accustomed to such a situation and they filter such information based on their common sense. Rescue teams sometimes call the police to disperse mob gatherings if they could not able to perform their duty. Therefore, it means that community involvement offers both positive and negative effects on tacit knowledge utilization. The positive effects overweight the negative effects as the community is the source of the first respondent and provides real-time information.

Rescue teams confront different situations during emergency dealing. Some of the situations might be complex in nature. These situations are unusual due to vague information, time constraint, resource constraint, and resource immobility. These situations push employees to use their knowledge, experience, and sense-making skills to handle the situation. Situational factors help employees to bring forth their tacit knowledge which could become explicit in the form of their actions. Such situational factors in an emergency make employees proactive, and

creative. Employees utilize their tacit knowledge when there is vague information, limited resources, and infrastructure. During such a situation, employees try to understand the situation by doing the scene assessment. They utilize their common sense and intuition to identify the problem. Gilgit is located in a mountainous region where employees sometimes unable to carry the required resources. They rely on their past knowledge and skills to handle the situation by relying on improvisation. Another situational problem is resource constraints. Resource constraint includes time constraint, immobility of resource and, lack of technology. As time is critical in rescue activities. Employees need to make decisions under time pressure (Mendonca & Fiedrich, 2006; Vera & Crosssan, 2005). Because of the time pressure they cannot call for required resources and try to use resources at hand or take help from the resources available in nearby places. The rescue activities require immediate response and therefore they need to perform a task under time pressure (Mendonca et al., 2001). In Pakistan, rescue teams do not operate GPS to locate the incident area. Alternatively, the organization recruits local drivers as they are familiar with the locations. In traffic congestion, they can adopt alternative routes to reach their destination. They also know the timings of traffic congestion and avoid those routes in times of emergency based on their experience.

Situational factors are also interlinked with other categories such as individual, group-level factors, organizational, and communal level factors. For instance, it has been observed that in unusual situations employees become more involved in decision making to serve humanity which increases their level of coordination. This finding is consistent with the past research of Mendonca & Fiedrich, (2006). In the same vein, getting misinformation during the initial call, field employees had to rely on the community to get a holistic picture of the situation such as asking for the seats of fire from the eye-witnesses. That is why situational factors trigger more outcomes rather than just getting a solution to the problem.

5.1 Improvisation

In Today's turbulent environment, organizations utilize knowledge as an important tool for adaptation, existence, and increased performance (Singala et al 2007). Wang et al (2015) described that organizations' activities are centered around performance because it ensures the exploitation of organizations existing resources both tangible and intangible assets to attain its goal. Different stimuli trigger an employee to resort to improvisation by utilizing their tacit knowledge in a non-profit organization (experience and practice). One of the stimuli for improvisation was resource constraint. Resource constraint does not mean exclusively unavailability of resources. Sometimes resources are not being carried to the location due to various reasons such as unavailability of roads or due to terrain of the location, etc. Time constraints and lack of technology are another resource constraint where employees have to decide because of the nature of the emergency. Due to resource constraints, employees bring in use of their past experience and knowledge (tacit knowledge) and try to make sense and get a solution through available resources at hand. These findings are consistent with past studies. According to Leybourne, (2010)

when improvisation occurs quick actions are needed as there is little chance to move additional resources and thus employees have to rely on the available resources (Cunha et al., 1998). From the available resources employees need to create required resources to face unusual obstacles through experiential and practical knowledge that has been acquired by watching, listening, and experiencing (learning by doing) by oneself (Cunha,2005; Johannisson & Olaison 2007).

It is concluded that during an unexpected and unusual situation in the absence of resources employees have to count on their practical and experiential knowledge to handle the situation. The rescue department lacks technological facilities and they are not as equipped as rescue organizations in western countries. The organization does not well equipped in technology and even do not have a navigation system in their vehicles. The Organization has the alternate choice to cope up with such a situation. For example, they recruit local drivers in their teams as

they know every nook and corner of the place. If rescue teams receive an emergency call, these drivers know the place and location. It has rarely happened that they were unable to find the location. Even these drivers know the alternative routes during traffic rush hours. It has been observed once we went to the emergency location. It was around 2 pm. The driver took us to the street. Upon asking why he chose this road. He said it is school off time and main road. There would be a lot of rush and will take more time.

However, few studies suggested that slake of resources are needed for improvisation. According to Senyard et al (2014), slack resources encourage managers to depart from previous plans and considers improvisation as an accelerator. It is true in the case of manufacturing context or any other context but in the presence of slack resources, the need for improvisation doesn't arise in rescue teams. However, it does not mean that no resource is required for improvisation. In rescue cases, they need basics resources to perform emergency tasks such as vehicles and fire extinguishers for firefighting. In a time, constraint environment, employees rely on their tacit knowledge to control the situation. Required information is available with employees because they have a specific problem at hand and gather relevant information during scene assessment. According to Josh and Ratten (2016), timely available information enables employees to improvise effectively. However, they viewed information provision as an organizational activity but in rescue, information is gathered by team members. They gathered relevant information based on their experience and knowledge at the spot. Based on that information they utilize their tacit knowledge to create new knowledge to deal with the situation at hand in compressed time.

Past studies have also explained the sense-making process in crisis (Maitlis & Sonenshein; Klein., et al,2010; Weick, 1995;). According to Klein et al (2010), sense-making is the process in which a team exerts its efforts to understand the current situation and to anticipate the future situation specifically in an unusual situation. According to them, sense-making co-creates knowledge. Rescue teams making sense of the situation by assessing the scene, process the relevant information through brainstorming to reach appropriate decisions. Therefore, Roux-Ddufort et al (2003) stated that lack of coordination and interaction among team members is an impediment for sense-making and prevents improvisation.

Sense-making, buddy system, coordination, and brainstorming are the important factors of socialization where the interplay of employee's tacit knowledge leads towards improvisation. Socialization means that group members come closer to each other to understand and devise the solution according to the situation (Von Krogh et al.,2000). According to Nonaka's SECI model, socialization is the transfer of tacit to tacit knowledge among team members through meetings and brainstorming. The codes originated from the data help in utilizing tacit knowledge for the completion of tasks as well as for improvisation. In a difficult situation, rescue workers need to think for out of the box solutions. Therefore, they coordinate and brainstorm to reach a certain conclusion. During brainstorming, employees share their ideas. They create shared mental models and collective minds through the sharing of ideas, interaction, and coordination. Sharing of ideas, brainstorming, and coordination proved to be vital for improvisation in the rescue team. Vera and Crossan (2005) argued that negotiation and coordination among team members lead to good improvisation. In a similar vein, Rankin et al (2013) stated that communication and coordination increase improvisation. The capability to improvise needs recombination of collective knowledge, the recreation of knowledge in real-time (Vera & Crossan; Weick, 1998). The shared understanding is deeply rooted in repeated practice (Zollo & Winter, 2002). Team members have multiple mental models related to the task, technology, and equipment and their adaptation to certain situations highlights their shared understanding (Mathieu., 2000). Leybourne et al (2006) claimed in their study that intuition which is deep-rooted in expertise is an antecedent of improvisation.

During critical situations, the individual differences are set aside by the employees because they develop common goodness among themselves. Common goodness arises in such situations because they are gathered for saving people's lives and their property. Erden et al (2008) described that in football teams the team players set aside their egoistic behavior for collective success. The rescue team does not have pre-determined roles and rules because of unusual and unpredictable situations. Unusual situations are one of the dominant aspects of the study. Therefore, these employees do not have predetermined rules and roles except for a few standard operating procedures (SOPs). As it has been mentioned earlier that rescue workers do not follow the hierarchy to get orders.

As it has been already discussed that job autonomy and lack of organizational structure in the category "organizational level factors of tacit knowledge utilization". Past studies have also endorsed that minimal structures give opportunity and permission to employees to perform their job according to the situation. The minimal structures enable employees to perform their job efficiently and make a room for improvisation (Sonenshein, 2014; Bingham & Eisenhardt,2014; Cunha et al., 2010)

Rescue workers themselves decide how to deal with certain situations. This has been asserted by Crossen (1998) that there is no predetermined rules and roles in improvisation According to them, spontaneity and intuition (sense-making and gut feelings) are the important dimensions of improvisation as well as a critical factor for tacit knowledge utilization. Therefore, a group needs to develop a collective mind through socialization to improvise in uncertain and unpredictable situations (Erden et al.,2008). According to them, the highest quality of tacit knowledge leads to improvisation. It means that improvisation is the outcome of a high level of group tacit knowledge (GTK). They defined GTK as:

"The ability of the group to act with collective mind and collective body". Hence it concluded that socialization help in sharing the tacit knowledge among team through coordination, brainstorming, and sense-making which leads towards improvisation. However, it is to be noted that two teams having the same situations may reach different outcomes because of the quality of tacit knowledge. team characteristics such as cohesiveness, team communication, and contextual influences greatly impact team improvisation (Moorman and Miner,1998a; Cunha et al., 1999). Two factors affect the quality of tacit knowledge which are "variety of individual experience and knowledge of that experience" (Sander, 2004).

Chapter 06. Conclusion

This study has focused on tacit knowledge utilization in a turbulent environment. Research has been conducted to get the answer to the following two questions:

- What contextual factors influence tacit knowledge utilization in a turbulent environment?
- How tacit knowledge utilization leverages improvisation in a turbulent environment having inadequate resources?

To conduct research, a Qualitative research methodology has been adopted. Data is collected through observation and semi-structured interviews. For Thematic analysis, ATLAS.ti have been used for data analysis. The study has revealed that tacit knowledge utilization is important in a turbulent environment because employees need to deal with the situation by using their past experience and knowledge. The results revealed that individual, organization, communal, and situational factors are critical factors for tacit knowledge utilization in a turbulent environment. In a turbulent and uncertain environment employees coordinate with all the concerned stakeholders to mitigate the uncertainty. Rescue employees resorted to improvisation when all the predetermined rules and roles become ineffective due to the nature of the emergency, time, and resource constraints. In such a situation, employees utilize their knowledge which is deeply rooted in specific incidents and context to handle the situation by coordination and creation of new knowledge.

6.1 Research Implications

This study has enriched the existing literature by exploring the contextual factors of tacit knowledge utilization in rescue teams. Previous studies have focused on the contextual factors of explicit knowledge (documented knowledge) **(**Cheuk et al., 2017; Teerajetgul et al.,2008; Nonaka & Takeuchi,2004). Past literature has shown a positive relationship between documented knowledge and improvisation in an empirical study

(Nisula & Kianto documented, (2015) while there is a paucity of research on tacit knowledge utilization and improvisation.

Knowledge provides a competitive edge to the organization because of the knowledge and expertise of the employees. Individuals utilize their tacit and explicit knowledge in their routines within organizations. Employees try to achieve organizational goals through their knowledge and skills. The knowledge of employees serves as a strategic resource, therefore organizations need to keep and motivate knowledge experts in their firms. These experts in return help the organization to achieve its objectives. Management should create an environment that fosters trust and encourages knowledge sharing and utilization for performance. Their interaction assists them to perform the difficult task. This study has found interesting insights into the phenomenon of tacit knowledge utilization for managerial implications. The work environment plays an instrumental role in the utilization of tacit knowledge. Employees utilize and share their knowledge when they have common good for the utilization of knowledge. The organization which fosters mutual trust, an amicable work environment, employee autonomy in their respective domain will gain the benefit of employee's tacit knowledge utilization and can reduce knowledge hoarding among them. Employees improvised when the organization provides a shared understanding of the situation, giving them job autonomy and create fellow feelings among employees. Moreover, the Organization where change is unpredictable need to recruit people who exhibit certain characteristics which are needed for improvisation.

6.2 Research Limitation and Future Research Direction

This study has a few research limitations. Therefore, it is imperative to take care while generalizing the results. The findings are specific to developing country (Pakistan) and centers around a rescue organization that may not reveal realities of other organizations. Moreover, this study has collected data by opting a purposive data

collection technique that is not free from certain research biasness. There is a little chance of unintentional personal biasness regardless of appropriate measures.

This study has employed a single case study with a longitudinal research design. Multiple case studies over a longer period of time will help to understand tacit knowledge utilization and improvisation across the different organization in future research. Quantitative study can be conducted through surveys and questionnaires for the generalizability of the results and findings. Future studies can be conducted to give a holistic picture of tacit knowledge utilization and improvisation in a technologically advanced developed nation. We suggest, future research should explore the phenomena in other organization setting such as product development, R&D, oil and gas, and forensic labs because in such setting tacit knowledge and employee's expertise play an important role. . The study has been conducted from a developing nation perspective. Future research can be performed in technologically developed countries to get more nuanced results and findings. The link between tacit knowledge and other creative behaviors such as innovation and employee creativity are understudied in the literature. Therefore, future research can be conducted on the aforementioned topics because tacit knowledge (employee's expertise) is critical for such behaviors.

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08. Appendices

Interview Guide

Can you please tell us the main factors that compel you to use your previous knowledge and experience to address a specific incident/situation?

Please elaborate on how do you and your teams respond to a certain call of emergency?

Please tell me about how do you address/cope with uncertain situations?

In your view do you feel any difference in dealing with the emergency as compared to your initial year of experience?

What are the main factors that influence decision making in an emergency and what are the reasons for the way you address the situation?

Being a member of the rescue team, what is the role of trust in your task performance?

How do you coordinate and to whom with you coordinate to resolve the emergency?

How much autonomy do you have in your job?

How much organizational support do you get at times of emergency?

Does the community perform any role in the utilization of your tacit knowledge?

Do you remember any situation where you did Joggard (Improvisation) to handle the situation?

As rescue works in a team so what is the role of teamwork in your case?

Pictures

Rescue team try to utilize resources from nearby place to make improvised bridge. Picture A

Another picture of improvisation. From crane stairs they made a bridge to carry patient. Community is around rescue team

Glimpse of coordination

Employee cohesivenss: sharing the same room

Informality among employees